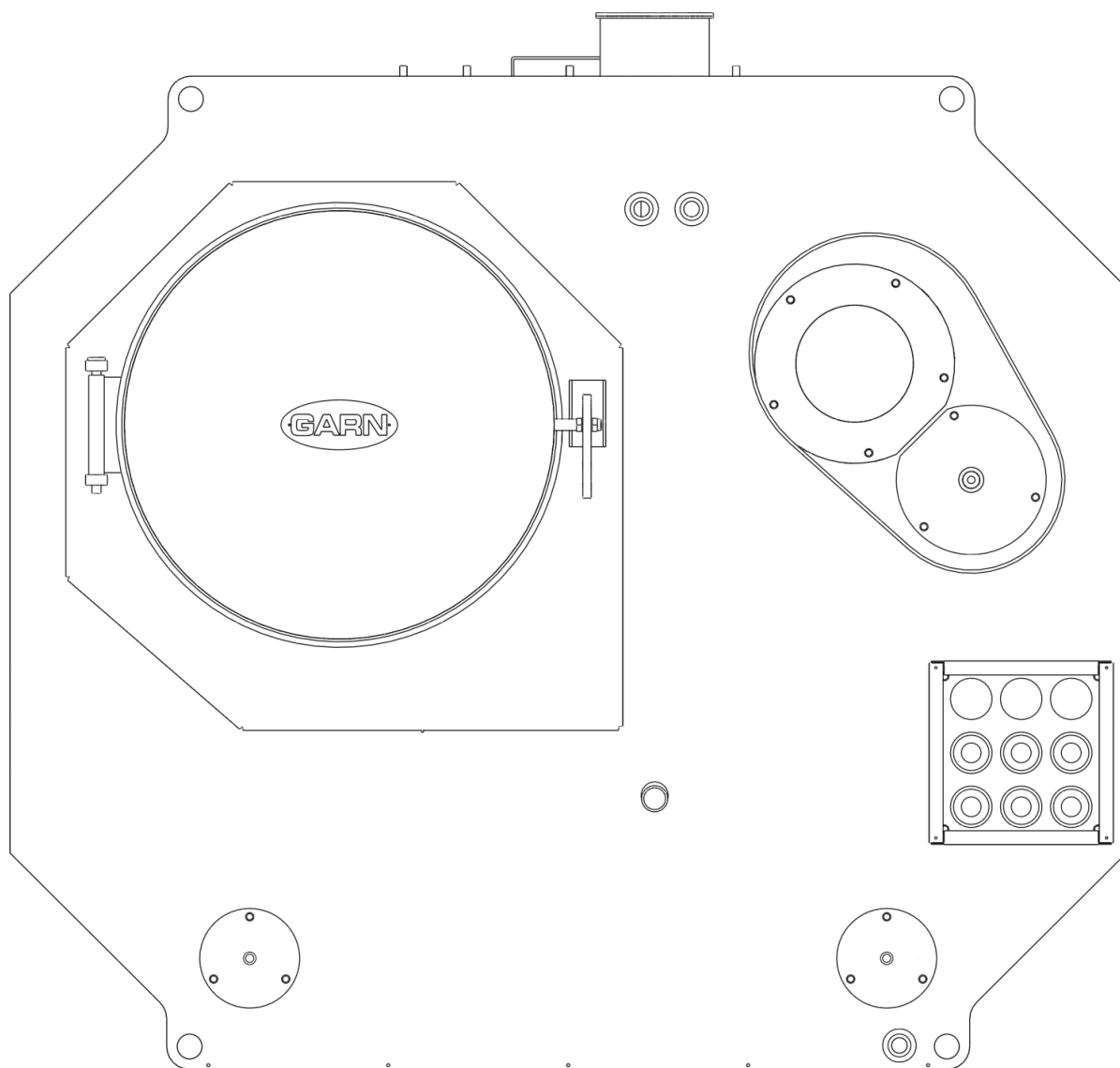


GARN® WHS 1000 (Junior) Owner's Manual Addendum



DECTRA CORPORATION • 3425 33rd Ave NE • St Anthony, Minnesota 55418

Phone: 612-781-3585 • www.garn.com

©2014 DECTRA CORPORATION. All rights reserved. No part of the contents of this manual may be reproduced or transmitted in any form or by any means without the written permission of DECTRA CORPORATION.

OWNER'S MANUAL FOR GARN® MODELS: WHS 1000

Thank you for purchasing GARN® equipment. Carefully read this manual. It contains instructions about how to unpack, install, operate, and maintain your GARN® WHS. Please compare your packing list with the delivered items. Contact your dealer, shipper, and DECTRA CORPORATION if any items are missing or damaged.

Table of Contents

A. CODES, INSURANCE, AND SAFETY SYMBOLS.....	3
B. HOW TO USE THIS MANUAL	4
C. UNPACKING AND ASSEMBLY:	4
FACTORY PREINSTALLED ITEMS:.....	5
D. MAJOR DIFFERENCES BETWEEN WHS-1000 (JUNIOR) AND THE 1500/2000:	5
COMBUSTION CHAMBER:	5
MANWAY COVER:	5
MANWAY GASKET:.....	6
SENSOR STEM:	6
ELECTRIC ELEMENT FLANGES AND ELECTRIC ELEMENT PACKAGE:	7
E. GARN® WHS-1000 DIMENSIONS AND CONNECTIONS	8
HORIZONTAL EXHAUST UNIT:	8
VERTICAL EXHAUST UNIT:	9
F. SPECIFICATIONS	10
G. WARRANTY	11

A. CODES, INSURANCE, AND SAFETY SYMBOLS

The GARN® WHS Wood Heating System is a direct-vented wood-burning appliance that stores heat in a non-pressurized vessel. It is listed by ITS/Warnock Hersey Testing Laboratory, Madison, Wisconsin according to ANSI/UL-391, UL-726 and CAN/USA B366.1-11. It is to be installed according to this manual, on-line technical bulletins, Federal, State and local codes, and your insurance underwriter's guidelines.



The GARN® unit, all related heating equipment (including pumps, piping, fan coils, hot water baseboard, radiant floor heating systems, etc), and all electrical equipment (including power wiring, controls, control wiring, back up electric heating, etc) must be installed by a qualified installer or licensed personnel in strict compliance with all Federal, State and local codes. All electrical equipment, devices and wiring installed with the GARN® unit must be UL/CSA listed. The installer is to supply and install all code required electrical over current and disconnect devices.

Local building and fire inspectors are given discretion to determine if construction and heating installations are safe. They use recommended guidelines developed by various national organizations, such as NFPA (National Fire Protection Association). Your insurance company may also have specific guidelines concerning the installation of wood heating equipment. Follow all local and national codes. The installation must comply with applicable sections of Canadian CSA Standard B365 or U.S. NFPA Standard 211.

The design of the GARN® Wood Heating System is unique and was developed under the following patents: United States Patents #4,401,101 and #4,549,526; Canadian Patents #1,163,880 and #1,220,686.

NOTICE

A **notice** provides a piece of information to make a procedure easier or clearer.

⚠ CAUTION

A **caution** emphasizes where equipment damage might occur. Personal injury is not likely.

⚠ WARNING

A **warning** emphasizes areas where personal injury or death may occur but is not likely. Property or equipment damage is likely.

⚠ DANGER

A **danger** emphasizes areas or procedures where death, serious injury, or property damage is likely if not strictly followed.

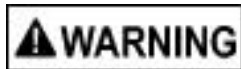
B. HOW TO USE THIS MANUAL

In addition to this manual addendum, a *standard* GARN® WHS 1000/1500/2000 Owner's Manual is supplied with the purchase of a GARN® WHS 1000 (Junior). Although the Junior has a physically different appearance (including size, weight, and pipe connections) than the GARN® WHS 1500/2000, all of the information from the standard Owner's Manual is transferable to the Junior. The GARN® 1000 has a different combustion chamber, manway cover, sensor stem, and HWS/HWR pipe connections, but it operates using the same principles of combustion and heat storage.

This *Addendum* to the standard Owner's Manual discusses the differences between the smaller GARN® WHS-1000 and the WHS-1500/2000. This is a short Addendum and should be reviewed before using the standard Owner's Manual. That way you will be familiar with the important differences.

C. Unpacking and Assembly:

The Junior's base is screwed to wood shipping skids made from dimensional lumber on its base for easier tie-down and movement during shipping. Remove the wood shipping skids prior to placing the unit. If the skids are not removed prior to filling the unit with water, the unit may be permanently damaged.



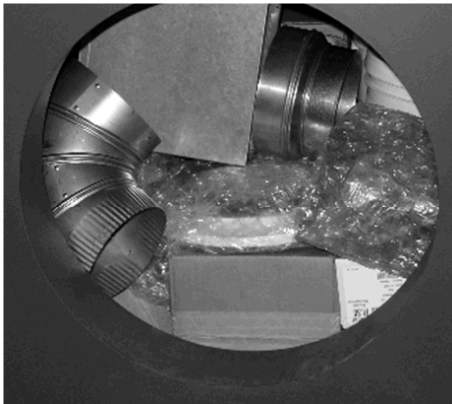
REMOVE WOOD SHIPPING SKIDS PRIOR TO PLACING THE UNIT INTO FINAL POSITION ON THE FOAM BASE. Failure to remove skids will cause significant damage to the unit when filled with water.

As with the WHS-1500/2000 most items are packed inside of the combustion chamber, but some items are pre-installed at the factory.



DO NOT REMOVE THE FIREBRICK. It is preinstalled at the factory.

The following components come with every GARN® WHS-1000 and should be removed from the combustion chamber:



- Digital controller
- Digital controller sensors:
 - Outdoor Temp
 - HWS Temp
 - HWR Temp
 - Flue Temp
- Air intake hood
- Low water cutoff stem with integral temperature sensor stem
- Water treatment test kit
- Water filter and housing
- Motor and blower wheel
- Motor mount plate and gasket
- Stainless steel elbow (horizontal units only)
- Bent flow stabilizer
- Upper cleanout plate and gasket

NOTICE

COMPONENTS TO UNPACK CAN VARY WITH TYPE OF INSTALLATION AND ACCESSORIES ORDERED. Compare the packing slip that came with your unit to the components unpacked.

FACTORY PREINSTALLED ITEMS:

The following items are assembled and properly installed at the factory:

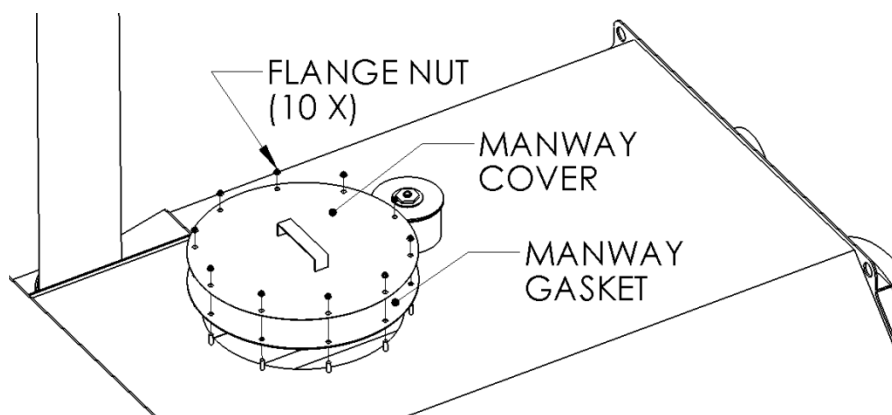
- Firebrick with insulation backing
- Ceramic reaction chamber tube (2 sections) with rear insulating ring
- Magnesium anode rod threaded into the top of the water storage tank
- Lower cleanout plates and gaskets
- Rear cleanout plate and gasket (vertical units only)

D. MAJOR DIFFERENCES BETWEEN WHS-1000 (Junior) AND THE 1500/2000:**Combustion Chamber:**

The combustion chamber design is functionally the same as the 1500/2000, only it is shaped slightly different. The side firebrick is set inside a lip so that as the wood pile burns, logs and combustibles do not hang on the edge of the brick. This feature results in improved, better, and full combustion.

Manway Cover:

The manway cover on the Junior is a bolt down cover with an EPDM gasket. The EPDM gasket is good to 500°F and protects the manway cover from any corrosion. Tighten the bolts with a socket wrench in an opposing pattern (like lug nuts on a car wheel) so that the bolts are snug enough to prevent leakage. When the water level rises in the GARN, it will be in full contact with the manway cover gasket. If leaking is observed, snug the bolts down in the vicinity of the leak.



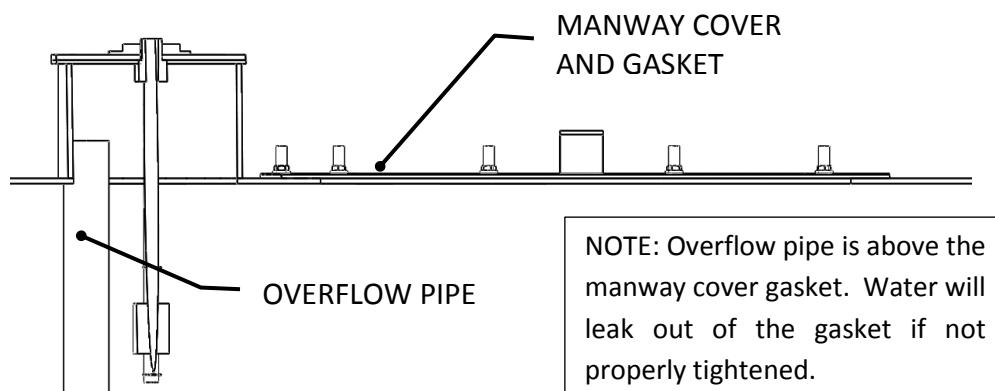
Manway Gasket:



WATER WILL LEAK OUT OF THE MANWAY IF THE MANWAY COVER IS NOT PROPERLY BOLTED BEFORE FILLING THE UNIT. Ensure the manway cover and

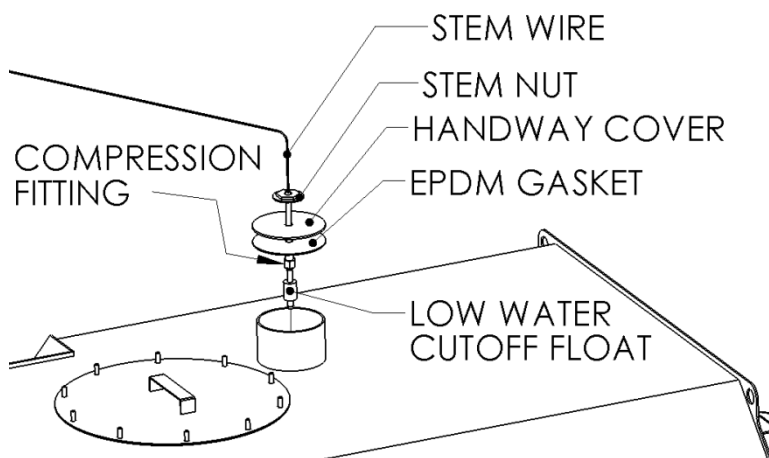
gasket are properly installed and bolted before filling the unit.

The reason that the unit will leak is because the overflow pipe is above the gasket. The Junior is specifically designed this way, so that water treatment chemicals can come in contact with the top of the tank.



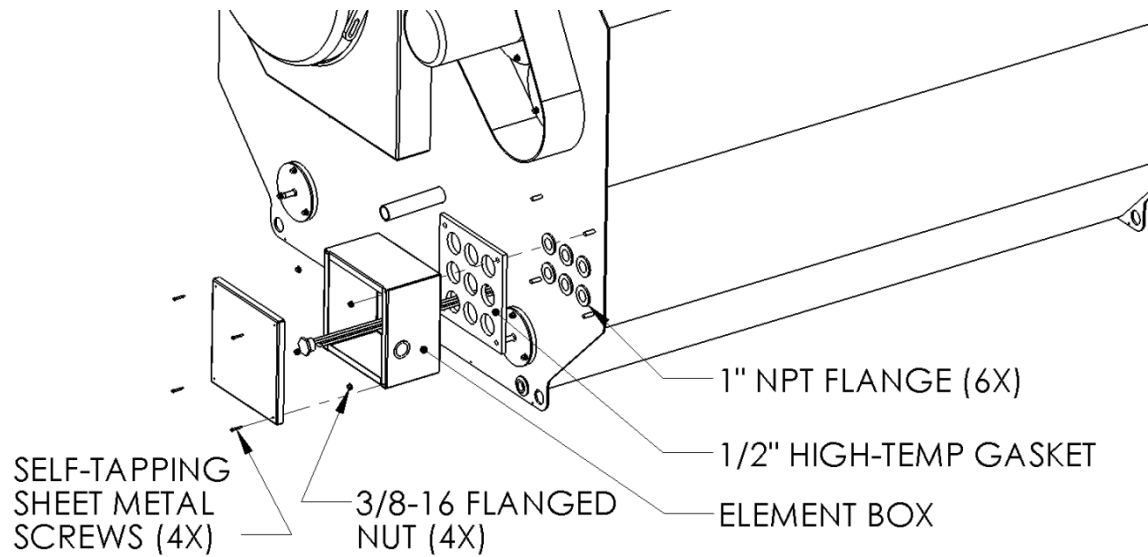
Sensor Stem:

The sensor stem on the Junior is shorter than the sensor stem on the 1500/2000. The stem is placed through the handway cover into the tank. The stem's compression fitting threads through the EPDM gasket, metal handway cover, and into the plastic stem nut. The sensor stem contains a float for the Low Water Cutoff and the Tank Temperature Sensor.



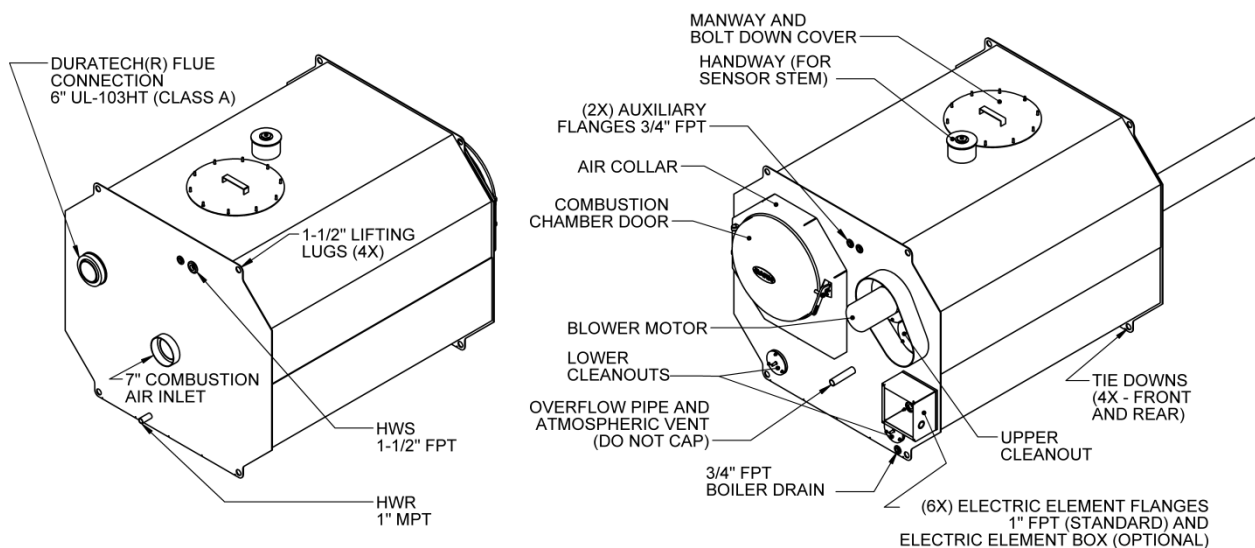
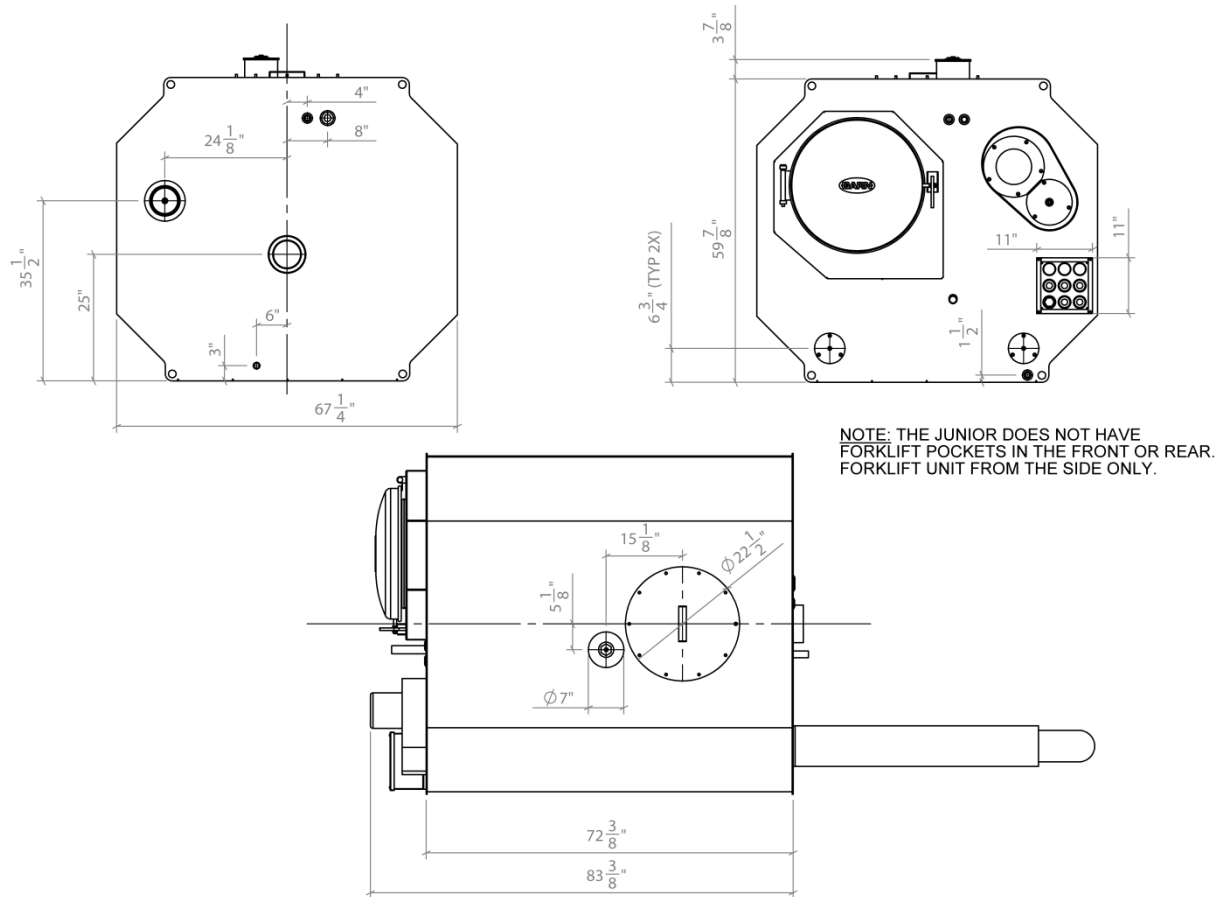
Electric Element Flanges and Electric Element Package:

The Junior comes with 6 electric element flanges which allows an electric heating package up to 33 kW (5.5 kW per element). However, the same electric element box, gasket, and element box cover is used with the Junior that is used with the 1500/2000.

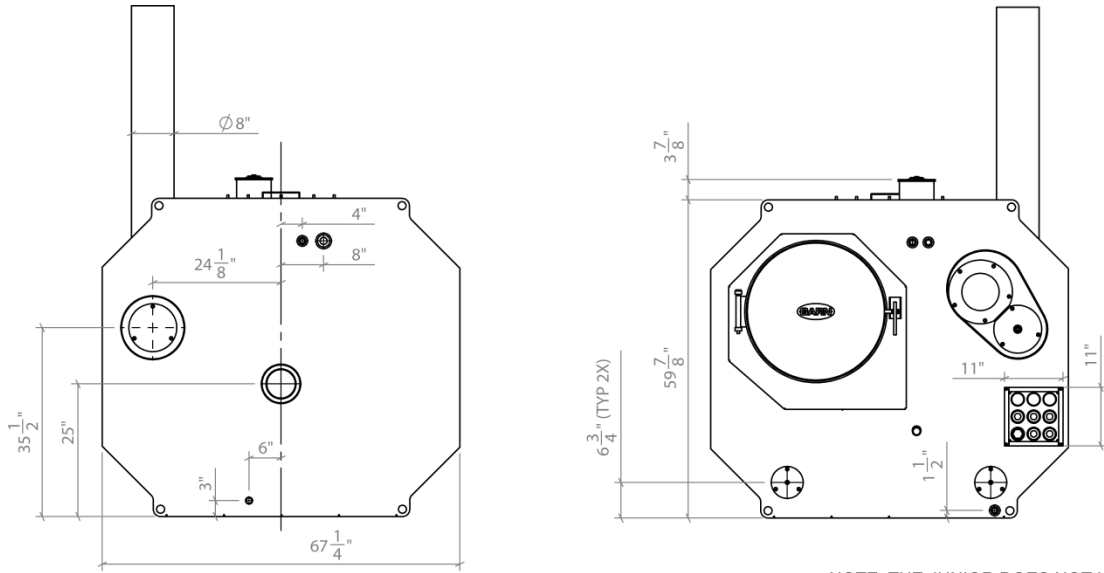


E. GARN® WHS-1000 DIMENSIONS AND CONNECTIONS

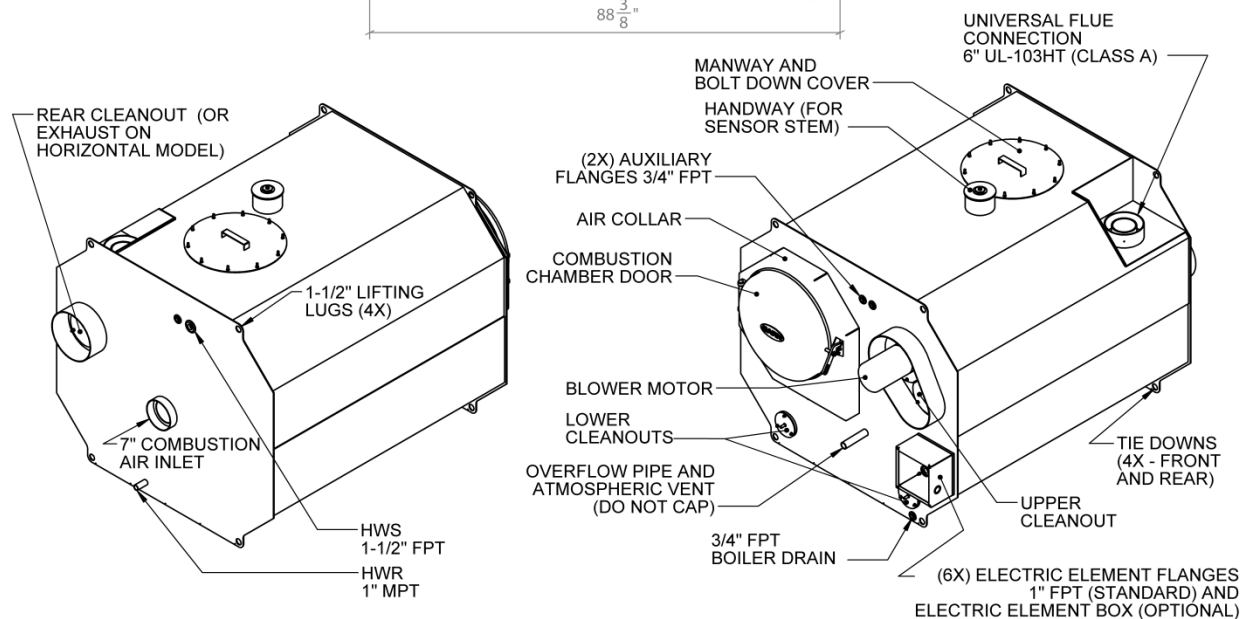
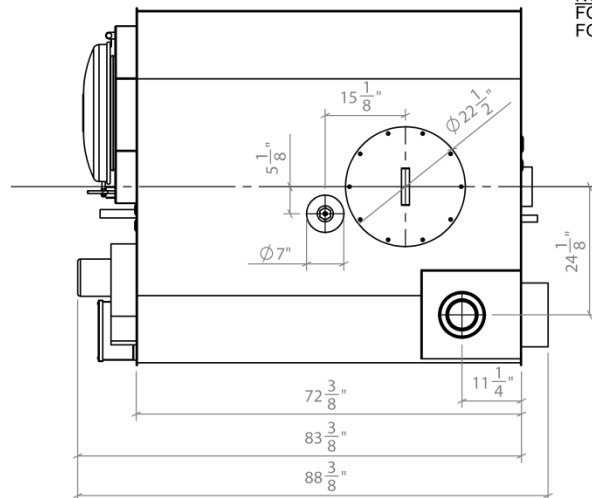
Horizontal Exhaust Unit:



Vertical Exhaust Unit:



NOTE: THE JUNIOR DOES NOT HAVE FORKLIFT POCKETS IN THE FRONT OR REAR. FORKLIFT UNIT FROM THE SIDE ONLY.



F. SPECIFICATIONS

GARN® WHS SPECIFICATIONS	WHS 1000 (JR)	WHS 1500	WHS 2000
APPLICATION	RESIDENTIAL	RESIDENTIAL/LIGHT COMMERCIAL	BUSINESS/COMMERCIAL
Maximum Heat Output †	180,000 btuh	250,000 btuh	325,000 btuh
Tested Efficiency (LHV)*	80.0%	80.0%	88.4%
Particulate Emissions output - PM2.5	0.190 lbs/mmbtu	0.131 lbs/mmbtu	0.088 lbs/mmbtu
Particulate Emissions rate - PM2.5	2.31 gr/hr	2.87 gr/hr	1.65 gr/hr
Nominal gallons of storage	980 gallons	1,420 gallons	1,830 gallons
Weight - Empty	2,200 lbs.	3,140 lbs.	3,570 lbs.
Weight - Filled	10,370 lbs.	15,000 lbs.	18,830 lbs.
Recommended wood length	16" to 20"	24" to 32"	24" to 32"
Recommended wood diameter	3" to 10"	3" to 10"	3" to 10"
Combustion chamber length	36"	40"	40"
Combustion chamber diameter	24"	25"	25"
Combustion chamber volume	110 gallons	130 gallons	130 gallons
NPT supply flange	1-1/2" (22 gpm MAX)	2"	2"
MPT return pipe	1"	1.5"	1.5"
Draft inducer motor	1/2 HP	1/2 HP	3/4 HP
Electrical requirements	115 VAC 15 amp	115 VAC 15 amp	115 VAC 15 amp
Flue	6" DuraTech Class A, 2100°F	6" DuraTech Class A, 2100°F	6" DuraTech Class A, 2100°F
Air intake	7" with screened hood	7" with screened hood	7" with screened hood

*Tested to ASTM E2618

† Reloading once every 3 hours with 24 inch long split white oak, 20% moisture content.

MATERIAL SPECIFICATIONS	WHS 1000 (JR)	WHS 1500	WHS 2000
Tank shell - mild steel	3/16"	3/16"	3/16"
Front and back heads - mild steel	3/16"	1/4"	1/4"
Combustion chamber - mild steel	3/16"	3/16" and 1/4"	3/16" and 1/4"
Blower housing components - mild steel	3/16"	3/16"	3/16"
Door spinnings			
Outer - mild steel - yellow zinc electroplated	12 GA	12 GA	12 GA
Middle - mild steel - yellow zinc electroplated	16 GA	16 GA	16 GA
Inner - 304 stainless steel	16 GA	16 GA	16 GA
Skids - mild steel	N/A - No Skids	10 GA	10 GA
Heat exchanger tubing	Sch. 40 A53 Grade B ERW	Sch. 40 A53 Grade B ERW	Sch. 40 A53 Grade B ERW

G. Warranty

GARN® products are warranted by the manufacturer to be free of defects in material and workmanship as follows, with the below-enumerated exclusions:

- With respect to the blower motor, controls and miscellaneous parts furnished as part of the basic unit, a one-year warranty shall apply.
- With respect to the storage tank, combustion chamber, flue tube heat exchanger, outer door, middle door and blower housing, a five-year warranty shall apply with regard to materials and workmanship.
- With respect to wear items such as gaskets, firebrick, reaction chambers, door latch and latch pin, door hinge and hinge pin, etc., a one-year warranty shall apply regarding materials and workmanship excluding normal wear and tear. Proper use and periodic maintenance will extend the life of these items. No warranty with regard to either anode rods or chemicals.
- NO WARRANTY SHALL APPLY WITH REGARD TO EPOXY COATINGS, PAINT, CORROSION OR CORROSION INDUCED FAILURES OF ANY COMPONENT OF THE UNIT OR COMPONENTS ATTACHED TO THE UNIT. It is the sole responsibility of the owner to install, maintain and test water treatment chemicals in order to minimize corrosion potential and damage. Testing of the GARN® water is required once every year. A record of this compliance is required or warranty is VOID.
- DECTRA shall not be liable for injury, loss, damage or any expense directly or indirectly arising from the use of the products it offers for sale or from any other cause.
- This warranty does not cover any parts replacement due to shortage or damage in shipment, exposure to weather, improper installation, operating the unit under abnormal conditions, or other claims not agreed to in writing by DECTRA. Replacement parts purchased from DECTRA are warranted for ninety (90) days from the date of installation.
- No warranty is given in connection with second-hand products and equipment, or products and equipment altered or rebuilt without DECTRA's knowledge or written approval.
- No warranty is given regarding the predicted or actual performance of any product manufactured or supplied by DECTRA.
- THIS WARRANTY IS EXPRESSLY MADE IN LIEU OF ANY & ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR PURPOSE SHALL APPLY. NO WARRANTY OF LOCAL CODE ACCEPTANCE OR OF INSURANCE CARRIER ACCEPTANCE SHALL APPLY. NO WARRANTY FOR INSTALLATION OR FOR HEATING SYSTEM PARTS OR PERFORMANCE SHALL APPLY.

The foregoing warranty periods shall each commence on the date of shipment to user of the products or parts and the obligation of DECTRA with respect to such products or parts shall be limited to replacement or repair FOB point of origin, and in no event shall DECTRA be liable for consequential or special damages, or for transportation, installation, adjustment, or other expenses which may arise in connection with such products or parts. Determination of what is a defective part, assembly or product is the sole responsibility of DECTRA CORPORATION personnel. The obligation of DECTRA hereunder with respect to any products or parts shall be to replace, or at its option, to repair parts determined to be defective in materials or workmanship. Correction of any such defects by repair or replacement shall constitute fulfillment of all obligations of DECTRA to the Purchaser hereunder.

DECTRA assumes no liability for labor or any other expenses incurred by anyone without DECTRA's express written consent.

No person, agent or representative is authorized to give any additional warranty on behalf of DECTRA or assume for DECTRA any other liability in connection with any GARN® products.