

23.090 – 23.091  
Digital Flow Meter  
Manual

**KC** Denmark A/S

Research Equipment  
Limnology • Oceanography • Hydrobiology

# Digital Flow Meter

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.


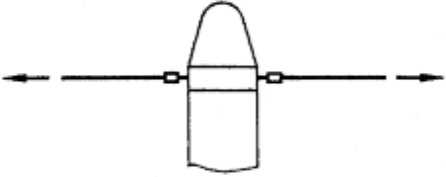

Use the digital flow meter with towed equipment such as plankton nets, etc., or in stationary applications such as flow monitoring of rivers, canals, pipes and outfalls or similar.

The flow meter is balanced in water for dynamic stability, and it has an unlimited depth capability because of the free-flooding system.

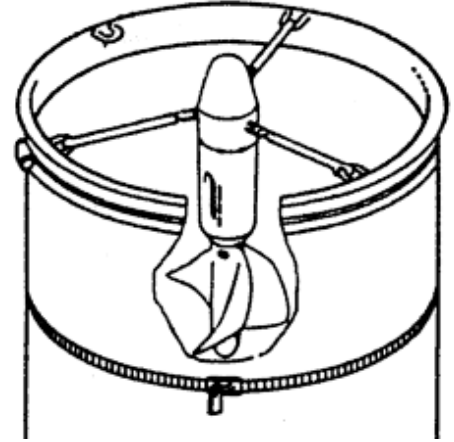
## Installation:

Easy installation by a single or double point connection of the nosepiece (Model 23.090). Recommended for **horizontal** operation.

Model 23.091 is mounted via a triple point connection inside the net ring. Recommended for **vertical and horizontal** operation.

| Item | Preparation for 23.090   |   |
|------|--|---|
| 1    | <p><b>Rigging instructions:</b></p> <p>The digital flow meter is supplied with a towing bridle which can be used in two different ways:</p>  |   |
| 2    | <p><b>Rigging option 1:</b></p> <p>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.</p>   |  |
| 3    | <p><b>Rigging option 2:</b></p> <p>When used with plankton nets, the bridle can be attached to the net mouth ring.</p>   |  |
| 4    | <p><br/><b>Caution</b></p> <p>Special care should be taken when beginning measurements. The flow meter is a bidirectional construction, in other words, the rotor will turn in direction along with the counter.</p> <p>It is therefore critical that you are aware that the flow meter is always pointing into the flow direction for accurate readings.</p> |   |

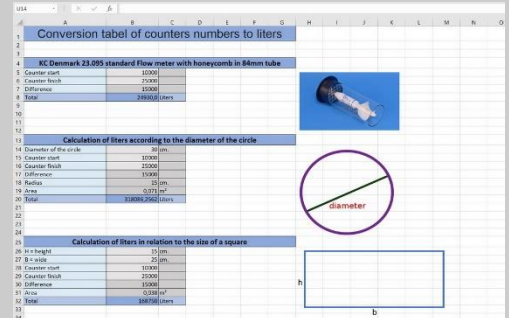
| Preparation for 23.090 (back-run stop) |  |
|--|--|
| 5                                      | <p><b>Rigging instructions:</b><br/>Install the digital flow meter by a triple point connection of the nosepiece inside the net ring.</p> <p><i>Please note that the counter is non-resetting.</i></p> <p>Note the number of revolutions before and after the deployment and then use the difference in read-out for calculating the flow.</p> |



| Determination of the water volume passing through a plankton net - manual conversion |  |
|--|--|
| 6  | <p>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.</p> <p>For quantitative measurements the threshold flow velocity of the impeller should not be smaller than 0,5 m/sec. For comparison measurements flow velocities smaller than 0,5 m/sec. are possible.</p> <p>Example: The number of revolutions is 100; this means a towing distance of 30 m.</p> <p>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:</p> <p>Indicated number of revolutions x 0,3 x net opening area (m<sup>2</sup>) x 1000 = water volume.</p> <p><b><u>Example: 1</u></b></p> <p>The plankton net has a diameter of 40 cm, i.e. the opening area is 0,125 m<sup>2</sup>.<br/>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:</p> <p>Volume = 266 x 0,3 x 0,125 m<sup>2</sup> x 1000 = 9975 L = 9,975 m<sup>3</sup></p> <p><b><u>Example: 2</u></b></p> <p>The Plankton Net has a diameter of 50 cm, i.e. the opening area is 0,196 m<sup>2</sup>.<br/>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:</p> <p>Volume = 100 x 0,3 x 0,196 m<sup>2</sup> x 1000 = 5880 L = 5,880 m<sup>3</sup></p> |

If more convenient, you can download a spreadsheet [here](#) or using the QR code below. It has a simple, intuitive design for calculating the water flow in L corresponding to the actual read-out of the flow meter. for 3 different options as follows:

1. Our standard 84 mm tube (23.095) with built-in flow meter
2. Individual input of diameter for a plankton net
3. Typing in height and width in cm for a square or rectangular design



7

## Maintenance



8

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.



| <b>Specifications</b>    |   |
|--------------------------|---|
| <b>Material</b>          |   |
| Rotor:                   | Polyamide, PA 6.6 Nylon rotor   |
| Nose Cone:               | POM Plastic   |
| Body:                    | POM Plastic   |
| Gear Shaft:              | Stainless steel main rotor and idler gear shaft   |
| <b>Other data</b>        |   |
| Depth rating:            | Unlimited because of the free flooding system   |
| Data read out:           | Five ten-digit counter wheels reading 00000 to 99999.<br>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.   |
| <b>Dimensions</b>        |   |
| Overall length:          | 190 mm  |
| Standard rotor diameter: | Ø75 mm  |
| Weight:                  | 500 g   |

Rev.: February 6, 2023 - lkj

**KC** Denmark A/S

Research Equipment  
Limnology • Oceanography • Hydrobiology

E-mail: [sales@kc-denmark.dk](mailto: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