

## All-in-One Piping System

Positive Pressure Exhaust Systems up to 90-inch water column

- Models SWKL & SWFL - Single Wall
- Models DWKL & DWFL - Double Wall Air & Fiber Insulation

## Installation Instructions



- Engine Exhaust
- Boiler Stack
- Grease Duct
- Gas and Oil Vents
- Chimney Liner

### IMPORTANT

DO NOT INSTALL THESE PRODUCTS UNTIL YOU HAVE READ AND FULLY UNDERSTAND THESE INSTRUCTIONS. FAILURE TO COMPLY WITH THESE INSTRUCTIONS WILL RESULT IN AN IMPROPER INSTALLATION AND WILL VOID THE WARRANTY.

- Examine all components for possible shipping damage prior to installation
- Proper joint assembly is essential for a safe installation – follow these instructions exactly as written and check severeness of joints upon completion of assembly
- This 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
- Different manufacturers have different joint systems and adhesives – do not mix pipe, fittings, or joining methods from different manufacturers

**A MAJOR CAUSE OF VENT RELATED FIRES IS FAILURE TO MAINTAIN REQUIRED CLEARANCES (AIR SPACES) TO COMBUSTIBLE MATERIALS. IT IS OF THE UTMOST IMPORTANCE THAT JEREMIAS SWKL/FL/DWKL/FL SYSTEMS BE INSTALLED ONLY IN ACCORDANCE WITH THESE INSTRUCTIONS.**

**Important:** Read all instructions before beginning the installation. Failure to comply with with these instructions may result in a hazardous installation resulting in injury or damage to property. An improper installation will void the manufacturer's warranty.

Keep these instructions for future reference.

For Technical Support or more product information please contact us at 678-388-2740 or visit our website at [www.jeremiasinc.com](http://www.jeremiasinc.com)

### WARNING

**CARBON MONOXIDE POISONING HAZARD.** Failure to follow the steps outlined below for each appliance connected to the venting system being placed into operation could result in carbon monoxide poisoning or death.

### WARNING

Risk of carbon monoxide poisoning or fire due to joint separation or pipe breakage.

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## SECTION 1 – GENERAL INFORMATION

### **IMPORTANT:**

These instructions must be followed in all details. Failure to do so may result in a hazardous installation. Contact Jeremias Inc. if there are any questions regarding these instructions.

The safe operation of a factory-built chimney assembly is based on the use of parts supplied by Jeremias and the performance of the assembly may be affected if the combination of these parts is not used in actual building construction. Compliance with local code, acceptance by the local code authority (AHJ) and warranty coverage is contingent upon the KL / FL system being installed and maintained in strict accordance with these installation and maintenance instructions.

Contact Local Building or Fire Officials about restrictions and installation inspection in your area.

Jeremias Special Gas Vent must be installed by an experienced professional familiar with the operation and maintenance of heating appliances and venting.

Failure to follow proper installation procedures as described in these instructions, including joint connections, vent pitch and improper appliance connections may cause unsafe conditions.

It is the responsibility of the installer to contact the local authorities having jurisdiction concerning any installation restrictions, including guarding or placement of terminations and/or inspection requirements that may apply.

Permits may be required before starting an installation. This product must be installed in accordance with local building code requirements as well as National codes: USA-National Fuel Gas Code ANSI-Z223.1 or NFPA Standard 54, or NFPA 211. In Canada, CAN/CGA-B149.1 or CAN/CGA-149.2 Propane Installation Code as applicable.

### **Introduction**

Jeremias model KL & FL are factory built stainless steel venting systems intended for use in connecting gas fired heating or hot water appliances, Type 1 and 2 kitchen hoods, cooking ovens, engines, and turbines to the outdoors. There are also many other applications and uses including, but not limited to the following: Engine Exhausts, Chimney Liners, Chutes, Fireplace Chimneys, Dryer Vents, Fume Venting, Industrial Oven and Process Stacks, Incinerator Exhausts, Paint Booth Exhausts, Particle Conveying, and Ventilation Ducts.

The vent segments are easily joined together to form a secure, install leak free vent system. A full range of fittings & accessories are available to accommodate each application.

Each model has several variations including single wall, double wall, material grade, material thickness, insulation type and insulation thickness. These models/variations may be intermixed in the same exhaust or chimney system assuming proper clearances and other installation guidelines are maintained for each system. For purposes of these instructions both models KL and FL as well as all variations will be treated together. Differences in UL listings, installation and weights will be shown where needed. See Product Code Key Section for model details.

## Listings

Model KL & FL are listed to the following Standards:

**UL-1978 Standard, Grease Duct** – under this Listing, Models DWKL, DWKL-Lt, SWKL, SWKL-Lt, DWFL+ & SWFL have been determined suitable for Grease Ducts as defined by NFPA-96, the “Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations”. UL confirmed proper minimum air space clearance to combustibles for 500°F continuous exhaust gas temperatures and 2000°F exhaust gas temperature for 30 minutes simulating a kitchen exhaust fire. UL also confirmed that the installed joints are grease and smoke tight. ULC-S662, (Canadian) Standard for Factory-Built Grease Ducts – under this (c-UL) Listing, Models DWFL and SWFL have been determined suitable for Grease Duct applications in accordance with the National Building Code -2010.

**UL-103 Standard, Building Heating Appliance Chimney Listing / ULC/ORD-C959 Industrial Type 540°C Chimney** – under this Listing, Model DWKL, DWFL & DWFL+ has been determined suitable for venting flue gases from gas, liquid and solid fuel fired appliances at a temperature not exceeding 1000°F (540°C) continuously. 1400°F (760°C) intermittent (maximum one hour), and 1700°F (930°C) brief (maximum 10 minutes) is also permitted under this application. Model SWFL & SWKL Listings for this application are per UL-103 only.

**UL-103 Standard, Additional Type HT Listing** – Model DWKL & DWFL+ (3” to 36” Diameter ONLY) has qualified for UL’s additional, optional Type HT rating for Building Heating Appliance Chimneys which indicates it has been evaluated and found suitable for exposure to 2100°F flue gases for 10 minutes. Many local authority having jurisdictions require a Type HT rating for chimneys for certain appliance venting applications, especially with solid fuel.

**UL-103 Standard, Additional Positive Pressure Listing** – UL has confirmed all the variations of Models DWKL, DWFL & DWFL+ exhaust and chimney system are suitable for use at maximum 90-inch water column internal pressure when used in positive pressure applications. This 90-inch water column was measured after the exhaust was influenced by UL-2561’s continuous 1400°F flue gas temperatures.

**UL-2561 Standard, 1400F Chimney Listing / ULC/ORD-C959 Industrial Type 760°C Chimney** – under this Listing, Model DWKL, DWFL & DWFL+ have been determined suitable for venting flue gases at a temperature not exceeding 1400°F continuously and intermittent service (maximum 10 minutes) at temperatures not exceeding 1800°F.

**UL-1738 Standard, Venting Systems for Gas-Burning Appliances, Categories II, III and IV** - under this Listing and in a category known as “Special Gas Vents”, all variations of Models KL & FL have been determined suitable for venting Category II, III and IV gas-fired appliances Listed in accordance with certain ANSI gas appliance standards. In this application Model DWKL/FL and SWKL/FL are suitable for use at a temperature not exceeding 550°F (288°C) continuously with maximum internal pressure not exceeding 20” water column (9,000 Pascal) for sizes 3”-12” and up to 90 Inch water column (22,400 Pascal) for sizes 13” – 48” diameter.

**ULC-S636 (Canadian) Standard for Type BH Gas Venting Systems** – under this (c-UL) Listing and in a category known as “Type BH Vents”, all variations of Models KL and FL have been determined suitable for venting certain gas fired appliances producing flue gas temperatures not exceeding 245°C (473°F) and positive internal pressures not exceeding 9,000 Pascal(20” water column) for sizes 3”-12” and 22,400 Pascals (90 Inch water column) for sizes 13” – 48” diameter.

**UL-441 Standard, Gas Vents / ULC-S605 (Canadian) Standard for Gas Vents** - under these Listings, all variations of Model DWKL/DWFL have been determined suitable for venting flue gases from gas fired appliances equipped with draft hoods and for venting certain other gas fired appliances specifically Listed for use with Type B Gas Vent.

**UL-641 Standard, Type L Low-Temperature Venting Systems / ULC-S609 (Canadian) Standard for Low-Temperature Vents Type L** - under these Listings, all variations Model DWFL+ & DWKL have been determined suitable for venting flue gases from gas and liquid fuel-burning appliances that exhaust low-temperature flue gases not exceeding 570°F (299°C) and that are Listed for use with Type L venting systems.

**UL-1777 Standard, Chimney Liners** – under this Listing, all variations of Model SWKL & SWFL have been determined suitable for venting flue gases from gas and liquid fuel fired appliances at a temperature not exceeding 570°F (299°C).

**ULC-S635, (Canadian) Standard for Lining Systems for Existing Masonry or Factory-Built Chimneys and Vents** - under this (c-UL) Listing, all variations of Models SWKL & SWFL have been determined suitable for venting flue gases from gas, liquid and solid fuel fired appliances where the temperature of the flue gases does not normally exceed 650°C (1200°F). See separate UL-1777 / ULC-S635 Installation Instructions Addendum for information and requirements specific to chimney liner applications.

**UL 2221 Standard for Tests of Fire Resistive Grease Duct Enclosure Assemblies** – Under this listing, DWFL-ZC has been determined to be an effective grease duct and as a fire rated enclosure system and through penetration firestop system.

**ISO 6944 - Fire Resistance Tests - Ventilation Ducts ANSI/UL 1479 (ASTM E814) - Fire Tests of Penetration Firestops**  
**CAN/ULC-S115 - Method of Fire Tests of Firestops Systems** – Jeremias “-ZC” models carry this listing.

## Product Code Key

Each part manufactured by Jeremias is identified with a product code. The product code contains the Model, Vent size, Part ID, and Other information.

### Part Number Example:

	Family	Model	Diameter	Product ID	Variant	Wall Space
Example	DW	FL	06	45EL	+	1
	SW = Single Wall DW = Double Wall	FL = Flange KL = Conical GV = Gas Vent GD = Grease Duct	03" to 48"		+ = Ceramic Insulation -RX = Mineral Wool insulation -LT = Lower Gauge ( ) = Air Space Insulation Note: DWKL includes Ceramic Insulation	1 = 1.25" Space 2 = 2.25" Space 3 = 3.25" Space 4 = 2.25" Space -ZC = 3.25" Space

## General Installation Requirements

- When venting Cat II, III or IV appliances KL or FL must be used for the entire length of the system.
- Do not mix pipe, fittings or joint methods from different manufacturers.
- Every vent system must be planned and installed for performance and safety.
- The vent system must be free to expand and contract and must be supported as required by 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 the installation and use of the appliance.

Failure to conform to these installation instructions and all applicable codes may result in catastrophic property damage, personal injury or death. These instructions are a guide to assist a professional installer.

- Proper operation of the vent system and appliance depends on the use and correct assembly of all parts specified for a particular installation.
- Tee sections should only be incorporated in conjunction with a drain on appliances tested for use with a drain, or if allowed by the manufacturer, for multiple appliance connections.
- If required by the appliance manufacturer, a drain fitting must be located as close as possible to the appliance's flue outlet. Depending on the arrangement of the vent system, more than one drain may be required. Unless a drain fitting is supplied with the appliance, install a Jeremias drain fitting.
- More than one Category II, III or IV appliance may not be connected to the same vent system unless the appliance manufacturer specifically approved such a system and the appliances are designed for multiple venting. Cat II, III and IV appliances may never be common vented with Cat I natural draft appliances.
- The vent system must not come in contact with plumbing or electrical systems.
- Maintain rated clearances to combustibles over the entire length of the vent system.
- Except for installation in one- or two-family dwellings, a vent system that extends through any zone above that on which the connected appliance is located, shall 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.
- Never install Jeremias Special Gas Vent on an appliance that is not listed for use with a special gas vent or Type BH vent.
- The vent system 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.
- Do not field install insulation in any required clearance around SWKL/FL/DWKL/FL vent system.
- Note: Reference the appliance manufacturer's installation and operating guides and follow any allowances and limitations for elbows.
- Reference the appliance manufacturer's installation and operating guides for maintaining ventilation and air circulation where required.

## Suggested Tools, Equipment & Hardware

Reciprocating & Keyhole Saws	Drill	Plumb Bob, Level & Tape Measure	#3 Phillips Screw Driver
Metal Snips	Hammer	Caulk Gun	5/16" Nut Driver
Screwdrivers	Safety Glasses & Gloves	Ladder	Roofing Nails
High Temp Sealant	8-penny nails	#8 1-1/2" x 2-1/2" screws	Framing Square
Anti-Seize for all Stainless-Steel fasteners			

## Safety Notice

Product has sharp edges. Use extreme caution while working with product. Always wear proper personal protection equipment (gloves, safety glasses, sleeves, etc.) while working with product.

## Enclosures & Clearances

Building Heating Appliance Chimney and Grease Duct systems are intended to be installed unenclosed or with non-combustible enclosures and are not for use in one- or two-story family dwellings.

If the Chimney or Grease Duct passes through any zone or story of a building outside of which the connected appliance or hood is located, it is to be enclosed in non-combustible construction having a fire rating equal to or greater than that of the wall or ceiling through which it passes. Check with the local code authority (AHJ) for material with an appropriate fire rating. Do not wrap or place any type of insulation in the required clearances space surrounding the Chimney in an effort to reduce the clearance to combustibles or to create some sort of fire protective enclosure. Follow NFPA-96 regarding methods of reduced clearances for Grease Ducts.

Where, according to local code, no chase enclosure is required, Model DWKL/DWFL may be installed adjacent to a wall of combustible construction at the minimum airspace clearance specified on each pipe section and in the individual Listing as shown in the following tables.

**Table 1-1 - Clearance to Combustibles – Industrial Chimney & Grease Duct**

Model:	Minimum Airspace Clearance to Combustibles					
	SWKL & SWFL	DWFL (Air)	DWKL & DWFL+1/+2			DWFL-ZC
Application:	Building Heating Appliance & Grease Duct	Building Heating Appliance 1400°F Chimney	Building Heating Appliance 1000°F Chimney	Building Heating Appliance 1400°F Chimney	Grease Duct UL1978	Grease Duct & Fire-Resistant Enclosure UL1978 & UL2221
3" (76mm) - 6" (152mm)	18" (457mm)	4" (102mm)	0.50" (12.7mm)	0.50" (12.7mm)	2" (50.8mm)	0" (0 mm)
7" (178mm)	18" (457mm)	4" (102mm)	0.75" (19.1mm)	0.75" (19.1mm)	2" (50.8mm)	0" (0 mm)
8" (302mm) - 13" (330mm)	18" (457mm)	6" (153mm)	0.75" (19.1mm)	0.75" (19.1mm)	2" (50.8mm)	0" (0 mm)
14" (456mm)	18" (457mm)	12" (305mm)	0.75" (19.1mm)	0.75" (19.1mm)	2" (50.8mm)	0" (0 mm)
16" (406mm) - 24" (863mm)	18" (457mm)	12" (305mm)	1.00" (25.4mm)	1.00" (25.4mm)	3" (76.2mm)	0" (0 mm)
26" (406mm) - 34" (863mm)	18" (457mm)	13" (330mm)	1.00" (25.4mm)	1.00" (25.4mm)	3" (76.2mm)	0" (0 mm)
36" (914mm)	18" (457mm)	13" (330mm)	1.00" (25.4mm)	1.00" (25.4mm)	4" (101.6mm)	0" (0 mm)
38" (965mm) - 48" (1219mm)	18" (457mm)	15" (381mm)	2.00" (50.8mm)	N/A	5" (127mm)	N/A

Special Gas Vent systems are intended to be installed in unenclosed. Some sizes can be installed in enclosed configurations. Reference Table 1-2 and 1-3 for proper clearance to combustibles.

To minimize condensation and protect against mechanical failure, it is recommended to use DWKL/FL double wall gas vent for installations that require more than 5' of exposure in the outdoors.

If the gas vent passes through any zone or story of a building outside of which the connected appliance is located, it is to be enclosed in non-combustible construction having a fire rating equal to or greater than that of the wall or ceiling through which it passes. Check with the Authority Having Jurisdiction for material with an appropriate fire rating.

Where, according to local code, no chase enclosure is required, Model DWKL/FL (all diameters) and SWKL/FL (3" and 4" diameters only) may be installed adjacent to a wall of combustible construction at the minimum clearance specified on each pipe section and in the individual Listing as shown in the following tables.

**Table 1-2 - Clearance to Combustibles - Gas Vent (Single-Wall and Double-Wall Air Insulated)**

		Minimum Airspace Clearance to Combustibles							
Diameter	Model:	SWKL / SWFL Single-Wall Special Gas Vent				DWFL Double-Wall Air Insulated Special Gas Vent			
	Max Flue Gas Temperature	Unenclosed		Enclosed		Unenclosed		Enclosed	
		Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal
3" & 4"	550°F	2"	2"	5"	9"	1"	1"	4"	8"
5" to 12"	550°F	3"	3"	N/A		1"	1"	4"	8"
13" to 18"	550°F	4"	4"	N/A		2.75"	2.75"	N/A	N/A
20" to 24"	550°F	5"	5"	N/A		3.75"	3.75"	N/A	N/A
26" to 30"	550°F	6"	6"	N/A		4.75"	4.75"	N/A	N/A
32" to 36"	550°F	7"	7"	N/A		5.75"	5.75"	N/A	N/A
38" to 48"	550°F	8"	8"	N/A		7"	7"	N/A	N/A
3" to 36"	Class IIC 230°F/110°C Class IIB 194°F/90°C	0"	0"	0"	0.25"	0"	0"	0"	0.25"
		0"	0"	0"	0"	0"	0"	0"	0"
3" to 24"	Type B Vent	N/A				1"			
26" to 36"	Type B Vent	N/A				2"			
38" to 48"	Type B Vent	N/A				3"			

**Table 1-3 - Clearance to Combustibles - Gas Vent (Double-Wall Fiber Insulated)**

		Minimum Airspace Clearance to Combustibles			
Diameter	Model:	DWKL / DWFL+1 & +2 (Double-Wall Fiber Insulated)			
	Max Flue Gas Temperature	Unenclosed		Enclosed	
		Vertical	Horizontal	Vertical	Horizontal
3" to 12"	550°F	0.5"	1"	0.5"	4"
	480 °F	0.5"	1"	0.5"	3"
	400 °F	0"	1"	0"	2"
13" to 18"	550°F	1"	2"	1"	5"
	480 °F	1"	2"	1"	4"
	400 °F	0"	1"	0.5"	3"
20" to 24"	550°F	1"	3"	1"	5"
	480 °F	1"	3"	1"	4"
	400 °F	0"	1"	0.5"	3"
26" to 36"	550°F	1"	5"	1"	6"
	480 °F	1"	5"	1"	4"
	400 °F	0"	1"	1"	4"
38" to 48"	550°F	2"	7"	2"	7"
3" to 36"	Class IIC 230°F/110°C Class IIB 194°F/90°C	0"			
3" to 34"	Type B Vent	1"			
36" to 48"		2"			
3" to 22"		1"			
24" to 36"	Type L Vent	2"			
38" to 48"		3"			

Notes: Unenclosed configuration requires at least one side of the enclosure open.

Regarding above Class IIC and IIB temperatures (for reference purposes) – common plastics used in venting applications are PP (Polypropylene) with limit of 230°F, CPVC with limit of 194°F, and PVC with limit of 148°F.

WARNING: Do not place insulation in the required clearances spaces surrounding the vent system.

### Clearance for Non-combustibles

0" clearance or as required for installation, access, inspection or per local code.

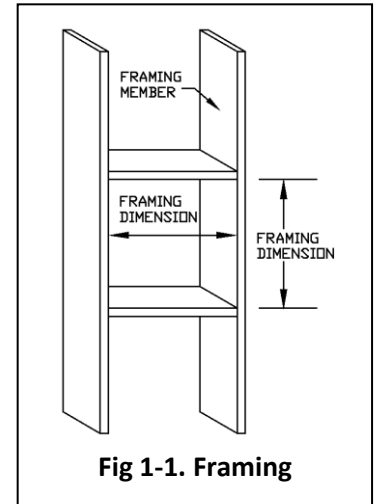
For clearances to combustibles for other items such as thimbles, see SECTION 6 – THIMBLE & FLASHINGS in these instructions.

### Minimum Framing Dimensions through Wall or Ceiling

Where the vent passes through the wall or ceiling, the minimum Clearance to Combustibles must be maintained (See Table 1-4). Framing should also provide support and attachment for roofing and other assemblies.

**Table 1-4 – Minimum Framing Dimensions**

Vent Size (ID) SWKL/FL & DWKL/FL	Vertical Penetration Ceiling/Roof	Horizontal Penetration Wall
3" to 12"	O.D. + 3.5" x O.D. + 3.5"	O.D. + 3.5" x O.D. + 3.5"
13" to 48"	O.D. + 3.5" x O.D. + 3.5"	O.D. + 3.5" x O.D. + 3.5"



**Fig 1-1. Framing**

### Vent Size

Refer to the appliance manufacturer's installation instructions for proper sizing and vent configuration – **contact Jeremias Technical Support for assistance in this regard.**

### Horizontal Installation Requirements / Vent Slope

Any horizontally installed portion of a venting systems shall have a slope upwards not less than  $\frac{1}{4}$ " (6.4mm) every 12" (305mm) and be installed so that condensate flows back toward the appliance or drain. The install must be such to prevent collection of condensates, formation of ice buildup or blockage at any location of the assembly. Condensate must flow freely and may not be retained in any part of the vent system. Refer to appliance manufacturer's installation instructions for further details regarding the installation of condensate drain fittings and the pitch of the system. See Fig. 1-3. As an option, the installer may also use Jeremias 87° elbows and fittings that will create a slope of  $\frac{5}{8}$ " (15.9mm) per every 12" (0.64mm). For Kitchen Ventilation System, see Section 7 for slope requirements.

Application	Minimum Slope
Condensing Gas Vent	$\frac{1}{4}$ " (6.4mm) Rise per 12" (305mm) Horizontal Run
Kitchen Grease Duct	$\frac{1}{16}$ " (1.6mm) Rise per 12" (305mm) Horizontal Run

### Vertical or Through-the-Roof Installation

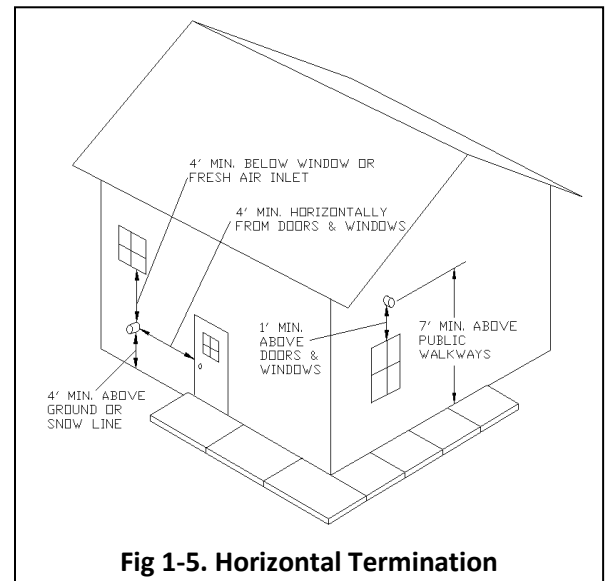
Determine an appropriate path to route the vent system. See Termination Requirements section for guidance on location. See Table 2-2 (DIM C) and Fig 2-1 for Maximum vertical unsupported height above the roof. If the vent length exceeds this figure, it must be re-supported with a Guy Section or other horizontal support. If necessary, cut holes in floors and ceilings to frame firestop plates. Exterior portions of the vent located below the roof line should be enclosed to limit condensation in the system. As an alternate, Model double-wall FL or KL may also be used.

### Termination Requirements

#### Gas Vents

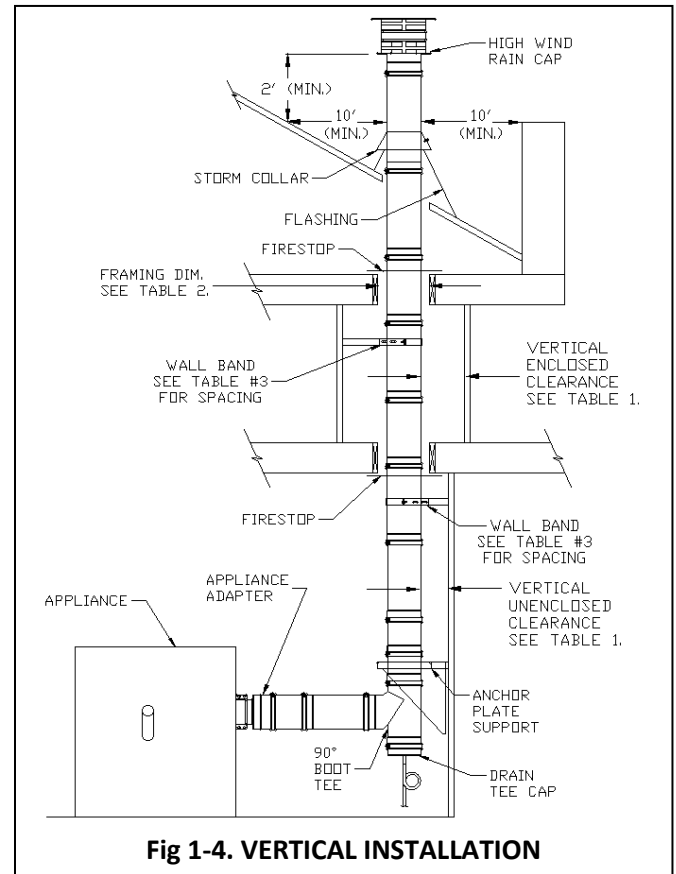
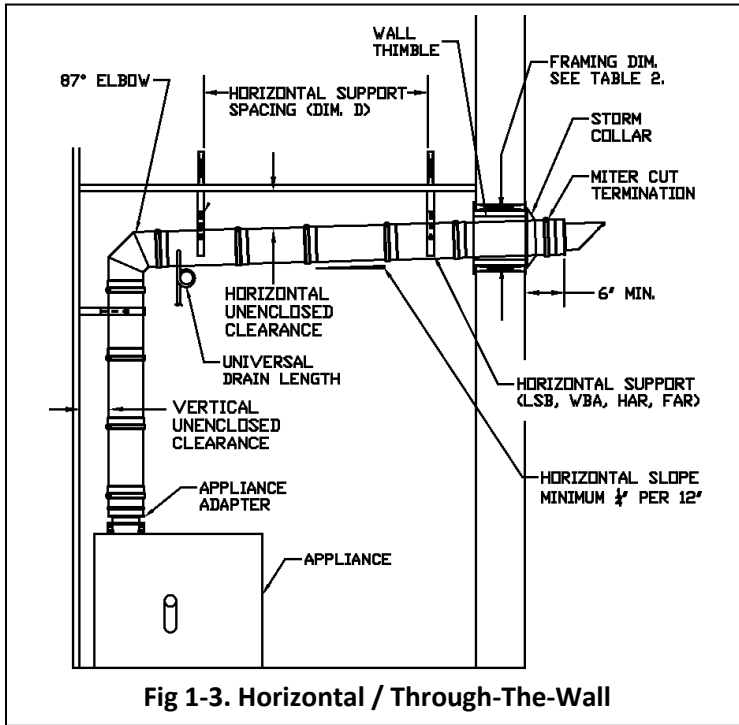
Location of the termination of the venting system should comply with the National Fuel Gas Code, ANSI Z223.1, manufacturer's recommendations and/or applicable local codes. See Diagram for typical terminal locations. See Fig. 1-4 & 1-5.

- When venting through a sidewall, terminate the system not less than 12" (.3m) above the ground and above the snow line in areas where snow accumulates. The termination area must be kept clear of snow and ice at all times.
- 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 or any appliance or 3' (.9m) from any other building opening, gas utility meter, service regulator or the like. It must also terminate at least 3' (.9m) above any forced air inlet within 10' (3.1m) and 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 Code ANSI Z223.1 and NFPA 54. Proper judgment may require greater distances depending on the size of the equipment installed or to allow for snow drift or fall from overhead roofs or trees.
- The termination shall be far enough away from trees, shrubs or decorative items to avoid damage.



**Fig 1-5. Horizontal Termination**

- D. Total vent length from the appliance flue collar to the outside termination shall not exceed the maximum specified by the appliance manufacturer's instructions.
- E. Reference Joint Assembly section for instructions on installing terminations parts. The Termination can be removed for inspection of the vent. Removal is the reverse procedure as defined in Joint Assembly section.



#### Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances

Per NFPA-211, building heating appliance chimneys are required to terminate a minimum of 3' above the highest point where it passes through a roof of a building and a minimum of 2' higher than any part of the building within a horizontal distance of 10'. There are exceptions to this requirement, such as mechanical draft and various listed appliances with other requirements, so consult with the Authority Having Jurisdiction for actual requirements if in question.

#### Commercial Cooking Operations

Strictly follow NFPA-96 for the termination requirements for Grease Duct and/or kitchen exhaust duct systems.

## PIPE WEIGHT

The approximate installed weight of the DWKL/FL and SWKL/FL exhaust systems can be found using Table 1-5. This table does not include accessories such as supports and guides, nor shipping packaging or palletizing weight (See Table 1-5).

**Table 1-5. DWKL/FL & SWKL/FL Installed Weight (Lb./ft)**

Model	DWKL	DWK L-Rx	DWKL -Lt	DWK L -Vt	SWKL	SWKL -Lt -Vt	DWFL	DWFL +1	DWFL +2	DWFL +3	DWFL +4	DWFL -ZC	SWFL
Wall Thickness	1.25"	1.25"	1.25"		N/A	N/A	1.25"	1.25"	2.25"	3.25"	4.25"	3.25"	N/A
Insulation Type	Ceramic Fiber	Fiber	Ceramic Fiber	Fiber	N/A	N/A	Air	Ceramic Fiber	Ceramic Fiber	Ceramic Fiber	Ceramic Fiber	Cerami c Fiber	N/A
Inside Diameter	lb/ft	lb/ft	lb/ft	lb/ft	lb/ft	lb/ft	lb/ft	lb/ft	lb/ft	lb/ft	lb/ft	lb/ft	lb/ft
3"	3.5	3.5	3	2.83	1.1	0.6	3.3	4.4	6.0	8.1	10.6	10.1	1.3
4"	4.4	4.4	3.8	3.48	1.5	0.9	4.1	5.5	7.2	9.5	12.1	11.7	1.7
5"	5.3	5.3	4.4	4.13	1.9	1.1	4.9	6.5	8.4	10.9	13.7	13.4	2.1
6"	6.3	6.3	5.4	4.78	2.2	1.3	5.7	7.6	9.6	12.2	15.2	15.0	2.5
7"	7.2	7.2	6.1	5.42	2.6	1.5	6.5	8.6	10.7	13.6	16.7	16.7	2.9
8"	8.1	8.1	6.8	6.07	3.0	1.7	7.2	9.7	11.9	14.9	18.2	18.3	3.4
9"	9.1	9.1	7.6	6.72	3.4	1.9	8.0	10.7	13.1	16.3	19.8	20.0	3.8
10"	10	10	8.4	7.37	3.7	2.1	8.8	11.8	14.3	17.6	21.3	21.6	4.2
11"	10.9	10.9	9.1	8.01	4.1	2.3	9.6	12.8	15.4	19.0	22.8	23.3	4.6
12"	11.9	11.9	10	8.66	4.5	2.6	10.4	13.8	16.6	20.3	24.3	25.0	5
13"	12.8	12.8	10.7	9.31	4.9	2.8	11.2	14.9	17.8	21.7	25.9	26.6	5.4
14"	13.8	13.8	11.6	9.96	5.2	3.0	12.0	15.9	19.0	23.0	27.4	28.3	5.8
16"	15.6	15.6	13	11.25	6.0	3.4	13.5	18.0	21.3	25.7	30.4	31.6	6.7
18"	17.5	17.5	14.6	12.55	6.7	3.8	15.1	20.1	23.7	28.4	33.5	34.9	7.5
20"	19.4	19.4	16.2	13.84	7.5	4.3	16.7	22.2	26.0	31.1	36.6	38.2	8.3
22"	21.3	21.3	17.8	15.13	8.2	4.7	18.2	24.3	28.4	33.8	39.6	41.5	9.2
24"	23.1	23.1	19.2	16.43	9.0	5.1	19.8	26.4	30.7	36.5	42.7	44.8	10
26"	23.7	23.7	N/A	N/A	9.5	N/A	21.4	28.5	33.1	39.2	45.7	48.1	10.8
28"	25.5	25.5	N/A	N/A	10.3	N/A	22.9	30.6	35.4	41.9	48.8	51.4	11.7
30"	27.2	27.2	N/A	N/A	11.0	N/A	24.5	32.7	37.8	44.6	51.8	54.7	12.5
32"	29	29	N/A	N/A	11.7	N/A	26.1	34.7	40.1	47.3	54.9	58.1	13.3
34"	30.7	30.7	N/A	N/A	12.5	N/A	27.7	36.8	42.5	50.0	57.9	61.4	14.2
36"	32.5	32.5	N/A	N/A	13.2	N/A	29.2	38.9	44.8	52.7	61.0	64.7	15
38"	45.0	45.0	N/A	N/A	19.3	N/A	41.2	51.4	57.8	66.3	75.1	78.8	21.7
40"	47.3	47.3	N/A	N/A	20.3	N/A	43.3	54.1	60.7	69.5	78.7	82.7	22.8
42"	49.6	49.6	N/A	N/A	21.3	N/A	45.4	56.7	63.6	72.8	82.3	86.5	24.0
44"	51.9	51.9	N/A	N/A	22.3	N/A	47.5	59.3	66.5	76.0	85.8	90.4	25.1
46"	54.2	54.2	N/A	N/A	23.3	N/A	49.6	61.9	69.4	79.2	89.4	94.2	26.3
48"	56.5	56.5	N/A	N/A	24.3	N/A	51.7	64.5	72.3	82.4	93.0	98.0	27.4

## Model KL

Models DWKL and SWKL are cylindrical, factory built, modular exhaust systems that incorporate a steel to steel conical joint and clamp system for quick and easy assembly in the field. The conical joint is tapped in place creating a gas and liquid tight seal where sealant is not needed.

The conical joints have a 2.2" wide steel to steel surface overlap area at each connection allowing greater stiffness, sealing, and durability.

The double wall Model DWKL is insulated with 1¼" thick compressed fiber which allows the inner and outer pipes to stay aligned, without the use of additional clips or brackets, eliminating hot spots at the joint connections.

Features of Model DWKL double wall and fiber insulated include:

- Easier to clean than field welded rectangular
- Reduced clearance to combustibles
- Reduced outer pipe skin temperatures
- Reduced building heat gain
- Increased efficiencies of energy recovery systems
- Reduced noise levels caused by high velocity exhausts

The single wall Model SWKL can be used as an option for Unlisted Metal Chimneys (Smokestacks) or single wall Steel Pipe Connectors as defined by NFPA-211. Model SWKL is intended for an entirely non-combustible surrounding and must be installed in strict accordance with NFPA-211 requirements for single wall stacks and connectors.

Further features of Model SWKL single wall include:

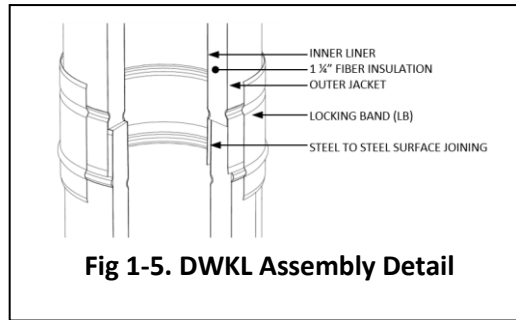
- No field welding
- All stainless-steel construction
- Smooth flowing inner liner
- Wide array of accessories such as supports and drains
- May be connected to and from DWKL

## Joint Assembly – Model KL

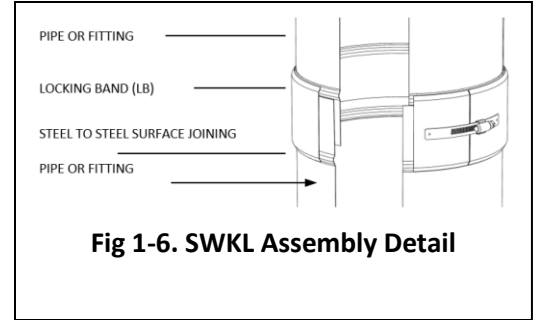
The Model KL joint system is designed for a quick and easy installation. The procedure for DW Double-wall and SW single-wall are identical. See Figs 1-5 to 1-10.

To Assemble:

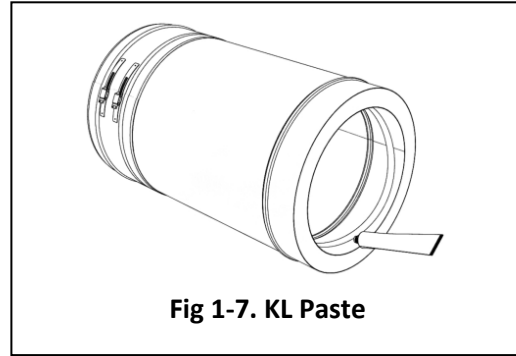
1. Clean the inner side of the female end and the outer side of the male end of each inner liner. Apply the KL Paste to the female end.
2. Position both pipes so they are in alignment. Engage the pipes and press them together as much as possible by hand.
3. Position the Wood Plate (supplied with shipment) and on the end of the assembly.
4. Tap Wood Plate 2-3 times. Make sure to push both inner and outer pipes at the same time; the inner should not be more than 1/8" longer than the outer pipe once the male/female conical ends are engaged.
5. Position the Locking Band (LB) around the joint and ensure grooves in LB are seated in the Pipe grooves.
6. Secure LB, using 5/16" nut driver or flat-head screwdriver to tighten gear clamps



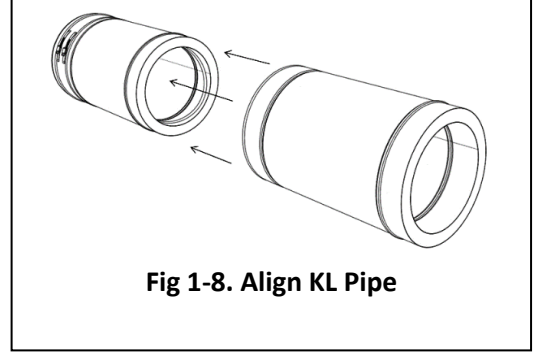
**Fig 1-5. DWKL Assembly Detail**



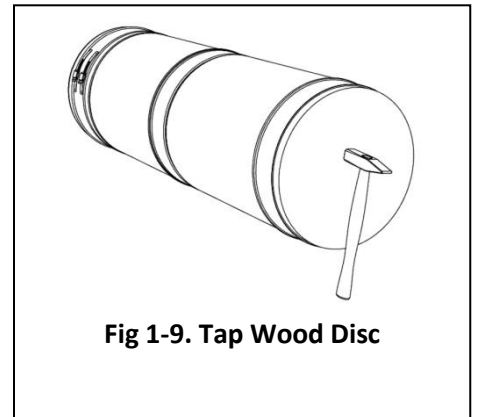
**Fig 1-6. SWKL Assembly Detail**



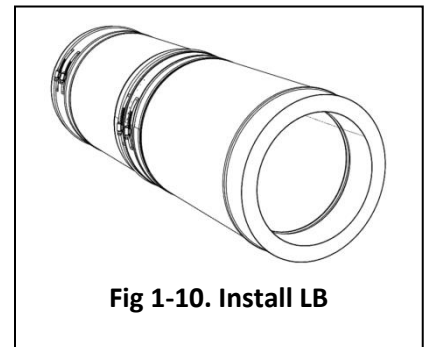
**Fig 1-7. KL Paste**



**Fig 1-8. Align KL Pipe**



**Fig 1-9. Tap Wood Disc**



**Fig 1-10. Install LB**

### Installed Vent Length

Due to the engagement of the vent sections, the effective installed length of any vent pipe or fitting is 2-3/16" less than the described length.

### KL Paste

KL Paste is a ceramic lubricating and assembly paste. The purpose is to help guide the pipe connections to assure the best steel to steel connection. It also seals the joint by allowing the ceramic to fill any microscopic steel imperfections. On fittings it will help the installer rotate to the correct position before tapping in place.

Use approximately 1 teaspoon of paste per 24" length of joint perimeter. Example: 10 inch diameter has 31" of perimeter length, so use about 1.3 teaspoons per each 10 inch joint connection. Below table allows for a 20% waste.

Table 1-1. No. of Joints per 3.5 oz Tube KL Paste											
Ø	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"
#	42.6	32.0	25.6	21.3	18.2	16.0	14.2	12.8	11.6	10.6	9.8
14"	16"	18"	20"	22"	24"	26"	28"	30"	32"	34"	36"
9.1	8.0	7.1	6.4	5.8	5.3	4.9	4.5	4.2	4.0	3.7	3.5
38"	40"	42"	44"	46"	48"						
3.3	3.1	3.0	2.9	2.8	2.6						

## Joint Assembly – Model FL

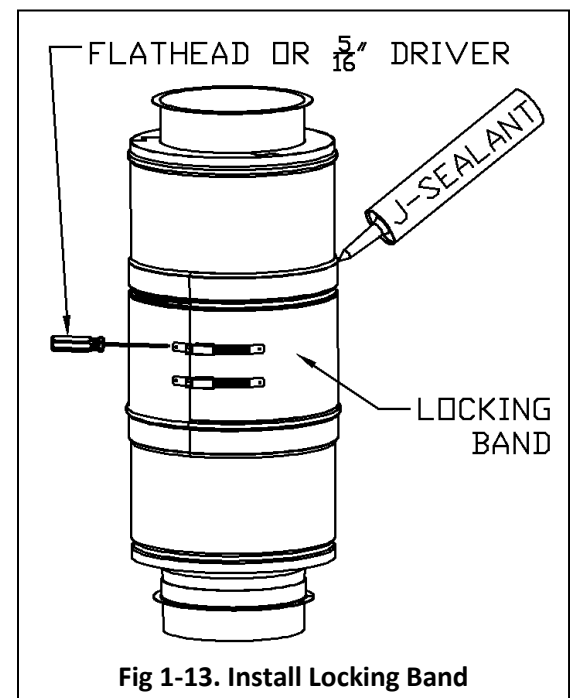
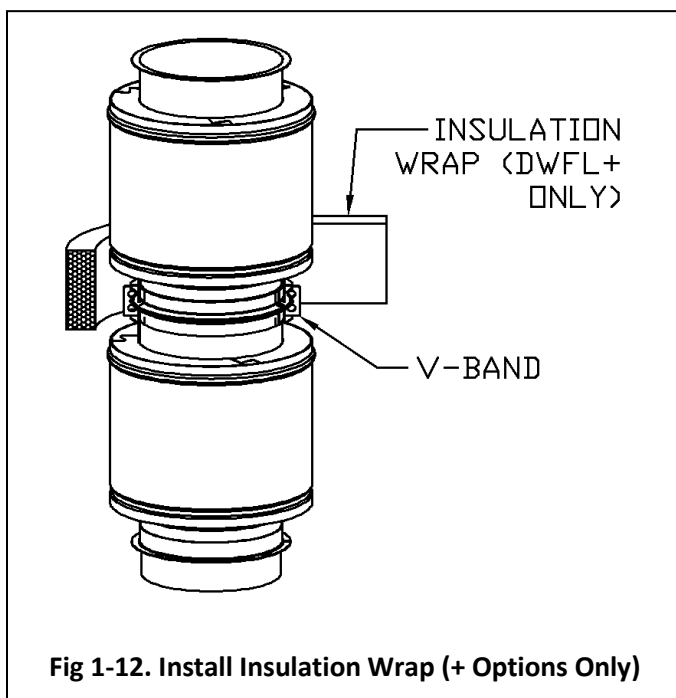
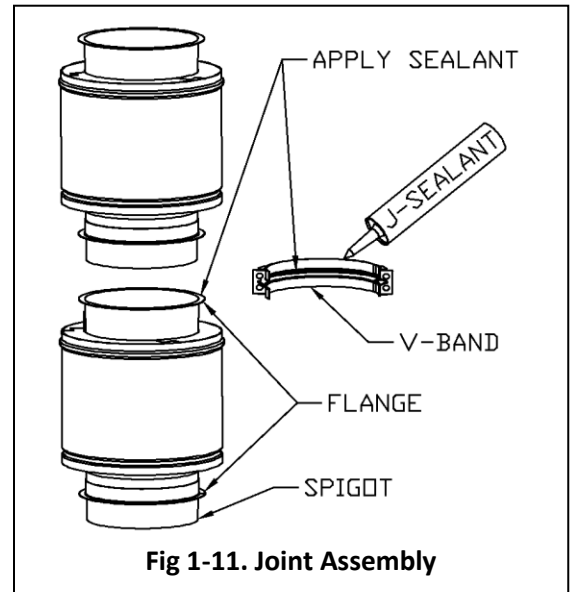
Model FL inner connection has 1.25" overlapping joint with ½" rolled flanges that are connected with a V-Band. The overlapping "spigot" facilitates alignment of pipe sections, provides support during assembly and protects the sealed joint during cleaning. The spigot should always be positioned down, back toward the appliance. Follow the flow direction arrow on the product label. If necessary, it is permissible to remove the spigot (with a cutting wheel or similar) to allow installation in tight spaces.

To Install:

1. Position the pipe so the UP/FLOW arrow is in the direction of the flue gas flow
2. Select correct sealant based on flue gas and application:
  - a. J-2000 Sealant for Flue Gas temperatures up to 2,000F. High temperature Heating system or Engine exhaust
  - b. J-600 Sealant for Flue Gas temperatures up to 600F. Low temperature heating system or Grease Duct.
3. Prepare all surfaces where sealant will be applied. Be sure all surfaces are clean of dirt and oil. Follow preparation instructions included with corresponding sealant.
4. Apply J- Sealant continuously (1/4" bead minimum) to the flange surface of the pipe (See Fig 1-11)
5. Join Flanged surfaces together. Ensure the Flow arrows are in the direction of the flue gas flow
6. Apply sealant to the inner groove of the V-Band (see Fig 1-11)
7. Position the V-Band around the joint, capturing the flanges in the groove of the V-Band
8. Install fasteners in V-Band retainer and tighten hardware. Tap the V-band to allow it to seat tightly against the flange.
9. Wrap the joint with insulation (DWFL+ only). See Fig 1-12.
10. Position the Locking Band (LB) around the outer pipe (DWFL Only)
11. Tighten hardware on Locking Band to secure (flat head screw driver or 5/16" nut driver)
12. For exterior installations, apply Dow 732 (grey) sealant around the circumference of the locking band seam. See Fig 1-13.

Diameter	# of Joints
3" - 6"	10
8" - 10"	9
11" - 12"	8
13" - 16"	7
18" - 20"	6
22" - 24"	5
26" - 28"	4
30" - 32"	3
34" - 36"	2
38" - 48"	1

**Table 1-6. Sealant Usage Chart**



## SECTION 2 – SUPPORT & GUIDING

### Vertical Support Spacing and Limits

FL & KL pipe vent must be supported properly. Several support options are available. Refer to Table 2-1 and Fig 2-1 (Dim A) for maximum support height capabilities. For all support options, ensure non-combustible hanger straps (or similar) are secured into joists or other solid structures. Ensure all minimum clearances to combustibles are maintained. Never drill or screw through the vent system. Additional support must always be located at an elbow or offset to prevent unacceptable stress on that fitting.

**Table 2-1 – Maximum Support Height (Dim A)**

Diameter	Dim A - Maximum Support Height (Feet)											
	DWKL DWKL- Rx	DWKL-Lt	DWKL-Vt	SWKL	SWKL-Lt SWKL-Vt	DWFL	DWFL+1	DWFL+2	DWFL+3	DWFL+4	DWFL- ZC	SWFL
Anchor Plate Support (APS) or Plate Support (PS)												
3" - 6"	300	300	300	300	300	330	239	198	155	124	126	264
7" - 10"	208	248	282	300	275	233	172	146	118	98	96	264
11" - 13"	162	194	223	300	200	183	136	117	96	80	78	272
14" - 18"	119	142	166	300	200	135	101	88	73	62	60	268
20" - 24"	90	108	127	231	150	103	77	68	57	49	46	208
26" - 30"	88	N/A	N/A	222	N/A	97	70	63	54	46	44	195
32" - 36"	86	N/A	N/A	213	N/A	95	69	62	53	46	43	187
38" - 48"	36	N/A	N/A	84	N/A	40	32	28	25	22	21	75
Anchor Plate Support (APS) or Plate Support (PS) with Heavy Duty Base (HDB)												
3" - 6"	300	300	300	300	300	330	239	198	155	124	126	264
7" - 10"	300	300	300	300	275	336	247	210	170	141	139	264
11" - 13"	300	300	300	300	200	338	251	216	177	148	144	272
14" - 18"	224	269	300	300	200	255	191	166	138	117	112	268
20" - 24"	170	205	239	300	150	194	146	128	108	92	88	270
26" - 30"	111	N/A	N/A	275	N/A	122	89	80	68	58	55	242
32" - 36"	93	N/A	N/A	230	N/A	102	75	67	57	50	47	202
38" - 48"	39	N/A	N/A	91	N/A	43	34	31	27	24	23	81
Anchor Plate Support (APS) or Plate Support (PS) with Wall Bracket (WB)												
3" - 6"	70	81	92	200	300	77	56	46	36	29	29	176
7" - 10"	44	52	60	119	208	49	36	31	25	21	20	105
11" - 13"	34	41	47	90	157	38	28	24	20	17	16	82
14" - 18"	25	30	35	66	115	28	21	18	15	13	13	59
20" - 24"	19	23	27	49	85	22	16	14	12	10	10	44
26" - 30"	12	N/A	N/A	29	N/A	13	10	9	7	6	6	26
32" - 36"	10	N/A	N/A	24	N/A	11	8	7	6	5	5	21

### Vertical Guide Spacing

In addition to vertical support, SWKL/FL & DWKL/FL systems require guides to maintain proper alignment of the system and lateral support for wind loads. Refer to Table 2-1 & Fig. 2-1 (Dim B) for Vertical Guide Spacing. Applicable vertical guides are FAR Full Angle Ring, LSB Light Support Band, and GWB Guy Wires Band. For Maximum Vertical Unsupported (Freestanding) Height above the support see Dim. C.

**Table 2-2 – Vertical Guide Spacing Between Supports (Dim B) & Max Vertical Unsupported / Freestanding Height Above Support (Dim. C)**

Diameter	DWKL, -Rx, SWKL, SWFL DWFL (+1, 2, 3, 4, ZC) (Dim. B)	(Dim. C)	DWKL -Vt DWKL - Lt (Dim. B)	(Dim. C)	SWKL-Vt SWKL-Lt (Dim. B)	(Dim. C)
3" - 24"	19'6"	10'	14'7"	7'6"	11'2"	5'9"
26" - 48"	20'4"	8' 2"	N/A	N/A	N/A	N/A

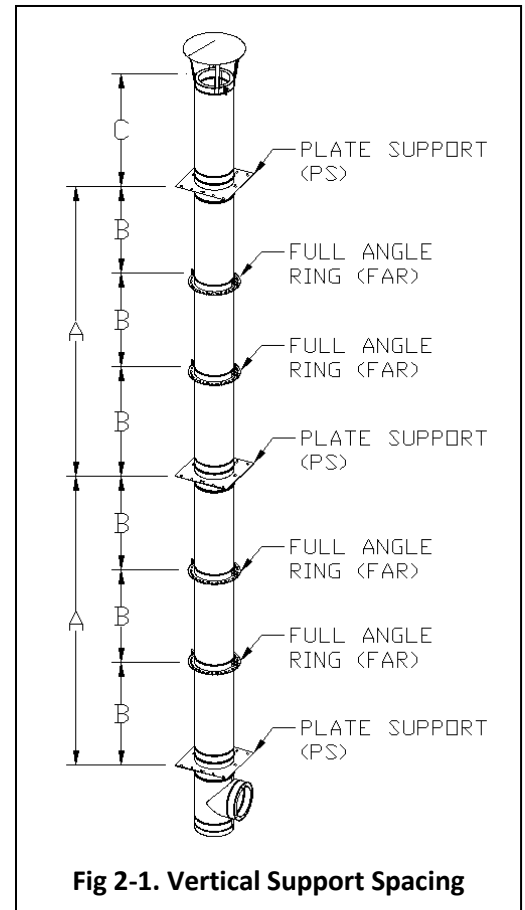
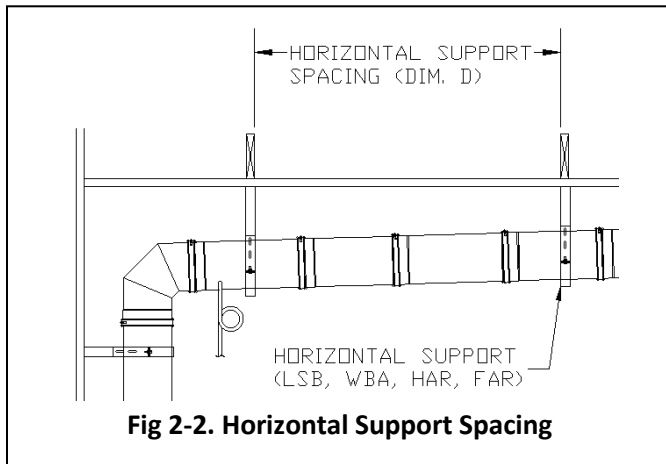
## Horizontal Support Spacing

Horizontal installations of KL & FL systems require guides to maintain proper alignment of the system and lateral support for wind loads. Refer to Table 2-3 and Fig. 2-2 for Horizontal Spacing.

Applicable horizontal supports are FAR Full Angle Ring, HAR Half Angle Ring, LSB Light Support Band, and GWB Guy Wires Band. Refer to corresponding section for detailed instructions.

**Table 2-3 – Maximum Horizontal Support Spacing Between Supports (Dim. D).**

Diameter	DWKL, -Rx SWKL, SWFL DWFL (+1, 2, 3, 4, ZC)	DWKL-Vt DWKL-Lt	SWKL-Vt SWKL-Lt
3" – 14"	15'	11' 4"	8' 7"
16" – 24"	12'	6' 9"	5'
26" – 36"	9'	N/A	N/A
38" – 48"	8'	N/A	N/A



## Anchor Plate Support (APS) & Wall Brackets (WB)

The APS is a section of vent that is used to provide vertical support. It can be supported with standard Wall Brackets (WB) or with field fabricated supports.

To Install (See Fig 2-3):

1. Use supplied fasteners to bolt APS to WB (optional) or other support member.
2. Secure WB or other support member to joist or other solid structure.
3. Install adjoining vent sections as described in Joint Assembly section.

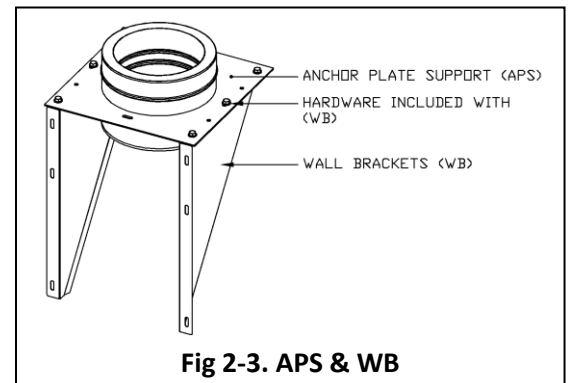
## Plate Support (PS)

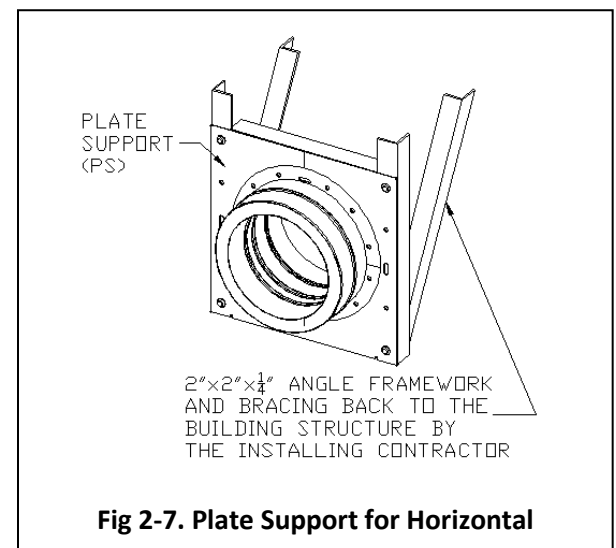
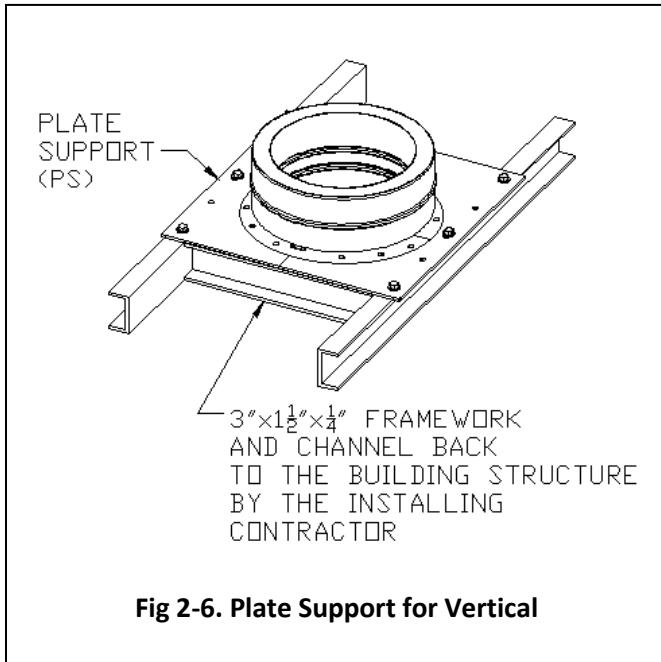
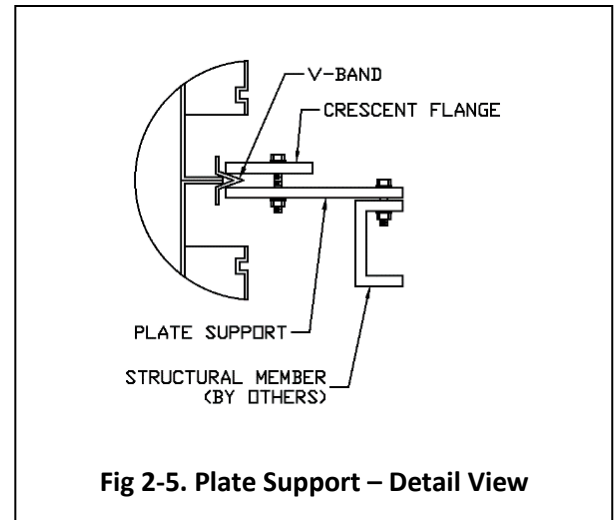
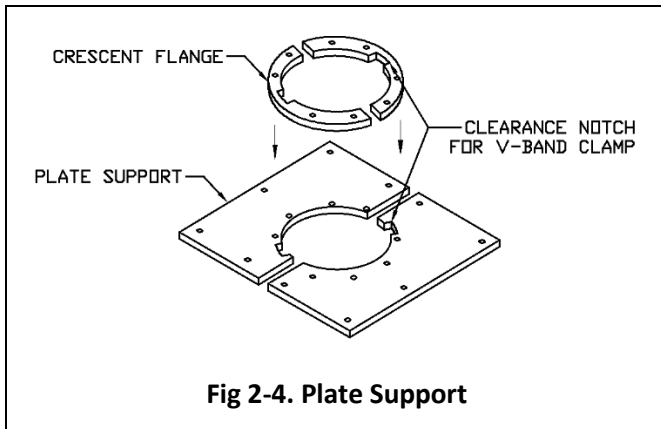
The Plate Support (PS) is intended to provide support to vertical sections and provide an anchor support for horizontal sections. The PS consists of Crescent-Flanges and Plates bolted together, sandwiching the V-band & Flange joint in the middle. The Plate Supports must be anchored with rigid structural members by the installing contractor.

The structural project engineer should select support members in accordance with good engineering practice to suit each specific application or follow the guidelines in Figs 2-6 & 2-7. The Anchor Plate Support may only be attached to non-combustible construction such as block, concrete, or steel. **DO NOT ATTACH THE SUPPORT PLATE TO COMBUSTIBLE MATERIALS.** See Table 2-1 for Maximum Support height.

To Install:

1. Complete pipe joint and secure V-Band (see Joint Assembly Section).
2. Position Plate Support below V-Band. Align clearance notch in Plate Support with Clamps on V-Band
3. Position Crescent Flange above V-Band. Align clearance notch in Crescent Flange with Clamps on V-Band. The Crescent Flanges should overlap the seam between Plate Supports. (See Fig. 2-4)
4. Install bolts through pilot holes in Crescent Flange and Plate Support, sandwiching V-Band joint in the middle.
5. Install Nuts and Tighten bolts.
6. Wrap inner flue pipe with insulation provided (DWKL/FL+1 only)
7. Position Finishing Band so formed edge engages with Bead on outer and tighten worm gear (DWKL/FL only).
8. Fasten / secure Plate Support to Structural Members (See Fig. 2-6 & 7)

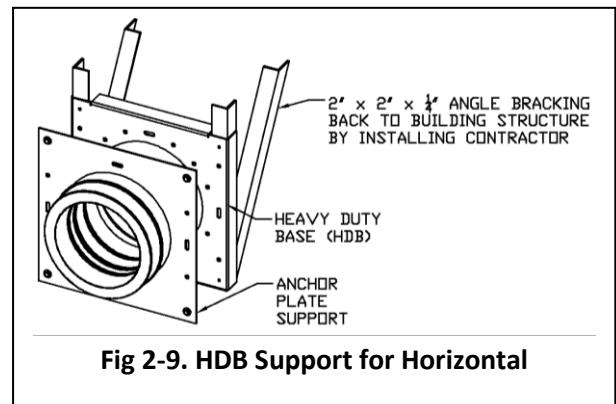
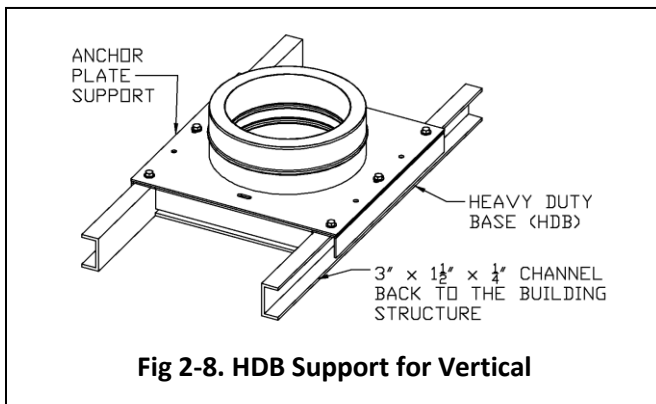




### HEAVY DUTY BASE (HDB)

The HDB is a factory-built base and framework for the Plate Support. It allows quick and easy installations when bracing the support back to the building structure. The installing contractor only provides the channel as Heavy-Duty Base acts as the framework. See Figs 2-8 & 2-9.

Hardware for attaching the Plate Support to the HDB Heavy Duty Base is supplied with the base.



### Half Angle Ring (HAR)

The Half Angle Ring is used to support/guide horizontal installations of vent. It may be suspended by threaded rods or angle iron. See Full Angle Ring (FAR) for outdoor or vibrating installations. See Fig 2-10.

### Full Angle Ring (FAR)

The Full Angle Ring is used as a vertical guide to keep system aligned and provide horizontal support. It is braced to the building structure by the installing contractor. It can also be used in horizontal configurations where exposed to weather (wind) or on vibrating or high-pressure applications such as engine exhaust. See Figs 2-11 & 2-12

### Light Support Band (LSB)

The Light Support Band can be used on low pressure and low temperature applications such as heating boiler stacks (not for use with engine or turbine exhaust) for support/guide in horizontal or vertical installations.

The band firmly clamps around the pipe outer jacket and includes four (4)  $\frac{1}{4}$ " x 20 stainless steel nuts and bolts. Remaining hole in the middle where wires or threaded rods (by the installing contractor) are used for support or guiding back to the building structure. See Fig 2-13.

### Guy Wires Band (GWB)

The Guy Wires Band permits easy connection for three (3) guy wires at 120 degrees apart. The band firmly clamps around the pipe outer jacket and includes three (3)  $\frac{1}{4}$ " x 20 stainless steel nuts and bolts. See Fig 2-14.

The actual guy wires are by others, the structural engineer should select wire size in accordance with good engineering practice to suit each specific application. See Fig 2-15.

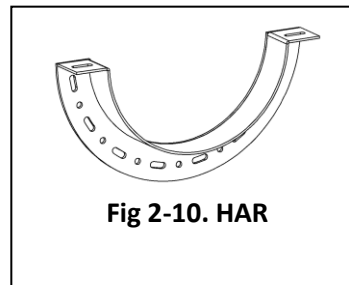


Fig 2-10. HAR

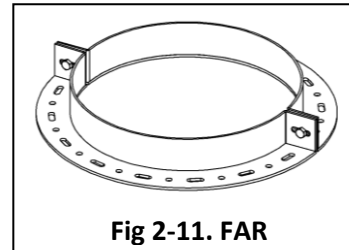


Fig 2-11. FAR

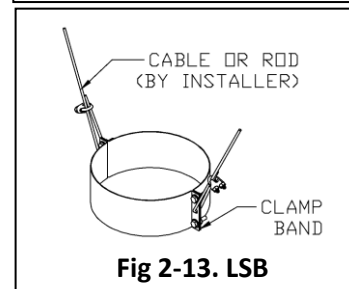


Fig 2-13. LSB

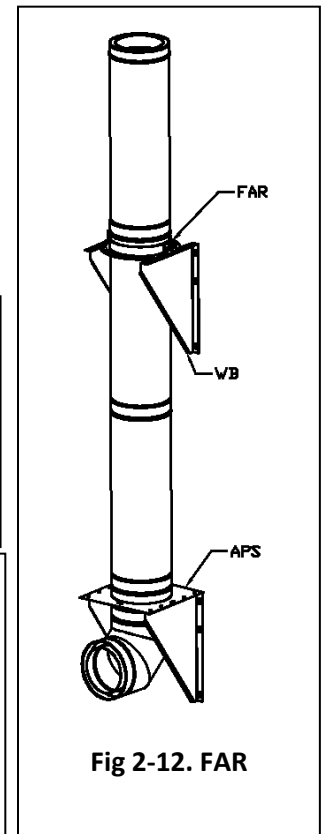


Fig 2-12. FAR

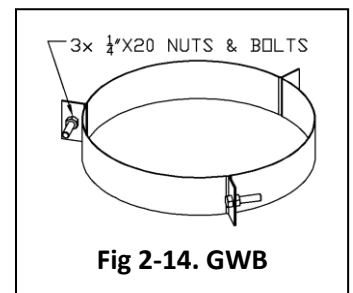


Fig 2-14. GWB

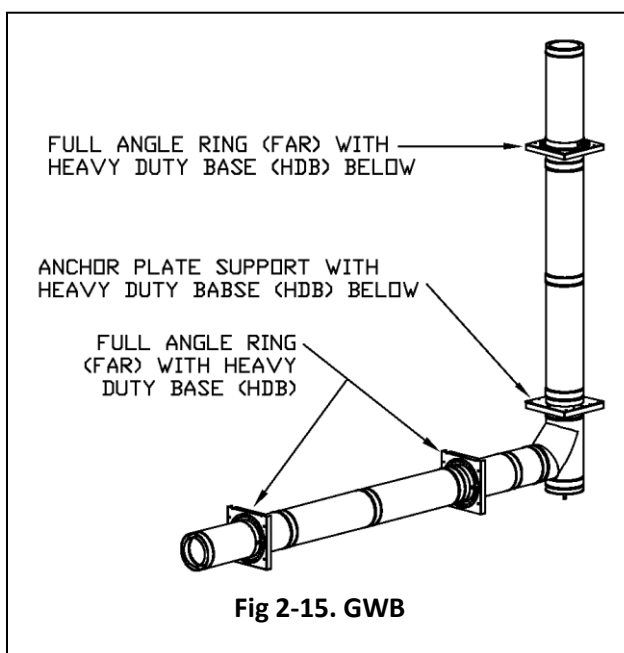


Fig 2-15. GWB

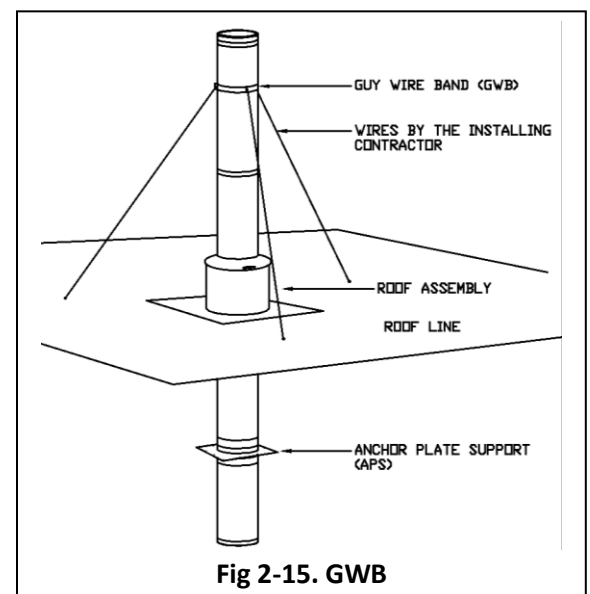
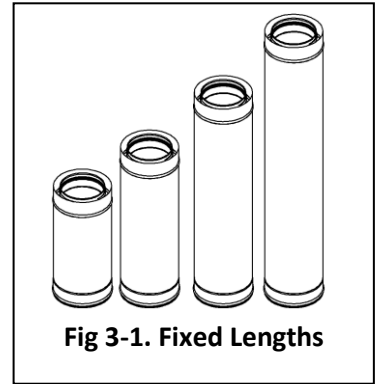


Fig 2-15. GWB

## SECTION 3 – PIPE & OTHER LENGTHS

### Fixed Pipe Lengths ( \_L)

Models KL and FL are available in a variety of fixed pipe lengths (e.g., 6", 9", 12", 18", 24", 30", 36", 42", & 48"). Refer to the catalog for available sizes. Additionally, where required, custom lengths may be ordered from Jeremias Inc. Refer to the corresponding Joint Assembly section for installation instructions.

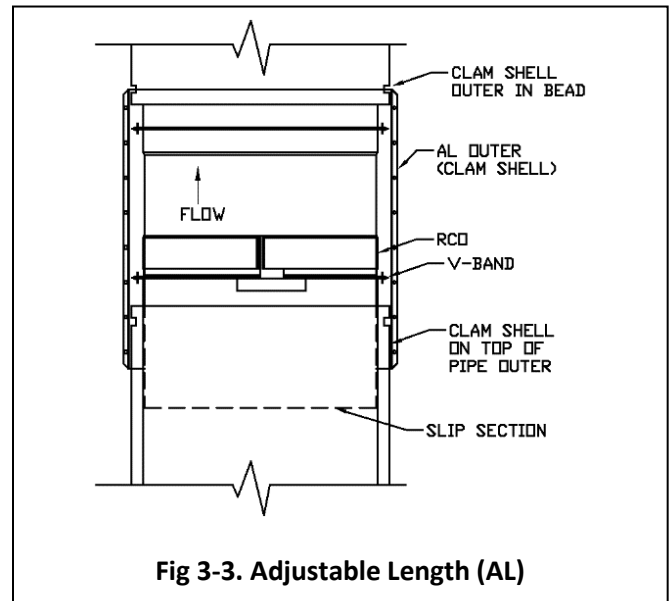
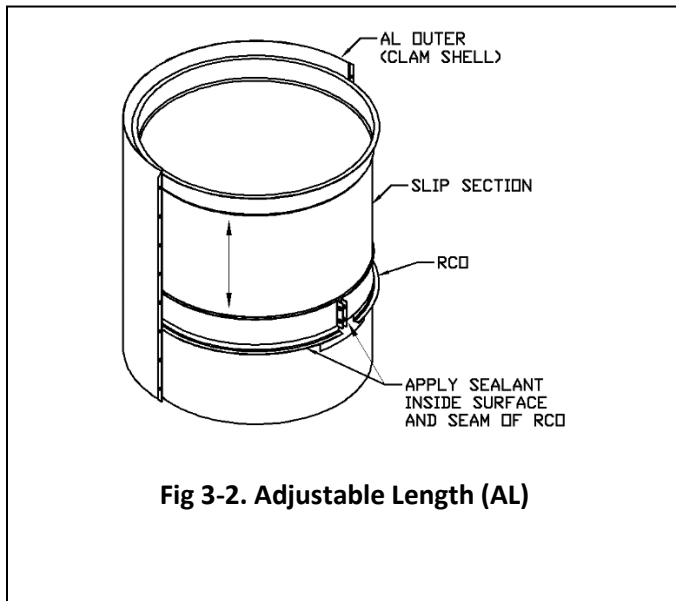


### Adjustable Length (AL) [Model FL]

The AL is used where odd length of vent is required. It is not intended to accommodate thermal expansion. The AL includes a Slip Section, an RCO and a Clam-Shell style outer jacket (Double-Wall only). The minimum installed length is 7" long. The Maximum installed length is 18" long.

To Install (See Figs 3-2 & 3-3):

1. Loosen Clamp on RCO and adjust/slide the Flange to the required location.
2. Clean/Prepare surface and apply sealant between the Slip Section and RCO to create a seal.
3. Tighten RCO clamp to secure it in place.
4. Install AL assembly to the adjacent pipe. The Slip Section will slide to the inside of the adjacent pipe. If the Slip Section is too long and interferes with elbow or other component, the extra length can be cut off.
5. Join the flanged ends to the adjacent pipe sections with V-Band. Refer to Joint Assembly section for proper sealant usage and joint connection method.
6. Wrap the inner flue with provided insulation (DWKL/FL+1 option only)
7. Install Clam-Shell style outer around AL (DWKL/FL options only). The outlet end of the Clam Shell has a flange that will seat in the bead. The Lower end of the Clam Shell is clamped flush against the outside of the pipe.



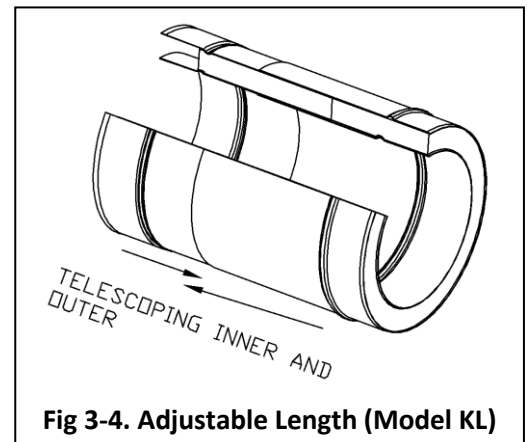
### Adjustable Length (AL) [Model KL]

The Model KL AL is used where odd length of vent is required and incorporate a telescoping length that compensates inner thermal expansion. These adjustable lengths ship completely assembled, and no modifications are required in the field.

Adjustable Lengths (AL) are intended to be used in negative internal pressure applications only. For positive pressure applications use Adjustable Lengths w/ Gasket (18AG or 30AG), Adjustable Lengths w/ Graphite Packing (18ALG or 30AG), or Lined Bellows Length (LBL).

- The minimum installed length of the 18AL is 10.5".
- The maximum installed length of the 18AL is 15.5".
- The minimum installed length of the 30AL is 22.5".
- The maximum installed length of the 30AL is 27.5".

See corresponding Joint Assembly section for installation. The Telescopic section of the AL is to be held securely while the joint is being tapped in place.



### Adjustable Length with Graphite Gasket (ALG) [Model FL]

The ALG is used to accommodate for thermal expansion and where odd length of vent is required.

The Adjustable Length with Graphite Packing has been evaluated by UL and confirmed suitable for positive internal static pressures up to 8" WC (2000 Pa).

The adjustable length incorporates a telescoping inner liner that accommodates thermal expansion in longer runs of pipe. It telescopes into a larger diameter stationary length and is sealed by a heavy gage clamp/graphite packing sealing system. It is finished off with a clam shell outer jacket.

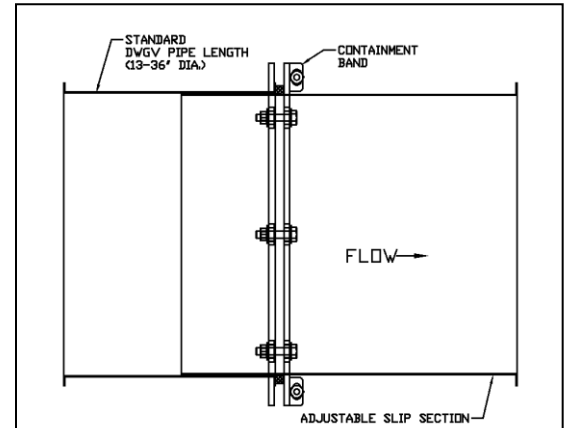
When also using the Adjustable Length to make up for an odd length, you must remove the outer jacket and loosen the clamp/graphite seal to allow the telescoping inner to easily slide further into the stationary length. The insulation may need to be trimmed back also. Tighten the sealing system back in place.

The minimum installed length of the 24 ALG is 6". The maximum installed Length is 22". Do NOT extend the telescoping inner outwards beyond the maximum installed Length.

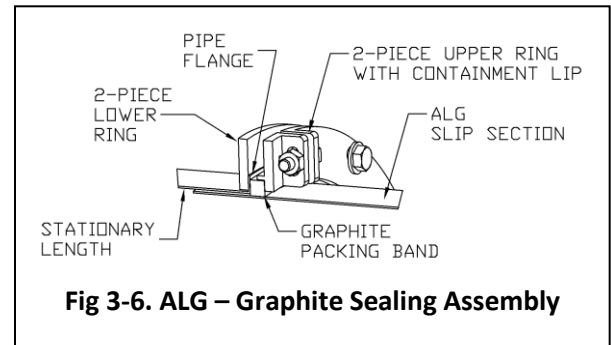
In horizontal Adjustable Length installations, always add guides near each end to assure correct alignment. In vertical installations, place the Adjustable Length just below a Support as the Adjustable Length is not load bearing.

To Install (See Fig 3-5, 6, 7 & 8):

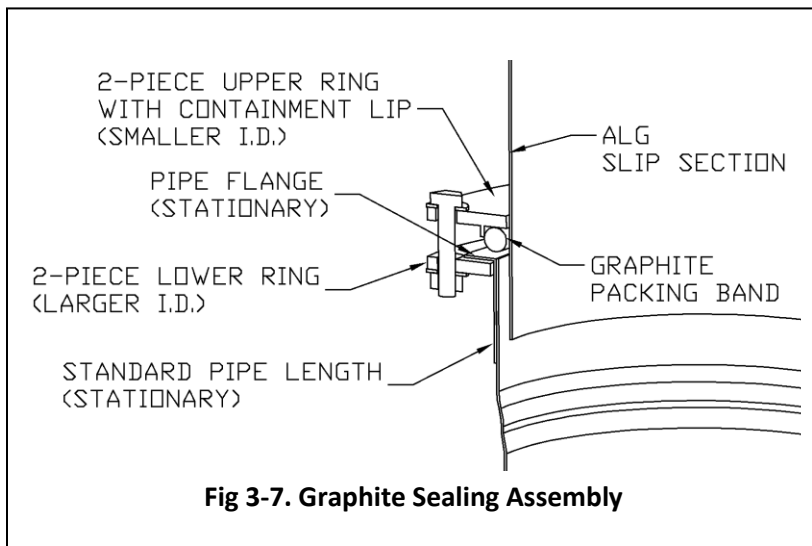
1. Remove bolts and separate the Lower 2-Piece ring from the Graphite sealing system.
2. Wrap the Lower 2-Piece ring around the inner liner (just below the flange) of the adjacent stationary section.
3. Slide the ALG Slip Section down, inside the adjacent stationary length with Lower 2-Piece ring from Step 1.
4. Join the Upper Ring with Containment Lip to the Lower Ring. The Graphite Band and Flange from Stationary Length should be sandwiched between Ring sections.
5. Secure Rings together with bolts provided
6. Tighten all hardware on Containment Rings.
7. Wrap inner flue pipe with insulation provided (DWKL/FL+1 only)
8. Install Outer Clam Shell



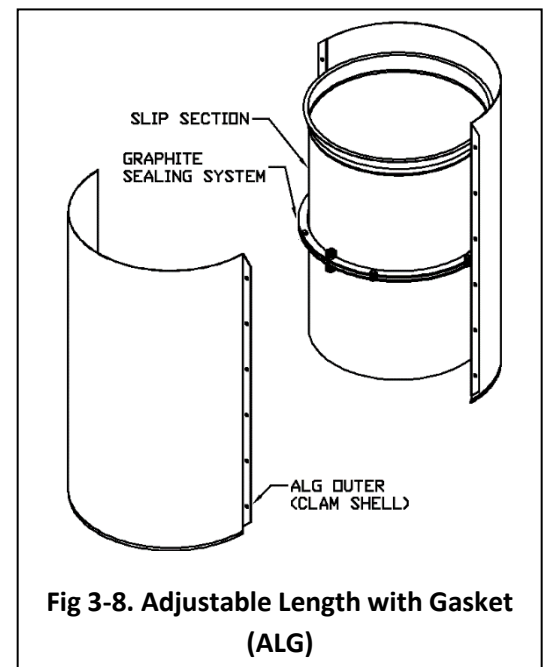
**Fig 3-5. ALG – Graphite Sealing Assembly**



**Fig 3-6. ALG – Graphite Sealing Assembly**



**Fig 3-7. Graphite Sealing Assembly**



**Fig 3-8. Adjustable Length with Gasket (ALG)**

### Adjustable Lengths W/ Graphite Packing (ALG) [Model KL]

Adjustable Lengths with Graphite Packing have two functions: to serve as an expansion joint and to make up for a required odd length. The adjustable length incorporates a telescoping inner liner that accommodates thermal expansion in longer runs of pipe. It telescopes into a larger diameter stationary length and is sealed by a heavy gage clamp/graphite packing sealing system. It is finished off with a clam shell outer jacket.

Adjustable Lengths ship completely assembled at the “maximum Installed Length” shown herein, and no modifications are required in the field when used only as an expansion joint.

When also using the Adjustable Length to make up for an odd length, you must remove the outer jacket and loosen the clamp/graphite seal to allow the telescoping inner to easily slide further into the stationary length. The insulation may need to be trimmed back also. Tighten the sealing system back in place.

To assure correct engagement of the inlet and outlet ends, the Adjustable Length must be installed to the connecting pipe or fitting while the graphite seal is tightened (either before loosening as the adjustable ships or after tightening when used to make up an odd length).

The Adjustable Length with Graphite Packing has been evaluated by UL and confirmed suitable for positive internal static pressures up to 8" WC" (2000 Pa).

- The minimum Installed Length of the 18ALG is 11.3"
- The maximum Installed Length of the 18ALG is 15.8"
- The minimum Installed Length of the 30ALG is 17.3"
- The maximum Installed Length of the 30ALG is 27.8"

The above figure shows Model SWKL which is the same as the inner liner of Model DWKL.

Do NOT extend the telescoping inner outwards further away from the stationary length than the above “maximum Installed Length”.

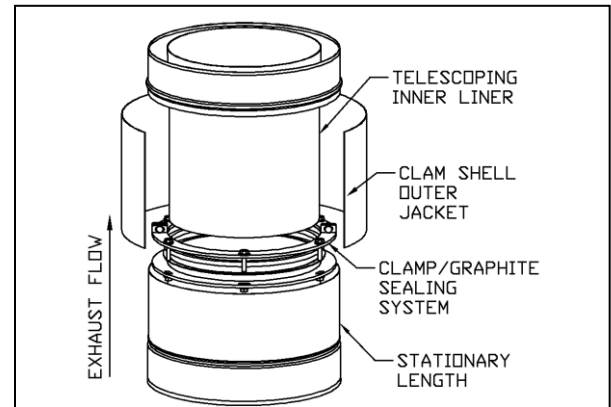
In horizontal Adjustable Length installations, always add guides near each end to assure correct alignment. In vertical installations, place the Adjustable Length just below a Support as the Adjustable Length is not load bearing.

### Adjustable Length with Gasket (AG) [Model KL]

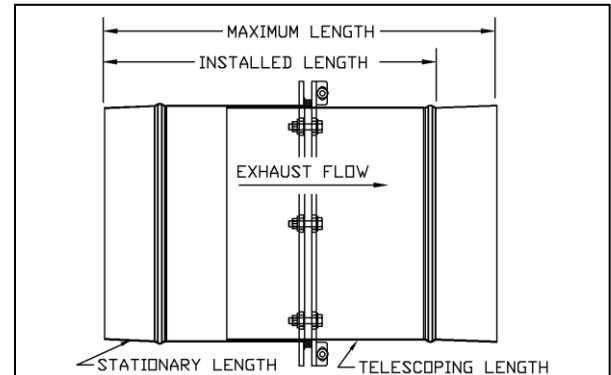
Adjustable Lengths with Gasket incorporate a telescoping length that compensates inner thermal expansion. These adjustable lengths ship completely assembled, and no modifications are required in the field.

- The minimum installed length of the 18AG is 10.5".
- The maximum installed length of the 18AG is 15.5".
- The minimum installed length of the 30AG is 22.5".
- The maximum installed length of the 30AG is 27.5".

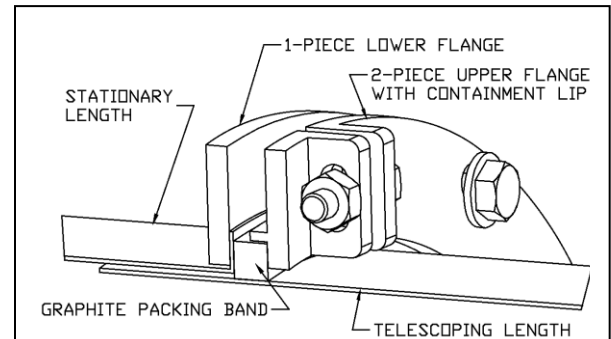
A gasket is factory installed to provide a maximum 0.8" W.C. (200 Pa) of positive pressure capability. The Adjustable Lengths w/ Gaskets are also limited to natural/propane gas and 400°F (200°C) maximum continuous internal operating temperatures (this part is not for use with solid fuel or oil). For higher positive pressures and/or temperatures use Lined Bellows Length (LBL).



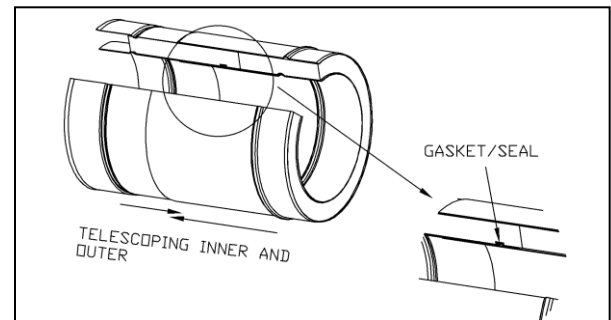
**Fig 3-9. Adjustable Length Graphite Packing (ALG) [Model KL]**



**Fig 3-10. ALG [Model KL]**



**Fig 3-11. – ALG GASKET DETAIL [Model KL]**



**Fig 3-12. AG – Adjustable Length Gasket (AG) [Model KL]**

### Cut Length (18" & 30"CL) [Model KL only]

Cut Pipe Lengths are specifically engineered to be field cut to desired length. This permits the greatest flexibility for complicated installations. CLs are available in 18" & 30" length.

- Minimum installed length of 18CL and 30CL is 5.3".
- Maximum installed length of the 18CL is 15.8".
- Maximum installed length of the 30CL is 27.8".

Cut Pipe Lengths are used in all applications and have been evaluated by UL and confirmed suitable for positive internal pressures up to 60" W.C. (15000 Pa).

**IMPORTANT:** Proper installation of the Cut Pipe Length involves a procedure of very careful measurement and cutting (either in the field or shop) of the outlet end(s) of the Cut Pipe Length with appropriate equipment and technique to achieve a clean, burr free, straight end(s). Experienced sheet metal tradesmen are familiar with such equipment and techniques and should be used for such purpose.

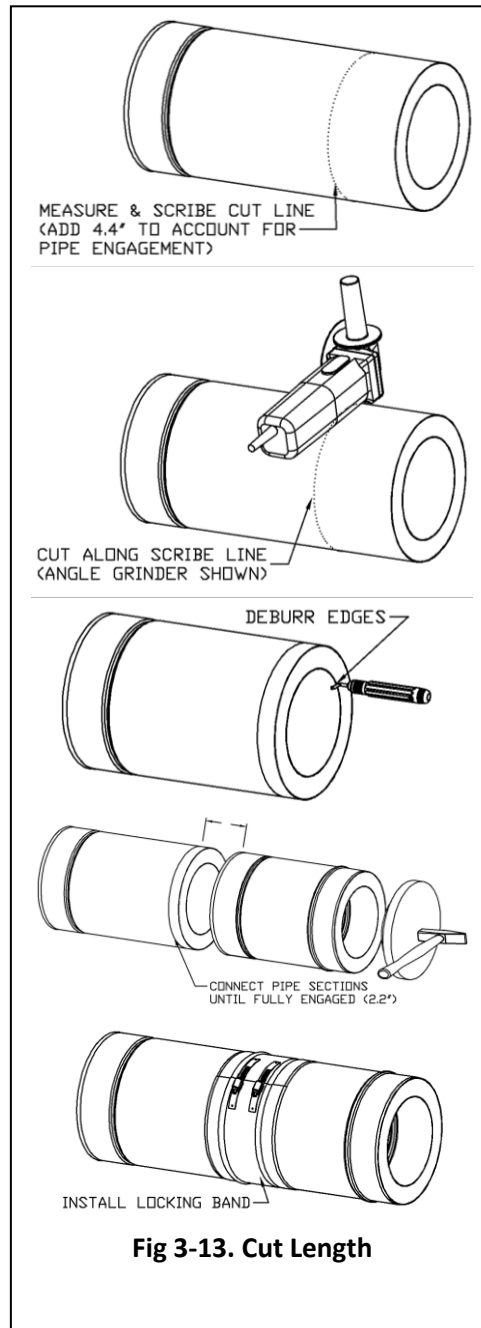
Examples of equipment commonly used for such purpose include:

Type 27 Right Angle Grinder Cutting Wheels for stainless steel and NOGA Model DB1000 double edge deburring tool for thin sheet metal.

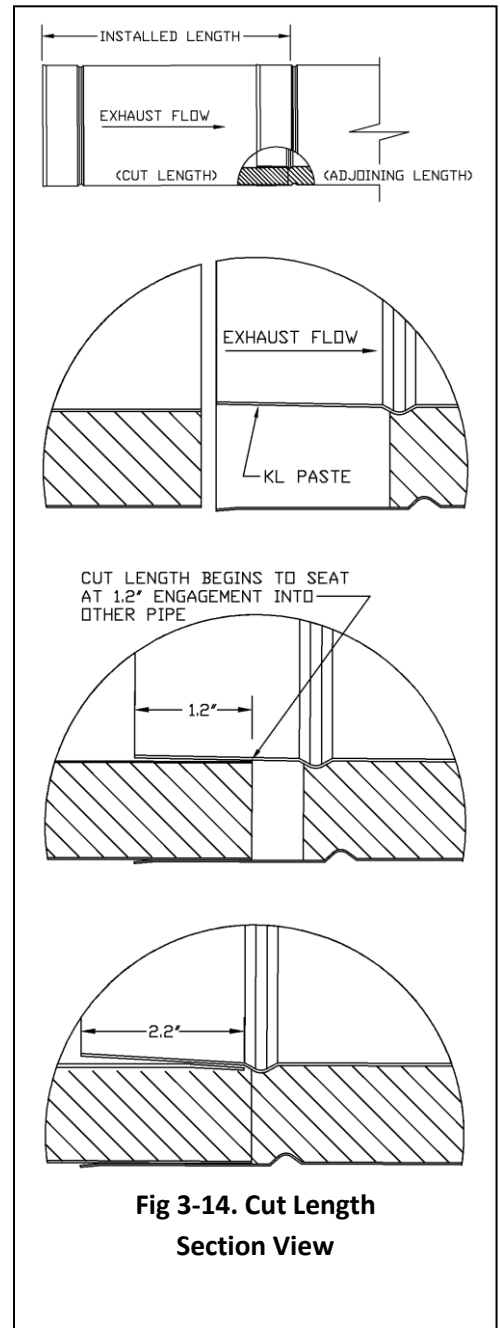
Cut pipe length ships as a standalone item. Arrow shows direction of flue gas flow, or up direction.

To Install (See Fig 3-13 & 14.).

1. Field measure required distance to fill between two pipe ends.
2. Add 4.4" to determine the overall cut pipe length required. The minimum overall permitted length is 7.5".
3. Measuring up from the inlet end of the cut length, mark and create a line around the perimeter of the cut length at the desired location for the cut.
4. Using the line as a guide, cut the extra material (outer wall, insulation, and inner liner) away leaving the desired overall length.
5. Deburr the edges of the inner and outer cut.
6. On the outer wall of the cl, measure and create a second line 2.2" back from the cut end.
7. Apply kl paste to the outer surface of the connecting inner pipe.
8. Tap the adjoining length or cut length into place using the supplied wood plate. Proper engagement is achieved when this dimension (\*) becomes zero.
9. Install the locking band (lb.) from the adjoining pipe section over the field cut joint location.



**Fig 3-13. Cut Length**



**Fig 3-14. Cut Length  
Section View**

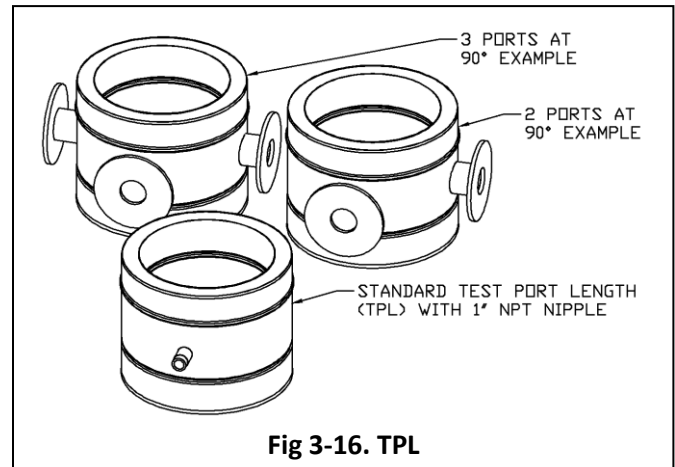
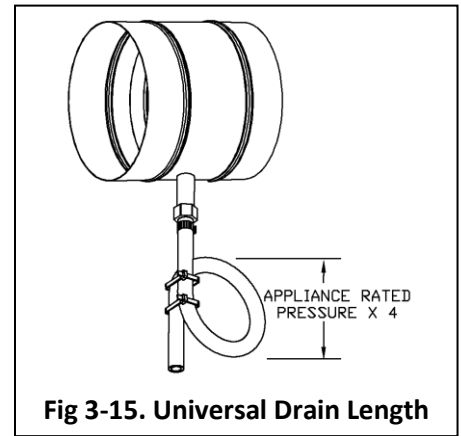
### Universal Drain Length (UDL)

The Universal Drain Length traps all rain water or condensation inside the pipe via an internal dam and routes to an external 1" NPT drain line. This is intended for Chimney applications and not Grease Ducts. The drain works in both horizontal and vertical configurations. See Fig 3-15.

### Test/Nozzle Port Length (TPL)

A Test/Nozzle Port Length can be used for monitoring flue gases, horizontal Grease Duct drain, or implementing internal cleaning equipment inside the pipe. Standard is one 1" NPT nipple, but any size can be factory installed and in multiple configurations.

All ports are continuously welded to the inner pipe. Gaskets or sealant used to connect other equipment and supporting of this equipment is by others. See Fig 3-16.



## SECTION 4 – FITTINGS, TEE CAPS & INCREASERS

### Special Considerations for Fittings

Notice: Tees, Elbows and other fittings must be protected from forces caused by thermal expansion and system weight. Where thermal expansion exceeds 0.375" prior to the fitting, it must be anchored with a support and provisions for thermal expansion be provided. After the fitting, the system is to be re-supported to accommodate weight from additional vent lengths. See Fig 4-2.

### Elbow ( \_EL)

Elbows are used to provide changes in direction. They are available in a variety of standard angles (1.5°, 3°, 15°, 30°, 45°, 70°, 87°, & 90°). Refer to the catalog for available sizes. Additionally, where available, custom lengths may be ordered from Jeremias Inc. Elbows are installed similar to standard pipe. Refer to the corresponding Joint Assembly section for installation instructions.

### TEE ( \_T)

Used as a manifold entry Tee, offset with one of the access cap options, or base Tee with one of the drain tee caps options. Snout can be same or any size smaller than the body.

### 87° & 90° Boot Tee ( \_Bt)

Jeremias Boot Tees offer the added 45-degree gore that directs the flue gases towards the outlet at a 45-degree angle. Most others still allow the flue gases to enter the outlet branch at 90-degrees. Snout can be same or any size smaller than the body.

### 45° Double Tee (45DT)

Used as a two-way manifold entry Tee, offset with one or two of the access cap options, or base Tee with one of the drain tee caps options. Snouts can be any size smaller than the body. See Fig 4-4.

### 90° Wye Tee (90WT)

Used for two-way entries where a tee cap or access cannot be used due to the application or as a 90° that can have an access cap at the middle. See Fig 4-5.

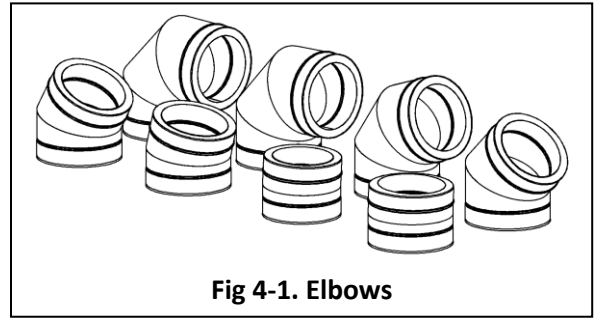


Fig 4-1. Elbows

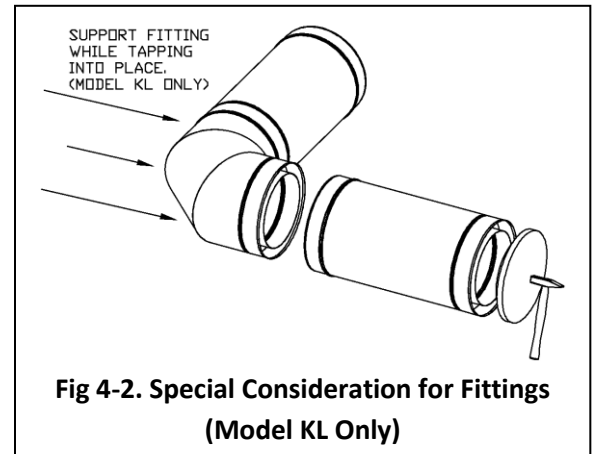


Fig 4-2. Special Consideration for Fittings  
(Model KL Only)

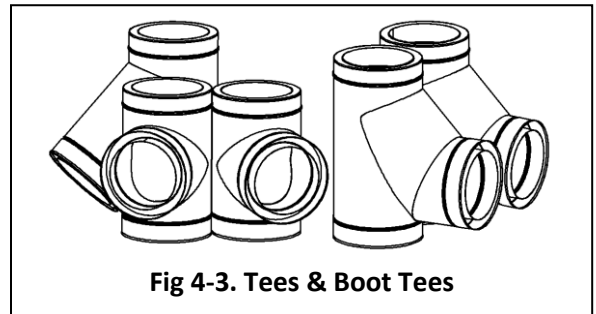


Fig 4-3. Tees & Boot Tees

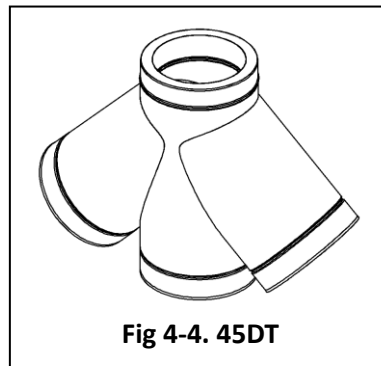


Fig 4-4. 45DT

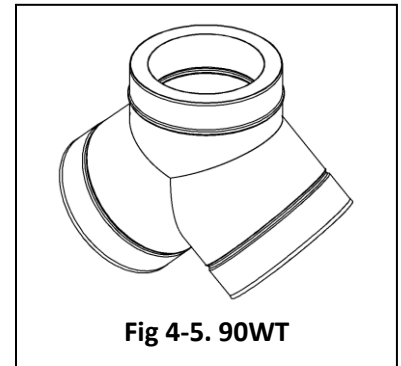


Fig 4-5. 90WT

### Tee Cap Access (TCA)

Tee Cap Access permits access to the inside of the vent for inspection and/or cleaning. It can be placed at the end of a snout of any three or four-way fitting.

Gasket and hardware are included so that the internal cap may be removed and reinstalled. See Fig 4-6.

### Increasesers and Reducers

Reduction fittings are typically used in manifold applications when needed. There are many options for increasers and reducers.

#### Tapered Increaser & Reducer (TI & TR)

Tapered Increasesers and Reducers keep the same centerline. Be cautious of using these in the horizontal, due to increased or decreased diameter changes this will cause a low point in the exhaust where condensate can trap. Use the Eccentric increaser and reducer in horizontal installations instead.

#### Tapered Eccentric Increaser & Reducer (TEI & TER)

Tapered Eccentric Increasesers and Reducers keep the same low point or are flat on bottom. They also create a slight centerline offset if used in the vertical installation

#### Stepped Increaser & Reducer (SI & SR)

Stepped Increasesers and Reducers can be used in tight situations and are available in all steps. The stepped increasers and reducers are non-structural part and must not be subject to loads in either the axial or lateral directions.

Be cautious of using these in the horizontal. Increased or decreased diameter changes will cause a low point in the exhaust where condensation can trap. Use the Eccentric increaser and reducer parts in horizontal installations instead.

#### Stepped Eccentric Increaser & Reducer (SEI & SER)

Stepped Eccentric Increasesers and Reducers can be used in tight situations and are available in all steps. The Stepped Eccentric Increasesers and Reducers are non-structural part and must not be subject to loads in either the axial or lateral directions.

### Condensate Drains – Universal Drain Length (UDL), Drain Tee Cap for Support (DCSS), Drain Tee Cap Side (DCS), Drain Tee Cap Bottom (DCB)

If appliance instructions or local code calls for a condensate drain, use a Jeremias drain fitting and tubing of appropriate size to route the condensate into the sanitary sewer drain.

Installation requirements:

- Install this drain fitting as close to the appliance flue collar as possible.
- When transitioning from horizontal to vertical, install Drain Tee Cap Side (DCS) or Drain Tee Cap Bottom (DCB) at bottom of Tee.
- For a straight horizontal run, install Universal Drain Length (UDL). Rotate fitting so that the drain tube points downward.
- Connect Condensate Drain Tube to fitting. Form drain tubing into a loop. Loop must be a diameter that is at least 4 times the appliance's rated stack pressure in inches of water column.
- Prior to final assembly prime the drain loop by pouring a small quantity of water into the drain tube.
- Follow all local and national codes and regulations for the draining of acidic condensate.
- Do not install drain tube in cold areas where ice can form causing potential damages and hazardous conditions.
- Do not use copper as a drain as it may corrode.

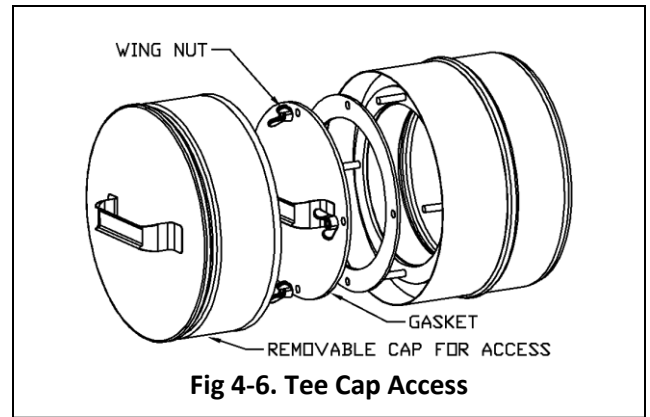


Fig 4-6. Tee Cap Access

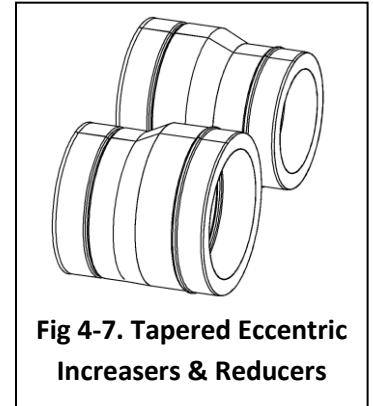


Fig 4-7. Tapered Eccentric Increasesers & Reducers

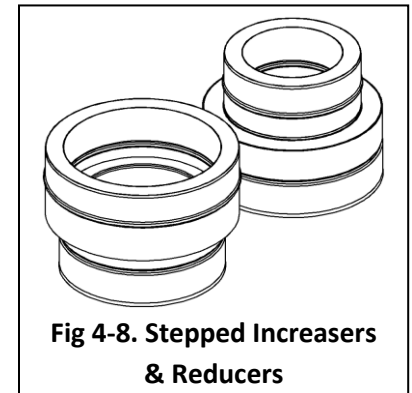


Fig 4-8. Stepped Increasesers & Reducers

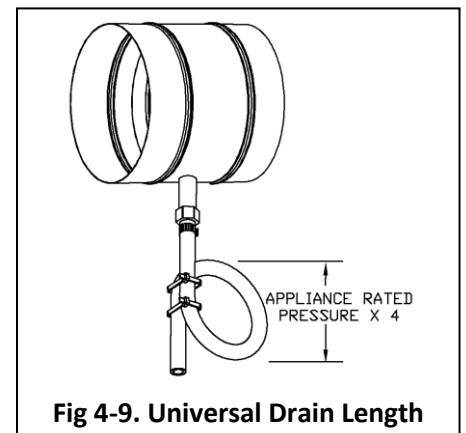


Fig 4-9. Universal Drain Length

### DRAIN TEE CAPS (DCB & DCS)

Two styles of Drain Tee Caps are available. Each includes a 1" NPT Nipple for a drain line attachment by the installing contractor or use of Jeremias' Drain Tube Kit.

The DCB (B for Bottom) has the nipple at the base. The DCS (S for Side) has the nipple on the side which is convenient in certain applications where the horizontal appliance outlet is very low to the floor.

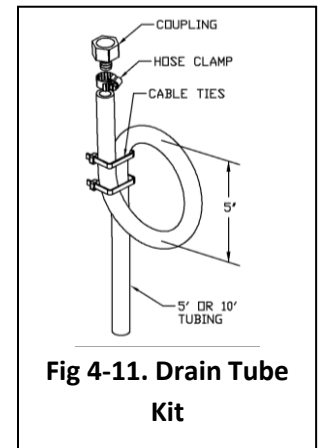
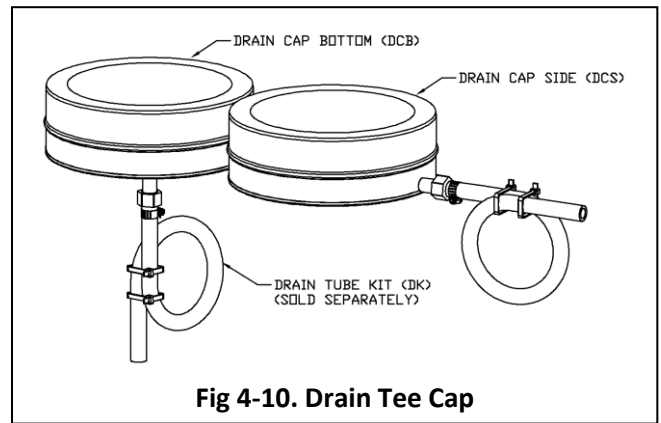
### Drain Tube Kits (5dk & 10dk)

The Jeremias Drain Tube Kits contains:

1. 1" N.P.T to  $\frac{5}{8}$ " hose coupling
2. Hose clamp
3.  $\frac{5}{8}$ " Silicone Tube in 5' or 10' length
4. Two (2) cable ties

When installing the Drain Tube Kits be sure make a trap by forming a 5" diameter loop and secure with the provided cable ties. Fill the trap with water before attaching the tube to the coupling and securing the hose clamp.

Check local codes/regulations to determine how the condensate fluid is to be drained. Local regulations may require the use of a neutralizer kit when using a condensate trap. A condensate pump may also be required. Contact the appliance manufacturer or local distributor if the neutralizer kit and/or condensate pump is required.



## SECTION 5 – ADAPTERS & TERMINATIONS

### Appliance Connection

Connect KL & FL to the appliance flue collar as directed in the appliance manufacturer's installation instructions. If the appliance flue collar is not designed to connect directly to KL or FL, a special adapter may be required. Consult the Jeremias catalog or contact Jeremias Technical Support for the proper appliance connector.

### Start & End Adapters

Models KL & FL are directional with flow therefore both START and END adapters are typically used in every application.

Up to 550°F flue gas temperatures use J-600 (Dow Corning 736) or equivalent sealant. Above 550°F use only appliance approved gaskets/blanket (that comes with equipment you are connecting to such as ANSI flange connections on engine and power generation equipment)

### Raw Collar Adapter (Inside/Outside) Start (RCIS/RCOS)

RCIS connects slides to the inside of a nominal outlet collar and is secured with a clamp band. The RCOS slides around the outside of the appliance collar and has clamp that compresses the assembly to the outlet. Use approved sealant for gas tight connection. See Figs 5-1A&B.

### Flange Collar Kit (FCK)

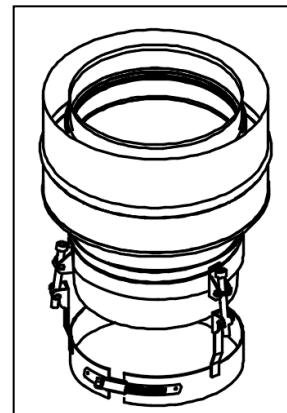
Connects SWKL/FL and DWKL/FL to any flanged appliance outlet and includes a split plate and beam clamps. Use approved sealant for gas tight connection

### Universal Appliance Adapter (UAA)

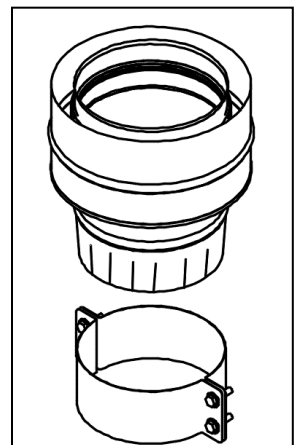
The UAA is used to connect gas fired appliances listed as Category II, III and IV to Jeremias SWKL/FL/DWKL/FL venting systems. It is a universal part for use where standard adapters will not connect to the appliance flue collar.

Refer to the gas appliance manufacturer's instructions to determine venting requirements and limitations with respect to the installation and use of the appliance To Install:

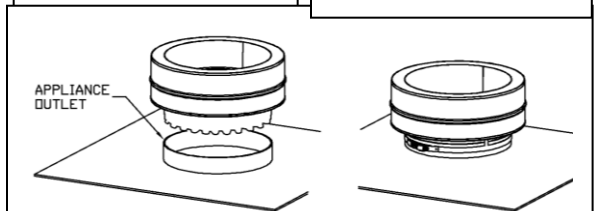
1. Align the KL/FL pipe with the appliance outlet (See Fig. 5-4)
2. Apply sealant to the following surfaces
  - a. Around the outside perimeter of the appliance outlet.
  - b. Around the outside of the KL/FL inner Pipe
  - c. Along the longitudinal seam of the UAA inner liner
3. Wrap the UAA inner liner around the outside surface of the flue outlet and KL/FL inner. The seam of the UAA should overlap and be sealed with sealant from step 2c. (See Fig. 5-4)
4. Secure the UAA inner liner with 2 hose clamps
5. Verify all seams are tight and sealed with sealant
6. Wrap the UAA outer around the outside of the DWKL/FL pipe
7. Secure UAA outer with 2 hose clamps



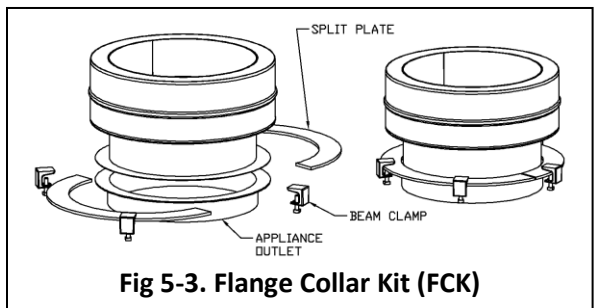
**Fig 5-1A.  
RCIS**



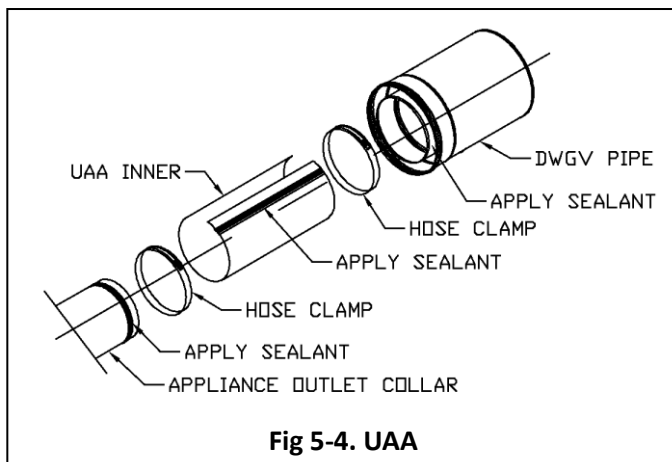
**Fig 5-1B.  
RCOS**



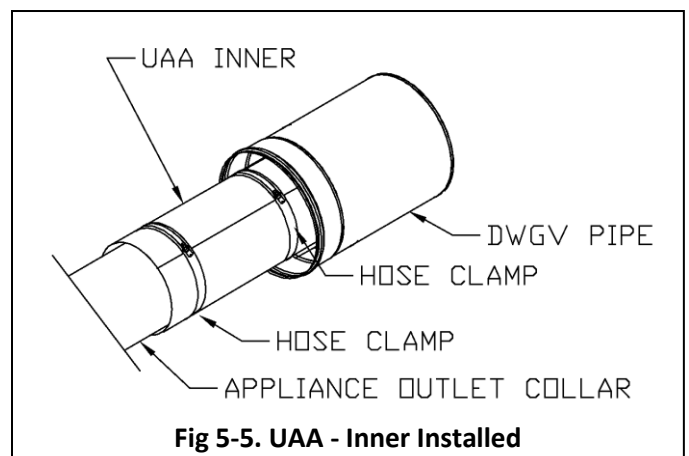
**Fig 5-2. Raw Collar Adapter Inside (RCI)**



**Fig 5-3. Flange Collar Kit (FCK)**



**Fig 5-4. UAA**



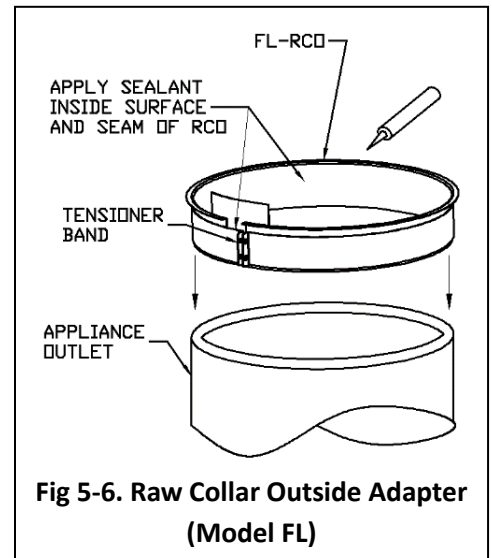
**Fig 5-5. UAA - Inner Installed**

### Raw Collar Outside Adapter (RCO) [Model FL Only]

The Raw Collar Outside Adapter is used to add a flange on an appliance outlet for connection purposes.

To Install (See Fig 5-6.):

1. Select correct sealant based on flue gas and application (See Joint Assembly Section). Clean/Prepare all surfaces will sealant to be applied.
2. Apply sealant to the outside surface of the appliance outlet.
3. Clamp the RCO outside of appliance outlet.
4. Secured by tightening tensioner bolts.
5. Refer to Joint Assembly section to install subsequent flange pipe sections.



### Raw Collar Adapter (Outside) Start & End (RCOS & RCOE) [Model KL Only]

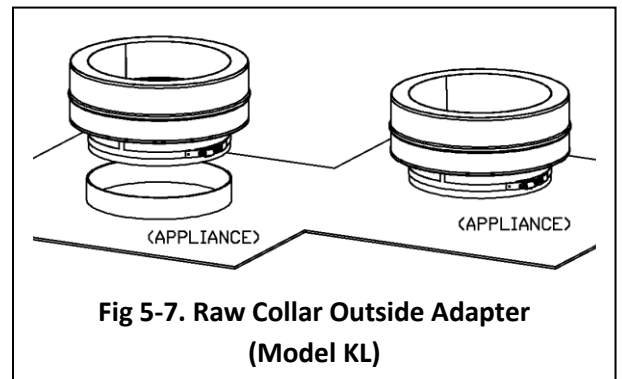
Connects Model KL to a nominal collar on the outside of the appliance collar. The adapter is split and uses hardware to tighten against the outside of the collar. Use approved sealant for gas tight connection. (See Fig 5-7)

### No-Weld Hood Adapter (NWAH)

Connects Models KL/FL duct to a kitchen exhaust hood without the need for field welding.

To Install (See Fig 5-8A & 8B):

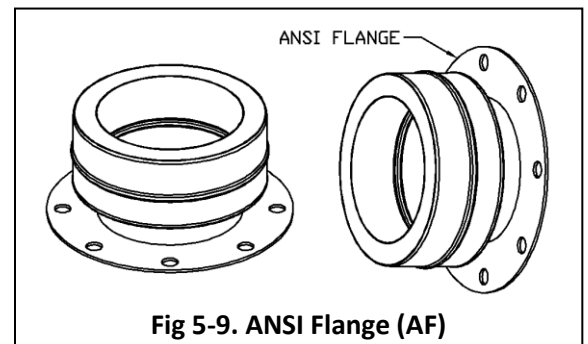
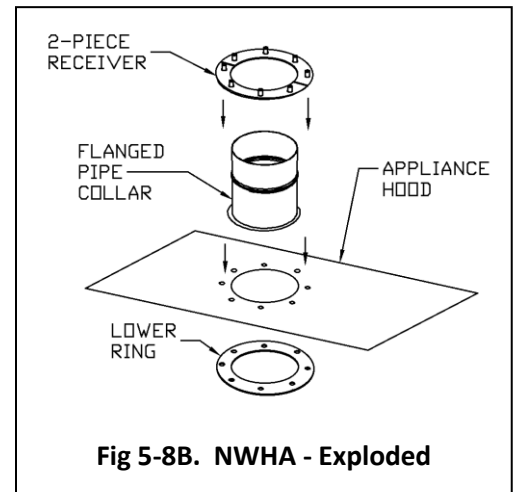
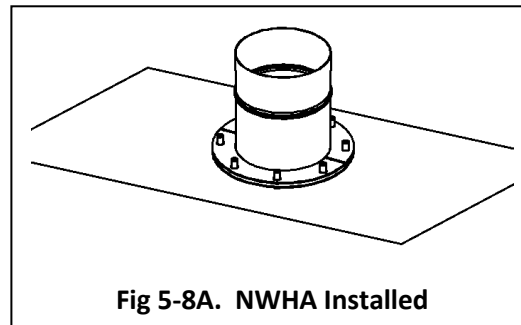
1. Using the Lower ring as a template, scribe and cut center hole and pilot holes in Appliance Hood
2. Align Flanged Pipe Collar on top of appliance hood
3. Apply Gasket between collar connection and appliance hood
4. Align 2-Piece Receiver on top of Flanged Pipe Collar
5. Install Bolts in the lower ring, through Appliance hood and into 2-piece receiver and tighten securely.



### 125/150 LB. ANSI FLANGE (AF)

125/150 ANSI Flange Start and End are typically used to connect to and from engine and cogeneration equipment.

These items do not come with hardware and gasket for the ANSI flange connection. These are typically supplied by the equipment you are connecting to. (See Fig 5-9)



### Fan Plate Adapter (FP)

This is a heavier gauge flat plate that can be used to start at a masonry fireplace outlet, or to attach a fan or fan curb housing at the termination.

When used as a Fan Plate Adapter End (as shown in Figure 5-10), the flat plate is designed to set directly on top of the roof curb (by others). The installing contractor uses bolts or screws through the plate into the curb.

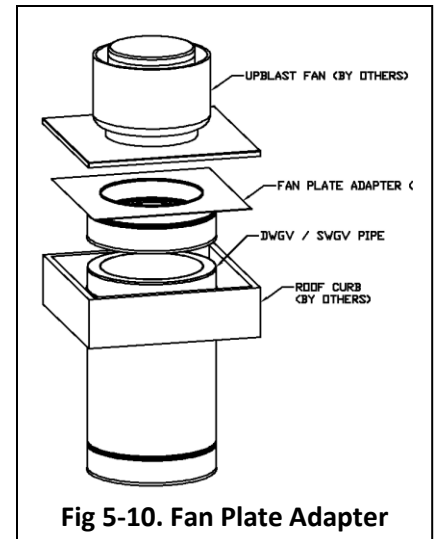
### DWKL/FL to SWKL/FL & SWKL/FL to DWKL/FL Adapters (D2S & S2D)

These adapters allow a smooth transition to and from DWKL/FL double wall and SWKL/FL single wall. They may be installed vertically or horizontally.

See Fig. 5-11.

### Transition to Round Start & End (TRS & TRE)

Used to connect to and from rectangular or square outlets on hood, fans, or auxiliary equipment. Transitions are custom made to order for project requirements. The rectangular or square base can be made in accordance with NFPA-96 no-weld hood connection or may be field welded by the installing contractor. See Fig. 5-12.



**Fig 5-10. Fan Plate Adapter**

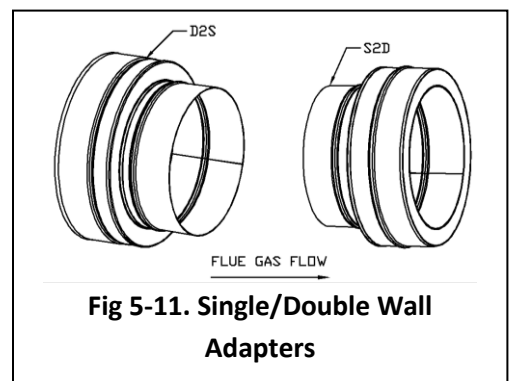
### Terminations

See SECTION 1 - GENERAL INFORMATION for termination height above roof requirements.

There are two options to most terminations:

No Screen (N) or With Screen (S).

Jeremias uses 1" x 1" x 0.059" thick stainless-steel wire mesh for termination screens. The purpose of a screen is to not allow debris or personnel into the exhaust and also used to restrict rodents or birds from entering the exhaust.



**Fig 5-11. Single/Double Wall Adapters**

### Horizontal Terminations

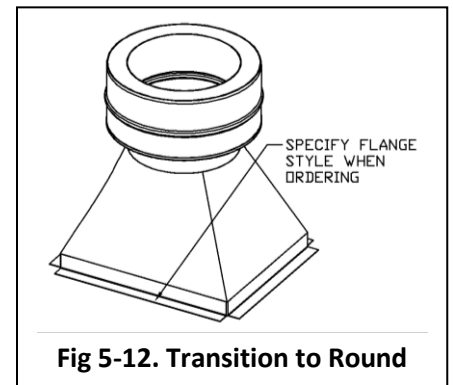
There are several terminations available to terminate a horizontal system. Horizontal termination options include Exit Cone (EC), Miter Cut Termination (MCS), Tee Termination w/ Screen (90TT), 30° & 90° Elbow Termination w/ Screen (30ET / 90ET) and Opened Termination (OTN). All horizontal terminations must extend a minimum of 6" from the wall. Reference Joint Assembly section for instructions on installing these parts. The Termination can be removed for inspection of the vent. Removal is the reverse procedure as defined in Joint Assembly section.

### Open Termination with Screen (OTS)

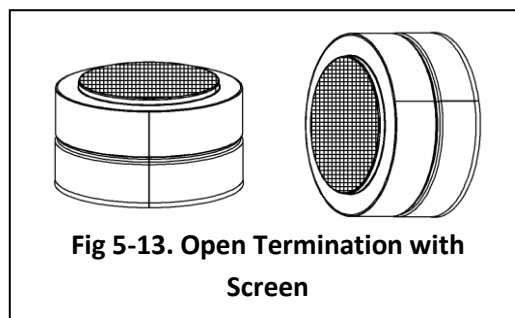
An Open Termination that is unrestrictive. Used in both vertical and sidewall scenarios. Use the Universal Drain Length (UDL) or Drain Tee Cap (DCB or DCS) below to drain rainwater from the exhaust. The OTS connects to the Model DWKL/FL or SWKL/FL pipe using a standard vee band. See Fig 5-13.

### Exit Cone (EC)

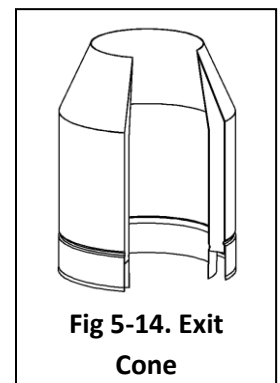
The Exit Cone increases velocity by 50%. Use the Universal Drain Length (UDL) or Drain Tee Cap (DCB or DCS) below to drain rainwater from the exhaust. Refer to corresponding Joint Assembly section for installation procedure. See Fig 5-14.



**Fig 5-12. Transition to Round**



**Fig 5-13. Open Termination with Screen**



**Fig 5-14. Exit Cone**

### High Wind Rain Cap (WRC)

This cap helps to reduce downdraft on gravity equipment and provides best rain protection. Refer to corresponding Joint Assembly section for installation procedure. See Fig 5-15.

### Stack Cap (SCN & SCS)

An ASHRAE style of rain cap, also known as china cap, has an inverted cone to help disperse flue gases and to provide a lower pressure drop. Refer to corresponding Joint Assembly section for installation procedure. See Fig 5-16.

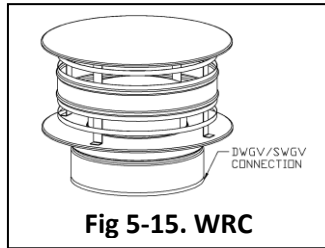


Fig 5-15. WRC

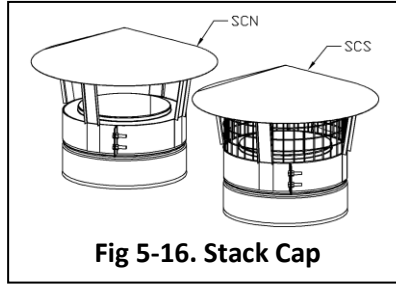


Fig 5-16. Stack Cap

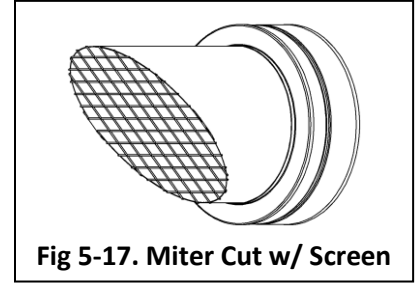


Fig 5-17. Miter Cut w/ Screen

### Miter Cut Termination W/ Screen (MCS)

The Miter Cut Termination can be used horizontal venting. Refer to corresponding Joint Assembly and termination requirements section for installation procedure & requirements. See Fig 5-17.

### 90° & 30° Elbow Terminations (90ET & 30ET)

The Elbow Terminations are used for sidewall terminations or at the end of a vertical stack as specified by certain appliance manufacturers. Refer to corresponding Joint Assembly and termination requirements section for installation procedure & requirements.

### 90° Tee Termination (90TT)

The 90° Tee Termination is used for sidewall terminations or vertical terminations as specified by certain appliance manufacturers. Refer to corresponding Joint Assembly and termination requirements section for installation procedure & requirements. See Fig 5-18.

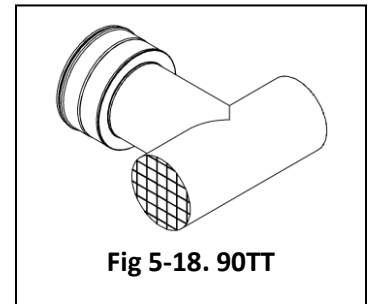


Fig 5-18. 90TT

### No-Loss Weather Head (NLWH)

The No-Loss Weather Head (NLWH) incorporated as part of the Jeremias Inc. DWKL/FL and SWKL/FL product offering is the same type and construction as no loss weather head style terminations used for vent applications in North America and other parts of the world for decades.

It is a very popular style of termination that provides the unique combination of appreciable rain protection without any obstruction to the vertical exit of the flue gases. It is detailed in American Conference of Governmental Industrial Hygienists (ACGIH) and American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) handbooks.

At present (June 2014), Underwriters Laboratories, Inc. (UL) has no safety standard for these devices so although they are shown in this document and condoned by NFPA, Jeremias Inc. and others, UL has not independently investigated this product.

If the total height exceeds the freestanding distance (Dimensions C) as shown in Section 1 – Support and Guiding, the structural engineer should support and guy the No-Loss Weather Head in accordance with good engineering practice to suit each specific application.

The No-Loss Weather Head incorporates the Open Termination (OTN) at the base and connects to the DWKL/FL or SWKL/FL pipe using a standard joint connection. See Fig 5-19.

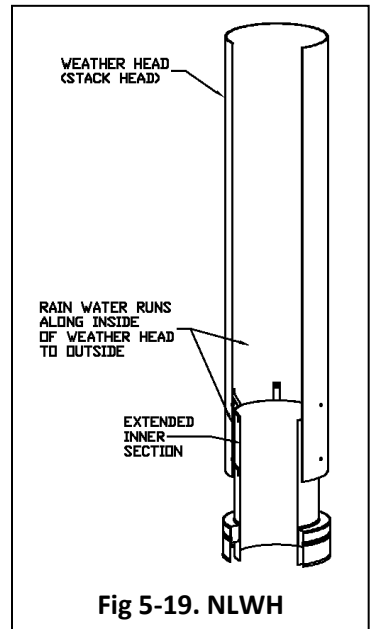


Fig 5-19. NLWH

## SECTION 6 – THIMBLES & FLASHINGS

### Thimble & Flashing Application Requirements

Thimbles provide for safe installation where DWKL/FL passes through a combustible wall or ceiling. See Table 6-1 for selection of required Thimble and corresponding flashing and storm collar.

Non-Combustible Roof or Wall penetrations do not require Thimble. Framing dimension is as required for installation, access, inspection or per local code.

**Table 6-1 - Thimble & Flashing requirements for Combustible Roof / Wall Penetrations**

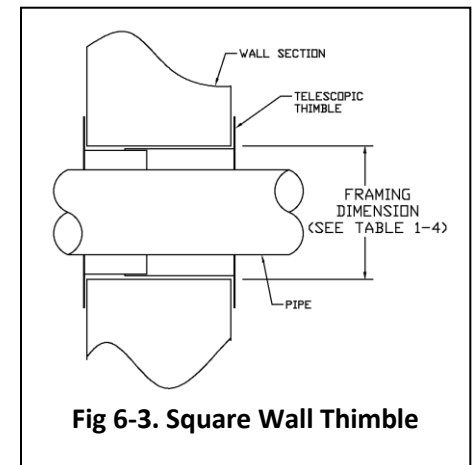
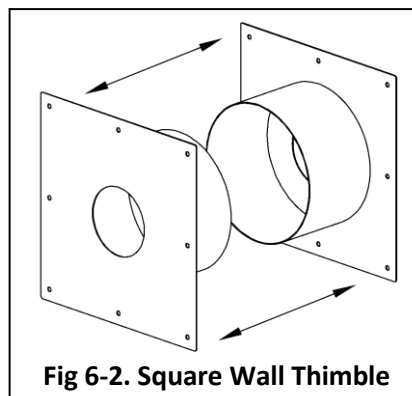
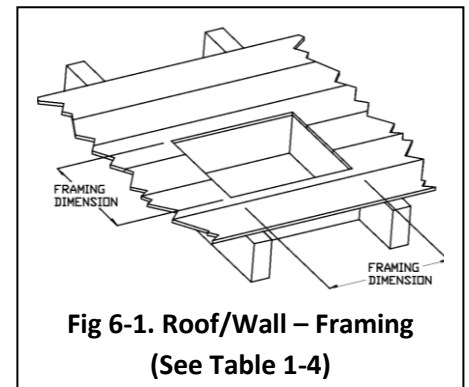
UL Listing / Application	Flue Gas (Max)	Framing Dimension	Roof Thimble	Flashing	Storm Collar	Wall Thimble	Fire-Rated Wall / Floor Penetration
UL-1738 / ULC-S636 UL-441 / ULC-S605 Gas Vents	550°F	Table 1-4	Not Required	FRF, PRF, FCF or PCF	SC or SCCF	SWT or LTT	N/A
UL-103 / ULC-C959 Building Heating Appliance	1,000°F	Table 1-4	HTT	FRF or PRF	SC	LTT	N/A
UL-2561 / ULC-C959 Industrial Chimney	1,400°F	Table 1-4	HTT	VRF	VSC	HTT	N/A
UL-1978 / ULC-S662 Grease Duct	500°F / 2,000°F	Table 1-4	HTT	FRF or PRF	SC	HTT	N/A
UL-2221 / ULC-S144 Fire Resistance Assy.	500°F / 2,000°F	Table 1-4	Not Required	FRF or PRF	SC	Not Required	TPF

### Square Wall Thimble (SWT) [Pipe Size 3" to 12"]

A Wall Thimble is required where vent passes through a combustible wall. When terminating through a non-combustible wall the thimble is optional.

To Install (See Fig. 6-2 & 3):

1. Determine the location for the wall thimble such that a continuous minimum slope of 1/4" per foot is maintained in any horizontal portion of the vent system.
2. Establish proper framing for Wall penetration. Refer to Thimble Sizing Table 1-4.
3. The wall thimble is supplied in two telescoping halves. From the outside, position the cylinder in the framed opening and secure WT plate to the exterior of the building.
4. From the inside, align the WT cylinder with the cylinder from Step #3 and engage WT halves together.
5. Secure with fasteners and use silicone to seal the thimble to the structure.
6. Install vent length through the center of the thimble.
7. Terminate the system with a termination tee, an elbow or a 45° termination with or without bird screen.



### Sidewall Thimble (LTT)

This wall thimble provides safe installation against combustible materials. Only for double-wall DWKL/DWFL use.

Noncombustible wall penetrations do not require a thimble. See Fig 6-4 & 6-5.

The LTT thimble is fiber insulated and includes a heavy gage outside wall plate that is welded to the thimble that centers the pipe. A floating inside plate is also provided to finish the inside wall opening. The Outside Plate is attached to the wall by the installing contractor. Both the outside and inside plates measures 10" larger than the DWKL/FL pipe I.D.

The minimum framed opening is DWKL/FL pipe I.D. plus 6". The maximum wall thickness is 11½".

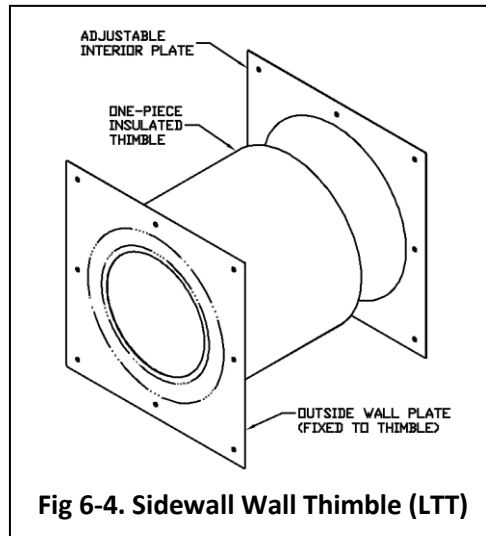


Fig 6-4. Sidewall Wall Thimble (LTT)

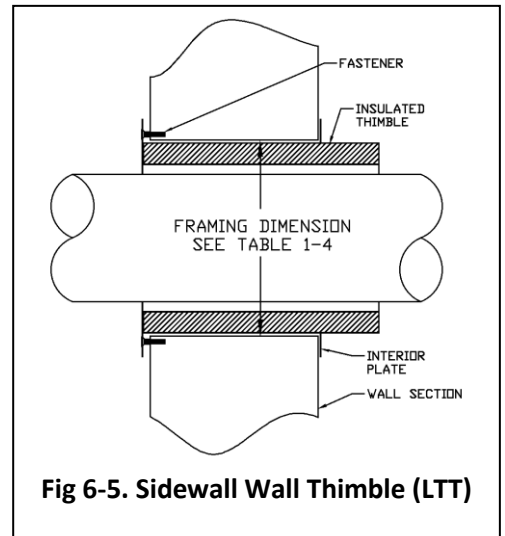


Fig 6-5. Sidewall Wall Thimble (LTT)

### High Temperature Thimble (HTT)

This roof thimble provides safe installation against combustible materials. It is part of the Unvented and the Vented Roof Assemblies (see Figure 6-6). Only for DWKL/FL use.

The thimble is fiber insulated and includes a lateral pipe guide with hardware at the top. The thimble extends 12" from the installation brackets. Hardware to connect brackets to the roof or wall is not included.

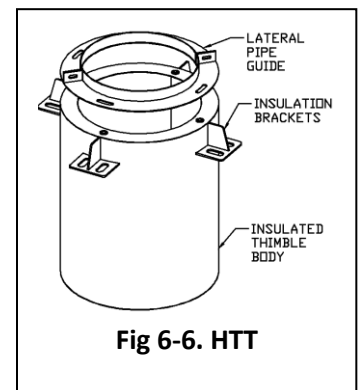


Fig 6-6. HTT

### Roofs with A Slope or Pitch

When using the roof thimble with sloped roof construction, the installing contractor has two choices:

1. Fabricate a flat, horizontal curb for installation of the roof thimble shown. The curb extends out from the high side of the roof opening.
2. Order a special version of the roof thimble that has the brackets factory installed to match the desired roof pitch.

In all cases, it is important to ensure that the thimble body extends down at least 1" past the lowest portion of the roof framing when installed. Thimbles with extended length bodies are available on special request from the factory.

### Flashings

A flashing is used to seal off the opening where the vent passes through the roof. Choose the correct flashing to match the vent size and pitch of the roof.

To install (See Fig 6-7 & 8):

1. Ensure the proper clearance to combustibles is maintained.
2. Position the flashing over the vent. The upper end of the flashing is installed underneath the roofing material. The lower end of the flashing is installed on top of the roofing material.
3. Seal the flashing in place and secure with appropriate roofing fasteners.

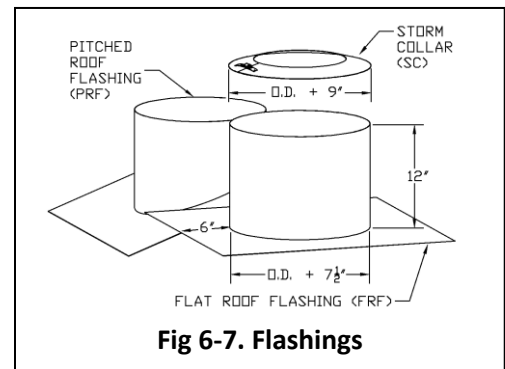


Fig 6-7. Flashings

### Flat & Pitched Roof Flashings (FRF & PRF) & Storm Collar (SC)

The Flat Roof Flashing and Pitched Roof Flashing can be used for non-combustible construction and also fit over the Roof Thimble (HTT) as part of the Roof Assembly with Thimble when DWKL/FL is used for chimney or vent applications with 1000°F flue gases or less. The Storm Collar flashes above the roof flashing and is sealed to the outer jacket (but not attached to the flashing permitting expansion).

### Flat & Pitched Cone Flashings (FCF & PCF) & Storm Collar (SCCF)

The Flat Cone Flashing and Pitched Cone Flashing can be used for non-combustible construction. The Storm Collar for Coned Flashings flashes above the Cone Flashings and is sealed to the outer jacket (but not attached to the flashing permitting expansion).

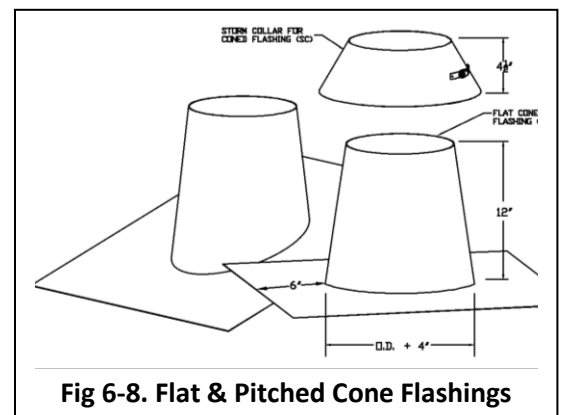


Fig 6-8. Flat & Pitched Cone Flashings

### Unvented Roof Assembly

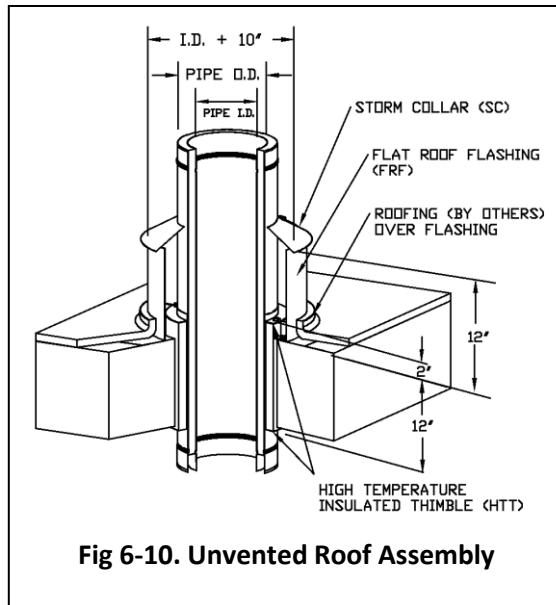
UL has determined the Roof Thimble (HTT) alone, without ventilation, provides a safe installation through a combustible roof for Model DWKL/FL applications with 1000°F flue gases or less. This also applies to enclosed Special Gas Vents, Type B Vents, and Type L Vents. In this manner, the Flat Roof Flashing (FRF) in conjunction with the standard Storm Collar (SC) is used. (See Fig 6-10).

### Ventilated Roof Assembly

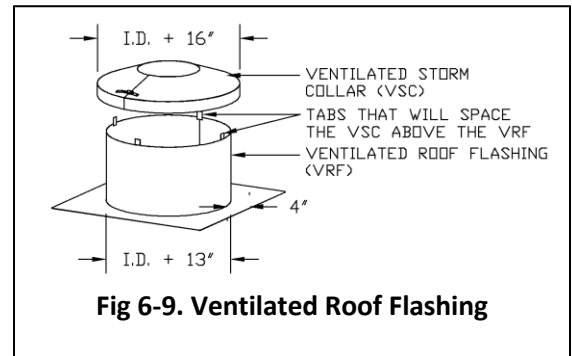
Ventilated Roof Flashing (VRF) and the Ventilated Storm Collar (VSC) are used in conjunction with the HTT High Temperature Insulated Thimble to provide a safe penetration through a combustible roof for all UL-2561 applications (1400°F maximum continuous temperature). (See Fig 6-11).

### Ventilated roof flashings (VRF) & Ventilated Storm Collar (VSC)

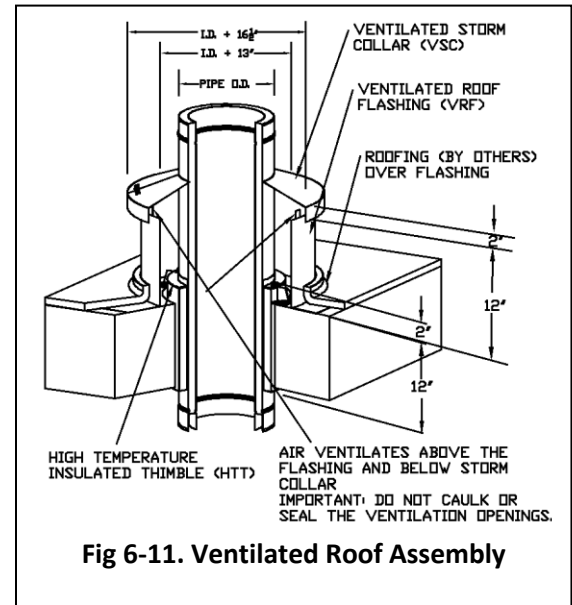
The Ventilated Roof Flashing is larger than the Flat Roof Flashing and incorporates tabs to allow air to flow under the Ventilated Storm Collar.



**Fig 6-10. Unvented Roof Assembly**



**Fig 6-9. Ventilated Roof Flashing**



**Fig 6-11. Ventilated Roof Assembly**

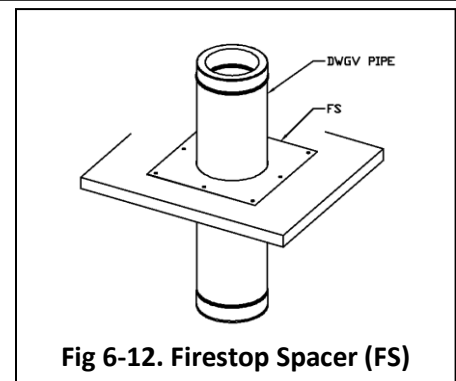
### Firestop Spacer (FS)

#### FIRESTOP SPACER (FS)

The Firestop Spacer is for use when penetrating a non-fire resistance rated ceiling or floor in installations where a separate fire rated enclosure is not required. Available in all diameters for DWKL/FL, only 3" and 4" diameters for SWKL/FL.

#### To Install:

1. Establish the correct framing dimension (See Table 1-2)
2. Nail the Fire Stop to top of the joist to prevent insulation from falling into the joist.
3. Route the vent through the Fire Stop plate.
4. Keep all attic insulation the proper minimum clearance from pipe by installing an enclosure or similar around the pipe.



**Fig 6-12. Firestop Spacer (FS)**

### Storm Collar

A Storm Collar is used to seal off the opening between the vent and flashing.

#### To Install (See Fig 6-9):

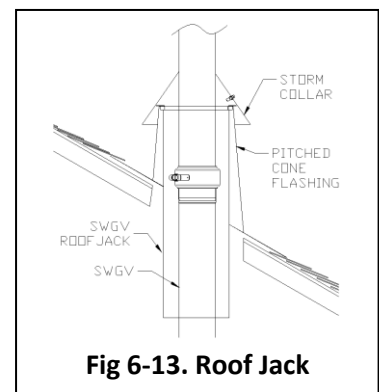
1. Position Storm Collar around vent and against the opening of the flashing.
2. Tighten worm gear to secure Storm Collar in place.
3. Apply sealant around seam between Storm Collar and vent.

### Roof Jack

The Roof Jack is required where single-wall model SWKL/FL passes through a combustible roof structure.

#### To Install (See Fig 6-13):

1. Slide the Roof Jack down inside the Flashing.
2. Position the tabs on the Roof Jack so that it is suspended from the top edge of the flashing.



**Fig 6-13. Roof Jack**

### Heat Shield (HSDW)

The Heat Shield is a light weight ventilated shield intended to lower the skin temperature of an installed DWKL/FL double wall exhaust system where personnel might be able to touch the installed exhaust system.

The Heat Shield has been UL evaluated to provide a maximum of 70°F rise skin temperatures with flue gas temperatures at 1000°F continuous or less.

#### IMPORTANT:

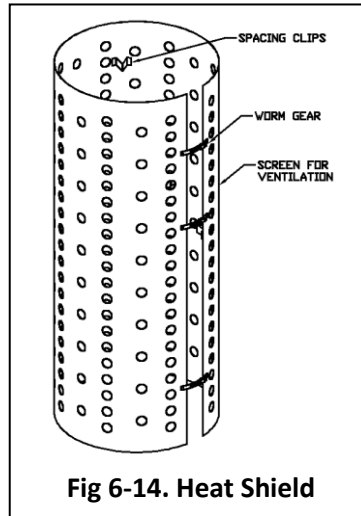
- Not for use with single wall SWKL system.
- Not used to change required surroundings and air space clearance to combustibles as shown in Part 1 General Information.

The Heat Shield consists of a ventilated shell that wraps around an installed DWKL/FL pipe. Spacing clips center the Heat Shield around the DWKL/FL pipe. The Heat Shield increases the DWKL outside diameter by 3". Total width of the DWKL/FL insulation and added Heat Shield, or distance from inside of pipe to outside of installed Heat-Shield is 2¾".

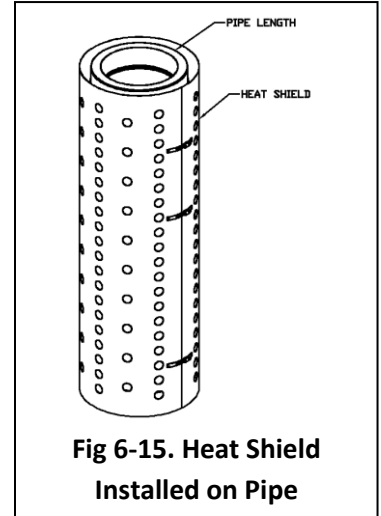
#### To Install:

1. The DWKL/FL system must be completely assembled and supported before installing the Heat Shield.
2. Unwrap the Heat Shield. The Heat Shield is factory packaged and delivered in a tighter roll (typically inside a DWKL/FL pipe length, or by itself with straps holding its cylindrical shape).
3. Place Heat Shield around the installed DWKL pipe.
4. Tighten the worm gears to a snug fit, the spacing clips will hold the Heat Shield in place in both horizontal and vertical installations.

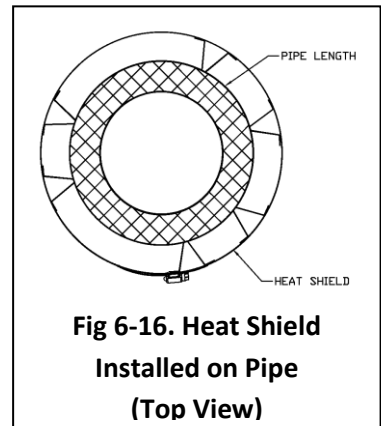
Multiple Heat Shields may be butted at ends or overlapped. If overlapped ensure all holes remain open.



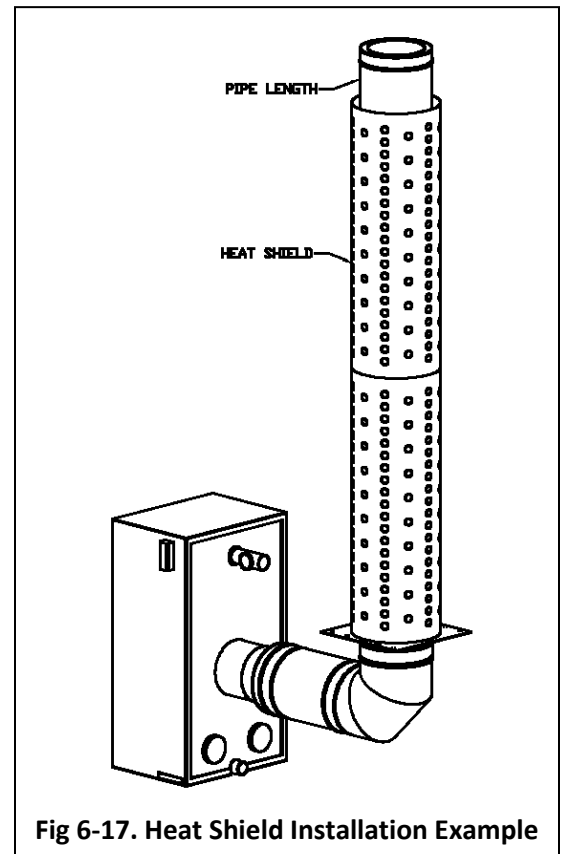
**Fig 6-14. Heat Shield**



**Fig 6-15. Heat Shield Installed on Pipe**



**Fig 6-16. Heat Shield Installed on Pipe (Top View)**



**Fig 6-17. Heat Shield Installation Example**

## SECTION 7 – Kitchen Ventilation Systems

### Single Wall

In Grease Ducts, the single wall Model SWKL & SWFL are intended to be an alternative option to field welded kitchen exhaust ducts as defined by NFPA-96. In this application these models have the same air space clearance to combustibles as field welded.

### Slope

Mechanical codes and good practice require that some slope (back to a grease reservoir or kitchen hood) be created to prevent pooling of grease within horizontal portions of grease duct systems. Per code, grease duct systems are required to incorporate a minimum  $\frac{1}{4}$ " per foot slope. Some codes require  $\frac{1}{4}$ " per foot for runs less than 75' in length and 1" per foot for runs of 75' and more.

While such slopes are critically important for flat bottom grease ducts in order to prevent pooling, it is well acknowledged that cylindrical ducts prevent pooling with far less slope.

Engineering analysis, including hydraulic fluid calculations and tests confirm that pooling of grease within factory-built, cylindrical grease duct systems can be achieved with far less slope compared to flat bottomed systems, due to the physical characteristics of their construction.

As such, per the terms of the UL Listing and in accordance with UL1978, Jeremias recommends a minimum slope of  $\frac{1}{16}$ " per foot (0.3 degrees) for horizontal segments of the KL / FL grease duct systems. Normal system components will permit such slopes to be achieved on horizontal offsets of at least 2' in dimension. Shorter runs require no slope. Where a specific slope is desired, Jeremias offers various options including 1.5°, 3° and 87° elbows as well as 87° tees.

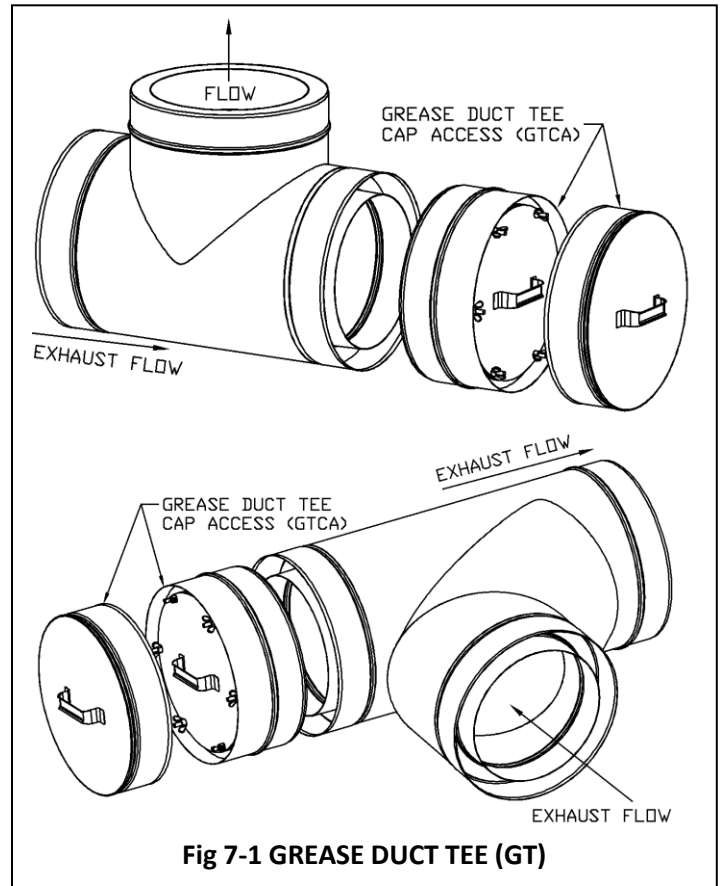


Fig 7-1 GREASE DUCT TEE (GT)

### Access for Cleaning Grease Ducts

Follow NFPA-96 for required openings in Grease Duct for accessibility required for thorough cleaning. Following are some openings requirements as mentioned in NFPA-96:

- 1) Openings at changes of direction, if not accessible from the duct entry or discharge.
  - 2) Access panel openings for installation and servicing of fire-extinguishing systems.
  - 3) Access for cleaning and inspection where fans with ductwork connected on both sides within 3' of each side of fan.
- Horizontal grease ducts only:
- 4) Opening for thorough cleaning at 12' intervals, where opening is not large enough for personnel entry.
- Vertical grease ducts only:
- 5) Access at the top of a vertical riser to accommodate personnel descent.
  - 6) Where personnel entry is not possible, access at every floor.

Model DWKL and SWKL have two standard options for access panels in Grease Duct systems. These are no-tool in design and specifically tested and Listed for Grease Duct use.

Inline Access Door (IAD), see Section 3.

Grease Duct Tee Cap Access (GTCA), see Section 4.

For Model SWKL single wall installations, it is permissible to install Listed Grease Duct Access Doors provided they are installed in accordance with the manufacturer's installation instructions.

### Interconnection with Field Welded Grease Ducts

Model DWKL/FL and SWKL/FL systems are intended to be installed as a complete system without the use of other manufacturer or field fabricated components. However, Jeremias recognizes the occasional requirement for a rectangular portion of grease duct due to space constraints at certain locations in a system, or when making modifications or additions to an existing grease duct. In such a case, it is permissible to transition to and from Model DWKL/FL and SWKL/FL Grease Duct to a code compliant, rectangular or round, welded steel grease duct and back again. In such a case, Jeremias will manufacture and supply a custom single wall stainless steel transition, meeting code thickness requirements, that permits field welding to or from the field welded duct section(s). Maintain the minimum air space to combustibles of 18" with these custom transitions. Follow NFPA-96 regarding methods for reduced clearances for these single wall custom transitions as well as the field fabricated grease ducts.

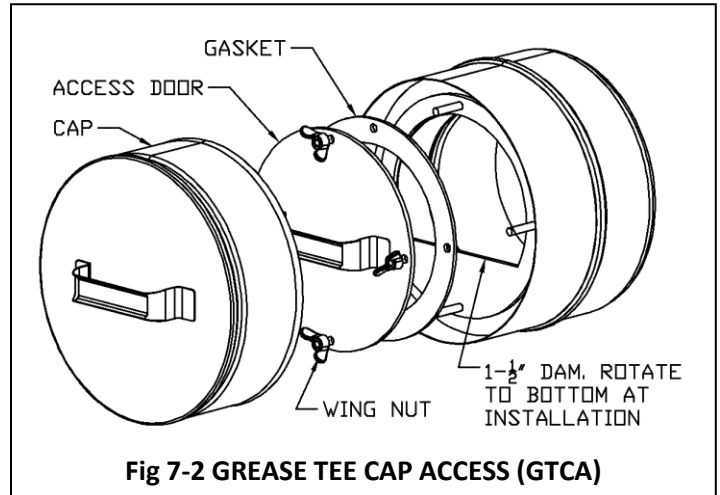
### Grease Duct Tee ( \_GT & \_GBT)

Grease Duct Tee fittings have a reversed snout that permits accessibility for cleaning. This is available in every tee option; the arrows below dictate exhaust flow.

### Grease Tee Cap Access (GTCA)

Grease Duct Tee Cap Access permits access to the inside Grease Duct for inspection and/or cleaning. It can be placed at the end of a snout of any three or four-way fitting and incorporates a 1½" tall dam to prevent liquid or grease from dropping out when opening.

Gasket and hardware are included so that the internal cap may be removed and reinstalled without tools.



**Fig 7-2 GREASE TEE CAP ACCESS (GTCA)**

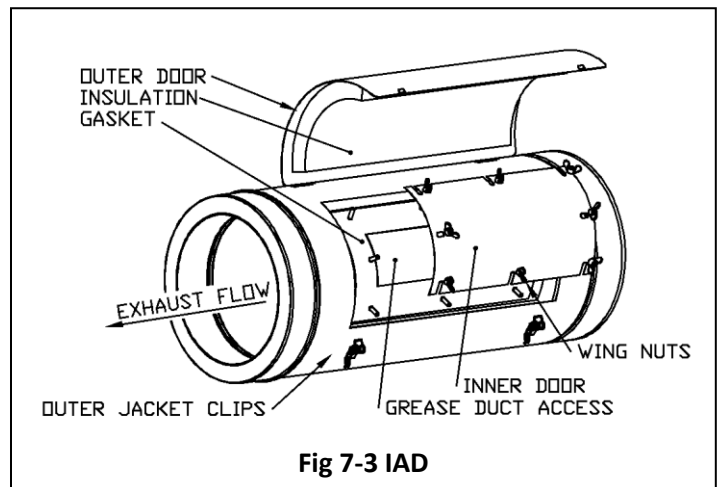
### Inline Access Door Length (IAD)

The Inline Access Door is for the Grease Duct application and provides an easy and no-tool access to the inside exhaust for cleaning and inspection. The Inline Access Door ships fully assembled, and no modifications are required in the field.

To open the door, and gain access to the Grease Duct, follow these steps:

1. Unlatch the outer jacket clips and open the door (hinges are on the opposite side of the clips).
2. Remove the precut insulation blanket.
3. Loosen and remove the wing nuts.
4. Remove the inner door.
5. Access the Grease Duct.

Reverse the steps to close the door.



**Fig 7-3 IAD**

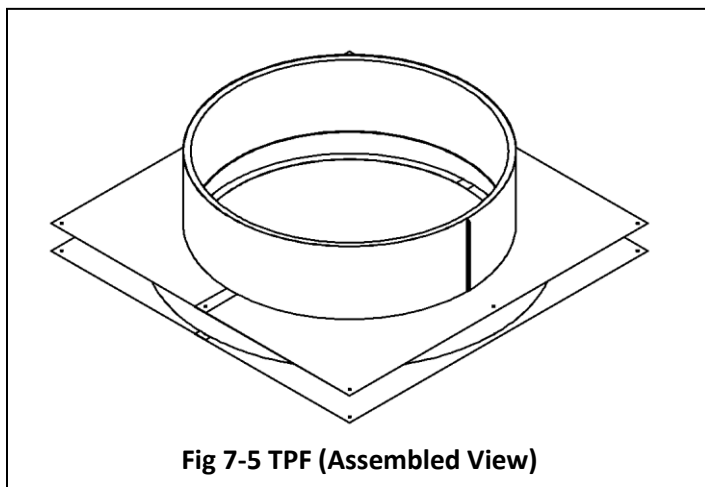
### Through Penetration Firestop (TPF)

The TPF is used to retain a fire rating where (only) model DWFL-ZC passes through a fire-rated floor or wall. See UL Fire Resistance Directory No. R39286. Classified in Accordance With UL-2221.

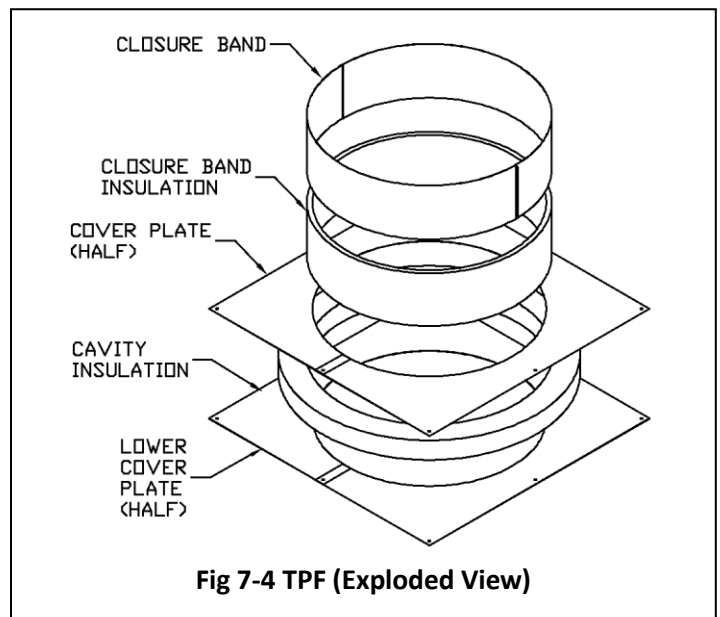
For floor penetration, one TPF is installed on the top the floor. For wall penetration a TPF is to be installed on each side of the wall.

To Install:

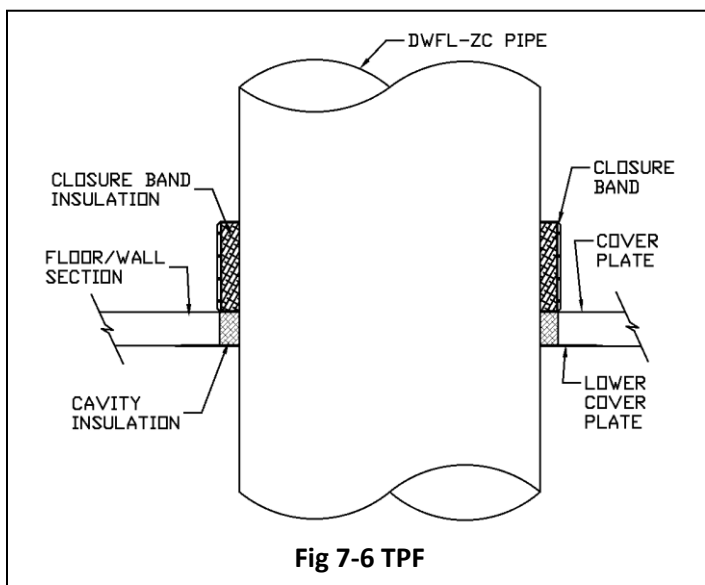
1. Create round or square hole in fire rated wall or floor. Hole is to be a maximum of 4" larger than outside diameter of pipe. The pipe can be centered or offset within the opening.
2. Route Duct through opening.
3. Support duct with APS or PS (see Section 2).
4. Position Lower Cover Plates around the circumference of pipe. Secure by installing fasteners through pilot holes and into floor/wall surface. The Lower Cover Plates will overlap to close off hole.
5. Fill wall / floor cavity with provided insulation. Insulation to be oriented in vertical layers to create a firmly packed surface.
6. Install upper Cover Plates (See step 4)
7. Wrap Closure Band insulation around outside surface of pipe
8. Position Closure Band around insulation (from step 7) and clamp flanges together using hardware provided.
9. Apply Fire Barrier sealant around perimeter of Cover Plates and pipe circumference. (Use HILTI FS-ONE Sealant, STI SpecSeal Series SSS, 3M CP 25WB+ or Rectorseal Metacaulk 1000 Intumescent Firestop Sealant).



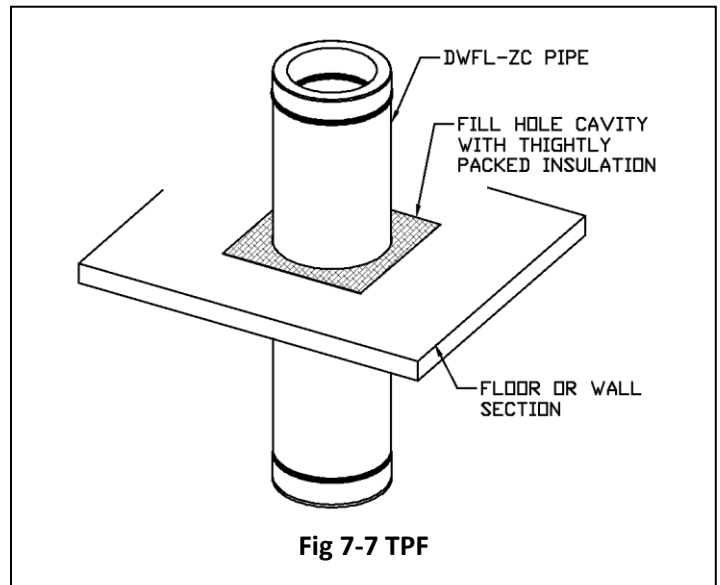
**Fig 7-5 TPF (Assembled View)**



**Fig 7-4 TPF (Exploded View)**



**Fig 7-6 TPF**



**Fig 7-7 TPF**

### 18" LINED BELLOWS LENGTH (LBL)

The Lined Bellows Length (LBL) incorporated as part of the Jeremias Inc. DWKL and SWKL product offering for engine exhaust applications is the same type and construction as bellows lengths that have been used for engine exhaust applications in North America and other parts of the world for decades.

These devices incorporate fully welded tubes (for the inner flue) of the same (stainless steel) material as the rigid chimney lengths and contain corrugations in the tube wall that provide for reducing the effective length via compression when force is applied at each end.

They incorporate a slightly smaller diameter rigid length (internally) through which the exhaust gases pass. Bellows lengths are fitted with the same inlet and outlet end construction and dimensions incorporated in fixed lengths making them completely compatible with other components.

Used between rigidly fixed supports, bellows lengths provide a very important means of accommodating thermal expansion of other parts in the system (due to the high temperature exhaust gas within) by compressing while maintain pressure and temperature capability without leakage.

At present (October 2018), Underwriters Laboratories, Inc. (UL) has no safety standard for these devices so although they are shown in this document and condoned by Jeremias Inc. and others, UL has not independently investigated this product.

### Pressure Relief Valve (PRV)

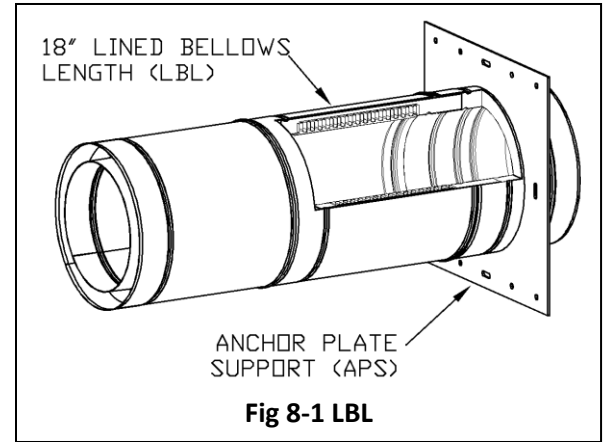
The Pressure Relief Valve (PRV) incorporated as part of the Jeremias Inc. DWKL/FL and SWKL/FL product offering for engine exhaust applications is the same type and construction as pressure relief valves that have been used for engine exhaust applications in North America and other parts of the world for decades.

Pressure relief valves are recommended by Jeremias Inc. and (other chimney manufacturers) on their chimneys - when used for engine exhaust applications - in order to provide protection in the unlikely, but possible, event of a delayed ignition of unburnt fuel in the system due to a malfunction of the engine. NFPA37 the "Standard for Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines" specifies the use of such a device in chimneys used for engine exhaust applications.

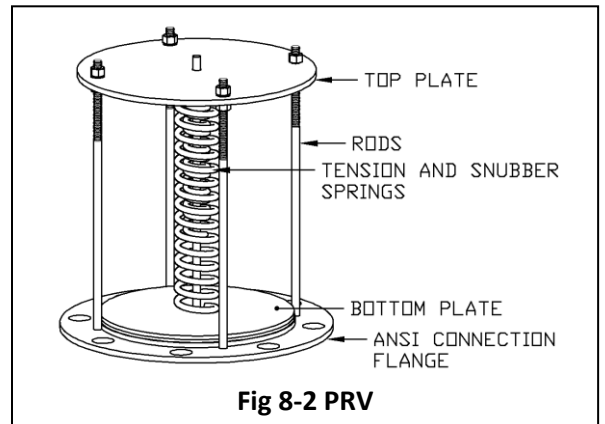
At present (October 2018), Underwriters Laboratories, Inc. (UL) has no safety standard for these devices so although they are shown in this document and condoned by NFPA, Jeremias Inc. and others, UL has not independently investigated this product.

### Option to Reinforce Fittings

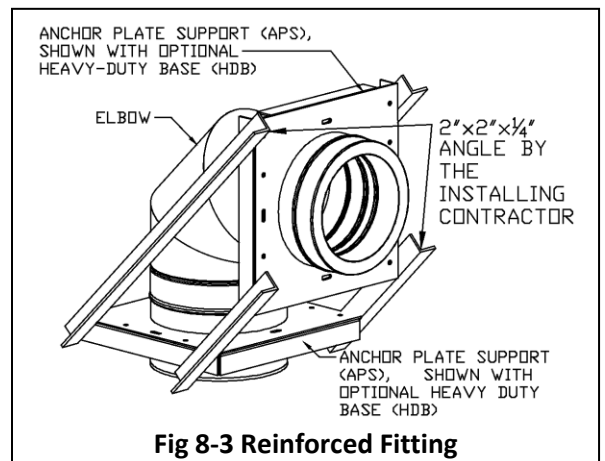
An option to requiring the use the Pressure Relief Valve in engine exhausts is to add external reinforcement to each fitting in the system. This is accomplished by using the Anchor Plate Support (APS) on the entry and exit sides and then reinforcing with external 2" x 2" x 1/4" angle. Use the Heavy-Duty Base (HDB) to minimize field supplied framework.



**Fig 8-1 LBL**



**Fig 8-2 PRV**



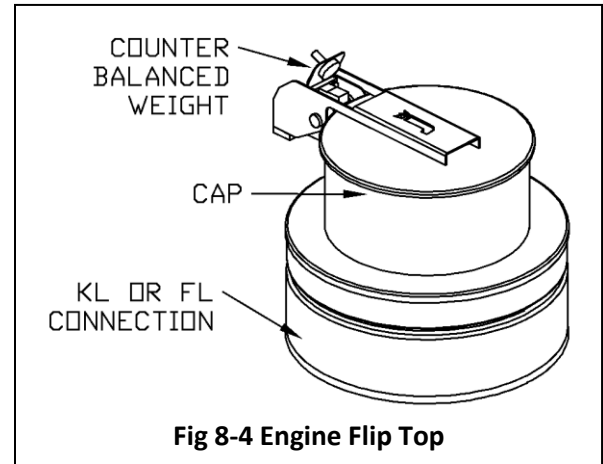
**Fig 8-3 Reinforced Fitting**

### Engine Flip Top (EFT & EFTH)

The Engine Flip Top / termination cap (EFT) shown herein and incorporated as part of the Jeremias Inc. DWKL/FL and SWKL/FL product offering is the same type and construction of cap that has been used for engine exhaust applications in North America and other parts of the world for decades.

At present (June 2014), Underwriters Laboratories, Inc. (UL) has no safety standard for these devices, so although they are shown in this document and condoned by Jeremias and others, UL has not independently investigated this product.

The Engine Flip Top is designed to be installed either on a vertical or horizontal exhaust. If installed in a horizontal configuration, the hinge must be on the top side. A counter balanced weight opens the cap when there is a slight exhaust pressure. For installation see corresponding Joint Connection section.



## SECTION 9 – FINISHING STEPS, INSPECTION & MAINTENANCE

### Final Check

Before completing assembly, recheck all joints to ensure the locking band has been properly installed and has captured the bead. For Category III and IV check joint for gas tightness. Confirm all clearances and support spacing is correct.

### OPERATING PRECAUTIONS

#### Creosote and Soot – Formation and Need for Removal

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

For this reason, the chimney should be inspected at least once every two months during the heating season to determine if a creosote or soot buildup has occurred. If creosote or soot has accumulated, it should be removed to reduce risk of a chimney fire.

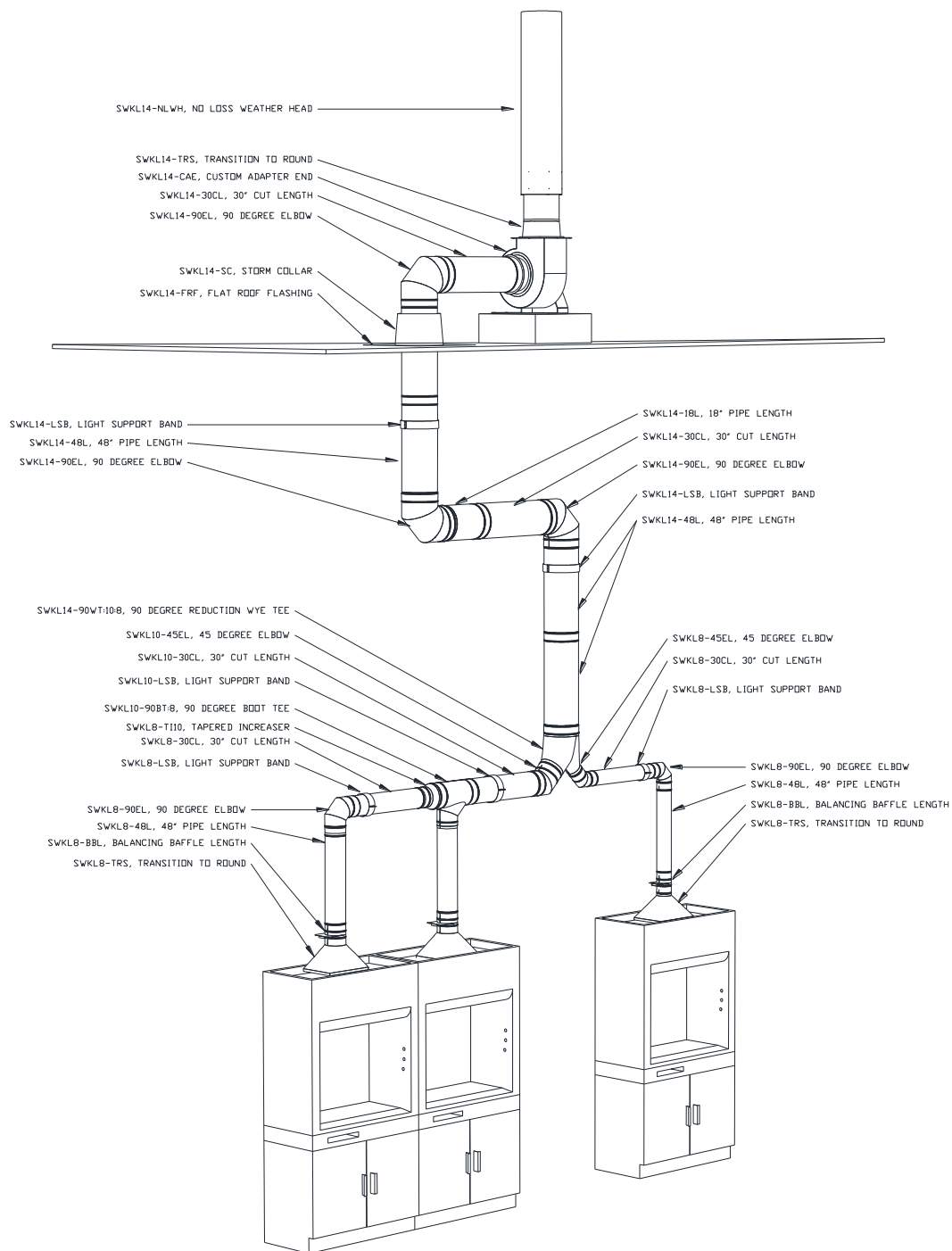
### Important Notice

The UL listing for this product is void if components other than the Listed Components are used. All warranties, stated or implied, are void if the vent or appliance is installed in a non-conforming manner. After installation, check all joints and supports to assure they are secure and functioning as intended and are properly sealed for containment of flue gases.

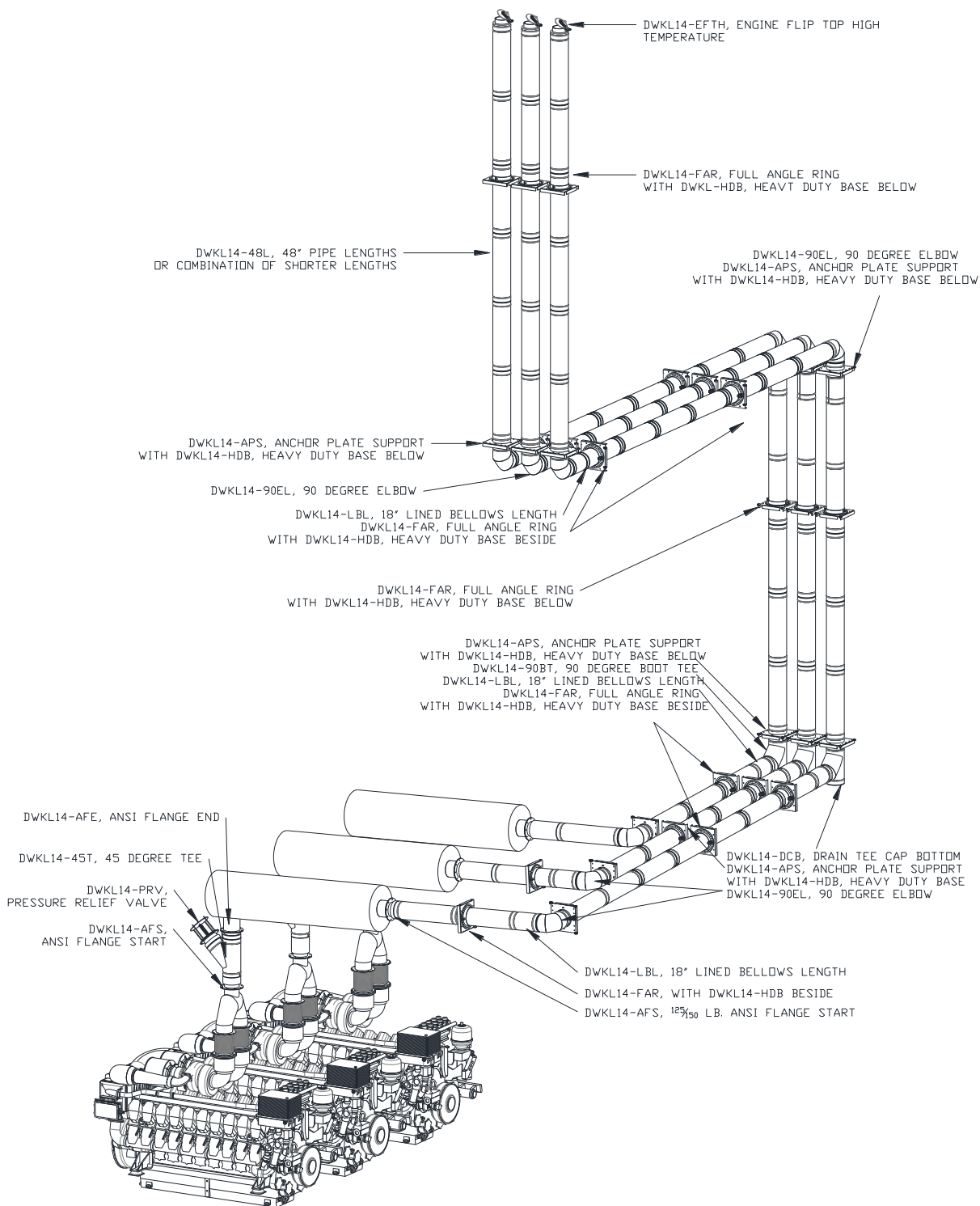
### Maintenance

Jeremias recommends that the entire system be checked by a qualified inspector at least once a year after the system is placed in service.

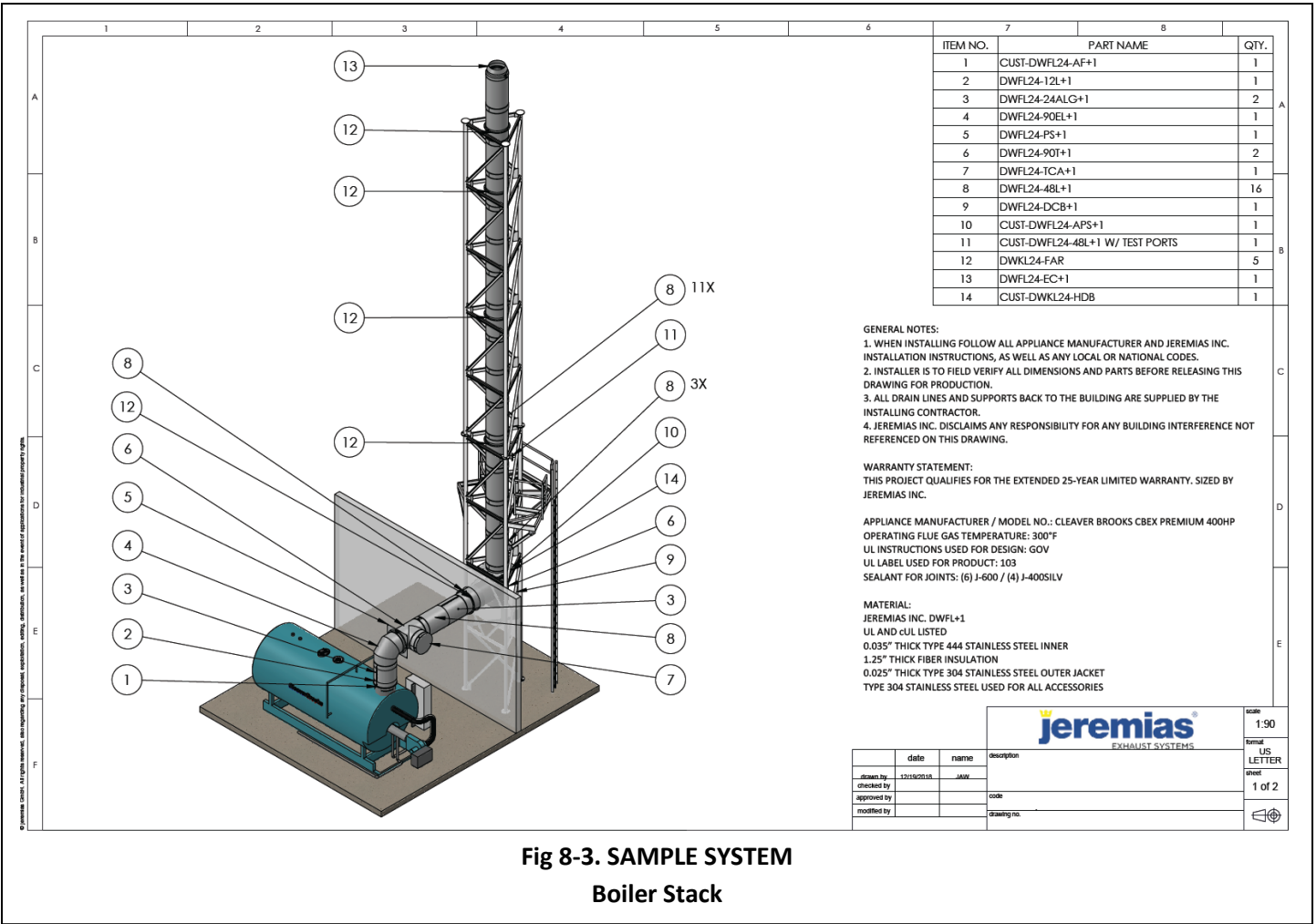
The installation must conform to the requirements of the appliance manufacturer's instructions, the National Fuel Gas Code and local codes and regulations.



**Fig 8-1. SAMPLE SYSTEM**  
**Fume Hood Exhaust**



**Fig 8-2. SAMPLE SYSTEM**  
**Engine Exhaust**





ITEM NO.	PART NAME	QTY.
1	CUST-DWFL24-AF+1	1
2	DWFL24-12L+1	1
3	DWFL24-24ALG+1	2
4	DWFL24-90EL+1	1
5	DWFL24-PS+1	1
6	DWFL24-90T+1	2
7	DWFL24-TCA+1	1
8	DWFL24-48L+1	16
9	DWFL24-DCB+1	1
10	CUST-DWFL24-APS+1	1
11	CUST-DWFL24-48L+1 W/ TEST PORTS	1
12	DWKL24-FAR	5
13	DWFL24-EC+1	1
14	CUST-DWKL24-HDB	1

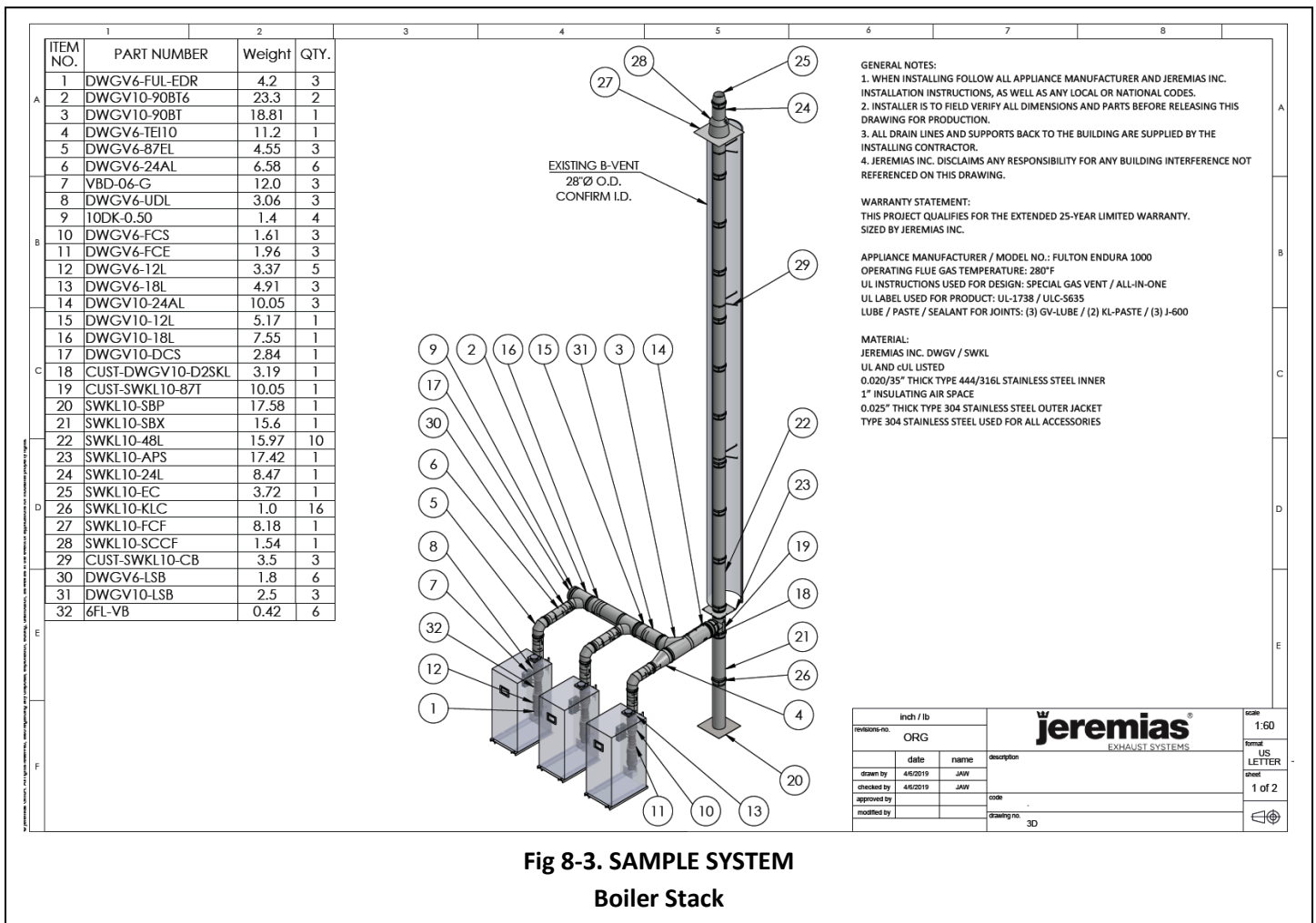
**GENERAL NOTES:**  
 1. WHEN INSTALLING FOLLOW ALL APPLIANCE MANUFACTURER AND JEREMIAS INC. INSTALLATION INSTRUCTIONS, AS WELL AS ANY LOCAL OR NATIONAL CODES.  
 2. INSTALLER IS TO FIELD VERIFY ALL DIMENSIONS AND PARTS BEFORE RELEASING THIS DRAWING FOR PRODUCTION.  
 3. ALL DRAIN LINES AND SUPPORTS BACK TO THE BUILDING ARE SUPPLIED BY THE INSTALLING CONTRACTOR.  
 4. JEREMIAS INC. DISCLAIMS ANY RESPONSIBILITY FOR ANY BUILDING INTERFERENCE NOT REFERENCED ON THIS DRAWING.

**WARRANTY STATEMENT:**  
 THIS PROJECT QUALIFIES FOR THE EXTENDED 25-YEAR LIMITED WARRANTY. SIZED BY JEREMIAS INC.

**APPLIANCE MANUFACTURER / MODEL NO.:** CLEAVER BROOKS CBEX PREMIUM 400HP  
**OPERATING FLUE GAS TEMPERATURE:** 300°F  
**UL INSTRUCTIONS USED FOR DESIGN:** GOV  
**UL LABEL USED FOR PRODUCT:** 103  
**SEALANT FOR JOINTS:** (6) J-600 / (4) J-400SILV

**MATERIAL:**  
 JEREMIAS INC. DWFL+1  
 UL AND cUL LISTED  
 0.035" THICK TYPE 444 STAINLESS STEEL INNER  
 1.25" THICK FIBER INSULATION  
 0.025" THICK TYPE 304 STAINLESS STEEL OUTER JACKET  
 TYPE 304 STAINLESS STEEL USED FOR ALL ACCESSORIES

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designed by	12/19/2019	AW		
checked by				
approved by			code	
modified by			drawing no.	
				



**Fig 8-3. SAMPLE SYSTEM**  
**Boiler Stack**

#### I. 1-Year Limited Warranty

Jeremias Inc. ("Jeremias") provides a 1-year limited warranty ("1-Year Limited Warranty") for its UL-1738/ULC-636 Gas vents, all variations of Models SWKL/FL and DWKL/FL (collectively, the "Products") for any defect in workmanship or materials under normal use from the date of shipment to the purchaser of Products ("Purchaser"), subject to the following conditions:

- Product sizing and specifications have been performed in accordance with generally accepted engineering practices.
- Correct installation and maintenance in full compliance with Jeremias' installation and maintenance instructions as published at the time of installation.

#### II. Extended 25-Year Limited Warranty

Jeremias provides for an extended 25-year limited warranty ("25-Year Limited Warranty") for any defect in workmanship or materials under normal use from the date of shipment to the Purchaser, subject to the satisfaction of the following conditions:

- Products must have been designed and sized by Jeremias' personnel.
- Availability of a written inspection report from the time of installation, or timely thereafter, by a Jeremias inspector or an inspector authorized by Jeremias, that the Product assembly and installation conformed to all of Jeremias' assembly and installation instructions.
- Products were at all times operated and maintained in full compliance with Jeremias' operation and maintenance instructions as published at the time of installation or as later provided to Purchaser by Jeremias.

#### III. Exclusion of Limited Warranty

The 1-Year Limited Warranty and the 25-Year Limited Warranty (collectively the "Limited Warranty") shall not cover (i) damages to: wear parts, e.g. seals; demonstration units; paintwork; moving parts, including but not limited to compensators, flue gas dampers, draught regulators, chimney, doors; flexible piping; insulation; consumables, such as granulates; minor Product deviations which do not effect functionality; or (ii) damages caused by: contamination of ambient air or combustion air by chlorinated hydrocarbons or other vapors which may cause excessively severe acid condensate to form within the Products; merchandise provided by other manufacturers; installation, transport or commissioning; Purchaser, an installer or other third parties; normal wear and tear; any party other than Jeremias in a willful manner; force majeure, including, but not limited to flood, fire or frost; non-compliance with the assembly, installation, operation and maintenance instructions available at [www.JeremiasInc.com](http://www.JeremiasInc.com); assembly, installation, maintenance or repair by unqualified personnel; improper commissioning; use of Products not in accordance with their intended purpose; exposure of Products to any metals of an inferior quality; contamination of the Products between unpacking and assembly; burning of wood other than unpainted, natural wood, which has been stored for at least 3 years and which moisture level does not exceed 20%; or burning of chipboard or domestic waste.

#### IV. Remedies

If a valid Limited Warranty claim arises, Jeremias shall, at its sole discretion, either repair the Product or deliver a properly functioning Product. This Limited Warranty is limited to repair or replacement of the Product plus shipping cost to the location of the defective Product. The Limited Warranty does not cover labor costs for removal or replacement of the defective Product, unless such labor shall be carried out by Jeremias itself in its sole discretion.

#### V. Filing of a Limited Warranty Claim

Limited Warranty claims may only be asserted during the term of the applicable Limited Warranty period. Any extension of the term of the Limited Warranties shall be excluded, regardless of the legal basis. If Purchaser believes that there is a justified Limited Warranty claim, Purchaser shall notify Jeremias to that effect in writing. Any claims stemming from or relating to a Limited Warranty shall be asserted in detail within eight weeks after the discovery of the defect (the time when the notification is received by Jeremias will be the basis for determining whether a claim has been reported within this deadline) or else shall be excluded and not be recognized by Purchaser. Such notification shall include a description of the defect, original proof of purchase, and a copy of the written inspection report as described in Section II above (if applicable).

#### VI. No Other Warranty

EXCEPT AS SET FORTH EXPRESSLY THEREIN, JEREMIAS MAKES NO WARRANTIES, EITHER EXPRESS OR IMPLIED, REGARDING THE PRODUCTS, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

#### VII. Damages Disclaimer and Limitation

IN NO EVENT SHALL JEREMIAS BE LIABLE TO ANY CLIENT OR ANY OTHER PERSON FOR ANY (A) INDIRECT, INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES, INCLUDING LOSS OF PROFIT OR GOODWILL OR (B) DIRECT DAMAGES TO BODY, HEALTH OR PROPERTY FOR ANY MATTER ARISING OUT OF OR RELATING TO THE PRODUCTS, WHETHER SUCH LIABILITY IS ASSERTED ON THE BASIS OF CONTRACT, TORT OR OTHERWISE EVEN IF JEREMIAS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL JEREMIAS' TOTAL AGGREGATE LIABILITY FOR DAMAGES EXCEED THE GREATER OF THE AMOUNT OF (A) TOTAL COMPENSATION PAID BY PURCHASER TO JEREMIAS FOR THE PRODUCTS, OR (B) PROCEEDS AVAILABLE FROM ANY INSURANCE POLICY IN EFFECT AND APPLICABLE TO THE EVENT GIVING RISE TO SUCH LIABILITY.

#### VIII. Notice

Any notice or other communication hereunder to Jeremias shall be sent postage prepaid, by certified mail, by courier such as United Parcel Service or e-mail, to the following: Jeremias Inc., 983 Industrial Park Drive, Marietta, GA 30062, E-mail: [Info@JeremiasInc.com](mailto:Info@JeremiasInc.com). Notices shall be effective upon receipt.

#### IX. Terms and Conditions of Sale

Purchaser's Terms and Conditions of Sale as currently in effect shall govern these Limited Warranties, including without limitation the rights and responsibilities granted hereunder. Jeremias Warranty and Terms & Conditions apply. Visit: <https://jeremiasinc.com/downloads/terms-conditions/>



Jeremias Inc.

983 Industrial Park Drive, Marietta, GA 30062