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# Appendix C:

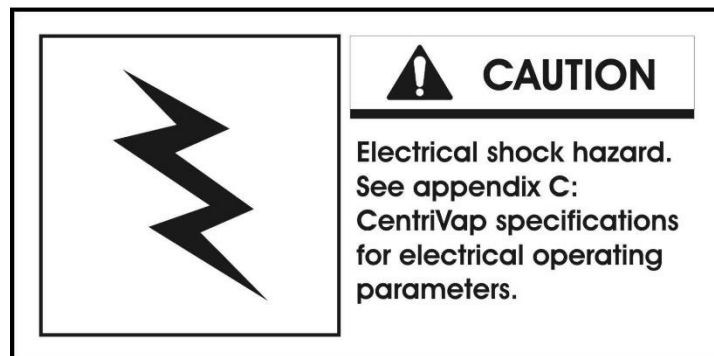
## CentriVap Refrigerated Concentrator Specifications

This Appendix contains technical information about the CentriVap including specifications, environmental operating conditions, and evaporation rates.

### Electrical Specifications

- Nominal amperage for 115V CentriVap Concentrator (model 7310020 series) (excluding vacuum pump): 8.0 amps (with vacuum pump) 16.0A max.
- Nominal amperage for 230V CentriVap Concentrator (model 7310030 & 7310040 series) (excluding vacuum pump): 3.5 amps (with vacuum pump) 8.0 amps max.
- Heater Power: 300 watts
- Phase: Single
- Rotor Speed: Up to 1,725 RPM

**CAUTION: Do not use the CentriVap in a manner not specified by the manufacturer. The electrical protection properties of the CentriVap may be impaired if the CentriVap is used inappropriately.**



## Environmental Conditions

- Indoor use only.
- Maximum altitude: 6562 feet (2000 meters).
- Ambient temperature range: 41° to 104°F (5° to 40°C).
- Maximum relative humidity: 80% for temperatures up to 88°F (31°C), decreasing linearly to 50% relative humidity at 104°F (40°C).
- Main supply voltage fluctuations not to exceed  $\pm 10\%$  of the nominal voltage.
- Transient overvoltages according to Installation Categories II (Overvoltage Categories per IEC 1010). Temporary voltage spikes on the AC input line that may be as high as 1500V for 115V models and 2500V for 230V models are allowed.
- Used in an environment of Pollution degrees 2 (i.e., where normally only non-conductive atmospheres are present). Occasionally, however, a temporary conductivity caused by condensation must be expected, in accordance with IEC 664.

## Evaporation Rates

Tube Size (ml)	Number of Samples	Sample Size (ml)	Heater Temp (C)	Vacuum Pump	Time to Dry (min)	Cold Trap	Rate Overall (ml/min)
<b>Methylene Chloride</b>							
<b>bp 40</b>							
50	12	25	45	Diaphragm	80	no	3.75
15	18	10	45	Diaphragm	45	no	4.00
<b>Toluene</b>							
<b>bp 111</b>							
50	12	25	45	Diaphragm	204	no	1.47
50	12	25	100	Diaphragm	96	no	3.13
15	18	10	45	Diaphragm	119	no	1.51
15	18	10	100	Diaphragm	42	no	4.29
<b>Acetonitrile</b>							
<b>bp 82</b>							
50	12	25	45	Diaphragm	184	no	1.63
50	12	25	100	Diaphragm	81	no	3.70
15	18	10	45	Diaphragm	106	no	1.70
15	18	10	100	Diaphragm	52	no	3.46
1.5	132	1	45	Diaphragm	55	no	2.40
1.5	90	1	45	Diaphragm	47	no	1.92
1.5	132	1	60	Diaphragm	37	no	3.57
1.5	132	1	75	Diaphragm	33	no	5.74
1.5	132	1	100	Diaphragm	21	no	6.29
<b>Methanol</b>							
<b>bp 65</b>							
50	12	25	45	Diaphragm	233	no	1.29
15	18	10	45	Diaphragm	141	no	1.28
1.5	132	1	35	Diaphragm	88	no	1.50
1.5	132	1	45	Diaphragm	64	no	2.06
1.5	132	1	60	Diaphragm	50	no	2.64
1.5	90	1	75	Diaphragm	38	no	2.37
1.5	132	1	75	Diaphragm	39	no	3.38
1.5	132	1	100	Diaphragm	25	no	5.28
<b>Water</b>							
<b>bp 100</b>							
50	12	25	45	Diaphragm	1397	no	0.21
50	12	25	100	Diaphragm	445	no	0.67
15	18	10	45	Diaphragm	841	no	0.19
1.5	132	1	45	Diaphragm	427	no	0.30
1.5	132	1	60	Diaphragm	303	no	0.44
1.5	132	1	75	Diaphragm	196	no	0.67
1.5	132	1	100	Diaphragm	117	no	1.13
50	12	25	45	Rotary vane	1002	yes	0.30
50	12	25	100	Rotary vane	424	yes	0.70
15	18	10	45	Rotary vane	565	yes	0.32
15	18	10	60	Rotary vane	456	yes	0.39
1.5	132	1	45	Rotary vane	299	yes	0.44
1.5	132	1	75	Rotary vane	207	yes	0.64
1.5	132	1	100	Rotary vane	131	yes	1.01
1.5	132	1	25	Rotary vane	627	yes	0.21
1.5	132	1	15	Rotary vane	794	yes	0.17
1.5	132	1	5	Rotary vane	1160	yes	0.11
1.5	132	1	-4	Rotary vane	1485	yes	0.09
<b>Ethanol</b>							
1.5	132	1	100	Rotary vane	34	yes	3.88
1.5	132	1	75	Rotary vane	45	yes	2.93
1.5	132	1	60	Rotary vane	55	yes	2.40
1.5	132	1	45	Rotary vane	70	yes	1.89
1.5	132	1	25	Rotary vane	95	yes	1.39
1.5	132	1	15	Rotary vane	120	yes	1.10
1.5	132	1	5	Rotary vane	160	yes	0.83
1.5	132	1	-4	Rotary vane	190	yes	0.70

Vacuum Pumps:

Diaphragm – Rated at 12 mbar ultimate vacuum and 34 L/min displacement

Rotary vane – Rated at  $2.0 \times 10^{-3}$  mbar ultimate vacuum and 195 L/min displacement

Chamber preheated prior to each run to run temp.