



INSTALLATION INSTRUCTIONS

MODEL DAS1-(BC) (5" TO 36")

1" air Double Wall for Special Gas Vent Category I, II, III, and IV Applications.

5" to 36" Diameter Vent for use on Positive, Neutral and Negative Pressures up to 35" W.C.



This installation manual will enable you to obtain a safe, efficient and dependable installation of this vent system. Please read and understand these instructions before beginning your installation.

Do not alter or modify the components of this chimney system under any circumstances. Any modification or alteration of the vent system or approved accessories, including but not limited to the appliance it is connected to, may void the warranty, listings and approvals of this system and could result in an unsafe and potentially dangerous installation.

- A. Examine all components for possible shipping damage prior to installation.
- B. Proper joint assembly is essential for a safe installation. Follow these instructions exactly as written: Check severeness of joints upon completion of assembly.
- C. This venting system must be free to expand and contract. This venting system must be supported in accordance with these instructions.
- D. Check for unrestricted vent movement through walls, ceilings, and roof penetrations.
- E. Different manufacturers have different joint systems and adhesives. Do not mix pipe, fittings, or joining methods from different manufacturers.

SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE



Intertek

Listed to standards:
UL-1738
ULC-S636 Type "BH" vent

Report #

⚠ WARNINGS

FAILURE TO FOLLOW THESE INSTALLATION INSTRUCTIONS COULD CAUSE FIRE, CARBON MONOXIDE POISONING, OR DEATH. IF YOU ARE UNSURE OF INSTALLATION REQUIREMENTS, CALL THE PHONE NUMBER LISTED ON THE BACK OF THESE INSTRUCTIONS.

A MAJOR CAUSE OF CHIMNEY RELATED FIRE IS FAILURE TO MAINTAIN REQUIRED CLEARANCES (AIR SPACES) TO COMBUSTIBLE MATERIALS. IT IS OF UTMOST IMPORTANCE THAT THIS VENT SYSTEM BE INSTALLED ONLY IN ACCORDANCE WITH THESE INSTRUCTIONS

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SECTION A: GENERAL INFORMATION FOR ALL MODEL DAS1-(BC)

INTRODUCTION

DAS1-(BC) double wall (5" TO 36") is a special stainless steel vent system for gas fired appliances listed as Category I, II, III, and IV in USA UL 1738 or in Canada as Type BH Gas Venting as noted in ULC-S636, with a maximum operating temperature of 480°F (250°C), and a maximum rated positive pressure of 35" water column. Must be installed by an experienced professional familiar with the operation and maintenance of heating appliances and venting. Before installing this product, examine all components for possible shipping damage and read the complete installation manual.

Failure to follow proper installation procedures, including vent pitch and improper appliance connections, may cause unsafe conditions. DuraVent recommends the system to be inspected once a year by a qualified service technician.

TESTING/LISTING INFORMATION

DuraVent Model DAS1-(BC) (5" TO 36") venting system is listed with Intertek Testing Services (ETL) to UL/ULC standards:

U.S.A.

- UL-1738
Special Gas Category I, II, III
and IV appliances

CANADA

- ULC-S636
Type BH Gas Vent Class I/II

This product must be installed in accordance with local building code requirements as well as national codes: USA - National Fuel Gas code AN-SI-Z223.1 or NFPA Standard 54, or NFPA 211. CANADA - CAN/CSA B-149.1 Natural Gas and Propane Installation code as applicable.

PART NUMBERS

These instructions identify major model DAS1-(BC) parts by name and part number.

Material Code Designations	
B	Type 316 Stainless Steel
C	Type 304 Stainless Steel
P	Type 439 Stainless Steel

Example:

DAS1 36" length with inside diameter 14" made of SS 316 inner flue and SS 304 outer casting.

DAS1	14	L36	BC
Model	Dia.	Part	Material

DAS1 30° elbow with inside diameter 22" made of 316L and SS 304 Outer Casing.

DAS1	22	E30	BC
Model	Dia.	Part	Material

DAS1 wall support for 8" diameter chimney made of stainless 439.

DAS1	8	WSHD	P
Model	Dia.	Part	Material

Use only factory-supplied components. Failure to do so will void the certification and the warranty of the chimney system.

EFFECTIVE LENGTH

DAS1-(BC) (5" to 36")

The effective length is the length of the part when it is assembled.

Example:

		Effective Length
L36	»	36-1/8"
L24	»	24-1/8"
L18	»	17-5/8"
L12	»	11-5/8"

CLEARANCES TO COMBUSTIBLES

Table 1 shows the required MINIMUM AIRSPACE CLEARANCE TO COMBUSTIBLES. "Combustibles" include framing lumber, drywall, plywood, paneling, insulation, wiring, and other building materials.

Minimum Clearance to Combustibles Double Wall DAS1-(BC)						
Diameter	Rated Operating Temp	Max Operating Temp	Enclosed (4 sides)		Unenclosed (2 sides max.)	
			Horiz.	Vert.	Horiz.	Vert.
5" to 36"	480°F (250°C)	550°F (288°C)	N/A	2"	6"	2"

Table 1 - Minimum Clearances to Combustible for DAS1-(BC)

Auxiliary parts such as combination Roof Supports, Roof Thimble, Flashings, and Wall Thimble outer shields are intended to be attached directly to the framing or to ceilings, floors, or walls in accordance with their respective instructions. These parts, which are installed in contact with wood or other combustibles, are designed and tested to assure that they do not overheat at points of contact.

NOTES:

1. Unenclosed requires at least two sides open.
2. Reduced clearances may be attained by using non-combustible enclosures.
3. Combustible material is any material made of or surfaced with wood, compressed paper, plant fibers, or other materials that are capable of being ignited or burned. Such material shall be considered combustible even though it is flame-proofed, fire-retardant treated, or plastered. (Source: NFPA 54/ANSI Z223.1)
4. Design any enclosure to permit inspection of the system.
5. Do not place insulation in any required clearance spaces surrounding the vent system unless these instructions suggest otherwise and the insulation is specified or supplied.
6. When using Viton caulking, follow the manufactures required drying times.

GENERAL INSTALLATION REQUIREMENTS

When venting Category I, II, III, or IV appliances or DAS1-(BC) must be used for the entire length of the system. Do not mix pipe, fittings, or joining methods from different manufacturers. **See the catalog for a complete list of parts and products.** Every vent system must be planned and installed for optimum performance and safety. The venting system must be free to expand and contract and must be supported in accordance with these instructions (Check for unrestricted vent movement through walls, ceilings, and roof penetrations). Refer to the gas appliance manufacturer's instructions to determine venting requirements and limitations with respect to installation and use of the appliance. **It is the responsibility of the installer to contact local building and fire officials concerning any installation restrictions and/or inspection requirements that may apply.** Permits may be required before starting an installation.

- If required by the appliance manufacturer, a Drain Tee Cap must be located as close as possible to the appliance flue outlet. Depending on the arrangement of the vent, **more than one drain may be required.** Unless a Drain Tee Cap is supplied with the appliance, install a DAS1-(BC) Drain Tee Cap.
- More than one Category II, III, IV appliance may not be connected into the same vent system, unless the appliance manufacturer specifically approved such a system and the appliance are designed for multiple venting. Cat. II, III or IV appliances MAY NOT be common vented with Cat. I, natural draft appliances. This limitation can be removed if an engineering analysis demonstrates normal and safe operation of appliances.
- DAS1-(BC) must not come in contact with plumbing or electrical systems.
- Maintain rated clearances to combustibles over the entire length of the vent system.
- DAS1-(BC) shall not be routed into, through, or within any vent, such as an existing masonry or factory-built chimney, that is connected to another appliance.

CHIMNEY WEIGHT

Chimney weight is given in pounds per foot for each diameter. It is important to know the weight of the chimney section for chimney support or guiding. Chimney weight (table 2) along with the maximum chimney height (table 3) is necessary to calculate the proper anchor strength needed with supports.

CHIMNEY WEIGHT IN LB/FT	
INSIDE DIAMETER (in)	DAS1-(BC)
5	3.5
6	4.1
7	4.8
8	5.5
9	6.2
10	6.9
11	7.6
12	8.3
13	9.0
14	9.7
16	11.0
18	12.4
20	13.8
22	15.2
24	16.6
26	17.9
28	19.3
30	20.7
32	22.1
34	23.5
36	24.8

Table 2 - Chimney weight for DAS1-(BC)

Example: Model DAS1-(BC) 6" diameter section of 25 feet in length, weight in lb/ft = 4.1. Total length 4.1 x 25 = 102.5 lbs.

GENERAL INFORMATIONS FOR SUPPORTS AND GUIDES

1. Several support and guiding methods are used to anchor a chimney against upward, downward and angular placement.
2. These supports and guides prevent bending stresses on the chimney elbows and joints.
3. Certain limitations apply for proper installation of supports and guides. For supports, see Table 3, and for Distance between Guides/supports, see Table 4.
4. For Typical installation, see Figure 5.

MAXIMUM HEIGHT LIMITS FOR EACH TYPE OF SUPPORT FOR MODEL DAS1-(BC)		
Parts	Flue Diameter Ø (in)	Height (ft)
Anchor Plate (AP) (For non-combustible application only)	Ø5 to Ø22	133
	Ø24 to Ø36	82
Anchor Plate with Length (APL) (For non-combustible application only)	Ø5 to Ø22	142
	Ø24 to Ø36	87
Anchor Plate Ventilated (APV)	Ø5 to Ø22	133
	Ø24 to Ø36	82
Anchor plate with length (APVL)	Ø5 to Ø22	142
	Ø24 to Ø36	87
Base supported Tee (T90 or T45)	Ø5 to Ø22	52
	Ø24 to Ø36	32
Wall Support Heavy Duty (WSHD)	Ø5 to Ø22	53
	Ø24 to Ø36	32

Table 3 : Maximum Height Limits for each Type of Support for DAS1-(BC)

GUYING AND BRACING

1. Proper guying and bracing is essential for part of the vent that extends above the roof or parapet wall. The vent at this point is subject to wind conditions and needs special attention for proper stabilization. See Figure 6.
2. If the vent above the roof does not exceed dimension H, no special guying or bracing is required. However, to protect the flashing from lateral movement, a guide must be installed at the roof level. See Figure 6.
3. For vent height above the roof that needs guying or bracing, a support, a small length and a expansion length must be installed near the roof level to absorb the thermal expansion and minimize this effect on the guy wire or brace.
4. When using guy wire, the cable must be slightly slack or loose to allow thermal expansion.
5. When using rigid bracing, the maximum vertical height between supports must be reduced to 5' to compensate thermal expansion.

SUPPORT AND GUIDE SPACING FOR MODEL DAS1-(BC)						
Inside diameter (in)	MVS		MHS (ft)	MDE (ft)	H (ft)	S (ft)
	Interior (ft.)	Exterior (ft)				
5	10	8	12	12	10	50
6	10	8	12	12	10	50
7	10	8	12	12	10	50
8	10	8	12	12	10	50
9	10	8	12	12	10	50
10	10	8	12	12	10	50
11	10	8	12	12	10	50
12	10	8	12	12	10	50
13	10	8	12	12	10	50
14	10	8	12	12	10	50
16	10	8	12	12	10	50
18	10	8	12	12	10	50
20	10	8	12	12	10	50
22	10	8	12	12	10	50
24	10	8	12	12	10	50
26	20	20	15	15	13	50
28	20	20	15	15	13' 6"	50
30	20	20	15	15	13' 9"	50
32	20	20	15	15	14' 3"	50
34	20	20	15	15	14' 6"	50
36	20	20	15	15	15	50

Table 4: Support and Guide Spacing for Model DAS1-(BC).

- MVS : Maximum Vertical Spacing between Guides/Supports
MHS: Maximum Horizontal Spacing between Guides/Supports
MDE: Maximum Distance between Elbows
H: Maximum Freestanding Height above the Roof
S: Maximum Suspended Length

HORIZONTAL INSTALLATION REQUIREMENTS

- When venting through a sidewall, terminate the system not less than 12" (.3m) above the ground and above the snow line in geographical areas where snow accumulates. The termination area must be kept clear of snow and ice at all times. See Figure 1.
- Terminate the system at least 7' (2.1m) above a public walkway or driveway, no less than 6' (1.8m) from the combustion air intake of any appliance or 3' (.9m) from any other building opening, gas utility meter, service regulator or the like. Less distance is permitted if specified in the appliance's installation instructions. It also shall terminate at least 3' (.9m) above any forced air inlet within 10' (3.1m) and shall terminate at least 4' (1.2m) below, 4' horizontally from, or 1' (.3m) above any door, window, or gravity air inlet into any building as provided in the National Fuel Gas Code ANSI Z223.1 and NFPA 54. See Figure 1. Proper judgment may require greater distances depending on the side of the equipment installed or to allow for snow drifting or falling from overhead roofs or trees. The termination should be far enough away from trees, shrubs, or decorative items to prevent damage.
- The total horizontal vent length from the appliance flue collar to the outside termination shall be in accordance with the appliance manufacturer's instructions.

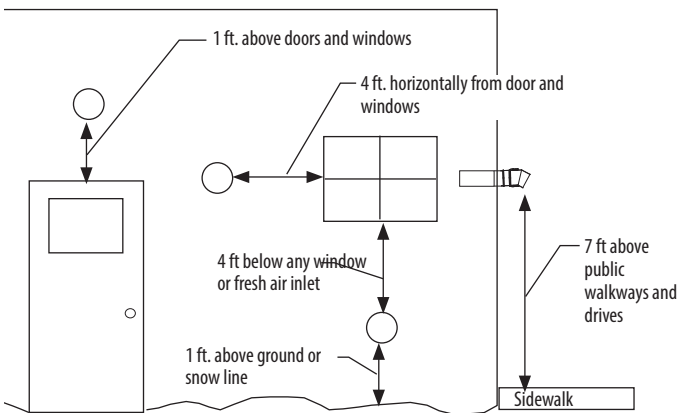


Figure 1 - Horizontal Termination Requirements

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. See Figure 2. 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 DAS1-(BC) terminations.

Except;

- a) Category I appliances (natural draft) must use a Rain Cap. It is optional on Category II. This limitation can be removed if an engineering analysis demonstrates normal and safe operation of appliance.
 - b) Vent systems without provisions for draining rain water must use a Rain Cap.
 - c) Terminations or approved mechanical vent devices specified or provided by the appliance manufacturer are permitted.
4. The total continuous distance of the vent system from the appliance flue collar to the termination shall not exceed that specified in the appliance manufacturer's installation instructions. When venting natural draft appliances the termination must be at least 5 feet above the topmost draft hood. Otherwise a listed mechanical draft inducing device is required. This limitation can be removed if an engineering analysis demonstrates normal and safe operation of appliance.
 5. In cold climates do not install a condensate drain on the exterior of the building. Doing so may result in dangerous icy conditions on surfaces near the drain and may cause damage to the vent system and/or the building exterior. DuraVent will NOT be held liable for any personal injury or property damage due to any formation of ice.
 6. Vertical supports are required after every transition to vertical. Vertical supports are also required after every offset elbow.
 7. Unless DAS1-(BC) is installed in a fire rated shaft, a roof thimble and support is required when penetration fire rated floors, walls or ceilings.

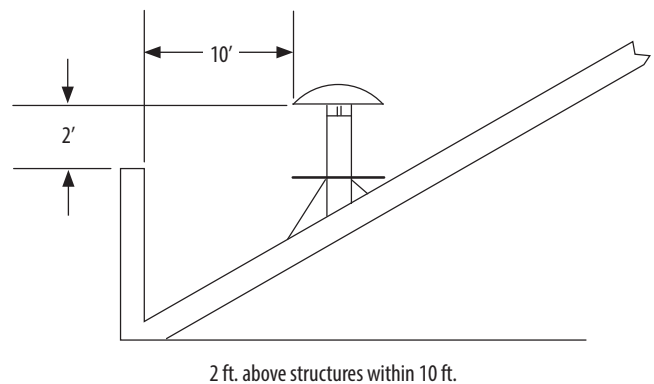


Figure 2- Vertical Installation Requirements

ROOF / FLOOR PENETRATION

1. A roof thimble (RT) or roof thimble insulated (RTI) for cold climate must be installed every time the vent system passes through a floor or roof.
2. Prepare the roof / floor by cutting a square opening. See Table 5.
3. Install the roof thimble. You may cut the radiation sleeve if it is too long. See Figure 3.
4. For roof installation, install a flashing.

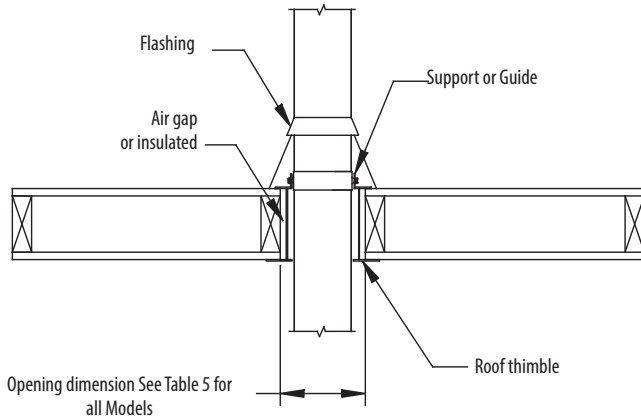


Figure 3 - Roof penetration

MAINTAIN PROPER SLOPE

- Install with a continuous 1/4" per foot (minimum) slope, as is required by the National Fuel Gas Code for all gas-fired appliances.
- Vent systems for condensing appliances must have a continuous 1/4" per foot (minimum) slope toward the appliance or a condensate drain. Always check the appliance manufacturer's instructions for proper drain requirements.
- DAS1-(BC) offers a range of tees and elbows that are built incorporating a 2 degree slope, we recommend that you use these to generate your slope.
- Some appliances require the venting system to be sloped toward the horizontal termination.
- Remember, if you raise the appliance or lower the ceiling you must adjust the slope of the vent to maintain the 1/4" per foot minimum. See Figure 5 & 26.

WALL PENETRATION

1. Prior to installation, determine proper location of wall thimble (WT) or wall thimble insulated (WTI) so that a minimum slope of 1/4" (6mm) per foot is maintained in the horizontal section of vent to ensure proper flow of condensation.
2. Prepare the wall by cutting a square opening. See Table 5 for opening for all Models.
3. Install the wall thimble by inserting the larger of the two parts on the appliance (interior side). See Figure 4.
4. Next, apply a bead of sealant around the edges of the exterior (smaller of the two parts) wall thimble component. Then install this part of the wall thimble by inserting the smaller collar into the other component from the previous step.

NOTE: The two horizontal cylinders of the thimble must engage a minimum of two inches.

5. Fasten both sides of the wall thimble using screws or nails.
6. Once the thimble is installed, vent pipe can be inserted into the thimble.
7. Close the gap between the thimble and the vent by installing the two half plate and fasten it using screws or nails.
8. Install horizontal termination to complete the assembly.
9. Once assembly is completed, apply a bead of high-temp sealant around the pipe and the exterior two half plates of the thimble to protect against weather.
10. The air gap is filled with insulation when using the insulated wall thimble (WTI).

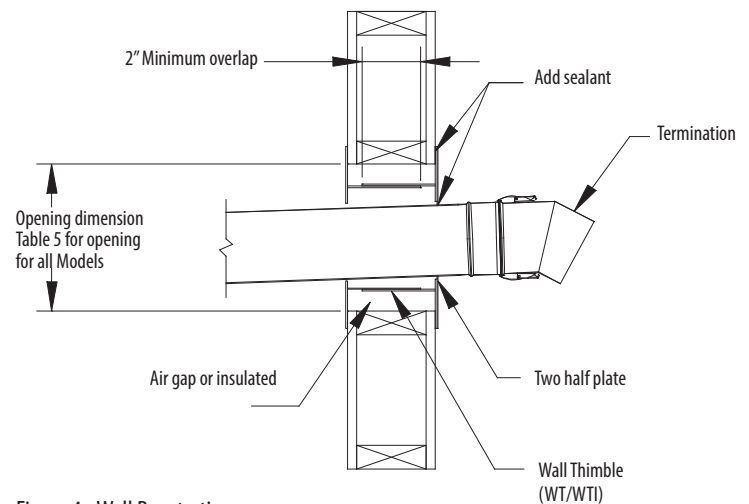


Figure 4 - Wall Penetration

OPENING DIMENSIONS FOR WALL/ROOF PENETRATION FOR MODEL DAS1-(BC)				
Inside Diameter (in)	Wall Thimble (WT)	Wall Thimble Insulated (WTI)	Roof Thimble (RT)	Roof Thimble Insulated (RTI)
5	19 x 19	19 x 19	11 x 11	11 x 11
6	20 x 20	20 x 20	12 x 12	12 x 12
7	21 x 21	21 x 21	13 x 13	13 x 13
8	22 x 22	22 x 22	14 x 14	14 x 14
9	23 x 23	23 x 23	15 x 15	15 x 15
10	24 x 24	24 x 24	16 x 16	16 x 16
11	25 x 25	25 x 25	17 x 17	17 x 17
12	26 x 26	26 x 26	18 x 18	18 x 18
13	27 x 27	27 x 27	19 x 19	19 x 19
14	28 x 28	28 x 28	20 x 20	20 x 20
16	30 x 30	30 x 30	22 x 22	22 x 22
18	32 x 32	32 x 32	24 x 24	24 x 24
20	34 x 34	34 x 34	26 x 26	26 x 26
22	36 x 36	36 x 36	28 x 28	28 x 28
24	38 x 38	38 x 38	30 x 30	30 x 30
26	40 x 40	40 x 40	32 x 32	32 x 32
28	42 x 42	42 x 42	34 x 34	34 x 34
30	44 x 44	44 x 44	36 x 36	36 x 36
32	46 x 46	46 x 46	38 x 38	38 x 38
34	48 x 48	48 x 48	40 x 40	40 x 40
36	50 x 50	50 x 50	42 x 42	42 x 42

Table 5: Opening Dimensions for Model DAS1-(BC).
Dimensions are in inches.

CONDENSATE DRAINS

When an internal condensate drain is NOT part of the appliance:

1. A Drain length (DL) or a Tee with a drain tee cap (DTC) is strongly recommended. Install this drain as close as possible to the appliance flue collar.
2. A condensate drain is required for every 30 feet of horizontal vent and at the bottom of a vertical stack.
3. Use the Drain length for a straight horizontal run. Rotate the fitting so that the drain tube is as vertical as possible.
4. Use a Tee at a transition from horizontal to vertical, and attach the Drain Tee Cap to the appropriate branch of the tee.
5. A condensate drain tube kit is available to direct the condensate to an appropriate location. A trap loop must be formed into the drain hose and must be a diameter that is at least four times the appliance's rated stack pressure in inches of water column or minimum 3 inches. Secure the loop with a cable tie.
6. Flue gas condensate can have a low (3 to 5) PH level, follow all local and national codes and regulations for the draining of acidic condensate.
7. In cold climate, do not install a condensate drain on the exterior of the building. Doing so may result in dangerous icy conditions on surfaces near the drain and may cause damage to the vent system and the building exterior. DuraVent will NOT be held liable for any injury or property damage due to formation of ice.

SECTION B

SPECIFIC INFORMATION MODEL DAS1-(BC) (5" TO 36")

TYPICAL INSTALLATION FOR DAS1-(BC)

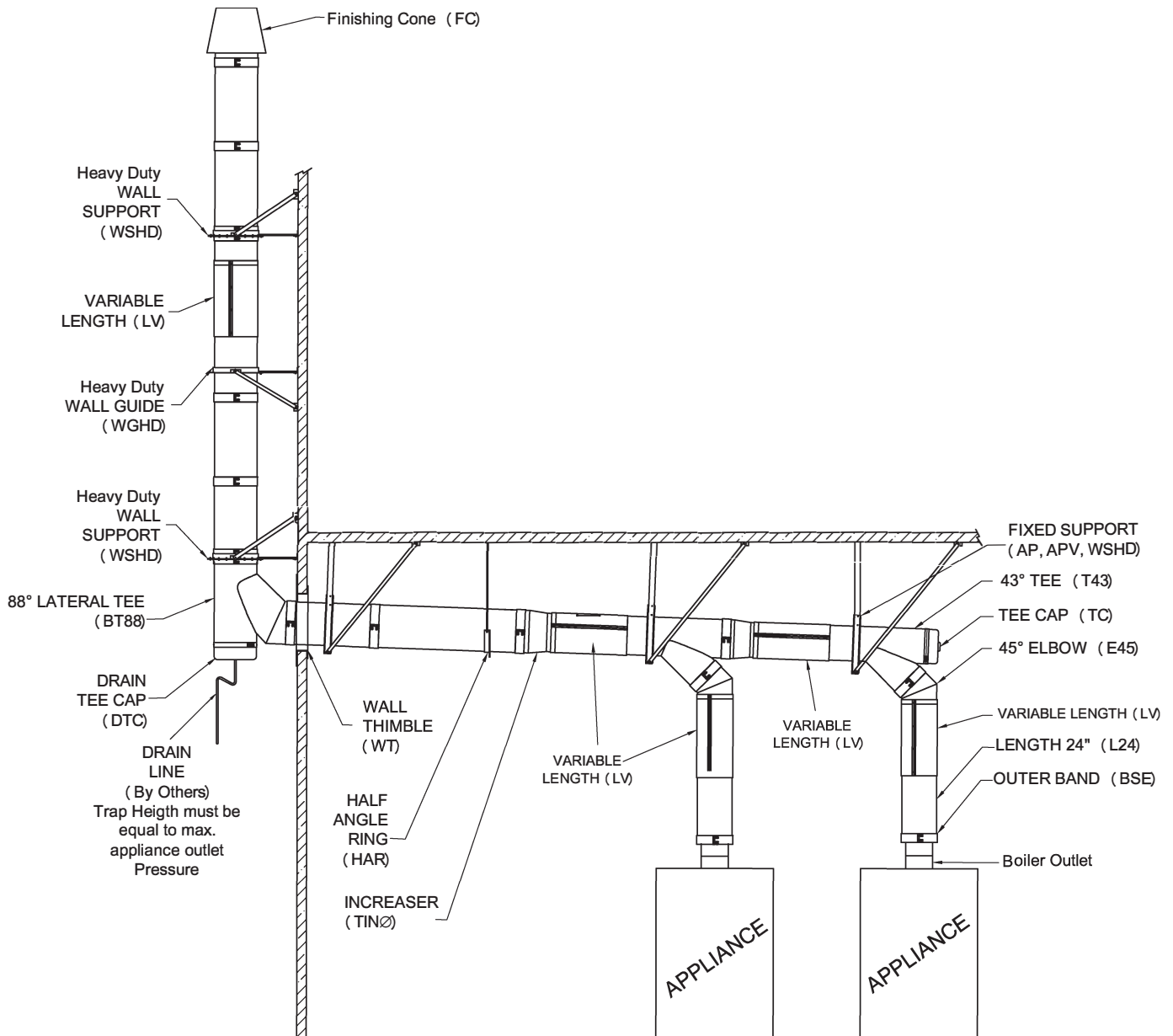


Figure 5- Typical installation for DAS1-(BC)

TYPICAL INSTALLATION FOR DAS1-(BC) (5" TO 36")

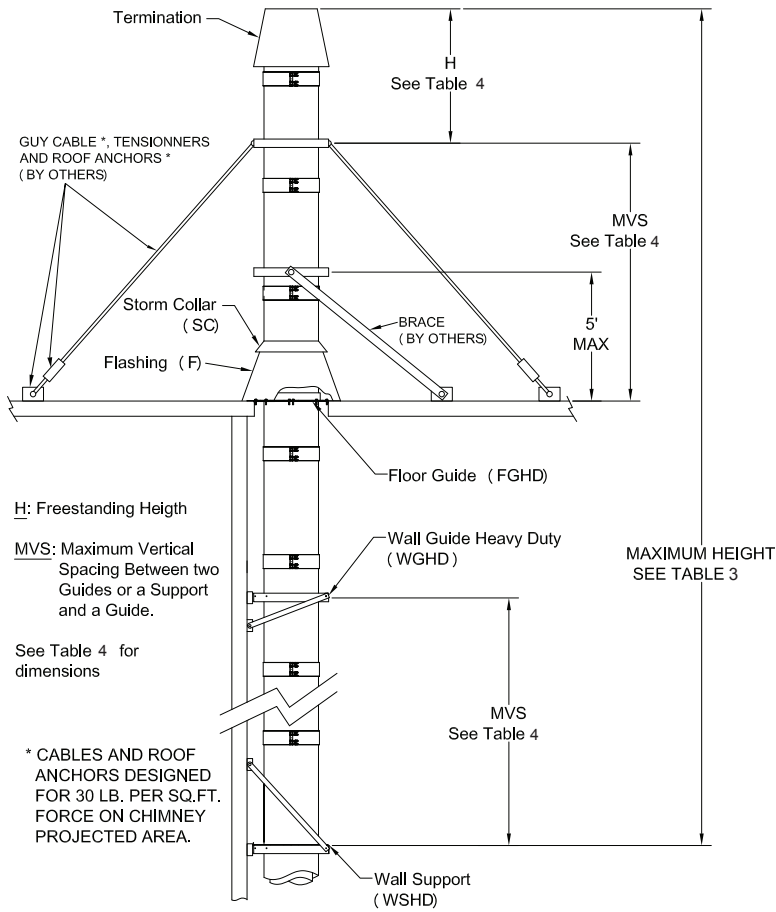


Figure 6 - Height with rigid bracing or guying option for DAS1-(BC)

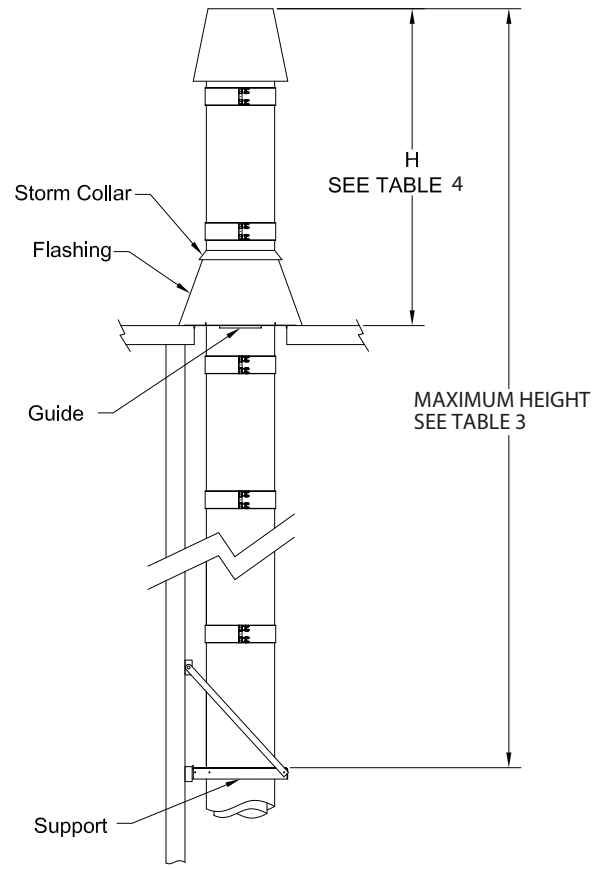


Figure 7- Maximum freestanding Height for DAS1-(BC)

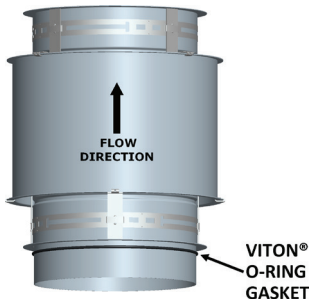
• If Dimension "H" exceeds the value in the Table 7 & 8, use bracing or cable guying to stabilize chimney section above the roof. See Figure 6

JOINT ASSEMBLY

All components have a male and female end: the male end has a Centering Flue Extension and a black Viton® O-ring on it (bottom side).

CAUTION: Each section must have on its male end. If not, it may impair the sealing effectiveness. For any VERTICAL installation (except for Variable Length (LV), no need for caulking when using the O-ring. For any HORIZONTAL installation, add a bead of Viton® caulking over the Viton O-ring to properly caulk.

NOTE: Diameter of the DAS1-(BC) shown in pictures for the installation assembly are smaller than reality.



Joint Assembly Step 1

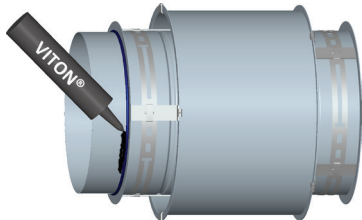
STEP 1:

Before installation, make sure there is a black Viton® O-ring on the Centering Flue Extension.

STEP 2 (for HORIZONTAL installation only):

Only on Horizontal installation, add a bead of black Viton® caulking over the Viton® O-ring.

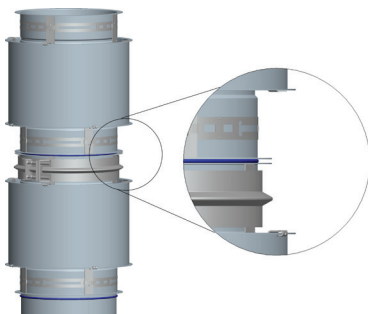
NOTE: Sealant Caulking is supplied by DuraVent and Individual tubes are marked Fluorodyn Caulk VITON®. Codes are **VITON-S** for a tube of 2.5 oz. or **VITON-L** for a tube of 11 oz. It must be ordered separately. See Table 6 for number of tubes per joint.



Joint Assembly Step 2

STEP 3:

For an easier installation, place the Inner V-Band (BSIK) on the spacers below the flange of the first section. Join the two flanged ends of the duct section together until it squeeze the Viton O-ring between both flanges.



Joint Assembly Step 3

STEP 4:

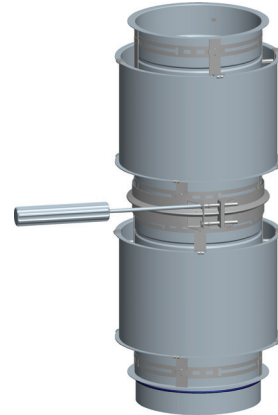
Install the V-Band around the flanges making sure the flanges are located within the V-Clamp.

NOTE: Do not locate V-Band hardware at the bottom side of horizontal duct joints.

STEP 5:

Tighten the screws of the band.

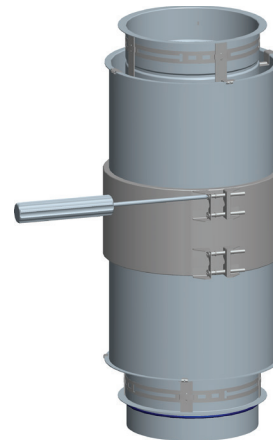
NOTE: Light tapping with a hammer all around the band while tightening bolts helps align and pull flanges together.



Joint Assembly Step 4-5

STEP 6

Secure the Outer Casing with the Outer Band (BSE) and tighten the screws.



Joint Assembly Step 6

EXPECTED NUMBER OF TUBES (11 oz) PER JOINT ASSEMBLY (FOR S-2100, S-650, S-375 OR VITON) for DAS1-(BC)	
Inner Duct Diameter (in)	Number of Tubes Per Joint Assembly
5 to 10	1/5
11 to 16	1/4
18 to 22	1/3
24 to 28	1/2
20 to 36	3/4

TABLE 6 - Expected number of tubes (11 oz) of Viton® or S-650 per Joint Assembly (depending of application) or S-375 for exterior weathering.

STRAIGHT SECTIONS

VERTICAL DRAIN LENGTH (DL)

A Drain Section is used to drain water on vertical installation. It is a special variation of an 18" pipe length with provision to drain rain or condensate from the chimney. The pipe flue is equipped with an annular gutter wall and a 1" (25) NPT nipple extending through the casing for attachment of drain piping. See Figure 8 for details. The drain piping should include a water leg of a height at least equal to the maximum expected operating pressure at the appliance outlet to avoid allowing flue gases to vent through the drain. Drain Length should be installed indoors to prevent freezing.

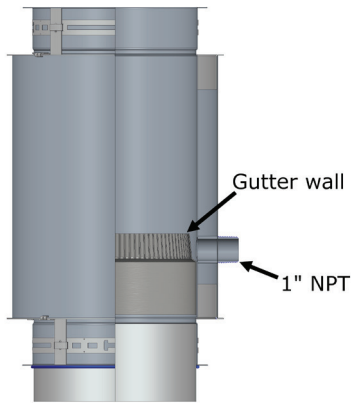


Figure 8- Vertical Drain Length

HORIZONTAL DRAIN LENGTH (HDL)

1. Horizontal Drain length is equipped with a 1" (25) NPT nipple, which is attached to the inner flue and extends through the outer casing to provide a path to drain, condensate or water from the chimney. See Figure 9.

2. A dam is attached to the inside of the inner flue adjacent to the nipple to channel the effluent to the drain.

3. The duct drain is intended for use at the end of a horizontal run where access and drainage is needed (see Figure 9).

4. The drain coupling must be connected to a "P" trap or approved container (supplied by others).

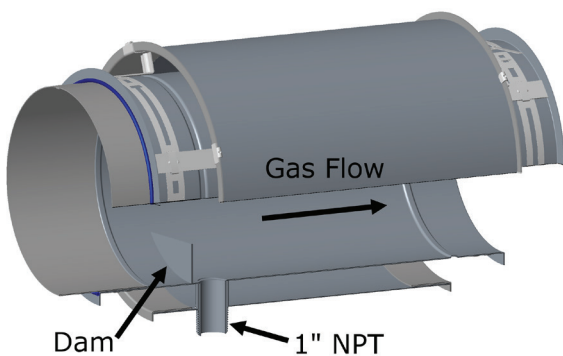


Figure 9- Horizontal Drain Length

VARIABLE LENGTH (LV)

The Variable Length (LV) has one major function. It makes up odd lengths of duct. It must not be used for expansion compensation.

It is shipped with a flanged retaining band assembly on the inner sliding wall. See Figure 10.

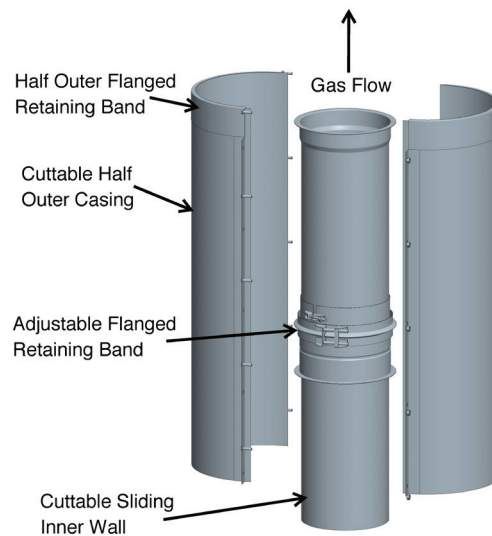


Figure 10- Variable Length (LV)

The whole LV assembly includes:

- A sliding inner wall that fit closely inside a standard pipe section and it is flanged on one side.
- An adjustable flanged retaining band, composed of:
 - Double flanged sleeve
 - Retaining flanged collar
 - An inner V-Band (BSI)
 - A different Inner Band (BS)
- Split outer casing with flanged half band on the top side only.

NOTE: Viton® caulking must be applied on each Variable Length (LV) and must be supplied by DuraVent. Sealant must be ordered separately (Not included in the LV assembly).

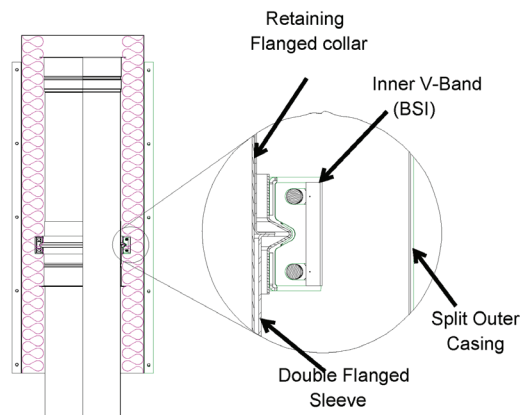


Figure 11- Detail of Variable Length

Flange to flange length adjustment can range from 7"x 281/2"

NOTE: If the flue is too long to fit into the adjacent section of duct without interfering with the flow path, it should be trimmed to desired flange to flange length plus an overlap of 4" with the inner wall of the inlet end duct section. The minimum overlap for the outer casing is 1" with the inlet end section outer wall. (See Figure 12 & 14).

NOTE: If an LV joint must be joined to one of these fittings, the unflanged end of the tube should always point downward or towards downward slope.

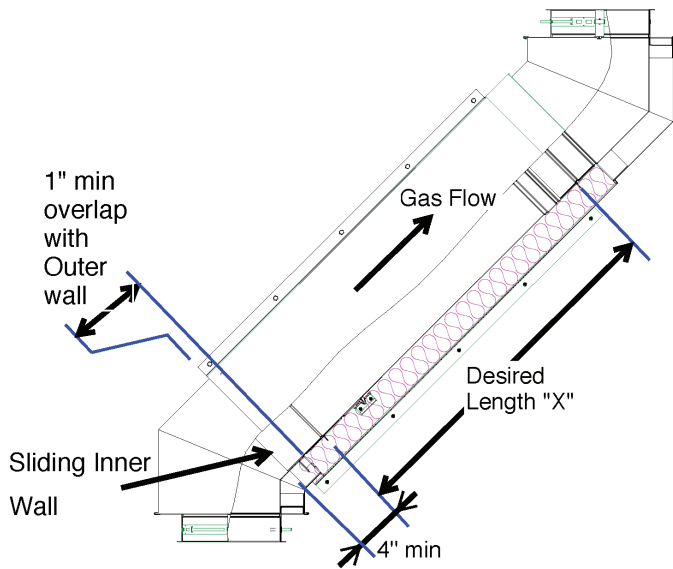


Figure 12 - Overlap Details for Variable Length

INSTALLATION STEPS FOR THE VARIABLE LENGTH (LV)

Step 1 - Measure the distance X required for the variable length. See Figure 13.

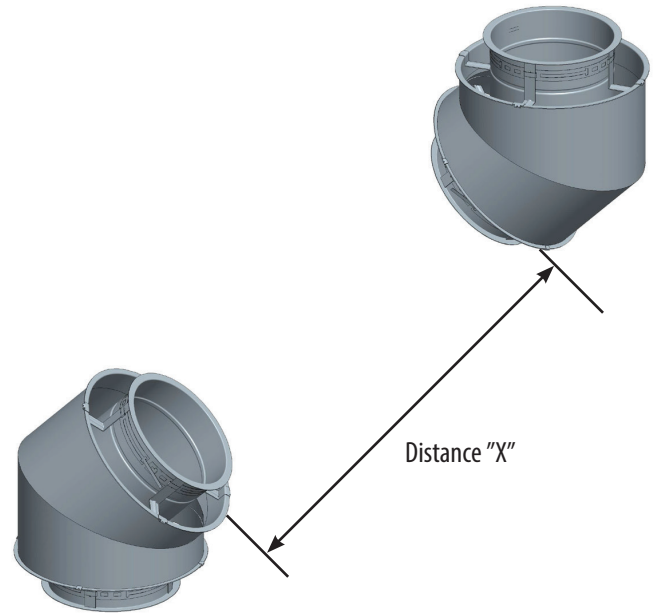


Figure 13 - Step 1 for Installation of Variable length

Step 2 - Cut the inner wall at the dimension X found at the first Step plus 4". See Figure 14.

Step 3 - Cut the split outer casing on the opposite side of the flanged half at dimension X plus 1". See Figure 15.

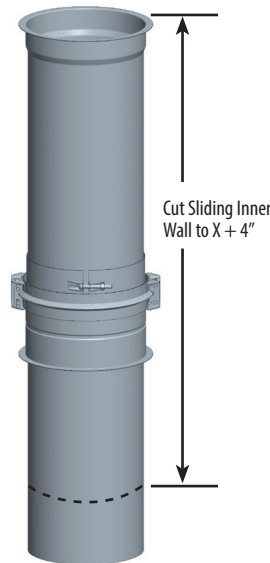


Figure 14 - Step 2 -
Cut of the Sliding Inner Wall

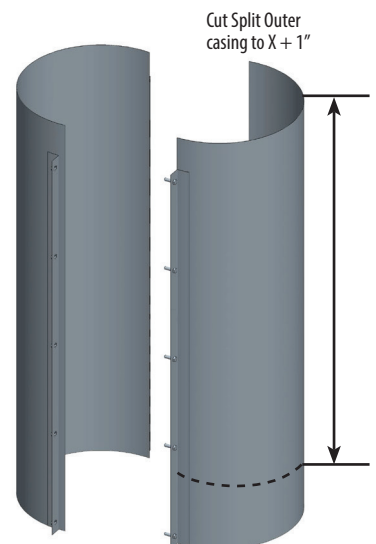


Figure 15 - Step 3 -
Cut of the Outer Casing

Step 4 - Install the interior assembly between the two parts. Place the adjustable flanged band assembly toward the downstream section.

Step 5 - Assemble the outlet end sliding innerwall to the outlet end section as a regular section (See JOINT ASSEMBLY section). See Figure 16.

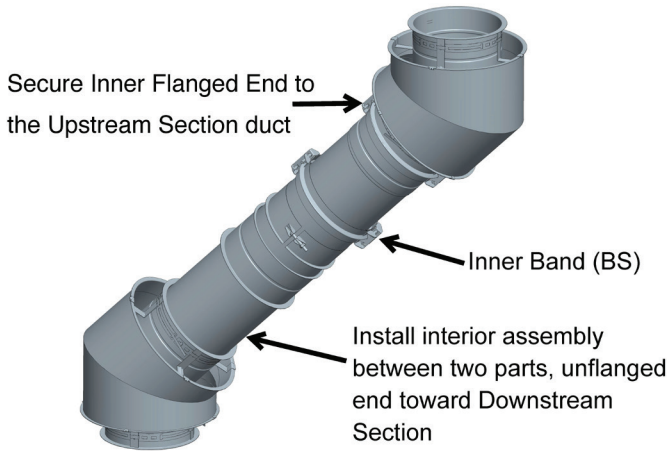


Figure 16 - Step 4-5- Install the inner LV and secure the outlet end flange

Step 6 - Before assembling the double flanged sleeve to the inlet end section, add a thin coat of sealant about 1" wide and a thin coat of sealant at the unflanged end of the LV joint when the joint slides into the mating duct section. Press sealant into any gap between the LV and the mating joint section.

Step 7 - Assemble the inlet end flange assembly with the inlet end section flange as a regular length installation (See JOINT ASSEMBLY section).

Step 8 - Apply thin layer of sealant inside the retaining collar, and also a continuous bead of sealant at the collar overlap seam. See Figure 17.

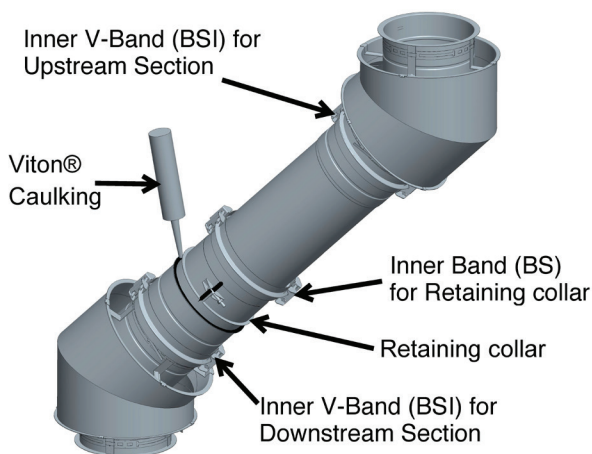


Figure 17- Step 7-9- Secure the Double Flanged Sleeve and seal the Retaining Flange Collar

Step 9 - Slide down the retaining band on the double flanged sleeve to mate their flanges and tighten the retaining collar.

Step 10 - Then install the other V-band (BSI) over these flanges (like regular joint assembly). See Figure 18.

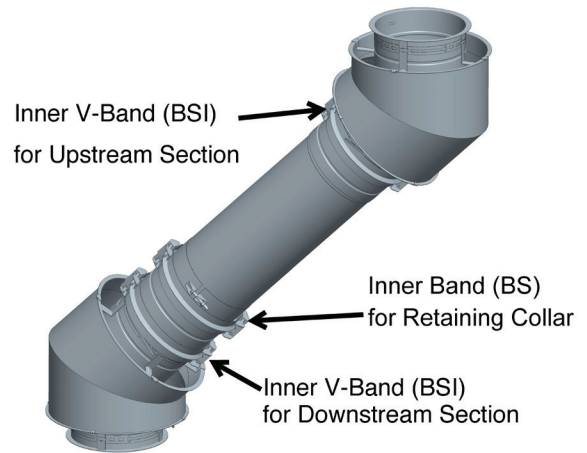


Figure 18 - Step 10-11 - Secure the Retaining Flanged Band

Step 11 - Install the split outer casing that covers from the outer wall of the inlet end section to the outer wall of the outlet end section. See Figure 19.

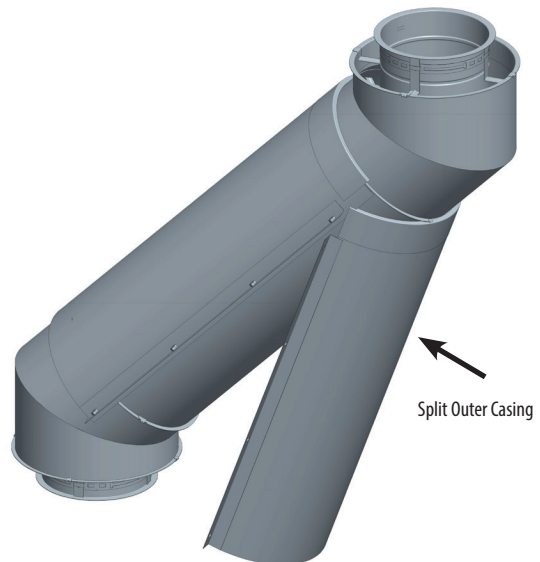


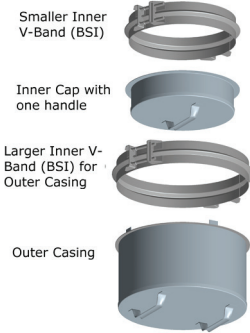
Figure 19 - Step 12- Install the Split Outer Casing

CAPS

TEE CAP (TC)

The Tee Cap provides access for cleaning and inspection. Usually on horizontal runs, the Tee Cap is used to close the unused port of any Tee and for clean out or access purposes only. When using clean-outs, always seal the connection to prevent leaks.

- The part list includes;
- 1x Cap with one Handle
 - 1x smaller V-Band (BSI)
 - 1x Outer Casing
 - 1x Larger V-Band (BSI)



INSTALLATION PROCEDURES

STEP 1- (only for horizontal installation): Add Viton® Caulking over the Viton O-ring Gasket. See Figure 20.

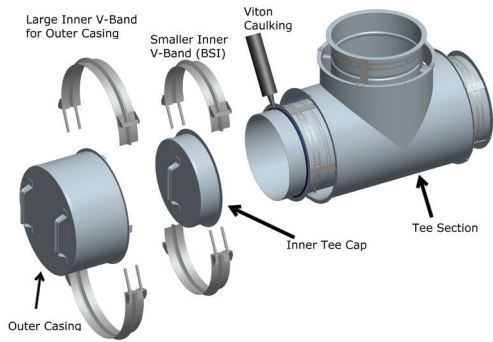


Figure 20: Step 1 (only for Horizontal installation) Installation of the TC
Step 2 -Use the inner V-Band (BSI) to secure the inner Cap Kit to the flange of the 90° Tee (T90, not included) as specified in the JOINT ASSEMBLY section.

NOTE: Be sure the handle of the Cap faces outward as shown. See Figure 20 or 21.

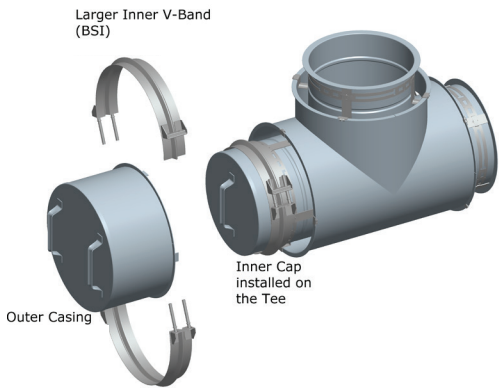


Figure 21: Step 2 for installation of the TC

Step 3 - Mate the flange of the outer casing with the flange of the out wall of the Tee section.

Step 4 - Secure with the bigger V-Band (BSI) by tightening the retaining screw. See Figure 22.

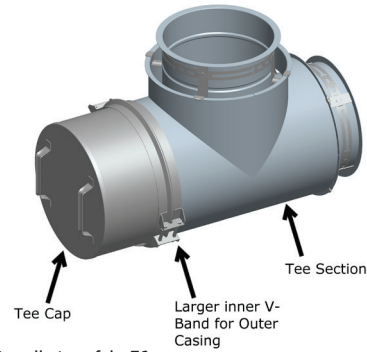


Figure 22: Step 3-4 for installation of the TC

DRAIN TEE CAP (DTC)

The Drain Tee Cap (DTC) is used as a drain for the base of vertical installations and must be connected to a suitable disposable point. It can also be used as an access for clean outs or access purposes. (See Figure 23) Same installation as a Tee Cap (TC).



Figure 23: Drain Tee Cap (DTC)

ELBOWS

ELBOWS (E2, E15, E30, E43, E45, E88, E90)

Elbows are used for changes in direction in horizontal or vertical portions of a system. All elbows feature the standard joint assembly as described in JOINT ASSEMBLY section. Elbows are used in combination to make different angles ranging from 2° to 90° in horizontal and vertical segments of the system.

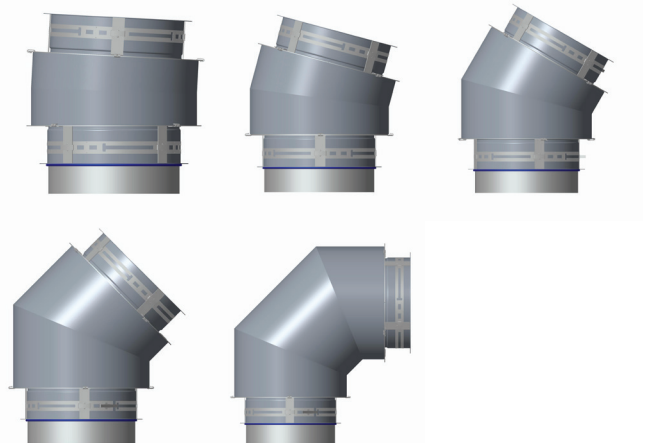


Figure 24: 3, 15, 30, 45 and 90° Elbow

Elbows are not designed to take bending loads and must be structurally supported. Structural parts such as posts or beams may also be needed to hold chimney supports in position. See ELBOW SUPPORT section.

OFFSETS

1. The length of the offset is determined by strength considerations. The maximum dimension between supports is given in Table 4, and is applicable to all horizontal and sloped orientations. See Figure 26.
2. The minimum offset is accomplished with two elbows directly connected to each other (see Figure 25 and Table 7).
3. With frequent re-support, there is no structural or operating limit to the length of horizontal or sloped portions, providing the system meets the capacity, pressure drop of available equipment.
4. The carrying capacity of supports and their structural attachments must take into account the weight of the offset plus whatever vertical section is carried by that support.
5. Height limits for supports are tabulated in Table 3.
6. The vertical sections above the offset must also be supported or anchored and guided where necessary.
7. Anchor Plate Wall Support (WSHD) and Wall Guide (WGHD) may be used in a variety of ways for offset support to achieve the structural stability of the system.
8. Re-supports must be securely anchored to walls, posts, or locally fabricated rigid framework. This framework must be designed to assure stability of supports, such as Ventilated anchor Plate (APV) supports and Heavy Duty Wall Supports (WSHD).
9. Supports suspended by threaded rods or from small size angles or straps are usually not satisfactory to resist bending moments due to offsets.

Figure 25: Minimum Offset for each Elbows

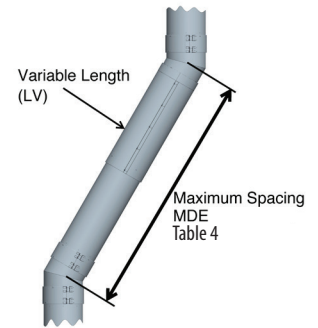
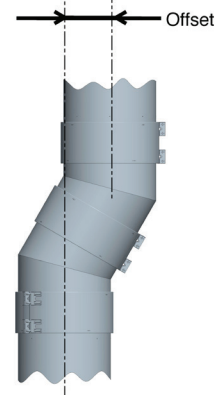


Figure 26: Maximum Spacing between supports for Offset

ADAPTERS

TAPERED INCREASER (TINØ)

The Tapered Increaser Adapter is used for a diameter change in duct system. Uses when there is a sufficient length for duct run available for the size change. The TINØ is used uses 2" of length per 1" increment diameter change. The TINØ is considered to have the same load strength as a straight duct. See Figure 27.

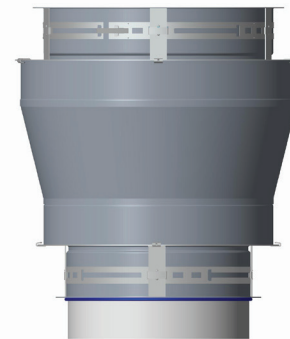


Figure 27: Tapered Increaser Adapter (TINØ)

ECCENTRIC TAPERED INCREASER (ETINØ)

The Eccentric Tapered Increaser Adapter is similar as the Tapered Increaser Adapter except the smaller diameter is offset from the larger diameter. When installed horizontally, the ETINØ keep a flat slope unlike the TINØ. See Figure 28.

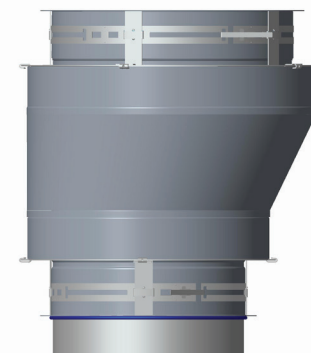


Figure 28: Eccentric Tapered Increaser (ETINØ)

MINIMUM ELBOW OFFSET FOR TWO (2) ELBOWS DAS1-(BC)

Flue Diameter Ø (in.)	2°	3°	15°	30°	45°	88°	90°
5	1/2	1/2	2 1/2	5 1/4	8 1/4	18 1/4	18 1/2
6	1/2	1/2	2 1/2	5 3/8	8 1/2	19 1/4	19 1/2
7	1/2	1/2	2 5/8	5 1/2	8 3/4	20 1/8	20 1/2
8	1/2	1/2	2 5/8	5 3/4	9 1/8	21 1/8	21 1/2
9	1/2	1/2	2 5/8	5 7/8	9 3/8	22 1/8	22 1/2
10	1/2	1/2	2 5/8	6	9 5/8	23	23 1/2
11	1/2	1/2	2 3/4	6 1/8	10	24	24 1/2
12	1/2	1/2	2 3/4	6 1/4	10 1/4	25	25 1/2
13	1/2	1/2	2 3/4	6 3/8	10 1/2	26	26 1/2
14	1/2	1/2	2 3/4	6 1/2	10 7/8	26 7/8	27 1/2
16	1/2	1/2	2 7/8	6 3/4	11 3/8	28 7/8	29 1/2
18	1/2	1/2	3	7	12	30 3/4	31 1/2
20	1/2	1/2	3	7 1/4	12 5/8	32 3/4	33 1/2
22	1/2	1/2	3 1/8	7 5/8	13 1/8	34 5/8	35 1/2
24	1/2	1/2	3 1/8	7 7/8	13 3/4	36 5/8	37 1/2
26	1/2	1/2	3 1/4	8 1/8	14 3/8	38 1/2	39 1/2
28	1/2	1/2	3 1/4	8 3/8	14 7/8	40 1/4	41 1/2
30	1/2	1/2	3 3/8	8 5/8	15 1/2	42 3/8	43 1/2
32	1/2	1/2	3 3/8	8 7/8	16 1/8	44 1/4	45 1/2
34	1/2	1/2	3 1/2	9 1/8	16 3/4	46 1/4	47 1/2
36	1/2	1/2	3 1/2	9 1/2	17 1/4	48 1/8	49 1/2

TABLE 7- Minimum Offset for Each Elbow for DAS1-(BC)

Dimensions are in inches

SUPPORTS

PLATE AND WALL SUPPORT

Ventilated Anchor Plate (APV)

Anchor Supports are designed to provide support to vertical sections and provide fixed-point support for horizontal sections. See Figure 29.

NOTE: Rings installed at 90° to plates.

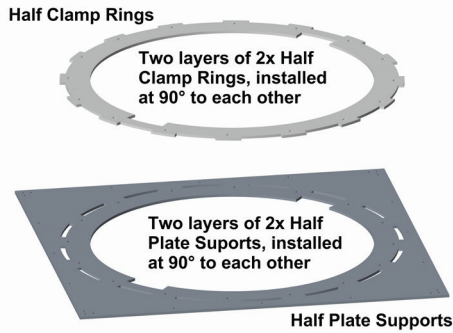


Figure 29: - Ventilated Anchor Plate for Combustible material

The Plate Support must be attached to the building structure or supported with rigid structural members. See Table 3 for maximum supported height.

For maximum support, the entire perimeter of the Plate Support must be attached to structural framing. Structural members are supplied by the installer. See Figure 30 and 31.

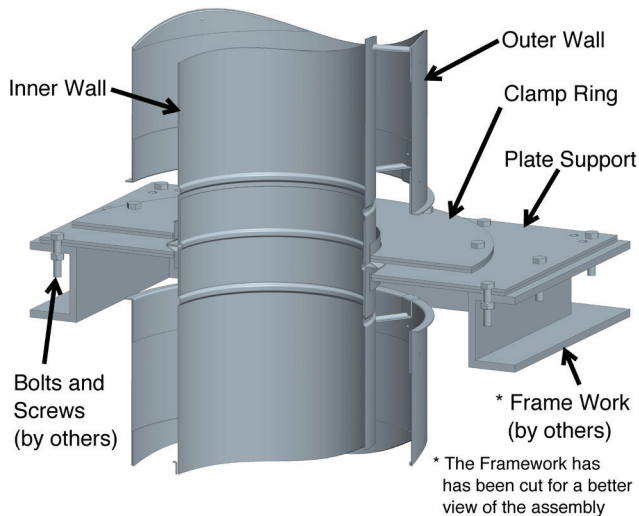


Figure 30: - Ventilated Anchor Plate on a Framework

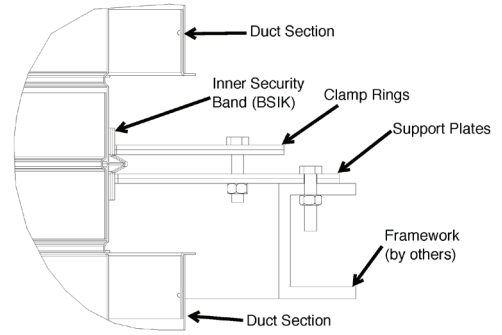


Figure 31: Detail of the Ventilated Anchor Plate on a Framework.

Supported duct sections in a vertical position must be braced with diagonal members or gussets to prevent deflection of the supported joint as shown in Figure 31. "X" is a minimum of 30°.

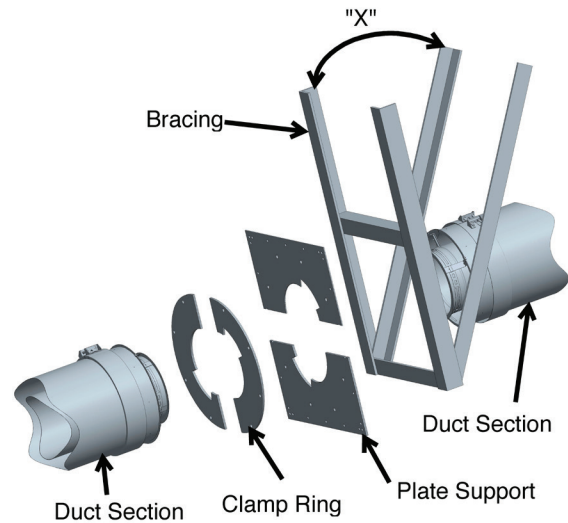


Figure 32: - Anchor Plate Horizontal Bracing

Plate Supports are usually located adjacent to fittings, such as tees or elbows, to protect fitting from expansion stresses. Table 8 shows Plate Support, bracing and framework requirements for duct size ranges.

NOTE: If bracing is used, minimum "X" angle is 30°. If there is no bracing, the framework must be attached to structural members to provide equivalent rigidity.

MINIMUM ACCEPTABLE SIZE FOR FRAMEWORK AND BRACING			
Duct Diameter Ø (in)	Plate thickness (in)	Bracing (in)	Framework (in)
5 to 24	3/16	2 x 2 x 3/16 Channel or Equivalent	2 x 2 x 1/4 Channel or Equivalent
26 to 36	1/4	3 x 3 x 1/4 Channel or Equivalent	3 x 3 x 1/4 Channel or Equivalent

TABLE 8 - Minimum Acceptable Size for Framework and Bracing for Model DAS1-(BC)

VENTILATED ANCHOR PLATE WITH LENGTH (APVL)

The APLV has a free anchor plate integrated on a length. It cannot be used has a fixed support for vertical or horizontal installation. Refer to the Ventilated Anchor Plate (APV) for all the warnings / details, except for the installation. See **Figure 33** for an **APLV**

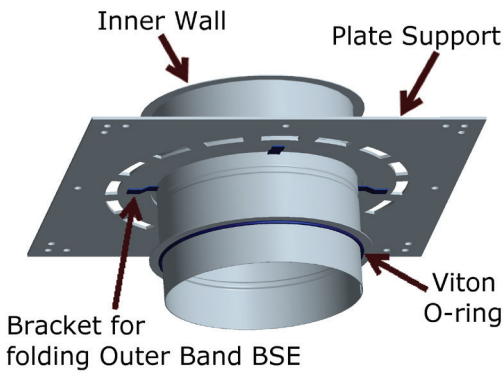


Figure 33: Ventilated Anchor Plate with Length (APVL)

It is assembled exactly like flange-to-flange assembly with the V-Band (BSI) (See JOINT ASSEMBLY Section).

The part doesn't have any outer wall, but Outer Band (BSE) is provided to secure the insulation on the part. See Figure 34, 35 & 36 for the three steps to install the DAS1-(BC).

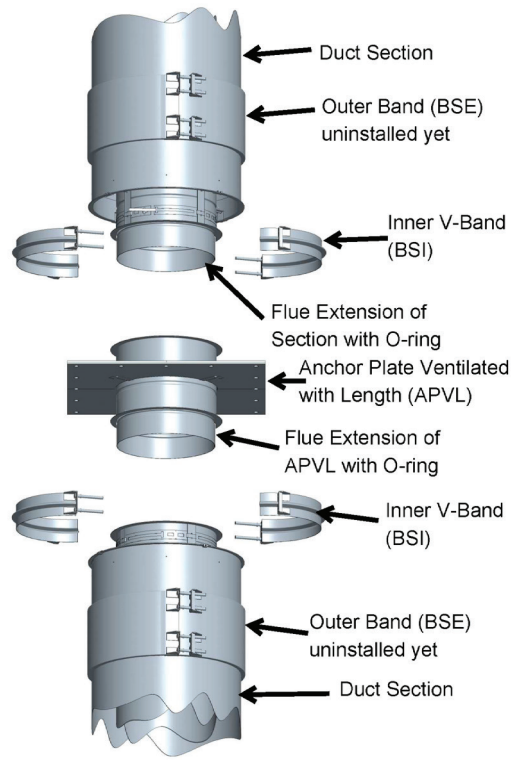


Figure 34: Step 1 of installation of APVL

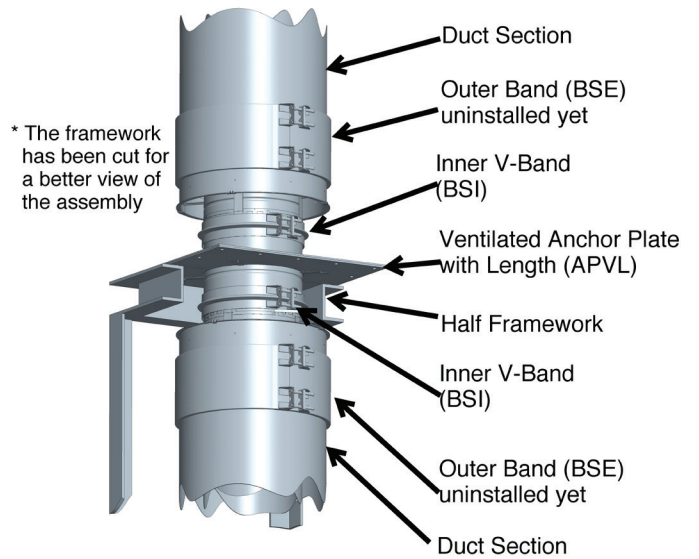


Figure 35: Step 2 of installation of APVL

For vertical installation, small brackets must be on the bottom side when the bottom Outer Band will be installed, these Brackets will hold the Casing Band (BSE) right to the support plates. See Figure 36.

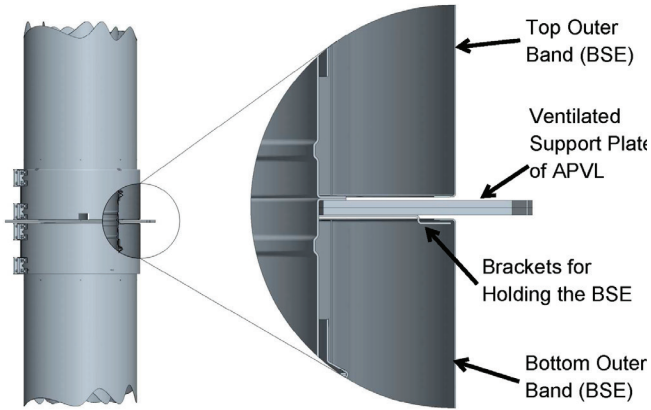


Figure 36: Step 3 of installation of APVL

HEAVY DUTY WALL SUPPORT (WSHD)

When attached to a non-combustible wall with brackets and struts, a Heavy Duty Wall Support makes up a fixed-point (See Figure 37). The clamp rings are installed with the splits 90° apart so that they support each other. The notches in the clamp rings are aligned with the draw screws of the flange band. The Heavy Duty Wall Support Assembly is bolted together with provided hardware. It is made with adjustable struts, which allows a variable clearance from the non-combustible wall to the chimney outer casing.

The minimum clearance varies with the size of the wall support, but is between 2 and 2 1/2" (based on the angle shape of the Full Angle Ring (FAR)). See Figure 38.

The maximum clearance for all sizes is around 10". See Figure 39

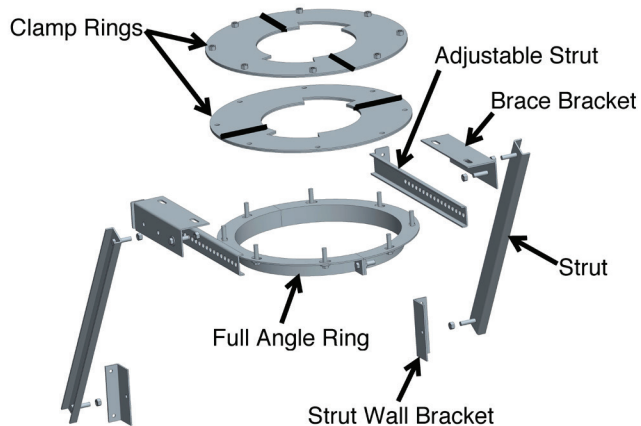


Figure 37: Wall Support (WSHD)

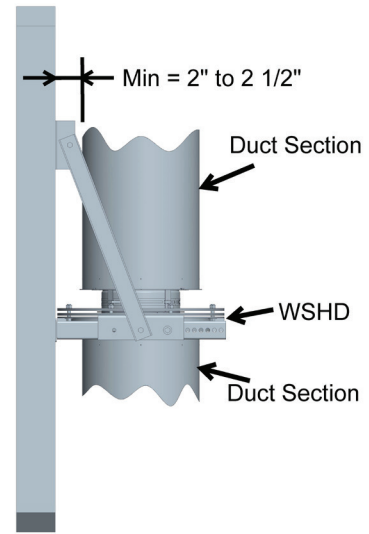


Figure 38: WSHD Minimum Adjustment

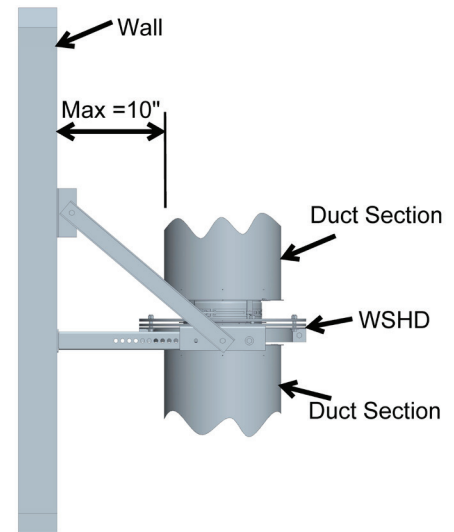


Figure 39: WSHD Maximum Adjustment

HEAVY DUTY WALL GUIDE (WGHD)

The Heavy Duty Wall Guide is designed to complement the Heavy Duty Wall Support (See Figure 40). It is used as a lateral guide to prevent the duct from flexing due to lateral loading. The proper location for a WGHD is immediately below the outer closure band near the duct joint. The Heavy Duty Wall Guide is bolted together with hardware provided to form a rigid assembly.

- NOTE:**
- Seal joint with S-375 sealant above and below support if exposed to weather.
 - Can be attached to combustible wall

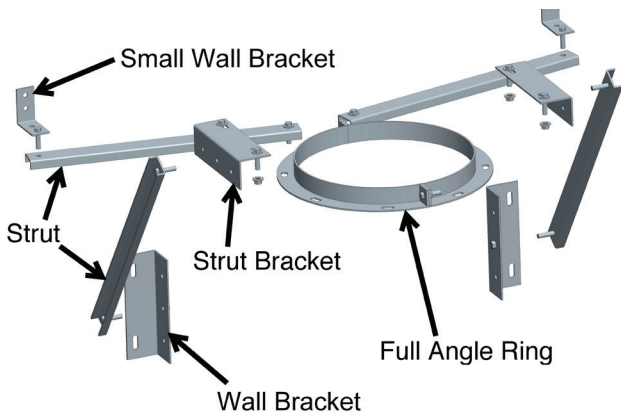


Figure 40: - Wall Guide Heavy Duty (WGHD)

FULL ANGLE RING (FAR)

A Full Angle Ring is used as a guide to prevent the duct from flexing due to lateral loading. The angle ring is split for ease of installation. It is 1/8" larger inside diameter than the outside diameter of the duct to allow movement of the duct inside the ring.



Figure 41: - Full Angle Ring (FAR)

HALF ANGLE RING (HAR)

A Half Angle Ring is used as a saddle in horizontal or sloped runs.



Figure 42: - Half Angle Ring (HAR)

LOCATION OF SUPPORTS

Supports can be used in different combinations to secure grease duct in place. See Figure 5, 6 and 7 for typical support and guide locations.

VARIABLE LENGTH SUPPORT

To prevent the LV from sagging, it is recommended that the duct section adjacent to a LV is supported or guided. See Figure 43 for typical support locations for Variable Length. When necessary, properly guide the Variable Length (LV) by installing a Heavy Duty Wall Guide (WGHD) or any support immediately on the next (upstream) section.

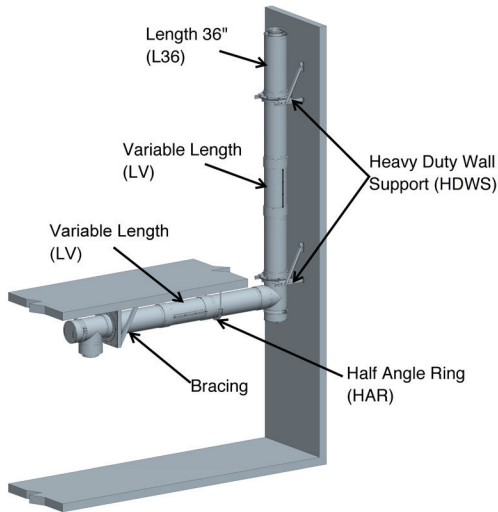


Figure 43: - Typical Installation locations for the Variable Lengths

NOTE: LV overlapping joints are not intended to support any weight in the vertical position. The inlet and outlet ends must each be supported.

TEE SUPPORT

The Tees must be supported properly to protect them from bending. It can be done by means of Anchor Plate (AP), Anchor Plate with Length (APL) or Heavy Duty Wall Support (WSHD)

When a tee is used at the base of the riser, the preferred location for support is above the Tee, thus suspending the Tee. See Figure 44.

A Heavy Duty Wall Support (WSHD), a Ventilated Anchor Plate (APV) or a Ventilated Anchor Plate with Length (APVL) can be used to support the TEE.

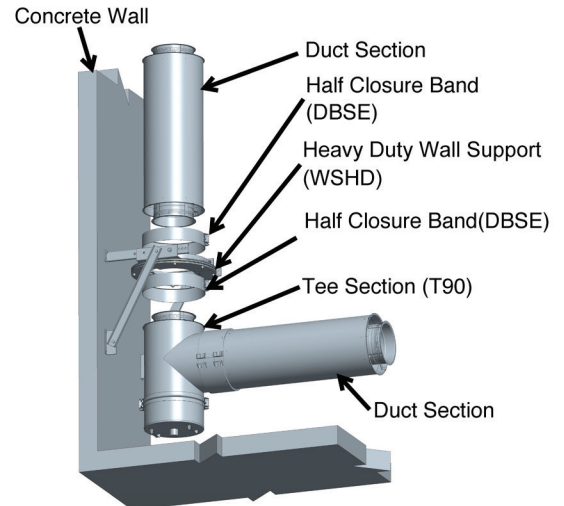


Figure 44: - Suspended Tee Support

NOTE: In the case of an AP, Flange joint of duct and Tee are to be secured in place between the Clamp Rings. If it is not possible to suspend the Tee, it may be supported with a base (a structural steel stand).

When a Tee is used as a supported Tee, A Drain Tee Cap (DTC) must be used at the bottom of the Tee for draining

ELBOW SUPPORT

Elbows are to be supported on one end with either a Ventilated Anchor Plate (APV), a Ventilated Anchor Plate with Length (APVL), or a Heavy Duty Wall Support (WSHD). See Figure 45 for an example with an APV and Figure 46 for an example with a (WSHD).

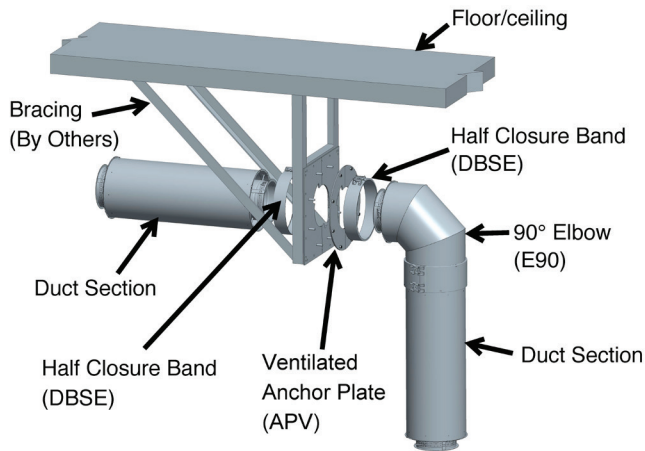


Figure 45: - Elbow with a Ventilated Anchor Plate (APV)

NOTE: In the case of an APV, flange joint of duct and elbow are to be secured in place between the Clamp Ring and square plate support.

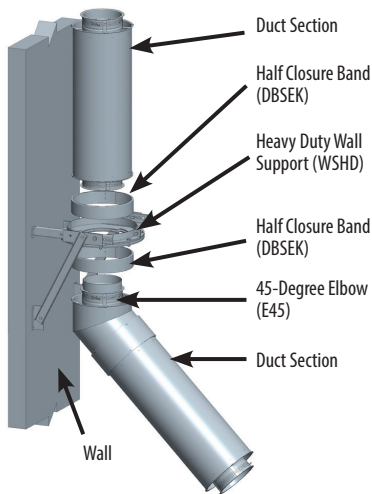


Figure 46: - Elbow with an Heavy Duty Wall Support (HOWS)

NOTE: Flange joint of duct and elbow are to be secured in place between the Clamp Rings

ROOF PENETRATION

STORM COLLAR (SC)

The Storm Collar (SC) is used above the flashing for complete weatherization above the roof. It has to be sealed with the outer joint sealant (not included). See Figure 47.

FLASHING (F)

The roof Flashing (F) is used in conjunction with Storm Collar (SC) for weatherization on a flat roof. See Figure 48.

ADJUSTABLE FLASHING (F30)

The Adjustable Flashing (F30) is used in conjunction with Storm Collar (SC) for weatherization on a roof with a pitch 5° to 30°. See Figure 49.



Figure 47 - Storm Collar

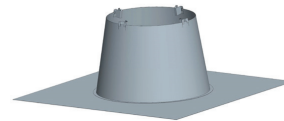


Figure 48 - Flashing

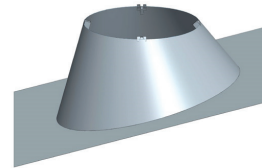


Figure 49 - Adjustable Flashing

NOTE: The flashings are non-ventilated and does not provide for any reduced clearance to combustible.

INSTALLATION PROCEDURE FOR FLASHINGS

1. Cut opening to dimensions specified in Table 5. See Figure 50 for flat roof and Figure 52 for a sloped roof.

NOTE: Reinforced the edges of the hole as appropriate for the expected lead bearing requirements.

2. Slide chimney section through the hole.

3. For lateral stability, supports or guides must be used. The Heavy Duty Floor Guide (WSHD) must be installed on top of the roof. Any supports (APV, APVL or WSHD) or a Full Angle Ring must be installed below.

NOTE: Flashing is not intended to take any side load or wind loads

4. Install flashing over the grease duct and the guide/support and screw it.

5. The Storm Collar (SC) is placed around the chimney and sealed to the casing with outer joint sealant S-350. See Figure 52 for an installed Flashing (F)

The storm collar should not quite rest on the flashing when the chimney is cold (a 1/4" gap between the collar and the top of the flashing).

NOTE: Maintain adequate spacing for expansion from the floor and the outer band (BSE) that is under the floor.

NOTE: If the maximum freestanding duct height above the Ventilated Anchor Plate (APV), Ventilated Anchor plate with length (APVL) or Full Angle Ring (FAR) exceeds that shown in the Table 4, guying is required.

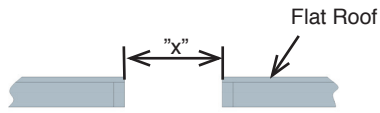


Figure 50 - Minimum Opening for flat roof

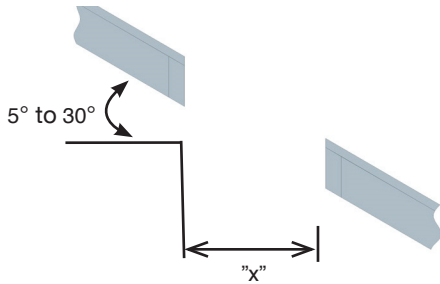


Figure 51 - Minimum Opening for sloped roof

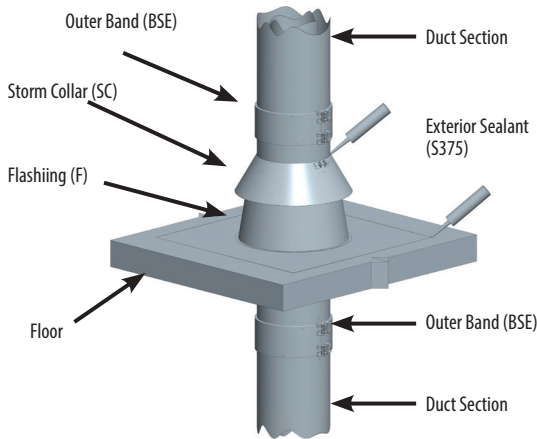


Figure 52 - Installation of Flashing-View Top of the Roof

MAINTENANCE INSTRUCTIONS

As with all vents, the DAS1-(BC) vent system should be inspected at least annually for the presence of deposits or debris and any accumulation should be removed. The vent system should also be inspected at regular periods for signs of leakage of condensate or combustion products at any joints.

If the vent system incorporates a drain hose from either a Drain length or a Drain tee cap, the hose must be inspected periodically to ensure that water is in the trap loop. If a proper trap loop is not maintained, exhaust from the connected appliances may accumulate in the building area.

WARRANTY

These products have a limited warranty. Please read the warranty to be familiar with its coverage.

Retain this manual. File it with your other documents for future reference.

PRODUCT REFERENCE INFORMATION

Please contact DuraVent for the phone number of your nearest DuraVent dealer who will answer your questions or address your concerns.

Normally, all parts should be ordered through your DuraVent distributor or dealer. Parts will be shipped at prevailing prices at time of order.

When ordering repair parts, always give the following information:

1. The model number of the chimney system.
2. The part number.
3. The description of the part.
4. The quantity required.
5. The installation date of the chimney system.

If you encounter any problems or have any questions concerning the installation or application of this system, please contact our dealer.

DuraVent®

10 Jupiter Lane • Albany • NY, 12205
800-835-4429; www.duravent.com

DuraVent Limited reserves the right to make changes at any time, without notice, in design, materials, specifications, prices.
Consult your local distributor for chimney system code information.

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