POCKET PANO VARIO

The variable panorama adapter for compact and system cameras

OPERATION MANUAL

for the perfect panorama with YOUR camera

Exemplary installation of a mirrorless camera with interchangeable lens on the pocketPANO VARIO-S (screw connection)

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About this guide

We would like to thank you for purchasing this panoramic tripod head and hope you enjoy it!

The pocketPANO VARIO is a complex support for taking all kinds of panoramas and has a wide range of adjustment possibilities and sophisticated details. In order to get to know the full functionality and the underlying considerations in the construction of the VARIO, you should read this manual carefully.

This manual provides information on the design, adjustment and use of the panoramic tripod head.

You will not find any hints for stitching the pictures on the computer. The market for suitable software is too large and supply is constantly evolving. Our recommendation: PTGui (fee-based) or Hugin (free of charge)

In this manual, there is also no description of how the nodal point or the position of the entrance pupil of a particular lens can be found. There are many different methods with advantages and disadvantages and it would go beyond the scope of this guide to detail it. These instructions are limited to the technical aspects of adjusting the pocketPANO VARIO nodal head.

Attention - instructions for safe use

This nodal point adapter was developed with the aim of ensuring high adaptability while maintaining low weight and compact dimensions. It's a precision tool and not a hammer that can beat nails into walls. For best results, your camera with lens should not significantly exceed a weight of 1kg. This weight recommendation is chosen conservatively and depends on the mounting position of the camera and the resulting leverage. Nevertheless, all functions are guaranteed under greater load. Only the risk of camera shake increases a bit and for good results, the 2s self-timer should be used. The pocketPANO VARIO is basically designed for the following types of cameras and lenses:

- All types of compact cameras with fixed lens (also bridge cameras)
- Mirrorless cameras with small to medium size lenses
- Cameras with laterally shifted tripod thread (with optional adapter)

The following cameras may **not** be suitable for use with the pocketPANO VARIO:

- Mirrorless cameras with big and heavy lenses
- DSLR

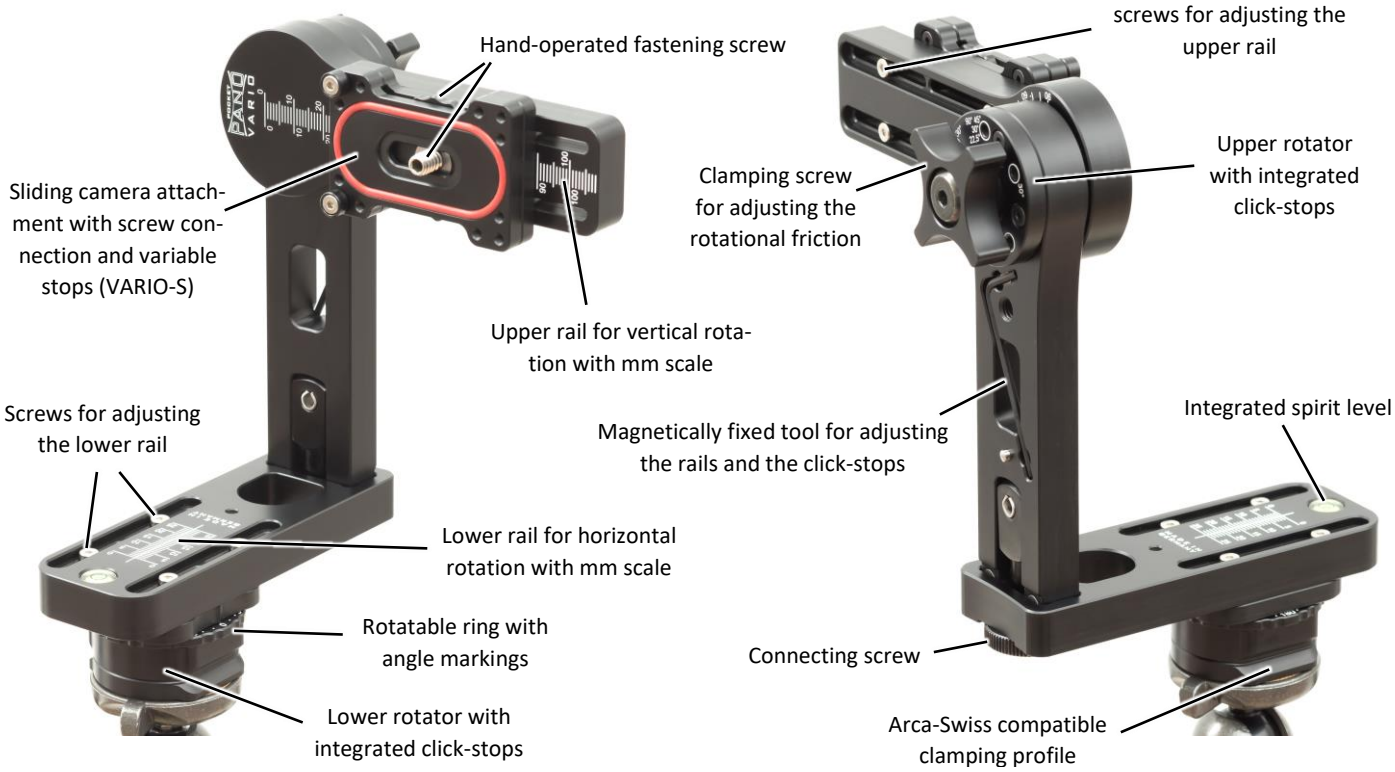
Basically, you should carefully check before using your camera (including lens) whether it collides with any part of the nodal head during assembly or during use. We are not liable for resulting damages.

Technical specifications

property	version with camera screw connection (VARIO-S)	version with quick release clamp (VARIO-K)
mass [g]	372 (XL: 378)	420 (XL: 426)
height / width / length [mm] (folded)	75,5 / 46,5 / 157 (XL: 167)	83 / 46,5 / 157 (XL: 167)
load capacity [kg] (recommendation)	1	
connection to the tripod	Arca-Swiss clamping profile; 3/8 "thread (1/4" with included adapter)	
click-stop angle lower rotator [°]	60° / 30° / 20° / 15° / freely rotating	
click-stop angle upper rotator [°]	90° / 45° / 30° / 22,5° / freely rotating	
adjustment range lower rail [mm]	25	
possible distance* of the camera base to the longitudinal axis of the lens [mm] * cameras with deviating distances can not be used	25 – 50 (XL: 35 – 60) 19 – 44* (XL: 29 – 54)* * with optional adapter for cameras with laterally offset tripod thread	21 – 46 (XL: 31 – 56) minus the thickness of the clamp used!
Adjustment range for lateral offset of the tripod thread of the camera [mm]	0 – 20* *only with optional adapter	possible by lateral displacement of the clamping plate. Adjustment range depending on the size of the clamping plate.
Adjustment range upper rail [mm]	74,5	
min./max. distance of the camera from the upper pivot point [mm]	3* / 122** *stop at the front of the camera **stop at the backside of the camera	25,5 / 100 measured from the pivot point to the middle of the clamping plate
Footprint [°] (half angle of shading)	10,3	

The most important components & functions

Overview (on the example of the VARIO-S with screw fixing)



Versions of camera mounting (VARIO-S and VARIO-K)

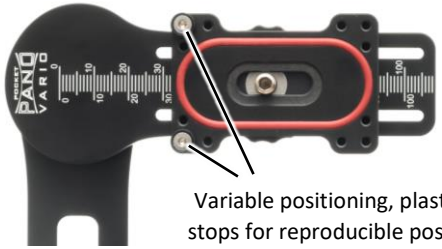
The pocketPANO Vario is available in two different versions, which differ in the way the camera is mounted.

VARIO-S: We recommend the version with screw connection (VARIO-S) for those who want to use their camera without a quick-release clamp or L-bracket. The screw connection can be used with a variety of cameras, has a large adjustment range and variable stops that ensure a reproducible camera position. For this version an optional adapter is available, which allows the use of cameras with laterally displaced tripod thread.

VARIO-K: For all users who have permanently mounted an Arca-Swiss compatible quick-release plate (clamping plate) or a compatible L-bracket on their camera, the fastening version with the quick-release clamp (VARIO-K) is the ideal solution. It should be noted that the additional thickness of the clamp and the plate attached to the camera reduce the adjustment range of the bottom rail of the nodal point adapter. This means that the distance from the underside of the clamping plate to the lens axis (the center of the lens) must not be greater than 46mm (VARIO-K) or 56mm (VARIO-K XL). When using cameras with a laterally offset tripod thread, this offset may be adjusted by the displacement of the quick-release plate or L-bracket inside the clamp. The clamping plate should have an appropriate mark for the correct position.

If you are unsure which version suits your camera best in the future: the different mounting options are interchangeable and available separately.

Universal screw connection with variable stops (VARIO-S)



Variable positioning, plastic-coated stops for reproducible positioning of the camera

Construction with optionally available adapter for the use of cameras with laterally shifted tripod thread

Arca-Swiss compatible quick release clamp (VARIO-K)

High-quality clamp with handy aluminum handle and mm scale

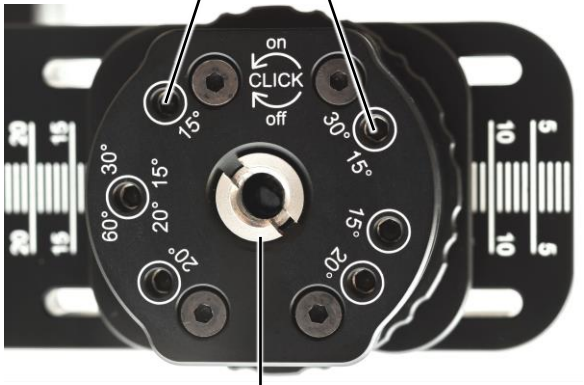
90° turned assembly of the quick release clamp

bottom

mm-scale on the underside of the lower rail (corresponding to the mm-scale of the upper side)

Knurled screw for connecting and disassembling the nodal point adapter

Labeled click-stop elements (6 pieces) for setting the desired click-stop angle



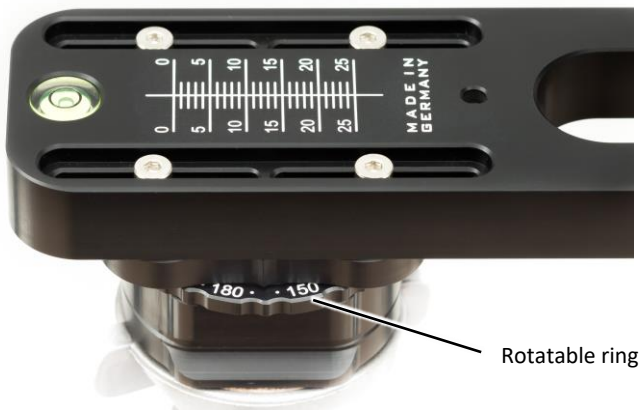
3/8" thread (here shown with supplied thread adapter for reduction to 1/4")

Side and detail view

The screws for mounting the camera slide can be fastened at different positions in order to allow a larger adjustment range than the slots would allow.

Angle scale for better orientation, including markings for the 22.5° detent (dots)

Labeled click-stop elements (6 pieces) for setting the desired click-stop angle



Rotatable ring with angle markings

Before the first use

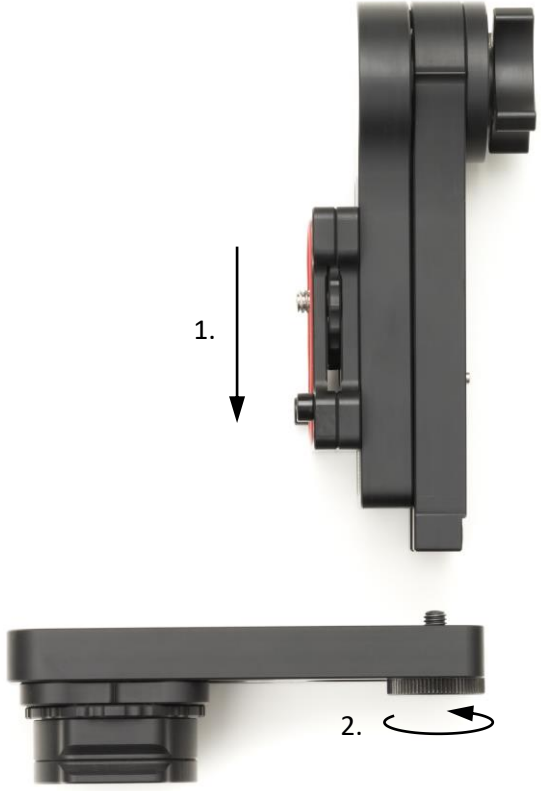
Attention: For all screwing and adjusting work on the nodal point adapter, please use the provided Allen wrench only. It is sufficient to use this with its short side and hand tighten the screws. Overtightening is unnecessary and can damage the threads!

Before using the nodal point adapter for the first time, connect the camera mount to the upper rail. Please use the included long screws (4 pieces M3x14). The camera mount has more than 4 threaded holes. These are used to move the camera mount into positions that would not be achievable with only 4 threaded holes. First use the outer threaded holes. If during the subsequent adjustment it turns out that the displacement is not sufficient, you can use the other threaded holes accordingly (see chapter "Adjustment of the upper rail").

Assembly and disassembly of the panoramic tripod head

1. Connecting

Before you attach the nodal point adapter to your tripod, you should connect the two parts of the adapter as shown. Insert the vertical part into the recess of the horizontal part and turn the knurled screw at the same time.



2. Mounting on the tripod

If you want to attach the nodal point adapter to your tripod with the tripod thread, the **maximum permissible length of the 3/8 "-UNC threaded bolt is 8.5 mm!** If the threaded bolt of your tripod is longer, the nodal point adapter must not be screwed on directly, otherwise this could damage it. If you would like to use a tripod or tripod head with a 1/4 "-UNC thread, you can screw the enclosed thread adapter into the 3/8" thread of the pocketPANO to reduce the thread diameter. Please use only the enclosed adapter, as other adapters may have a different head shape and could possibly damage the thread in the pocketPANO.

We recommend using the integrated clamping profile and an Arca-Swiss compatible quick release clamp on the tripod head. Of course, you can also mount any other quick release plate below the adapter.

Hint: We recommend using a ball head or a leveling head between the tripod and nodal point adapter, so that you can level the nodal point adapter horizontally with the help of the integrated spirit level. This is particularly useful if there are no horizontal or vertical structures in the image that could be used to align the panorama during the stitching process.

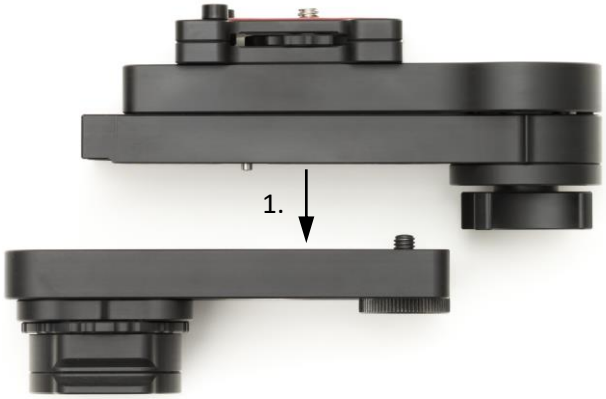
3. Mounting the camera

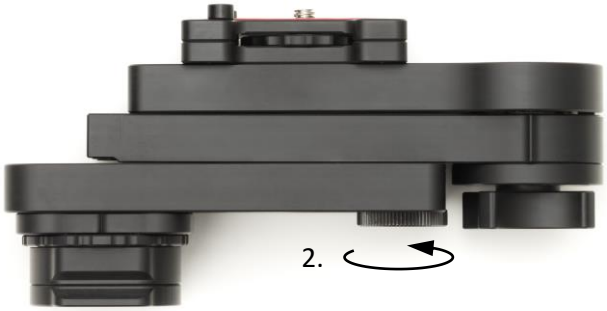
Version with screw connection (VARIO-S): After the adapter is securely mounted on your tripod or tripod head, position the upper rail (where your camera is attached) in a horizontal position. Now you can screw your camera to the arm. During screwing, make sure that the camera is correctly positioned against the intended stops, thus ensuring the exact position of the camera (for the adjustment of the stops, see chapter "Adjusting the camera mounting"). Screw the camera firmly so that the slip-resistant rubber insert is flattened and the camera base rests completely over the entire surface. This ensures a stable position during the entire recording time.

Version with Arca-Swiss clamp (VARIO-K): When mounting the camera, make sure that the clamping plate is exactly in the center of the clamp (the clamping plate used should have a center mark). After tightening the clamp, check that the camera is securely and firmly clamped before releasing it.

4. Disassembly & transport mode

When you're done shooting your panorama, you can combine the pocketPANO VARIO nodal point adapter into a compact unit for transport. For this, the vertical arm is separated from the horizontal arm (loosening the hand screw). Subsequently, the parts are stacked and the hand screw is screwed into the provided thread of the vertical arm. Make sure that the cylindrical pin of the vertical arm fits correctly in the corresponding hole of the horizontal arm. Do not overtighten the hand screw!





Adjusting the camera mount

Version with camera screw connection (VARIO-S): The screw fastening is designed so that the camera rests against two round plastic stops either on its front or back. This ensures a repeatable and straight mounting of the camera.

Since each camera has a different housing shape and the position of the tripod thread varies, the stops can also be attached to different positions. Many variations are possible and you can choose which one you like the most.

Some cameras with an irregular shape may not have a flat contact surface on the camera. Here the use of the movable stops can help. This results in countless possibilities for optimal adaptation to a wide variety of cameras. Just try out which variant suits your camera best!

cameras with laterally offset tripod thread: For the use of cameras with laterally offset tripod thread an *optional* adapter is required, which can compensate a lateral displacement of up to 20mm. This adapter is installed between the camera mount and the swivel arm (only compatible with VARIO-S).

1. First, adjust the camera mount and the variable stops on the camera body as described above.

2. If the offset adapter is not already preassembled, unscrew the entire camera mount from the nodal point adapter. Screw the offset adapter under the camera mount with the 4 included short M3x8 screws as shown. Shift the camera mount as far as the lateral offset of the tripod thread makes necessary. See also the tip in the chapter "Adjustment of the lower rail".

3. Now screw the entire mounting unit with the 4 long M3x14 screws back to the nodal point adapter.

Tip: Typically, the tripod thread of compact cameras (seen from the rear) is shifted to the right. For some cameras, however, it is shifted to the left. In order to move the camera into the correct direction with the offset adapter (i.e. to the left), the offset adapter must be installed "upside down" (so that the scale of the offset adapter lies in the direction of the hinge).

Version with quick release clamp (VARIO-K): The clamp can be mounted both longitudinally and transversely to the lens axis and thus adapt to the orientation of your preferred clamping plate (not included). To change the orientation of the clamp, remove the central M6 countersunk screw with a 4mm Allen key. Now the clamp can be removed and screwed on again in the desired orientation. Please tighten the screw only slightly, as the anti-twist protection is ensured by the integrated dowel pins!

When mounting the camera, make sure that the clamping plate is exactly in the center of the clamp (the clamping plate used should have a center mark). After tightening the clamp, check that the camera is securely and firmly clamped before releasing it.

Adjustment of the lower rail (adjustment to your camera)

The bottom rail is used to set the nodal point adapter for your camera (regardless of the lens used). The lower rail must be adjusted so that the center of the lens (or lens axis) is exactly in the vertical axis of rotation of the lower rotator. If you use different lenses or focal lengths with the same camera, the bottom rail does *not* need to be readjusted!

To make this setting easier, you can do the following:

1. Attach your camera and lens to the nodal point adapter as described above (see chapter "Adjusting the camera mount") and turn the upper arm to the vertical position so that the camera looks directly downwards. (The upper rotator detent should be activated for an exactly vertical orientation)

2. Focus as good as possible on the mm scale of the lower rail. To do this, use the existing macro mode of your camera and stop down your lens (for example, aperture 11 or 16) to make the scale look as sharp as possible.

3. Take a photo or use the live view and magnification of your camera and check which mm-mark is exactly in the middle of the picture (viewed from top to bottom, picture in landscape orientation). Some cameras offer the possibility of displaying an additional grid pattern, which makes it easier to find the exact center of the image. If necessary, look at the picture at your PC and check there which mm marking is exactly in the middle of the picture.

example: The magnification of the mm-scale can be seen directly on the display using the live-view magnification. The small triangular arrows on the left and right of the display (here camera-specific for the SONY NEX 6, actually intended for the navigation) make it easier to find the exact center of the image (represented by the white dashed line). The value determined here is approx. 21.5mm.

4. There is a second mm scale on the underside of the lower rail. Set here the value found on the upper scale. To do this, set the correct mm value in accordance with the corresponding edge of the movable part. First loosen the 4 screws on the top with the enclosed tool (loosen only slightly, do not unscrew). Then move the rail to the desired position and tighten the screws again.

Now the lower rail is already set quite well. If you like it more precisely, you can use this basic setting as the starting point for further optimization.

Tip: The vertical bar in the upper mm scale can be used to align cameras with laterally shifted tripod thread easily. If the adapters for lateral adjustment are correctly adjusted, the vertical line of the scale must be exactly in the middle of the picture.

The described procedure should be a relief for finding the correct setting of the lower rail. Of course, those who prefer to use classic rail adjustment methods instead can do so as well. Many roads lead to Rome or to the panorama.

example (continued): Based on the mm scale on the underside of the lower rail, the previously determined value of approx. 21.5 mm is set. To do this, match the edge of the sliding part (either left or right, depending on the value) with the desired value on the mm scale.

Adjusting the upper rail (adjustment to your lens)

The upper rail is used to move the camera along the lens axis. The correct shift is set when the lens is rotated by a point with no parallax shift between the individual images. If you want to use a different lens or a different focal length, only the *upper* rail has to be readjusted. The setting of the *lower* rail depends only on the camera used!

In the following, only the technical implementation for the displacement will be described. There are many methods to find the right shift setting for your lens and we recommend a short Google search (for example, "set up nodal point"); Youtube® also offers some helpful videos.

Tip: In order to find the right adjustment of the upper rail without the impact of possible errors in the adjustment of the *lower* rail, you can also tilt the camera "up-down" instead of typically "left-right"

The entire camera mount is attached with 4 M3x14 screws. When you loosen these screws a little, the whole slide can be moved along the slots. The slots of the upper rail are interrupted for stability reasons. Should it be necessary to move the camera mount into this area, the other threaded holes of the sliding mount can be used for attachment. The used threaded holes should always be as far apart as possible. It is important to use at least the distance between the middle and one of the outer threaded holes (for example, if the distance between the camera and the upper pivot point is particularly small or very long).

example: 3 possible positions for the fixing screws, which allow the variable attachment of the camera mount

Tip: If you want to use different lenses or focal lengths to capture panoramas, you will need to re-adjust the upper rail. To make it easier to find a specific position, you can color-mark the lens-matching position. To do this, mark the corresponding mark on the mm scale with a water-soluble film marker (no permanent marker!). This can be removed later with a damp cloth almost residue-free. Use different colors for different lenses and focal lengths for a better overview!

Setting the rotational friction

The pocketPANO VARIO is designed in such a way that ***no*** clamping has to be loosened and tightened again for vertical swiveling of the camera (up-down).

Instead, the rotational resistance of the upper rail is adjusted individually to the weight of the camera and the preferences of the photographer. The rotational resistance can be infinitely adjusted with the large clamping screw. Turning clockwise increases the frictional resistance, turning it counterclockwise decreases the resistance. Please do not try to unscrew the clamping screw "by force". With sufficient force, the entire swivel joint can be dismantled and a readjustment by us is required. In normal use, however, an accidental disassembly is excluded.

The rotational resistance should be adjusted so that your camera is held securely in the horizontal position and does not move on its own even when it is turned horizontally and locked into place.

If set correctly, the camera can be tilted up or down without having to use a clamp screw. This is comfortable, saves time and reduces the risk of recording errors.

Technical background: The clamping screw changes the preload of the igus® iglidur® plain bearing, which ensures a permanently stable friction pairing and thus ensures that the preload does not have to be readjusted even after many exposures.

Adjustment of the click-stop (locking angle)

The pocketPANO VARIO has integrated and adjustable click stops in both axes of rotation, which facilitate the capture of panoramas. To set a certain locking angle, certain click-stop elements must be "activated". This "activation" is done by turning screw elements which are marked by a white circle and the number of degrees. To **activate** a click-stop element, it must be turned **counterclockwise** until a stop is felt. Use the enclosed Allen key and insert the long leg into the opening of the corresponding click-stop element. To **deactivate** a click-stop element, turn it **clockwise** until a stop is felt. **Never use too much force** and stop when you feel a resistance.

Basic rule: To set a particular locking angle, **all** click-stop elements must be **activated** which have the desired angle label. **All other** locking elements must be **deactivated**.

example: If you want to set a locking angle of 20 ° on the lower rotator, activate all click-stop elements (screw to the left) which have the marking "20°" (3 pieces). All other click-stop elements must be deactivated (screw to the right).

With the upper rotator it can happen that not all elements can be reached, depending on the position of the big clamping screw. Then simply turn the clamping screw or the upper arm a little further until the desired click-stop element can be reached.

The angle between the individual images should be adjusted so that the images overlap by approx. 20% - 50%. Less overlap makes it hard for the stitching software to find checkpoint pairs; more overlap leads to unnecessarily much image material and can also have a negative impact on stitching. However, there are no fixed limits, so the above-mentioned overlap is only a recommendation.

The table on the right can be used as a reference for setting the click-stop angle depending on the focal length used (based on the 35mm format).

hint: The locking angle to be set on the rotator is shown in bold. Some angles can only be realized by multiple clicking. In this case, take your picture at only every second or third click-stop position.

example: With a 21mm wide-angle lens you want to achieve a horizontal angle of 40° between the individual images. To do this, set the locking angle to **20°** on the lower rotator (activate all 20° locking elements). When taking pictures of a series, however, an image is taken only at every second click-stop of the rotator, i.e. every 40 ° (2x**20°**).

Tip: The **strength** of the locking elements is chosen so that the detent is well noticeable even with cameras near the weight limit. If you prefer a slightly weaker detent, you can turn back **all of the activated click-stop elements** by about a half to full turn (clockwise from the fully activated state).

	lower rotator			upper rotator	
focal length	angle between pictures	# of pictures for each row	overlap between pictures	angle between pictures	overlap between pictures
8 mm cirkular-fisheye	120° (2x**60°**) 90° (3x**30°**)	3 4	30 % 50 %	**90°**	50 %
16 mm diagonal-fisheye	**60°**	6	39 %	**90°**	39 %
15 mm	**60°** 45° (3x**15°**)	6 8	22 % 42 %	**90°** 60° (2x**30°**) **45°**	10 % 40 % 55 %
18 mm	45° (3x**15°**) 40° (2x**20°**)	8 9	33 % 41 %	60° (2x**30°**) **45°**	33 % 50 %
21 mm	40° (2x**20°**) **30°**	9 12	33 % 49 %	60° (2x**30°**) **45°**	26 % 45 %
24 mm	40° (2x**20°**) **30°**	9 12	25 % 43 %	60° (2x**30°**) **45°**	19 % 39 %
28 mm	**30°**	12	35 %	**45°**	31 %
35 mm	**30°** **20°**	12 18	21 % 47 %	**45°** **30°**	17 % 45 %
50 mm	**20°** **15°**	18 24	26 % 44 %	**30°** **22,5°**	24 % 43 %
75 mm	**15°**	24	18 %	**22,5 °**	17 %
> 75 mm	deactivate click-stops and read the angle on the scale				

Preparing the camera to capture your panorama

After mounting your camera, make sure all your camera settings are the way you want. If your camera has a zoom lens, zoom the lens to the focal length for which you have set the nodal point adapter. We strongly recommend that you take all pictures for a panorama with a fixed aperture, a fixed exposure, a fixed white balance, fixed ISO sensitivity and manual or fixed focus. It is best to shoot in RAW format so that you have more reserves later to better correct too bright or dark subject areas.

Now you are ready to take your panorama.

Single row (cylindrical) panoramas

Here are some tips for taking single-row (cylindrical) panoramas:

1. First, think about the vertical angle of your camera. Not every single row panorama has to be taken with a horizontal positioned camera. Sometimes, for example, the foreground is more interesting than the empty sky and you would rather take the single-row panorama with the camera slightly tilted downwards. Even with the camera tilted down, your panorama is not wavy or crooked, because you've mounted the nodal point adapter on the tripod horizontally. Only the camera is tilted down, the horizontal rotation is not affected.

2. Think about where your panorama should start and turn the adapter with your camera up to this point. Turn the ring with the angle marks in the bottom rotator to see the 0° mark.

3. Now make your first picture, preferably with a remote control or the self-timer function of your camera. Then turn the adapter clockwise to the next stop position (or depending on the desired angle to the second or third following rest position) and take the next picture. Repeat this until you captured the entire subject. If you want to do a full 360 ° cylindrical panorama, take so many pictures until the ring with the angle scale shows the 0° mark again.

Now you have taken all the pictures for your single-row (cylindrical) panorama!

Multi-row (spherical) panoramas

With the pocketPANO nodal point adapter you can also record multi-row and complete spherical panoramas. The procedure is in principle the same as when taking a single-row panorama, performed several times with different tilting of the camera until all image areas are captured. Use the tilting angle of the nodal point adapter given by the click-stops of the vertical swivel arm. For very large vertical tilt angles (e.g. in the top or bottom row), it may be sufficient to take the picture at only every second horizontal click stop. This varies from camera to camera, and you can easily check on the display if the images still overlap sufficiently even with a horizontal pan of more than one click-stop.

In fact, there is not *the right* order for creating a multi-row panorama. Basically, you always try to minimize the number of shots you need. But there are other aspects to consider: e.g. In the center of the picture (the "horizon") are usually image-important elements, such as persons who should not be "cut up". Therefore, it may be useful to take the center row of photos in the panorama, although you might want to get the desired panorama with fewer rows without a center row (for example, a little down and a little up) with a smaller total number of photos.

Just try it! This will give you a sense of how YOU work best with your nodal point adapter.

bottom picture (nadir): If you would like to take an additional picture of the area under your tripod, you can simply unscrew the vertical arm of the pocketPANO VARIO and screw it back rotated by 180 ° (the camera then sits "outside" and looks down past the nodal point adapter).

Cleaning & Care

The pocketPANO nodal point adapters do not require any maintenance.

If you want to clean the nodal point adapter, we recommend a moistened (not wet) cloth. Please do not use solvents for cleaning; this can damage the paint of the engravings.

If necessary, you can treat the nodal point adapter thinly with normal plastic or cockpit care. This gives the adapter a strong deep black color.

When using, make sure that the nodal point adapter is not exposed to moisture for long periods of time. Although almost all metallic parts of the adapter are made of stainless steel or rustproof, this is not possible with all components (for example, needle roller bearings). After use in humid weather, you should thoroughly dry the nodal point adapter.

If you ever have a problem with your pocketPANO nodal point adapter, there is nothing to worry about: All parts are standard parts, thus permanently available and easily replaceable. If necessary, just contact us, we can help you!

Should it ever come to a complaint or other clarification, do not hesitate to contact us. We will do our best to solve the problem to your satisfaction! The contact details can be found at the end of this manual.

Space for your own notes

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