

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

Project Number: 24205
 Test Date: April 9, 2024

Fan:		Motor:		Shutter:	
Make- <i>Better Air</i>		Make- <i>NA Pacific</i>		Material- <i>plastic</i>	
Model- <i>FW-60EC w/ cone</i>		Model- <i>NPM23-230T</i>		# Doors- <i>19 per column</i>	
Blade dia.- <i>60"</i>		Hp- <i>3.0 (2.2 kW)</i>		# Columns- <i>3</i>	
Orifice dia.- <i>60.5"</i>		RPM- <i>500</i>		Door length <i>20.4"</i>	
		Volts- <i>230</i>		Location- <i>intake</i>	
Blade:		Amps- <i>10</i>			
Number- <i>3</i>		Hz- <i>50 // 60</i>		Guards:	
Shape- <i>propeller</i>		Phase- <i>3</i>		Description- <i>wire</i>	
Material- <i>poly w/ alum hub</i>		S. F.- <i>1.2</i>		Spacing- <i>2" concentric</i>	
Pitch- <i>-</i>				Location- <i>exhaust</i>	
Clearance- <i>0.3"</i>		Housing:			
		Material- <i>fiberglass</i>		Discharge Cone:	
Drive Sheaves:		Intake area- <i>61.9" x 61.8"</i>		Depth- <i>23"</i>	
Drive dia.- <i>direct</i>		Discharge- <i>60.5" dia.</i>		Minor dia.- <i>60.5"</i>	
Axle dia.- <i>drive</i>		Depth- <i>34.5" top</i>		Major dia.- <i>66.5"</i>	
		<i>30.5" bottom</i>			

Notes: *230V 3 phase, 60 Hz input. Speed controlled with Phason SSV-DC

Test Conditions:

T(wb) F: 58
 T(db) F: 74.3
 Barometric Pressure 29.14 (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	39000	578	230.2	6.88	1939	20.1	0	66200	34.2	29
0.05	36900	578	230.7	6.94	1971	18.7	12	62600	31.8	31
0.10	33400	578	230.7	6.96	1970	16.9	25	56700	28.8	35
0.15	29700	578	230.3	6.91	1935	15.3	37	50400	26.1	38
0.20	24900	578	228.9	6.87	1882	13.2	50	42300	22.5	45
0.25	17800	578	228.9	6.91	1895	9.4	62	30200	16	63
0.30	12100	579	228.9	7.74	2169	5.6	75	20600	9.5	105
85% speed										
0.00	36800	549	229.6	6.26	1683	21.9	0	62600	37.2	27
0.05	34000	549	230.2	6.23	1693	20.1	12	57800	34.2	29
0.10	30500	549	230.3	6.16	1684	18.1	25	51800	30.8	33
0.15	26200	549	229.4	6.14	1639	16.0	37	44500	27.1	37
0.20	21400	549	229.2	5.97	1587	13.5	50	36400	22.9	44
0.25	14200	550	229.4	6.40	1732	8.2	62	24100	13.9	72
80% speed										
0.00	33300	506	230.3	5.04	1318	25.3	0	56600	43	23
0.05	30000	506	230.3	5.06	1319	22.7	12	50900	38.6	26
0.10	25900	506	230.4	4.97	1300	19.9	25	44000	33.9	30
0.15	21100	506	229.6	4.88	1248	16.9	37	35800	28.7	35
0.20	13600	506	229.8	5.07	1334	10.2	50	23200	17.4	58
0.25	7000	506	229.9	5.62	1514	4.6	62	11900	7.9	127
70% speed										
0.00	26400	423	231.1	3.26	773	34.1	0	44800	58	17
0.05	22800	423	231.5	3.20	764	29.8	12	38700	50.7	20
0.10	16900	423	231.1	3.12	738	22.8	25	28600	38.8	26
0.15	8300	423	230.6	3.49	843	9.8	37	14100	16.7	60
0.18	3000	423	230.6	3.71	913	3.3	45	5100	5.5	181