



*“Advanced SOLUTIONS for  
Physiology Teaching and Research”*



## Tech Note

## Optional Spirometer Flowheads

The iWorx SP-304/300 spirometer is supplied with the A-FH-300 flowhead, which has a linear range of -300 to +300 liters/minute and is suitable for most measurements on human subjects. Other flowheads with different ranges of linearity are available for use with the SP-304/300 spirometer. For example, the A-FH-1000, with a linear range of -1000 to +1000 liters/minute, is suitable for performing certain lung function tests and measuring respiratory volumes from human subjects that are exercising. Three smaller flowheads, the A-FH-100 or the A-FH-10 or the A-FH-1, are more suitable for measuring volumes from small animals that range in size from dogs to mice. The common feature of all these models of flowheads is that they all have good linearity in their respective normal range because the flow of air through each model of head is laminar. If a flowhead has laminar flow (low turbulence), the back pressure, that develops in the flowhead from the presence of fine stainless gauze across the stream of air, is related to the velocity of the air (or its viscosity) in a linear manner. When this velocity-dependent pressure contacts a sensitive differential pressure transducer like the one built into the SP-304, the voltage output created by the transducer is also velocity dependent. So, the volume respired can be accurately derived from the voltage output of the transducer.

Another feature of all these flowheads is the minimal amount of condensation that develops in the flowhead. Because the fine stainless steel gauze in the flowhead is mounted between plastic rings, the gauze rapidly equilibrates with the passing air and condensation is prevented. Each model of flowhead can be easily calibrated; especially, if a 1 liter syringe and the calibrate function from the LabScribe recording software is used. Also, each model of flowhead can be easily cleaned or sterilized.

The A-FH-1000 flowhead is molded in ABS plastic, like the A-FH-300, so it is light. Unlike the A-FH-300, the A-FH-1000 can be easily dismantled for replacement of the gauze assembly.

The A-FH-100, A-FH-10, and A-FH-1 flowheads are machined in acetal, so they are also light. They also have interchangeable gauze.

<b>Flow Head</b>	<b>Linear Range (L/min)</b>	<b>Airflow with Pressure Equal to 10 mm H<sub>2</sub>O</b>
A-FH-1	+/- 1	1.2 L/min
A-FH-10	+/- 10	12 L/min
A-FH-100	+/- 100	90 L/min
A-FH-300	+/- 300	125 L/min
A-FH-1000	+/- 1000	485 L/min

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