



TECHNICAL SPECIFICATION

Multi-Stage Warm Air freewatt® System WA-Z Series

COMBINED HEAT AND POWER FOR THE HOME

The freewatt® System combines two technologies, an advanced warm air furnace and a gas-fired engine-generator. This hybrid heat and power generation package provides unrivaled total energy efficiency in combined heat and power delivery to the home. The freewatt® system is designed to be installed in the place of a typical furnace and uses the same ductwork system to deliver the heat to the home.

freewatt® SYSTEM FEATURES

- **Honda MCHP Power Generation Technology**
 - Honda Reliable
 - Quiet (47 dBA)
 - Efficient (85%+ = Heat And Power)
 - 1.2 kW of Electric Power Production
 - UL 1741 Certified for Grid Interconnection
 - Proven Technology
 - PVC Exhaust Venting
- **Advanced Warm Air Furnace**
 - Energy-Star Qualified
 - High Efficiency Two Stage (95% AFUE)
 - ECM Blower Motor: Low Power Consumption
- **Hybrid Integration Module**
 - Permanent Magnet Pump
 - Custom Air Coil Heat Exchanger
 - High Efficiency Air Filter (MERV 8)
- **Supervisory Control System**
 - freewatt System Controller
 - Advanced Heat And Power Algorithm
 - Communicating Thermostat
 - Internet Connection
- **Simple Installation**
- **Compatible with Conventional Air Conditioning Systems**

freewatt® SYSTEM BENEFITS

- Reliable Power Generation, Powered by Honda™
- Significantly Reduces:
 - Home's Carbon Footprint Using Energy Conservation
 - Monthly Electric Bill by Net-Metering Power Generation & Use
- Enhanced Comfort
 - Low Level of Continuous Heat Delivery
- Indoor Air Quality – MERV 8 Air Filtration
- Increases house value by \$5,000 to \$20,000 (National Appraiser's Institute)
- Return on Investment (ROI) of up to 20% annually
- System Monitoring through the Internet Connection
- Breakthrough Home Energy Technology
- Simplified Grid Interconnection



The Furnace and HI Module assembly is design certified in the US and Canada by the Canadian Standards Association.



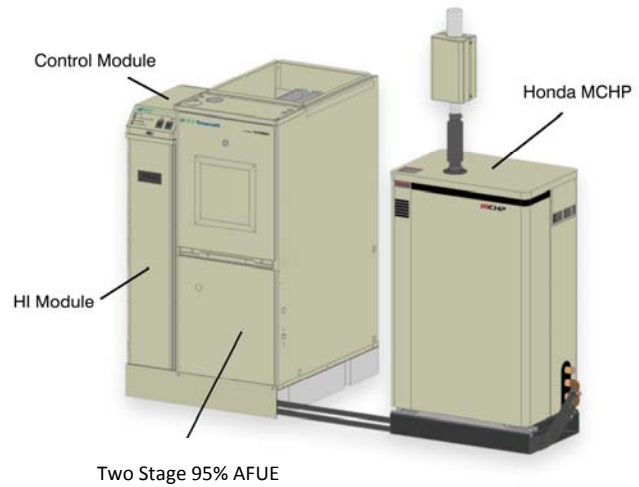
As an Energy Star partner, ECR International has determined that the furnace included as part of the freewatt® system meets Energy Star guidelines for energy efficiency.



The Honda MCHP is an Underwriter's Laboratory (UL) Listed, "Utility Interactive, Cogeneration, Stationary Engine-Generator Assembly, File Number FTSR.AU2004 (U.S.) and FTSR7.AU2004 (Canada)."

Engineered for High Efficiency

1. Honda MCHP
 - Delivers a steady-state efficiency of 85%+ while producing power and heat, thereby reducing the amount of energy consumed to generate your power
 - Delivers exhaust through PVC Venting
2. **freewatt**® Two-Stage Furnace
 - Delivers 95% AFUE with a corrosion resistant heavy gauge aluminized-steel tubular triple-pass heat exchanger coupled with a stainless steel heat recovery coil
 - Reduces electric power consumption by 20% over conventional blower motors using an electronically commutated motor (ECM) in High Heat mode and over 80% in Low Heat Mode
3. Hybrid Integration (HI) Module
 - Consumes under 30 watts to deliver heat from Honda MCHP unit to air coil heat exchanger
4. Control Module
 - Advanced heat and power algorithm optimizes power production of Honda MCHP unit



Warm Air freewatt System

Advanced Technology

5. Onboard Inverter
 - Integrated inverter delivers high quality power to the home's main circuit panel
 - UL 1741 Certified for Grid Interconnection
6. Exhaust Heat Exchanger
 - High efficiency heat exchanger reduces exhaust products to 140° F, allowing use of PVC venting
 - Three-way catalytic converter significantly reduces emissions
7. Combustion Control System
 - Oxygen sensor feedback allows for excellent emissions control
 - Stepping gas valve offers almost unlimited control of gas:air mixture

Quiet Operation & Comfort

Honda MCHP

- Generates heat & power at a noise level of only 47 dBA

Advanced Warm Air Furnace

- Low Heat mode drastically reduces temperature swings, increases overall comfort and lowers the unit's noise

freewatt® System

- Low Heat mode – MCHP operates
- High Heat mode – MCHP and furnace operate



Honda MCHP Unit

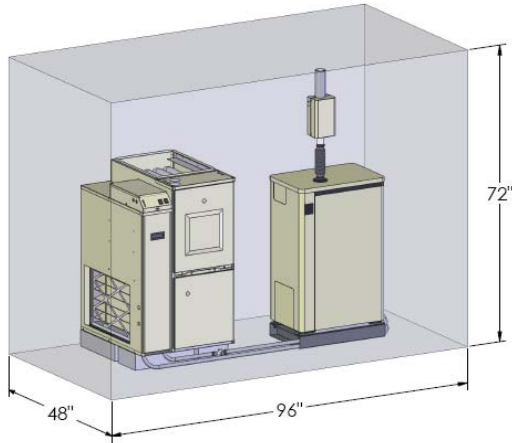
Reliability

Honda's commitment to bringing products to market that improve the quality of people's life goes well beyond cars and motorcycles. Since 1953, Honda has manufactured over 40 million power products worldwide and continues as a leader in the development of low-emission, fuel efficient, environmentally friendly 4-stroke engines for use in numerous power equipment applications. Now Honda's unwavering reliability, quality, durability and environmentally conscious efficiency combines with ECR International's **freewatt**® System to bring micro-combined heat and power to the home.

Multi-Stage Warm Air **freewatt®** System WA-Z Series

Model WA-Z

Typical Warm Air **freewatt®** System Footprint



Model WA-Z

Connections

Furnace/Hi Module

Electrical: 120 Volts AC, 60 Hz, 1 phase, Less than 12 amps

Air Intake/Vent: 2" / 3" Sch 40 PVC

Gas: 1/2" NPT

Condensate Drain: 1/2" PVC

Internet Connection: RJ45

Honda MCHP

Electrical: 240 Volts AC, 60 Hz, 1 phase, Less than 5 amps

Vent: 2" Sch 40 PVC

Gas: 1/2" NPT w/ flexible connector

Condensate Drain: 1/2" Tube

Consult Installation Manuals for more details.

Model WA-Z

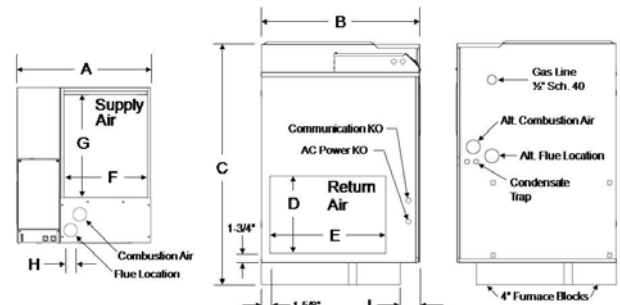
System Clearances

Dimensions	Furnace/ HI Module	Honda MCHP	Service
Top	1"	20"	8"
Left Side	0"	12"	24"
Right Side	0"	12"	-
Base	C - Note 1	B - Note 2	-
Front	0"	21"	24"
Back	0"	2"	-
Intake/Vent Piping	0"	0"	-

- Note: 1. Combustible floor (but not carpet or non-ceramic tile).
 2. MCHP is attached to base that is anchored to concrete floor.
 3. All dimensions are inches and are measured from cabinet.

Model WA-Z

Integrated Furnace and HI Module Dimensions



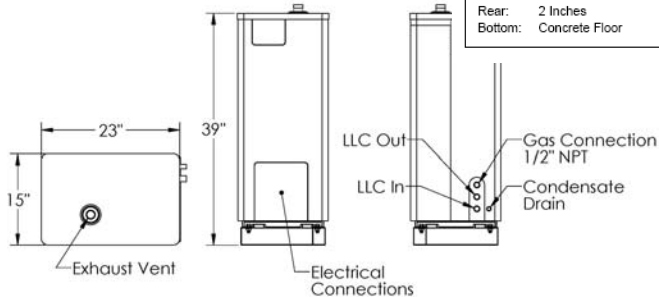
Model	Width A	Depth B	Height C	Vents H	Supply Air (F x G)	Return Air (D x E)	Overhang J
60	25	29	44	2	15-7/8 x	14 x 22	3-1/2 to 5
80	26-1/2	29	44	2	17-1/2 x	14 x 22	3-1/2 to 5
100	28-1/2	29	44	2	19-1/2 x	14 x 22	3-1/2 to 5
120	31-1/2	29	44	2	22-1/2 x	14 x 22	3-1/2 to 5

Model WA-Z

Honda MCHP Unit - Standard YM2Z Model

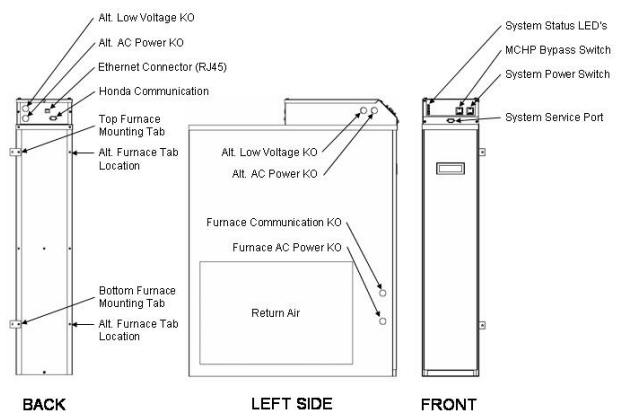
CONCRETE FLOOR REQUIREMENTS:
 THICKNESS: 3" MINIMUM
 FLATNESS: 1/8" IN 10 FEET CLASS CX
 DROP-IN ANCHOR: 3/8" OD x 1.75" LONG (5/16"-18 THREAD) QUANTITY 4

Clearance to Combustibles
 Top: 20 Inches
 Front: 21 Inches + Service
 Sides: 12+ Inches
 Rear: 2 Inches
 Bottom: Concrete Floor



Model WA-Z

Hybrid Integration Module Details



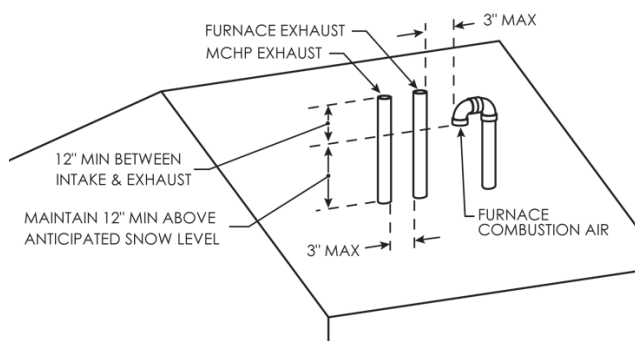
freewatt® HEATING CAPACITIES – NATURAL GAS

Model	WAZ060N00A	WAZ080N00A	WAZ100N00A	WAZ120N00A
Honda MCHP				
Input (MBH) 0-2,000'	18.5	18.5	18.5	18.5
Output (MBH) 0-2,000'	12	12	12	12
Furnace				
Input Hi/Lo (MBH) 0-2,000'	60/36	80/48	100/60	120/72
Output Hi/Lo (MBH) 0-2,000'	57/34.2	76/45.6	95/57	114/68.4
Furnace Efficiency (AFUE)	95%	95%	95%	95%
Cooling Capacity (tons)	1.5, 2, 2.5, 3	2, 2.5, 3, 4	2, 3, 4, 5	2, 3, 4, 5
CFM Range @ 0.50" WC	600 -1200	800 -1600	800 -2000	800 -2000
CFM Low Fire @ 0.20" WC	700	1065	1325	1685
CFM High Fire @ 0.20" WC	845	1385	1,740	2190
Motor – ECM Direct Drive	½ hp	¾ hp	1 hp	1 hp
Supply Air (F x G)	16 x 20	17.5 x 20	19.5 x 20	22.5 x 20
Return Air (D x E)	14 x 22	14 x 22	14 x 22	14 x 22
Venting Length (ft.) - Furnace (3")	100 ft.	100 ft.	100 ft.	100 ft.
Venting Length (ft.) - Honda MCHP (2")	90 ft.	90 ft.	90 ft.	90 ft.

freewatt® Air Filter Details

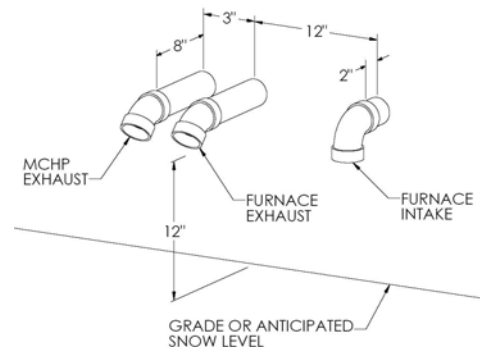
MERV Rating: 8
 Air Flow Rating:
 Medium: 1,400 cfm
 High: 1,750 cfm
 Resistance:
 Medium: 0.19 W.G.
 High: 0.29 W.G.
 Face Area: 18.6 sq. ft.
 Media Area/Face Area: 1.0 sq. ft.
 The filter is Class 2 Approved and Listed.

Typical Roof Vent/Intake Terminations



Consult Installation Manuals for more details.

Typical Sidewall Vent/Intake Terminations



Consult Installation Manuals for more details.

Grid Interconnection

The Honda MCHP unit must be grid interconnected in order to operate properly. Depending on the state's regulations and the electric utility, different grid interconnection application processes are required. ECR International is actively educating state governments and electric utilities about the benefits of micro-CHP and how the freewatt® System can be a critical component in their energy conservation portfolio. If any questions surface during the grid interconnection process, please contact ECR International Technical Support at 877-622-8934.



2201 Dwyer Ave.
 Utica, NY 13501

Tel: 877-386-5475 Fax: 716-366-4670

Web site: www.ecrinternational.com or www.freewatt.com

PN 240007706