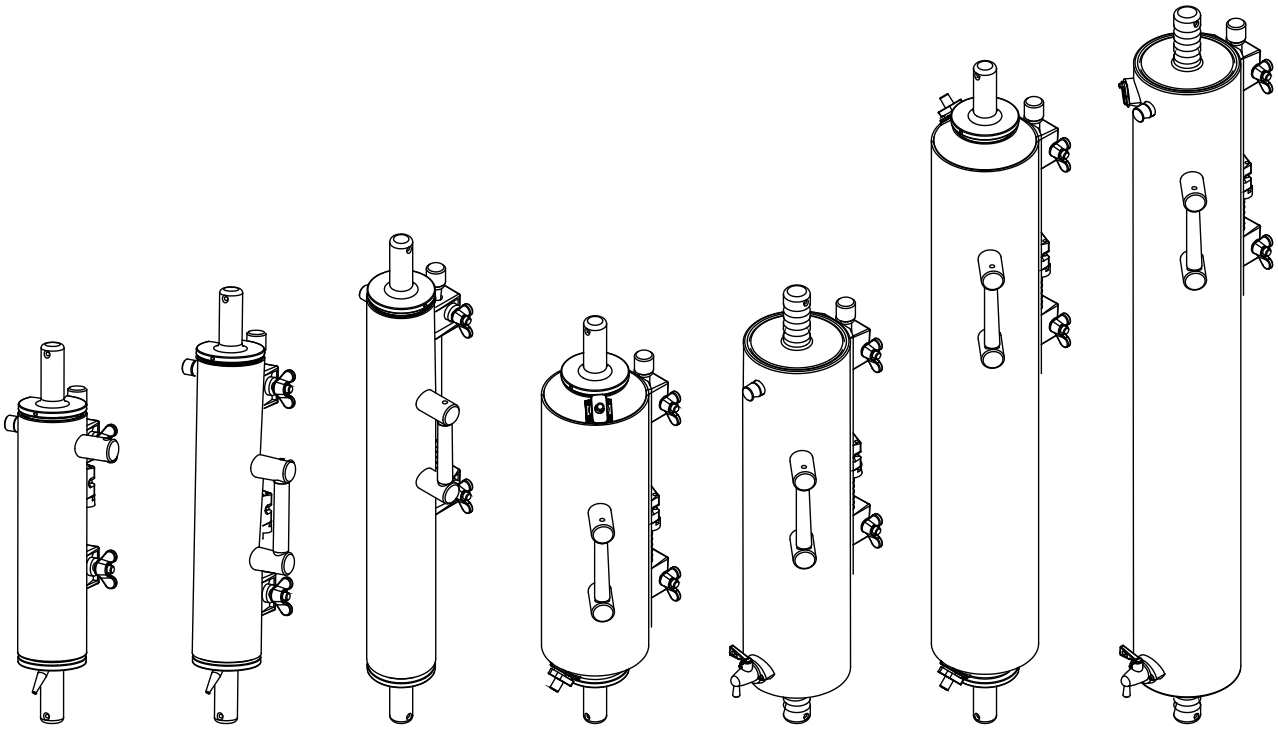


Water Sampler: PWS and Free Flow

OPERATION MANUAL

Product ID 436 300 - 345

Edition 09/26

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NOTICE



Please read this manual carefully before operating or performing maintenance on the instrument. Pay special attention to all danger, warning and caution statements. Failure to do so could result in serious injury and/or damage to the instrument. Keep manual available at all times.

LAYOUT AND MEANING OF WARNINGS

All safety instructions found in this operation manual are composed in accordance with the following pattern (signal words):

DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to personal injury.
NOTICE may also indicate a situation which, if not avoided, may cause damage to equipment.

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GENERAL DESCRIPTION

PLASTIC WATER SAMPLER

Niskin-type plastic water sampler

The PWS is made entirely of plastic (uPVC) and consists of a tube with two lids connected by a latex hose. The lids remain open during the immersion process to ensure adequate flushing of the sampling tube. The sampling tube is completely metal-free.

The PWS is the standard oceanographic sampler and can be used - without any modifications - for deployment on multi-water samplers / rosette and carousel arrays as well as single or serial instrument on a hydrographic wire. When used on a wire, a messenger (not included) lowered along the wire from the surface triggers the tension cables to close the sampler. To deploy several PWS in sequence, a second messenger is attached to the release mechanism of the first sampler and positioned below it on the wire. This allows a series of samplers to be triggered along the wire.

When operated as a single instrument without bottom weight, we recommend to use a Centered Mounting Rack (Product ID 436 380-385), which ensures vertical alignment of the sampler. All PWS have a drain tap on the lower cone and a vent tap resp. vent screw on the upper cone for partitioning the water sample. This makes it easy to drain off the sample in controlled quantities.

FREE FLOW WATER SAMPLER

Oceanographic water sampler with optimal water exchange

The Free Flow Water Sampler is an innovative design that overcomes the limitations of PWS/Niskin bottles which are caused by their reduced inlet and outlet diameters. Its unique feature is the truly free flow in which no cone or ball valve affects the water exchange within the sampling tube. There are virtually no carry-over effects.

The Free Flow Water Sampler is made entirely of plastic (uPVC and POM) and consists of a tube with two lids connected by a latex hose. The lids remain open during firing, ensuring perfect water exchange within the sample tube. The Free Flow Sampler can be used - without any modification - on multi-water sampler, rosette and carousel arrays as well as single or serial instrument on a hydrographic wire. When used on a wire, a messenger (not included) lowered along the wire from the surface triggers the tension cables to close the sampler. To deploy several samplers in sequence, a second messenger is attached to the release mechanism of the first sampler and positioned below it on the wire. This allows a series of samplers to be triggered along the wire.

When operating as a single instrument without a bottom weight, we recommend using a Centered Mounting Rack (Product ID 436 380-385), which ensures vertical alignment of the sampler. All Free Flow Samplers have a drain tap on the lower cone and a vent screw on the upper cone for partitioning the water samples. This makes it easy to drain off the sample in controlled quantities.

STANDARD EQUIPMENT

1. 1 Plastic Water Sampler or Free Flow Sampler

OPTIONAL EQUIPMENT

2. Messenger 400 g for wires up to 6 mm (Product ID: 440 000)
3. Centered Mounting Rack
    - Product ID 436 380 for 1.7 and 2.5 l sampler
    - Product ID 436 386 for 1and 3.5 l sampler
    - Product ID 436 385 for 5 and 10 l sampler

TECHNICAL DATA

PWS

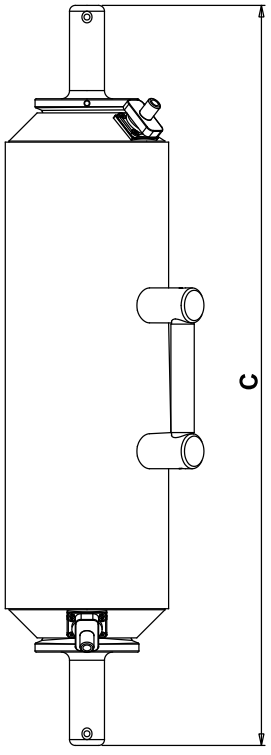
Product ID	sample volume [l]	length [mm]	width [mm]	height [mm]	diameter [mm]	weight on air [kg]
436 300	1.7	590	165	140	90	3
436 302	2.5	765	165	140	90	3.5
436 303	3.5	540	185	210	140	2.6
436 305	5	640	185	210	140	3.6
436 315	10	1040	185	210	140	5.5

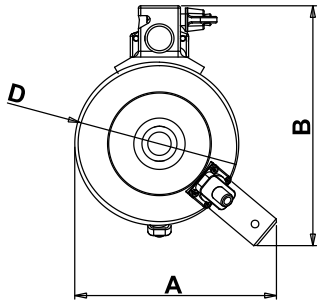
PWS, EXTERNAL CLOSING MECHANISM

Product ID	sample volume [l]	length [mm]	width [mm]	height [mm]	diameter [mm]	weight on air [kg]
436 505	5	692	190	185	142	3.6
436 515	10	1041	190	185	142	5.7

Free Flow

Product ID	sample volume [l]	length [mm]	width [mm]	height [mm]	diameter [mm]	weight on air [kg]
436 340	1	515	165	140	90	3
436 344	5	700	190	210	140	6
436 346	10	1150	190	210	140	8.5





A. width
B. height
C. length
D. diameter

PREPARATION OF THE SAMPLER

The drain tap on the lower cone and the vent tap resp. vent screw on the upper cone have to be closed.

⚠ CAUTION

To prevent accidental closing never attempt to mount an open sampler to the wire or to a Centered Mounting Rack!

CLAMPING THE SAMPLER TO THE WIRE

All water samplers are equipped with the same clamping mechanism. The wire must have a diameter of between 4 and 6.5 mm.

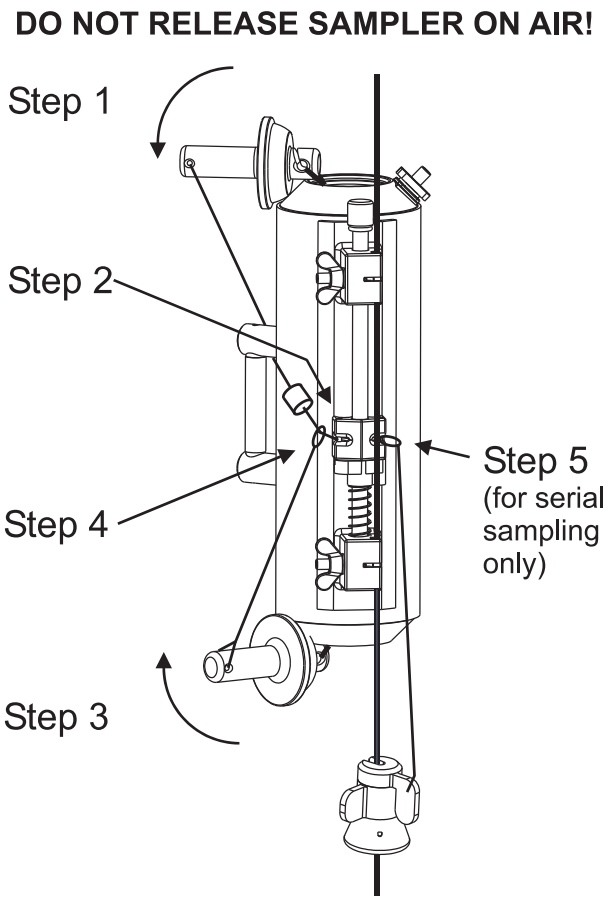
1. Loosen both wing nuts so that the wire can be easily put into the groove of the clamp blocks.
2. Put the wire into the groove and tighten the wing nuts by hand ONLY!
3. If several water samplers are used in sequence a second messenger is attached to the release mechanism of the previous sampler and positioned below it on the wire.

ARM THE SAMPLER

1. Lift the top lid and tilt it towards the handle (Step 1 in the picture).
2. Hold the lid with your left hand, guide the rope through the handle and press the release block downwards. Hook the loop of the rope onto the pin of the release block (Step 2).
3. Pull the lower cover out of the cone and tilt it towards the handle as well (Step 3).
4. Hook the snap hook on the rope over the first rope (Step 4).

   Notice: For standard PWS and Free Flow Sampler the rope runs alongside the handle and the snap hook must be hooked **around** the first rope (Fig. 1).

   For PWS with external closing mechanism the lower rope must also be pulled through the handle and the snap hook must be hooked **into the loop** of the first rope (Fig. 2).



5. If several samplers are to be operated on a single wire, the loop of the next messenger must be hooked onto the second pin of the release block (Step 5).

> ***NOTICE***
>
> Ensure that the other loop does not slip out again. Closing the sampler on air could cause in injuries or damage to the sampler.

If an armed sampler needs to be closed while on air, proceed as follows:

1. Firmly hold the lower lid on its outer handle and pull it a bit up such that the rope comes loose.
2. Detach the snap hook from the upper rope and gently guide the lower cover to its closed position.
3. Firmly hold the upper lid on its outer handle and push it a bit down such that the rope comes loose. Press the release head to free the loop of the upper rope.
4. Gently guide the cover to its closed position.

Ideally the sampler should be armed ONLY immediately prior to deployment.

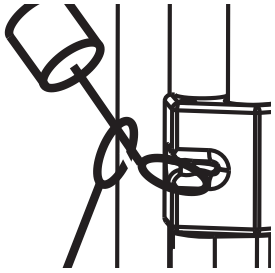


Fig. 1: Arming PWS and Free Flow Sampler

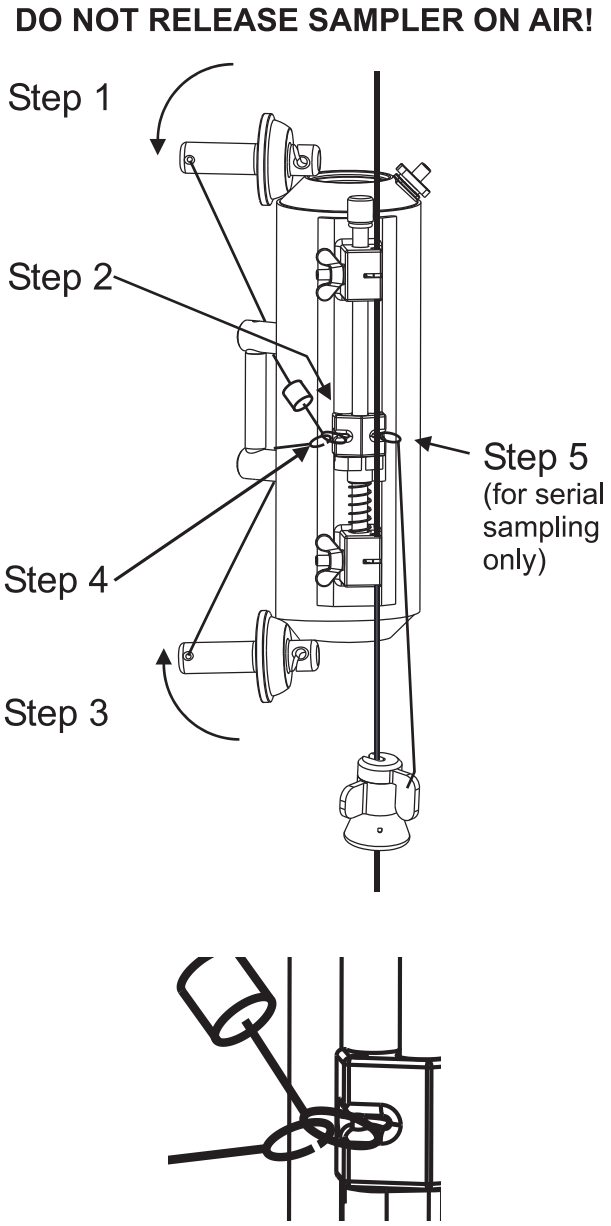


Fig. 2: Arming PWS with external closing mechanism

DEPLOYMENT

> ***CAUTION***
>
> 
>
> **PINCH POINT!**
> **Keep hands and fingers clear.**

1. Prepare the sampler(s) as described above.
2. Arm the sampler(s) immediately prior to deployment.
3. Lower the sampler(s) to the desired depth.
4. Attach the messenger to the rope just before you need it.
5. Release the messenger.
6. Wait sufficiently long for all samplers to be closed.
7. Hoist the sampler(s) back on board.
8. Open the upper vent / drain tap and remove the sample through the lower drain tap.