

User Manual



HDN-1 DC drive for Slide Kamera S series

Slide Kamera drive specially designed for smooth shots in motion ranging from 2mm/s to 55mm/s as well as Timelapse photos.

The cart is driven by a DC motor connected to the controller. Drive can be supplied from either AC adapter or three R6/AA batteries.



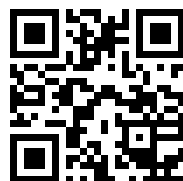
HDN-2 DC drive for Slide Kamera HSK and SP series

**Software Version
rev 3.0**



HDN-3 DC drive for Slide Kamera HSO-4

HDN-1 DC drive for Slide Kamera S series
HDN-1 PRO DC drive for Slide Kamera S series
HDN-2 DC drive for Slide Kamera HSK and SP series
HDN-2 PRO DC drive for Slide Kamera HSK and SP series
HDN-3 DC drive for Slide Kamera HSO-4
HDN-3 PRO DC drive for Slide Kamera HSO-4



Pdf version of the manual available for download: www.slidekamera.eu

Before you start your work with HDN DC drive we strongly recommend to read the manual carefully. **Please note that using the drive in a manner inconsistent with these instructions, unauthorized repair attempts or any kind of modification of the drive can cause damage the manufacturer is not responsible for.**

Table of contents

1. Elements of the drive.....	2
2. Construction.....	3
2.1. HDN-ST/HDN-ST PRO Controller.....	3
2.2. Power unit.....	5
3. Mounting.....	5
3.1. Mounting HDN-1 DC drive for Slide Kamera S series.....	5
3.2. Mounting HDN-2 DC drive for Slide Kamera HSK and SP series.....	6
3.3. Mounting HDN-3 DC drive for Slide Kamera HSO-4.....	6
4. Controller modes.....	9
4.1. VIDEO Mode.....	9
4.2. LOOP Mode.....	9
4.3. PULSE TIMELAPSE.....	10
5. Technical Specification.....	12
6. Terms of warranty.....	12

Slide Kamera ®

High Engineering Technology CNC s.c.
Sebastian Pawelec Karol Mikulski
Głina 45
82-522 Sadlinki
Vat Identification Number: 581-188-33-32

Slide Kamera Office

80-175 Gdańsk (Poland)
Ul. Kartuska 386

tel./fax (+48) 58 710 41 04
e-mail: biuro@slidekamera.pl / office@slidekamera.eu
www.slidekamera.pl / www.slidekamera.eu

1. Elements of the drive

Once the shipment is received please make sure that all elements of the drive are inside.



Included in the set:	HDN-1	HDN-1 PRO	HDN-2	HDN-2 PRO	HDN-3	HDN-3 PRO
Controller [1]	HDN-ST	HDN-ST PRO	HDN-ST	HDN-ST PRO	HDN-ST	HDN-ST PRO
Power unit [2]	HDN-ZN-1	HDN-ZN-1	HDN-ZN-2	HDN-ZN-2	HDN-ZN-3	HDN-ZN-3
AC adapter [3]	✓	✓	✓	✓	✓	✓
R6/AA batteries (3pcs)	✓	✓	✓	✓	✓	✓
Cable release: WS-1, WS-2, WS-3, WS-4, WS-5, WS-6 (one item to choose from)		✓		✓		✓

2. Construction

2.1. HDN-ST / HDN-ST PRO controller

Display unit and the knobs are located on the front panel of the electric drive controller. Electric connector sockets and the power switch are located on the side of the controller housing.



It is advisable to pay special attention so that retaining PIN at the end of the motor cable [9] enters the socket pit of the controller [8].

HDN-ST controller



- Power switch [1]
- Motor socket [2]
- Power socket [3]
- LCD display [4]
- MODE knob [5]
- SPEED knob [6]
- Cable release socket [7]
- Socket pit [8]
- 1/4" mounting hole [9]

HDN-ST PRO controller



1/4" mounting hole placed in HDN-ST/HDN-ST PRO controller base allows to mount the controller on Slide Kamera devices with the use of articulated arm.



HDN-ST PRO controller mounted
on Slide Kamera S series cart



HDN-ST PRO controller mounted
on Slide Kamera HSK series cart

Cable releases that trigger the shutter in the photo camera are compatible only with DC drives PRO version.

- ☑ **WS-1** cable release is intended for cameras such as: Canon EOS 1V, 3, 5, 1D, D60, 1Ds, 1D Mark II, 1Ds Mark II, 1D Mark III, 1Ds Mark III, 10D, 20D, 30D, 40D, 50D, 5D, 5D Mark II.
- ☑ **WS-2** cable release is intended for cameras such as: Canon Powershot G11, G12, EOS 50, EOS 50E, EOS 300, EOS 3000, EOS 500N, EOS 500, EOS 5000, EOS 3000N, EOS 300V, EOS 300X, EOS 300D, EOS 350D, 400D oraz 450D, 500D, 550D, 600D, 60D and 1100D.
- ☑ **WS-3** cable release is intended for cameras such as: Nikon D700, D800, D300D, D300, D200, D3X, D3S, D3, D4, D2X, D2H, D2, F5, F6, F100, F90x, D100 z MB-D100, Fuji Finepix S3 pro, S5 pro, Kodak DCS-14n
- ☑ **WS-4** cable release is intended for cameras such as: Nikon D90, D5000, D5100, D3100, D7000, D600
- ☑ **WS-5** cable release is intended for cameras such as: Nikon D80, D70/s
- ☑ **WS-6** cable release is intended for cameras such as: Panasonic LUMIX GH1, GH2, GH3



WS-1



WS-2



WS-3



WS-4



WS-5



WS-6

2.2. Power unit

HDN-ZN-1 power unit



Drive roller [1]

Clamping knob that locks the position of the motor arm [2]

Clamping lever that locks the position of the motor arm [3]

Motor with the cable [4]

Motor arm [5]

Set screw hole [6]

Mounting screw hole [7]

Standstill brake integrated with power unit [8]

Retaining PIN at the end of the cable [9]

HDN-ZN-2 power unit



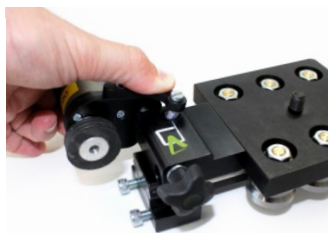
HDN-ZN-3 power unit



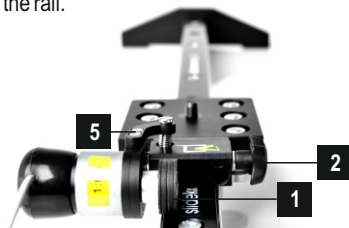
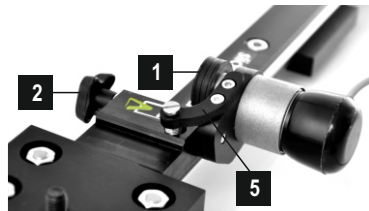
3. Mounting

3.1. Mounting HDN-1 DC drive for Slide Kamera S series

To mount the HDN-1 DC drive for Slide Kamera S Series first remove the side feet on the side, where the standstill brake is mounted. Next, remove the standstill brake from the cart.



Screw the attached M6x10mm screw into the left mounting hole of the Slide Kamera cart (the screw is used to determine the proper position of the drive in relation to the cart plate). Lift up and lock the arm and the motor using the clamping knob [2]. Then move the cart to the centre of the rail.



Loosen the clamping knob that locks the motor arm. This will result in pressing down the drive roller [1] to the rail (the drive is ready to use). Next, mount the side feet back to the Slide Kamera. In order to shoot without using the drive lift the motor arm [5] and lock it in this position with the clamping knob. The cart will move freely.

3.2. Mounting HDN-2 DC drive for Slide Kamera HSK and SP series

To mount HDN-2 DC drive for Slide Kamera HSK and SP series unscrew standstill brake from the cart using 5mm Allen wrench and screw the drive instead. It is important that the drive is in parallel position in relation to the cart plate. Make sure that the arm with the motor is lifted (the spring should be compressed) before you mount the drive.



When using the drive, be sure to unlock standstill brake integrated with HDN-ZN-2 power unit. In order to shoot without using the drive lift the motor arm and lock it in this position with the clamping knob. The cart will move freely.



3.3. Mounting HDN-3 DC drive for Slide Kamera HSO-4

HDN-3 DC drive can be mounted, depending on the need, on one of three rotational heads [11] built in HSO-4. Each head is equipped with four mounting holes. To mount the drive screw the clamping lever [5] into the hole no. 1 [8] and M6x20 screw into the hole no. 2 [7]. Please note that M6x20 screw is screwed from the bottom of the rotational head.

To connect and disconnect the drive move close or apart the drive roller and the caster wheel (motor and the motor base will move) and lock the power unit with the clamping lever [5].

Mounting diagram of HDN-3 DC drive for Slide Kamera HSO-4

M4x20 screws that mount head angle adjustment module [1]

Head angle adjustment module housing [2]

M6x16 screws that mount the rack [3]

Head angle adjustment module rack [4]

Clamping lever that locks the position of the motor arm [5]

Power unit [6]

M6x20 screw that sets the position of the power unit [7]

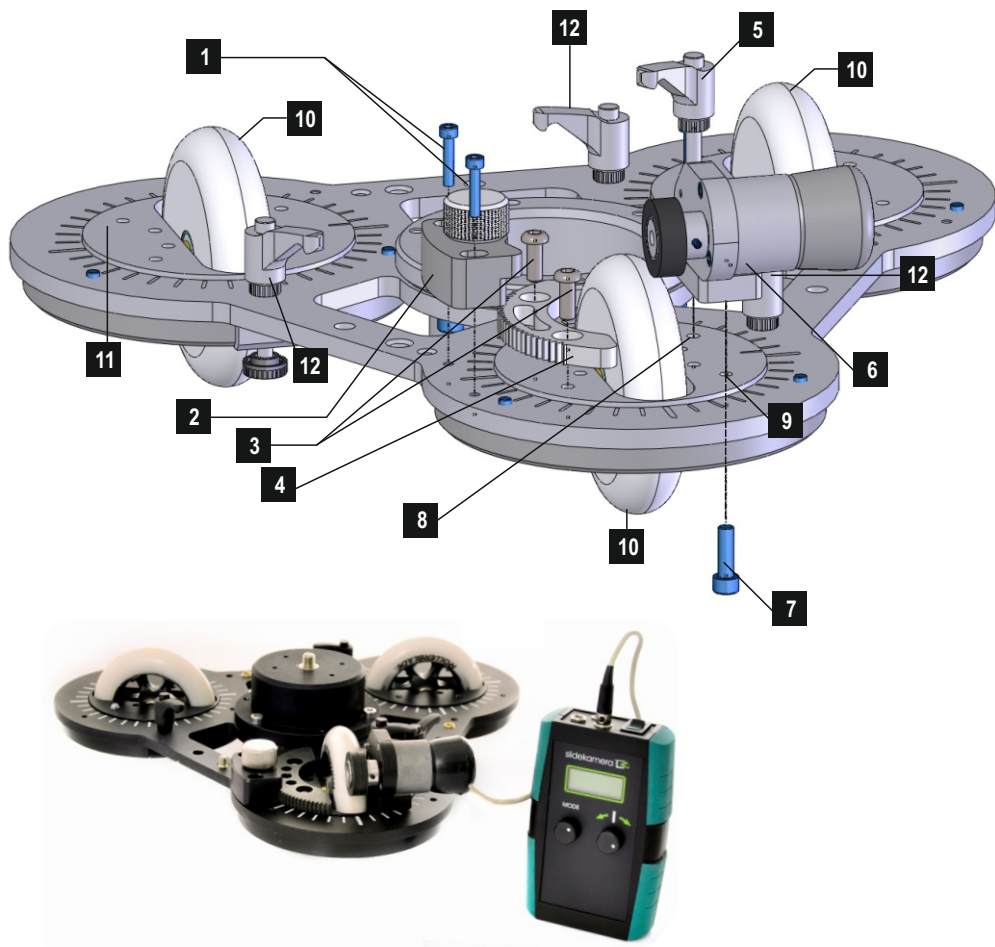
Hole no.1 for mounting clamping lever [8]

Hole no.2 for mounting the M6x20 screw that sets the position of the power unit [9]

100mm caster wheels [10]

Caster wheel rotational head [11]

Clamping knob that locks the rotation of the caster wheel head [12]



Sample configuration of Slide Kamera HSO-4 with accessories

Slide Kamera HSO-4 [1]

Slide Kamera AF-15 Adapter [2]

HDN-3 PRO DC drive for Slide Kamera HSO-4

- HDN-ST PRO controller [3]

- HDN-ZN-3 power unit [4]

- Cable release for HDN PRO drive [5]

Head angle adjustment module [6]

AFL-1 laser pointers for Slide Kamera HSO-4 [7]

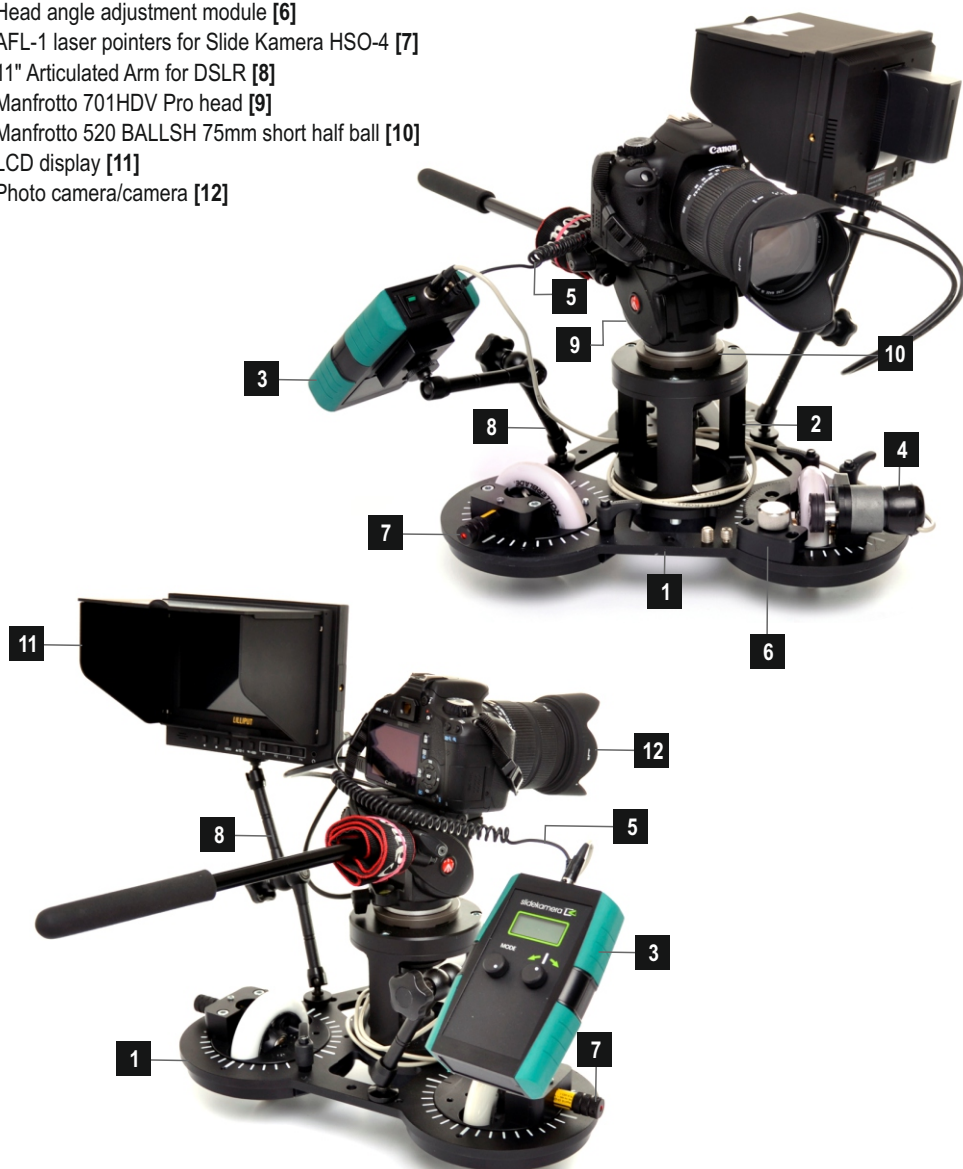
11" Articulated Arm for DSLR [8]

Manfrotto 701HDV Pro head [9]

Manfrotto 520 BALLSH 75mm short half ball [10]

LCD display [11]

Photo camera/camera [12]

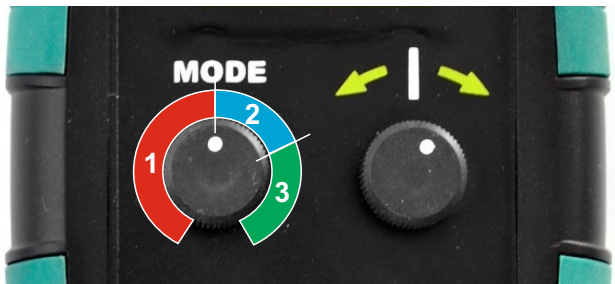


4. Controller modes

HDN-ST/HDN-ST PRO controller has three working modes: VIDEO, LOOP and TIMELAPSE. Use MODE knob to choose a proper working mode.

Range of working modes:

- TIMELAPSE mode [1]
- LOOP mode [2]
- VIDEO mode [3]



4.1. VIDEO Mode

VIDEO mode is designed for smooth shots from the camera or a photo camera mounted on a cart of Slide Kamera device. It is possible to control the direction and speed of the shift using SPEED knob.
To set the VIDEO mode: set the MODE knob in the middle. The sign VIDEO should appear on the upper line of the screen. The bottom line displays the current set point speed. The maximum speed corresponds to the value of the 99. The sign "-" indicates the movement in the opposite direction (depending on the place where the operator stands).

- Name of the selected mode [1]
- Speed [2]
- Battery level [3]

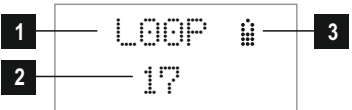


VIDEO mode enables the uphill track at the angle of 20°, with a load up to 2 kg. In this case, the motor should be in the back of the cart. In VIDEO mode, the drive always tries to maintain the desired speed of the cart (also after reaching the end of movement range). This setting results in batteries discharging faster.

4.2. LOOP Mode

LOOP mode similarly to VIDEO mode, is designed for smooth shots from the camera or a photo camera mounted on a cart of Slide Kamera device. In this mode, when the drive encounters too much resistance, it automatically starts to move in the opposite direction.
To set the LOOP mode: turn the MODE knob left. Set the desired speed with the SPEED knob. The sign LOOP should appear on the upper line of the screen. The bottom line displays the absolute value of the current set point speed.

- Name of the selected mode [1]
- Speed [2]
- Battery level [3]



- NOTE:** Friction factor of the drive roller is very essential in LOOP mode. If the cart in HDN-1 and HDN-2 drive does not turn round automatically, make sure that the rail of the device and the drive roller are clean.
- NOTE:**When working with HDN-2 drive make sure that the standstill brake is loose. If the cart turns back before it reaches the determined obstacle, loosen the brake.
- NOTE:** Slide Kamera HSO-4 device should move on a flat and level surface in LOOP mode .

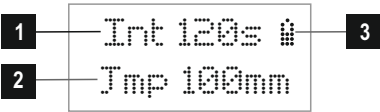
4.3. TIMELAPSE Mode

TIMELAPSE mode is designed for Timelapse shots synchronized with the movement of the cart (Motion Timelapse). In this mode, the operator sets the length of the jump and time at which the drive stops thus enabling to take a photo without a motion blur.

In PRO version thanks to the cable release that connects the controller with the photo camera, the drive controller releases the shutter in time when the cart is motionless. If you do not have the PRO version, we suggest using a wireless timer and shutter release.

Sample controller screen in a TIMELAPSE mode.

- Interval** - time at which you want to take a photo [1]
- Length of the jump [2]
- Battery level [3]



In order to work in TIMELAPSE mode:

- ☒ Set SPEED knob in the middle (at 12 o'clock)
- ☒ Set desired Interval using MODE knob. Available values: 1, 2, 3, 5, 7, 10, 12, 15, 20, 30, 45, 60, 90, 120, 180 and 300s
- ☒ Use SPEED knob to set length of jump and direction of movement. Available values: 0,2; 0,3; 0,5; 0,7; 1,0; 1,5; 2; 3; 5; 7; 10; 15; 20; 30; 50; 70; 100; 150; 200; 300; 500; 700 and 999mm

NOTE: Due to the fact that in HDN-ZN-3 power unit included in HDN-3 DC drive for Rotational Slide Kamera HSO-4 we used a motor that is more powerful and has twice a fast maximum speed, the above values should be multiplied by two.

Since with longer jumps the drive needs more time to cover the given distance, if necessary, the controller can automatically set the minimum value of the Interval.

Minimum values of the Interval.

Length of the jump	0,2...3	5...30	50	70...150	200...300	500	700	999
Minimum Interval	1s	2s	3s	5s	7s	12s	15s	20s

Length of the jump depending on working conditions may vary from the one already set $\pm 10\%$. However, in normal operating conditions it is repeatable.

Number of jumps (which corresponds to the number of photos) on a given Slide Kamera device can be determined from the relation:

$$\text{NUMBER OF JUMPS} = \frac{\text{working range}}{\text{length of jump}}$$

Working range of a given Slide Kamera device working with DC drive.

Slide Kamera	SP-600	HSK-6	S-980 HSK-5 1000	SP-1000	S-1500 HSK-5 1500	HSK-5 2000	HSO-4
Working Range [mm]	430	645	785	830	1285	1785	infinite

Approximate amount of jumps (shots) during the cart track on a given Slide Kamera device.

Length of jump*	SP-600	HSK-6 800	S-980, HSK-5 1000 SP-1000	S-1500 HSK-5 1500	HSK-5 2000	HSO-4 at 1000 mm distance
0,2	2150	3220	3920	6420	8920	2500
0,3	1430	2150	2610	4280	5950	1666
0,5	860	1290	1570	2570	3570	1000
0,7	614	920	1120	1830	2550	714
1	430	645	780	1280	1780	500
1,5	285	430	520	855	1190	333
2	215	320	390	640	890	250
3	143	215	262	428	595	166
5	86	129	157	257	357	100
7	61	92	112	184	255	71
10	43	64	79	129	179	50
20	21	32	39	64	89	25

*For HDN-3 DC drive on Rotational Slide Kamera HSO-4 length of the jump multiplies by two.
Jumps over 20mm are not included in the above chart.

Time of the DC drive track on a given Slide Kamera device can be determined from the relation:

$$\text{TIME OF THE TRACK} = \text{number of jumps} \times \text{Interval}$$

Approximate minimum times of the DC drive track on a given Slide Kamera device.

Length of jump	Minimum Interval	SP-600	HSK-6 800	S-980, HSK-5 1000 SP-1000	S-1500, HSK-5 1500	HSK-5 2000	HSO-4 at 1000 mm distance
0,2	1	35min.	53min.	1h 5min.	1h 45min.	2h 28min.	1h 23min.
0,3	1	24min.	35min.	43min.	1h 10min.	1h 39min.	55min.
0,5	1	14min.	21min.	26min.	52min.	59min.	33min.
0,7	1	10min.	15min.	18min.	30min.	42min.	23min. 30s.
1	1	7min.	10min. 45s.	13min.	21min.	29min.	16min. 30s.
1,5	1	4min. 45s.	7min.	8min. 30s.	14 min.	19min.	11min.
2	1	3min. 35s.	5min. 20s.	6min. 30s.	10min. 30s.	14min. 30s.	8min. 15s.
3	1	2min. 20s.	3min. 30s.	4min. 20s.	7min.	9min. 50s.	5min. 30s.
5	2	2min. 50s.	4min. 15s.	5min. 10s.	8min. 30s.	11min. 50s.	6min. 40s.
7	2	2min.	3min.	3min. 40s.	6 min.	8min. 30s.	4min. 40s.
10	2	1min. 25s.	2min. 9s.	2min. 35s.	4min. 15s.	5min. 50s.	3min. 20s.
20	2	43s.	1min. 4s.	1min. 15s.	2min. 7s.	2min. 55s.	1min. 40s.

Jumps over 20mm are not included in the above chart.

NOTE: Slide Kamera HSO-4 device should move on a flat and level surface in TIMELAPSE mode.

5. Technical Specification

Top speed in VIDEO and LOOP modes	~55mm/s for Rotational Slide Kamera HSO-4: ~110mm/s
Minimal speed in VIDEO and LOOP modes	<2mm/s (~11cm/min) for Rotational Slide Kamera HSO-4: <4mm/s
Battery runtime	about 3 hours in VIDEO and LOOP mode (rail set up horizontally, load 3 kg), up to 10h in TIMELAPSE mode
Cart load (horizontal track)	Slide Kamera S series - up to 3kg Slide Kamera SP series - up to 4kg Slide Kamera HSK series - up to 10 kg Rotational Slide Kamera HSO-4 - up to 10kg

6. Terms of warranty

All products are covered with Slide Kamera warranty for a period of 12 months from the date of sale. Warranty covers defects in design and material.

The warranty covers repair, or if the repair is impossible, replacing the product with a new one. However the cost of repair cannot overrun the catalog value of the product. The warranty does not cover damage and / or product defects resulting from improper use, as well as non-compliance with maintenance of the product.

The warranty is also void if:

- ☒ unauthorized attempts to repair or modify
- ☒ mechanical damage caused during transport and operation of such features, scratches, dents, pits, dirt, etc ...
- ☒ flooding, moisture

To obtain warranty service the purchaser should deliver the damaged product with proof of purchase and proof of payment (invoice, receipt, cash) to the point where the equipment was purchased. At the end of each guarantee period, you can purchase a replacement part from the manufacturer or in selected retail outlets listed on www.slidekamera.eu / www.slidekamera.pl

Producer after sales service is also available at:
HET-CNC sc, 80-175 Gdańsk, Ul. Kartuska 386

