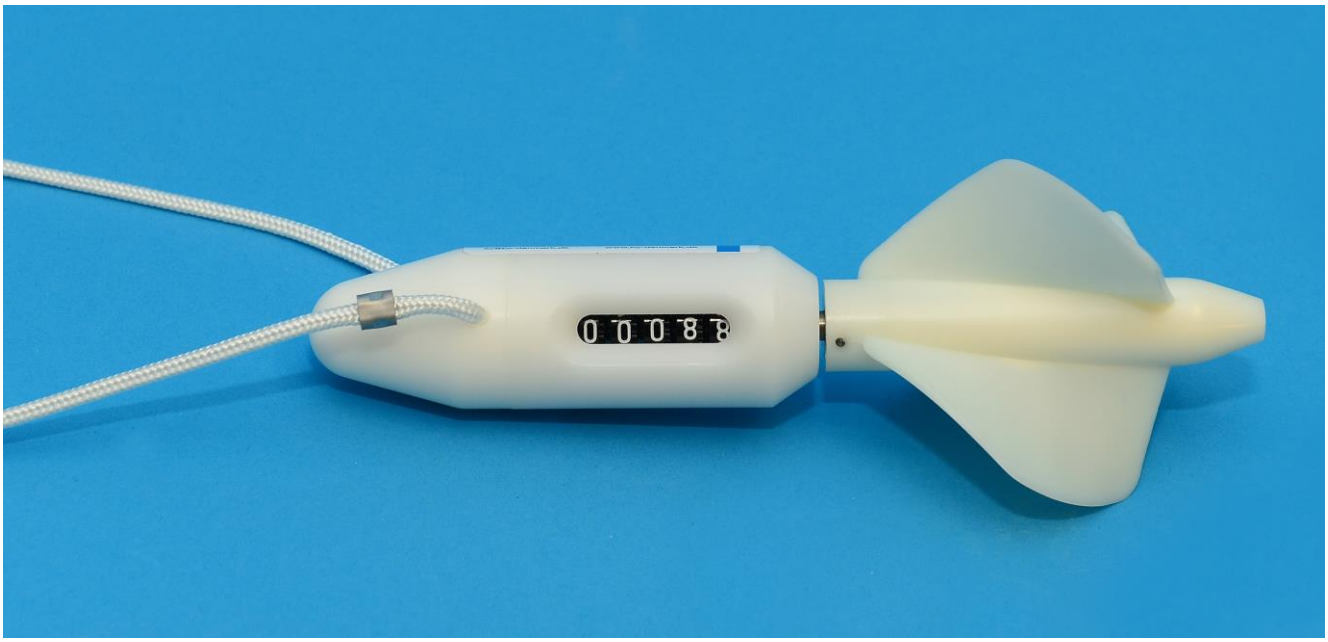

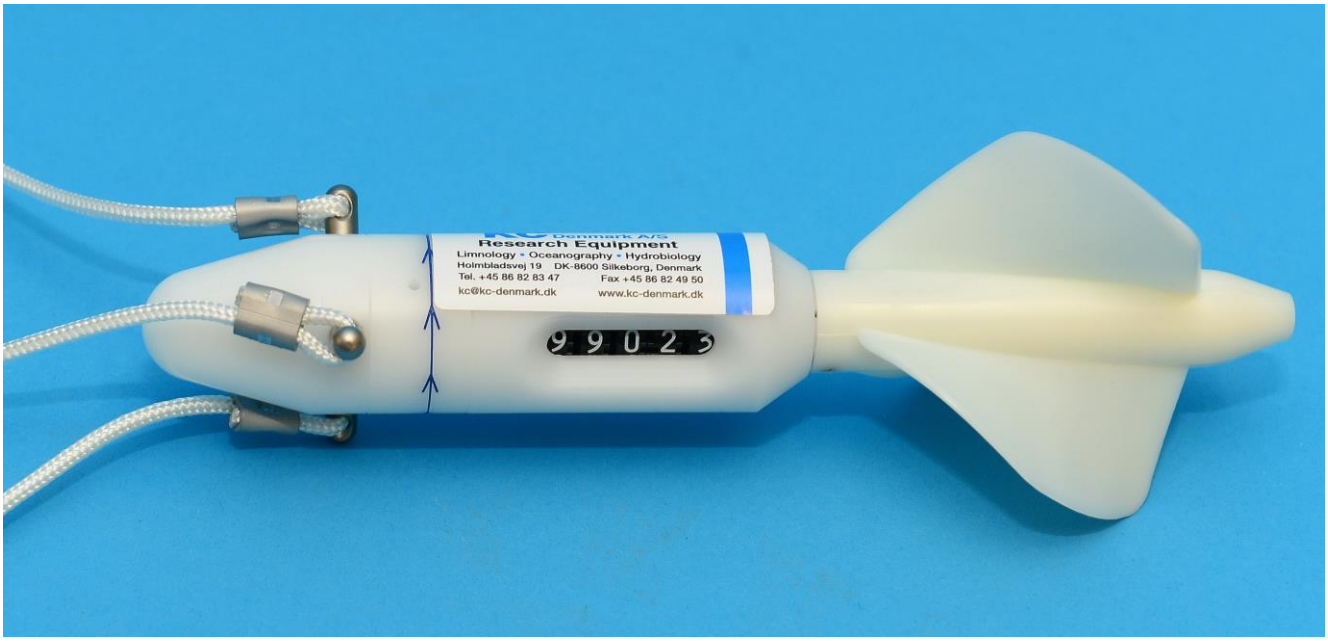

Digital flow meter
Model 23.090 – 23.091

Manual

KC Denmark A/S

Research Equipment
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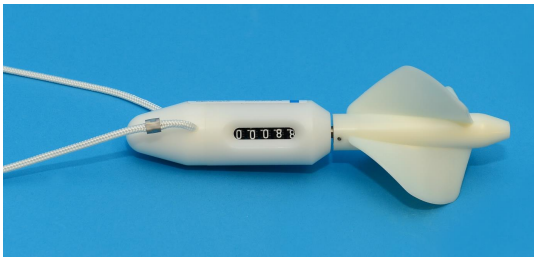
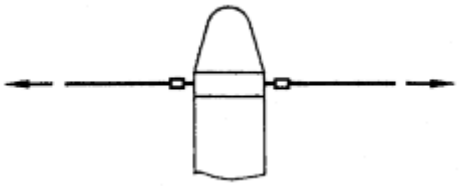
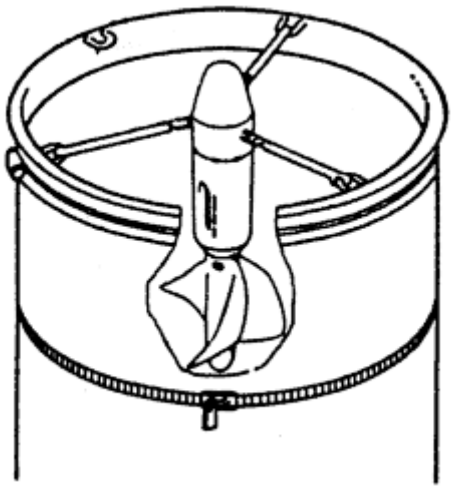
	Manual for Digital flow meters	Model no. 23.090 and 23.091
	The Digital Flow Meter (Model 23.090 and 23.091) incorporates a three-blade impeller coupled directly to a five-digit counter, which records every revolution of the impeller. Use the digital flow meter with towed equipment such as plankton nets, etc., or in stationary applications such as flow monitoring of rivers, canals, pipes and outfalls or similar. The flow meter is balanced in water for dynamic stability, and it has an unlimited depth capability because of the free-flooding system.	 23.090  23.091
	Preparation for 23.090:	
1	**Rigging instructions:** The digital flow meter is supplied with a towing bridle which can be used in two different ways:	
2	**Rigging option 1:** When towed from vehicles or streamed from fixed structures, the towing bridle can be connected to a single point forward of the digital flow meter.	
3	**Rigging option 2:** When used with plankton nets, the bridle can be attached to the net mouth ring.	
4	 Special care should be taken when beginning measurements. The flow meter is a bidirectional construction, in other words, the rotor will turn in either direction along with the counter. It is therefore critical that you are aware that the flow meter is always pointing into the flow direction for accurate readings.	

	Preparation for 23.091:	
5	**Rigging instructions:** Install the digital flow meter by a triple point connection of the nosepiece inside the net ring. Please note that the counter is non-resetting. Note the number of revolutions before and after the deployment and then use the difference in read-out for calculating the flow.	
	Determination of the water volume passing through a plankton net	
6	The pitch of the impeller is 0,3 m per revolution, i.e. the number of revolutions multiplied by 0,3 makes the towing distance. For quantitative measurements the threshold flow velocity of the impeller should not be smaller then 0,5 m/sec. For comparison measurements flow velocities smaller than 0,5 m/sec. are possible. Example: The number of revolutions is 100; this means a towing distance of 30 m. The opening area of the plankton net must be known or it has to be calculated. The water volume passed through the plankton net is determined as follows: Indicated number of revolutions x 0,3 x net opening area (m^2) x 1000 = water volume. **Example: 1** The plankton net has a diameter of 40 cm, i.e. the opening area is 0,125 m^2. If the number of revolutions associated with a tow is 266 (noted from the Digital Flow Meter counter), the water volume passed through the plankton net is: Volume = 266 x 0,3 x 0,125 m^2 x 1000 = 9975 L = 9,975 m^3 **Example: 2** The Plankton Net has a diameter of 50 cm, i.e. the opening area is 0,196 m^2. If the number of revolutions associated with a tow is 100 (noted from the Digital Flow Meter counter), the water volume passed through the plankton net is: Volume = 100 x 0,3 x 0,196 m^2 x 1000 = 5880 L = 5,880 m^3	

	Maintenance	
7	Caution After use, clean the flow meter with fresh water so any polluted or salt water is washed out from the gear counter assembly. Otherwise, a residue of salt or dirt can be built up and avoid a smooth running and poor performance.	

	Specifications	
	Material	
	Rotor	Polyamide, PA 6.6 Nylon rotor
	Nose Cone	POM Plastic
	Body	POM Plastic
	Gear Shaft	Stainless steel main rotor and idler gear shaft
	Other data	
	Depth rating	Unlimited because of the free flooding system
	Data read out	Five ten-digit counter wheels reading 00000 to 99999. One count per rotor revolution
	Counter	99999 counts, equal 16,2 nautical miles (approx.)
	Mounting	Universal bridle
	Threshold	20 cm/sec
	Range	20 cm/sec to 8,0 m/sec.
	Dimensions	
	Overall length	190 mm
	Standard rotor diameter	Ø75 mm
	Weight	500 g

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