

University of Illinois Department of Agricultural and Biological Engineering
 Bioenvironmental and Structural Systems Lab
 Final Report

Project Number: 24219
 Test Date: April 11, 2024

Fan:	Motor:	Shutter:
Make- <i>Better Air</i>	Make- <i>AG-1</i>	Material- <i>plastic</i>
Model- <i>LPEC-3801</i>	Model- <i>ECN48B10CN/EC10</i>	# Doors- <i>12 per column</i>
Blade dia.- <i>36.5"</i>	Hp- <i>1.0</i>	# Columns- <i>2</i>
Orifice dia.- <i>37"</i>	RPM- <i>300 - 900</i>	Door length <i>20.5"</i>
	Volts- <i>115 / 230</i>	Location- <i>intake</i>
Blade:	Amps- <i>9.8 / 5.8</i>	
Number- <i>3</i>	Hz- <i>60</i>	Guards:
Shape- <i>propeller</i>	Phase- <i>1</i>	Description- <i>wire</i>
Material- <i>poly</i>	S. F.- <i>1.0</i>	Spacing- <i>2" concentric</i>
Pitch- <i>-</i>		Location- <i>exhaust</i>
Clearance- <i>0.3"</i>	Housing:	
	Material- <i>poly</i>	Discharge Cone:
Drive Sheaves:	Intake area- <i>40.5" x 40.5"</i>	Depth- <i>none</i>
Drive dia.- <i>direct</i>	Discharge- <i>37" dia.</i>	Minor dia.- <i>-</i>
Axle dia.- <i>drive</i>	Depth- <i>32" top</i>	Major dia.- <i>-</i>
	<i>28.8" bottom</i>	

Notes: *60 Hz test. Blade angle: purple angle ring

Test Conditions:

T(wb) F: 57.4
 T(db) F: 71.5
 Barometric Pressure 28.76 (In. Hg)

Static Pressure (in.H2O)	Airflow (cfm)	rpm	Volts	Amps	Watts	cfm/Watt	SI Units			
							Static Pressure (Pa)	Airflow (m ³ /hr.)	(m ³ /hr)/W	W/1000m ³ /hr
100 % speed										
0.00	11760	856	229.5	4.73	626	18.8	0	20000	31.9	31
0.05	10910	855	229.3	4.87	646	16.9	12	18500	28.7	35
0.10	10140	856	229.2	5.00	661	15.3	25	17200	26.1	38
0.15	9390	856	229.4	4.99	665	14.1	37	16000	24	42
0.20	8440	856	229.6	4.96	660	12.8	50	14300	21.7	46
0.25	7340	855	229.5	4.92	654	11.2	62	12500	19.1	52
0.30	6080	855	229.9	4.89	650	9.3	75	10300	15.9	63
80% speed										
0.00	9150	681	231.8	2.65	326	28.1	0	15600	47.7	21
0.05	8190	681	231.8	2.75	341	24.0	12	13900	40.8	25
0.10	7070	681	231.8	2.76	343	20.6	25	12000	35	29
0.15	5840	681	231.7	2.72	340	17.2	37	9900	29.2	34
0.20	4250	681	231.8	2.72	337	12.6	50	7200	21.4	47
0.25	3030	681	231.8	2.80	351	8.6	62	5100	14.6	68
70% speed										
0.00	7880	594	229.6	1.86	226	34.9	0	13400	59.3	17
0.05	6760	595	229.6	1.93	237	28.5	12	11500	48.5	21
0.10	5280	595	229.5	1.92	234	22.5	25	9000	38.3	26
0.15	3660	595	229.6	1.89	229	16.0	37	6200	27.1	37
0.20	1990	595	230.5	1.96	238	8.4	50	3400	14.2	70
60% speed										
0.00	6580	512	229.6	1.28	150	43.9	0	11200	74.6	13
0.05	5080	512	229.6	1.31	155	32.7	12	8600	55.6	18
0.10	3270	511	229.5	1.28	150	21.8	25	5600	37	27
0.13	2030	512	229.6	1.30	152	13.4	32	3500	22.7	44