VAN-PACKER® CO., INC.

Model DW Series

General Installation Guidelines

UL Listed under Standard 103 for Flue Gas
Temperatures up to 1400°F (759°C)
Venting System for Factory-Built Chimneys
For Building Heating Appliances

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

These guidelines give the limits of installation for both the 1400°F (760°C) chimney and the building heating appliance chimney 1000°F (538°C) in accordance with the Underwriters Laboratories, Inc. Listings. This product requires preliminary planning because it can be installed in many different ways. It has to be presumed that all such planning and preparation work has been done by the time you are ready to erect this material.

UNDERWRITERS LABORATORIES LISTING Van-Packer Model DW Series products are "Listed" by UL (under file number MH 11435) as a "1400° Fahrenheit Chimney" for continuous operation at 1400°F (760°C) and intermittent operation at 1800°F (983°C). The Model DW Series is also suitable for use as a "Building Heating Appliance Chimney" (UL103) for continuous operation at 1000°F (538°C) and intermittent operation at 1400°F (760°C).

APPLICATION The Model DW Series is suitable for applications where continuous temperatures do not exceed 1400°F (760°C) and intermittent temperatures do not exceed 1800°F (983°C). The Model DW Series is also suitable for use as a building heating appliance chimney at lesser clearances on applications where continuous flue gas temperatures do not exceed 1000°F (538°C) and intermittent temperatures do not exceed 1400°F (760°C). See the Chimney Selection Chart in NFPA 211 for descriptions of Building Heating Appliances and Low Heat Appliances. The chimney is to be sized in accordance with ASHRAE methods or the appliance manufacturer's instructions.

ENCLOSURES The Model DW Series Chimney is intended to be installed unenclosed or with in non-combustible enclosures. The Model DW Series Chimney is not for use in one or two-family residences. CAUTION – Do not enclose the Model DW Series Chimney in a passageway or chase constructed of combustible material such as wood. When the chimney extends through any zone or story above that on which the connected appliance is located, it is to be provided with an enclosure having a fire resistance rating equal to or greater than that of the floor or roof assemblies through which it passes (NOTE – Always check with local building code authorities having jurisdiction for material with appropriate fire resistance rating). If a portion of the Model DW Series Chimney is placed between a dropped ceiling and roof, that portion should be enclosed in an appropriate fire rated enclosure. The Model DW Series is NOT intended to pass through a combustible wall, but any wall, which the chimney passes through, must be of non-combustible construction.

TERMINATION HEIGHT ABOVE ROOF The height of a chimney above the roof through which it passes and any surrounding equipment should be determined based on the appliance type. See NFPA 211 for appliance categories and their requirements. Consideration should also be given to local building codes, fire codes, and air pollution regulations. The appliance manufacturer's recommendations for minimum heights for the operating draft needs of that particular appliance must also be taken into account.

CLEARANCES			
Model DW		1400°F (760°C)	1000°F (538°C)
Combustible	All Sizes	6” (152mm)	4” (102mm)
Non-Combustible	18”ID or Less	2” (51mm)	2” (51mm)
Non-Combustible	Over 18”ID	4” (102mm)	4” (102mm)
Model DWplus Series			
Combustible	All Sizes	4” (102mm)	2” (51mm)
Non-Combustible	18”ID or Less	2” (51mm)	2” (51mm)
Non-Combustible	Over 18”ID	4” (102mm)	2” (51mm)

NOTE Clearance in a non-combustible interior chase shall be as necessary for installation or access.

WARNING Do not place any type of insulation or combustible material in the required clearance spaces surrounding the chimney.

ROOF PENETRATION The Insulated Roof Thimble (Part THM) and the Ventilated Roof Thimble (Part VRT) may be installed at zero clearance to combustible construction.

WALL PENETRATION The wall through which the chimney passes must be non-combustible. Do not pass the chimney, tee section, or any type connector pipe through a combustible wall.

FLOOR PENETRATION See Enclosure Section on page 2.

MODEL DW / DWplus PARTS IDENTIFICATION All part numbers have a “D” prefix, for Model DW. All part numbers have a “+” (+2, +3, +4) prefix, for the Model DWplus, followed by the section ID, part description, liner/shell designation and a special qualifier code. The qualifier code is used to denote section length on straight sections, projection ID on tee sections and the larger ID on increasers. The part number for a Model DW, 8”ID straight section with type 304 stainless steel liner and aluminized steel shell, 18” long would be:

D08STRA18

D = Model DW Code
08 = Section ID
STR = Part Code
A = Shell/Liner Code
18 = Qualifier Code

SHELL / LINER	
CODE	**DESCRIPTION**
A	Type 304 liner w / aluminized shell
B	Type 316 liner w / aluminized shell
C	Type 316 liner with type 316 shell
D	Type 304 liner with type 304 shell
E	Type 316 liner with type 304 shell
F	Type 304 liner with type 316 shell

MODEL DW LIMITATIONS Maximum height above top lateral brace/guy:
6”ID – 12”ID….10 feet
14”ID – 48”ID……15 feet
Maximum space between lateral brace/guy 30 feet.
Maximum height above Straight section, Tee sections, and Plate Support Assembly’s are based upon chimney diameter. See following chart..

Model DW			
Chimney ID (inches)	Allowable Heights (feet)		
	Straight	Tee	Support
6	225	89	284
8	225	89	284
10	225	89	284
12	225	89	284
14	213	89	272
16	201	89	260
18	189	82	247
20	177	75	235
22	165	68	223
24	153	60	211
26	150	53	198
28	147	46	186
30	144	39	174
32	141	31	162
34	138	24	149
36	135	17	137
38	102	15	125
40	101	15	113
42	101	15	101
44	101	15	89
46	100	15	76
48	100	15	64

The Adjustable Expansion Section (ADJ) and the Variable Length Section (VLS) are non-load bearing. Adjustable Expansion Sections and Variable Length Sections may require field cutting for proper fit.

MODEL DWplus SERIES LIMITATIONS
6”ID – 12”ID….10 feet
14”ID – 48”ID……15 feet
Maximum space between lateral brace/guy = 30 feet.
Maximum height above Straight Sections, Tee Sections, and Plate Support Assembly’s is based upon chimney diameter. See following chart.

Model Dwplus			
Chimney ID (inches)	Allowable Heights (feet)		
	Straight	Tee	*Support
6	189	76	235
8	189	76	235
10	189	76	235
12	189	76	235
14	179	76	225
16	169	76	215
18	159	70	205
20	148	64	195
22	138	57	185
24	128	51	175
26	126	45	165
28	123	39	155
30	120	33	145
32	118	27	135
34	115	20	125
36	113	14	115
38	88	13	105
40	86	13	95
42	84	13	85
44	82	13	75
46	81	13	65
48	79	13	55

*See page 11, Allowable Height Chart

NOTE For systematic installation instructions, see the individual part.

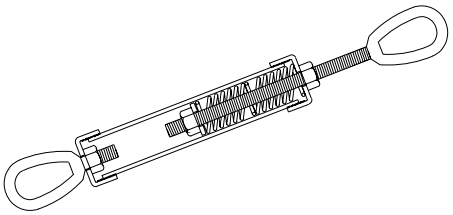
FOR WOOD BURNING APPLIANCES
CREOSOTE AND SOOT – FORMATION AND NEED FOR REMOVAL

When wood is burned slowly, it produces tar and organic vapors, which combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cool chimney flue of slow-burning fire. As a result, creosote residue accumulates on the flue lining. When ignited this creosote makes an extremely hot fire.

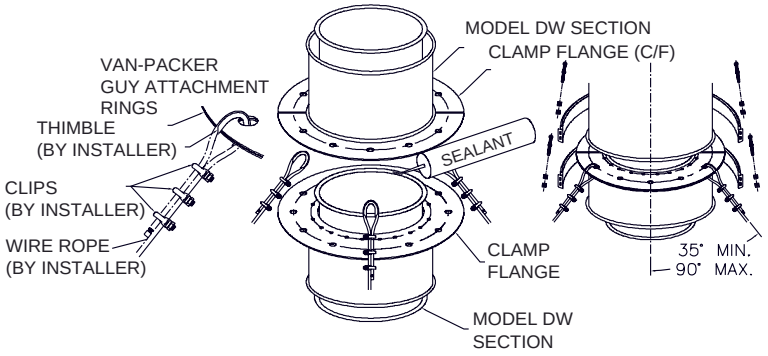
Chimney inspection should be at least once every two months during the heating season to determine if a creosote or soot buildup has occurred. Accumulation of creosote or soot should be removed to reduce the risk of chimney fire. Van-Packer recommends cleaning the flue by mechanical means (brushes). It is necessary that access be provided for the inspection and cleaning of all sections of the chimney. Contact local building or fire officials about restrictions and installation inspection in your area.

SUGGESTED GUYING/BRACING MATERIALS:
Guying Cable and Accessories 1/4" galvanized guy cable is usually adequate.
Standard Pipe Pipe guying is preferable to cable wherever it is practical, because only two points of contact are required, whereas it takes three contacts to anchor a stack with cable. Minimal maintenance is required with pipe guying. Cable guys must be periodically checked and turn buckles adjusted for tension. One-inch standard galvanized pipe, with plain ends, will handle most requirements.
Structural Steel Angles Random lengths of 1-1/2" x 1-1/2" x 3/16", or larger, steel angles will handle most requirements.
General Guying and bracing materials should be selected in accordance with good engineering practice to suit each specific application.
Note A qualified structural project engineer should use support details shown in the installation instructions only after appropriate structural review of the building. Van-Packer assumes no responsibility for the design and/or modification of buildings to accept the given reaction performed by the structural project engineer.

Guy Tensioner
Part 1500GUY
Van-Packer offers a 1500 pound Guy Tensioner, which is good for up to 3" of expansion. Use the Guy Tensioner in conjunction with the Guy Attachment Ring. Installing contractor shall provide wire rope, thimble, clips, and any type of hardware for attachment to roof and or building. Van-Packer suggests using 1/4 inch min. galvanized guying cable with the guy-attachment ring and guy-tensioner devices. Select guying materials in accordance with good engineering practice to suit each specific application.



Guy Attachment Ring
Part GAR
Chimneys that extend above the roof, or installed in severe weather regions, may require a Guy Attachment Ring to enable the chimney to resist wind loads. The Guy Attachment Rings connect to the building or other structure by means of cables. The Guy Attachment Ring consists of two sets of Clamp Flanges (C/F) (or four identical half rings) with hardware to secure them together. The cables, which attach to the Guy Attachment Ring, must be slightly loose, allowing for thermal expansion of the chimney without damaging fastenings or attachments. Most stack configurations require a spring-loaded guy-tensioner to pre-load the guy-cables for a satisfactory installation. The cable-guy must incorporate this displacement limiting tension device if expected thermal expansion exceeds allowable slack in the cables. A minimum of three cables spaced 120° apart is required for one Guy Attachment Ring assembly. Place two sections together following the sealant guidelines and sandwich the section flanges between the clamp flanges. Offset the splits of the Clamp Flanges by 90°. NOTE: It is suggested the Guy Attachment Ring be placed at the top Vee band connection then proceeds with 30'-0" (9m) maximum intervals for lateral support. See page 4.



Positive Pressure Sealant
Part 101091F
For all Positive Pressure applications use Van-Packer High Temperature Sealant. UL Listed for up to 60" water column.

INSTRUCTIONS

Using a Pneumatic Caulking Gun is recommended for ease of installation.

For further information, see Sealant Container.

Components join with a Vee Band, which is placed over the flanges of the adjoining liner and bolted in place. Draw Band is then placed over the shell.

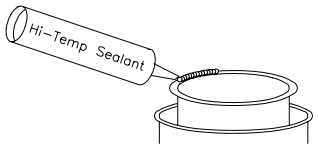


Illustration 1

1. Apply 1/8" (min.) bead of sealant to one of the flanges to be joined.

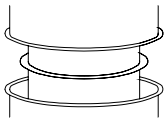


Illustration 2

2. Join the two-flanged ends of the pipe sections together.

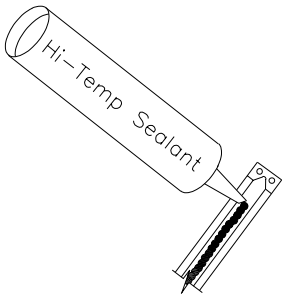


Illustration 3

3. Fill the channel of the Vee Band with sealant. 3A. Omit step three when using silicone sealant. See page 7.

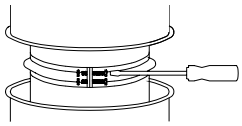


Illustration 4

4. Install Vee Band around flanges. On large diameters it will be necessary to lightly tap the band while tightening, this will ensure a snug fit. 11R VISE-GRIP LOCKING C-CLAMPS modified to fit in holes; can assist in tightening.

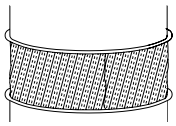


Illustration 5

5. Install insulation strips to ensure all air gaps are filled, if installing Model DWplus Series.

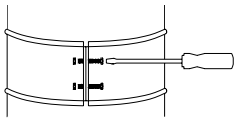


Illustration 6

6. Secure the outer shell with the Draw Band. It is recommended that silicone sealant be applied around the top of the draw band to prevent moisture from entering between the chimney walls. This should only be done on all components exposed to the atmosphere. Van-Packer does not supply sealant for this application.

High Temperature Sealant Consecutive Curing Schedule
1 hour at 200ºF (93ºC)
1/2 hour at 250ºF (121ºC)
1/2 hour at 300ºF (149ºC)
1 hour at 350ºF (176ºC)
1 hour at 400ºF (204ºC)
1 hour at 500ºF (260ºC)

High Temperature Sealant Air Dry Curing Schedule	
40ºF to 50ºF	10 Days
51ºF to 60ºF	8 Days
61ºF to 70ºF	6 Days
71ºF & above	4 Days

NOTE This chimney system is rated for use at maximum 60-inch water column internal pressure when used in Positive Pressure applications.

Sealant Chart			
Inside Diameter (Inches)	Silicone Joints Per Tube	High Temp Joints Per Tube	High Temp or Grease Duct Joints Per Tube
6	10	7	8
8	9	5	6
10	9	4	4.5
12	8	3.5	4
14	7	3	4
16	7	2.5	3.5
18	6	2	2.5
20	6	2	2
22	5	1.5	1.5
24	5	1.5	1.5
26	4	1.5	1.5
28	4	1.5	1.5
30	3	1	1
32	3	1	1
34	2	1	1
36	2	1	1
38	2	1	1
40	2	1	1
42	1	1	1
44	1	.50	.50
46	1	.50	.50
48	1	.50	.50

Joint Sealant Guidelines
General The Model DW Series Chimneys where tested by Underwriters Laboratories.

Negative Pressure / Low Temperature Applications Most applications will be for neutral or negative pressure systems with flue gas temperature below 600°F. In these cases, a bead of silicone sealant in the Vee Band will be sufficient.

Positive Pressure / Low Temperature Applications For applications where the system will be under a positive pressure and flue gas temperatures will be below 600°F, a bead of silicone should be placed between the liner flanges in addition to the bead in the Vee Band. Tested by Van-Packer In-House for pressures up to 5-inches of water column.

High Temperature Applications For all installations where flue gas temperatures will be over 600°F, Van-Packer High-Temp joint sealant should be used. The joint sealant should be placed between the liner flanges and in the Vee Band if the system is to be under positive pressure.

IMPORTANT!
Special care must be taken when assembling joints on engine exhaust systems. Carefully read the installation instructions and follow the curing schedule. Let the joint sealant cure at least the minimum time required before starting the engine. Failure to do this may result in leakage.

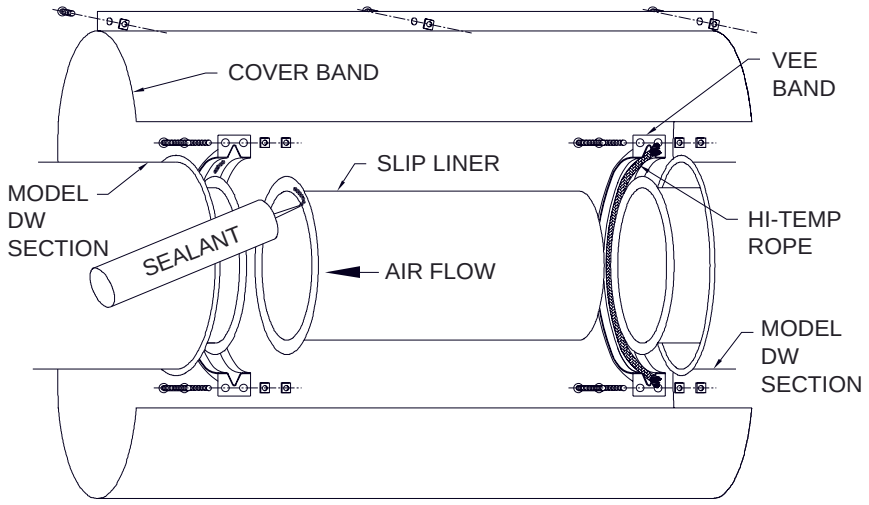
The installation of Model DWplus is the same as the Model DW. The only difference is the addition of insulation in the DWplus series components. It is important to insulate the joints as outlined.

Adjustable Expansion Chart (Inches)

	"A"	"A" Minimum for 50 Foot Lengths						
	Max.	200°F	400°F	600°F	800°F	1000°F	1200°F	1400°F
DW	18	5/8	1-3/8	2-1/4	3-1/4	4-1/2	5-1/2	6-3/8
DWplus	18	1	2	2-7/8	3-7/8	4-7/8	5-3/4	6-3/4

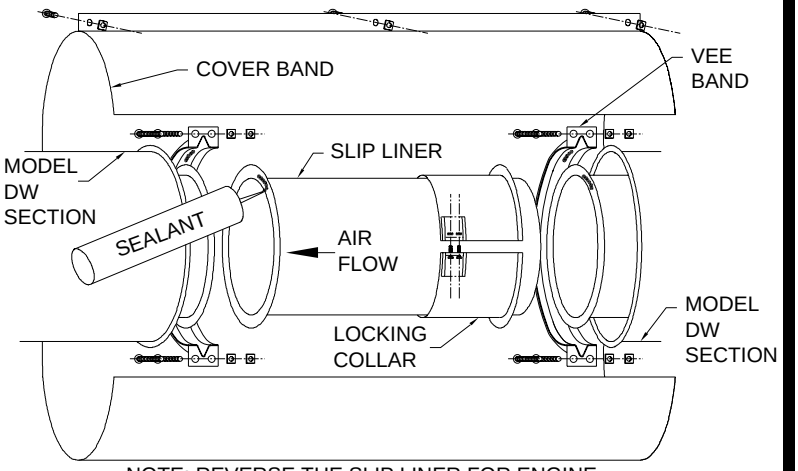
Adjustable Expansion Section
Part ADJ
The Adjustable Expansion Section used for thermal expansion, includes, 3/8"Ø Hi-Temp packing rope, Vee band, Slip Liner, and a Cover band. The Model DWplus Series includes a wide sheet of insulation.

1. The slip liner slides into the end of the section liner that is already in place. Use the chart plus 1-1/2" for flange-to-flange dimensions. When the adjustable expansion section is installed between two other sections, the maximum length gained is 19-1/2". This allows for 18-inches of movement.
2. Insert the gasket into the vee band and install over the flange of the previous section, install bolts provided.
3. Install the next section. Use a vee band on the liner in accordance with the joint installation instructions.
4. For DWplus only: cut the wide sheet of insulation to the required width and install over the slip liner and vee bands.
5. Install cover band over insulation: do not over tighten. The cover band may require field-trimming if used between two fittings (elbows, tees, etc.). Make sure the cover band has enough room to move. The length of the space should be equal to or greater than "A" minimum from above chart.
6. This is a non-load bearing section.



Variable Length Section
Part VLS
The VLS used for custom length sections. Length ranges from 4-1/2" to 19-1/2". It includes a Locking Collar, Vee band, Slip Liner and Cover Band. Model DWplus Series includes a wide strip of insulation.

1. Place the locking collar over the slip liner with the flange of the locking collar toward the un-flanged end of the slip liner. Then slide the slip liner into the end of the section that is already in place and adjust to the required length.
2. Place sealant between the slip liner and the section liner, between the locking collar and slip liner, and in the vee band.
3. Slide the flange of the locking collar up to the previously installed liner flange. Tighten the bolts on the locking collar and install a vee band.
4. Install the next section using a vee band in accordance with the joint installation instructions.
5. For DWplus only: cut the wide sheet of insulation to the required width and install over the slip liner and vee bands.
6. Install cover band over insulation. The cover band may require field-trimming if used between two fittings (elbows, tee, etc.).
7. Allow sealant to cure before operating the appliance.
8. This is a non-load bearing section.

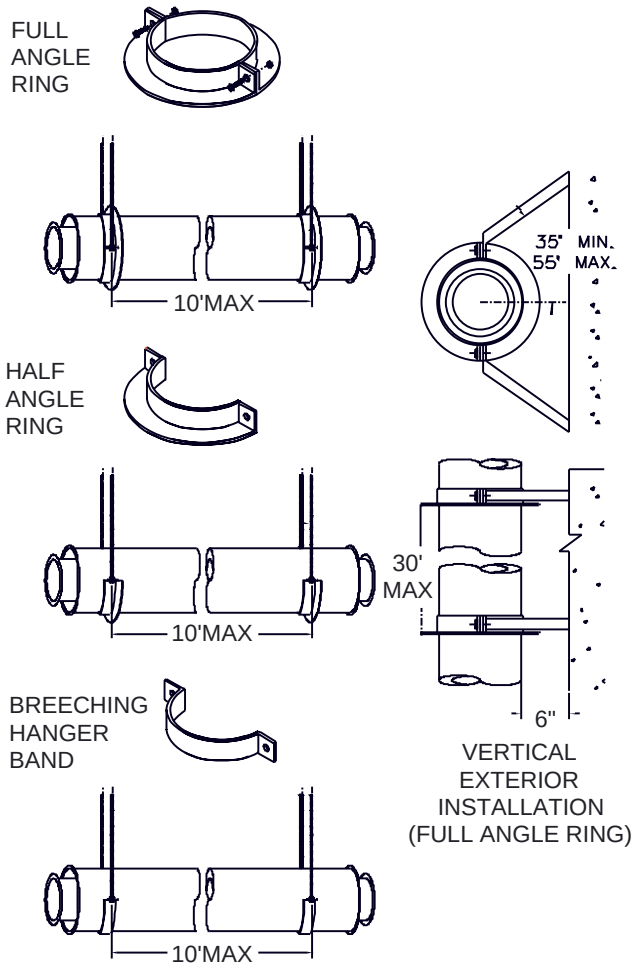


NOTE: REVERSE THE SLIP LINER FOR ENGINE EXHAUST APPLICATIONS SUCH AS GENERATORS.

Full Angle Ring
Part FAR
The FAR supports horizontal and vertical lengths of pipe in all diameters, Models, and exhaust types.

Half Angle Ring
Part HAR
The HAR supports horizontal lengths of pipe 24"ID and under. For Models Dwplus2, 3, and 4. Not for use on engine exhaust systems.

Breeching Hanger Band
Part BHB
The BHB supports horizontal lengths of pipe 24"ID and under. For Models DW & Dwplus, not for use on engine exhaust systems.



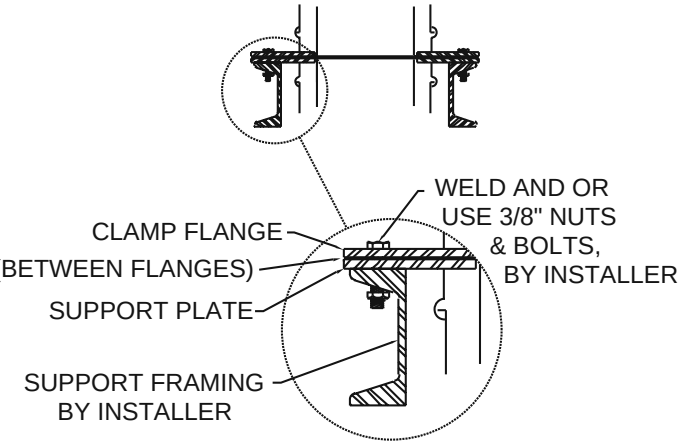
VERTICAL EXTERIOR INSTALLATION (FULL ANGLE RING)

HORIZONTAL INSTALLATIONS

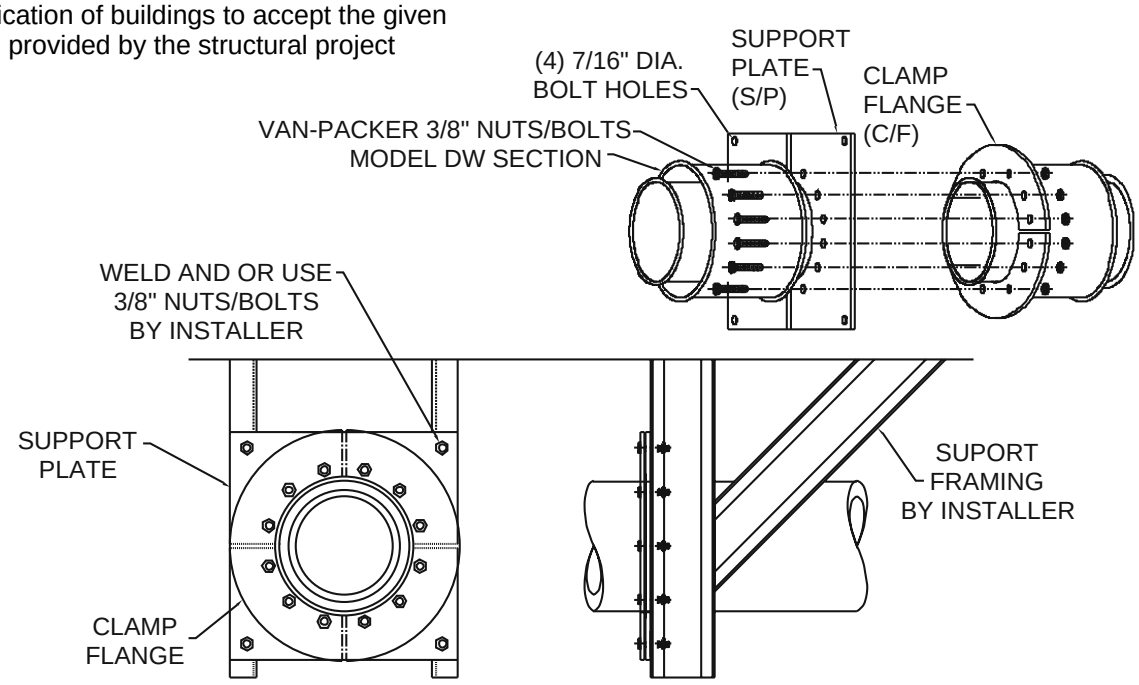
Plate Support Assembly
Part PLS

1. The PLS consists of one square two-piece Support Plate (S/P), one round two-piece Clamp Flange (C/F), two half draw bands, bolts and nuts. The PLS in conjunction with field fabricated support members provides support for the chimney.
2. Put sealant on one end of liner flange. Put the two liners together (no Vee Band is required) to capture the flanges between the support plate and the clamp flange. Bolt together the support plate and the clamp flange with the 3/8" (9.52mm) bolts provided. Before the bolts are fully tight, tapping around the inside of the sections at the joint will help align the sections if required. Fully tighten all the bolts except those at the locations where the support members will attach.
3. Using a 7/16" (11.11mm) drill bit, drill through the existing holes in the plate support assembly into the support members and bolt in place. you may also weld support members to the plate support.
4. Support all four sides of the plate support. Construct structural support members from 1-1/2" x 1-1/2" x 3/16" or larger steel angles, steel channels, beams, or other appropriate material (depending on the load being supported). See chart on page 11.

The structural project engineer should select support members and fasteners in accordance with *Good Engineering Practice* to suit each specific application. Van-Packer assumes no responsibility for the design and/or modification of buildings to accept the given load reaction provided by the structural project engineer.



VERTICAL INSTALLATION



HORIZONTAL INSTALLATION

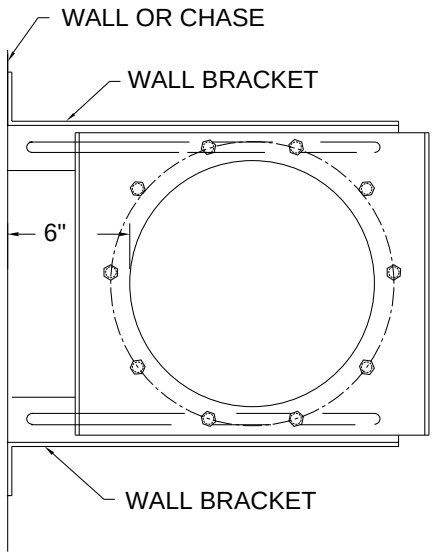
Wall Support Assembly
Part WSA

Use the WSA to support vertical lengths of chimney along a wall or chase. The Wall Support Assembly consists of: Left & Right Wall Bracket, 2-piece Bottom Support Plate, 2-piece Top Support Plate, Bolts/Nuts and 2 Half Draw Bands.

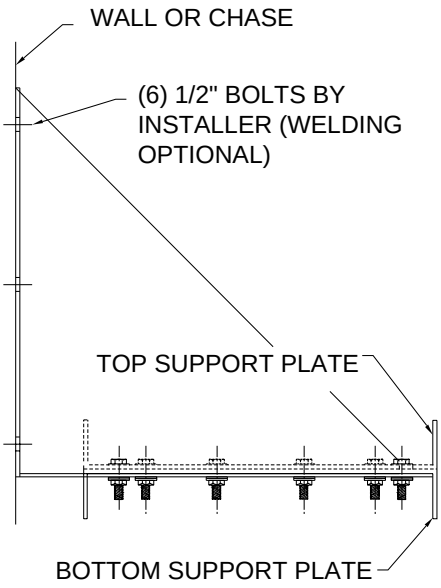
1. Place a bead of sealant between the liner flanges of the two adjoining sections.
2. Place the bottom support plate around the lower section liner with the bent flange pointing down.
3. Place the top support plate around the upper section liner with the flanges pointing up.
4. Bolt through the top support plate, bottom support plate, and the wall brackets with the bolts provided. *Capture the liner flanges of the two sections between the top support and bottom support plate. The bottom support plate rests on top of the wall bracket legs.*
5. Attach the left and right wall brackets to the wall or structure. Bolting or welding may accomplish this. For bolted installations, use (6) 1/2" (12.7mm) diameter bolts provided by the installer.

Notes:

A. The project engineer is to review and approve attachment to the building.
B. Before installation, plumb a line so wall brackets are align with the chimney.
C. The wall support assembly maintains a 6" (152 mm) spacing between the building wall and the chimney.



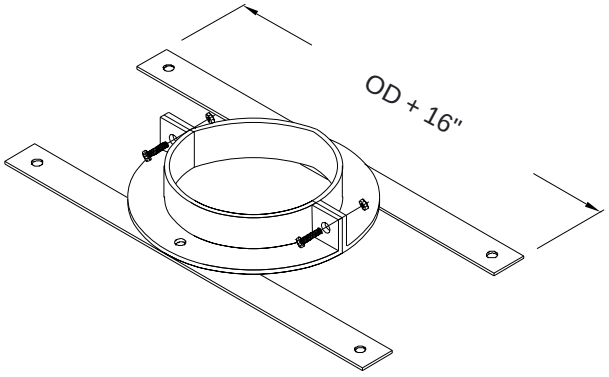
PLAN VIEW



SIDE VIEW

Floor Guide Assembly
Part FGA

Use the Floor Guide Assembly (Part FGA) when penetrating floors. The floor guide rests on the floor and the struts that attach to the lateral support are lagged into the framing around the chimney vent. Fasteners by installer.



Allowable Height chart (Feet)																									
Vent	DW					DWplus					DWplus2					DWplus3					DWplus4				
ID	WSA	WFA	PLS	STR	TEE	WSA	WFA	PLS	STR	TEE	WSA	WFA	PLS	STR	TEE	WSA	WFA	PLS	STR	TEE	WSA	WFA	PLS	STR	TEE
6”	201	201	284	225	89	174	174	235	189	76	145	145	189	152	62	119	119	156	125	52	99	99	130	105	44
8”	170	167	284	225	89	149	146	235	189	76	122	120	189	152	62	101	99	156	125	52	85	83	130	105	44
10”	152	146	284	225	89	131	126	235	189	76	107	103	189	152	62	89	86	156	125	52	75	72	130	105	44
12”	142	134	284	225	89	123	116	235	189	76	97	92	189	152	62	81	76	156	125	52	68	64	130	105	44
14”	107	99	272	213	89	91	84	225	179	76	77	71	183	145	62	65	60	152	121	52	56	52	128	102	44
16”	102	92	260	201	89	88	79	215	169	76	73	66	176	138	62	61	55	147	115	52	53	47	124	98	44
18”	91	8	247	189	82	78	69	205	159	70	65	58	168	131	57	55	49	141	110	48	48	42	120	93	41
20”	85	74	235	177	75	72	63	195	148	64	61	52	161	122	53	51	44	136	103	44	44	38	116	88	38
22”	76	64	223	165	68	65	55	185	138	57	54	46	153	114	47	47	39	130	97	40	40	34	111	83	34
24”	70	58	211	153	60	60	50	175	128	51	50	42	145	106	42	43	36	123	90	36	37	31	106	78	31
26”	67	54	198	150	53	57	46	165	126	45	48	39	137	105	37	41	33	117	89	32	35	29	101	77	27
28”	64	50	186	147	46	54	42	155	123	39	45	36	129	103	33	39	30	107	87	28	33	26	95	76	24
30”	60	46	174	144	39	51	39	145	120	33	43	33	121	100	28	36	28	104	86	24	32	24	91	75	21
32”	57	43	162	141	31	48	36	135	118	27	40	30	113	99	23	34	25	98	86	20	27	20	75	66	15
34”	50	38	149	138	24	42	32	125	115	20	36	27	105	97	17	27	21	79	73	13	24	18	70	64	11
36”	42	34	137	135	17	36	29	115	113	14	27	21	85	83	10	24	19	73	72	9	21	17	65	63	8
38”	37	30	125	102	15	32	26	105	88	13	25	21	84	77	11	22	18	73	68	10	19	16	65	60	9
40”	32	27	113	101	15	27	23	95	86	13	23	20	83	75	11	20	17	73	66	10	18	15	65	59	9
42”	26	23	101	101	15	23	20	85	84	13	20	18	74	73	11	17	15	65	64	10	15	14	58	57	9
44”	21	19	89	101	15	19	17	75	82	13	16	15	66	72	11	15	13	58	63	10	13	12	52	56	9
46”	17	17	76	100	15	16	15	65	81	13	14	13	57	71	11	12	12	50	63	10	11	11	45	56	9
48”	15	15	64	100	15	13	13	55	79	13	12	12	48	69	11	11	11	43	61	10	10	10	38	55	9

Wall Guide Assembly
Part WGA

Used for lateral support the Wall Guide Assembly attaches to a wall or chase. The Wall Guide Assembly consists of: Left & Right Wall Bracket, two Half Angle Rings, Bolts and Nuts.

1. Attach the wall bracket assembly, with one half-angle ring in place, to the wall or structure. Bolting or welding may accomplish this. For bolted installations, use (6) 1/2" (12.7mm) diameter bolts (provided by installer).
2. Install the chimney section through the WGA and bolt the other half angle ring in place.

Notes:

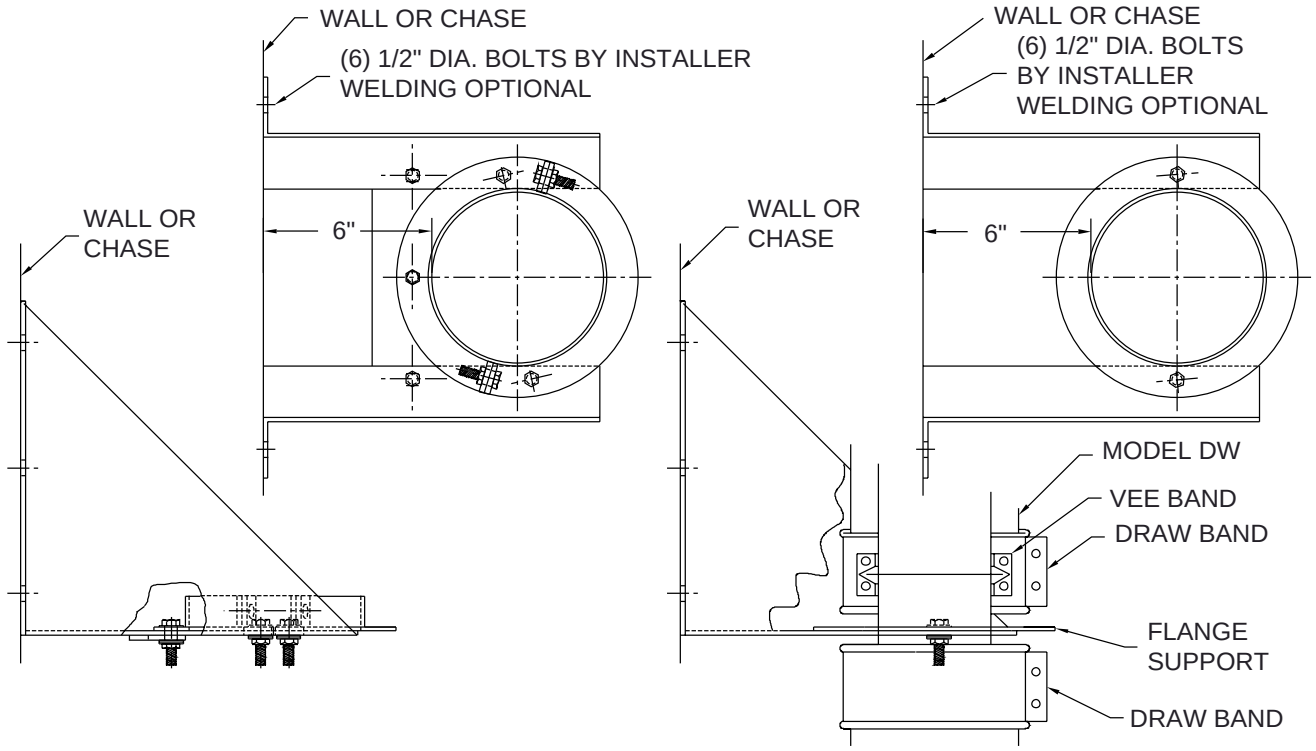
A. The project engineer should review and approved the attachment.
B. Before installation, plumb a line so wall brackets are align with the chimney.
C. Plan the placement of the WGA so that a Draw Band will not interfere with the angle ring.
D. Remember that the chimney will expand and contract during the heating cycle.
E. The Wall Guide Assembly maintains a 6-inch (152 mm) spacing between the building wall and the chimney.

Wall Flange Assembly
Part WFA

Use the WFA to support vertical lengths of chimney along a wall or chase. The Wall Flange Assembly consists of: Left & Right Wall Bracket, Flange Assembly, Vee Band, Draw Band, Bolts and Nuts.

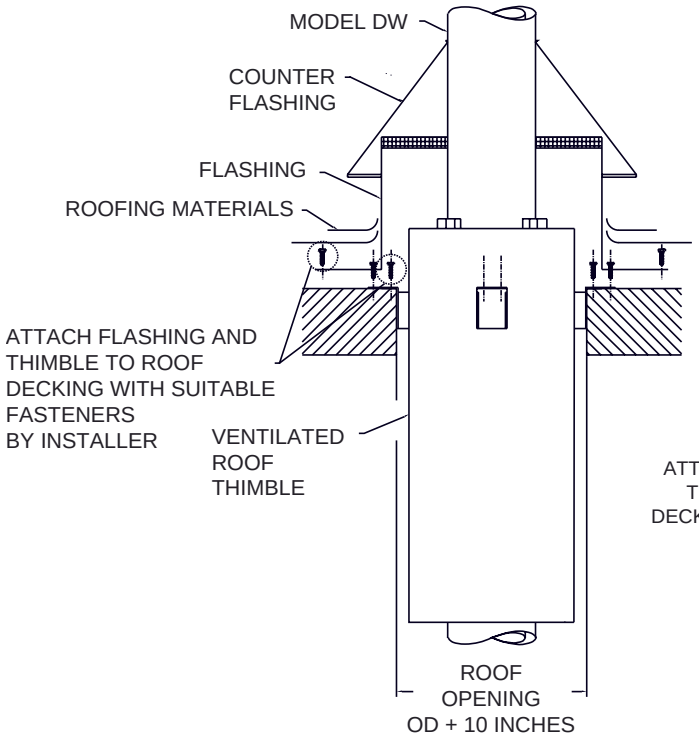
1. Attach the flange assembly to the venting system by placing a bead of sealant on the rolled flange and connect the two sections together with a vee band.
2. Before installation, plumb a line so wall brackets are align with the chimney.
3. Attach the left and right wall brackets to the wall or structure. This may be by bolting or welding. For bolted installations, use (6) 1/2" (12.7mm) diameter bolts (not provided).
4. Attach flange assembly to wall brackets.
5. Place a bead of sealant between the upper liner flanges of the two adjoining sections and continue adding components.
6. Place a drawband around the jacket of the upper and lower portions of the flange assembly.

Note: The structural project engineer should select support members and fasteners in accordance with Good Engineering Practice to suit each specific application. Van-Packer assumes no responsibility for the design and/or modification of buildings to accept the given load reaction provided by the structural project engineer.



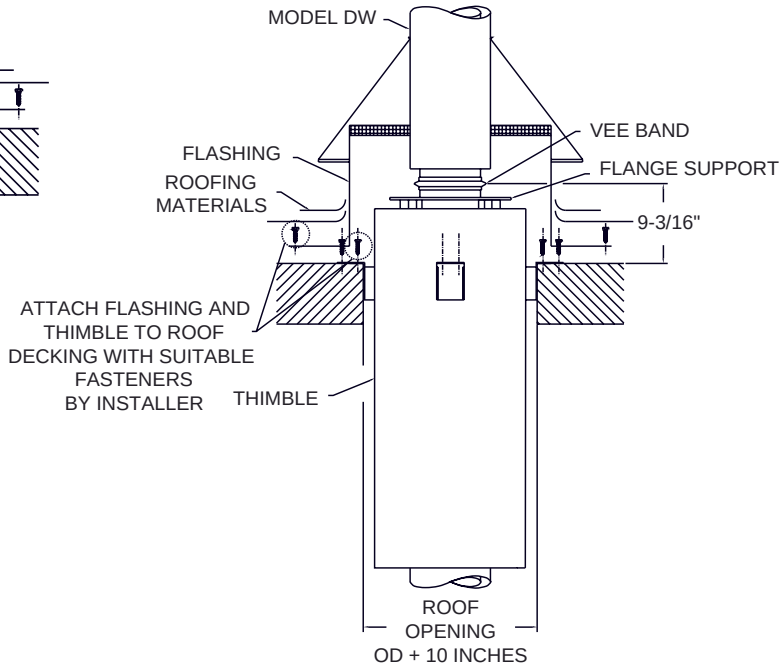
Ventilated Roof Penetration Assembly
Part RPA

1. The Ventilated Roof Thimble (part VRT) used in conjunction with the Flashing (part FLS) and the Counter Flashing (part CFL) for passage through a combustible roof structure. These three components are used for a standard flat roof penetration and may be used for up to a 1/12 pitch.
2. The Ventilated Thimble can be installed at zero clearance to combustible construction. **DO NOT BLOCK** the airflow between the thimble and the venting system.
3. The nominal framing opening is the venting system OD plus 10 inches.
4. The thimble mounts directly on a level roof deck and attaches with four 8d nails in each support Clip. There are four clips per thimble. Fasteners by installer.
5. The flashing fits over the thimble and sits on the roof deck. The flashing has 1 inch (25mm) of screen, which prevents the counter flashing from sliding down too far and blocking off the airflow.
6. The counter flashing fits around the venting system and rests on the flashing screen. After tightening up the counter flashing, place a bead of silicone around the top edge to prevent the entry of rain (silicone provided by installer).
7. For installation on a sloped roof, the installer must provide a flat level roof curb. See page 15.



Ventilated Roof Support Assembly
Part VRS

1. The Ventilated Thimble (part VRT) used in conjunction with the Flange Support Assembly (FSA), Flashing (part FLS), and the Counter Flashing (part CFL) for passage through a combustible roof structure. Use these four components for a standard flat roof support assembly.
2. **DO NOT BLOCK** the airflow between the thimble and the venting system.
3. The nominal framing opening is the venting system OD plus10 inches.
4. The thimble mounts directly on a level roof deck and attaches with four 8d nails in each support clip. There are four clips per thimble. Fasteners by installer.
5. The flashing fits over the thimble and sits on the roof deck. The flashing has 1 inch (25mm) of screen, which prevents the counter flashing from sliding down too far and blocking off the airflow.
6. Connect vent pipe to both sides of the flange support and rest the flange support on top of the ventilated thimble, align the vent pipe.
7. The counter flashing fits around the venting system and rests on the flashing screen. After tightening up the counter flashing, place a bead of silicone around the top edge to prevent the entry of rain (silicone provided by installer).
8. The project engineer is to review and approve any attachments to a building. Before installation, make sure roof is level so the chimney will be plumb. For a pitched roof, it will be necessary to construct a level roof curb.



Minimum Roof Opening Insulated Thimble (Inches)						
ID	OD	DW	DW+	DW+2	DW+3	DW+4
6	8	16-1/2	16-1/2	18-1/2	20-1/2	22-1/2
8	10	18-1/2	18-1/2	20-1/2	22-1/2	24-1/2
10	12	20-1/2	20-1/2	22-1/2	24-1/2	26-1/2
12	14	22-1/2	22-1/2	24-1/2	26-1/2	28-1/2
14	16	24-1/2	24-1/2	26-1/2	28-1/2	30-1/2
16	18	26-1/2	26-1/2	28-1/2	30-1/2	32-1/2
18	20	28-1/2	28-1/2	30-1/2	32-1/2	34-1/2
20	22	30-1/2	30-1/2	32-1/2	34-1/2	36-1/2
22	24	32-1/2	32-1/2	34-1/2	36-1/2	38-1/2
24	26	34-1/2	34-1/2	36-1/2	38-1/2	40-1/2
26	28	36-1/2	36-1/2	38-1/2	40-1/2	42-1/2
28	30	38-1/2	38-1/2	40-1/2	42-1/2	44-1/2
30	32	40-1/2	40-1/2	42-1/2	44-1/2	46-1/2
32	34	42-1/2	42-1/2	44-1/2	46-1/2	48-1/2
34	36	44-1/2	44-1/2	46-1/2	48-1/2	50-1/2
36	38	46-1/2	46-1/2	48-1/2	50-1/2	52-1/2
38	40	48-1/2	48-1/2	50-1/2	52-1/2	54-1/2
40	42	50-1/2	50-1/2	52-1/2	54-1/2	56-1/2
42	44	52-1/2	52-1/2	54-1/2	56-1/2	58-1/2
44	46	54-1/2	54-1/2	56-1/2	58-1/2	60-1/2
46	48	56-1/2	56-1/2	58-1/2	60-1/2	62-1/2
48	50	58-1/2	58-1/2	60-1/2	62-1/2	64-1/2

Minimum Roof Opening Ventilated Thimble (Inches)						
ID	OD	DW	DW+	DW+2	DW+3	DW+4
6	8	18	18	20	22	24
8	10	20	20	22	24	26
10	12	22	22	24	26	28
12	14	24	24	26	28	30
14	16	26	26	28	30	32
16	18	28	28	30	32	34
18	20	30	30	32	34	36
20	22	32	32	34	36	38
22	24	34	34	36	38	40
24	26	36	36	38	40	42
26	28	38	38	40	42	44
28	30	40	40	42	44	46
30	32	42	42	44	46	48
32	34	44	44	46	48	50
34	36	46	46	48	50	52
36	38	48	48	50	52	54
38	40	50	50	52	54	56
40	42	52	52	54	56	58
42	44	54	54	56	58	60
44	46	56	56	58	60	62
46	48	58	58	60	62	64
48	50	60	60	62	64	66

Ventilated Roof Support (VRS) Allowable Height Chart (Feet)						
ID	OD	DW	DW+	DW+ 2	DW+ 3	DW+ 4
6	8	103	89	74	61	50
8	10	88	77	64	53	44
10	12	81	69	57	47	40
12	14	76	66	52	43	36
14	16	59	50	42	36	31
16	18	57	48	40	34	29
18	20	52	44	37	31	27
20	22	49	41	36	29	25
22	24	44	38	32	27	23
24	26	41	36	30	25	22
26	28	40	34	29	25	21
28	30	39	32	27	23	20
30	32	37	31	26	22	19
32	34	38	30	25	21	18
34	36	32	27	23	17	15
36	38	28	24	18	16	14
38	40	25	21	17	15	13
40	42	22	19	16	14	12
42	44	19	17	14	13	11
44	46	16	14	12	11	10
46	48	13	12	11	10	9
48	50	12	11	9	8	8

Pitched Roof Penetrations

Combustible Roof Penetration for Model DW and DWplus 1400°F Chimney Installation

1. The Insulated Roof Thimble (THM) is used in conjunction with the Flashing (FLS) and Counter Flashing (CFL) for passage through a combustible roof structure.
2. For a pitched roof, it is necessary to construct a level curb provided by the installer.
3. You may install the insulated thimble at zero clearance to combustible construction. *Do not* block the airflow between the insulated thimble and the chimney.
4. The nominal framing opening is the chimney OD + 8-1/2 inches for the Model DW and Model DWplus 1400°F chimney. The Model DWplus 1000°F chimney does not require an Insulated Thimble; instead, it uses a Heat Shield (HTS).
5. The insulated thimble mounts directly on a level roof deck and attaches with one 8d nail in each support clip (4 clips per thimble). Fasteners by installer.
6. The flashing fits over the insulated thimble and sits on the roof deck. The flashing has a wire mesh, which prevents the counter flashing from sliding down too far and blocking off the air flow.
7. The counter flashing fits around the chimney and rests on the flashing spacers and screen. Place a bead of silicone around the top edge of the counter flashing and tighten up the draw-up bolts.

Combustible Roof Penetration for DWplus thru DWplus4 1000°F Chimney Installation

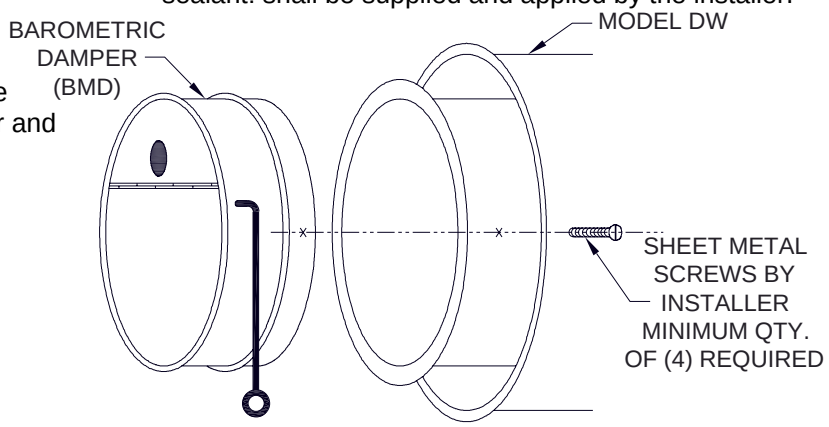
1. The Heat Shield (HTS) is used in conjunction with the standard Flashing (FLS) and the counter Flashing (CFL) for passage through a combustible roof structure.
2. For a pitched roof, it is necessary to construct a level curb provided by installer.
3. You can install the heat shield at zero clearance to combustible construction. *Do not* block the airflow between the heat shield and the chimney.
4. The nominal framing opening is the chimney OD + 4-1/2 inches. For the Model DWplus thru DWplus4 1000°F chimney. *The Model DW and the Model DWplus 1400°F chimney Can Not use a heat shield; instead, it uses the insulated thimble.*
5. The heat shield mounts directly on a level roof deck and attaches with one 8d nail in each support clip (4 clips per shield). Fasteners by installer.
6. The flashing fits over the heat shield and sits on the roof deck. The flashing has a wire mesh, which prevents the counter flashing from sliding down too far and blocking off the airflow.
7. The counter flashing fits around the chimney and rests on the flashing. Tighten up the draw-up bolts and place a bead of silicone around the top edge of the counter flashing.

Minimum Roof Opening Heat Shield (Inches)					
ID	OD	DW+	DW+2	DW+3	DW+4
6	8	12-1/2	14-1/2	16-1/2	18-1/2
8	10	14-1/2	16-1/2	18-1/2	20-1/2
10	12	16-1/2	18-1/2	20-1/2	22-1/2
12	14	18-1/2	20-1/2	22-1/2	24-1/2
14	16	20-1/2	22-1/2	24-1/2	26-1/2
16	18	22-1/2	24-1/2	26-1/2	28-1/2
18	20	24-1/2	26-1/2	28-1/2	30-1/2
20	22	26-1/2	28-1/2	30-1/2	32-1/2
22	24	28-1/2	30-1/2	32-1/2	34-1/2
24	26	30-1/2	32-1/2	34-1/2	36-1/2
26	28	32-1/2	34-1/2	36-1/2	38-1/2
28	30	34-1/2	36-1/2	38-1/2	40-1/2
30	32	36-1/2	38-1/2	40-1/2	42-1/2
32	34	38-1/2	40-1/2	42-1/2	44-1/2
34	36	40-1/2	42-1/2	44-1/2	46-1/2
36	38	42-1/2	44-1/2	46-1/2	48-1/2
38	40	44-1/2	46-1/2	48-1/2	50-1/2
40	42	46-1/2	48-1/2	50-1/2	52-1/2
42	44	48-1/2	50-1/2	52-1/2	54-1/2
44	46	50-1/2	52-1/2	54-1/2	56-1/2
46	48	52-1/2	54-1/2	56-1/2	58-1/2
48	50	54-1/2	56-1/2	58-1/2	60-1/2

Note: Any use of silicone applied to exterior portions of chimney shall be supplied by installer.

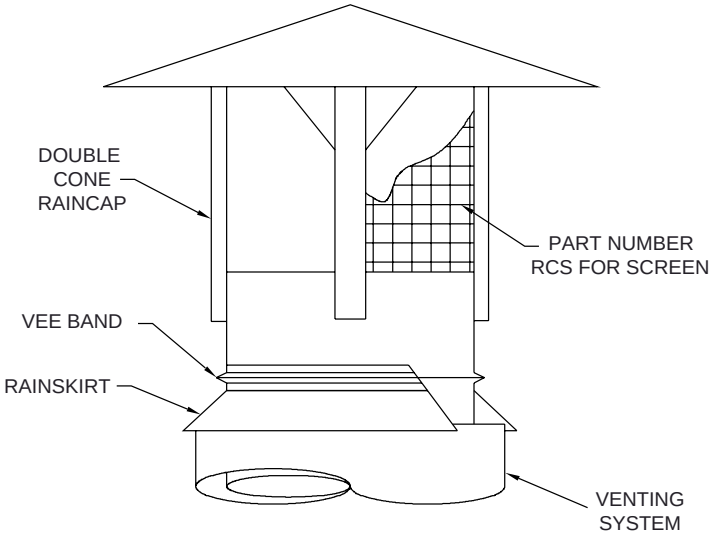
sealant: shall be supplied and applied by the installer.

Barometric Damper
Part BMD
Atmospheric type draft regulator used to balance chimney draft requirements. Slide BMD into liner and connect with sheet metal screws by installer.

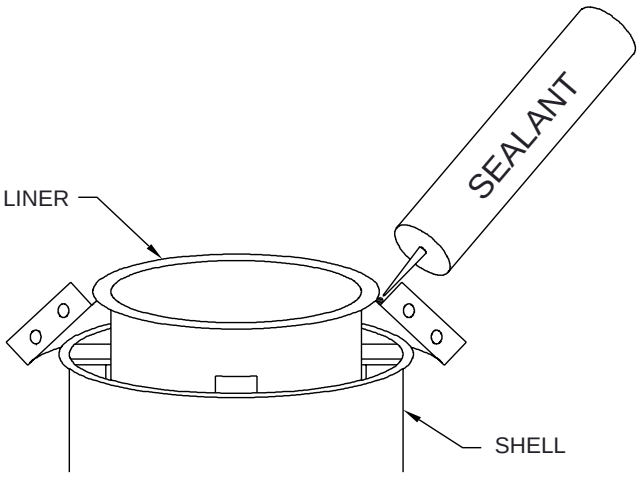


Double Cone Rain Cap
Part DCR
The DCR is for vertical terminations. The Double Cone Rain Cap comes with or without a screen. The part number for a rain cap with screen is (RCS).

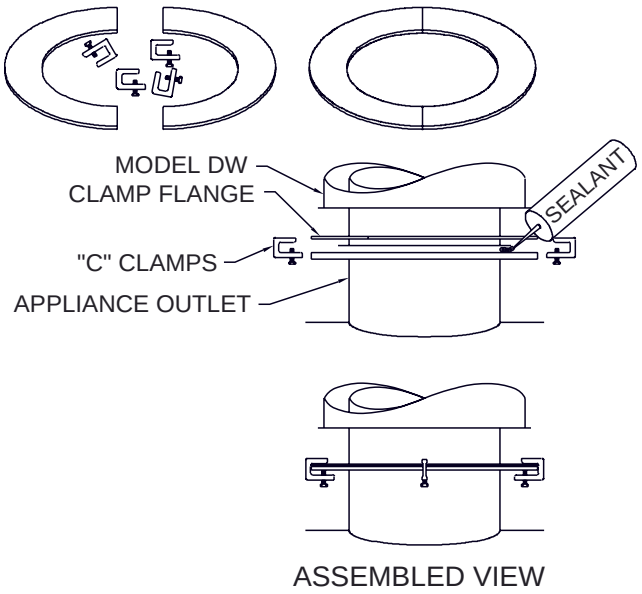
1. Connect Rain Cap to vent pipe with a vee band. Follow instructions for sealant.
2. Fit Rain Skirt around vent liner and snug up against vee band, tighten nuts/bolts.
3. Place a bead of silicone (provided by installer) between rain skirt and vee band for weatherproofing.



Open Top Closure
Part OTC
The OTC is for vertical terminations. The open top closure closes the gap between the liner and the shell. Place OTC around liner, but underneath flange. Bolt in place and put a bead of silicone around the upper portion of the OTC for weatherproofing.



Note: All exterior portions that require silicone



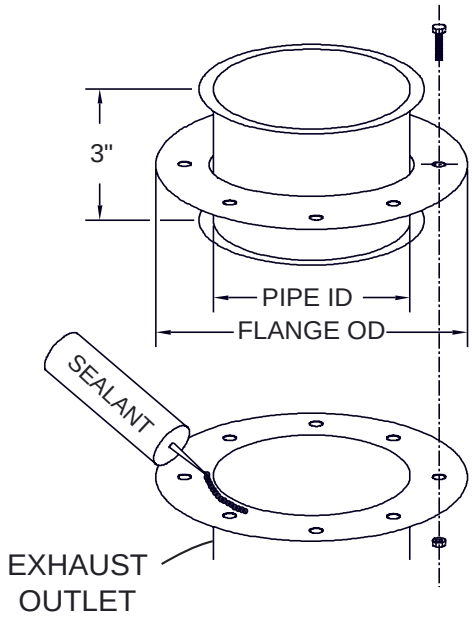
Boiler Adapter Flange
Part BAFA

Use the BAFA when the appliance has a blank flanged outlet. Place a bead of sealant around flanged outlet about 1/8 inch from inside diameter. Next place flue pipe on top of outlet, align, set clamp flange around liner flange of flue pipe, and fasten down with “C” clamps.

Boiler Adapter Flange Chart (Inches)							
ID	6	8	10	12	14	16	18
# Of “C” Clamps	4	4	5	6	7	8	9
ID	20	22	24	26	28	30	32
# Of “C” Clamps	10	11	12	13	14	15	16
ID	34	36	38	40	42	44	46
# Of “C” Clamps	17	18	19	20	21	22	23
ID	48						
# Of “C” Clamps	24						

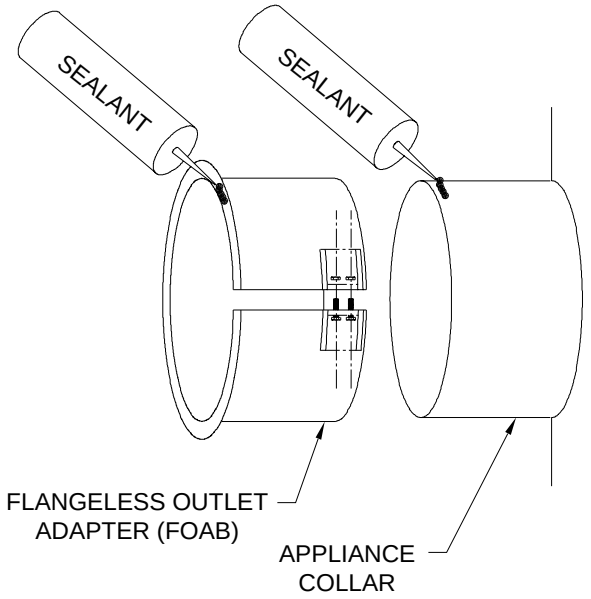
Flange Adapter Kit
Part FAKB

Use the FAKB when the appliance has a 150# drilling (bolt hole pattern). Place a bead of sealant around flanged outlet about 1/8 inch from inside diameter. Next place flue pipe on top of outlet, align, and fasten down with bolts and nuts by installer.



Flange Adapter Chart (Inches)				
Section ID	Flange OD	Bolt Circle	Bolt Holes	
			Qty	Dia
6	11	9-1/2	8	7/8
8	13-1/2	11-3/4	8	7/8
10	16	14-1/4	12	1
12	19	17	12	1
14	21	18-3/4	12	1-1/8
16	23-1/2	21-1/4	16	1-1/8
18	25	22-3/4	16	1-1/4
20	27-1/2	25	20	1-1/4
22	29-1/2	27-1/4	20	1-3/8
24	32	29-1/2	20	1-3/8
26	34-1/4	31-3/4	24	1-3/8
28	36-1/2	34	28	1-3/8
30	38-3/4	36	28	1-3/8
32	41-3/4	38-1/2	28	1-5/8
34	43-3/4	40-1/2	32	1-5/8
36	46	42-3/4	32	1-5/8
38	48-3/4	45-1/4	32	1-5/8
40	50-3/4	47-1/4	36	1-5/8
42	53	49-1/2	36	1-5/8
44	55-1/4	51-3/4	40	1-5/8
46	57-1/4	53-3/4	40	1-5/8
48	59-1/2	56	44	1-5/8

Flangeless Outlet Adapter
Part FOAB-1
Use the FOAB-1 on appliance collars without a flange. Caulk a bead of sealant around the flue collar and place the FOAB-1 around or over the collar. Tighten up snug with nuts and screws supplied by Van-Packer. Place a bead of sealant on the rolled flange of the adapter for preparation of the next joint.



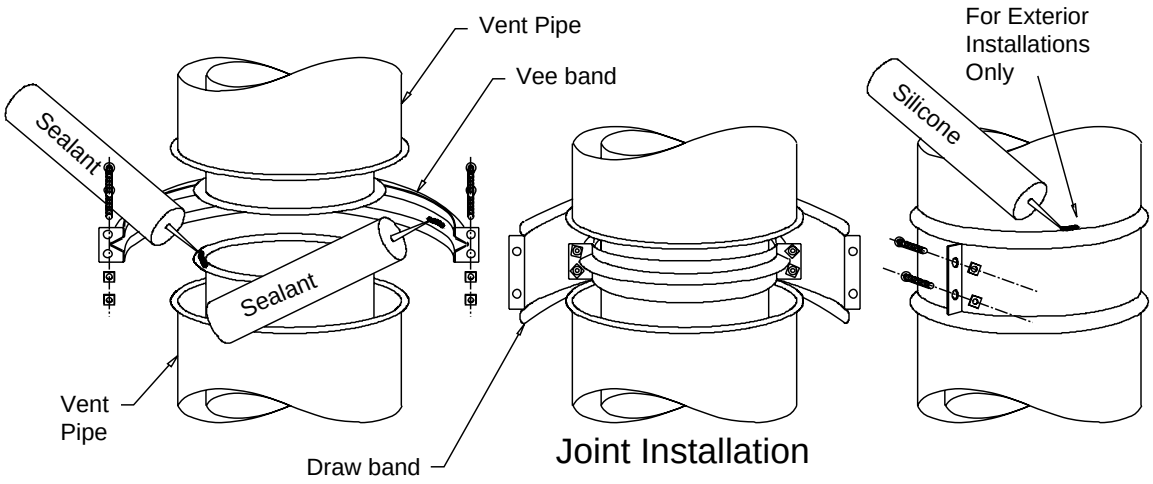
The flangeless outlet adapter is designed to seal the pipe inner wall to an appliance equipped with an un-flanged outlet collar. The FOAB-1 is also ideal for connections to a draft diverter (draft hood), or barometric damper.

The flangeless outlet adapter has two draw-up tabs that allow the joint to be loosened and slid down over the appliance collar. The draw-up tabs draw tight with square nuts and pan head screws. This holds the FOAB-1 to the collar. The first section of piping is connected to the flange of the FOAB-1.

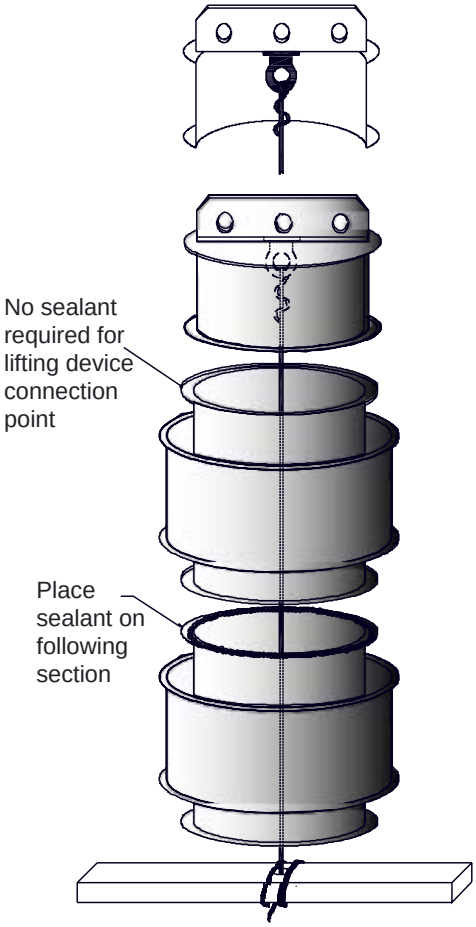
The flangeless outlet adapter *Does Not* provide any type of load bearing support. The *FOAB-1 must always* be isolated from loads and expansion forces. This is done by installing support assemblies above (vertical runs) or breeching supports (horizontal runs) beside the FOAB-1.

Model DW Lifting Device Instructions
(Not UL Listed) See following page for illustrations.

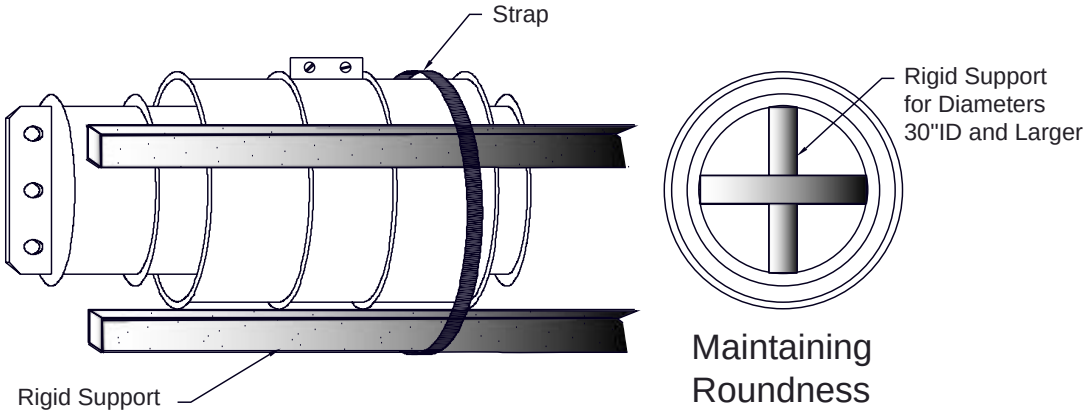
1. Use the lifting device on the top section. Use of sealant will not be required on this joint.
2. A vee band holds the lifting device in place, provided with all parts and pieces shipped from the factory to your jobsite.
3. Install the vee band by wrapping around the flange of the lifting device and the intended top DW chimney section. Use 1/4" diameter bolts to draw the vee band tight (do not over-tighten bolts). Stripping the threads will cause delays and problems. Lightly tap the vee band around the section. This will help draw the vee band closer. After tapping, try to tighten bolts again. Repeat procedure until vee band is snug. See page 19.
4. Assembling in the Vertical:
    a. Start by placing one section in the vertical position and apply joint sealant to the top flange. Once this is complete; set the section with the lifting device already attached on top of the section with sealant.
    b. Install the vee band and drawband in accordance with the installation instructions.
5. Assembling in the Horizontal:
    a. Lay the section with the lifting device already installed on its side. Install following components using vee bands and draw bands in accordance with installation instructions.
    b. Maintain roundness of inner liner with braces (by installer) on diameters 30" and up. Drilling a hole at the center of the crossed braces and attaching a rope will make easy removal after setting joint. Maintaining the roundness at the joint will make assembly easier and minimize the loss of sealant.
    c. Have two points of lifting when moving vent pipe into the vertical. This will allow the bottom section to lift off the ground without damage to the flange. It may be necessary to strap long lengths of supports to it, in order to keep straight and stiff.
6. Safety Cable Attachment:
    Vertical or horizontal lifting requires the use of the pad eye. The pad eye is located inside the top of the lifting device. Installer must provide a safety cable attached to the pad eye. The end of the cable should be attached to a length of support (by installer) that surpasses the width of the inside diameter and ends directly at the last vent pipe. This enables safety for the installer and components if a joint may become dislodged.
7. 30-foot lengths of pipe in all sizes are the maximum capacity of the lifting device.
8. To receive deposit credit, return lifting device to Van-Packer Company in good condition. See following page for demonstrations.



Joint Installation



Safety Cable Attachment



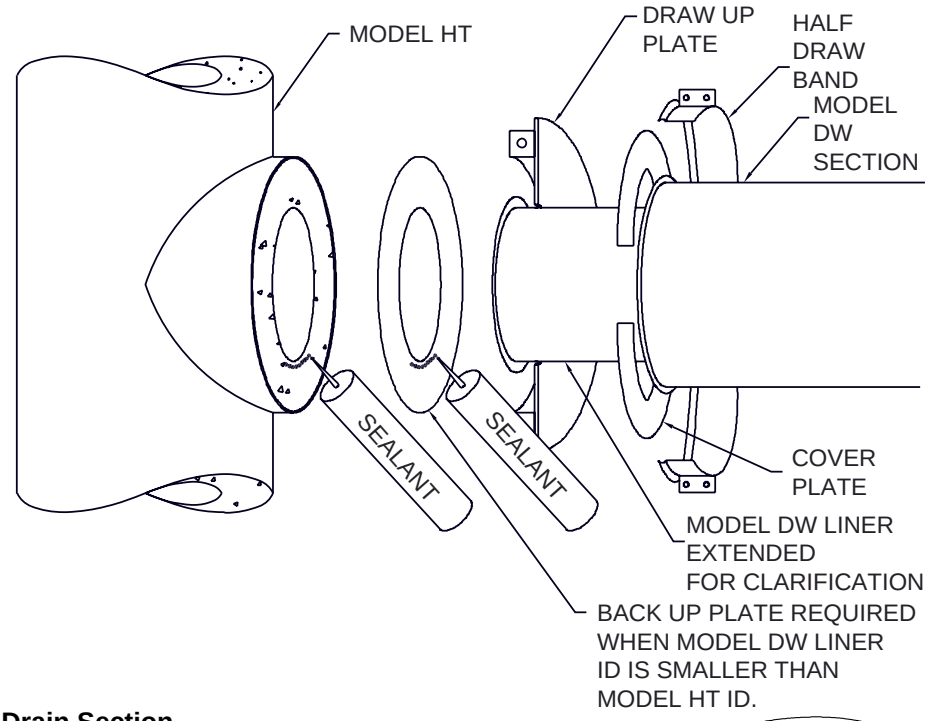
Horizontal Stiffeners

Maintaining Roundness

HT / DW Adapter
Part H/D-6
Use the H/D-6 to connect Model DW Series to Model HT components.

1. Place a 1/4" minimum bead of sealant on the Model HT refractory about 1/4" out from inside diameter.
2. Center Model DW section ID with the Model HT ID and butt together. Make sure sealant is between the Model DW liner flange and the surface of the refractory for a good seal.
3. Back up plates are required when the ID of the Model DW is smaller than the ID of the Model HT.
   3a. Follow step number one.
   3b. Center back up plate with the Model HT and butt together. Make sure sealant is between the plate and the refractory for a good seal.
   3c. Center Model DW section ID with the ID of the back up plate and butt together. Make sure sealant is placed between the Model DW liner flange and the surface of the back up plate for a good seal.
4. Place 2-pc donut plate around joint. Press up and bolt down around refractory. Tap 2-pc donut plate against refractory for a sure fit.
5. When back up plate is *not required*, place half draw band around the Model DW jacket flange with the raw end towards the donut plate and draw up.
6. When back up plate *is required*, place 2-pc cover band around liner and butt up to Model DW jacket flange. Place half draw band around the Model DW jacket flange with the raw end away from donut plate and draw up.

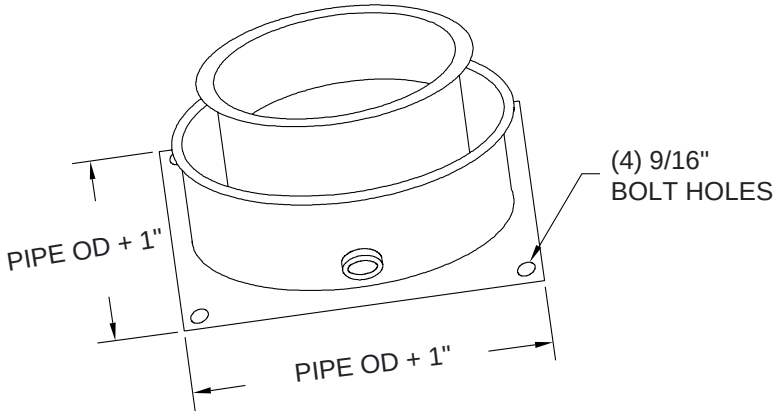
The half draw band and cover band seal off the airspace between the liner and the jacket of the Model DW.



6" Long Base Drain Section
Part BDS
Use this component on vertical chimney installations when supports are not feasible. The BDS permits drainage of rain and or condensation. Completely closes off base of stack. Supplied with a 1" NPT coupling.

1. Install a level pad fabricated of non-combustible material.
2. Install base drain onto pad with (4) 7/16" fasteners (Drill in anchors or "J" hooks). By installer

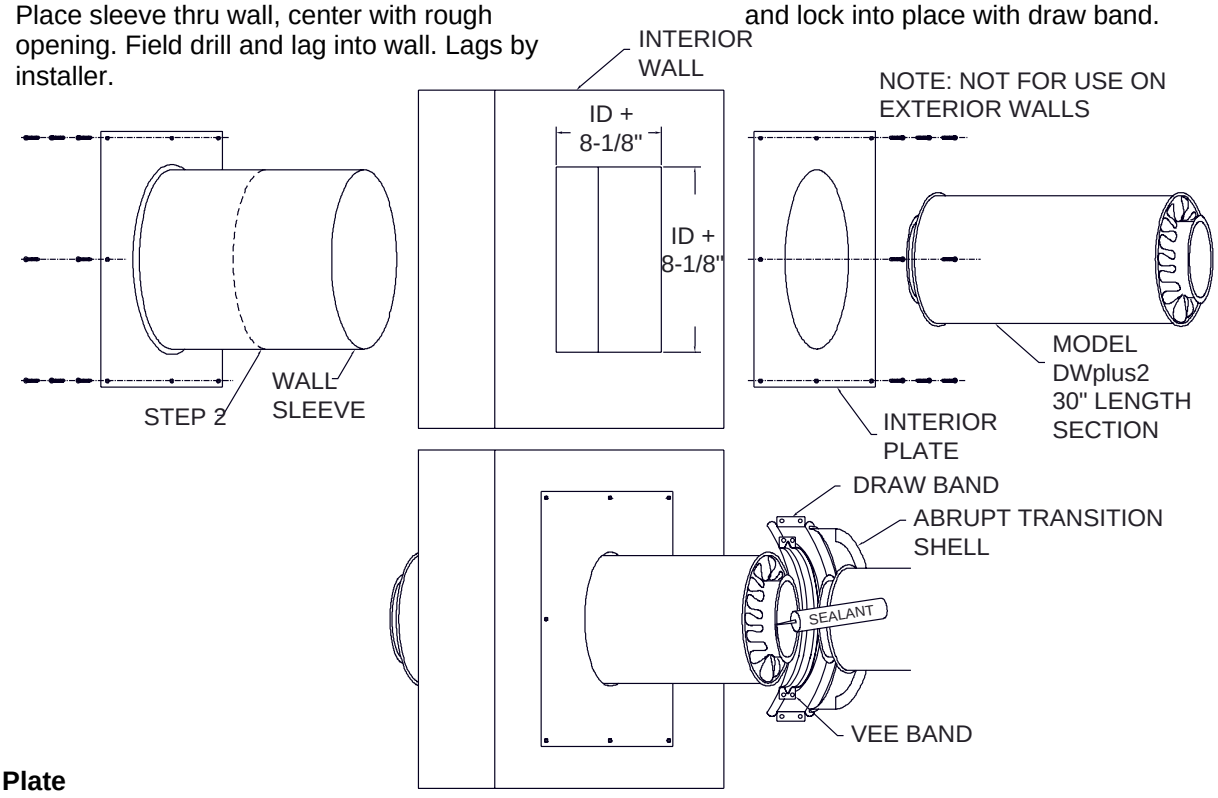
Note: For allowable height above a base drain section use the allowable height chart for straight sections.



Wall Penetration Assembly
Part WPA

Use on interior walls for Models DW, DWplus, and DWplus2.

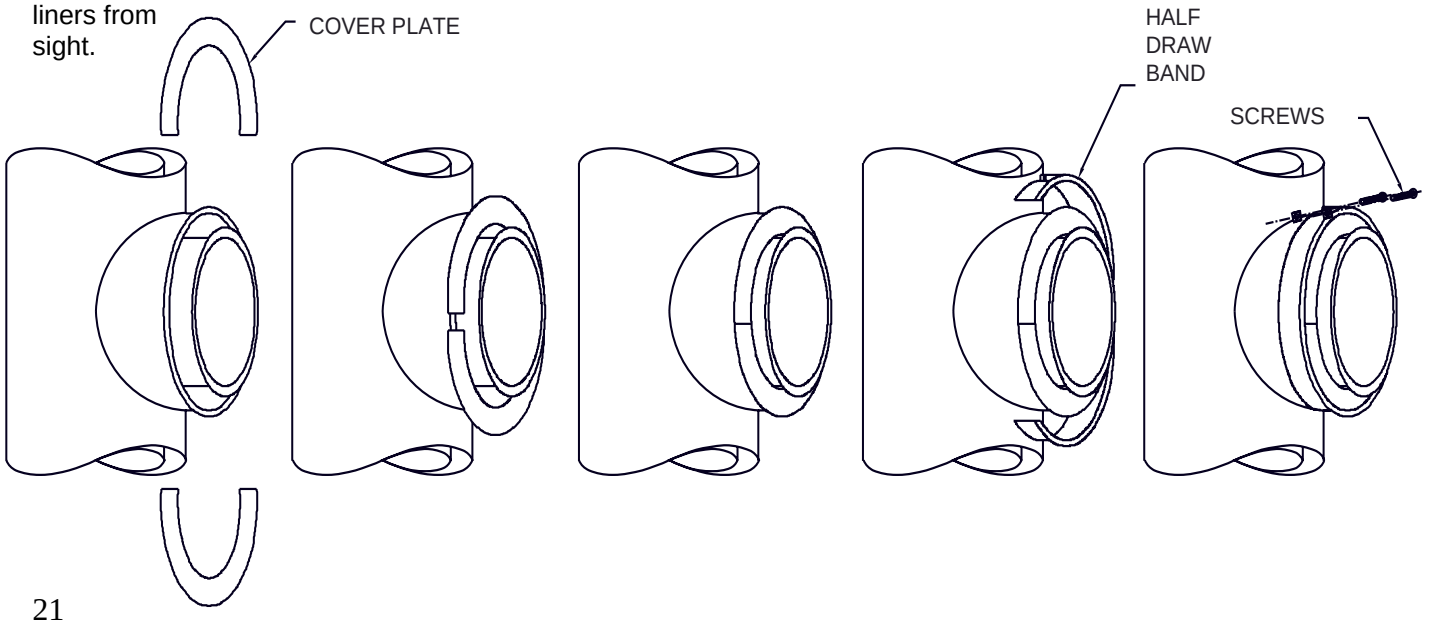
1. The Interior Wall Penetration Assembly requires a rough opening of flue ID plus 8-1/8 inches.
2. Place sleeve thru wall, mark excess penetration, remove from wall and cut off excess.
3. Place sleeve thru wall, center with rough opening. Field drill and lag into wall. Lags by installer.
4. Place interior plate over rough opening and center in place. Field drill and lag into wall. Lags by installer.
5. Slide 30” long DWplus2 section thru opening in wall.
6. Follow installation procedures for vee band, draw band placement. When installing draw band, an abrupt transition shell is required and supplied for Models DW & DWplus. Place transition shell on joining component and lock into place with draw band.



THIS VIEW IS TYPICAL OF BOTH SIDES

Cover Plate
Part CVR

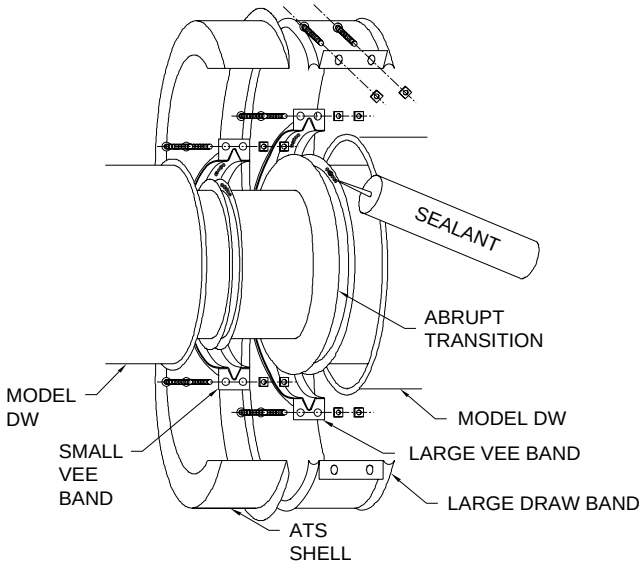
Used as an optional component, the Cover Plate (Part CVR) closes off the space between the liner and the shell. Use the cover plate for a uniform outside appearance or to hide insulation and liners from sight.

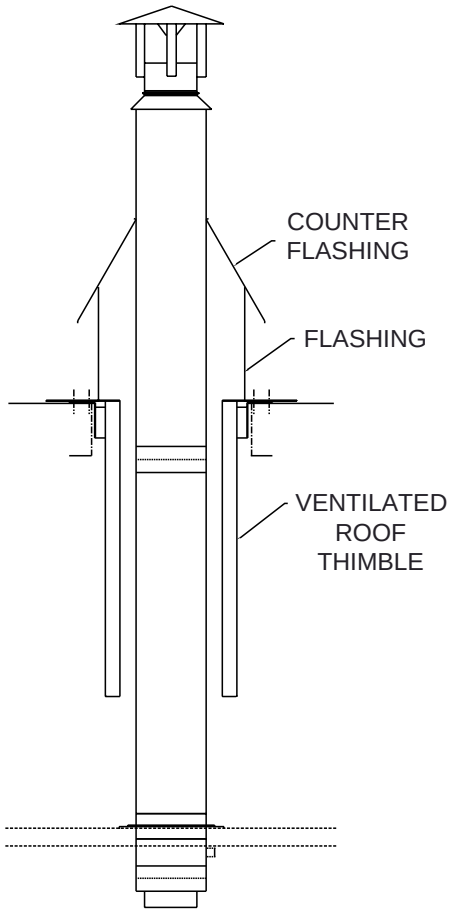


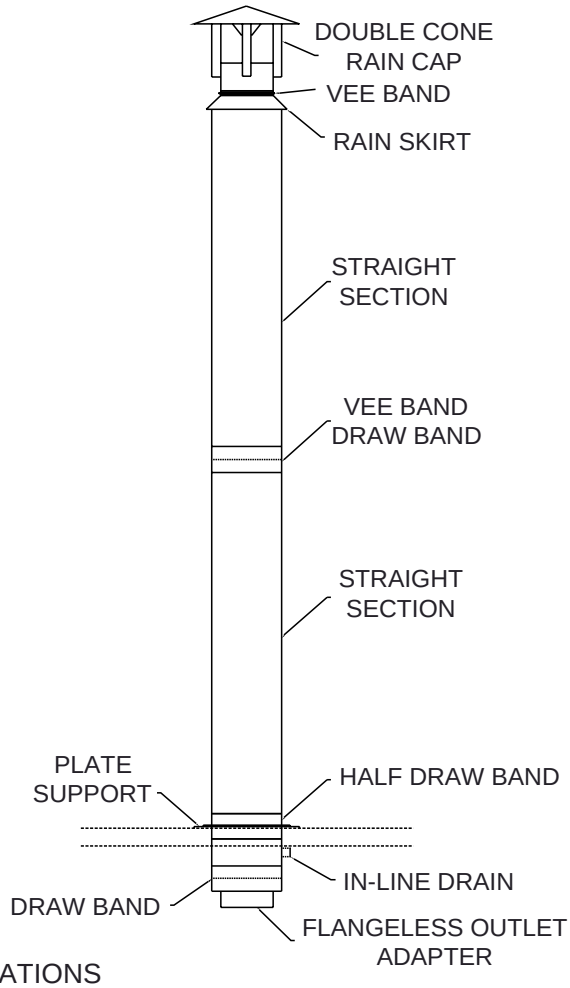
Abrupt Transition
Part ATS

The ATS is a three-inch long component designed for changes in diameters. The component consists of a Liner, Shell, and a Vee band. The ATS does not provide any type of load bearing support. The ATS must always be isolated from loads. Do this by installing a support next to the ATS.

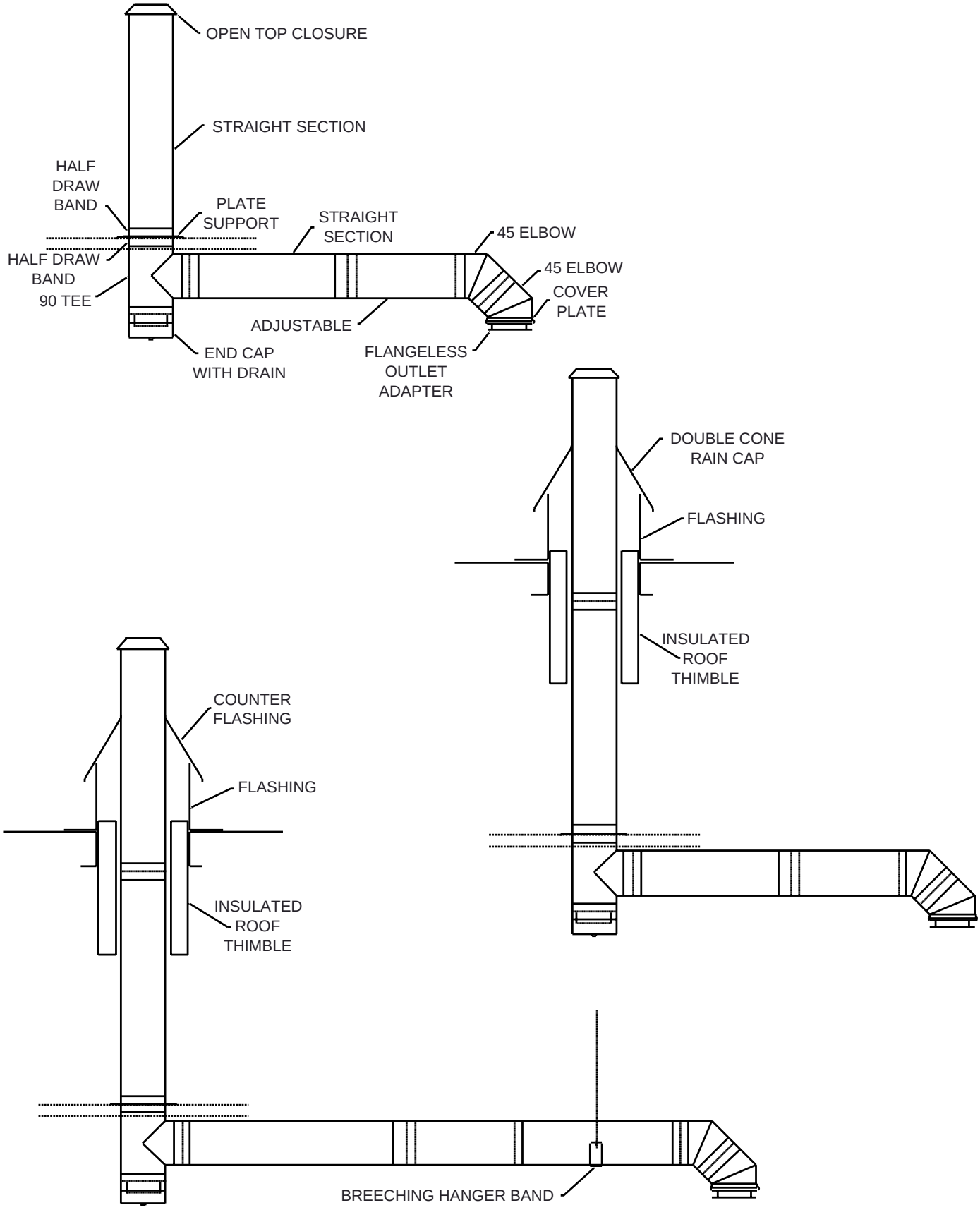
1. Slip ATS Shell over small diameter of pipe prior to installing the ATS Liner.
2. Connect ATS Liner to small diameter of pipe. Follow vee band installation on page 6 & 7.
3. Connect ATS Liner to large diameter of pipe. Follow vee band installations.
4. Install breeching support to either side of ATS.
5. Slide ATS Shell over to large section and install Draw Band.







TYPICAL INSTALLATIONS



TYPICAL INSTALLATIONS

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ALTERNATE POSITIVE PRESSURE SEALANT

High Temperature Sealant
Part 101091

Mixing Instructions

1. Remix dry powder in container. Some separation may occur in shipping. Mixing may be by hand or with a slow speed mixer.
2. Mix 4.5 parts dry powder to 1 part potable water. Mix thoroughly. The mixture should be thick and smooth in texture.
3. For ease of installation, place sealant in empty caulking tubes (provided by Van-Packer), using a Pneumatic Caulking Gun, is recommended.

Note:
For best results, keep the temperature of the powder, water, and chimney parts between 70º and 100ºF (21º and 38ºC) during mixing, use, and curing.

For further information, see Sealant Container.

Components are joined together with a Vee Band, which is placed over the flanges of the adjoining liner and bolted in place. A Draw Band is then fitted over the shell.

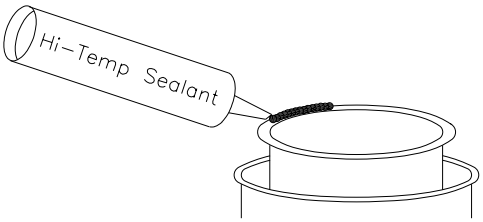

Illustration 1

1. Apply a 1/4” bead of sealant to one of the flanges to be joined.

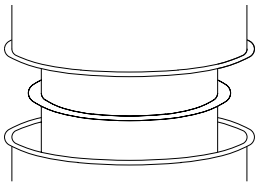

Illustration 2

2. Join the two-flanged ends of the pipe sections together.

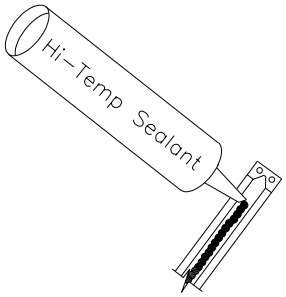

Illustration 3

3. Fill the channel of the Vee Band with sealant.

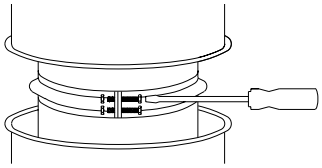

Illustration 4

4. Install Vee Band around flanges. On large diameters it may be necessary to lightly tap the band while tightening, this will ensure a snug fit. 11R VISE-GRIP LOCKING C-CLAMPS will assist in tightening.

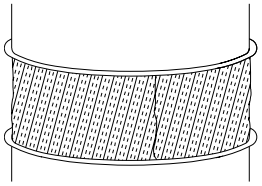

Illustration 5

5. Install insulation strips to ensure all air gaps are filled, if installing Model DWplus Series.

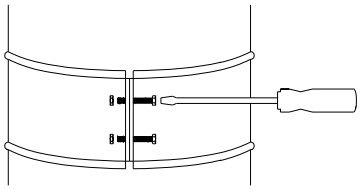

Illustration 6

6. Secure the outer shell with the Draw Band. It is recommended that silicone sealant be applied around the top of the draw band to prevent moisture from entering between the chimney walls. This should only be done on all components exposed to the atmosphere.

NOTE This chimney system is rated for use at maximum 60-inch water column internal pressure when used in Positive Pressure Applications