VSP3041

EN

INSTRUCTIONS
VSP INSPECTION SYSTEM

> TROTEC

TROTEC

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Information on the use of these instructions

Symbols

Warning of electrical voltage
This symbol indicates dangers to the life and health of persons due to electrical voltage.

Warning
This signal word indicates a hazard with an average risk level which, if not avoided, can result in serious injury or death.

Caution
This signal word indicates a hazard with a low risk level which, if not avoided, can result in minor or moderate injury.

Notice
This signal word indicates important information (e.g. material damage), but does not indicate hazards.

Info
Information marked with this symbol helps you to carry out your tasks quickly and safely.

Follow the manual
Information marked with this symbol indicates that the instructions must be observed.

You can download the current version of the instructions and the EU declaration of conformity via the following link:

VSP3041

https://hub.trotec.com/?id=43120

Safety

Read this manual carefully before starting or using the device. Always store the manual in the immediate vicinity of the device or its site of use.

Warning
Read all safety warnings and all instructions. Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury. **Save all warnings and instructions for future reference.**

- Do not use the device in potentially explosive rooms or areas and do not install it there.
- Do not use the device in aggressive atmosphere.
- Do not use the device in atmospheres containing oil, sulphur, chlorine or salt.
- Protect the device from permanent direct sunlight.
- Only use the device in de-energized facilities and objects. For reasons of safety, de-energize all plant components and objects prior to every inspection.
- Before using the measuring probes and camera heads, de-energize any circuits located in walls.
- Before using the measuring probes and camera heads in metal pipes inside a wall, have an authorised specialist company carry out a check to ensure that the metal pipes are not electrically charged.
- For reasons of safety, do not use the measuring probes and camera heads for inspections in moving parts.
- Do not open the device.
- Do not remove any safety signs, stickers or labels from the device. Keep all safety signs, stickers and labels in legible condition.
- Observe the storage and operating conditions (see Technical data).

Intended use

Only use the device for the visualization of objects.

To use the device for its intended use, only use accessories and spare parts which have been approved by Trotec.

Any use other than the intended use is regarded as misuse.

Reasonably foreseeable misuse

Do not use the device:
- in potentially explosive atmospheres
- in live environments
- in unsuitable liquids, e.g. acids and alkalis
- on people or animals

Do not use the control unit with display underwater.

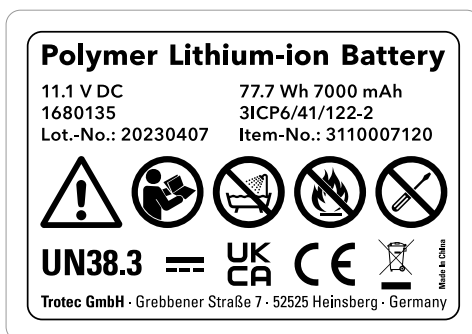Any unauthorised modifications, alterations or structural changes to the device are forbidden.

Personnel qualification

People who use this device must:
- take measures to protect themselves from direct contact with live parts.
- have read and understood the instructions, especially the Safety chapter.

Safety signs and labels on the battery

Observe the label attached to the battery with the following warnings:

Polymer Lithium-ion Battery

11.1 V DC	77.7 Wh 7000 mAh
1680135	3ICP6/41/122-2
Lot.-No.: 20230407	Item-No.: 3110007120

UN38.3 ⎓ UK CA CE

Trotec GmbH · Grebbener Straße 7 · 52525 Heinsberg · Germany

Made in China

Safety symbol	Meaning
⚠	This symbol indicates that you must be aware of the dangers that can occur when working with the battery.
📖	This symbol indicates that the operating manual must be read before using the appliance.
	Do not let the battery come into contact with water! Avoid direct moisture. There is a risk of explosion!
	Do not expose the battery pack or tool to fire or excessive temperature! Do not let the battery come into contact with fire! Avoid direct solar radiation. There is a risk of explosion!
	This device may only be repaired and serviced by the manufacturer. Any unauthorised modifications, alterations or structural changes to the device are forbidden. Risk of injury due to electrical voltage. Damage to the device may occur.

Residual risks

Warning of electrical voltage
Risk of death due to electric shock!
An electric shock can result in severe personal injury or death! The device may only be used in accordance with all safety instructions listed here.

Warning of electrical voltage
Electric shock due to contact with live parts! Do not touch any live parts. Secure neighbouring live parts by covering them or by switching them off.

Warning of electrical voltage
There is a risk of a short-circuit due to liquids penetrating the housing!
Do not immerse the device and the accessories in water. Make sure that no water or other liquids can enter the housing.

Warning of electrical voltage
Work on the electrical components must only be carried out by an authorised specialist company!

Warning of explosive substances
Do not expose the batteries to temperatures above 60 °C! Do not let the batteries come into contact with water or fire! Avoid direct sunlight and moisture. There is a risk of explosion!

Warning
Risk of suffocation!
Do not leave the packaging lying around. Children may use it as a dangerous toy.

Warning
The device is not a toy and does not belong in the hands of children.

Warning
Dangers can occur at the device when it is used by untrained people in an unprofessional or improper way! Observe the personnel qualifications!

Caution
Lithium-ion batteries might catch fire in case of overheating or damage. Ensure a sufficient distance to heat sources, do not subject lithium-ion batteries to direct sunlight and make sure not to damage the casing. Do not overcharge lithium-ion batteries. If the battery is not permanently installed in the device, only use smart chargers that switch off automatically when the battery is fully charged. Charge lithium-ion batteries in due time before they are discharged completely.

⚠️ **Caution**

Keep a sufficient distance from heat sources.

Notice

To prevent damages to the device, do not expose it to extreme temperatures, extreme humidity or moisture.

Notice

Do not use abrasive cleaners or solvents to clean the device.

Information about the device

Device description

The device VSP3041 serves for inspecting concealed machine components and poorly accessible or inaccessible hollows.

A high-resolution camera and a moveable camera head with an adjustable, bright LED illumination are available for the display and capturing/recording of images and videos. The supplied camera head VSP-H41M is connected to the push-cable drum VSP-R30 and modularly also to the mobile control unit VSP Control. The supplied camera head can be exchanged for other optional Trotec camera heads.

The camera's functions can be controlled via the mobile control unit VSP Control. Using the provided snap-in system, the mobile control unit can be affixed to the rear of the supplied push-cable drum.

A digital metre counter with partial distance measurement function is integrated in the push-cable drum.
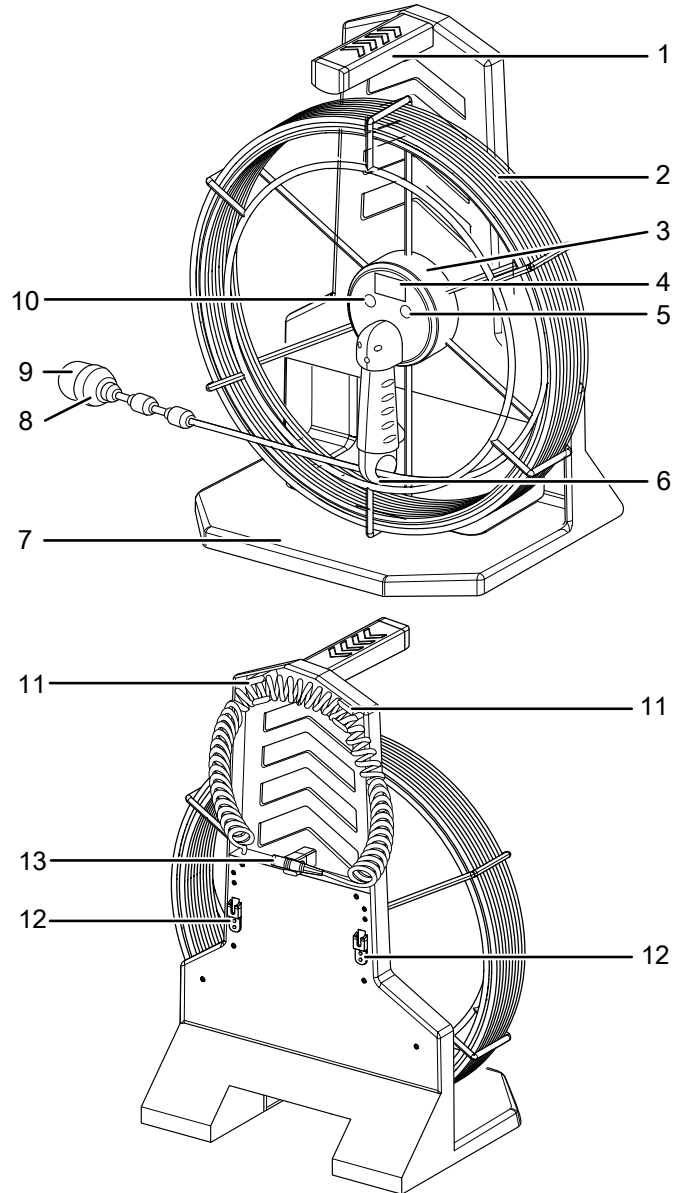
The functions of the device VSP3041 can be controlled via the integrated operator software of the VSP Control.

The recordings and measurements can be stored on an SD card and transmitted via a USB interface.

The set can be extended with further optional components of the VPS inspection system as required.

Device depiction

Push-cable drum and camera head

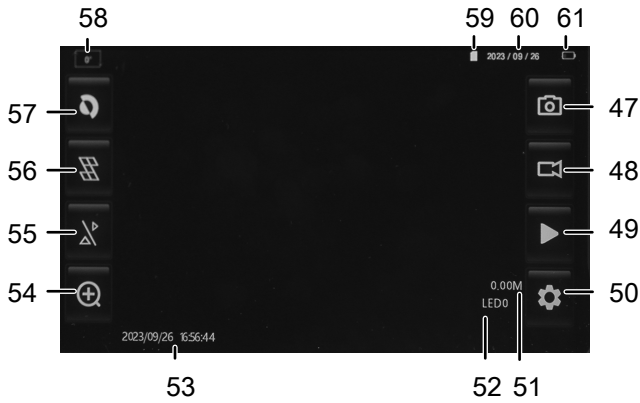| No.	Designation
1	Carrying handle push-cable drum
2	Push cable
3	Un-/reeling aid
4	Digital metre counter
5	*Section* button
6	Coiled cord brake
7	Foot
8	Exchangeable camera head
9	Plastic protective cap
10	*Clear* button
11	Coiled cord holder
12	Snap-in system for attaching the VSP Control
13	Multi-connector for the VSP Control

Control unit VSP Control
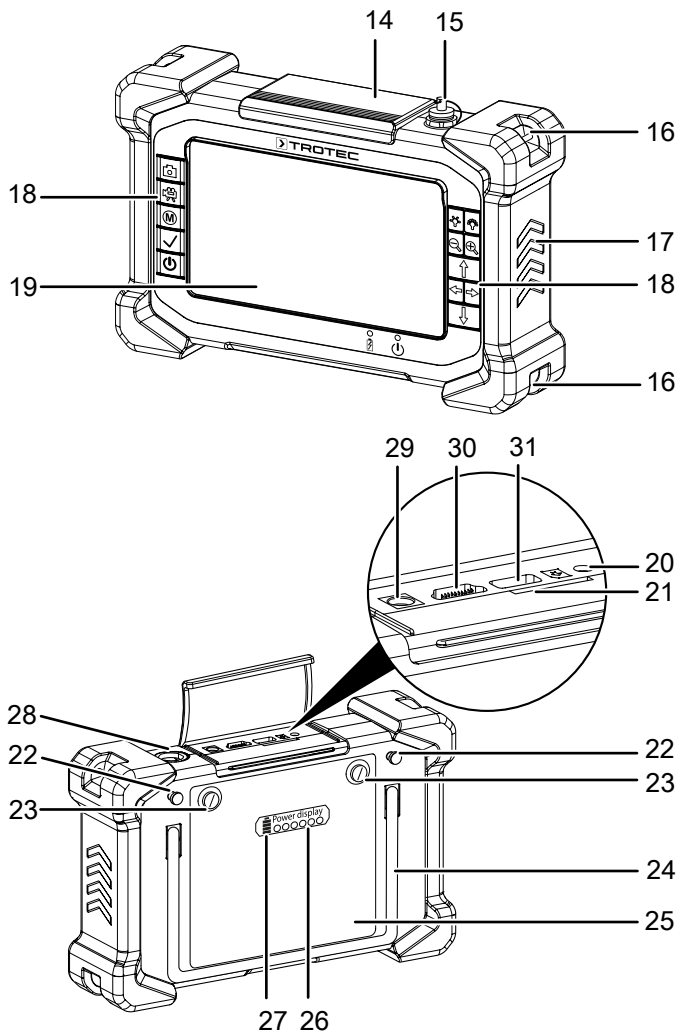
No.	Designation
14	Protective flap
15	Sealing cap multi-connector socket
16	Wrist strap holder
17	Rubber protectors
18	Control panel
19	Display
20	Audio connection
21	SD card slot
22	Standoff for snap-in attachment to the push-cable drum
23	Battery attachment screw
24	Fold-out stand
25	Battery
26	Battery level indication
27	Battery test button
28	Multi-connector socket with protective cap
29	Power adapter connection
30	HDMI port
31	USB connection

Operating elements
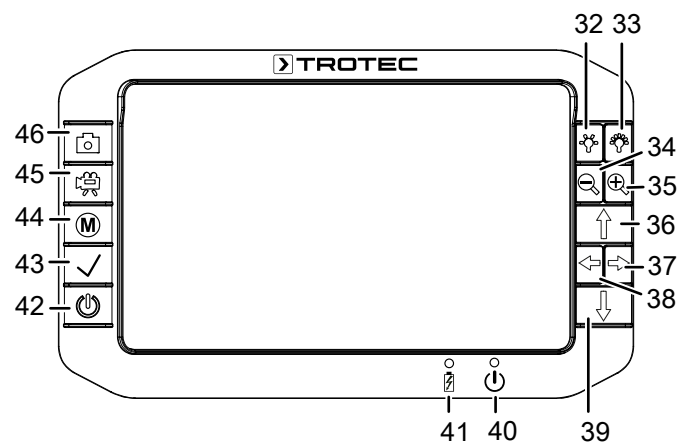
No.	Designation	Meaning
32	*Minus brightness* button	For reducing the illumination intensity at the camera head
33	*Plus brightness* button	For increasing the illumination intensity at the camera head
34	*Minus focus* button	For focussing on close objects
35	*Plus focus* button	For focussing on distant objects
36	Arrow button *up*	For moving the camera head up
37	*Right* arrow button	For moving the camera head to the right
38	*Left* arrow button	For moving the camera head to the left
39	*Down* arrow button	For moving the camera head down
40	Operation indicator	Is illuminated in red when the device is switched on.
41	Charging indicator	Is illuminated in red when the device is charging.
42	*Power* button	Switching the device on and off
43	*Confirm* button	For confirming the selection / opening the browser for recordings
44	*Menu* button	For opening / closing the menu
45	*Video* button	For starting / stopping a video recording
46	*Photo* button	For taking a photo

Display

No.	Designation	Meaning
47	*Photo* display button	For taking a photo
48	*Video* display button	For starting / stopping a video recording
49	*Play* display button	Opens the browser for photo and video recordings
50	*Settings* display button	Opens the menu
51	*Metre counter* indication	Indicates metre reading
52	*LED* indication	Indicates the number of activated LEDs (0 – 12)
53	*Time stamp* indication	Date and time printed on recordings
54	*Zoom* display button	Zooming in
55	*Dual Vision* display button	Switch between camera views (depending on the probe version)
56	*Grid* display button	Show/hide grid
57	*Negative* display button	Invert display colours
58	*Rotation* indication	Indicates whether the display has been rotated
59	*Memory card* indication	Indicates whether the memory card is activated
60	*Date* indication	Indicates the current date
61	*Battery status* indication	Indicates the charge status of the battery

Technical data

Parameter	Value
Control unit VSP Control	
Article number	3.110.007.110
Display brightness control	manually adjustable
LCD display	7 inch TFT LCD (1280 x 720 px)
Type of protection	IP64
Memory	slot for removable SD card (max. 64 GB)
File formats	image format JPEG (1024 x 768), video format AVI (640 x 480 [4:3] or 800 x 480 [16:9])
Power supply	11.1 V lithium polymer battery pack (7,000 mAh, charging time 8 h), power adapter
Interfaces	USB, SD card slot, HDMI, multi-connector socket for push-cable camera, borescope and videoscope
Dimensions (W x H x D)	257 x 171 x 64 mm
Weight	1.74 kg
Physical characteristics	rubberized operator keypad, lateral rubber protectors, wrist straps, fold-out stand, integrated battery capacity indication
Control software	
Operator guidance	simple interactive menu control
Available menu languages	German, English, French, Italian, Dutch, Danish, Finnish, Portuguese, Russian, Spanish, Chinese, Korean, Japanese, Turkish
Software functions	system settings, video settings, memory functions

Parameter	Value
Push-cable drum VSP-R30	
Article number	3.110.007.115
Push cable	
Dimensions	length 30 m, ø 5.4 mm
90° bend flexibility	lines ≥ 135 mm
Protection type of the camera head connection	IP67
Type	Fibreglass-reinforced
Drum	
Dimensions (H x W x D)	515 x 405 x 200 mm
Weight	6.5 kg

Parameter	Value
Camera head VSP-H41M	
Article number	3.110.007.130
Diameter	ø 41 mm
Length	60 mm
Resolution	1,000,000 pixels
Focus	manual
Illumination	12 LEDs
DOF	15 mm to ∞
Field of vision	> 75°
Pivoting radius	180°
Rotation	360°
Type of protection	IP67
Watertightness	to a depth of 1 m
Material	Stainless steel probe with plastic dome

Parameter	Value
Transmitter VSP3041	
Article number	3.110.007.140
Transmission frequency	512 Hz
Modulation method	FM
Max. transmission power	45 mW
Range	5 m*
Dimensions	length 66.8 mm, ø 21 mm

*The range may vary depending on the receiver and the surface/material to be penetrated.

Scope of delivery

- 1 x VSP Control with Li-ion battery
- 1 x Push-cable drum VSP-R30
- 1 x Camera head VSP-H41M
- 1 x Transport case
- 1 x SD card
- 1 x USB cable (type A-A, for the connection of a compatible external monitor)
- 1 x HDMI cable
- 5 x Spare protective cap for camera head VSP-H41M
- 1 x LCD cleaning cloth
- 1 x Plug-on anti-glare shield
- 1 x Domed protective cage for camera head VSP-H41M
- 1 x Guide ball
- 1 x Tool for disconnecting the camera heads
- 1 x Charger
- 1 x Manual

Further information on spare parts and accessories is available via the following link:

https://hub.trotec.com/?id=43120

Transport and storage

> **Notice**
> If you store or transport the device improperly, the device may be damaged.
> Note the information regarding transport and storage of the device.

Transport

For transporting the device, use the transport case included in the scope of delivery in order to protect the device from external influences.

The supplied Li-ion batteries are subjects to the requirements of dangerous goods legislation.

Observe the following when transporting or shipping Li-ion batteries:

- The user may transport the batteries by road without any additional requirements.
- If transport is carried out by third parties (e.g. air transport or forwarding company), special requirements as to packaging and labelling must be observed. This includes consulting a dangerous goods specialist when preparing the package.
  - Only ship batteries if their housing is undamaged.
  - Mask open terminals with tape and pack the battery in a way that it cannot move inside the packaging.
  - Please also observe any other national regulations.

Storage

When the device is not being used, observe the following storage conditions:

- dry and protected from frost and heat
- protected from dust and direct sunlight
- For storing the device, use the transport case included in the scope of delivery in order to protect the device from external influences.
- the storage temperature complies with the values specified in the Technical data
- Battery/Batteries removed during prolonged storage

Operation

Inserting the battery into the control unit VSP Control / exchanging the battery

> **Notice**
> Make sure that the surface of the device is dry and the device is switched off.

1. Loosen the two attachment screws (23) at the rear of the rechargeable battery (25) without removing them.
   ⇨ The battery can now be removed.
2. When inserting the battery, first place the locating tabs at the bottom of the battery into the designated openings at the rear of the device.
3. Now slightly press the top of the battery down and tighten the two attachment screws (23) at the rear of the battery.
   ⇨ The battery is inserted in the device

Inserting the SD card

1. Lift off the protective flap (14) at the top of the VSP Control.
2. Insert the SD card in the SD card slot (21).
3. Slightly press down the SD card until it engages.
4. Close the protective flap (14) again.

Connecting the control unit VSP Control to the push-cable drum VSP-R30 and attaching / removing it
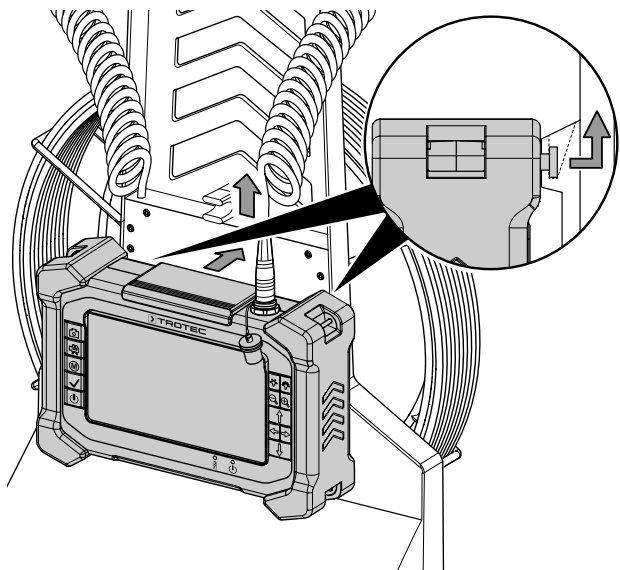
Please proceed as follows if you want to connect the control unit VSP Control to the supplied push-cable drum VSP-R30 and attach or remove it:

1. Pull out the sealing cap for the multi-connector socket (15) on the top of the VSP Control.
   ⇨ The sealing cap is attached to a wire on the control unit. Make sure that the plug is located on the display side and does not dangle at the rear of the VSP Control.

2. Plug the multi-connector (13) at the rear of the push-cable drum into the multi-connector socket (28) on top of the VSP Control so that it fits exactly.
   ⇨ Make sure that the red markings on the plug and socket are aligned and that the multi-connector engages firmly.
3. Lift the control unit VSP Control onto the snap-in system (12) at the rear of the push-cable drum VSP-R30. First press the control unit against the push-cable drum's rear panel, then downwards. The two standoffs for snap-in attachment (22) at the rear of the control unit VSP Control must engage with the two guide rails of the snap-in system (12).
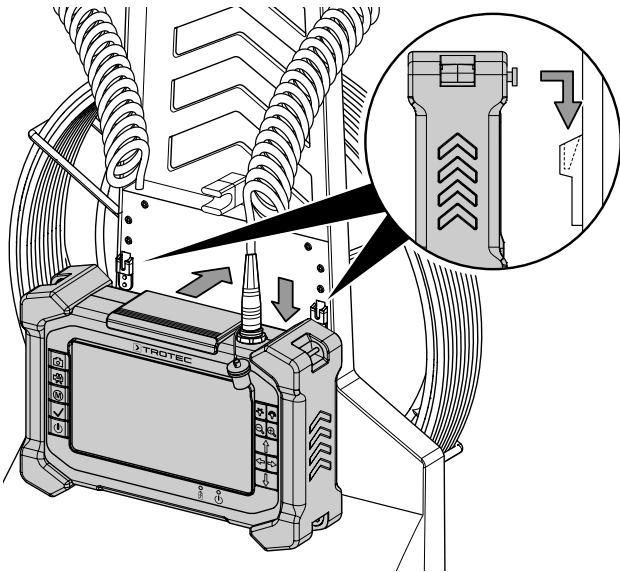
4. In order to detach the VSP Control, first press it against the push-cable drum, then upwards.


Connecting the camera head to the push-cable drum

You can connect the supplied camera head (or one of the optional camera heads from Trotec) to the end of the push-cable drum VSP-R30. Please proceed as follows to connect the supplied camera head VSP-H41M to the push-cable drum:

> **Notice**
> Only use the tool included in the scope of delivery to connect a camera head to the push-cable drum.

1. Unless already carried out upon delivery, first guide the push cable without camera head through the hole in the coiled cord brake (6).
2. Unreel the push cable (2) a little for better access to the end of the push-cable drum.
3. Lock the push cable with the brake as described in the section "Preventing the push cable from unreeling using the brake" to prevent further unreeling.
4. Manually screw the camera head's threaded connector clockwise onto the threaded connection at the end of the push cable.
5. To fasten the connection, apply the supplied wrench (62) just beneath the threaded connection of the push cable as depicted. Make sure that the wrench engages with the existing grooves so it cannot slip.
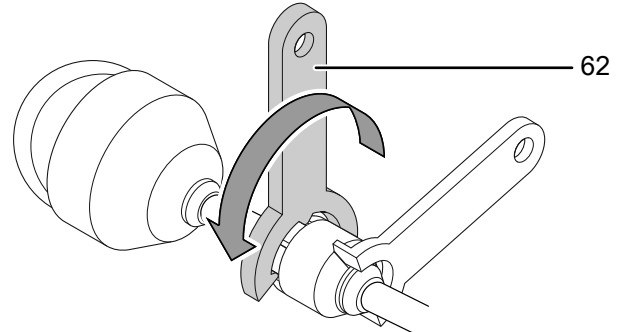
6. Apply the other supplied wrench to the threaded connection beneath the camera head and make sure that its teeth engage with the grooves under the threaded connection.
   ⇨ Turn the wrench until the camera head is fixed in place.
7. Also use the supplied wrenches as described to disconnect and possibly replace the camera head from the push-cable drum.

Preventing the push cable from unreeling using the brake

> **Notice**
>
> The push cable of the VSP-R30 push-cable drum is tensioned and can unwind unexpectedly. Use the coiled cord brake (6) if you do not want to unwind the push cable.

You can use the integrated brake (6) to prevent the push cable from unwinding unintentionally. To do so, please proceed as follows:

1. Turn the coiled cord brake (6) inwards so that the coiled cord can no longer be rolled off.
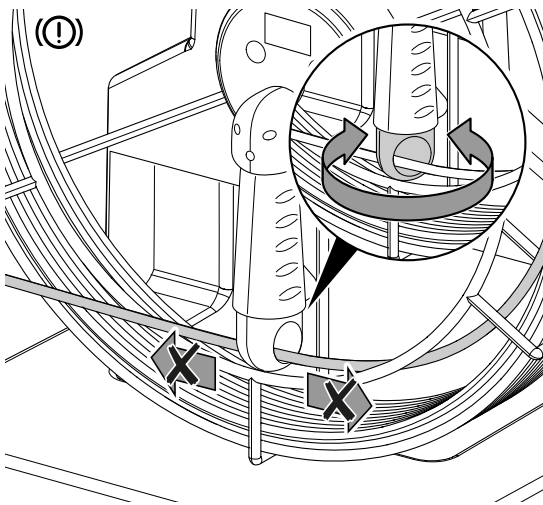
2. To release the coiled cord brake (6) turn it back into its initial position.

Using plastic protective caps

> **Notice**
>
> In order to prevent damaging of the device, never use the camera head VSP-H41M without one of the impact-proof and break-resistant plastic protective caps from the scope of delivery.

Unless already preassembled you should protect the camera head by mounting one of the supplied plastic protective caps as follows before every application:

1. Check the threading of the camera head for dirt and clean it if necessary.
2. Attach the plastic protective cap (9) to the camera head (8) and make sure that the threading does not get wedged. Screw the plastic protective cap down by hand.
   ⇨ Make sure that neither dirt nor moisture can enter the movable camera unit.
3. If the mounted plastic protective cap was affected too much by using the device resulting in too many scratches, replace it with a new one.

Mounting the domed protective cage to the camera head VSP-H41M

For additional protection of the camera head VSP-H41M and its plastic protective cap, it is possible to use a domed protective cage. Mount it as follows before use:

1. Carefully slide the domed protective cage (63) onto the camera head (I.) until the cage's teeth engage with the groove of the camera head.
2. Push the outer ring of the domed protective cage downwards (II.) in order to fasten it.
3. Now turn the outer ring (64) slightly counter-clockwise (III.) to protect the plastic dome from unintentional shifting.
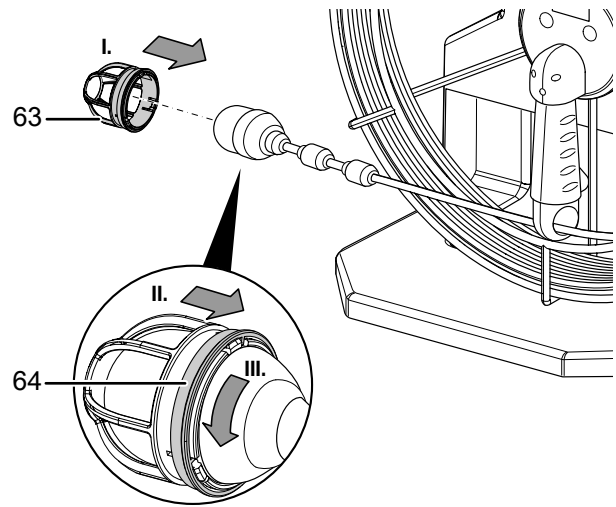
Using the guide ball

The guide ball makes it easier to centre the camera head in a pipe section. The guide ball also lifts the camera head above contaminations on the ground. Fit the guide ball as follows:

1. Open the guide ball (65) using the two corrugated blades (I.). To do so, press against the corrugated surfaces of the two blades simultaneously so that the tongue and groove of the retaining mechanism are pushed apart.
2. Place the open guide ball around the lower threaded connection between the camera head and the push cable (II.).
3. Close the guide ball (III.). To do so, press against the corrugated surfaces of the two blades simultaneously and then clip the tongue and groove together so that both halves of the guide ball are firmly hooked into each other again.
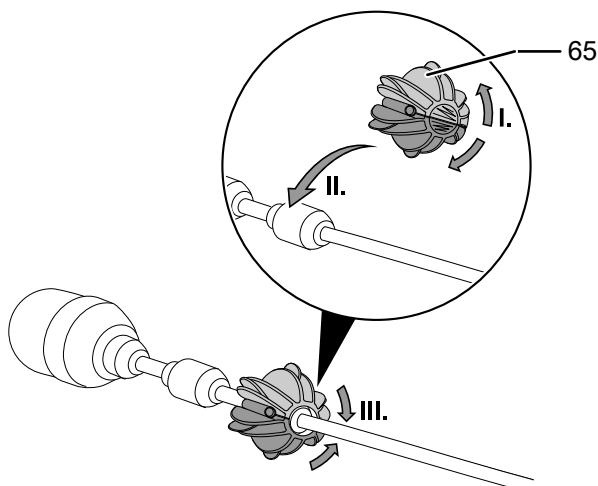
Using the anti-glare shield of the VSP Control unit

In order to ensure that the display of the VSP Control unit is clearly visible even in bright light, you can use an anti-glare shield. Fit the anti-glare shield as follows:

1. Push the groove of the anti-glare shield (66) onto the protruding bar that surrounds the display of the control unit.
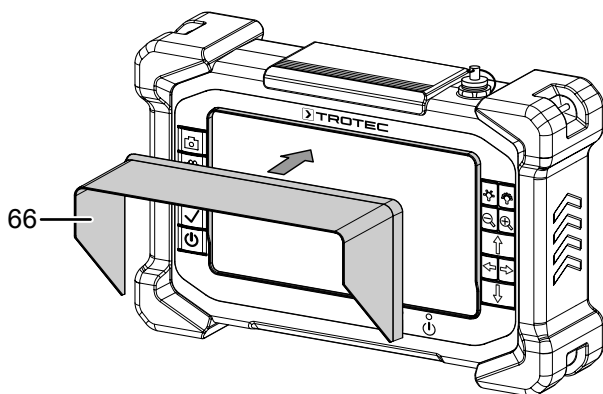
Switch-on / switch-off

1. Press the *Power* button (42) on the VSP Control unit for 3 seconds.
   ⇨ The welcome sound is emitted.
   ⇨ The operating elements at the device light up and the operation indicator (40) will be permanently illuminated in red.
   ⇨ If an SD card is inserted, a message appears indicating that the SD card has been successfully inserted.
   ⇨ The control unit VSP Control is now ready for operation.
   ⇨ If the camera is connected, the current recordings are displayed in the live image mode.
2. Press the *Power* button (42) for approx. 2 seconds to switch the device off again.
   ⇨ A melody sounds and the device switches off after a few seconds.

Aligning / moving / holding the camera

Please proceed as follows when using the VSP inspection system in combination with push-cable drum VSP-R30 and camera head VSP-H41M:

1. First connect the control unit VSP Control and the push-cable drum VSP-R30 by means of the multi-connector.
2. Switch the VSP Control on.
   ⇨ The LEDs of the camera head VSP-H41M light up.
   ⇨ The camera head's current image transmission will be indicated on the display (19) of the VSP Control unit.
3. Gently move the camera head towards the object to be examined.
4. Unreel the required length of push cable from the push-cable drum.
   ⇨ Read the currently unreeled length of push cable from the display (19) of the control unit VSP Control or from the digital metre counter (4) at the rear of the push-cable drum.
5. If necessary, prevent the coiled cord from unreeling any further during device operation by use of the brake (6) of the push-cable drum.
6. Use the arrow buttons (36–39) on the VSP Control to control the camera head VSP-H41M.
7. Via the brightness buttons (32, 33) you can regulate the brightness of the LEDs at the camera head VSP-H41M.
   ⇨ By pressing the *Minus brightness* button (32) repeatedly you can switch the camera head's LEDs off completely.
   ⇨ Press the *Plus brightness* button (33) to switch the LEDs on the camera head back on.
8. Using the focus buttons (34, 35) you can zero in on the object to be examined at the respective distance.
   ⇨ For focussing on close objects press the *Minus focus* button (34).
   ⇨ For focussing on distant objects press the *Plus focus* button (35).

Using the metre counter

The metre counter of the VSP inspection system VSP3041 can display the number of metres the push cable has been unreeled based on the position 0.0. This means the unreeled length is displayed immediately upon switch-on of the connected control unit VSP Control. Even if the push cable has already been unreeled a few metres, the metre counter always starts counting at 0.0 after switching on. Moreover, if the device is switched on already, the VSP inspection system VSP3041 can also start measuring the currently unreeled length of push cable from a freely selectable local zero point. Please proceed as follows to use the metre counter:

1. Unreel the push cable (2) and switch on the connected control unit VSP Control as soon as the metre counter shall start measuring from the standard zero point.
   ⇨ The metre counter measures the length of push cable unreeled and indicates the meterage both on the control unit's display (19) and on the digital metre counter (4) of the push-cable drum VSP-R30.
2. In order to additionally measure the number of metres of only a section starting from a freely selectable local zero point first press the *Section* button (5) on the push-cable drum VSP-R30.
   ⇨ The length of the measured section will only be displayed on the digital metre counter (4) of the push-cable drum VSP-R30.
3. Press the *Section* button (5) twice to delete a partial distance measurement.
   ⇨ Despite having deleted the measurement of the section, you can resume measuring the total distance.
4. To delete all the values measured by the metre counter press the *Clear* button (10) on the push-cable drum VSP-R30.

☞ **Info**
Pressing the *Clear* button (10) deletes the total distance measured and the partial distance of the metre counter.

Taking a picture

1. Press the *Photo* button (46) on the VSP Control unit.
   ⇨ The picture is taken and saved on the SD card.

Recording a video

1. Press the *Video* button (45).
   ⇨ The video recording is started.
   ⇨ A recording symbol and the recording duration appear on the display.
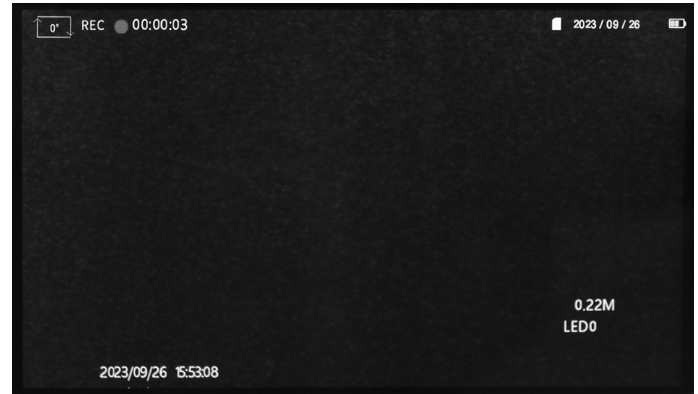
2. Press the *Video* button (45) again.
   ⇨ The video recording is stopped and saved on the SD card.

Viewing a photo or video recording

1. In the live image mode, press and hold the *Menu* button (44) for approx. 5 seconds.
   ⇨ The browser for recordings opens.
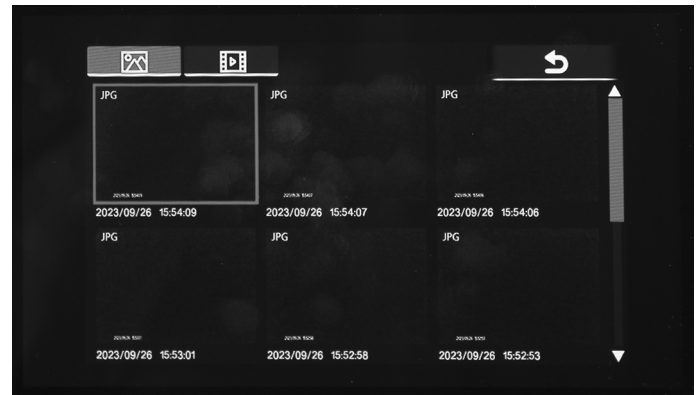
2. Press the *Menu* button (44) to switch between the browsers for photo and video files or tap the option on the display.
3. Use the arrow button (36 – 39) to navigate to the desired file or tap the file on the display.
4. Open the desired file by pressing the *Confirm* button (43) or tap it again on the display.
   ⇨ The photo or video file is opened.
   ⇨ You have the option of zooming in on image sections of photos, playing videos or deleting files.
5. Press the *Power* button (42) to return to the browser for recordings.
6. Press the *Power* button again (42) to return to the live image mode.

Using a transmitter (optional)
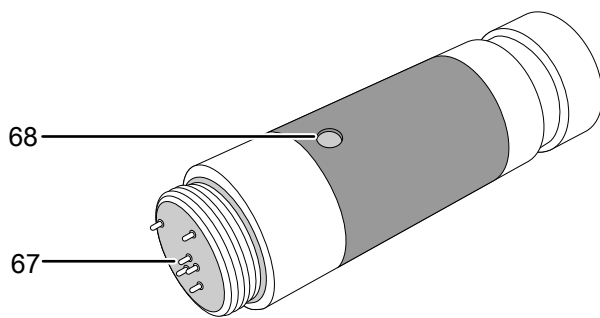
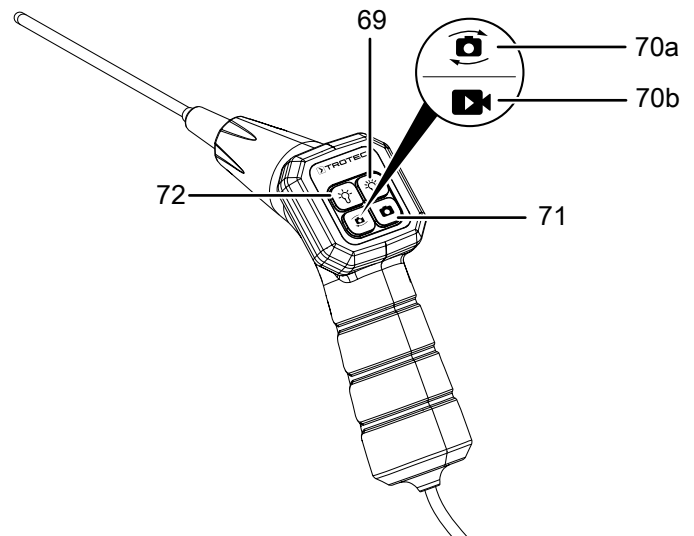| No.	Designation	Meaning
67	Contacts	Connecting contacts to the push cable
68	Transmitter LED	Is illuminated when the transmitter is switched on.

You can use the VSP Control unit with an optionally available radio transmitter from Trotec. It transmits the position of the camera head at the end of the push cable to a receiver, e.g. the Trotec SR-24 pipe detector. Please proceed as follows to use the optional transmitter:

1. Mount the transmitter between the push cable and the camera head. The contacts (67) point in the direction of the push cable end.
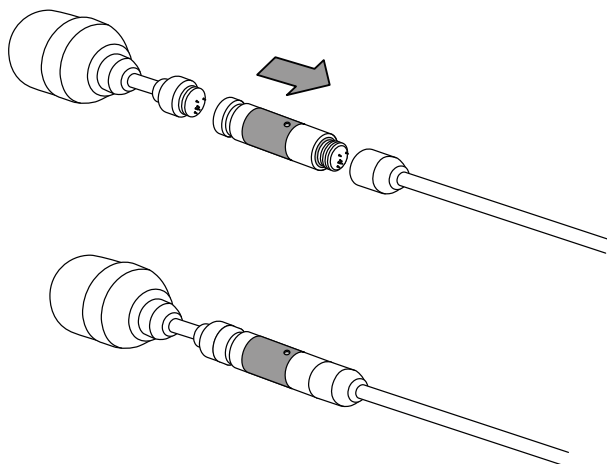
⇨ The transmission runs automatically as soon as the VSP Control unit is switched on and the transmitter is supplied with power.

⇨ The LED (68) is illuminated for as long as the transmitter is in operation.

2. To terminate the transmission, switch off the VSP Control unit.

Using the video borescope VSP-BS (optional)

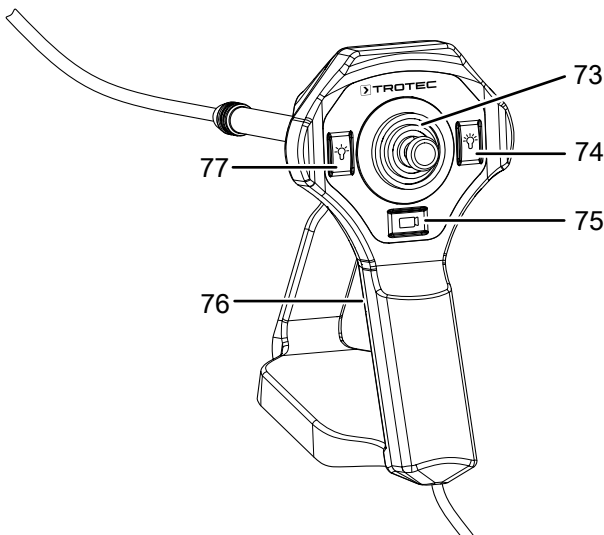| No.	Designation	Meaning
69	*Plus brightness* button	For increasing the illumination intensity at the camera head
70a	*Switch view* button	Switch between front and side view or dual camera view (depending on the probe version)
70b	*Video* button	Start and stop video recording (depending on the probe version)
71	*Photo* button	For taking a photo
72	*Minus brightness* button	For reducing the illumination intensity at the camera head

Notice

In order to prevent damaging of the device, never use the borescope probe to free an object from surrounding material or to pierce through material.

You can use the control unit VSP Control with various borescope probes optionally available from Trotec. These probes vary in diameter and are fitted with different cameras such as front-, side-view or dual camera. To use an optional borescope, please proceed as follows:

1. Plug the multi-connector at the connection cable of the borescope into the multi-connector socket (28) on top of the VSP Control.

2. Switch the VSP Control on.
   ⇨ The borescope can be controlled via the VSP Control and the buttons at the borescope.

3. Carefully direct the borescope at the object to be examined.

4. Adjust the brightness of the LEDs on the camera head of the borescope using the brightness buttons on the borescope (69, 72).

5. By pressing the *Minus brightness* button (72) repeatedly you can switch the camera head's LEDs off completely.

6. Press the *Plus brightness* button (69) to switch the LEDs on the camera head back on.
7. Press the *Photo* button on the borescope (71) or on the VSP Control unit (46) to take a photo.
   ⇨ The picture is taken and saved on the SD card.
8. If available, press the *Video* button on the borescope (70b) or on the VSP Control unit (45) to record a video with the borescope.
   ⇨ The video recording is started.
   ⇨ The recording time is shown on the display (19) for the duration of the recording.
9. Press the Video button (70b, 45) again.
   ⇨ The video recording is stopped and saved on the SD card.
10. If available, press the *Switch view* button (70a) to switch between the front and side view or dual camera view.

Using the video endoscope VSP-VS (optional)

| No.	Designation	Meaning
73	Joystick	Moving the camera head
74	*Plus brightness* button	For increasing the illumination intensity at the camera head
75	*Video* button	Start and stop video recording
76 (Rear)	*Photo* button	For taking a photo
77	*Minus brightness* button	For reducing the illumination intensity at the camera head

Notice

In order to prevent damaging of the device, never use the video endoscope probe to free an object from surrounding material or to pierce through material!

You can use the control unit VSP Control with various video endoscope probes optionally available from Trotec. To use an optional video endoscope, please proceed as follows:
1. Plug the multi-connector at the connection cable of the video endoscope into the multi-connector socket (28) on top of the VSP Control.
2. Switch the VSP Control on.
3. Carefully direct the video endoscope at the object to be examined.
4. The video endoscope's camera head can be controlled with the joystick (73).
5. Adjust the brightness of the LEDs on the camera head of the video endoscope using the brightness buttons on the video endoscope (77, 74).
   ⇨ By pressing the *Minus brightness* button (77) repeatedly you can switch the camera head's LEDs off completely.
   ⇨ Press the *Plus brightness* button (74) to switch the LEDs on the camera head back on.
6. To take a picture, press the Photo button on the video endoscope (76) or at the VSP Control unit (46).
   ⇨ The picture is taken and saved on the SD card.
7. Press the *Video* button on the endoscope (75) or the VSP Control unit (45) to record a video with the endoscope.
   ⇨ The video recording is started.
   ⇨ The recording time is shown on the display (19) for the duration of the recording.
8. Press the *Video* button (75, 45) again.
   ⇨ The video recording is stopped and saved on the SD card.

Software

The device has various setting options which can be accessed via an operator software.

The device can be operated using the buttons on the control panel (18) and the touch display (19). Tap on the display to indicate the buttons (47 – 61). The buttons disappear again after a few seconds of inactivity.
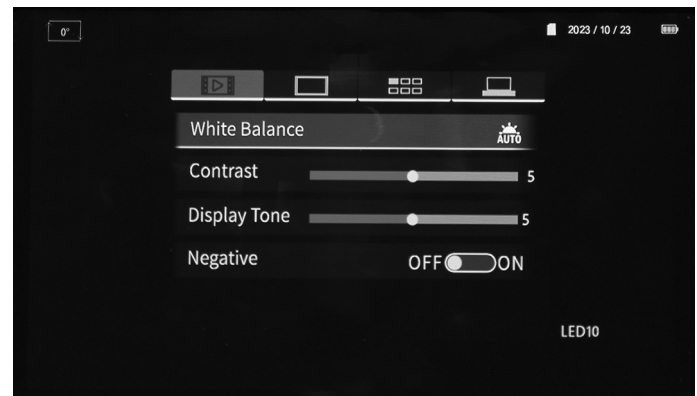
The main menu consists of four submenus allowing the adjustment of the basic device settings and of the photo/video settings.
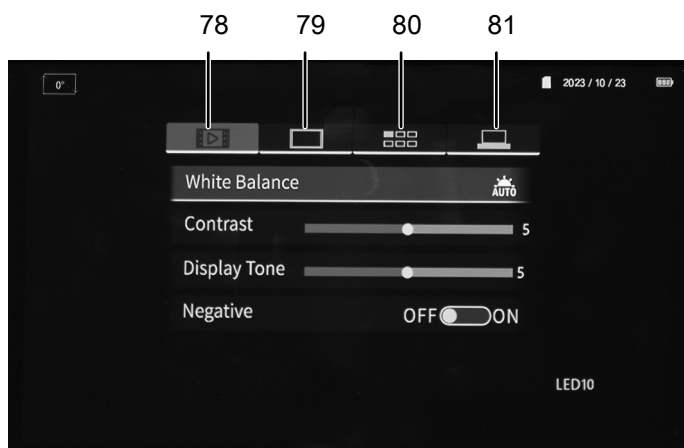
No.	Submenu
78	Recording settings
79	Display Settings
80	Application settings
81	System settings

1. Press the *Menu* button (44) or press the *Menu* button (50) on the display.
   ⇨ The menu will be displayed.
2. Press the *Menu* button (44) to switch between the submenus or tap the symbol of the desired submenu on the display.
3. Use the *Up* (36) and *Down* (39) arrow buttons to navigate to the desired setting or tap it on the display.
4. Make the adjustment.
5. Press the *Power* button (42) to close the setting or menu.

Recording settings submenu

The submenu offers the following options:

Setting	Function
White Balance	Select mode for white balance
Contrast	Set contrast for display
Display Tone	Set colour saturation
Negative	Invert colours

Setting the white balance
1. Navigate to the White Balance setting.
2. Press the *Confirm* button (43) or tap the setting on the display.
   ⇨ The selection options will be displayed.

3. Use the *Up* (36) and *Down* (39) arrow buttons to navigate to the desired setting or tap it on the display.
4. Press the *Confirm* button (43) or tap the setting on the display again.
   ⇨ The desired setting is adopted.
   ⇨ The menu is displayed again.

Contrast
1. Navigate to the Contrast setting.
2. Set the desired contrast using the *Left* (38) and *Right* (37) arrow buttons, or shift the slider on the display to the desired position with your finger.
   ⇨ The setting is applied immediately.

Display Tone
1. Navigate to the Display Tone setting.
2. Set the desired saturation level using the *Left* (38) and *Right* (37) arrow buttons, or shift the slider on the display to the desired position with your finger.
   ⇨ The setting is applied immediately.

Negative
1. Navigate to the Negative setting.
2. Press the *Confirm* button (43) or tap the slider on the display.
3. Alternatively, use the *Negative* display button (57).
   ⇨ The colour inversion is switched on or off.

**Screen settings submenu**

The submenu offers the following options:

Setting	Function
Brightness	Adjust the display brightness
Grid	Select grid to be displayed
Display Mode	Switching the dual camera view (optional) on and off
Rotation	Rotate the display by 180°

Brightness
1. Navigate to the Brightness setting.
2. Set the desired brightness level using the *Left* (38) and *Right* (37) arrow buttons, or shift the slider on the display to the desired position with your finger.
   ⇨ The setting is applied immediately.

Grid
1. Navigate to the Grid setting.
2. Press the *Confirm* button (43) or tap the setting on the display.
   ⇨ The selection options will be displayed.
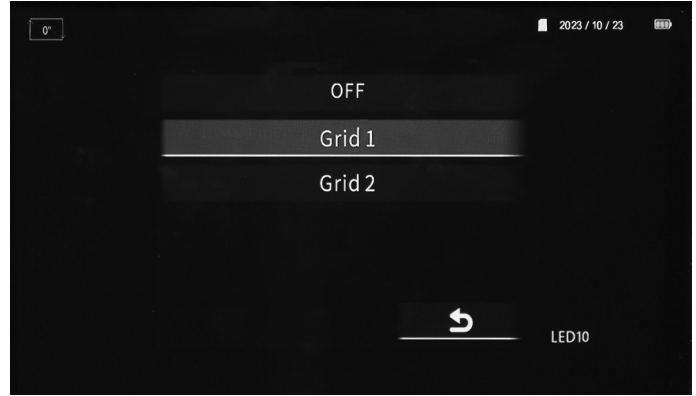
3. Use the *Up* (36) and *Down* (39) arrow buttons to navigate to the desired setting or tap it on the display.
   ⇨ You can select one of the grids or deactivate the function.
4. Press the *Confirm* button (43) or tap the setting on the display again.
   ⇨ The desired setting is adopted.
   ⇨ The menu is displayed again.
   ⇨ If a grid has been activated in the menu, it is shown or hidden when you press the *Grid* display button (56).

Display Mode
1. Navigate to the Display Mode setting.
2. Press the *Confirm* button (43) or tap the slider on the display.
3. Alternatively, use the *Dual Vision* display button (55).
   ⇨ The dual camera view is switched on or off (depending on the probe version).

Rotation
1. Navigate to the Rotation setting.
2. Press the *Confirm* button (43) or tap the slider on the display.
   ⇨ The display is rotated by 180°.
   ⇨ The rotation status is shown on the display (58).

Application settings submenu

The submenu offers the following options:

Setting	Function
Date and time setting	Setting the date and time
Language setting	Selecting the menu language
Sounds	For setting the sounds
Icon display	Show/hide symbols on the display

Date and time setting
1. Navigate to the Date and time setting.
2. Press the *Confirm* button (43) or tap the setting on the display.
   ⇨ The setting is opened.
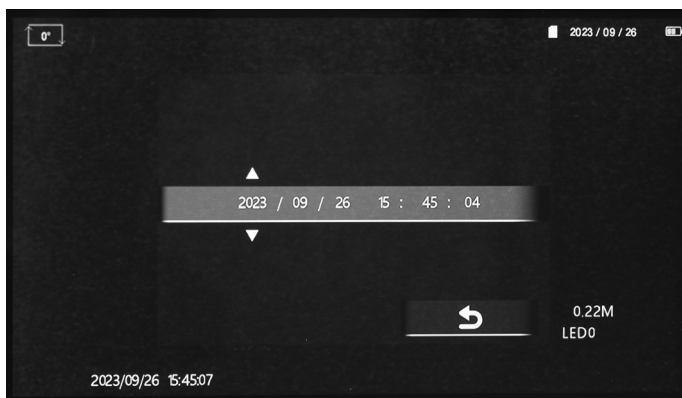
3. Use the *Up* (36) and *Down* (39) arrow buttons to make the relevant setting or tap the arrows on the display.
4. Press the *Confirm* button (43) to save the settings and return to the menu.
5. Press the *Power* button (42) to exit the setting without saving the changes.

Language setting
1. Navigate to the Language setting.
2. Press the *Confirm* button (43) or tap the setting on the display.
   ⇨ The selection options will be displayed.

3. Use the *Up* (36) and *Down* (39) arrow buttons or the arrows on the display to navigate through the list and scroll further.
4. Navigate to the desired language or tap it on the display.
5. Press the *Confirm* button (43) or tap the setting on the display again.
   ⇨ The desired setting is adopted.
   ⇨ The menu is displayed in the selected language.

Sounds
1. Navigate to the Sounds setting.
2. Press the *Confirm* button (43) or tap the setting on the display.
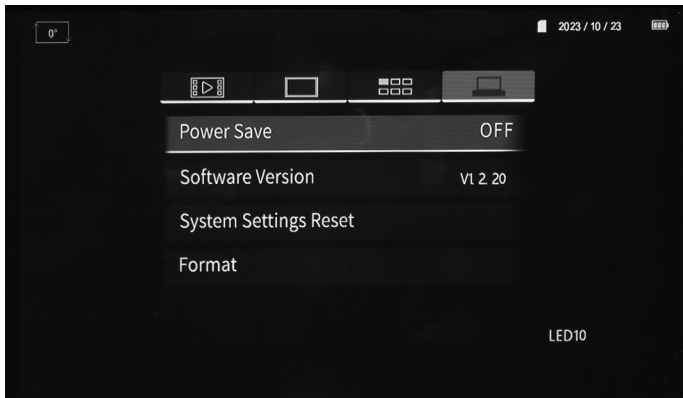   ⇨ The selection menu is opened.
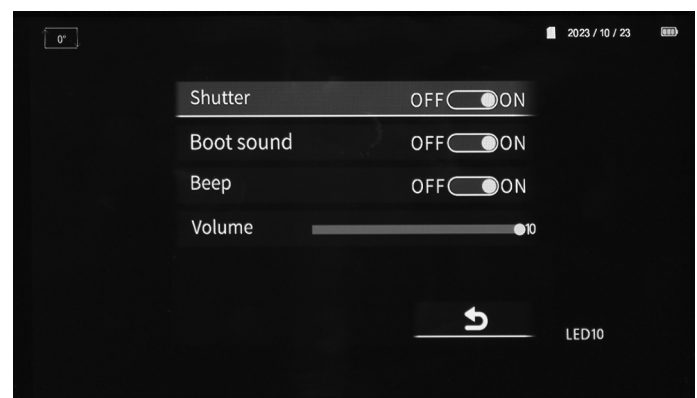
3. Use the *Up* (36) and *Down* (39) arrow buttons to navigate to the desired signal setting or tap it on the display.
4. Press the *Confirm* button (43) or tap the slider on the display.
   ⇨ The respective beep is switched on or off.
5. Navigate to the Volume setting.
6. Set the desired volume setting using the *Left* (38) and *Right* (37) arrow buttons, or shift the slider on the display to the desired position with your finger.
   ⇨ The setting is applied immediately.

Icon display

1. Navigate to the Icon display setting.
2. Press the *Confirm* button (43) or tap the slider on the display.
   ⇨ All symbols except for the timestamp are shown or hidden.

System settings submenu

The submenu offers the following options:

Setting	Function
Power Save	For selecting automatic shutdown to save energy
Software Version	Indicates the current software version
System Settings Reset	Reset system to factory settings
Format	Formats the SD card

Power Save

1. Navigate to the Power Save setting.
2. Press the *Confirm* button (43) or tap the setting on the display.
   ⇨ The selection menu is opened.

3. Use the *Up* (36) and *Down* (39) arrow buttons to navigate to the desired setting or tap it on the display.
4. Press the *Confirm* button (43) or tap the setting on the display again.
   ⇨ The setting is applied immediately.
   ⇨ The device switches off automatically after the set time if no input is detected.
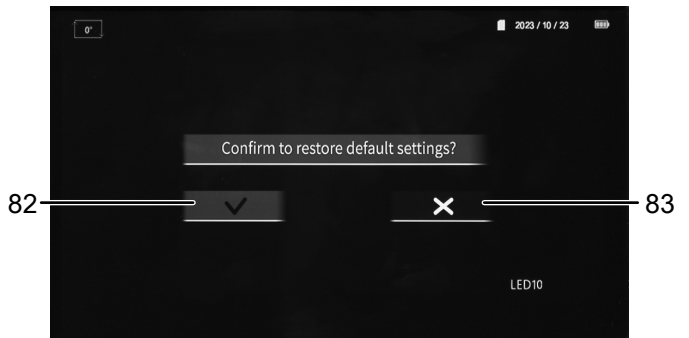
Software Version

The version of the currently installed software is displayed.

Resetting the system to factory settings

> **Notice**
> When the system is reset to factory settings, all system settings made are deleted.

1. Navigate to System Settings Reset.
2. Press the *Confirm* button (43) or tap the setting on the display.
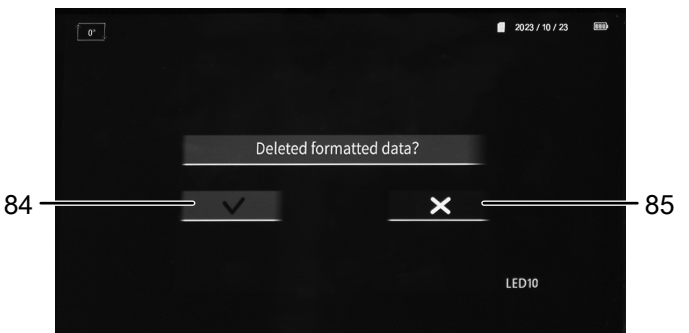   ⇨ The safety prompt is opened.

3. Press the *OK* button (82) to confirm the reset.
   ⇨ The factory settings are restored.
4. Press the *Cancel* button (83) to cancel the process.

Formatting the SD card

> **Notice**
> Formatting the SD card deletes all stored data.

1. Navigate to the Format setting.
2. Press the *Confirm* button (43) or tap the setting on the display.
   ⇨ The safety prompt is opened.

3. Press the *OK* button (84) to confirm formatting.
   ⇨ The files on the SD card are deleted.
4. Press the *Cancel* button (85) to cancel the process.

Errors and faults

The device has been checked for proper functioning several times during production. If malfunctions occur nonetheless, check the device according to the following list.

Spots in the image section:

- Check the plastic cap of the camera head for scratches or dirt (on the inside, too).
- Check the camera lens for dirt and carefully blow it clean with dry air if required.
  If necessary, carefully clean the camera lens. Only use a slightly damp, lint-free cloth, but never use aggressive cleaning agents or abrasive cleaners!

No image displayed by the monitor:

- Check the battery capacity and recharge if necessary.
- Check the plug connection of the multi-connector between VSP Control and VSP-R30 for proper fit.
- Check the connection between camera head and push-cable drum for proper fit.

Maintenance and repair

Charging the battery

The battery should be charged prior to initial start-up and when the battery is low. The current battery power can be read from the *Battery status* display (61). When the device is switched off, you can check the battery capacity by pressing the check button (27) for a few seconds. Only use the supplied power adapter or one with identical specifications for charging the battery!

☞ **Info**

The power adapter may become hot during charging of the battery, particularly if the videoscope is operated while the power adapter is connected. This is normal and does not affect its functioning.

☞ **Info**

You can supply the device with electricity via the power adapter. To do this, connect the cable of the supplied power adapter to the power adapter connector (29).

Fitting the plug adapter

Adapters for different socket variants are included in the scope of delivery for the power adapter connectors. Before using the system, you have to connect the correct adapter for your mains to the power adapters. To do so, please proceed as follows:

1. Select the correct adapter from the scope of delivery.
2. Place the adapter straight onto the connector and push it down until it clicks into place.
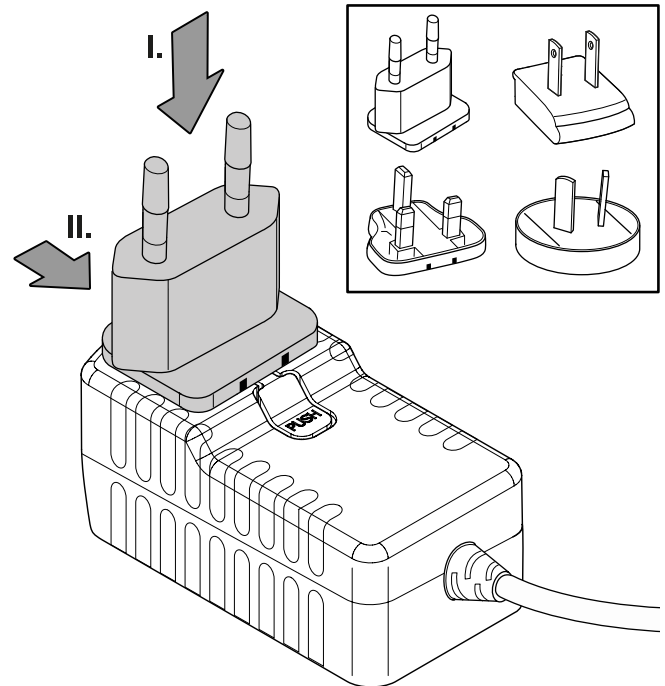

3. To remove the adapter, press the "PUSH" lever on the power adapter and push the adapter upwards.
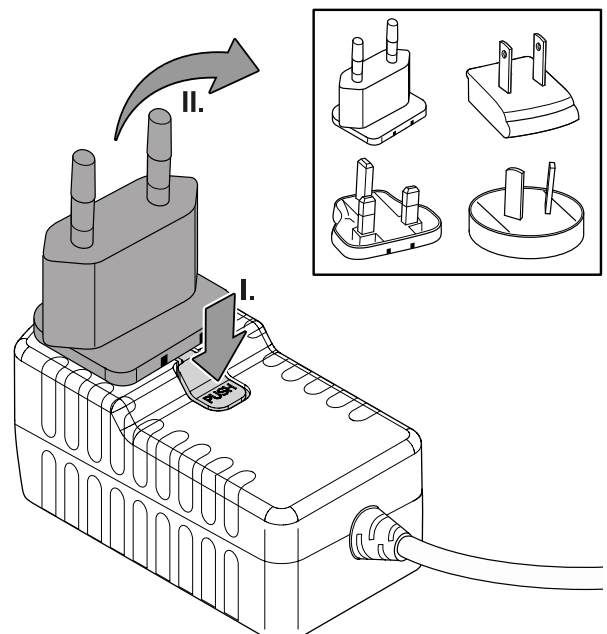
Please proceed as follows to charge the battery using the supplied power adapter:

1. Plug the charger into a sufficiently fused power socket. Only use the original power adapter or one with identical specifications, for otherwise both battery and device could be damaged!
2. With the battery inserted, insert the barrel-type connector of the power adapter into the power adapter connector (29) of the VSP Control unit.
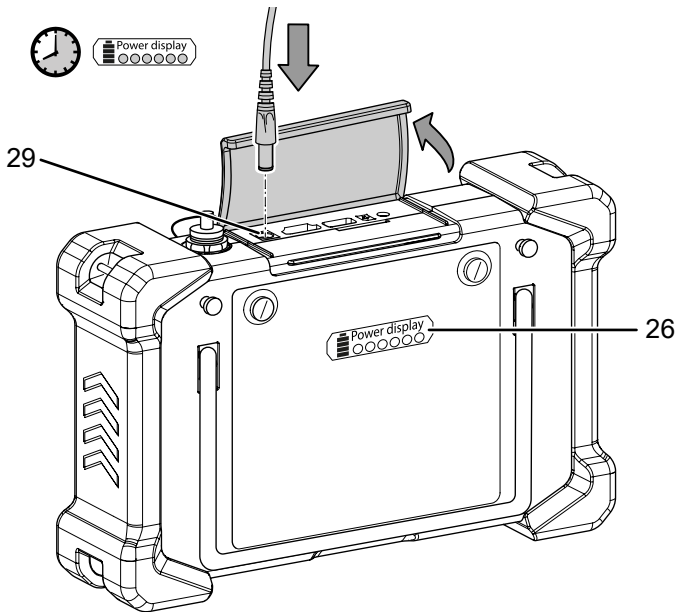
⇨ The device's charging indicator (41) is illuminated in red.
⇨ The LEDs of the battery level indication (26) at the rear are flashing.

3. Alternatively, you can remove the battery from the control unit VSP Control and charge it using the separate charging socket and power adapter.

⇨ Once the battery is completely charged, the LEDs of the battery level indication (26) will be permanently illuminated.

Cleaning

Clean the device with a soft, damp and lint-free cloth. Make sure that no moisture enters the housing. Do not use any sprays, solvents, alcohol-based cleaning agents or abrasive cleaners, but only clean water to moisten the cloth.

Repair

Do not modify the device or install any spare parts. For repairs or device testing, contact the manufacturer.

Disposal

Always dispose of packing materials in an environmentally friendly manner and in accordance with the applicable local disposal regulations.

The icon with the crossed-out waste bin on waste electrical or electronic equipment is taken from Directive 2012/19/EU. It states that this device must not be disposed of with the household waste at the end of its life. You will find collection points for free return of waste electrical and electronic equipment in your vicinity. The addresses can be obtained from your municipality or local administration. You can also find out about other return options that apply for many EU countries on the website https://hub.trotec.com/?id=45090. Otherwise, please contact an official recycling centre for electronic and electrical equipment authorised for your country.

The separate collection of waste electrical and electronic equipment aims to enable the re-use, recycling and other forms of recovery of waste equipment as well as to prevent negative effects for the environment and human health caused by the disposal of hazardous substances potentially contained in the equipment.

Li-Ion In the European Union, batteries and accumulators must not be treated as domestic waste, but must be disposed of professionally in accordance with Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators. Please dispose of batteries and accumulators according to the relevant legal requirements.

Only for United Kingdom

According to Waste Electrical and Electronic Equipment Regulations 2013 (SI 2013/3113) (as amended) devices that are no longer usable must be collected separately and disposed of in an environmentally friendly manner.