



**Riverside Energy Efficiency Laboratory
3100 SH 47, Building 6502
Bryan, Texas 77807**

Report of a Fan Test

Fan Tested For

Reversomatic Mfg., Ltd
790 Rowntree Dairy Road
Woodbridge, Ontario, Canada L4L 5V3

Fan Model Tested

RERV-C100 ECM, RERV-D100 ECM, RERV-CF100 ECM, RERV-S100 ECM

Test Date

3/8/2022

Contract No. 22-1343A

Release Date

3/28/2022

**Riverside Energy Efficiency Laboratory
Accredited Laboratory Certificate # 2977.01**



Report of a Fan Test

Fan Tested For

Reversomatic Mfg., Ltd
790 Rowntree Dairy Road
Woodbridge, Ontario, Canada L4L 5V3

Fan Model Tested

RERV-C100 ECM, RERV-D100 ECM, RERV-CF100 ECM, RERV-S100 ECM

Test Date

3/8/2022

Contract No. 22-1343A

The test results contained herein apply only to the specific fan assembly including motor, wheel, and other components named above and further described in this report.

These tests were made in accordance with Figure No. 12 of ANSI/AMCA Standard 210-16, ANSI/ASHRAE Standard 51-16, AMCA Standard 300-14, HVI Publication 915 (February 2016), HVI Publication 916 (September 2015), and HVI Publication 920 (February 2020)

Caution: The name of the Energy Systems Laboratory is not to be used in advertising matter, catalogs, or similar material except in the following manner: 'Rated (or ratings) in accordance with the Standard Test Code by the Energy Systems Laboratory of the Texas A&M Engineering Experiment Station.'

Laboratory Director:



Michael B. Pate, Ph.D.
Energy Systems Laboratory

Laboratory Manager:



James F. Sweeney, Ph.D.
Energy Systems Laboratory

Customer Information

Company Reversomatic Mfg., Ltd
Address 790 Rowntree Dairy Road
City Woodbridge

State Ontario, Canada
Zip Code L4L 5V3
Contact Bhavesh Shah
Contact Title
Phone 1 (905) 457 6701
Phone 2 N/A
Fax N/A
Email bhavesh@reversomatic.com

Test Notes ERV Unit (2 speed) Test
Sound on High Speed
setting. Horizontal
discharge. Mfg. stated
airflow @ 160 cfm @
0.2sp

Test Information

Contract Number 22-1343A
Test Date 3/8/2022
Fan Model Number RERV-C100 ECM, RERV-D100 ECM
RERV-CF100 ECM, RERV-S100 ECM
Motor Model Number N/A
Number of Motors 2
Number of Blades Blower
Blade Material Plastic
Motor Volts 120 (1 ph, AC)
Wheel Diameter (in) N/A
Outlet Diameter (in) N/A
Outlet Area (sq ft) N/A
Number of Points N/A
Test Type N/A
Test Figure N/A
Discharge Configuration Horizontal
Fan Speed HS
Testing Supervised By: James F. Sweeney

Sound Test Operator: Ahmad Jawad

View of Test Set-UP
TEES-ESL
Reversomatic Mfg., Ltd
RERV-C100 ECM, RERV-D100 ECM, RERV-CF100 ECM, RERV-S100 ECM
22-1343A



**Riverside Energy Efficiency Laboratory
Equipment List
22-1343A**

		Description	Manufacturer (Model No)	Calibration Service Provider	Calibration Status		
					Acc. By/Cert. #	Calibration Date	Calibration Due
1	3025055 - 3131651	Microphone & Preamplifier	Bruel & Kjaer 4942-L-001	West Caldwell Calibration Laboratories Inc.	A2LA/1533.01	3/18/2021	3/18/2022
2	3025056 - 3131652	Microphone & Preamplifier	Bruel & Kjaer 4942-L-001	West Caldwell Calibration Laboratories Inc.	A2LA/1533.01	3/18/2021	3/18/2022
3	3070914 - 3144440	Microphone & Preamplifier	Bruel & Kjaer 4942-L-001	West Caldwell Calibration Laboratories Inc.	A2LA/1533.01	3/18/2021	3/18/2022
4	3070915 - 3144441	Microphone & Preamplifier	Bruel & Kjaer 4942-L-001	West Caldwell Calibration Laboratories Inc.	A2LA/1533.01	3/18/2021	3/18/2022
5	2228462 - 2220899	Microphone & Preamplifier	Bruel & Kjaer 4942-L-001	West Caldwell Calibration Laboratories Inc.	A2LA/1533.01	3/18/2021	3/18/2022
6	2228464 - 2220901	Microphone & Preamplifier	Bruel & Kjaer 4942-L-001	West Caldwell Calibration Laboratories Inc.	A2LA/1533.01	3/18/2021	3/18/2022
7	3050-110716	Pulse Multi-channel Data Analyzer	Bruel & Kjaer 3050-A-060	West Caldwell Calibration Laboratories Inc.	A2LA/1533.01	12/7/2021	12/7/2022
8	2498836	Acoustical Calibrator	Bruel & Kjaer 4231	West Caldwell Calibration Laboratories Inc.	A2LA/1533.01	3/18/2021	3/18/2022
9	1725562	RSS	Bruel & Kjaer 4204	Riverbank Acoustical Laboratories	NVLAP/ #100227-0	8/5/2021	8/5/2022
10	1483712	Digital Panel Tachometer	Monarch ACT-3	Cal Lab Co., Inc.	LAB/L2216	10/18/2021	10/18/2022
11	1483306	Digital Panel Tachometer	Monarch ACT-3	Cal Lab Co., Inc.	LAB/L2216	8/9/2021	8/9/2022
12	40380203	Multimeter	FLUKE 87V	Fluke Corporation	A2LA/2166.01	5/28/2021	11/28/2022

Test Note	Sound RPM:4430, 3964
-----------	----------------------

Line No.	Symbol	Column	ANSI 1/3-Octave Band No.	17	18	19	20	21	22	23	24	25	26	27	28	
			Hertz	50	63	80	100	125	160	200	250	315	400	500	630	
			Limits for BGD Steadiness	2	4	2	2	2	1	1	1	1	1	1	1	1
			Limits for SNR	10	10	10	10	10	10	10	15	15	15	15	15	15

Enter Test Measurements:															
1	L_{pfm}	Meas. FAN+BGD	31.24	35.53	36.59	36.85	42.57	38.90	41.87	46.38	50.01	48.78	50.77	49.92	
2	L_{pbm}	Meas. BGD	18.66	18.75	9.81	7.37	3.03	0.01	0.86	-1.28	-1.05	1.02	0.20	-0.12	
3	L_{prm}	Meas. RSS+BGD	71.35	64.28	66.65	69.87	69.43	70.66	69.33	70.65	72.79	74.35	76.24	78.25	
4	L_{pbck}	Meas. BGD for check	18.70	18.16	9.27	5.86	2.71	-0.10	0.84	-1.23	-1.01	0.68	0.26	-0.15	

Check Background Steadiness and Level:															
5		2-4, Arith. Steady BGD?	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	
6		3-2, Arith. RSS SNR	52.699	45.530	56.839	62.502	66.403	70.656	68.471	71.930	73.841	73.325	76.037	78.367	
7		1-2, Arith. Separation (FAN SNR)?	12.586	16.772	26.780	29.481	39.544	38.896	41.015	47.656	51.067	47.758	50.566	50.040	
8	$L_{psnr,z}$	Zero Sone Fan SNR (from SNR sheet)	30.953	22.008	29.993	33.654	35.155	36.407	31.724	33.482	33.393	30.878	31.390	30.721	

Subtract Background measurement:															
9	L_{pr}	Log 3-2 (RSS+BGD)-BGD=RSS	71.355	64.283	66.650	69.868	69.429	70.662	69.328	70.649	72.789	74.348	76.239	78.246	
10	L_{pf}	Log 1-2 (FAN+BGD)-BGD=FAN	30.995	35.433	36.582	36.842	42.569	38.901	41.871	46.376	50.015	48.782	50.768	49.918	

Calculate Room Characteristic Ratio and 1/3-Oct. Fan Sound Power:															
11	L_{wr}	RSS CAL Calibration Data (Given)	79	78.8	78.1	78.1	78.5	79.5	80	79.7	79.7	79.7	79.9	80.7	
12	L_{rcr}	Arith. 11-9 (RSS pow-pres=RCR)	7.645	14.517	11.450	8.232	9.071	8.838	10.672	9.051	6.911	5.352	3.661	2.454	
13	L_{wf}	Arith. 10+12 (FAN pres+RCR=pow)	38.640	49.950	48.032	45.074	51.640	47.740	52.544	55.426	56.926	54.134	54.429	52.373	

Fan Pressure at Std Distance, in Std Environment:															
14	K_{rd}	Given, dB down @ 5 feet	-14.65	-14.65	-14.65	-14.65	-14.65	-14.65	-14.65	-14.65	-14.65	-14.65	-14.65	-14.65	
15	$L_{p'}$	Arith. 13-14 (Fan Test Results)	23.990	35.300	33.382	30.424	36.990	33.090	37.894	40.776	42.276	39.484	39.779	37.723	

Convert to single Sones Rating Number:															
16	s	Lookup sones for each band	0.000	0.000	0.000	0.000	0.210	0.124	0.484	0.840	1.158	1.059	1.162	1.078	

17	S	Add sones &					3.353									
----	---	-------------	--	--	--	--	--------------	--	--	--	--	--	--	--	--	--

(Reference: Lookup table ref. column number.) 3 4 5 6 7 8 9 10 11 12 13 14
 (Refer to the separate SNR calculation sheet for detailed SNR calculation procedure)

Test Note
Sound RPM:4430, 3964

Page 2
Contract : 22-1343A

Company: Reversomatic Mfg., Ltd

Test Date: 3/8/2022

Model: RERV-C100 ECM, RERV-D100 ECM

RERV-CF100 ECM, RERV-S100 ECM

Line No.	Symbol	Column	ANSI 1/3-Octave Band No.	29	30	31	32	33	34	35	36	37	38	39	40	
			Hertz	800	1,000	1,250	1,600	2,000	2,500	3,150	4,000	5,000	6,300	8,000	10,000	
			Limits for BGD Steadiness	2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
			Limits for SNR	15	15	15	10	10	10	10	10	10	8	3	3	3
Enter Test Measurements:																
1	Lp _{fm}	Meas. FAN+BGD		49.64	48.65	45.16	44.17	41.98	38.03	36.13	33.52	28.80	25.66	22.38	20.50	
2	Lp _{bm}	Meas. BGD		0.69	0.95	1.26	1.95	2.76	3.51	4.27	4.95	5.43	5.76	5.82	5.54	
3	Lp _{rm}	Meas. RSS+BGD		80.48	81.53	82.50	82.51	81.49	78.69	76.88	76.71	75.31	73.17	70.87	68.22	
4	Lp _{bck}	Meas. BGD for check		0.72	0.92	1.24	1.98	2.71	3.49	4.29	4.96	5.42	5.74	5.82	5.53	
Check Background Steadiness and Level:																
5		2-4, Arith. Steady BGD?		OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	
6		3-2, Arith. RSS SNR?		79.793	80.581	81.245	80.558	78.735	75.187	72.608	71.762	69.875	67.403	65.044	62.673	
7	L _{psnr,f}	1-2, Arith. Separation (FAN SNR)?		48.953	47.692	43.899	42.220	39.225	34.522	31.853	28.570	23.371	19.894	16.556	14.954	
8	L _{psnr,z}	Zero Sone Fan SNR (from SNR sheet)		28.150	26.940	25.407	23.129	20.425	17.024	14.033	12.277	10.255	8.341	6.652	7.893	
Bands with FAN and Zero Sone Fan SNR < Limit:																
Subtract Background measurement:																
9	Lp _r	Log 3-2 (RSS+BGD)-BGD=RSS		80.480	81.535	82.504	82.507	81.495	78.693	76.881	76.711	75.308	73.165	70.869	68.217	
10	Lp _f	Log 1-2 (FAN+BGD)-BGD=FAN		49.640	48.646	45.158	44.169	41.984	38.027	36.122	33.512	28.783	25.611	22.284	20.357	
Calculate Room Characteristic Ratio and 1/3-Oct. Fan Sound Power:																
11	L _{wr}	RSS CAL Calibration Data (Given)		82.8	83.8	85	85.6	85.5	84.4	83.9	83.9	83.2	81.9	80.6	78.2	
12	L _{r cr}	Arith. 11-9 (RSS pow-pres=RCR)		2.320	2.265	2.496	3.093	4.005	5.707	7.019	7.189	7.892	8.735	9.731	9.983	
13	L _{wf}	Arith. 10+12 (FAN pres+RCR=pow)		51.959	50.911	47.654	47.262	45.989	43.734	43.142	40.702	36.675	34.346	32.015	30.340	
Fan Pressure at Std Distance, in Std Environment:																
14	K _{rd}	Given, dB down @ 5 feet		-14.65	-14.65	-14.65	-14.65	-14.65	-14.65	-14.65	-14.65	-14.65	-14.65	-14.65	-14.65	
15	Lp'	Arith. 13-14 (Fan Test Results)		37.309	36.261	33.004	32.612	31.339	29.084	28.492	26.052	22.025	19.696	17.365	15.690	
Convert to single Sones Rating Number:																
16	s	Lookup sones for each band		1.125	1.121	0.940	0.989	0.967	0.876	0.904	0.804	0.612	0.535	0.468	0.315	
17	S	Add sones & weight for HVI Sone Rating:														

(Reference: Lookup table ref. column number.)

(Refer to the separate SNR calculation sheet for detailed SNR calculation procedure)

15 16 17 18 19 20 21 22 23 24 25 26

Test Note

HVI Signal-to-Noise Ratio (SNR) Calculation Spreadsheet
 Contract : 22-1343A Results: **3.35** Sones
 (Spreadsheet Version: Jun-04-15)

Company: Reversomatic Mfg., Ltd

Test Date: 3/8/2022

Model: RERV-C100 ECM, RERV-D100 ECM

RERV-CF100 ECM, RERV-S100 ECM

Line No.	Symbol	Column	ANSI 1/3-Octave Band No.	17	18	19	20	21	22	23	24	25	26	27	28
			Hertz	50	63	80	100	125	160	200	250	315	400	500	630
			Limits for SNR Pass	10	10	10	10	10	10	10	15	15	15	15	15
1	Lpbm	Measured BGD		18.66	18.75	9.81	7.37	3.03	0.01	0.86	-1.28	-1.05	1.02	0.20	-0.12
2	Lrcr	RCR from Sound Report A		7.65	14.52	11.45	8.23	9.07	8.84	10.67	9.05	6.91	5.35	3.66	2.45
3	Lpzs	Given, Interpolated Zero Sone Lp*		42.60	40.60	36.60	34.60	32.60	30.60	28.60	26.60	24.60	22.60	20.60	18.40
4	Lwzs	Arith. Lpzs+14.65dB, Zero Sone Lw		57.25	55.25	51.25	49.25	47.25	45.25	43.25	41.25	39.25	37.25	35.25	33.05
5	Lpzsc	Arith. 4-3 (Lwzs - Lrcr = Lpzsc)		49.60	40.73	39.80	41.02	38.18	36.41	32.58	32.20	32.34	31.90	31.59	30.60
6	Lpzsf	Log 5+1 (Lpzsc+BGD)		49.61	40.76	39.80	41.02	38.18	36.41	32.58	32.20	32.34	31.90	31.59	30.60
7	Lpsnr,z	Arith 6-1 (Zero Sone Fan SNR)		30.95	22.01	29.99	33.65	35.15	36.41	31.72	33.48	33.39	30.88	31.39	30.72
8	Lpsnr,f	Fan SNR, Arith. (Fan+BGD) - BGD		12.59	16.77	26.78	29.48	39.54	38.90	41.02	47.66	51.07	47.76	50.57	50.04
9	Lpsnr	HVI Sound Testing SNR		30.95	22.01	29.99	33.65	39.54	38.90	41.02	47.66	51.07	47.76	50.57	50.04
SNR Margin (Arith. HVI SNR - SNR Limit)				20.95	12.01	19.99	23.65	29.54	28.90	31.02	32.66	36.07	32.76	35.57	35.04
<i>Bands with SNR < SNR Limit?</i>															

*(Reference: HVI Loudness Indices)

Line No.	Symbol	Column	ANSI 1/3-Octave Band No.	29	30	31	32	33	34	35	36	37	38	39	40
			Hertz	800	1,000	1,250	1,600	2,000	2,500	3,150	4,000	5,000	6,300	8,000	10,000
			Limits for SNR Pass	15	15	15	10	10	10	10	10	8	3	3	3
10	Lpbm	Measured BGD		0.69	0.95	1.26	1.95	2.76	3.51	4.27	4.95	5.43	5.76	5.82	5.54
11	Lrcr	RCR from Sound Report B		2.32	2.27	2.50	3.09	4.01	5.71	7.02	7.19	7.89	8.73	9.73	9.98
12	Lpzs	Given, Interpolated Zero Sone Lp*		16.50	15.50	14.50	13.50	12.50	11.50	10.50	9.50	8.50	7.50	6.50	8.00
13	Lwzs	Arith. Lpzs+14.65dB, Zero Sone Lw		31.15	30.15	29.15	28.15	27.15	26.15	25.15	24.15	23.15	22.15	21.15	22.65
14	Lpzsc	Arith. 13-11 (Lwzs - Lrcr = Lpzsc)		28.83	27.88	26.65	25.06	23.14	20.44	18.13	16.96	15.26	13.42	11.42	12.67
15	Lpzsf	Log 14+10 (Lpzsc+BGD)		28.84	27.89	26.67	25.08	23.18	20.53	18.31	17.23	15.69	14.10	12.48	13.44
16	Lpsnr,z	Arith 15-10 (Zero Sone Fan SNR)		28.15	26.94	25.41	23.13	20.42	17.02	14.03	12.28	10.26	8.34	6.65	7.89
17	Lpsnr,f	Fan SNR, Arith. (Fan+BGD) - BGD		48.95	47.69	43.90	42.22	39.22	34.52	31.85	28.57	23.37	19.89	16.56	14.95
18	Lpsnr	HVI Sound Testing SNR		48.95	47.69	43.90	42.22	39.22	34.52	31.85	28.57	23.37	19.89	16.56	14.95
SNR Margin (Arith. HVI SNR - SNR Limit)				33.95	32.69	28.90	32.22	29.22	24.52	21.85	18.57	15.37	16.89	13.56	11.95
<i>Bands with SNR < SNR Limit?</i>															

*(Reference: HVI Loudness Indices)

Reversomatic Mfg., Ltd
RERV-C100 ECM, RERV-D100 ECM, RERV-CF100 ECM, RERV-S100 ECM
22-1343A

Frequency	Unit	Background 1	Reference	Background 2	Background Diff.	Maximum Diff.	Steady Bkgrd.
50	31.24	18.66	71.35	18.70	0.04	2.00	OK
63	35.53	18.75	64.28	18.16	-0.59	4.00	OK
80	36.59	9.81	66.65	9.27	-0.54	2.00	OK
100	36.85	7.37	69.87	5.86	-1.50	2.00	OK
125	42.57	3.03	69.43	2.71	-0.31	2.00	OK
160	38.90	0.01	70.66	-0.10	-0.10	1.00	OK
200	41.87	0.86	69.33	0.84	-0.01	1.00	OK
250	46.38	-1.28	70.65	-1.23	0.05	1.00	OK
315	50.01	-1.05	72.79	-1.01	0.04	1.00	OK
400	48.78	1.02	74.35	0.68	-0.34	1.00	OK
500	50.77	0.20	76.24	0.26	0.06	1.00	OK
630	49.92	-0.12	78.25	-0.15	-0.03	1.00	OK
800	49.64	0.69	80.48	0.72	0.03	2.00	OK
1000	48.65	0.95	81.53	0.92	-0.03	0.50	OK
1250	45.16	1.26	82.50	1.24	-0.02	0.50	OK
1600	44.17	1.95	82.51	1.98	0.03	0.50	OK
2000	41.98	2.76	81.49	2.71	-0.05	0.50	OK
2500	38.03	3.51	78.69	3.49	-0.01	0.50	OK
3150	36.13	4.27	76.88	4.29	0.02	0.50	OK
4000	33.52	4.95	76.71	4.96	0.01	0.50	OK
5000	28.80	5.43	75.31	5.42	-0.01	0.50	OK
6300	25.66	5.76	73.17	5.74	-0.02	0.50	OK
8000	22.38	5.82	70.87	5.82	-0.01	0.50	OK
10000	20.50	5.54	68.22	5.53	-0.01	0.50	OK

Sound levels are in decibels.

Reversomatic Mfg., Ltd
RERV-C100 ECM, RERV-D100 ECM, RERV-CF100 ECM, RERV-S100 ECM
22-1343A

