Plankton Pump for 6000 m

Model 23.590

Manual

KC Denmark A/S

Research Equipment
Limnology • Oceanography • Hydrobiology

Plankton Pump for 6000 m

Caution

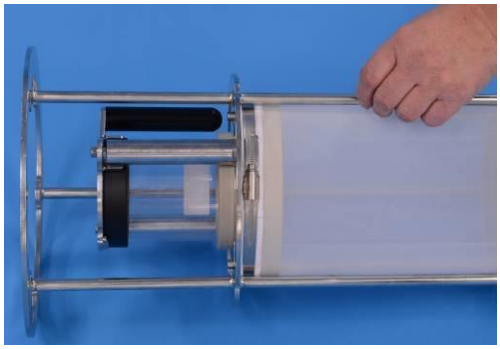
KC Denmark A/S is not, and cannot be held, responsible for any damage(s) made to equipment or to operators who ignore safety precautions or because of misuse or wrong operation.

Table of contents	Page
Charging and preparation	2
Connect motor cable, charger and USB cable	3-4
Dummies	3-4
Plug for starting the pump	3-4
Emptying the collecting bottle	4
How to handle the pump	4
Zinc anode	5
Pressure compensation	5
Adding a flow meter, determination of pumped volume	6
Maintenance	7
SubConn handling instructions	8-11
Safety information, technical specifications	12

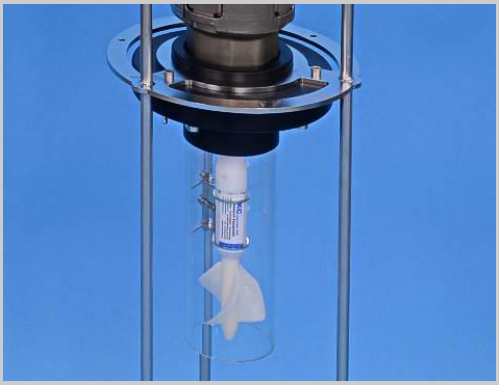
Item	Charging and preparation	
1	The battery cylinder has 2 Subconn connectors: 1. Always grease the connectors with Molykote, see pg. 6-8 2. Power supply to motor (5 pins - MCBH5F). 3. Charging the battery (8 pins - MCBH8F). Once the battery is charged, you also use this connector for programming by USB. 4. The photo shows the programming plug and a dummy to the right; the dummy is not part of the standard delivery.	
2	1. Connect the charger to ensure the battery is fully charged. Allow up to 10 hours of charging 2. The charger has a built-in circuit to prevent overcharging the battery. 3. The battery charger is useable for a main voltage between 100 and 240 VAC.	

3	Connect the cable from the motor to the battery cylinder, connector **1**.	
4	A is connected at top of the motor. B is inserted into **1** on the battery cylinder. You may secure the motor cable to the vertical bar with 2 plastic strips, C and D.	
5	The delivery includes a laptop with preinstalled software. Turn on the laptop. Connect the USB cable from the laptop to the USB connector on the battery cylinder. Start the application via the icon on the desktop, adding the requested data for start/stop etc. Disconnect the cable and once you are ready to deploy the pump, insert the 8-pins programming plug into the battery cylinder. The plug is shown in front of the laptop; please also refer to item 6, next pg. Once inserted, the programmed session will start. Deploy the pump.	

6	Once the plug is inserted, the actual programming cycle will start within 1 min. It is possible implementing a longer delay in the program so that the pump first starts pumping after a set amount of time. Another option is a trigger system done by pressure transmitter. *(Pressure transmitter is not included, please ask KC Denmark A/S for more information)*.	
7	When the pump is retrieved back on deck, you can empty the collecting bottle. Loosen the wing nuts and remove the bottle.	

	Handling the pump	
8	 <u>Do not lift the pump here</u>, you may damage the net itself or cause a stretch of the plankton cloth.	
9	Lift the pump here as shown.	

10	The 3 zinc anodes on top will prevent corrosion if the pump when used in salt water. Replace the zinc anodes when they are eroded.	
11	Caution The pressure compensation, A, will compensate the over pressure during the deployment. It is important, to rinse the membrane A regularly with fresh water. To extend life of the membrane please don't expose to direct sunlight for a long time. The motor and the pressure compensation contains Fluorinert FC-770 liquid. If you need to add extra liquid please contact KC Denmark A/S for more information.	
12	Caution It is highly recommended, that the pump isn't exposed to direct sunlight for a longer period. The battery cylinder and the motor will accommodate the heat. Battery's life will increase and the Fluorinert in the pump's house may expand, so it can break the membrane for the pressure compensation.	

	Adding a flow meter (optional)	
13	The pump supports a flow meter and inside the net bag it has a slide-in option similar for mounting the collecting bottle, item 7. For determination of the pumped volume, insert a flow meter.	
14	Loosen the upper clamp on the net bag, insert the flow meter and fasten it by means of 3 wing nuts. The flow meter's read-out is not resettable. Note the setting and mount the net bag. Remount the net bag and the clamp.	

	Determination of pumped volume	
15	In order to read the count of the flow meter, it may be necessary to loosen the upper part of the net bag. Formula for calculating the pumped volume: *Indicated number of revolutions x 0,3 x opening area (m²) x 1000 = water volume (L).* The tube has an inner diameter of 85 mm, i.e. the opening area is 0,00567 m². Example: If the number of revolutions associated with a pump session is 500 (noted from the digital flow meter counter), the water volume passed through the pump is: Volume = 500 x 0,3 x 0,00567 m² x 1000 = 850 L	

	Maintenance	
16	**The pump:** It is very important to rinse the pump by pumping fresh water for a few minutes. Also, flush on the outer side of the pump.	
17	**The net bag and collecting bottle:** Give the plankton net bag proper care and maintenance. Do not let particulate matter dry on the net because it can significantly reduce size of mesh apertures and increase frequency of clogging. Wash the net and collection bucket thoroughly with freshwater after each use. Periodically clean with a lukewarm soap solution. Do not use alcohol for cleaning acrylic parts. It is also advisable to let the net air-dry after cleaning. Nylon net material is susceptible to deterioration from abrasion and sunlight, guard against unnecessary wear and store in the dark. Repair small flakes or damages by lubricating a regular PVC glue on the fabric and cover the damaged area with a piece of plankton cloth.	
18	**The flow meter:** After use, you must clean the flow meter with fresh water and washing out any polluted or salt water from the gear counter assembly. Otherwise, a residue of salt or dirt can be built up and avoid a smooth running and poor performance.	
19	**Zinc anodes:** Replace the anodes once the material erodes.	

SubConn® handling instructions

Follow these instructions carefully to ensure correct use of your SubConn® connectors.

Handling

- Always apply grease before mating (see next page)
- Disconnect by pulling straight, not at an angle
- Do not pull on the cable and avoid sharp bends at cable entry
- When using a bulkhead connector, ensure that there are no angular loads
- Do not over-tighten the bulkhead nuts
- SubConn® connectors should not be exposed to extended periods of heat or direct sunlight. If a connector becomes very dry, it should be soaked in fresh water before use

Untagged cable and pigtail colour coding

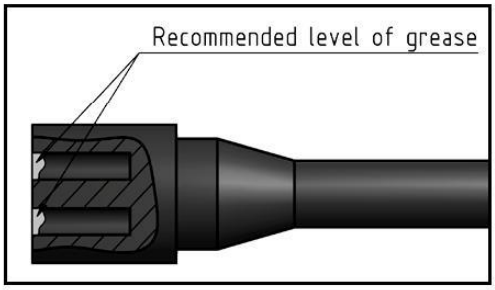
2 - 25 pin connectors (excluding 3 pin connectors):

1 Black	7 White / Black	13 Red / White
2 White	8 Red / Black	14 Green / White
3 Red	9 Green / Black	15 Blue / White
4 Green	10 Orange / Black	16 Black / Red
5 Orange	11 Blue / Black	17-25 Tagged numbering
6 Blue	12 Black / White	

3 pin connectors:

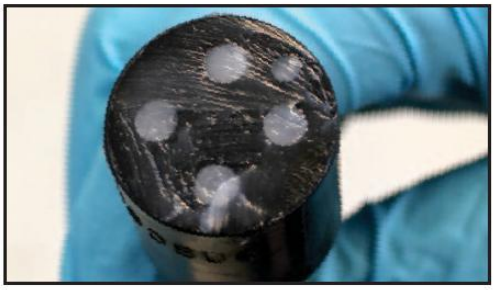
1 Black	2 White	3 Green

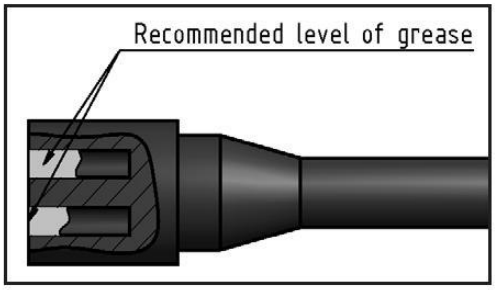
Greasing and mating above water (dry mate)



- Connectors must be greased with Molykote 44 Medium before every mating
- A layer of grease corresponding to minimum 1/10 of socket depth should be applied to the female connector
- The inner edge of all sockets should be completely covered, and a thin transparent layer of grease left visible on the face of the connector
- After greasing, fully mate the male and female connector in order to secure optimal distribution of grease on pins and in sockets
- To confirm that grease has been sufficiently applied, de-mate and check for grease on every male pin. Then re-mate the connector

Greasing and mating under water (wet mate)





- Connectors must be greased with Molykote 44 Medium before every mating
- A layer of grease corresponding to approximately 1/3 of socket depth should be applied to the female connector
- All sockets should be completely sealed, and transparent layer of grease left visible on the face of the connector
- After greasing, fully mate the male and female connector and remove any excess grease from the connector joint

Cleaning

- General cleaning and removal of any accumulated sand or mud on a connector should be performed using spray based contact cleaner (isopropyl alcohol)
- New grease must be applied again prior to mating

Scan to access SubConn® greasing and cleaning instruction videos

Bulkhead Connectors

Tightening force

Type	Material	Rec. Torque - Nm
3/8" - 24 UNF	Brass, Aluminium	4,0
	Stainless Steel, Titanium	6,0
	Non-metallic (Peek)	2
7/16" - 20 UNF	Brass, Aluminium	10,0
	Stainless Steel, Titanium	14,0
	Non-metallic (Peek)	4,2
1/2" - 20 UNF	Brass, Aluminium	15,0
	Stainless Steel, Titanium	21,0
	Non-metallic (Peek)	5,2
5/8" - 18 UNF	Brass, Aluminium	29,0
	Stainless Steel, Titanium	41,0
	Non-metallic (Peek)	10,0
3/4" - 16 UNF	Brass, Aluminium	44,0
	Stainless Steel, Titanium	63,0
	Non-metallic (Peek)	15
7/8" -14 UNF	Brass, Aluminium	60
	Stainless Steel, Titanium	80
	Non-metallic (Peek)	20

Use of Loctite

- Always use Loctite 5910 to lock non-metallic (Peek) connectors
- For locking metallic connectors, the use of Loctite 243 is recommended

For further support and advice, please contact your local SubConn® distributor or MacArtney (www.macartney.com)

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	Safety information
	Disconnect power supply to avoid any unattended operation causing accident to personnel and pump. An expert maintenance technician fully familiar with the attendant hazards must only do all maintenance, inspection and repairs. When working on the unit in areas, which are difficult to access or hazardous, ensure to take adequate safety precautions for the operator and others in compliance with the provisions of law on health and safety at work. Replace worn component with original spare parts.

Technical specifications	
Power supply:	24 VDC
Max. depth:	6000 m
Capacity:	Up to 225 L/min (clean water), volume is reduced if water contents plankton or other particles so the net bag is clogged
Motor:	800 rpm.
Filtration area:	3000 cm²
Rack:	AISI 316 stainless steel
Collecting bottle:	Capacity: 1 L
Optional:	
Programmable sampling:	Supported
Digital flow meter:	Supported via the slide-in functionality
Trigger by pressure:	Mounted in the battery cylinder, requires 60.010 time lapse trigger
Dimensions:	
Max. width of pump:	500 mm incl. battery cylinder
Height:	1510 mm
Weight:	Inclusive/exclusive battery cylinder: 24/51 kg

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E-mail: sales@kc-denmark.dk website: http://www.kc-denmark.dk/
Holmbladsvej 17-19, DK 8600 Silkeborg, Denmark. Tel. +45 86 82 83 47
Bank: Sydbank. SWIFT: SYBKDK22 - IBAN DK5070460000104832
VAT no. DK 29 61 96 62