



## A Comparison of the SASS® 2300 with Two Competitors – 060514

Feature	SASS 2300 (2)	Competitor: Coriolis RECON (Bertin)	Competitor: Airport MD8 (Sartorius)	Comment
<b>Operating Principle</b>	Patented multi-stage wetted-wall cyclone with enhanced particulate collection.	Wet cyclone, conical sample cup	Filter sampler with gelatin filter that is laid directly onto agar – or direct impingement onto an agar plate	Coriolis uses a similar physical principle to the SASS 2300. The MD8 collects onto a gelatin filter which is then put into contact with an agar growth media; or an agar plate is put directly into the MD8. The MD8 suffers from an inability to effectively collect for other methods of analysis, such as antibody or PCR/nucleic acid. It is very much focused on the “old school” method of organism collection and identification.
<b>Sampling rate, LPM</b>	325	600	30, 40, 50, and 125	The Coriolis has a higher sampling rate, but the water volume is 20cc versus our five cc. Hence, the organism concentration in our sample water is double that of the Coriolis. This is always the important issue in sampling – the organism concentration in the final sample fluid.
<b>Maximum air sample volume (m<sup>3</sup>)</b>	No limit	3 to 9	2000 liters	Due to the fact that the Coriolis water inventory in the cyclone cup is fixed, they cannot sample for more than 10 minutes without danger of the water drying out in the cup due to evaporation. They now have an ‘option’ that they say lets them collect for 6 hours. They have the user set a drip rate into the cup, and run it that way for up to 6 hours! As anyone can observe, humidity and temperature can change a lot in 6 hours, so this fixed drip rate method is nothing more than a ruse to muddy the water, so that they can say “we have evaporation water makeup too.” From a practical perspective, their method is childish and the cup is likely to either run over or dry up. No wonder they offer it as an option only.
<b>Max sampling time</b>	No limit	Up to 15 minutes (6 hr option(6))	1.1 hour; factory-set max. time	Competitors have fixed and smaller maximum sampling times.
<b>Programmable sampling protocols</b>	Yes, single and multiple sampling events per run	No, other than time for single sample	No, other than time for single sample	2300 can be set to wait before first sampling, then to sample at intervals. Competitors have no such ability.
<b>Remote PC control and operation</b>	Yes; full protocol and command	Limited; remote trigger only	No	The Coriolis has only limited on/off communication with other devices or a PC. Many operating parameters can be changed remotely, and repetitive protocols programmed into the 2300’s memory
<b>Sampling medium</b>	Water or injected buffer	Water or buffer	Gelatin filters or agar plates	The MD8’s gelatin filters and agar plates seriously limit the temperature range of operation- too cold and the bugs don’t stick; too hot and dry and the bugs die or the materials dry out and lose their adhesive character. The MD8 is a very ‘hands-on’ device and you can’t leave it in the field for many hours with a plate inserted.



## A Comparison of the SASS® 2300 with Two Competitors – 060514

<b>Output sample type and size</b>	Pumped out sample or vial; 4.5 ml typical	20 ml in vial	80mm Gelatin membrane or inoculated agar dish	Our patented method of using a very small amount of water results in high organism concentrations in the sample fluid.
<b>Particle diameter range (microns)</b>	1 and up	0.5 – 10	Not known	The Coriolis can theoretically collect smaller organisms than the 2300, but the danger here is that delicate organisms may not survive the collection process. RI has tried to balance collection forces with high viability post-collection.
<b>Organism concentration after 5 min (5)</b>	361/ml	150/ml	N/A	Large Coriolis sample volume (due to uncontrolled evaporation) leads to lower sample organism concentrations.
<b>Concentration enhancement by extended collection time</b>	Yes	Yes, with Long Time Monitoring option	No	But the Coriolis Long Time Monitoring option is not likely to work correctly in the field, particularly if there are rapidly changing environmental conditions
<b>Automated sample transfer</b>	Yes	No	No	Only the 2300 can operate as part of an automated sampling system
<b>Rinse protocol between samples</b>	Yes	No	N/A	The Coriolis is set up for “one-at-a-time” sampling, and there is no built-in rinsing capability. Also, our rinse protocol can be modified by the user to their liking.
<b>Total samples</b>	1 sample or unlimited samples via pump-out port	1 integrated sample	1 integrated sample	Already discussed above.
<b>Consumables</b>	Water and collection vials	Water and collection vials	Gelatin membranes	
<b>Max. battery time / AC operation?</b>	>20 hr on rechargeable /Yes	1 hour /Unknown	4 hr at 125 LPM /No	The Coriolis’s higher air flow rate draws the battery down rapidly. Their air flow rate is 2 times that of the 2300, but the power required is 250 watts versus 16 watts! The MD8 is also limited in long-term operation, although that is more problematic due to the agar or gelatin changing properties out in the field after being left so long.
<b>Quick battery change out</b>	Yes	No; 3 hrs to recharge	No; 4.5hrs to recharge	Neither competitor’s units can be sent out immediately after the battery has been exhausted because the battery is built in. With our removable rechargeable battery, you don’t have to wait 3 to 4.5 hours before the instrument is useable again.
<b>Temp. range</b>	Above freezing to 66°C	+0°C to +50°C	Gelatin:30°C, 85%RH; or agar limits	Due to uncontrolled evaporation and agar sensitivity, neither of the competitors can be used at higher temperatures.



## A Comparison of the SASS® 2300 with Two Competitors – 060514

<b>Size</b>	18.4cm W x 21.3cm D x 34.3 cm H	36.5cm x 22cm x30.6cm	30.cm L x 13.5cm W x 16.5cm H	
<b>Weight, kg</b>	4.7 with battery 3.7 without	10	2.5	The Coriolis unit is unusually heavy
<b>Sampler physical volume, liters</b>	13.0	25	6.7	The Coriolis unit is twice the size of the SASS 2300
<b>Power Source options</b>	Removeable battery or DC adapter for AC power	Internal battery	Internal battery	Already discussed
<b>Power Consumption</b>	16W @ 12V	250W	Unknown; Internal battery	Already discussed.
<b>Noise level, dB(A) @1m</b>	45-60	Unknown	48	It would be interesting to measure the Coriolis's sound level.
<b>Serial interface</b>	Yes	Yes?	no	The Coriolis can be triggered by other equipment. Our serial interface is bi-directional, allowing triggering and such commands as 'sample ready' to be sent out.
<b>Wireless control option</b>	Yes	No	No	No wireless options offered by the other mfrs.
<b>Consumable: cost</b>	Low- water or buffer, vials	Low: Water and vials	Gelatin Filter or agar plate	Already discussed.

### Notes:

- 1) Manufactured by FLIR under license from Research International, Inc.: U.S. Patents 6,484,594 and 7,261,008.
- 2) Covered by U.S. patents 6,532,835 and 7,846,228.
- 3) Extraction method covered by U.S. patents 8,057,608 and 8,142,570.
- 4) Covered by Chinese patent ZL-2009 10166843.8 and U.S. pending patents
- 5) Assuming 1 colony/liter of sampled air
- 6) Standard time is 10 minutes. For longer collection time option, user must input an expected evaporation rate and pump will replenish at this rate. This is impractical, as humidity can change significantly over a 6 hour period. The SASS 2300 automatically adjusts makeup water for changes in humidity and temperature.