



Quality People. Building Solutions.

Comfort Systems USA (Arkansas), Inc.
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Date: 3/13/2024

Return Request: 3/23/2024

Project: Stone Bank HQ - Chenal

Supplier: Boone & Boone

Manufacturer: Duraseal

Submittal: Boiler Flue Piping

Submittal Number: 23 00 00-03

Drawing # and Installation: Mechanical Drawings

ARCHITECT

WDD Architects
5050 Northshore Lane
N. Little Rock, AR 72118
501-376-6681

ENGINEER

Batson Inc.
1300 Brookwood Dr.
Little Rock, AR 72202
501-664-3311

GENERAL CONTRACTOR

East Harding
2230 Cottondale Lane #3
Little Rock, AR 72202
501-661-1646

MECHANICAL SUBCONTRACTOR

Comfort Systems USA (Arkansas), Inc.
9924 Landers Rd.
N. Little Rock, AR 72117
501-834-3320

Notes:

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dpierce@comfortar.com

9924 Landers Rd.
No. Little Rock, AR 72117

DURASEAL®

SINGLE & DOUBLE WALL

SPECIAL GAS VENT

Job: Stone Bank Headquarters
Engineer: Batson, Inc.
Contractor: Comfort Systems USA
Factory Rep: Boone & Boone Sales
Rep Contact: Mark Eley, 501-940-7747

DuraSeal DS, DSD, DSID, & Flex

DuraSeal features a smooth weld seam inside and out, which is completely shielded during the welding process. Contamination or molecular changes in the weld seam are avoided and no fillers are used in the welding process. The DuraSeal double-wall system is fully interchangeable with our DuraSeal single-wall system. Both have been conformed to UL1738 and certified to ULC-S636 safety standards. When installed according to DuraVent installation instructions, DuraSeal meets all test requirements for horizontal and vertical, interior or exterior installations. DSID features the same construction as DSD, but with 2" air space filled with mineral wool insulation.



Features	Benefits
Laser welding	<ul style="list-style-type: none">• Reinforces strength• Prevents leakage• Increases durability and reliability
Built-in Secure Lock system	<ul style="list-style-type: none">• Provides quick and easy assembly and disassembly• Requires less time on the job site
DuraSeal sealing gaskets	<ul style="list-style-type: none">• Self-sealing, so there's no need to apply sealing material when pieces are joined together• Easier and faster installation
Standard adjustable vent length	<ul style="list-style-type: none">• Provides vertical or horizontal adjustment for easy system pitching
AL29-4C stainless steel standard or 316L stainless steel alternative	<ul style="list-style-type: none">• Resists the extreme corrosive environments found in condensing boilers• Assures safe and trouble-free operation
Proven track record	<ul style="list-style-type: none">• Conformed to UL1738 and certified to ULC-S636• Type L: Listed to UL-641 and ULC-S609 (DSD/DSID)• 15-year warranty
All accessories made of stainless steel	<ul style="list-style-type: none">• For durability

DuraSeal® DS, DSD, DSID, & Flex

QUALITY AND DEPENDABILITY

The DuraSeal flue is manufactured from stainless steel designed for extreme resistance to chloride ion pitting, crevice corrosion and stress corrosion cracking, as well as general corrosion in oxidizing and moderately reducing environments. 29-4C is the standard choice, but also available in 316L, for withstanding the harmful effects of corrosive condensates created by partially or fully condensing high-efficiency natural gas and propane-fired heating appliances.

The Canadian Gas Research Institute found that test results proved 29-4C and 316L to be one of the two “most corrosion-resistant alloys of 20 candidate stainless steels evaluated for resistance to chloride-induced corrosion in condensing and partially condensing gas-fired appliances.”

STRINGENT STANDARDS FOR QUALITY ASSURANCE

To guarantee a perfect fit every time and to avoid built-in stress points or weak areas, tube ends are formed under stringent guidelines and held to exacting standards.

The casing (outer tube on DuraSeal DSD/DSID) is manufactured from type 441 stainless steel to provide long-lasting performance and stability when exposed to the outdoors.

The air space between the flue and casing is 1” on DSD and 2” insulated on DSID, providing close clearances to combustibles, reasonable outside dimensions and an additional heat shield or margin of safety where needed.

BUILT TO LAST

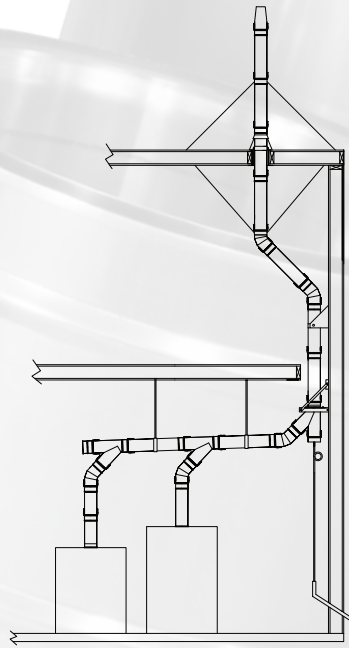
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DuraSeal Single Wall (DS)
Vertical Installation



DuraSeal Double Wall (DSD) Vertical
Through-the-Roof Installation

Effective Length:
 When assembling two parts together,
 the joint will overlap 2-3/8". So
 effective length is normal length
 minus 2-3/8".

Vertical Installation Requirements

1. The vent system must terminate
 at least 3 feet above the roof line
 and at least 2 feet higher than any
 portion of the building within 10 feet.
 This limitation can be removed if an
 engineering analysis demonstrates
 normal and safe operation of
 appliance.

2. When terminated at a height of
 more than 10 feet, the stack must be
 supported by a Guy Section.

3. The vent system must
 terminate with one of the DuraSeal
 terminations.

DURASEAL SINGLE WALL (DS)

Minimum Clearance to Combustibles

Diameter	Rated operating temperature	Max flue gas temperature	Enclosed		Unenclosed	
			Horizontal	Vertical	Horizontal	Vertical
3" to 12"	194° F/90° C (Canada Only)	550° F	N/A	N/A	0"	0"
	480° F	550° F	N/A	N/A	2"	2"
14" to 24"	194° F/90° C (Canada Only)	550° F	N/A	N/A	0"	0"
	480° F	550° F	N/A	N/A	4"	4"

DURASEAL DOUBLE WALL (DSD) ~~DSH~~

Minimum Clearance to Combustibles

Diameter	Rated operating temperature	Max flue gas temperature	Enclosed		Unenclosed	
			Horizontal	Vertical	Horizontal	Vertical
3" to 12"	194° F/90° C (Canada Only)	550° F	N/A	0"	0"	0"
	480° F	550° F	N/A	1"	1"	1"
14" to 24"	194° F/90° C (Canada Only)	550° F	N/A	0"	0"	0"
	480° F	550° F	N/A	1"	3"	1"
3" to 12" (L-Vent)	194° F/90° C (Canada Only)	570° F	N/A	0"	0"	0"
	480° F	570° F	N/A	2"	2"	2"
14" to 24" (L-Vent)	194° F/90° C (Canada Only)	570° F	N/A	0"	0"	0"
	480° F	570° F	N/A	2"	3"	2"

Material Thickness

Diameter	Inner Wall Material Thickness	Outer Wall Material Thickness
3" - 9"	29-4C - .015" 316L - .015"	29-4C - .015" 316L - .015"
10" - 16"	29-4C - .020" 316L - .019"	29-4C - .020" 316L - .019"
18" - 24"	29-4C - .024" 316L - .024"	29-4C - .024" 316L - .024"

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Project Data

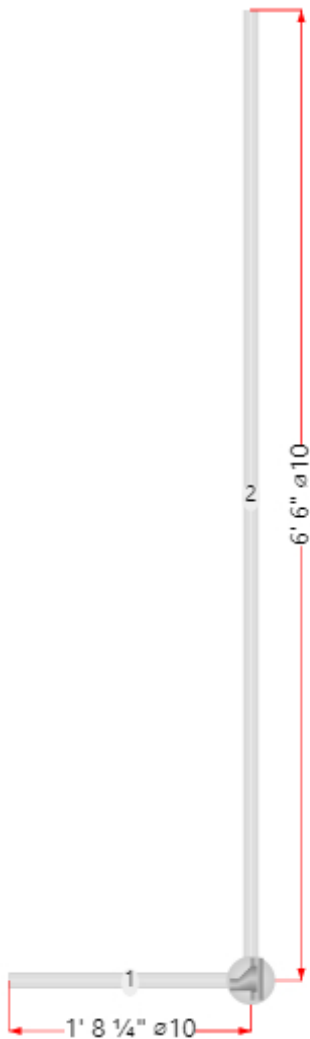
Project No:	DVG24-277	Project Name:	Outdoor Raypak Boiler Flue
System No:	302439	Location:	AR
Date:	1/18/2024	Layout/BOM Title:	DVG24-277
Prepared for:	Boone & Boone Sales Mark Eley	Product(s):	DuraSeal DSD-BK(316/441)
Prepared by:	DuraVent Group Collin Ludwig		

Qty	Item No	Description
1	LUBE	Silicone Oring Lube 5 oz
1	VITON-S	Viton Caulking 2,2 oz
1	DSD10UNIBAOUK	UNIV BOILER ADAP - OUTSIDE FLUE DSD10" AL29-441
1	DSD10DTC1NPTBK	DRAIN TEE CAP DSD10" 316-441
1	DSD10BTUK	Lateral DuraTEE DSD10" AL29-441
1	DSD10APP	ANCHOR PLATE DSD10" 439
1	DSD10L36BK	LENGTH DSD10" X 36" 316-441
1	DSD10L24BK	LENGTH DSD10" X 24" 316-441
1	DSD10TPL1/2NPTBK	LENGTH TEST PORT DSD10" 316-441

Section Legend

Section	Product	Dia/Cross Dim	Vertical	Horizontal	Length
1	DuraSeal DSD-BK(316/441)	ø10	0' 0" (0")	1' 8¼" (20¼")	1' 8¼" (20¼")
2	DuraSeal DSD-BK(316/441)	ø10	6' 6" (78")	0' 0" (0")	6' 6" (78")
Total			6' 6" (78")	1' 8¼" (20¼")	8' 2¼" (98¼")

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Customer		
Boone & Boone Sales		
Project		
Outdoor Raypak Boiler Flue		
Layout		
DVG24-277		
Date	By	
1/18/2024	Collin Ludwig	
System No	Ref.No	Scale
302439	DVG24-277	None

Schematic Drawing - Not to Scale

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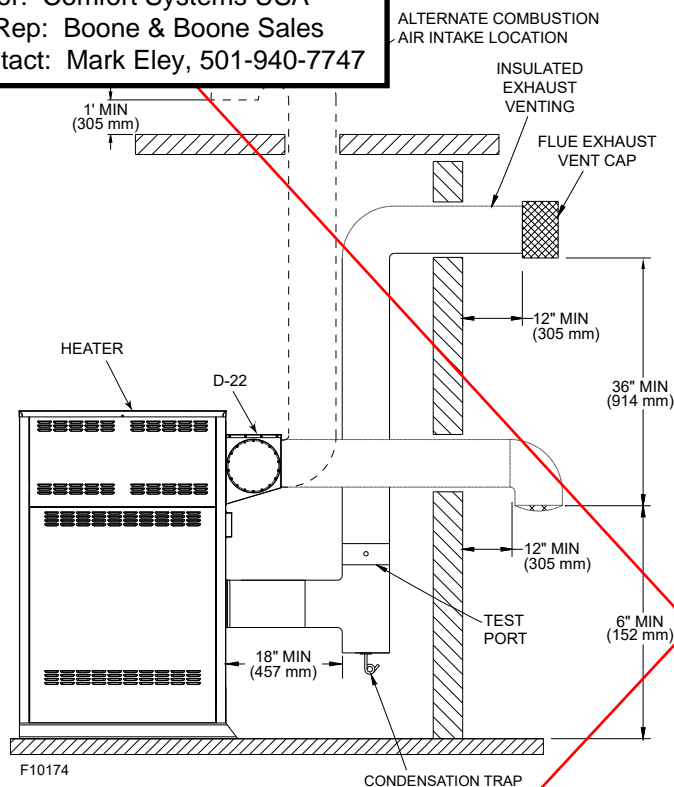


Figure 32. Horizontal Through-the-Wall Direct Venting

CAUTION: This venting system requires the installation of a condensate drain in the vent piping per the vent manufacturer's instructions. Failure to install a condensate drain in the venting system will void all warranties on this heater (See page 35, Condensate Management).

Installation

These installations utilize the heater-mounted blower to vent the combustion products to the outdoors. Combustion air is taken from inside the room and the vent is installed horizontally through the wall to the outdoors. Adequate combustion and ventilation air must be supplied to the equipment room in accordance with the NFGC (U.S.) or B149.1 (Canada).

The total length of the horizontal through-the-wall flue system should not exceed 100 equivalent ft. (30 m) in length. If horizontal run exceeds 100 equivalent ft. (30 m), an appropriately-sized variable-speed extractor must be used. Each elbow used is equal to 10 ft. (3 m) of straight pipe. This will allow installation in one of the four following arrangements:

- 100 ft. (30 m) of straight flue pipe
- 90 ft. (27.4 m) of straight flue pipe and one elbow
- 80 ft. (24.4 m) of straight flue pipe and two elbows
- 70 ft. (21.3 m) of straight pipe and three elbows

The vent cap is not considered in the overall length of the venting system.

The vent must be installed to prevent flue gas leakage. Care must be taken during assembly to ensure that all joints are sealed properly and are airtight. The vent must be installed to prevent the potential accumulation of condensate in the vent pipes. It is required that:

1. The vent must be installed with a condensate drain located in proximity to the heater as directed by the vent manufacturer.
2. The vent must be installed with a slight upward slope of not less than 1/4 inch per foot (21 mm per linear meter) of horizontal run to the vent terminal.
3. The vent must be insulated through the length of the horizontal run.

Termination

The flue direct vent cap **MUST** be mounted on the exterior of the building. The direct vent cap cannot be installed in a well or below grade. The direct vent cap must be installed at least 1 ft. (0.3 m) above ground level and above normal snow levels. The Raypak-approved stainless steel flue direct vent cap must be used (option D-15). The vent terminal must be located **NO CLOSER** than 1 ft. (0.3 m) off the wall.

WARNING: No substitutions of flue pipe or vent cap material are allowed. Such substitutions would jeopardize the safety and health of inhabitants.

Model No.	Certified Vent Material	Vent Size in. (mm)	Maximum Horizontal Vent Length* ft. (m)	Combustion Air Intake Pipe Material	Air Inlet Max. Length* ft. (m)			
					10" Ø	12" Ø		
2503	Category IV (UL-Listed - SS)	10 (254)	100 (30)	Galvanized Steel, PVC, ABS, CPVC	100 (30)			
3003								
3503		12 (305)				100 (30)		
4003								

* Subtract 10 ft. (3 m) per elbow. Max. 4 elbows.

Table N. Category IV Horizontal Vent & Horizontal Direct Vent

Job: Stone Bank Headquarters
Engineer: Batson, Inc.
Contractor: Comfort Systems USA
Factory Rep: Boone & Boone Sales
Rep Contact: Mark Eley, 501-940-7747

These installations utilize the heater-mounted blower to draw combustion air from outdoors and vent combustion products to the outdoors.

The total length of air supply pipe cannot exceed the distances listed in **Table L** and **Table N**. Each elbow used is equal to 10 ft. (3 m) of straight pipe. This will allow installation in any arrangement that does not exceed the lengths shown in **Table L** and **Table N**.

The vent cap is not considered in the overall length of the venting system.

CAUTION: This venting system requires the installation of a condensate drain in the vent piping per the vent manufacturer's instructions. Failure to install a condensate drain in the venting system will void all warranties on this heater (See page 35, Condensate Management).

Care must be taken during assembly that all joints are sealed properly and are airtight.

The vent must be installed to prevent the potential accumulation of condensate in the vent pipes. It is required that:

1. The vent must be installed with a condensate drain located in proximity to the heater as directed by the vent manufacturer.
2. The vent must be installed with a slight upward slope of not more than 1/4 inch per foot (21 mm per meter) of horizontal run to the vent terminal.
3. The vent must be insulated through the length of the horizontal run.

Termination

The vent cap **MUST** be mounted on the exterior of the building. The vent cap cannot be installed in a well or below grade. The vent cap must be installed at least 1 ft. (0.3 m) above ground level and above normal snow levels.

The vent cap **MUST NOT** be installed with any combustion air inlet directly above a vent cap. This vertical spacing would allow the flue products from the vent cap to be pulled into the combustion air intake installed above.

This type of installation can cause non-warrantable problems with components and poor operation of the heater due to the recirculation of flue products. Multiple vent caps installed in the same horizontal plane must have a 4 ft. (1.2 m) clearance from the side of one vent cap to the side of the adjacent vent cap(s).

Combustion air supplied from outdoors must be free of particulate and chemical contaminants. To avoid a blocked flue condition, keep the vent cap clear of snow, ice, leaves, debris, etc.

The stainless steel flue direct vent cap must be furnished by the heater manufacturer in accordance with its listing (sales order option D-15).

WARNING: No substitutions of flue pipe or vent cap material are allowed. Such substitutions would jeopardize the safety and health of inhabitants.

Outdoor Installation

Units installed outdoors must be vented with listed vent material per the following instructions and installed with the optional factory-supplied outdoor vent kit. A special vent cap and air intake hood are provided in accordance with CSA requirements. These must be installed directly on the vent pipe as illustrated in **Figure 34**.

Care must be taken when locating the heater outdoors, because the flue gases discharged from the vent cap can condense as they leave the cap. Improper location can result in damage to adjacent structures or building finish. For maximum efficiency and safety, the following precautions must be observed:

CAUTION: Use of double-wall vent pipe is recommended to minimize the risk of personal injury.

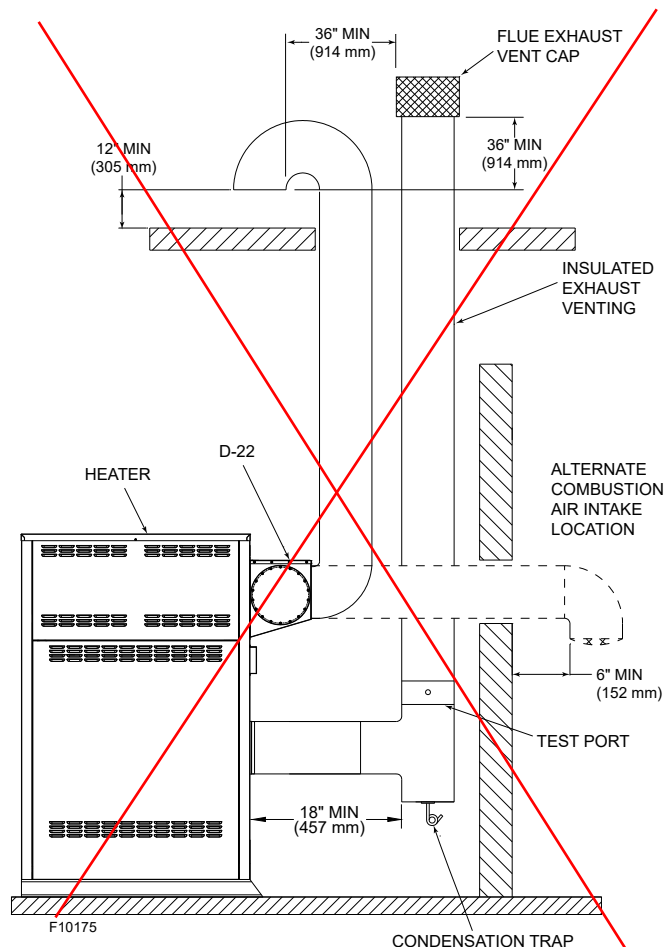


Figure 33. Direct Vent - Vertical

1. Outdoor models must be installed outdoors and must use the outdoor vent cap and air intake hood available from the manufacturer (sales order option D-11).
2. Periodically check venting system. The heater's venting areas must never be obstructed in any way and minimum clearances must be observed to prevent restriction of combustion and ventilation air. Keep area clear and free of combustible and flammable materials.
3. Do not locate adjacent to any window, door, walkway, or gravity air intake. The vent must be located a minimum of 4 ft. (1.2 m) horizontally from such areas.
4. Install above grade level and above normal snow levels.
5. Vent terminal must be at least 3 ft. (0.9 m) above any forced air inlet located within 10 ft. (3 m).
6. Adjacent brick or masonry surfaces must be protected with a rust-resistant sheet metal plate.

NOTE: The vent cap and air intake hood must be furnished by the heater manufacturer in accordance with its listing (sales order option D-11).

NOTE: Condensate can freeze on the vent cap. Frozen condensate on the vent cap can result in a blocked flue condition.

**Provided by
Raypak**

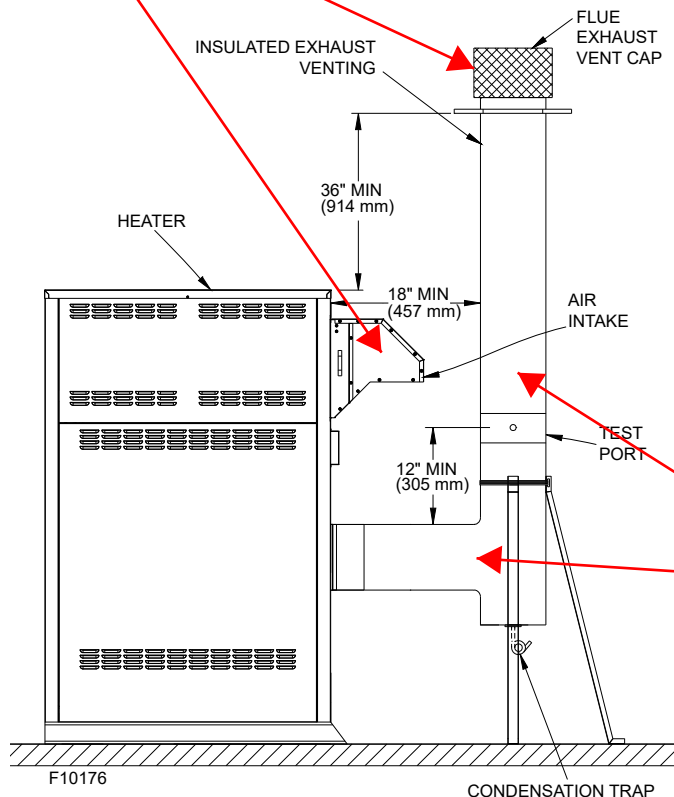


Figure 34. Outdoor Venting

Condensate Management

The condensate must be drained properly to protect the appliance. The condensate from the boiler vent system is acidic. Its pH is between 3.2 and 4.5. Raypak recommends treating the condensate with a condensate treatment kit (sales option Z-12).

The treatment kit is connected to the vent system drain to raise the pH level of the condensate. The kit may be added to avoid long-term damage to the drainage system and to meet local code requirements. The pH of the effluent entering a sanitary drain must be 5.0 or higher.

Vent pipe condensate drains are required for installation of the category IV MVB. Follow vent manufacturer instructions for location of condensate drains in the vent.

The treatment kit must be sized to handle the condensate generated by the appliance vent. The possible max volume of condensate produced is 1 GPH per 100,000 BTUH input. Design the drain system accordingly.

CAUTION: In general, the condensate piping from the vent system must have a downward slope of 1/4" per horizontal foot (21 mm per horizontal meter). Condensate drain traps must be primed with water to prevent flue gas leaks.

Treatment systems should be checked at least once per year, and the media should be replenished as necessary. Follow the manufacturer's instructions for the installation of the treatment kit and condensate drains.

Freeze Protection

To enable freeze protection, DIP switch position 7 (on the PIM) must be turned on (UP position). This is the default position.

If the water temperature drops below 45°F (7°C) on the Outlet or Inlet sensors, the Boiler pump is enabled. The pump is turned off when both the Inlet and Outlet temperatures rise above 50°F (10°C).

If either the Outlet or Inlet temperature drops below 38°F (3°C), the VERSA starts the burner at the minimum firing rate. The burner cycle will terminate when both the Inlet and Outlet temperatures rise above 42°F (6°C).

**Provided by
Duravent**

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