WAND OPERATION INSTRUCTIONS
Model 2100-12, -13, -14, -C80 & -C140

STREAM VELOCITY MEASUREMENTS

1. Extend the Guide Rod slightly and swivel the Sensor to the 90° reading position.

2. Remove the Sensor Optics Protection Cap and install the Rotor Assembly (2100-A21) on the Sensor (2100-A22). *Make sure that the Set Screw is snug against the rotor shaft (2100-A26) but do not tighten it too much to avoid stripping the threads or cracking the sensor.* Check that the Rotor Assembly spins very freely.

3. Connect the sensor to the indicator via the twist-lock connector. The connector is "keyed" and only mates one way.

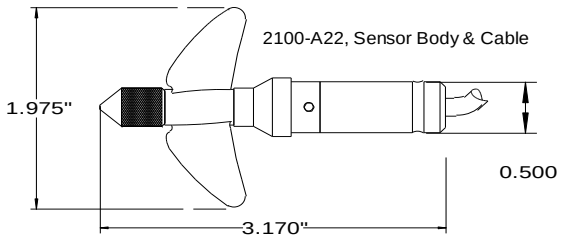
4. Place the Sensor Wand vertically in the stream and point the propeller rotor into the stream flow.

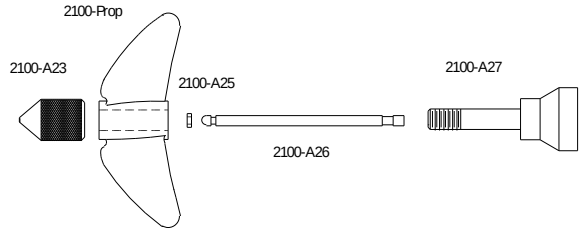
5. With the Foot of the Guide Rod at the stream bed, adjust the Depth Rod up or down until the tip of the propeller is intersected by the stream surface

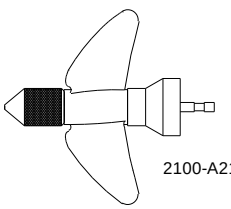
6. Read the stream depth on the Depth Rod Scale. Depth is measured at the top of the Slide Index fitting (see diagram back page).

7. Next lower the sensor until the top of the Slide Index fitting is opposite the corresponding numerical depth reading on the 6/10 Depth Scale. The sensor propeller is now at 6/10 of the stream depth from the surface of the stream.

8. Select one of the velocity measurement methods available with the Model 2100 meter and take your readings (see the Model 2100 Indicator Operation Instructions). The Model 2100 should now be reading the stream velocity directly in feet or meters per second.







SENSOR WAND-CARE AND MAINTENANCE

1. Treat the Propeller Assembly very gently. The calibration could be changed by propeller or sensor damage. *Never put the wand assembly back into the carrying case with the Rotor Assembly still attached.* Replace the Rotor with the Protection Cap (1/2" Cap Plug) and store the Rotor Assembly elsewhere, preferably with the Model 2100 Indicator.

2. When swiveling the sensor from the "stowed" position to the "read" position grip the Sensor Boom, not the Rotor or the Sensor Body. The Rotor Shaft could be damaged and the Sensor Body harmed if the swivel joint is too tight.

3. The connector is weatherproof only when mated. Keep both ends of the connector dry when not coupled

4. Dry the Sensor Wand completely before returning it to storage to reduce the possibility of corrosion. Although the wand is made of aluminum alloy, some amount of corrosion will occur making sliding of the Guide Rod difficult. A light film of oil or grease will help maintain proper sliding characteristics.

5. The sliding resistance of the Scale Rod on the Guide Rod can be adjusted by loosening the plastic set screw protruding from the Slide Index Fitting. Tightening of this screw will increase friction between the Guide Rod and the Depth Rod.

6. Keep the Sensor/Propeller above the stream bed when taking readings to prevent sand and silt from entering the bearing surfaces of the Rotor. The Photo-Fiber-Optic sensor should be frequently checked for freedom of rotation especially if the water has suspended particulates. *In some cases it may be necessary to clean the sensor after each immersion.*

CARE OF THE 2100 SENSOR

The Sensor of the *Model 2100* Current Meter is the single most important part of the instrument and great care must be observed for its continued accurate output.

Keep the Sensor/Propeller assembly above the stream bed when taking readings and avoid rocks and other hazards when moving from one measuring site to another. This will prevent damage to the Rotor, Rotor Shaft, Propeller and the Sensor Body.

Never transport or store the sensor wand with the propeller rotor installed*. Use the 1/16" hex screwdriver to loosen the setscrew and remove the entire rotor assembly when not using the Model 2100.* Do not tighten the set screw any tighter than necessary to keep the rotor in place on the sensor. If too tight, the set screw can damage the surface of the rotor shaft causing it in turn to damage the inside of the fiberoptic rotor when it is removed for normal maintenance and cleaning.

Always replace the batteries in the Model 2100 Indicator with fresh ones.

1. During rough use check the propeller frequently for frayed leading edges and for cracks. Chipped or cracked props should be replaced. Frayed leading edges can be brought back to acceptable levels of operation by reshaping them with 150 grit (or finer) sandpaper. Propellers which show signs of being bent or misshapen should be discarded.

2. Rotational friction is by far the biggest cause of erroneous data especially at velocities below 2 feet per second. Check the freedom of rotation frequently especially in turbid water or after rough handling. In some measuring situations it may be necessary to completely disassemble the rotor and clean the parts with clear water after each immersion. Use spare rotor assemblies and interchange them often. ***Never leave the rotor assembly attached to the sensor after taking readings.***

3. Water is the lubricant for the *2100* rotor. "Canned air" and spray type degreasers should be used to regularly clean the "bore" of the Rotor (**2100-A27**) and the polished surface of the Rotor Shaft (**2100-A26**). Avoid oil & grease if possible.

4. The Rotor Assembly (**2100-A21**) should spin very freely when held in the vertical position (propeller pointing up) and simply blow lightly on the propeller. If it does not, clean the bore of the Rotor and the surface of the Rotor Shaft thoroughly.
One method to determine an acceptable level of low-velocity performance by a particular Rotor Assembly is to perform a "Spin Test" :
Install the Rotor on the sensor, connect the sensor to the Indicator, and place the Indicator in the **COUNT** mode. With the propeller pointing up blow very hard straight down on the propeller. *At the instant you stop blowing* hit the **RESET** key on the indicator and allow the rotor to coast to a stop. A rotor which will perform to the low velocity limits of its design produces counts on the indicator of at least 300.

5. If the Rotor begins to "buzz" when spun by hand it means that the bore diameter of the Rotor (**2100-A27**) and the outside diameter of the Shaft (**2100-A26**) are too far apart. In this case it is advised to replace the Rotor with a new one. If the shaft shows visible signs of wear replace it also. Severe buzzing indicates that the rotor is bouncing off the shaft as it rotates around it. This slows the rotor significantly especially at velocities above 3 FPS and will cause readings to be slower than actual. **Note:** Some slight buzzing may be heard in the later versions of the rotor when it is spun "dry". This buzzing should cause no significant loss of efficiency.

6. Periodically examine the Thrust-Bearing Nut (**2100-A23**) and check inside on the bottom (the bearing surface). If a pronounced "cup" begins to form (wear from the ball-shaped end of the Rotor Shaft) the **2100-A23** should be replaced. This is especially necessary when using the *Model 2100* in low-flow situations, 2 FPS or lower.

7. The Photo-Optics in the sensor body must be kept clean. Use soap and water and a soft tooth brush to keep the "eyes" clean if necessary. *Be careful and do not scratch the Photo-optics as this could cause unwanted light scattering and therefore erroneous readings.* Likewise the Fiber optics "eyes" in the base of the Rotor (**2100-A27**) should also be kept clean.

Treat the *Model 2100* Rotor Assembly and Sensor with care and it will continue to produce accurate data with minimum maintenance.

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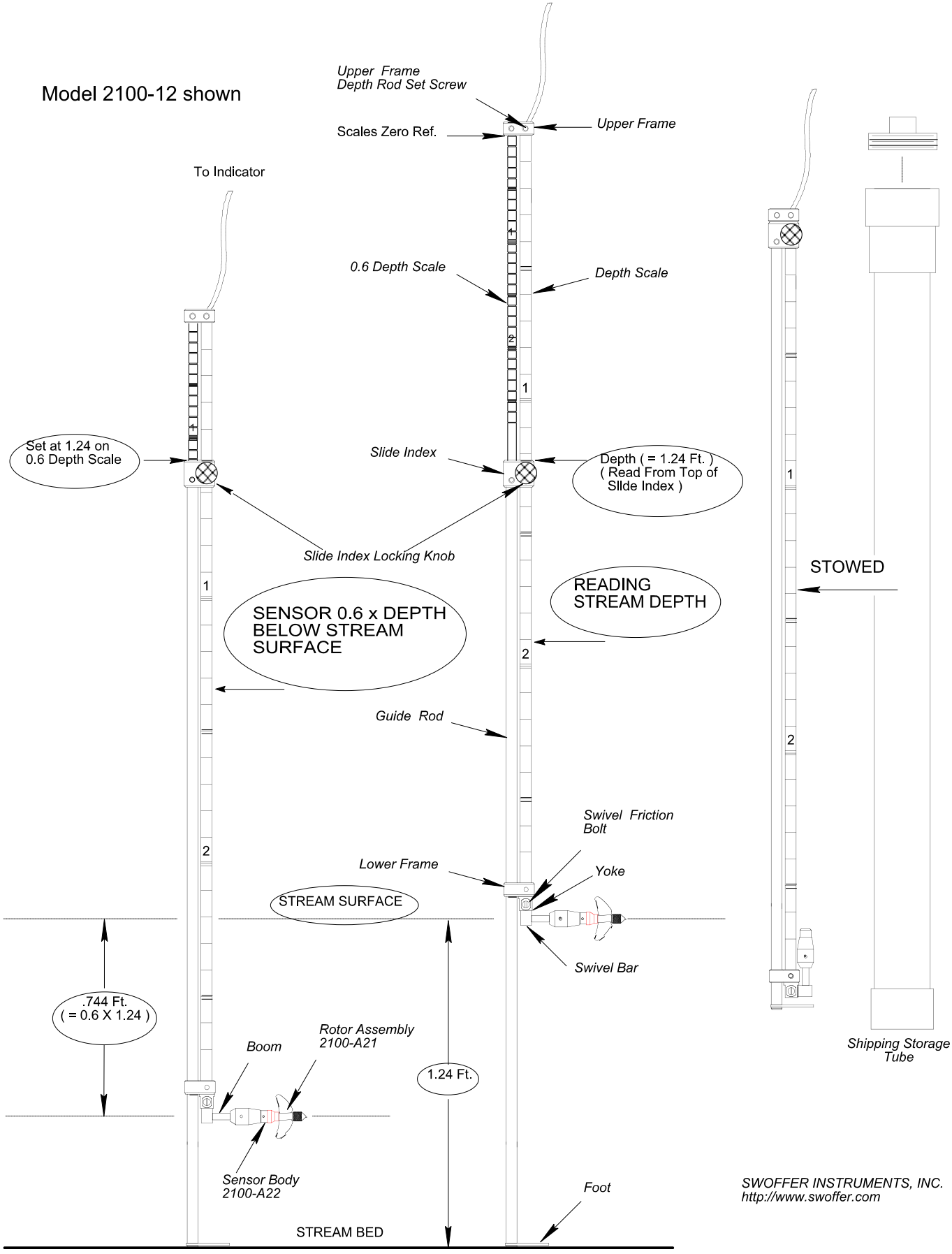

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