

Model WE Energy Recovery Ventilators (300 to 8,000 CFM)

Model WE Energy Recovery Ventilators provide affordable outside ventilation by combining an exhaust fan, make-up air handler and Carnes Energy Recovery Wheel into a compact package that minimizes capital investment and maximizes payback for heating and cooling equipment. Units available for both inside and outside mounting.

BENEFITS:

- Low investment with maximum payback.
- Easy to use in new construction or renovation.
- Flexible, convenient installation and startup.
- AHRI certified.

AVAILABLE OPTIONS INCLUDE:

- ETL/CSA Listing for quick Building Code approvals.
- Corrosion Protective Media coating and edge coating.
- 4 Duct arrangements with Weather Hoods, Dampers and Roof Curbs.
- Temperature and Enthalpy Economizers, Preheat or Defrost Controls.
- Remote panels, Time Clocks, BMS interface for effective control.
- Rotation Detector, Dirty Filter Switches for operation assurance.
- Double Wall Construction, Airflow Gauge for airflow quality.
- Optional 5 Year Warranty.



▼ PRODUCT OVERVIEW

Carnes Model WE_C is a packaged energy recovery ventilator (ERV) suitable for 300 to 8,000 CFM that allows the designer or building owner to economically provide fresh outside air at near indoor conditions for commercial or institutional construction. First cost requirements for cooling and heating capacity are minimized. The total energy

wheel is the only recovery technology that passively corrects humidity levels (latent energy) and temperature (sensible energy) while pre-conditioning outside makeup air. The WE_C unit builds on Carnes thirty-plus years of manufacturing quality, commercial total energy recovery products.

▼ APPLICATION BENEFITS

Carnes model WE_C helps designers economically meet ASHRAE Standard 62 Ventilation for Acceptable Indoor Air Quality guidelines for minimum fresh air ventilation of 15 to 20 CFM per person. ASHRAE Standard 62 guidelines require dramatically increased outside air intake to avoid sick building syndrome and related problems from indoor air contaminants. Adherence to ASHRAE Standard 62 is generally considered the best possible defense against liabilities related to design ventilation rates. Increased outside air intake necessarily demands increased

cooling capacity or preconditioning of outside air. ASHRAE 90.1 often requires energy recovery as well.

In many cases, a realistic design credit for energy recovery will result in lower first costs due to reduced cooling equipment requirements. In most middle latitude climates with moderate to high summer humidity levels, payback periods range from immediate to one year. Additional annual operating savings calculations are available by consulting the factory.

Benefits

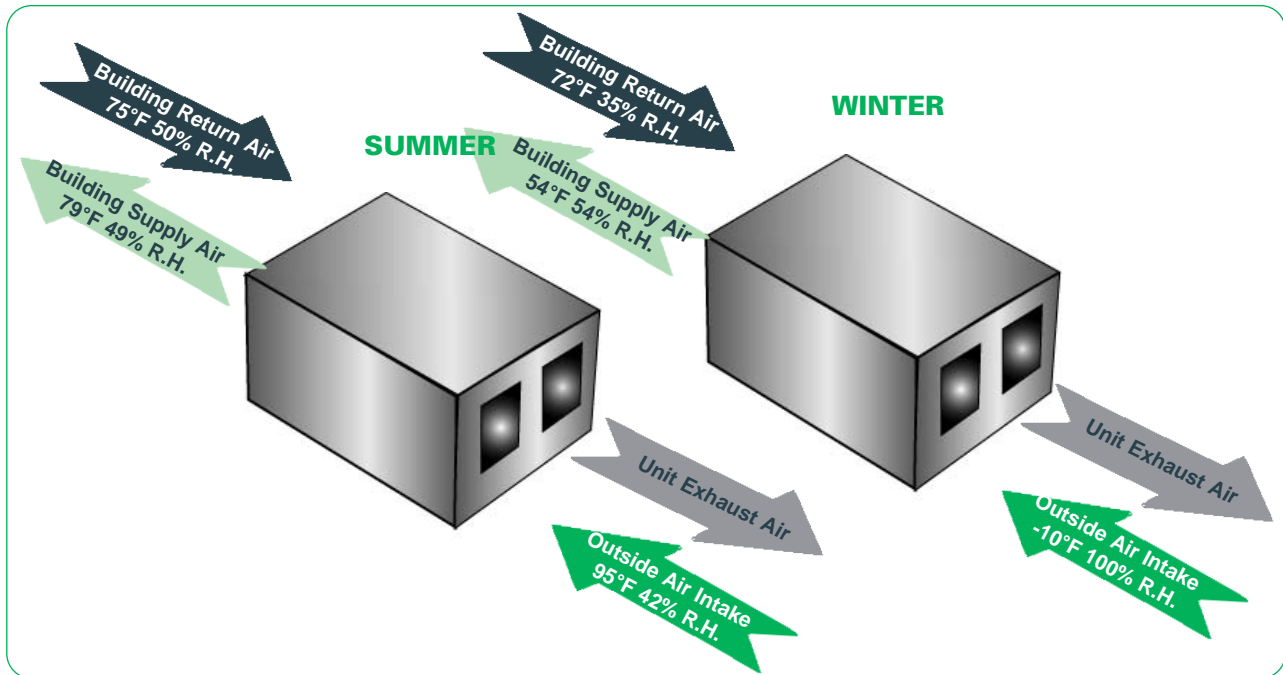
- Improves comfort via humidity control
- Reduces peak capacity requirements by 75%
- Reduces first cost of conditioning equipment
- Reduces HVAC energy cost by up to 50%
- Reduced humidity improves duct conditions, with better health and less maintenance
- Reduces peak energy demand and utility service
- Reduces climate extremes to air handlers

Typical Applications

- Hospitals
- Nursing Homes
- Animal Laboratories
- Pharmaceutical Manufacturing
- Casinos and Bars
- Smoking Lounges
- Schools
- Office Buildings
- Hotels/Motels
- Government Buildings, Prisons
- Military

▼ APPLICATION EXAMPLE — Indianapolis, IN

A school requires fresh air ventilation for 4 classrooms containing 100 students and staff. ASHRAE Standard 62 requires 15 CFM per person, or 1,500 CFM total of outside air supply. Conventional air conditioning required to cool the outside air supply to 55°F is 10 tons. Applying a Carnes WE_C Energy Recovery Ventilator preconditions outside air to 79°F @ 49% RH, reducing cooling load by 5 tons.



Applying a 75% design credit, the required cooling capacity is reduced by 3.75 tons, reducing installed system cost by \$3,750, minus the cost of the Carnes WE_C unit. In addition, annual energy cost savings total approximately \$3,000. Net benefit is no first cost increase, continuing annual energy cost savings for the life of the unit, and compliance with design target for fresh air ventilation.

▼ CONSTRUCTION DETAILS

The energy recovery wheel in Carnes model WEHC features durable 8 inch (203mm) thick corrugated aluminum construction with a permanently bonded 3 augstrom molecular sieve desiccant media. Corrosion protection is standard on the enthalpy wheel.

Carnes WEHC is designed for simple installation and maintenance. Wiring is via a single point exterior disconnect. Factory wheel control options include constant speed drive or a heating and cooling mode for economizer operation using either outside air temperature or enthalpy setpoints. Drain pans and

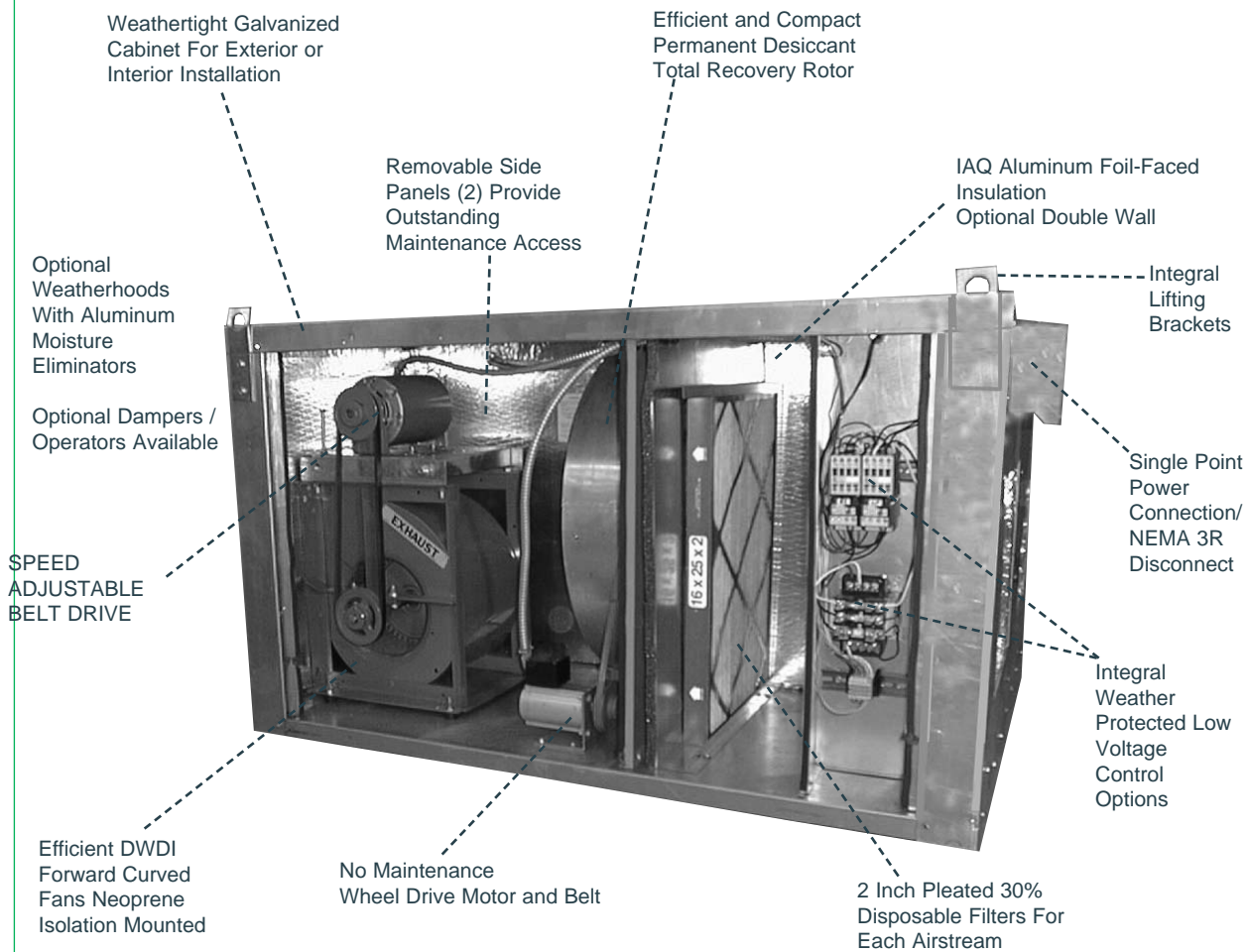
associated field plumbing are not required as all moisture is transferred in the air streams without condensation.

The recovery wheel is self cleaning. Because the wheel alternates between opposite direction supply and exhaust air streams, any particulate matter too large to pass through the wheel corrugations will be removed by the opposite airstream. Disposable 2" pleated filters are standard.

A variety of standard duct orientations make this product suitable for new or retrofit

WE SIZES 01 - 03

**300 to 2,800 CFM — Up To 1.5 Inch w.g. E. S. P. —
Compatible with all Energy Management Systems!**



Model WEHC Energy Recovery Ventilator

▼ CONSTRUCTION DETAILS

construction wherever supply and exhaust ductwork can be co-located. Units can be exterior or interior mounted. Standard unit construction is galvanized steel mill finish exterior.

Installation options include:

* Independent fresh air ventilation. This method provides constant quantities of fresh outside air to each space independent of variable heating and cooling requirements. This technique provides assurance of fresh

air ventilation goals without regard to variable room heating and cooling loads.

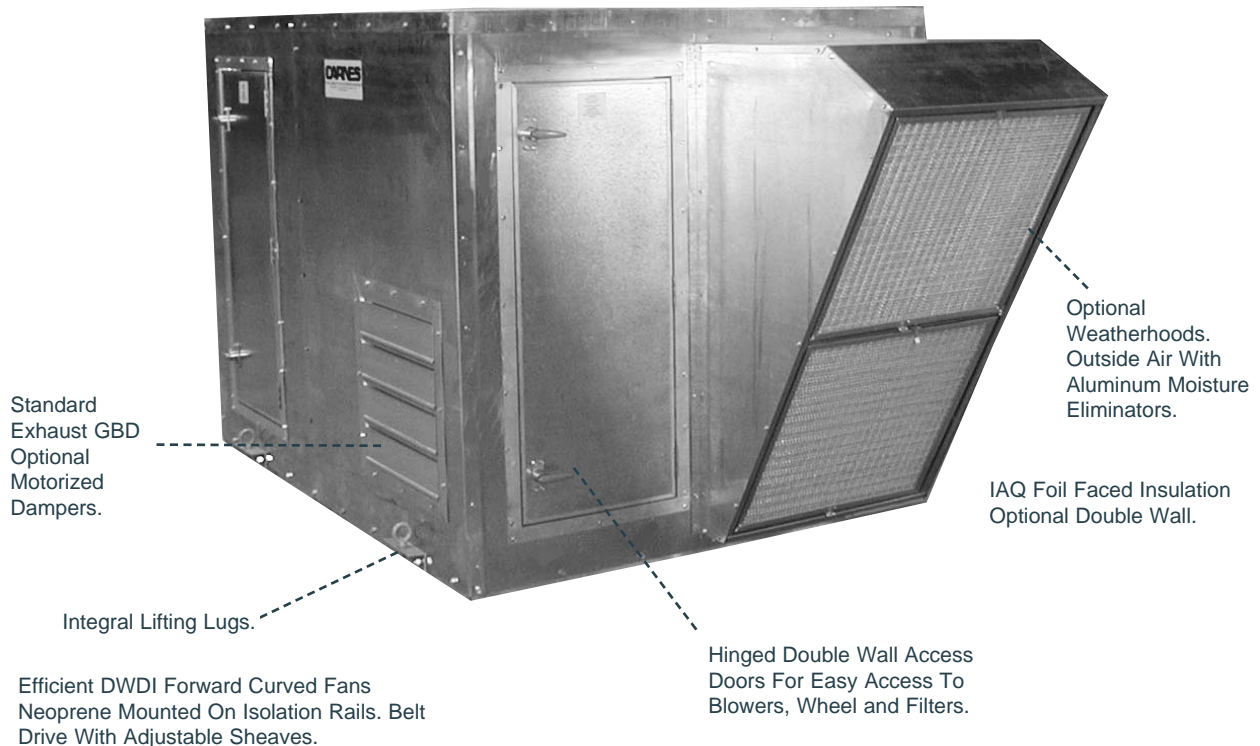
* Integrated with an existing or new duct system. This configuration intercepts room exhaust and preconditions fresh air supplied to a system air handler, rooftop unit or similar system device. Outside air is delivered to the air handler at near room neutral conditions of temperature and humidity.

WE SIZES 04 - 08

1,600 to 8,000 CFM — To 1.5 Inch w.g. E. S. P.

Weatherproof Heavy Gauge Galvanized Cabinet For Exterior or Interior Installation.

Single Point Power Connection. NEMA 3R Disconnect.



Model WEHC Energy Recovery Ventilator

▼ UNIT SELECTION PROCEDURE

Carnes provides equipment selection and performance calculation software for the Energy Recovery Ventilators (Energy-C-Lect). This powerful tool is the simplest and fastest way to perform energy recovery performance, unit selection, and submittals. The latest Energy-C-Lect version is available upon request from the Carnes website.

The following manual selection guidelines are provided primarily so that you may understand the underlying assumptions and calculations behind the selection software. Use Energy-C-Lect for actual unit selection, performance, and submittals.

1. Determine the type of recovery media required. Total recovery (sensible + latent transfer) is recommended for most HVAC comfort to comfort ventilation applications to gain the maximum benefit for precooling. Under normal circumstances total recovery media will not result in condensation within the cabinet.
2. Determine the minimum unit size from the Performance Data Charts that provides the required airflow at the design external static pressure, and the desired wheel efficiency. Determine the desired horsepower for each fan. Note the drive range selection for the Product Identifier Description.
3. Determine the desired duct configuration for unit arrangement. Check for compliance with any dimensional limitations. Verify minimum clearance on unit sides for filter and service access. Special duct configurations are available only on Model WM MiniSystems.
4. Select the desired options and accessories for the installation.

▼ FROST CONSIDERATIONS

Frost formation on energy recovery devices is a function primarily of outside air temperature (O.A.T.) and return air relative humidity (%RH). Typical frost formation temperatures with total recovery media range from 0 to 15 Degrees F. O.A.T. Frost control is not normally required if outside air temperatures are not less than 15°F. more than a few hours per year.

Consult Energy-C-Lect to determine expected condensation and frost temperatures and determine a suitable control strategy.

Consider the following factors to decide which option is most suited to the application utilizing total recovery media.

Unit On/Off Frost Control shuts the unit off whenever the outside air temperature falls below an adjustable setpoint temperature. The unit returns to normal operation when the outside temperature rises above the setpoint. This option is suitable for climates

with limited hours below 0°F, and such that supply air is not required during those hours. Buildings occupied during daytime only may experience such low temperatures for very limited times when occupied.

Exhaust Only Defrost shuts off the supply blower for a customer adjustable interval when frost is detected on the wheel to defrost the wheel with warm exhaust air, then restarts the supply air blower. The defrost cycle only occurs when frost is detected, and thus minimizes supply air shutoff. This option is suitable for applications where momentary stoppages of supply air are acceptable, and where temperatures are below 15°F. for extended occupied periods.

Variable Speed Defrost slows the enthalphy wheel to allow a customer adjustable timed defrost cycle.

Electric Preheat is suitable where temperatures will be below 15°F. for extended peri-

▼ FROST CONSIDERATIONS

ods of occupied time and supply air must be continuously provided. An electric coil is provided to heat outside air above the expected frost temperature via a customer adjustable temperature setpoint. Independent mounting support at supply air inlet to be provided by others. A separate power circuit may be

required. Optional ETL Listing is not available.

Typical preheat design temperature rises are less than 20°F, with relatively low initial and operating expense in most climates.

▼ OPTIONS

• WHEEL CONTROLS

Constant Speed Drive Wheel continuously operates at constant speed. An external on/off wheel control circuit is supplied.

Temperature Controlled Economizer Mode Adjustable temperature actuated thermostats operate wheel for heating and cooling, and stop wheel for “free cooling” economizer mode. Most appropriate for low humidity climates.

Enthalpy Controlled Economizer Mode Adjustable enthalpy controller operates wheel for cooling, and stops wheel for economizer mode. Ideal for use in high humidity climates where latent recovery is the major contributor to total energy savings. Override circuit for heating mode is required.

Wheel Variable Speed Drive external speed signal varies wheel speed to control supply air temperature.

• UNIT OPTIONS

Double Wall Construction securely isolates insulation to prevent damage and air supply contamination.

Dirty Filter Sensors provide adjustable setpoint pressure drop indication for supply and exhaust air streams.

Rotation Detector provides output signal for remote alarm (by others) upon rotation failure.

ETL Listing Available listing shows tests for conformity to UL Standard 1812, and certification to CAN/CSA C22.2 No. 236.

7-Day Programmable Time Clock

Remote Panel with customer selected display is available to be field installed and wired.

Security Cables are available on Sizes 01-03 to prevent loss or damage to access panels.

Painted Cabinets are available to match existing building equipment.

Airflow Monitor Gage allows reading of actual supply or return airflow at the unit.

• EXTENDED WARRANTIES

- Standard wheel warranty - 5 years.

- Optional mechanical only extended warranties are available for up to 5 years from shipment.

▼ **ACCESSORIES**

• **DAMPERS**

- Gravity backdraft dampers for both outside air and exhaust opening.
- Motorized supply damper with gravity damper on exhaust.
- Motorized supply and exhaust damper.
- On unit sizes 01-03, dampers will be mounted in the weatherhoods or in external duct sleeves.
- On unit sizes 04-08, motorized supply and exhaust will have motorized outside and return air dampers and GBD exhaust damper.

• **WEATHERHOODS**

- Galvanized steel weatherhoods are available. Outside air intakes are complete with aluminum moisture eliminators.

• **ROOF CURBS**

- Prefabricated roof curbs of galvanized or galvalume construction with fiberglass insulation are available in 8 inch and 14 inch heights for outdoor installation. Other curb heights are available.

▼ **PERFORMANCE DATA**



WEHC 01 (300 to 700 CFM)

EXTERNAL STATIC PRESS, INCH W. G. (Pa)

CFM (L/s)		0.000 (0)	0.125 (31)	0.250 (62)	0.375 (93)	0.500 (124)	0.750 (186)	1.000 (249)	1.250 (311)
300 (142)	RPM					1,275			
	BHP					0.12			
	[KW]					[0.09]			
400 (189)	RPM	1,111	1,172	1,240	1,317	1,402	1,592	1,782	1,949
	BHP	0.12	0.13	0.15	0.17	0.19	0.23	0.32	0.39
	[KW]	[0.09]	[0.10]	[0.11]	[0.13]	[0.14]	[0.17]	[0.24]	[0.29]
500 (236)	RPM	1,392	1,442	1,483	1,545	1,605	1,734	1,879	2,040
	BHP	0.24	0.25	0.26	0.28	0.30	0.34	0.41	0.52
	[KW]	[0.18]	[0.19]	[0.19]	[0.21]	[0.22]	[0.25]	[0.31]	[0.39]
600 (283)	RPM	1,669	1,708	1,753	1,789	1,836	1,939	2,041	2,160
	BHP	0.41	0.42	0.43	0.45	0.48	0.53	0.58	0.67
	[KW]	[0.31]	[0.31]	[0.32]	[0.34]	[0.36]	[0.40]	[0.43]	[0.50]
700 (330)	RPM	1,947	1,981	2,021	2,053	2,084			
	BHP	0.65	0.66	0.68	0.69	0.71			
	[KW]	[0.48]	[0.49]	[0.51]	[0.51]	[0.53]			

▼ PERFORMANCE DATA

WEHC 02 (600 to 1,700 CFM)



EXTERNAL STATIC PRESS, INCH W. G. (Pa)

CFM (L/s)		0.000 (0)	0.125 (31)	0.250 (62)	0.375 (93)	0.500 (124)	0.750 (186)	1.000 (249)	1.250 (311)	1.500 (373)
600 (283)	RPM				988	1,081				
	BHP				0.20	0.25				
	[KW]				[0.15]	[0.19]				
700 (330)	RPM			958	1,052	1,097	1,346			
	BHP			0.21	0.25	0.27	0.43			
	[KW]			[0.15]	[0.19]	[0.20]	[0.32]			
800 (378)	RPM		943	1,040	1,087	1,156	1,397	1,510	1,606	1,707
	BHP		0.21	0.26	0.29	0.34	0.50	0.62	0.71	0.83
	[KW]		[0.16]	[0.20]	[0.22]	[0.25]	[0.37]	[0.46]	[0.53]	[0.62]
900 (425)	RPM	938	1,034	1,083	1,146	1,223	1,450	1,544	1,650	1,751
	BHP	0.25	0.29	0.32	0.36	0.42	0.59	0.71	0.82	0.94
	[KW]	[0.19]	[0.22]	[0.24]	[0.27]	[0.32]	[0.28]	[0.53]	[0.61]	[0.70]
1,000 (472)	RPM	1,043	1,085	1,147	1,220	1,294	1,504	1,589	1,696	1,796
	BHP	0.34	0.36	0.39	0.44	0.52	0.69	0.81	0.94	1.07
	[KW]	[0.26]	[0.27]	[0.29]	[0.33]	[0.39]	[0.52]	[0.60]	[0.70]	[0.80]
1,100 (519)	RPM	1,089	1,159	1,233	1,300	1,334	1,538	1,640	1,743	
	BHP	0.40	0.45	0.51	0.57	0.60	0.81	0.93	1.07	
	[KW]	[0.30]	[0.34]	[0.38]	[0.43]	[0.45]	[0.60]	[0.70]	[0.80]	
1,200 (566)	RPM	1,173	1,248	1,309	1,340	1,395	1,588	1,695	1,794	
	BHP	0.50	0.57	0.63	0.65	0.70	0.88	1.08	1.22	
	[KW]	[0.38]	[0.42]	[0.47]	[0.48]	[0.52]	[0.67]	[0.80]	[0.91]	
1,300 (614)	RPM	1,271	1,319	1,347	1,409	1,471	1,649	1,751		
	BHP	0.63	0.69	0.70	0.77	0.83	0.99	1.12		
	[KW]	[0.47]	[0.51]	[0.52]	[0.57]	[0.62]	[0.74]	[0.84]		
1,400 (661)	RPM	1,331	1,373	1,427	1,488	1,524	1,714	1,809		
	BHP	0.75	0.79	0.85	0.92	0.97	1.24	1.31		
	[KW]	[0.56]	[0.59]	[0.63]	[0.68]	[0.72]	[0.92]	[0.98]		
1,500 (708)	RPM	1,404	1,464	1,507	1,533	1,574	1,780			
	BHP	0.89	0.96	1.02	1.06	1.12	1.39			
	[KW]	[0.66]	[0.72]	[0.76]	[0.79]	[0.83]	[1.03]			
1,600 (755)	RPM	1,497	1,523	1,548	1,598	1,651	1,753			
	BHP	0.97	1.12	1.16	1.23	1.31	1.44			
	[KW]	[0.72]	[0.84]	[0.87]	[0.92]	[0.98]	[1.07]			
1,700 (802)	RPM	1,538	1,577	1,630	1,680	1,728				
	BHP	1.21	1.27	1.37	1.45	1.53				
	[KW]	[0.90]	[0.95]	[1.02]	[1.08]	[1.14]				

DRIVE RANGE 1
DRIVE RANGE 2
DRIVE RANGE 3
DRIVE RANGE 4

▼ **PERFORMANCE DATA**

WEHC 03 (1,200 to 2,800 CFM)



EXTERNAL STATIC PRESS, INCH W. G. (Pa)

CFM (L/s)		0.000 (0)	0.125 (31)	0.250 (62)	0.375 (93)	0.500 (124)	0.750 (186)	1.000 (249)	1.250 (311)	1.500 (373)
1,200 (566)	RPM			672	796	818				
	BHP			0.25	0.32	0.40				
	[KW]			[0.19]	[0.24]	[0.30]				
1,400 (661)	RPM		660	735	803	865	986			
	BHP		0.29	0.36	0.41	0.51	0.69			
	[KW]		[0.21]	[0.27]	[0.30]	[0.38]	[0.52]			
1,600 (755)	RPM	662	734	800	863	922	1,019	1,115		
	BHP	0.36	0.42	0.48	0.58	0.64	0.82	1.02		
	[KW]	[0.27]	[0.31]	[0.36]	[0.44]	[0.48]	[0.61]	[0.76]		
1,800 (850)	RPM	745	809	869	927	982	1,048	1,147		
	BHP	0.51	0.59	0.67	0.74	0.83	0.93	1.12		
	[KW]	[0.38]	[0.44]	[0.50]	[0.55]	[0.62]	[0.70]	[0.84]		
2,000 (944)	RPM	827	886	941	993	1,023	1,100	1,183	1,261	
	BHP	0.70	0.76	0.85	0.96	1.02	1.14	1.34	1.46	
	[KW]	[0.52]	[0.57]	[0.63]	[0.72]	[0.76]	[0.85]	[1.00]	[1.09]	
2,200 (1,038)	RPM	910	963	1,007	1,031	1,060	1,152	1,228	1,307	1,383
	BHP	0.92	1.00	1.08	1.14	1.18	1.37	1.60	1.62	2.00
	[KW]	[0.69]	[0.75]	[0.80]	[0.85]	[0.88]	[1.02]	[1.19]	[1.21]	[1.49]
2,400 (1,133)	RPM	993	1,020	1,042	1,080	1,124	1,198	1,280	1,358	
	BHP	1.20	1.25	1.27	1.36	1.46	1.71	1.93	2.13	
	[KW]	[0.90]	[0.93]	[0.95]	[1.01]	[1.09]	[1.27]	[1.44]	[1.59]	
2,600 (1,227)	RPM	1,036	1,067	1,107	1,150	1,179	1,255	1,355		
	BHP	1.40	1.43	1.57	1.67	1.76	2.01	2.29		
	[KW]	[1.04]	[1.07]	[1.17]	[1.25]	[1.31]	[1.50]	[1.71]		
2,800 (1,321)	RPM	1,101	1,143	1,170	1,197	1,236	1,316	1,391		
	BHP	1.68	1.79	1.90	1.99	2.11	2.38	2.69		
	[KW]	[1.26]	[1.34]	[1.41]	[1.48]	[1.57]	[1.78]	[2.00]		

Recovery Ventilator

▼ PERFORMANCE DATA

WEHC 04 (1,550 to 4,100 CFM)



EXTERNAL STATIC PRESS, INCH W. G. (Pa)

CFM (L/s)		0.000 (0)	0.125 (31)	0.250 (62)	0.375 (93)	0.500 (124)	0.750 (186)	1.000 (249)	1.250 (311)	1.500 (373)
1,544 (729)	RPM	619	686	743	801					
	BHP	0.25	0.29	0.33	0.37					
	[KW]	[0.19]	[0.22]	[0.25]	[0.28]					
1,758 (830)	RPM	677	733	791	840	892				
	BHP	0.35	0.39	0.44	0.48	0.53				
	[KW]	[0.26]	[0.29]	[0.33]	[0.36]	[0.40]				
1,971 (930)	RPM	726	778	832	879	928	1,016			
	BHP	0.46	0.51	0.56	0.61	0.66	0.77			
	[KW]	[0.34]	[0.38]	[0.42]	[0.45]	[0.49]	[0.57]			
2,185 (1,031)	RPM	769	828	868	913	960	1,044	1,124		
	BHP	0.59	0.65	0.70	0.76	0.81	0.93	1.04		
	[KW]	[0.44]	[0.48]	[0.52]	[0.57]	[0.60]	[0.69]	[0.78]		
2,375 (1,121)	RPM	813	859	907	950	994	1,076	1,152	1,224	
	BHP	0.73	0.79	0.85	0.91	0.97	1.09	1.22	1.34	
	[KW]	[0.54]	[0.59]	[0.63]	[0.66]	[0.72]	[0.81]	[0.91]	[1.00]	
2,556 (1,206)	RPM	850	899	941	985	1,024	1,103	1,177	1,247	1,314
	BHP	0.88	0.95	1.01	1.08	1.14	1.27	1.40	1.53	1.66
	[KW]	[0.66]	[0.71]	[0.75]	[0.81]	[0.85]	[0.95]	[1.04]	[1.14]	[1.24]
2,746 (1,296)	RPM	888	933	974	1,016	1,054	1,130	1,202	1,271	1,336
	BHP	1.04	1.12	1.19	1.26	1.33	1.47	1.61	1.75	1.89
	[KW]	[0.78]	[0.84]	[0.89]	[0.94]	[0.99]	[1.10]	[1.20]	[1.30]	[1.41]
2,921 (1,379)	RPM	921	961	1,003	1,042	1,081	1,155	1,225	1,291	1,355
	BHP	1.21	1.29	1.37	1.44	1.52	1.67	1.81	1.96	2.11
	[KW]	[0.90]	[0.96]	[1.02]	[1.07]	[1.13]	[1.25]	[1.35]	[1.46]	[1.57]
3,088 (1,457)	RPM	962	1,000	1,041	1,078	1,116	1,187	1,254	1,335	1,386
	BHP	1.40	1.49	1.57	1.665	1.74	1.89	2.05	2.20	2.36
	[KW]	[1.04]	[1.11]	[1.17]	[1.23]	[1.30]	[1.41]	[1.53]	[1.64]	[1.76]
3,240 (1,529)	RPM	986	1,026	1,02	1,101	1,136	1,205	1,271	1,335	1,396
	BHP	1.57	1.66	1.75	1.84	1.92	2.09	2.25	2.42	2.58
	[KW]	[1.17]	[1.24]	[1.30]	[1.37]	[1.43]	[1.56]	[1.68]	[1.80]	[1.92]
3,406 (1,607)	RPM	1,026	1,061	1,098	1,133	1,169	1,236	1,301	1,363	1,422
	BHP	1.79	1.88	1.98	2.07	2.17	2.35	2.52	2.69	2.86
	[KW]	[1.33]	[1.40]	[1.48]	[1.54]	[1.62]	[1.75]	[1.88]	[2.01]	[2.13]
3,577 (1,688)	RPM	1,062	1,098	1,132	1,167	1,199	1,265	1,328	1,388	1,446
	BHP	2.03	2.14	2.23	2.33	2.43	2.62	2.80	2.99	3.16
	[KW]	[1.51]	[1.60]	[1.66]	[1.74]	[1.81]	[1.95]	[2.09]	[2.23]	[2.36]
3,753 (1,771)	RPM	1,100	1,132	1,167	1,198	1,232	1,296	1,357	1,416	1,473
	BHP	2.31	2.40	2.51	2.61	2.72	2.92	3.12	3.31	3.50
	[KW]	[1.72]	[1.79]	[1.87]	[1.95]	[2.03]	[2.18]	[2.33]	[2.47]	[2.61]
3,938 (1,859)	RPM	1,128	1,161	1,191	1,225	1,254	1,316	1,377	1,434	1,490
	BHP	2.58	2.69	2.79	2.90	3.01	3.22	3.44	3.64	3.84
	[KW]	[1.92]	[2.01]	[2.08]	[2.16]	[2.24]	[2.40]	[2.57]	[2.71]	[2.86]
4,104 (1,937)	RPM	1,153	1,182	1,213	1,243	1,274	1,334	1,393	1,450	1,505
	BHP	2.84	2.94	3.05	3.16	3.28	3.50	3.73	3.95	4.16
	[KW]	[2.12]	[2.19]	[2.27]	[2.36]	[2.45]	[2.61]	[2.78]	[2.95]	[3.10]

DRIVE RANGE 1
DRIVE RANGE 2
DRIVE RANGE 3
DRIVE RANGE 4
DRIVE RANGE 5

Recovery Ventilator

▼ PERFORMANCE DATA

WEHC 06 (2,450 to 6,200 CFM)

EXTERNAL STATIC PRESS, INCH W. G. (Pa)



CFM (L/s)		0.000 (0)	0.125 (31)	0.250 (62)	0.375 (93)	0.500 (124)	0.750 (186)	1.000 (249)	1.250 (311)	1.500 (373)
2,438 (1,151)	RPM	503	552	594	638					
	BHP	0.40	0.47	0.53	0.60					
	[KW]	[0.30]	[0.36]	[0.40]	[0.45]					
2,775 (1,310)	RPM	543	595	637	674	713				
	BHP	0.55	0.63	0.70	0.78	0.86				
	[KW]	[0.41]	[0.47]	[0.52]	[0.58]	[0.64]				
3,113 (1,469)	RPM	595	633	672	706	743	809			
	BHP	0.73	0.81	0.89	0.97	1.06	1.24			
	[KW]	[0.54]	[0.60]	[0.66]	[0.72]	[0.79]	[0.92]			
3,450 (1,628)	RPM	638	673	709	742	776	839	898		
	BHP	0.94	1.03	1.12	1.21	1.31	1.50	1.69		
	[KW]	[0.70]	[0.77]	[0.84]	[0.90]	[0.98]	[1.12]	[1.26]		
3,750 (1,770)	RPM	675	708	742	773	805	865	922	977	
	BHP	1.16	1.25	1.35	1.44	1.55	1.75	1.96	2.18	
	[KW]	[0.87]	[0.93]	[1.01]	[1.07]	[1.16]	[1.30]	[1.46]	[1.63]	
4,035 (1,904)	RPM	708	742	772	804	832	889	944	997	1,048
	BHP	1.38	1.49	1.59	1.70	1.80	2.02	2.24	2.47	2.70
	[KW]	[1.03]	[1.11]	[1.19]	[1.27]	[1.34]	[1.51]	[1.67]	[1.84]	[2.01]
4,335 (2,046)	RPM	743	775	804	835	862	917	969	1,020	1,069
	BHP	1.65	1.77	1.87	1.99	2.10	2.33	2.57	2.80	3.05
	[KW]	[1.23]	[1.32]	[1.39]	[1.48]	[1.57]	[1.74]	[1.92]	[2.09]	[2.27]
4,613 (2,177)	RPM	779	808	838	865	893	945	996	1,045	1,092
	BHP	1.95	2.06	2.18	2.30	2.42	2.66	2.91	3.16	3.42
	[KW]	[1.45]	[1.54]	[1.63]	[1.72]	[1.80]	[1.98]	[2.17]	[2.36]	[2.55]
4,875 (2,301)	RPM	812	839	868	893	921	972	1,021	1,068	1,114
	BHP	2.25	2.36	2.49	2.61	2.74	3.00	3.26	3.52	3.79
	[KW]	[1.68]	[1.76]	[1.86]	[1.95]	[2.04]	[2.24]	[2.43]	[2.62]	[2.83]
5,115 (2,414)	RPM	838	866	892	919	944	993	1,041	1,087	1,131
	BHP	2.53	2.66	2.79	2.92	3.05	3.32	3.59	3.86	4.13
	[KW]	[1.89]	[1.98]	[2.08]	[2.18]	[2.27]	[2.48]	[2.68]	[2.88]	[3.08]
5,378 (2,538)	RPM	871	897	923	948	973	1,021	1,067	1,112	1,155
	BHP	2.89	3.02	3.16	3.29	3.44	3.71	4.00	4.28	4.57
	[KW]	[2.16]	[2.25]	[2.36]	[2.45]	[2.57]	[2.77]	[2.98]	[3.19]	[3.41]
5,648 (2,666)	RPM	904	931	955	980	1,003	1,049	1,093	1,137	1,179
	BHP	3.29	3.44	3.57	3.72	3.86	4.15	4.44	4.74	5.04
	[KW]	[2.45]	[2.57]	[2.66]	[2.77]	[2.88]	[3.09]	[3.31]	[3.53]	[3.76]
5,925 (2,796)	RPM	939	963	988	1,010	1,034	1,079	1,122	1,164	
	BHP	3.74	3.88	4.04	4.18	4.34	4.64	4.95	5.26	
	[KW]	[2.79]	[2.89]	[3.01]	[3.12]	[3.24]	[3.46]	[3.69]	[3.92]	
6,218 (2,935)	RPM	965	989	1,011	1,035	1,057	1,100	1,143	1,183	
	BHP	4.19	4.35	4.50	4.66	4.81	5.13	5.44	5.76	
	[KW]	[3.12]	[3.24]	[3.36]	[3.47]	[3.59]	[3.83]	[4.06]	[4.30]	
6,480 (3,058)	RPM	991	1,013	1,036	1,057	1,080	1,122	1,162		
	BHP	4.63	4.79	4.96	5.11	5.28	5.61	5.93		
	[KW]	[3.45]	[3.57]	[3.70]	[3.81]	[3.94]	[4.18]	[4.42]		

▼ PERFORMANCE DATA

WEHC 08 (3,000 to 8,000 CFM)



EXTERNAL STATIC PRESS, INCH W. G. (Pa)

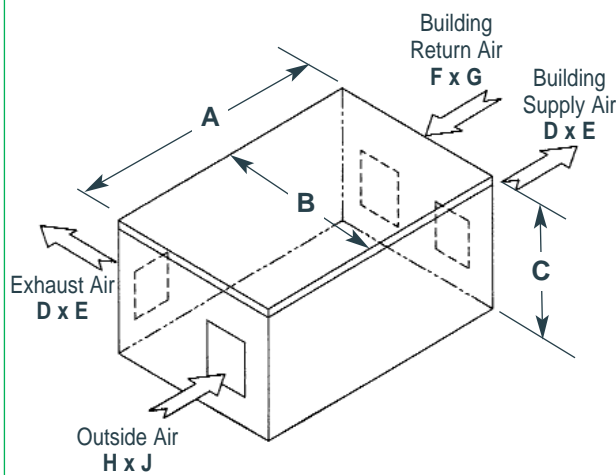
CFM (L/s)		0.000 (0)	0.125 (31)	0.250 (62)	0.375 (93)	0.500 (124)	0.750 (186)	1.000 (249)	1.250 (311)	1.500 (373)
3,023 (1,427)	RPM	438	484	523						
	BHP	0.47	0.56	0.64						
	[KW]	[0.35]	[0.42]	[0.48]						
3,441 (1,624)	RPM	480	521	558	595					
	BHP	0.64	0.74	0.84	0.95					
	[KW]	[0.48]	[0.55]	[0.63]	[0.71]					
3,860 (1,822)	RPM	513	551	585	620	651				
	BHP	0.84	0.95	1.05	1.17	1.28				
	[KW]	[0.63]	[0.71]	[0.78]	[0.87]	[0.95]				
4,278 (2,019)	RPM	545	581	612	645	675	733			
	BHP	1.06	1.18	1.29	1.42	1.53	1.79			
	[KW]	[0.79]	[0.88]	[0.96]	[1.06]	[1.14]	[1.33]			
4,650 (2,195)	RPM	571	601	634	663	693	750	803		
	BHP	1.28	1.40	1.52	1.65	1.78	2.05	2.33		
	[KW]	[0.95]	[1.04]	[1.13]	[1.23]	[1.33]	[1.53]	[1.74]		
5,003 (2,361)	RPM	605	636	664	694	721	775	826	874	
	BHP	1.56	1.69	1.82	1.96	2.09	2.37	2.67	2.96	
	[KW]	[1.16]	[1.26]	[1.36]	[1.46]	[1.56]	[1.77]	[1.99]	[2.21]	
5,375 (2,537)	RPM	634	664	690	718	744	795	845	892	937
	BHP	1.85	2.00	2.13	2.28	2.42	2.72	3.02	3.34	3.66
	[KW]	[1.38]	[1.49]	[1.59]	[1.70]	[1.80]	[2.03]	[2.25]	[2.49]	[2.73]
5,720 (2,670)	RPM	662	690	715	742	767	816	863	909	953
	BHP	2.17	2.31	2.46	2.61	2.76	3.07	3.39	3.72	4.06
	[KW]	[1.62]	[1.72]	[1.83]	[1.95]	[2.06]	[2.29]	[2.53]	[2.77]	[3.03]
6,045 (2,853)	RPM	691	717	742	767	791	838	884	928	971
	BHP	2.50	2.66	2.81	2.97	3.12	3.45	3.78	4.13	4.48
	[KW]	[1.86]	[1.98]	[2.10]	[2.21]	[2.33]	[2.57]	[2.82]	[3.08]	[3.34]
6,343 (2,994)	RPM	712	738	761	786	809	855	899	942	984
	BHP	2.81	2.98	3.13	3.30	3.46	3.79	4.14	4.49	4.86
	[KW]	[2.10]	[2.22]	[2.33]	[2.46]	[2.58]	[2.83]	[3.09]	[3.35]	[3.62]
6,668 (3,147)	RPM	740	763	787	809	832	877	920	962	1,002
	BHP	3.21	3.37	3.54	3.70	3.88	4.23	4.59	4.95	5.33
	[KW]	[2.39]	[2.51]	[2.64]	[2.76]	[2.89]	[3.15]	[3.42]	[3.69]	[3.97]
7,003 (3,305)	RPM	765	789	811	834	855	897	939	979	1,019
	BHP	3.63	3.81	3.98	4.16	4.33	4.69	5.06	5.44	5.83
	[KW]	[2.71]	[2.84]	[2.97]	[3.10]	[3.23]	[3.50]	[3.77]	[4.06]	[4.35]
7,347 (3,467)	RPM	792	813	836	857	878	920	960	999	1,037
	BHP	4.11	4.28	4.47	4.64	4.84	5.21	5.59	5.99	6.39
	[KW]	[3.06]	[3.19]	[3.33]	[3.46]	[3.61]	[3.89]	[4.17]	[4.47]	[4.77]
7,710 (3,639)	RPM	816	836	858	878	899	939	977	1,016	1,053
	BHP	4.61	4.79	4.99	5.17	5.37	5.76	6.08	6.56	6.98
	[KW]	[3.44]	[3.57]	[3.72]	[3.86]	[4.00]	[4.30]	[4.53]	[4.89]	[5.20]
8,035 (3,792)	RPM	838	860	879	900	919	958	996	1,033	
	BHP	5.11	5.31	5.5	5.7	5.89	6.30	6.71	7.12	
	[KW]	[3.81]	[3.96]	[4.10]	[4.25]	[4.39]	[4.70]	[5.00]	[5.31]	

Recovery Ventilator

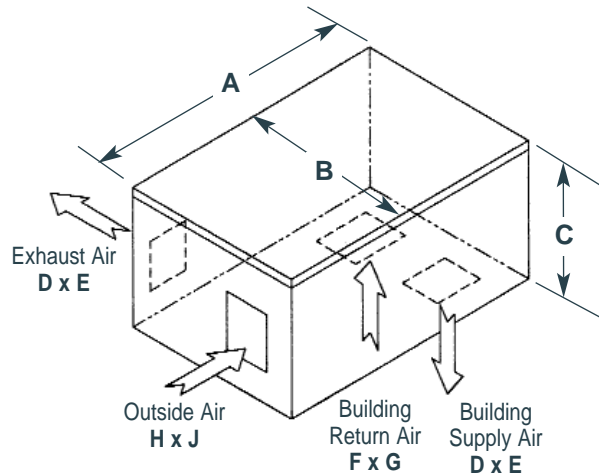
▼ **DIMENSIONS and WEIGHTS**

SIZE	DIMENSIONS LISTED IN INCHES (In Millimeters)									HOOD LENGTH		WGT
	A	B	C	D	E	F	G	H	J	Intake	Exhaust	Lbs.(Kg)
01	49 (1247)	32 (813)	32 (813)	7-1/8 (181)	8-1/2 (216)	8 (203)	10 (254)	8 (203)	10 (254)	12-1/2 (318)	14-1/4 (362)	400 (181)
02	58 (1473)	46 (1168)	38 (965)	9-3/8 (238)	10-1/2 (267)	14 (356)	14 (356)	14 (356)	14 (356)	18-1/4 (464)	18-1/4 (464)	740 (336)
03	70 (1778)	54 (1372)	49 (1247)	12-1/2 (318)	13-3/4 (349)	18 (457)	18 (457)	18 (457)	18 (457)	21 (534)	20-1/4 (515)	1050 (476)
04	72 (1829)	54 (1372)	55-1/2 (1410)	18 (457)	18 (457)	18 (457)	18 (457)	18 (457)	24 (610)	28-1/2 (724)	20-1/4 (514)	1400 (635)
06	80 (2032)	72 (1829)	67-1/2 (1715)	24 (610)	20 (508)	24 (610)	20 (508)	22 (559)	26 (660)	34-1/2 (876)	24-3/4 (629)	1900 (862)
08	87-1/2 (2223)	78 (1981)	72-1/2 (1842)	24 (610)	24 (610)	24 (610)	24 (610)	28 (711)	34 (864)	34-1/2 (876)	24-3/4 (629)	2400 (1089)

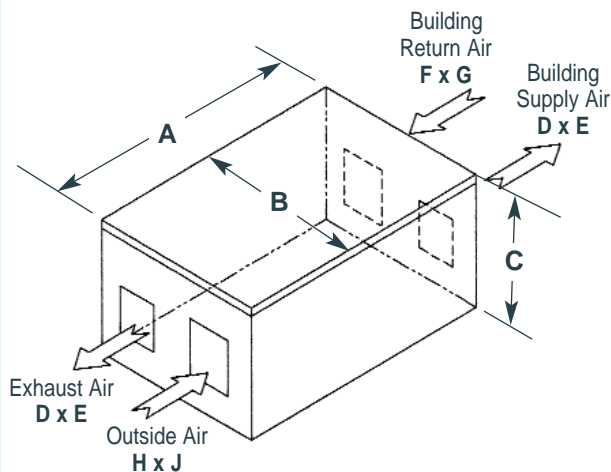
UNIT ARRANGEMENT # 1



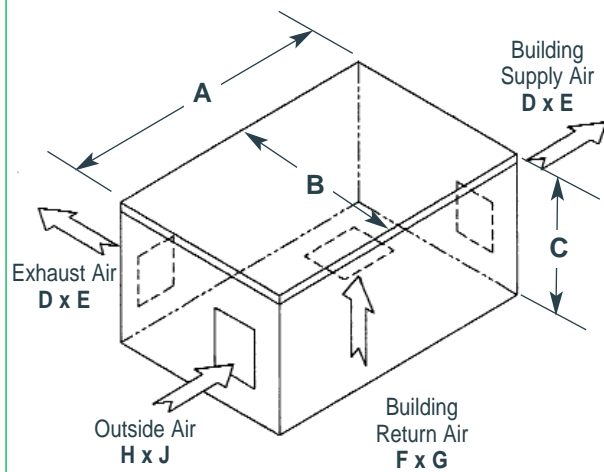
UNIT ARRANGEMENT # 2



UNIT ARRANGEMENT # 6

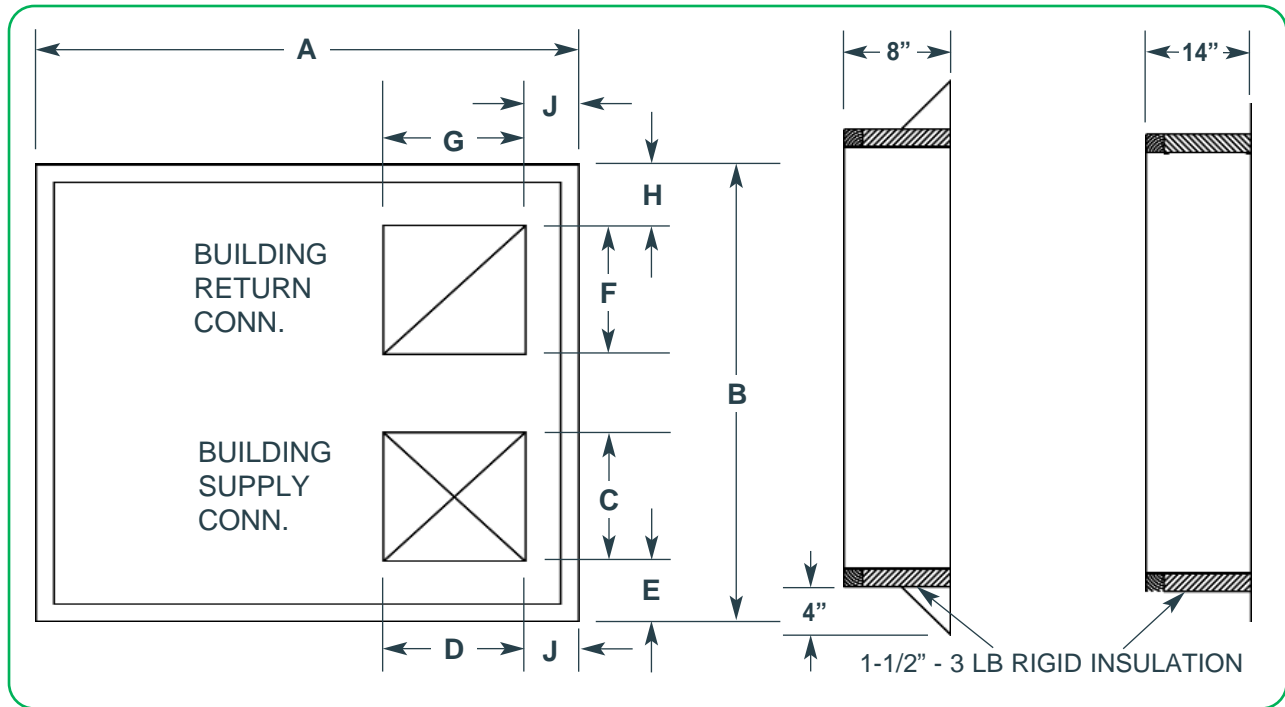


UNIT ARRANGEMENT # 7



▼ CURB & ROOF OPENING

DIMENSIONS LISTED IN INCHES (IN MILLIMETERS)									
SIZE	A	B	C	D	E	F	G	H	J
01	47 (1194)	30 (762)	7-1/8 (181)	8-1/2 (216)	3-1/8 (79)	8 (203)	10 (254)	6 (152)	2-1/4 (57)
02	56 (1422)	44 (1118)	9-3/8 (238)	10-1/2 (267)	5-7/8 (149)	14 (356)	14 (356)	6-1/2 (165)	2-1/4 (57)
03	68 (1727)	52 (1321)	12-1/2 (318)	13-3/4 (349)		18 (457)	18 (457)	6-1/2 (165)	2-1/4 (57)
04	69 (1753)	51 (1295)	18 (457)	18 (457)	3 (76)	18 (457)	18 (457)	3 (76)	
06	77 (1956)	69 (1753)	24 (610)	20 (508)	5 (127)	24 (610)	20 (508)	5 (127)	2-1/2 (64)
08	84-1/2 (2070)	75 (1905)	24 (610)	24 (610)	6-1/4 (159)	24 (610)	24 (610)	6-1/4 (159)	2-1/2 (64)

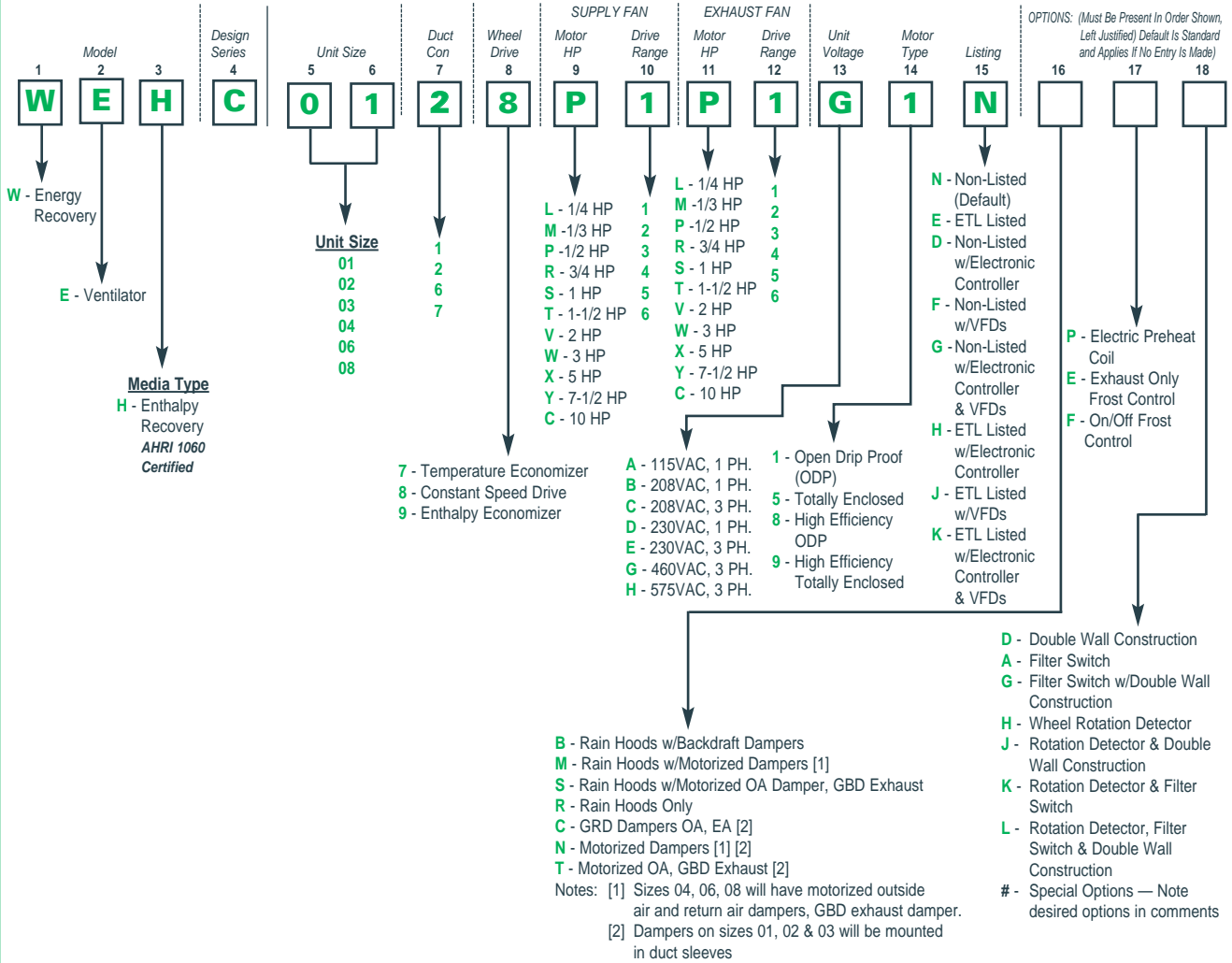


SIZE	SERVICE CLEARANCE		FILTERS QTY AND SIZE
	SUPPLY SIDE	EXHAUST	
01	32 (813)	30 (762)	2 - 12 x 20 x 2 (305 x 508 x 51)
02	46 (1168)	32 (813)	2 - 16 x 25 x 2 (406 x 635 x 51)
03	54 (1372)	42 (1067)	4 - 18 x 20 x 2 (457 x 508 x 51)
04	54 (1372)	42 (1067)	4 - 24 x 24 x 2 (610 x 610 x 51)
06	72 (1829)	42 (1067)	12 - 16 x 20 x 2 (406 x 508 x 51)
08	78 (1981)	42 (1067)	8 - 16 x 25 x 2 (406 x 635 x 51) 4 - 20 x 25 x 2 (508 x 635 x 51)

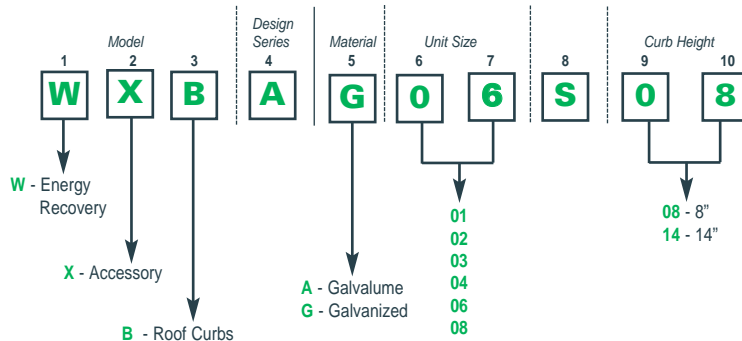
Integral Control Panel mounted inside return air plenum.

▼ ORDERING INFORMATION

VENTILATORS



ROOF CURBS



Recovery Ventilator

▼ TYPICAL SPECIFICATIONS

• GENERAL

Furnish and install where shown the Carnes Energy Recovery Ventilator, Model WE_C. Unit manufacturer shall have a minimum of 10 years experience in the design, application, and manufacture of Energy Recovery Wheels and associated air handling devices.

Option: Unit shall be ETL listed in Category 169 and Category 294 for Heating and Cooling Equipment in accordance with UL Standard 1995, Heating and Cooling Equipment, and CSA C22.2 No. 236.

• UNIT CASING

Unit casing shall be heavy gauge galvanized steel construction designed for outdoor installation; with unit base and internal components of heavy gauge galvanized or painted steel. Housing roof, sides, and internal partition shall be furnished with one inch foil faced fiberboard fiberglass insulation of minimum 4 pound density. 2 inch pleated, MERV7, disposable filters shall be provided in supply and exhaust air streams. Lifting points shall be provided. On outside mounted units, outside air intake and exhaust air outlet shall not be located on same side of unit.

Option: Double wall of galvanized sheet metal shall enclose insulation.

• ACCESS

Access shall be provided through removable access panels (Optionally with Security Cables) or hinged and latched double wall access doors.

• ENERGY RECOVERY WHEEL

Wheel shall be an enthalpy (sensible + latent) energy recovery rotor constructed of corrugated aluminum coated with a non migrating, water selective, permanently bonded, desiccant coating to permit sensible and latent energy transfer. Energy recovery ratings shall be in accordance with ASHRAE Standard 84, and performance certified to ARI 1060. Wheel media shall be independently tested in accordance with ASTM-E-87, and shown to conform to the requirements of NFPA-90A by documenting a flame spread of

less than 25 and a smoke generations rating of less than 50.

Moisture transfer shall take place in the vapor phase and media shall remain dry to the touch in both summer and winter operation. A purge section shall be incorporated to limit carryover of exhaust air contaminants into the supply air. Rotor shall be driven by maintenance free speed reducer and welded urethane belt. Rotor shall require no cleaning under normal operating conditions. However, if cleaning should be required, the rotor shall be capable of being cleaned with vacuum, compressed air, dry steam, hot water, or light detergent.

The two faces of the energy recovery wheel shall be covered and sealed with an epoxy coating chosen for corrosion resistance.

Option: Economizer Mode - adjustable temperature or enthalpy controlled operate wheel for heating and cooling modes, and stops wheel for "free cooling" economizer mode.

Option: Rotation detector provides output signal for remote alarm (by others) upon rotation failure.

▼ TYPICAL SPECIFICATIONS

• FANS

Fans shall be double width, double inlet, forward curved type, with individual motors and adjustable belt sheaves to enable independent balancing of supply and exhaust air streams. All blower wheels shall be statically and dynamically balanced.

• MOTORS

Motors shall be permanently lubricated, heavy duty, sealed bearing type. Motors shall meet EPACT minimum efficiency standards. Fan/motor assembly shall be mounted on neoprene vibration isolators to unit base.

• ELECTRICAL

Electrical components shall be prewired to a single point power connection, complete with all required operating circuitry installed in an internal control panel, integral fuse protection, 24 volt control circuit, fan motor starters with overload protection, terminal strip connections, and externally mounted NEMA 3R disconnect as standard. External circuit connections to control unit on/off, and independently, recovery rotor on/off, shall be provided.

Option: Intake weather hood shall be complete with moisture eliminator. Exhaust weather hood shall contain an integral gravity backdraft damper or motorized damper.

Option: Gravity backdraft or motorized dampers shall be mounted in duct sleeves, weather hoods, or flush to cabinet exterior.

Option: Dirty Filter Sensors provide adjustable set point pressure drop indication for supply and exhaust air stream filters for alarm circuits by others.

Option: Painted cabinet is available.

Option: Airflow monitor gauges are available to set and ensure supply and exhaust airflows.

Option: 7 Day Programmable Time Clock mounted in internal control panel or

remotely is available.

Option: Remote control panel of customer defined configuration may be provided.

Option: Electric Preheat Coil shall be weatherproof, of sufficient capacity to raise outside air from winter design to calculated frost formation potential temperature, and complete with supply air thermostat of appropriate temperature range. A separate electrical power circuit shall be provided to the preheat coil.

Option: Exhaust Fan Only Frost Control shall initiate field adjustable timed defrost cycle upon sensing low supply air temperature, shutting off supply blower momentarily for wheel defrost.

Option: Variable wheel speed defrost allows warm exhaust air to defrost the wheel.

Option: On/Off Frost Control will shut unit off when low outside air temperatures are sensed. Unit shall restart when outside air temperature rises above adjustable setpoint.

Option: Fan VFD for each fan to vary fan speed by external speed signal.

Option: 1 VFD to operate both fans with speed controlled by external speed signal.

Option: Digital electronic controller to monitor and control the ERV. BACnet and LonWorks communications.

• ROOF CURBS

Full perimeter prefabricated roof curbs of galvanized or galvalume construction with fiberglass insulation in standard 8 inch or 14 inch heights for outdoor installation shall be provided by the unit manufacturer.