



TECHNICAL SPECIFICATION

Hydronic freewatt® System

Model HD-Z200N

MICRO-COMBINED HEAT AND POWER SYSTEMS

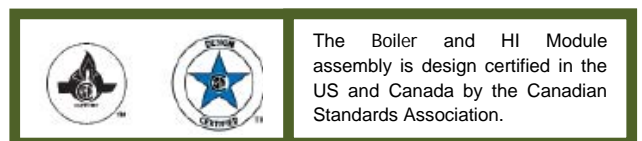
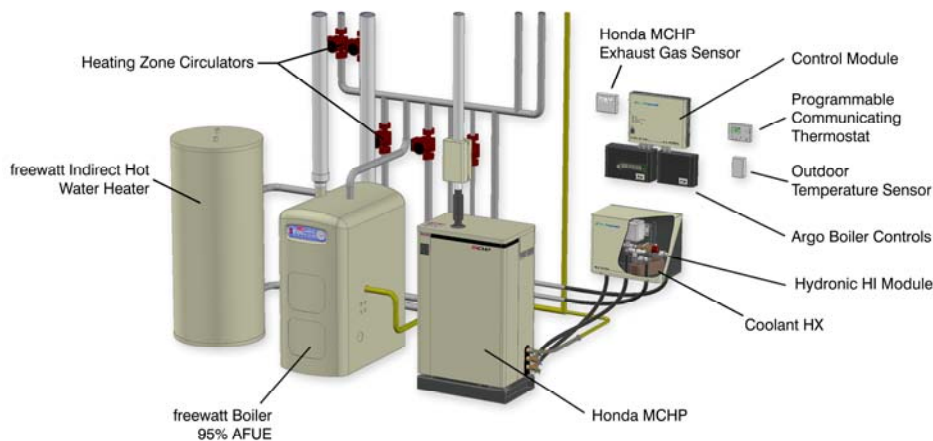
The freewatt® System combines two technologies, an advanced boiler and a gas-fired engine-generator. This hybrid heat and power generation package provides unrivaled total energy efficiency in combined heat and power delivery to the home. The freewatt® system is designed to be installed in the place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

freewatt® SYSTEM FEATURES

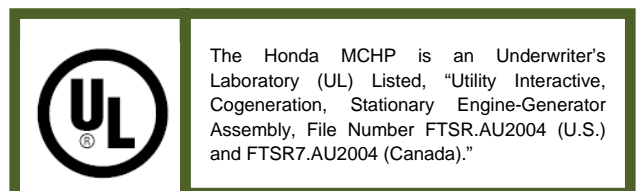
- **Honda MCHP Power Generation Technology**
 - Honda Reliable
 - Quiet (47 dBA)
 - Efficient (85%+ = Heat And Power)
 - 1.2 kW of Electric Power Production
 - UL 1741 Certified for Grid Interconnection
 - Proven Technology
 - PVC Exhaust Venting
- **Advanced Boiler**
 - Energy-Star Qualified
 - High Efficiency (95% AFUE)
 - Modulating, Condensing Appliance
 - Outdoor Reset
- **Hybrid Integration Module**
 - Permanent Magnet Pump
 - Compact Brazed Plate Heat Exchanger
- **Control Module**
 - freewatt® System Controller
 - Advanced Heat And Power Algorithm
 - Communicating Thermostat
 - Internet Connection
- **Simple Installation**
- **Compatible with Conventional Baseboard and Radiant Heat Emitters**

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
- 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



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



Engineered for High Efficiency

1. Honda MCHP Unit
 - Delivers a steady-state efficiency of 85%+ while producing power and heat, thereby reducing the amount of energy consumed to generate your power
 - Exhausts through PVC Venting
2. Advanced Hot Water Boiler
 - Delivers 95% AFUE with a corrosion resistant aluminum block heat exchanger
 - Outdoor reset increases efficiency and indoor comfort
3. Hybrid Integration Module
 - Consumes under 30 watts to deliver heat from Honda MCHP unit to brazed plate heat exchanger and the hydronic water
4. Control Module
 - Advanced heat and power algorithm optimizes power production of Honda MCHP unit



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

- Advanced Hot Water Boiler
- Ultra quiet operation
 - Low Heat mode reduces temperature swings and increases overall comfort

freewatt® System

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

Reliability

Honda's commitment to bringing products to market that improve the quality of people's lives 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 power equipment applications. Now Honda's unwavering reliability, quality, durability and environmentally conscious efficiency combines with the freewatt® System to bring micro-combined heat and power to the home.

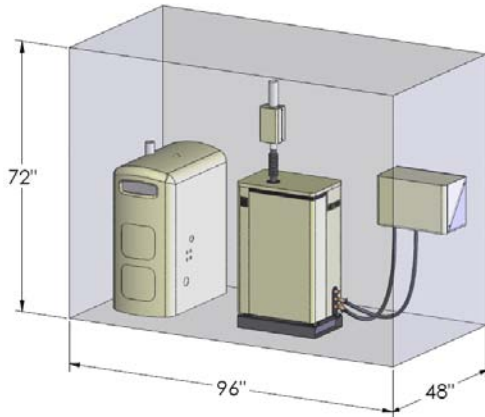
Hydronic freewatt® System



Honda MCHP Unit

Model HD-Z200N

Typical Hydronic freewatt® System Footprint



Model HD-Z200N

Connections

Boiler/Hi Module

- Electrical:** 120 Volts AC, 60 Hz, 1 phase, Less than 12 amps
- Air Intake/Vent:** 3" Sch 40 PVC
- Gas:** ½" NPT
- Condensate Drain:** ½" PVC
- Internet Connection:** RJ45

Honda MCHP

- Electrical:** 240 Volts AC, 60 Hz, 1 phase, Less than 5 amps
- Vent:** 2" Sch 40 PVC
- Gas:** ½" NPT w/ flexible connector
- Condensate Drain:** ½" Tube

Consult Installation Manuals for more details.

Model HD-Z200N

System Clearances

Dimensions	Boiler	Honda MCHP	Service
Top	1"	20"	8"
Left Side	1"	12"	24"
Right Side	1"	12"	-
Base	C - Note 1	B - Note 2	-
Front	0"	21"	24"
Back	6"	2"	-
Intake/Vent Piping	0"	0"	-
Near Boiler HW Piping	1"	0"	-

- Note:
1. Combustible floor approved, but not carpet.
 2. MCHP is attached to base that is anchored to concrete floor.
 3. All dimensions are inches and are measured from cabinet.

Model HD-Z200N

Dimensions & Locations

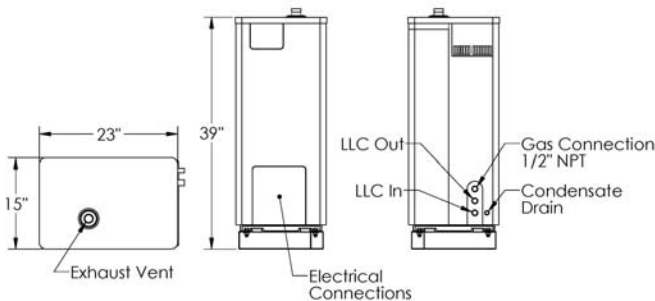
Dimensions	Boiler	HI Module	System Controller
Height	39 3/8"	13"	13"
Width	18"	24"	15"
Depth	30 7/8"	8"	3.5"
Hydronic Return	Back/Right/Left		
Hydronic Supply	Top		
Exhaust Vent	Top		
Air Intake	Back/Left		
Fuel Gas	Back/Right/Left		

Model HD-Z200N

Honda MCHP Unit - Std YM2Z Model

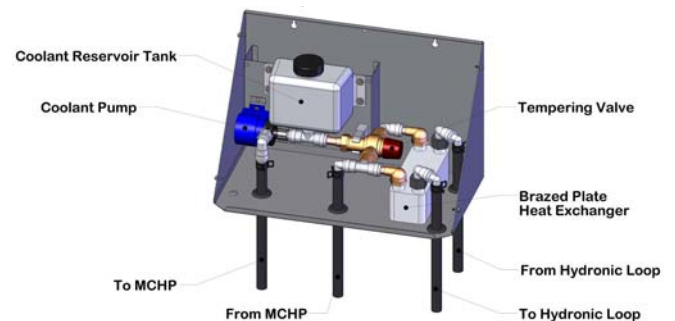
CONCRETE FLOOR REQUIREMENTS:
 THICKNESS: 3" MINIMUM
 FLATNESS: ½" IN 10 FEET CLASS CX
 DROP-IN ANCHOR: 3/8" OD x 1.75" LONG (5/16"-18 THREAD) QUANTITY 4

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



Model HD-Z200N

Hydronic Hybrid Integration Module Details



HEATING CAPACITIES – NATURAL GAS

Model	HD-Z200N
Honda MCHP	
Input (MBH) 0-2,000'	18.5
Output (MBH) 0-2,000'	12.0
Boiler: Min Heat Mode	
Input (MBH) 0-2,000'	80
Output (MBH) 0-2,000'	76
Boiler: Max Heat Mode	
Input (MBH) 0-2,000'	200
Output (MBH) 0-2,000'	190
Boiler Efficiency (AFUE)	95%

BOILER CONNECTION DIMENSIONS

Supply	1 ½"
Return	1 ½"

MAXIMUM VENTING LENGTHS (EACH ELBOW EQUALS FIVE FEET)

Venting Length (ft.) – Boiler (3")	100 ft.
Venting Length (ft.) – Honda MCHP (2")	90 ft.

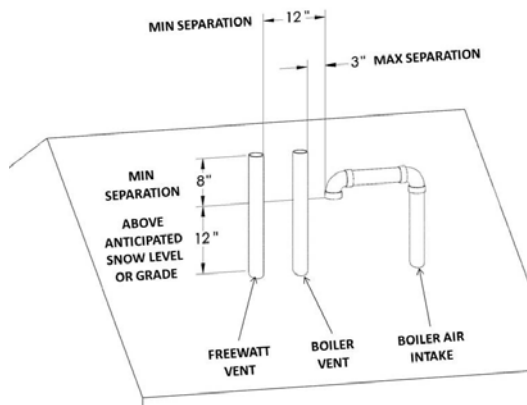
Model HD-Z200N

Control Module Details



Model HD-Z200N

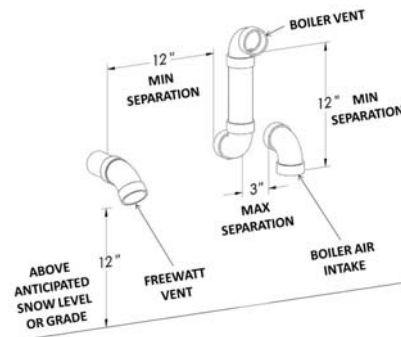
Typical Roof Vent/Intake Terminations



Consult Installation Manuals for more details.

Model HD-Z200N

Typical Sidewall Vent/Intake Terminations



Consult Installation Manuals for more details.

Model HD-Z200N

Grid Interconnection

The grid interconnection of the Honda MCHP unit is required to operate the system. 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 your product technician or 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

PN240007707