

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

Project Number: 24204  
 Test Date: April 9, 2024

<b>Fan:</b>	<b>Motor:</b>	<b>Shutter:</b>
Make- <i>Better Air</i>	Make- <i>NA Pacific</i>	Material- <i>plastic</i>
Model- <i>FW-60EC</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>
<b>Blade:</b>	Amps- <i>10</i>	
Number- <i>3</i>	Hz- <i>50 // 60</i>	<b>Guards:</b>
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>	<b>Housing:</b>	
	Material- <i>fiberglass</i>	<b>Discharge Cone:</b>
<b>Drive Sheaves:</b>	Intake area- <i>61.9" x 61.8"</i>	Depth- <i>none</i>
Drive dia.- <i>direct</i>	Discharge- <i>60.5" dia.</i>	Minor dia.- <i>-</i>
Axle dia.- <i>drive</i>	Depth- <i>34.5" top</i>	Major dia.- <i>-</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: 74.1  
 Barometric Pressure 29.15 (In. Hg)

Static Pressure (in.H2O)	Airflow (cfm)	rpm	Volts	Amps	Watts	cfm/Watt	SI Units			
							Static Pressure (Pa)	Airflow (m <sup>3</sup> /hr.)	(m <sup>3</sup> /hr)/W	W/1000m <sup>3</sup> /hr
<b>100% speed</b>										
0.00	35600	578	230.7	7.07	1988	17.9	0	60400	30.4	33
0.05	33100	578	230.7	7.04	1972	16.8	12	56200	28.5	35
0.10	30200	578	230.5	7.01	1939	15.6	25	51200	26.4	38
0.15	26500	578	230.3	6.84	1882	14.1	37	45100	24	42
0.20	22100	579	231.0	6.66	1838	12.0	50	37500	20.4	49
0.25	17700	579	230.8	6.79	1895	9.3	62	30100	15.9	63
0.30	12200	579	230.5	7.52	2162	5.6	75	20700	9.6	104
<b>85% speed</b>										
0.00	33600	549	231.1	6.15	1701	19.8	0	57100	33.6	30
0.05	31000	549	231.0	6.11	1686	18.4	12	52600	31.2	32
0.10	27700	549	231.1	5.99	1653	16.7	25	47000	28.5	35
0.15	23400	549	231.1	5.80	1588	14.7	37	39700	25	40
0.20	18800	549	229.5	5.77	1569	12.0	50	31900	20.3	49
0.25	13900	550	231.1	6.25	1750	7.9	62	23600	13.5	74
<b>80% speed</b>										
0.00	30500	506	230.7	5.03	1323	23.0	0	51800	39.1	26
0.05	27400	506	230.7	4.99	1308	20.9	12	46600	35.6	28
0.10	23100	506	230.7	4.82	1263	18.3	25	39300	31.1	32
0.15	18600	506	230.7	4.72	1231	15.1	37	31700	25.7	39
0.20	13300	506	230.7	5.12	1342	9.9	50	22600	16.8	59
0.25	6800	506	230.2	5.65	1513	4.5	62	11600	7.7	131
<b>70% speed</b>										
0.00	24400	423	230.9	3.22	773	31.6	0	41500	53.7	19
0.05	19900	423	231.1	3.12	738	26.9	12	33800	45.8	22
0.10	15200	423	230.9	3.10	738	20.5	25	25800	34.9	29
0.15	8200	423	230.6	3.49	844	9.7	37	13900	16.4	61
0.18	3400	423	230.7	3.71	913	3.7	45	5700	6.3	159