

PRESSURE INDUSTRIAL CHIMNEY



For Heating Appliances,
Generator & Fume Exhaust

SELECTION GUIDE

PRESSURE RATED CHIMNEYS & VENTS

MODELS

PSW
Single Wall

PIC
Double Wall
1" Air
Insulated

IPIC-1
Double Wall
1" Ceramic
Insulation

IPIC-2
Double Wall
2" Ceramic
Insulation

IPIC-4
Double Wall
4" Ceramic
Insulation

CONSTRUCTION

Flues
Casings

304 or 316 Stainless Steel
Aluminized Steel, 304 or 316 Stainless Steel

PRESSURES

Positive – Neutral – Negative

APPLICATIONS

Chimney
Stacks
Commercial Fireplaces
Air Duct

Vents
Solid Fuel Burning Appliances
Building Heating Appliances
1400° F Chimney

Stationary Combustion Engines
Stationary Gas Turbines
Fume Exhausts / Venting*

*Consult appropriate authority to determine fume compatibility with 304 or 316 stainless steel & silicone sealants.

KITCHEN VENTILATION

In addition to the products listed above, Metal-Fab offers "G Series" Factory-Built Grease Duct Systems in full compliance with the current requirements. Additional components include Fan Curb Terminations, clean out access, and transitions. For more information, request the "G Series" Factory-Built Grease Duct Design Manual (L2084) Visit our website: www.metal-fabcommercial.com

CONDENSING APPLICATIONS

For condensing appliances and other acidic/caustic applications select Corr/Guard®. Flues are constructed from AL29-4C stainless steel, the choice for corrosive environments. Additional information is available by requesting the Corr/Guard® Design Manual (L2610) or visit our website: www.metal-fabcommercial.com

MISCELLANEOUS

Metal-Fab manufactures a complete line of products for Category I gas-burning appliances, a variety of Hearth and HVAC applications. Visit our website www.metal-fabinc.com

STANDARDS AND LISTINGS

NFPA 37	Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines.
NFPA 54	National Fuel Gas Code
NFPA 211	Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning appliances.
UL 103	Standard for Safety, Factory-Built Chimneys for Residential and Building Heating Appliances.
ASTM E119	Standard Test Methods for Fire Tests of Building Construction and Materials.

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MODEL CODES

ICC: International Code Council

The ICC is a not-for-profit organization established by the International Conference of Building Officials, Building Officials and Code Administrators International, and the Southern Building Code Congress International to create a single set of comprehensive and coordinated international codes. This set is called the International Codes. ICBO, BOCA, and SBCCI no longer publish separate codes. Codes regarding chimneys and vents are in the International Mechanical Code (IMC).

IAPMO: International Association of Plumbing & Mechanical Officials

IAPMO publishes the Uniform Plumbing Code® (UPC), Uniform Mechanical Code® (UMC), and a number of other life safety codes. IAPMO is most recognized for their development of the Uniform Plumbing Code.

NFPA: National Fire Protection Association

NFPA develops codes and standards for fire safety. There are over 300 NFPA codes and standards.

GENERAL INFORMATION

Pertinent information is consolidated in this publication to assist you with application information, codes and standards, dimensional information, support requirements and other data of special interest. It is our goal to enable you to select the proper product to meet the requirements of your project confidently and efficiently.

For additional information you may contact us via:

Web Site: www.metal-fabcommercial.com
 Telephone: 316-943-2351
 Toll Free Phone: 800-835-2830
 Fax: 316-771-4168
 E-mail: cvpcs@metal-fabinc.com

Complete information for proper and safe installations is found in the Metal-Fab Installation Instructions for each product.

Model PIC and IPIC building heating appliance chimneys are suitable for use with building heating appliances and other low heat appliances as described in NFPA 211; Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances, that produce exhaust flue gas temperatures not exceeding 1000°F continuous or 1400°F intermittently. The PIC and IPIC chimneys are also suitable for higher heat applications where continuous temperatures do not exceed 1400°F and where the intermittent maximum temperature is less than 1800°F.

NOTE: Dimensions are American Standard (feet & inches), with metric in parenthesis except where stated otherwise. Always consult appliance installation instructions for exhaust temperatures, pressures, and operating conditions. Appliance manufacturer may limit horizontal runs, elbows, offsets, vertical heights, etc.



PRODUCT MODEL	PSW	PIC	IPIC-1	IPIC-2	IPIC-4
UL File No. - Chimney	MH17528	MH8251	MH8251	MH8251	MH8251
UL Listings					
Building Heating Appliance		X	X	X	X
1400°F Factory-Built Chimney		X	X	X	X
Standards					
NFPA 37		X	X	X	X
NFPA 211	X	X	X	X	X
UL 103		X	X	X	X
UL 1777	X				
Regional Acceptance					
California State Fire Marshall					
Chimney No.: 4146-296:100		X			
City of New York					
Chimney No.: MEA245-97-M		X	X	X	X
Massachusetts					
Chimney No.: G3-0207-314		X	X	X	X

FUEL TYPES	
All Models	Natural and LP Gas, #2-6 Fuel Oil, Coal, Wood, Fumes

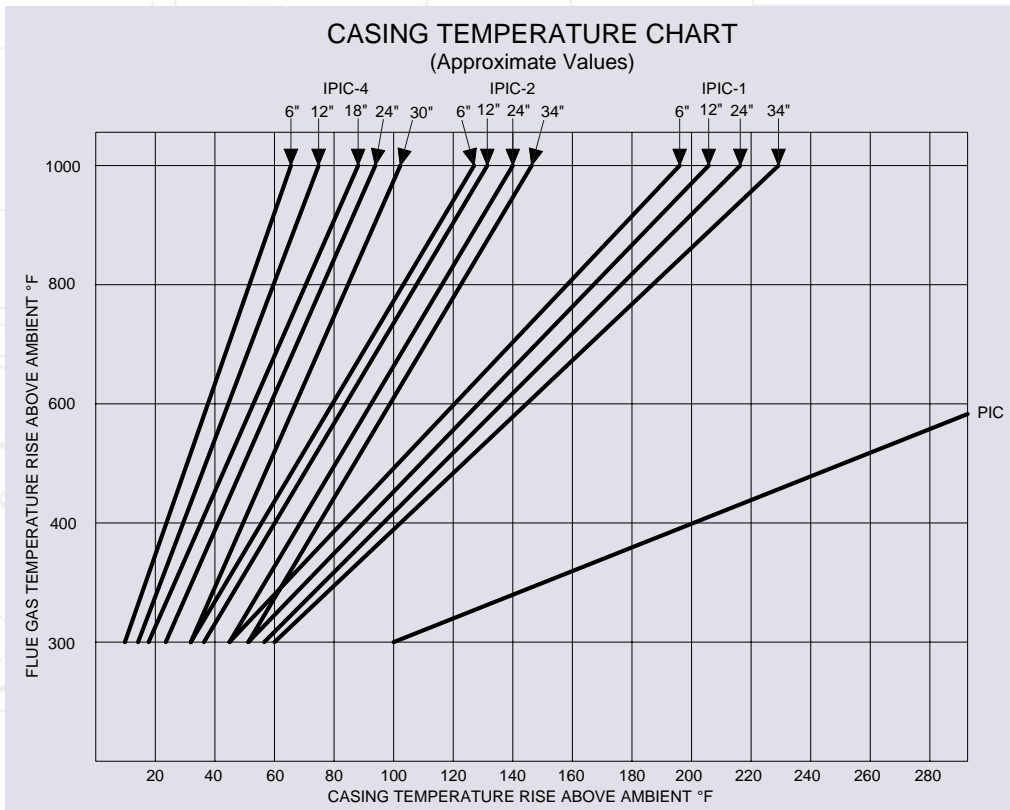
EXHAUST PRESSURE	
All Models	Positive, Neutral, Negative

MATERIAL SELECTIONS	
FLUE	CASING
304 Stainless Steel	Aluminized Steel
316 Stainless Steel	304 Stainless Steel
	316 Stainless Steel

TEMPERATURE RATINGS		
	Building Heating Appliances	Factory-Built Chimneys
Continuous	1000°F (538C)	1400°F (760C)
Intermittent	1400°F (760C)	1800°F (982C)

MATERIAL THICKNESS					
Flue	PSW	PIC	IPIC-1	IPIC-2	IPIC-4
6"-36" (152-914)	.035"(.9)	.035"(.9)	.035"(.9)	.035"(.9)	.035"(.9)
38"-48" (965-1219)	.048" (1.2)	.048" (1.2)	.048" (1.2)	.048" (1.2)	.048" (1.2)
Casing – Based on Flue Diameter – *Aluminized / Stainless					
6"-18" (152-457)	Not Applicable	*.024"(.6) / .024(.6)	*.024"(.6) / .024(.6)	*.024"(.6) / .024(.6)	*.024"(.6) / .024(.6)
20"-22" (508-559)		*.024"(.6) / .024(.6)	*.024"(.6) / .024(.6)	*.024"(.6) / .024(.6)	*.034"(.9) / .024(.6)
24" (610)		*.024"(.6) / .024(.6)	*.024"(.6) / .024(.6)	*.034"(.9) / .024(.6)	*.034"(.9) / .024(.6)
26"-30" (660-762)		*.034"(.9) / .024(.6)	*.034"(.9) / .024(.6)	*.034"(.9) / .024(.6)	*.034"(.9) / .024(.6)
32"-34" (813-864)		*.034"(.9) / .024(.6)	*.034"(.9) / .024(.6)	*.034"(.9) / .024(.6)	*.034"(.9) / .035(.9)
36" (914)		*.034"(.9) / .024(.6)	*.034"(.9) / .024(.6)	*.034"(.9) / .035(.9)	*.034"(.9) / .035(.9)
38"-48" (965-1219)		*.034"(.9) / .035(.9)	*.034"(.9) / .035(.9)	*.034"(.9) / .035(.9)	*.034"(.9) / .035(.9)

INSULATION THICKNESS				
PSW	PIC	IPIC-1	IPIC-2	IPIC-4
None	1" Air Space	1" Ceramic	2" Ceramic	4" Ceramic



DEFINITIONS

Alternative Methods: The use of other methods or devices for the compliance with a standard, provided that sufficient technical data are submitted to the Authority Having Jurisdiction to demonstrate that the proposed method or device is equivalent in quality, strength, fire endurance, effectiveness, durability and safety to that of the standard.

Authority Having Jurisdiction: The organization, office, or individual responsible for approving equipment, an installation, or procedure.

Breeching: That portion of the system that conveys products of combustion from the appliance(s) to the chimney. Also referred to as vent connector.

Chimney: A primarily vertical passageway for removing products of combustion from a structure. Factory-built chimneys shall be listed by an accredited testing agency.

Combustible Material: Material subject to an increase in combustibility or flame spread rating beyond the limits established in the definition of limited combustibles.

Limited Combustibles: Building combustible material that does not comply with the definition of a non combustible material, that in the form used, has a potential heat value not exceeding 3500 Btu/lb. (Abbreviated... see NFPA for full definition)

Liquid-tight: Constructed and performing in such a manner as not to permit the passage of any liquid at any temperature.

Listed: Equipment, materials, or services included in a list published by an organization that is acceptable to the Authority Having Jurisdiction and concerned with the evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material or service meets the identified standards or has been tested and found suitable for a specific purpose.

DEFINITIONS (CONTINUED)

Non Combustibles: A material that, in the form in which it is used and under the conditions anticipated, will not ignite, burn, support combustion, or release flammable vapors when subjected to fire or heat. Materials that are reported to pass ASTM E 136 *Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750C* shall be considered noncombustible materials.

Special Gas Vent: A vent constructed and listed to UL 1738. This standard refers to venting Category II, and IV appliances, considered to be condensing types. Metal-Fab Corr/Guard is recommended for these appliances.

Vents, Type B: Factory made vents listed by a nationally recognized testing agency for venting listed gas appliances with draft hoods and other Category I gas appliances listed for use with Type-B gas vents.

CLEARANCE TO COMBUSTIBLES

Refer to the table clearances. Consideration in design should be given to allow adequate clearances for installation. Roof Support Assemblies and Ventilated Thimble Assemblies are used to penetrate a combustible roof. All other parts are for attachment to noncombustible construction (i.e. floor guides, wall guides, plate and wall support assemblies).

DO NOT ENCLOSE WITH COMBUSTIBLE CONSTRUCTION

CLEARANCE: 1000°F (538°C) CONTINUOUS, 1400°F (760°C) INTERMITTENT BUILDING HEATING APPLIANCE

DIAMETER	PSW		PIC		IPIC-1		IPIC-2		IPIC-4	
	INT.	EXT.	INT.	EXT.	INT.	EXT.	INT.	EXT.	INT.	EXT.
6" (152)	18" (457)	18" (457)	4" (102)	4" (102)	1" (25)	1" (25)	1" (25)	1" (25)	1" (25)	1" (25)
8"-16" (203-406)	18" (457)	18" (457)	4" (102)	4" (102)	2" (51)	2" (51)	1" (25)	1" (25)	1" (25)	1" (25)
18" (457)	18" (457)	18" (457)	5" (127)	5" (127)	3" (76)	3" (76)	1" (25)	1" (25)	1" (25)	1" (25)
20" (508)	18" (457)	18" (457)	6" (152)	6" (152)	3" (76)	3" (76)	1" (25)	1" (25)	1" (25)	1" (25)
22" (559)	18" (457)	18" (457)	7" (178)	6" (152)	3" (76)	3" (76)	1" (25)	1" (25)	1" (25)	1" (25)
24" (610)	18" (457)	18" (457)	8" (203)	6" (152)	3" (76)	3" (76)	1" (25)	1" (25)	1" (25)	1" (25)
26" (660)	18" (457)	18" (457)	9" (229)	6" (152)	3" (76)	3" (76)	1" (25)	1" (25)	1" (25)	1" (25)
28"-32" (711-813)	18" (457)	18" (457)	10" (254)	6" (152)	4" (102)	4" (102)	1" (25)	1" (25)	1" (25)	1" (25)
34" (864)	18" (457)	18" (457)	10" (254)	6" (152)	5" (127)	5" (127)	1" (25)	1" (25)	1" (25)	1" (25)
36"-40" (914-1016)	18" (457)	18" (457)	10" (254)	6" (152)	5" (127)	5" (127)	3" (76)	1" (25)	3" (76)	1" (25)
42"-44" (1067-1118)	18" (457)	18" (457)	10" (254)	6" (152)	6" (152)	6" (152)	3" (76)	1" (25)	3" (76)	1" (25)
46" (1168)	18" (457)	18" (457)	10" (254)	6" (152)	6" (152)	6" (152)	3" (76)	1" (25)	3" (76)	1" (25)
48" (1219)	18" (457)	18" (457)	10" (254)	6" (152)	6" (152)	6" (152)	3" (76)	1" (25)	3" (76)	1" (25)

CLEARANCE: 1400°F (760°C) CONTINUOUS, 1800°F (982°C) INTERMITTENT FACTORY-BUILT CHIMNEY

DIAMETER	PSW		PIC		IPIC-1		IPIC-2		IPIC-4	
	INT.	EXT.	INT.	EXT.	INT.	EXT.	INT.	EXT.	INT.	EXT.
6" (152)	18" (457)	18" (457)	4" (102)	4" (102)	1" (25)	1" (25)	1" (25)	1" (25)	1" (25)	1" (25)
8"-16" (203-406)	18" (457)	18" (457)	4" (102)	4" (102)	2" (51)	2" (51)	1" (25)	1" (25)	1" (25)	1" (25)
18" (457)	18" (457)	18" (457)	6" (152)	6" (152)	3" (76)	3" (76)	1" (25)	1" (25)	1" (25)	1" (25)
20" (508)	18" (457)	18" (457)	8" (203)	8" (203)	3" (76)	3" (76)	1" (25)	1" (25)	1" (25)	1" (25)
22" (559)	18" (457)	18" (457)	9" (229)	9" (229)	3" (76)	3" (76)	1" (25)	1" (25)	1" (25)	1" (25)
24" (610)	18" (457)	18" (457)	10" (254)	10" (254)	3" (76)	3" (76)	1" (25)	1" (25)	1" (25)	1" (25)
26" (660)	18" (457)	18" (457)	10" (254)	10" (254)	3" (76)	3" (76)	1" (25)	1" (25)	1" (25)	1" (25)
28"-32" (711-813)	18" (457)	18" (457)	10" (254)	10" (254)	4" (102)	4" (102)	1" (25)	1" (25)	1" (25)	1" (25)
34" (864)	18" (457)	18" (457)	10" (254)	10" (254)	5" (127)	5" (127)	1" (25)	1" (25)	1" (25)	1" (25)
36"-40" (914-1016)	18" (457)	18" (457)	10" (254)	10" (254)	5" (127)	5" (127)	3" (76)	1" (25)	3" (76)	1" (25)
42"-48" (1067-1219)	18" (457)	18" (457)	10" (254)	10" (254)	6" (152)	6" (152)	3" (76)	1" (25)	3" (76)	1" (25)

SUPPORT DATA

NOTE: Thermal expansion between supports should always be determined. If the computed expansion between fixed points is greater than 0.375", we recommend an Adjustable Length or Bellows Joint be installed.

The formula for computing expansion is:

[Length (feet)/100] X [Temperature Rise degreesF/100]

Example [50' / 100] X [500F/100] = 2.5" Expansion.

SUPPORTS - VERTICAL		Maximum Supported Height			
PRODUCT	PSW	PIC	IPIC-1	IPIC-2	IPIC-4
Plate Support (PS)	100' (30.5m)	100' (30.5m)	85' (25.9m)	75' (22.9m)	73' (22.3m)
Roof Support Assembly (RSA)	30' (9.1m)	30' (9.1m)	25' (7.6m)	22' (6.7m)	22' (6.7m)
Wall Support Assembly (WSA)	40' (12.2m)	40' (12.2m)	34' (10.4m)	30' (9.1m)	29' (8.8m)
Stack Support Assembly (SSA)	100' (30.5m)	100' (30.5m)	100' (30.5m)	100' (30.5m)	100' (30.5m)
Pier or Structural Support	100' (30.5m)	100' (30.5m)	85' (25.9m)	75' (22.9m)	73' (22.3m)

Values shown are the maximum distance between supports. Guides are also required.

GUIDES - HORIZONTAL		Maximum Spacing-Horizontal			
(See Components Section for guide selection)					
PRODUCT	PSW	PIC	IPIC-1	IPIC-2	IPIC-4
Component Choices:					
Half Angle Ring (HAR)	10' 6" (3.2m)	10' 6" (3.2m)	10' (3.1m)	9' (2.7m)	9' (2.7m)
Full Angle Ring (FAR)	10' 6" (3.2m)	10' 6" (3.2m)	10' (3.1m)	9' (2.7m)	9' (2.7m)
Plate Support (PS)	10' 6" (3.2m)	10' 6" (3.2m)	10' (3.1m)	9' (2.7m)	9' (2.7m)

GUIDES - VERTICAL		Maximum Spacing-Vertical / OUTSIDE			
Adjacent to Structure					
(See Components Section for guide selection)					
Flue Diameter - Inches	PSW	PIC	IPIC-1	IPIC-2	IPIC-4
6" (152)	17' (5.2m)	17' (5.2m)	17' (5.2m)	10' 6" (3.2m)	8' 3" (2.5m)
8" (203)	17' 6" (5.3m)	17' 6" (5.3m)	17' 6" (5.3m)	12' (3.7m)	9' 7" (2.9m)
10" (254)	18' 6" (5.6m)	18' 6" (5.6m)	18' 6" (5.6m)	13' 3" (4.0m)	10' 9" (3.3m)
12" (305)	20' (6.1m)	20' (6.1m)	20' (6.1m)	14' 6" (4.4m)	11' 11" (3.6m)
14" (356)	21' (6.4m)	21' (6.4m)	21' (6.4m)	15' 11" (4.8m)	13' 2" (4.0m)
16" (406)	22' (6.7m)	22' (6.7m)	22' (6.7m)	17' (5.2m)	14' 2" (4.3m)
18" (457)	23' (7.0m)	23' (7.0m)	23' (7.0m)	18' 3" (5.6m)	15' 4" (4.7m)
20" (508)	24' (7.3m)	24' (7.3m)	24' (7.3m)	19' 6" (5.9m)	16' 4" (5.0m)
22" (559)	24' 6" (7.5m)	24' 6" (7.5m)	24' 6" (7.5m)	20' 2" (6.2m)	17' (5.2m)
24" (610)	25' (7.6m)	25' (7.6m)	25' (7.6m)	20' 9" (6.3m)	17' 7" (5.4m)
26" (660)	26' (7.9m)	26' (7.9m)	26' (7.9m)	21' 5" (6.5m)	18' 2" (5.5m)
28" (711)	27' (8.2m)	27' (8.2m)	27' (8.2m)	22' 1" (6.9m)	18' 9" (5.7m)
30" (762)	27' (8.2m)	27' (8.2m)	27' (8.2m)	22' 8" (7.1m)	19' 4" (5.9m)
32" (813)	28' 6" (8.7m)	28' 6" (8.7m)	28' 6" (8.7m)	23' 4" (7.3m)	19' 11" (6.1m)
34" (864)	29' (8.8m)	29' (8.9m)	29' (8.9m)	24' (7.3m)	20' 6" (6.2m)
36" (914)	30' (9.1m)	30' (9.1m)	30' (9.1m)	24' 7" (7.5m)	21' (6.4m)
38" (965)	30' 6" (9.3m)	30' 6" (9.3m)	30' 6" (9.3m)	24' 7" (7.5m)	21' (6.4m)
40" (1016)	31' (9.4m)	31' (9.4m)	31' (9.4m)	24' 7" (7.5m)	21' (6.4m)
42" (1067)	32' (9.8m)	32' (9.8m)	32' (9.8m)	24' 7" (7.5m)	21' (6.4m)
44" (1118)	32' 6" (9.9m)	32' 6" (9.9m)	32' 6" (9.9m)	24' 7" (7.5m)	21' (6.4m)
46" (1168)	33' 6" (10.2m)	33' 6" (10.2m)	33' 6" (10.2m)	24' 7" (7.5m)	21' (6.4m)
48" (1219)	34' 6" (10.5m)	34' 6" (10.5m)	34' 6" (10.5m)	24' 7" (7.5m)	21' (6.4m)

GUIDES - VERTICAL		Max. Vertical Spacing - VERTICAL/INTERNAL			
Below Roofline					
(See components section for guide selection)					
PRODUCT	PSW	PIC	IPIC-1	IPIC-2	IPIC-4
All Diameters - Full Angle Ring	25' (7.6m)	25' (7.6m)	21' (6.4m)	19' (5.8m)	18' (5.5m)

WEIGHT/LIFT INFORMATION

The average weight of the chimney, per foot of length, can be calculated using the following formula:

$$\text{Weight (lbs. per lineal foot)} = \text{pipe dia. in inches} \times \text{"weight factor"}$$

Weight Factor:

PSW	= 0.40	IPIC-2	= 1.05
PIC	= 0.80	IPIC-4	= 1.45
IPIC-1	= 0.95		

Example: 8" IPIC-1 weight calculated: 8 x 0.95 = 7.6 lbs. per lineal foot.

STACK LIFT CHART

This chart indicates maximum height that can be suspended without support.

PIPE DIA.	PSW Height	PIC Height	IPIC-1 Height	IPIC-2 Height	IPIC-4 Height
6" (152)	220' (67.1m)	110' (33.5m)	90' (27.4m)	80' (24.4m)	60' (18.3m)
8" (203)	190' (57.9m)	90' (27.4m)	80' (24.4m)	70' (21.3m)	50' (15.2m)
10" (254)	170' (51.8m)	80' (24.4m)	70' (21.3m)	60' (18.3m)	40' (12.2m)
12" (305)	150' (45.7m)	80' (24.4m)	70' (21.3m)	60' (18.3m)	40' (12.2m)
14" (356)	140' (42.7m)	70' (21.3m)	60' (18.3m)	50' (15.2m)	40' (12.2m)
16" (406)	130' (39.6m)	70' (21.3m)	60' (18.3m)	50' (15.2m)	40' (12.2m)
18" (457)	120' (36.6m)	60' (18.3m)	50' (15.2m)	50' (15.2m)	40' (12.2m)
20" (508)	110' (33.5m)	60' (18.3m)	50' (15.2m)	40' (12.2m)	30' (9.1m)
22" (559)	110' (33.5m)	50' (15.2m)	40' (12.2m)	40' (12.2m)	30' (9.1m)
24" (610)	100' (30.5m)	50' (15.2m)	40' (12.2m)	40' (12.2m)	30' (9.1m)
26" (660)	90' (27.4m)	50' (15.2m)	40' (12.2m)	40' (12.2m)	30' (9.1m)
28" (711)	90' (27.4m)	40' (12.2m)	40' (12.2m)	30' (9.1m)	20' (6.1m)
30" (762)	80' (24.4m)	40' (12.2m)	40' (12.2m)	30' (9.1m)	20' (6.1m)
32" (813)	80' (24.4m)	40' (12.2m)	30' (9.1m)	30' (9.1m)	20' (6.1m)
34" (864)	70' (21.3m)	40' (12.2m)	30' (9.1m)	20' (6.1m)	20' (6.1m)
36" (914)	70' (21.3m)	30' (9.1m)	30' (9.1m)	20' (6.1m)	15' (4.6m)
38" (965)	60' (18.3m)	30' (9.1m)	20' (6.1m)	20' (6.1m)	15' (4.6m)
40" (1016)	60' (18.3m)	30' (9.1m)	20' (6.1m)	20' (6.1m)	15' (4.6m)
42" (1067)	60' (18.3m)	30' (9.1m)	20' (6.1m)	20' (6.1m)	15' (4.6m)
44" (1118)	60' (18.3m)	30' (9.1m)	20' (6.1m)	20' (6.1m)	15' (4.6m)
46" (1168)	50' (15.2m)	20' (6.1m)	20' (6.1m)	20' (6.1m)	10' (3.0m)
48" (1219)	50' (15.2m)	20' (6.1m)	20' (6.1m)	20' (6.1m)	10' (3.0m)

CHIMNEY ENVIRONMENT

When a chimney is exposed to a corrosive atmosphere, consideration should be given to the types of materials used in the chimney construction. Chemical vapors, when passed through the combustion process, may produce acids, which can corrode the heating equipment and chimney.

316 stainless steel is more resistant to corrosion than 304 stainless steel. It is recommended that aluminized steel casings, exposed to an atmosphere high in pollutants, be protected with one base coat and one finish coat of heat resistant primer and paint. 304 and 316 stainless steel is also available for flue and casing material and does not require painting.

ENGINE/TURBINE EXHAUSTS

Metal-Fab Metal-Fab product models PSW, PIC, IPIC-1, -2, and -4, are suitable for exhausting gasoline, natural gas/LP, diesel and turbine type engines. Installations comply with NFPA 37, "Standard for Installation and Use of Stationary Combustion Engines and Gas Turbines," when installed in accordance with Metal-Fab Installation Instructions.

Special consideration should be given to engine exhaust systems. There is the possibility of delayed fuel ignition in the exhaust system that may result in an explosion. It is important to protect all changes in direction with additional supports.

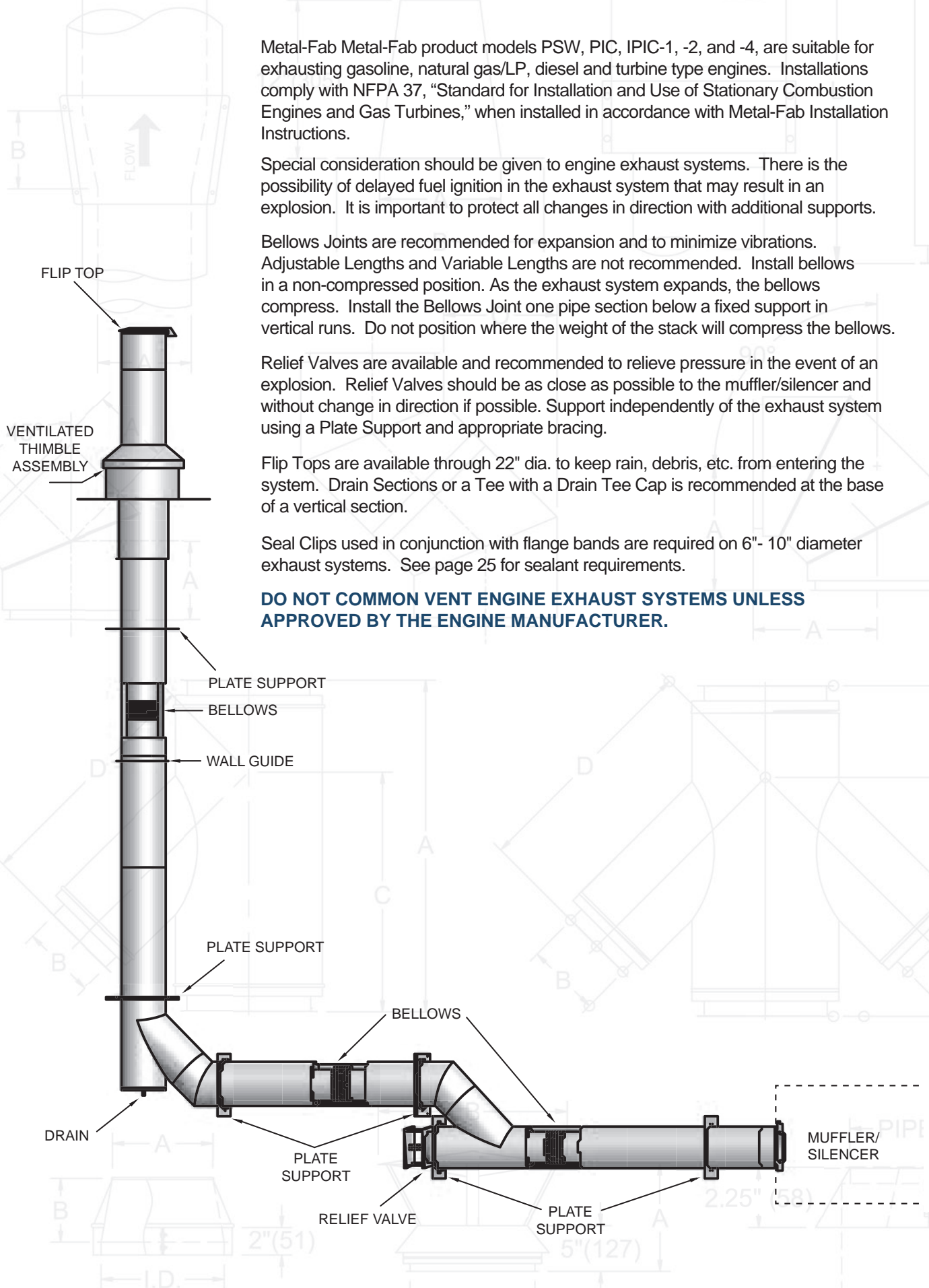
Bellows Joints are recommended for expansion and to minimize vibrations. Adjustable Lengths and Variable Lengths are not recommended. Install bellows in a non-compressed position. As the exhaust system expands, the bellows compress. Install the Bellows Joint one pipe section below a fixed support in vertical runs. Do not position where the weight of the stack will compress the bellows.

Relief Valves are available and recommended to relieve pressure in the event of an explosion. Relief Valves should be as close as possible to the muffler/silencer and without change in direction if possible. Support independently of the exhaust system using a Plate Support and appropriate bracing.

Flip Tops are available through 22" dia. to keep rain, debris, etc. from entering the system. Drain Sections or a Tee with a Drain Tee Cap is recommended at the base of a vertical section.

Seal Clips used in conjunction with flange bands are required on 6" - 10" diameter exhaust systems. See page 25 for sealant requirements.

DO NOT COMMON VENT ENGINE EXHAUST SYSTEMS UNLESS APPROVED BY THE ENGINE MANUFACTURER.



COMPONENTS

Components are identified by part number AND a CTO Code. The part number consists of three sections: first the diameter, second the model designation, and third the component designation. Example: 24 inch diameter, Pressure Industrial Chimney, 42 inch long pipe section = 24PIC42. Several material options are available, and defined by the CTO code. The CTO code consists of three sections: first the flue material, second the casing material, and third the insulation thickness. Example: 304 Stainless Steel flue, Aluminized Steel casing, 0" of insulation (1" air space) = 4A0. See table below.

CTO CODES		
First Position	Second Position	Third Position
(Flue Material)	(Casing Material)	(Insulation)
4 = 304 STAINLESS STEEL	A = ALUMINIZED STEEL	1 = 1" AIR SPACE
6 = 316 STAINLESS STEEL	4 = 304 STAINLESS STEEL	1 = 1" CERAMIC
	6 = 316 STAINLESS STEEL	2 = 2" CERAMIC
		4 = 4" CERAMIC

PIPE LENGTHS

- 9" (229)
- 18" (457)
- 30" (762)
- 42" (1067)

Flow Resistance $K = .4 \left(\frac{L}{I.D.} \right)$ for 6" - 16" diameters

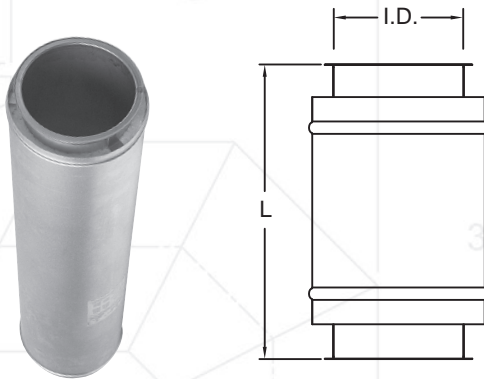
Flow Resistance $K = .3 \left(\frac{L}{I.D.} \right)$ for 18" - 48" diameters

Flow Resistance $K = .25 \left(\frac{L}{I.D.} \right)$ for engine and turbine exhausts,

L = pipe length (feet)

I.D. = pipe diameter (inches)

NOTE: Custom lengths available, please contact factory.



PIPE I.D.	PIPE O.D.		
	PSW	PIC / IPIC-1	IPIC-2
6" (152)	8" (203)	10" (254)	14" (356)
8" (203)	10" (254)	12" (305)	16" (406)
10" (254)	12" (305)	14" (356)	18" (457)
12" (305)	14" (356)	16" (406)	20" (508)
14" (356)	16" (406)	18" (457)	22" (559)
16" (406)	18" (457)	20" (508)	24" (610)
18" (457)	20" (508)	22" (559)	26" (660)
20" (508)	22" (559)	24" (610)	28" (711)
22" (559)	24" (610)	26" (660)	30" (762)
24" (610)	26" (660)	28" (711)	32" (813)
26" (660)	28" (711)	30" (762)	34" (864)
28" (711)	30" (762)	32" (813)	36" (914)
30" (762)	32" (813)	34" (864)	38" (965)
32" (813)	34" (864)	36" (914)	40" (1016)
34" (864)	36" (914)	38" (965)	42" (1067)
36" (914)	38" (965)	40" (1016)	44" (1118)
38" (965)	40" (1016)	42" (1067)	46" (1168)
40" (1016)	42" (1067)	44" (1118)	48" (1219)
42" (1067)	44" (1118)	46" (1168)	50" (1270)
44" (1118)	46" (1168)	48" (1219)	52" (1321)
46" (1168)	48" (1219)	50" (1270)	54" (1372)
48" (1219)	50" (1270)	52" (1321)	56" (1422)

ADJUSTABLE LENGTH EXPANSION JOINT (AL)

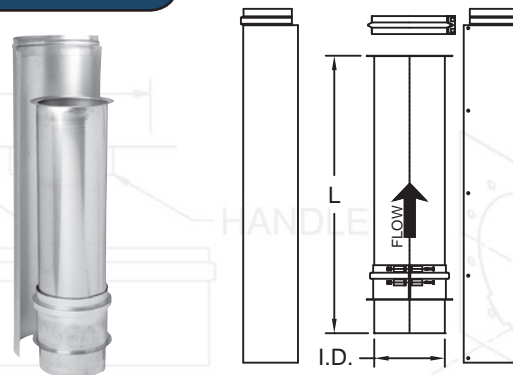
Flow Resistance $K = .4 \left(\frac{L}{I.D.} \right)$

L = pipe length (feet)

Field adjusted to fill gaps between standard length components and compensates for thermal expansion or contraction between two fixed points.

INSTALLED LENGTH

- Minimum: 5.5"
- Maximum: 22"



COMPONENTS

VARIABLE LENGTH (VL)

$$\text{Flow Resistance } K = .4 \left(\frac{L}{\text{I.D.}} \right)^2 (305)$$

L = pipe length (feet)

I.D. = flue diameter (inches)

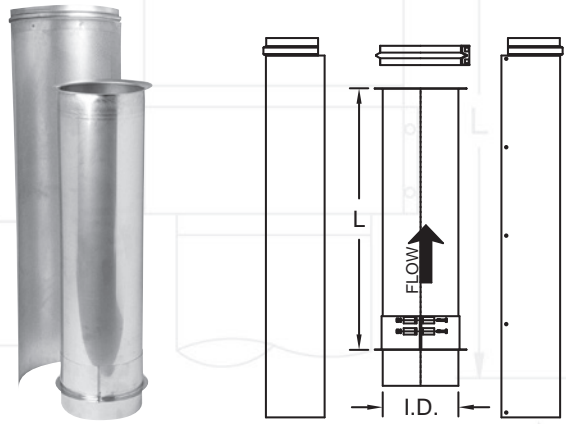
Fills gaps between standard length components.

INSTALLED LENGTH

Minimum: 4"

Maximum: 26"

NOTE: Does not allow for thermal expansion



TAPERED INCREASER (TI)

6" - 36" Diameters

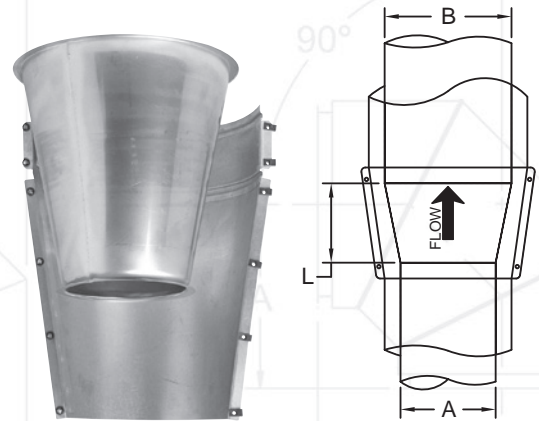
$$\text{Flow Resistance } K = .51 \frac{[1 - (\frac{A}{B})^2]^2}{(\frac{A}{B})^4}$$

Tapered increasers are preferred over step increasers when space permits. Refer to the table below to determine component length. One-step equals 2" increase in flue diameter.

Step	1	2	3	4	5	6
"L" Length	5" (127)	10" (254)	15" (381)	20" (508)	25" (635)	30" (762)

NOTE: When ordering specify both diameters with small diameter first (ie. 18PICI22 for 18" to 22").

NOTE: Please contact factory for larger diameters.



ECCENTRIC TAPERED INCREASER (ETI)

6" - 36" Diameters

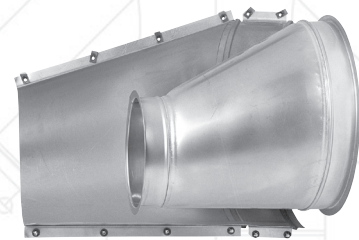
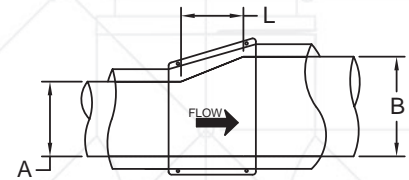
$$\text{Flow Resistance } K = .51 \frac{[1 - (\frac{A}{B})^2]^2}{(\frac{A}{B})^4}$$

Tapered increasers are preferred over step increasers when space permits. Refer to the table below to determine component length. One-step equals 2" increase in flue diameter.

Step	1	2	3	4	5	6
"L" Length	10" (254)	10" (254)	15" (381)	20" (508)	25" (635)	30" (762)

NOTE: When ordering specify both diameters with small diameter first (ie. 18PICETI22 for 18" to 22").

NOTE: Please contact factory for larger diameters.



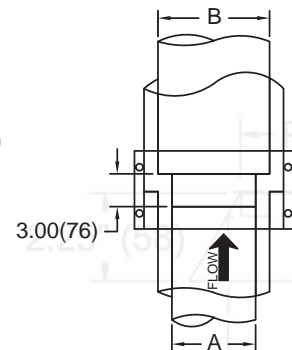
STEP INCREASER (SI)

$$\text{Flow Resistance } K = \frac{[1 - (\frac{A}{B})^2]^2}{(\frac{A}{B})^4}$$

LENGTH:

Step Increaser installs at 3",
1-6 steps is standard.

NOTE: When ordering, specify both diameters with small diameter first (ie. 18PICS122 for 18" to 22").



COMPONENTS

15° ELBOW (15L)

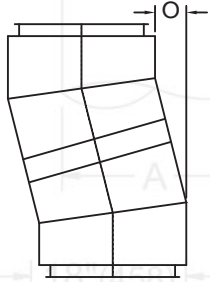
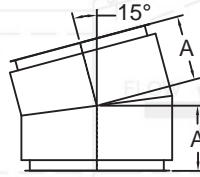
Flow Resistance $K = 0.06$

Offset Distance:

$$O = 2 \times "A" \times 0.259$$

Offset distance with pipe length between elbows:

$$O = (2 \times "A" + \text{pipe length}) \times 0.259$$



PIPE I.D.	A		
	PSW / PIC / IPIC-1	IPIC-2	IPIC-4
6" (152)	6.00" (152)	6.00" (152)	6.00" (152)
8" (203)	6.00" (152)	6.00" (152)	7.75" (197)
10" (254)	6.00" (152)	6.00" (152)	7.75" (197)
12" (305)	6.00" (152)	7.75" (197)	7.75" (197)
14" (356)	7.75" (197)	7.75" (197)	7.75" (197)
16" (406)	7.75" (197)	7.75" (197)	7.75" (197)

PIPE I.D.	A		
	PSW / PIC / IPIC-1	IPIC-2	IPIC-4
18" (457)	7.75" (197)	7.75" (197)	7.75" (197)
20" (508)	7.75" (197)	7.75" (197)	8.50" (216)
22" (559)	7.75" (197)	7.75" (197)	8.50" (216)
24" (610)	7.75" (197)	8.50" (216)	8.50" (216)
26" (660)	8.50" (216)	8.50" (216)	8.50" (216)
28" (711)	8.50" (216)	8.50" (216)	8.50" (216)
30" (762)	8.50" (216)	8.50" (216)	8.50" (216)
32" (813)	8.50" (216)	8.50" (216)	11.00" (279)
34" (864)	8.50" (216)	8.50" (216)	11.00" (279)
36" (914)	8.50" (216)	11.00" (279)	11.00" (279)
38" (965)	11.00" (279)	11.00" (279)	11.00" (279)
40" (1016)	11.00" (279)	11.00" (279)	11.00" (279)
42" (1067)	11.00" (279)	11.00" (279)	11.00" (279)
44" (1118)	11.00" (279)	11.00" (279)	11.00" (279)
46" (1168)	11.00" (279)	11.00" (279)	11.00" (279)
48" (1219)	11.00" (279)	11.00" (279)	11.00" (279)

30° ELBOW (30L)

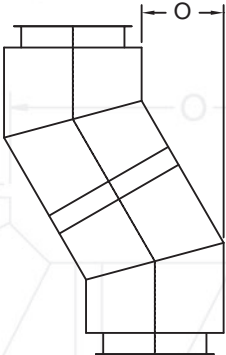
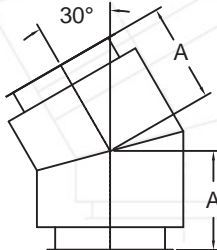
Flow Resistance $K = 0.12$

Offset Distance:

$$O = 2 \times "A" \times 0.5$$

Offset distance with pipe length between elbows:

$$O = (2 \times "A" + \text{pipe length}) \times 0.5$$



PIPE I.D.	A		
	PSW / PIC / IPIC-1	IPIC-2	IPIC-4
6" (152)	6.00" (152)	6.00" (152)	6.00" (152)
8" (203)	6.00" (152)	6.00" (152)	7.75" (197)
10" (254)	6.00" (152)	6.00" (152)	7.75" (197)
12" (305)	6.00" (152)	7.75" (197)	7.75" (197)
14" (356)	7.75" (197)	7.75" (197)	7.75" (197)
16" (406)	7.75" (197)	7.75" (197)	7.75" (197)

PIPE I.D.	A		
	PSW / PIC / IPIC-1	IPIC-2	IPIC-4
18" (457)	7.75" (197)	7.75" (197)	7.75" (197)
20" (508)	7.75" (197)	7.75" (197)	8.50" (216)
22" (559)	7.75" (197)	7.75" (197)	8.50" (216)
24" (610)	7.75" (197)	8.50" (216)	8.50" (216)
26" (660)	8.50" (216)	8.50" (216)	8.50" (216)
28" (711)	8.50" (216)	8.50" (216)	8.50" (216)
30" (762)	8.50" (216)	8.50" (216)	8.50" (216)
32" (813)	8.50" (216)	8.50" (216)	11.00" (279)
34" (864)	8.50" (216)	8.50" (216)	11.00" (279)
36" (914)	8.50" (216)	11.00" (279)	11.00" (279)
38" (965)	11.00" (279)	11.00" (279)	11.00" (279)
40" (1016)	11.00" (279)	11.00" (279)	11.00" (279)
42" (1067)	11.00" (279)	11.00" (279)	11.00" (279)
44" (1118)	11.00" (279)	11.00" (279)	11.00" (279)
46" (1168)	11.00" (279)	11.00" (279)	11.00" (279)
48" (1219)	11.00" (279)	12.75" (324)	11.00" (279)

45° ELBOW (45L)

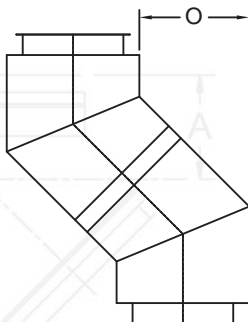
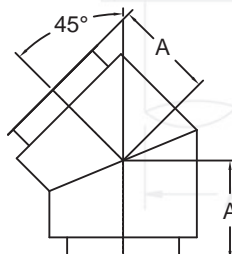
Flow Resistance $K = 0.15$

Offset Distance:

$$O = 2 \times "A" \times 0.707$$

Offset distance with pipe length between elbows:

$$O = (2 \times "A" + \text{pipe length}) \times 0.707$$



PIPE I.D.	A		
	PSW / PIC / IPIC-1	IPIC-2	IPIC-4
6" (152)	7.00" (178)	7.00" (178)	7.00" (178)
8" (203)	7.00" (178)	7.00" (178)	10.00" (254)
10" (254)	7.00" (178)	7.00" (178)	10.25" (260)
12" (305)	7.00" (178)	10.00" (254)	10.25" (260)
14" (356)	10.00" (254)	10.25" (260)	10.25" (260)
16" (406)	10.25" (260)	10.25" (260)	10.25" (260)

PIPE I.D.	A		
	PSW / PIC / IPIC-1	IPIC-2	IPIC-4
18" (457)	10.25" (260)	10.25" (260)	10.25" (260)
20" (508)	10.25" (260)	10.25" (260)	11.75" (298)
22" (559)	10.25" (260)	10.25" (260)	11.75" (298)
24" (610)	10.25" (260)	11.75" (298)	11.75" (298)
26" (660)	11.75" (298)	11.75" (298)	11.75" (298)
28" (711)	11.75" (298)	11.75" (298)	11.75" (298)
30" (762)	11.75" (298)	11.75" (298)	11.75" (298)
32" (813)	11.75" (298)	11.75" (298)	14.00" (356)
34" (864)	11.75" (298)	11.75" (298)	14.00" (356)
36" (914)	11.75" (298)	14.00" (356)	14.00" (356)
38" (965)	14.00" (356)	14.00" (356)	14.00" (356)
40" (1016)	14.00" (356)	14.00" (356)	14.00" (356)
42" (1067)	14.00" (356)	14.00" (356)	14.00" (356)
44" (1118)	14.00" (356)	14.00" (356)	15.25" (387)
46" (1168)	14.00" (356)	14.00" (356)	15.25" (387)
48" (1219)	14.00" (356)	15.25" (387)	15.25" (387)

COMPONENTS

90° ELBOW (90L)

Flow Resistance K:

6" - 8" = 0.38

10" - 18" = 0.42

20" - 26" = 0.54

28" - 36" = 0.66

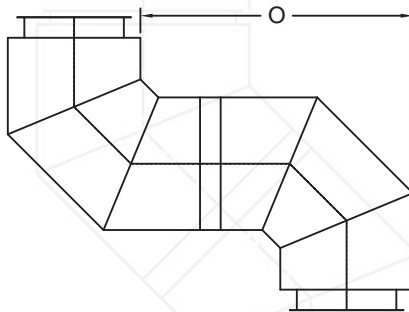
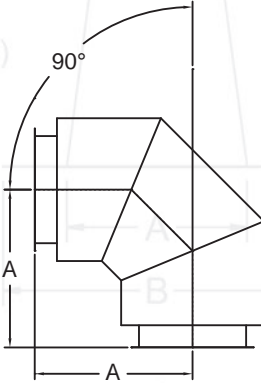
38" - 48" = 0.72

Offset Distance:

$O = 2 \times "A"$

Offset Distance with pipe length between elbows:

$O = 2 \times "A" + \text{pipe length}$

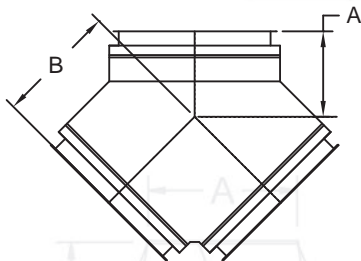


PIPE I.D.	A		
	PSW / PIC / IPIC-1	IPIC-2	IPIC-4
6" (152)	11" (279)	12" (305)	14" (356)
8" (203)	12" (305)	13" (330)	15" (381)
10" (254)	13" (330)	14" (356)	16" (406)
12" (305)	14" (356)	15" (381)	17" (432)
14" (356)	15" (381)	16" (406)	18" (457)
16" (406)	16" (406)	17" (432)	19" (483)
18" (457)	17" (432)	18" (457)	20" (508)
20" (508)	18" (457)	19" (483)	21" (533)
22" (559)	19" (483)	20" (508)	22" (559)
24" (610)	20" (508)	21" (533)	23" (584)
26" (660)	21" (533)	22" (559)	24" (610)
28" (711)	22" (559)	23" (584)	25" (635)
30" (762)	23" (584)	24" (610)	26" (660)
32" (813)	24" (610)	25" (635)	27" (686)
34" (864)	25" (635)	26" (660)	28" (711)
36" (914)	26" (660)	27" (686)	29" (737)
38" (965)	27" (686)	28" (711)	30" (762)
40" (1016)	28" (711)	29" (737)	31" (787)
42" (1067)	29" (737)	30" (762)	32" (813)
44" (1118)	30" (762)	31" (787)	33" (838)
46" (1168)	31" (787)	32" (813)	34" (864)
48" (1219)	32" (813)	33" (838)	35" (889)

90° WYE (90Y)

6" - 36" Diameters

Flow Resistance K = 0.6



PIPE I.D.	PSW / PIC / 1G		IPIC-2		IPIC-4	
	A	B	A	B	A	B
6" (152)	5.12" (130)	9" (229)	5.62" (143)	10" (254)	6.50" (165)	12" (305)
8" (203)	5.62" (143)	10" (254)	6.00" (152)	11" (279)	7.00" (178)	13" (330)
10" (254)	6.00" (152)	11" (279)	6.50" (165)	12" (305)	7.25" (184)	14" (356)
12" (305)	6.50" (165)	12" (305)	7.00" (178)	13" (330)	7.75" (197)	15" (381)
14" (356)	7.00" (178)	13" (330)	7.25" (184)	14" (356)	8.12" (206)	16" (406)
16" (406)	7.25" (184)	14" (356)	7.75" (197)	15" (381)	8.50" (216)	17" (432)
18" (457)	7.75" (197)	15" (381)	8.12" (206)	16" (406)	9.00" (229)	18" (457)
20" (508)	8.12" (206)	16" (406)	8.50" (216)	17" (432)	9.37" (238)	19" (483)
22" (559)	8.50" (216)	17" (432)	9.00" (229)	18" (457)	9.75" (248)	20" (508)
24" (610)	9.00" (229)	18" (457)	9.37" (238)	19" (483)	10.25" (260)	21" (533)
26" (660)	9.37" (238)	19" (483)	9.75" (248)	20" (508)	10.62" (270)	22" (559)
28" (711)	9.75" (248)	20" (508)	10.25" (260)	21" (533)	11.12" (282)	23" (584)
30" (762)	10.25" (260)	21" (533)	10.62" (270)	22" (559)	11.50" (292)	24" (610)
32" (813)	10.62" (270)	22" (559)	11.12" (282)	23" (584)	11.87" (302)	25" (635)
34" (864)	11.12" (282)	23" (584)	11.50" (292)	24" (610)	12.25" (311)	26" (660)
36" (914)	11.50" (292)	24" (610)	11.87" (302)	25" (635)	12.62" (321)	27" (686)

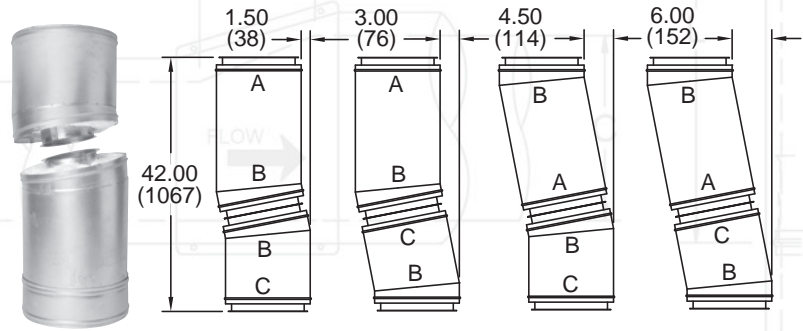
COMPONENTS

VARIABLE OFFSET KIT (VOK)

Flow Resistance $K = 0.09$
 Assembled Length = 42"

ENDS JOINED	OFFSET
B-B	1.50"
B-C	3.00"
A-B	4.50"
A-C	6.00"

Provides offsets of 1.5", 3.0", 4.5", & 6" by rotating components.

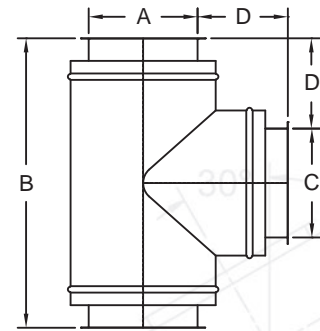


90° MANIFOLD TEE (90MT)

Flow Resistance $K = 1.25$

- A = Pipe I.D.
- B = "C" I.D. + (2 x "D")
- C = Tap I.D.
- D = PSW/PIC/IPIC-1 = 5"
- IPIC-2 = 6"
- IPIC-4 = 8"

NOTE: Specify tap diameter (C) at time of order.
NOTE: Tap can be reduced by 1-4 steps as standard.



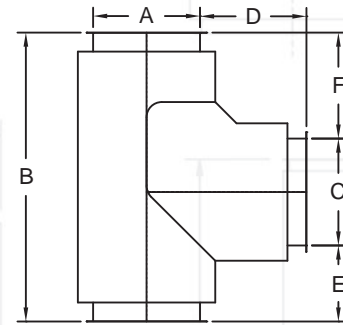
BOOT TEE (BT)

6" - 30" Diameters

Flow Resistance $K = 0.65$

- A = Pipe I.D.
- B = "C" + 10" + (2 x insulation thickness)
- C = Tap I.D.
- D, E, F =
- PSW/PIC/IPIC-1 = 6", 5" & 7"
- IPIC-2 = 7", 6" & 8"
- IPIC-4 = 9", 8" & 10"

NOTE: Specify tap diameter (C) at time of order
NOTE: Tap can be reduced by 1-4 steps as standard.

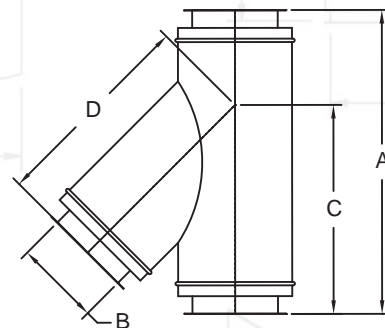


45° MANIFOLD TEE (45MT)

Flow Resistance $K = 0.4$

For low resistance flow into a vertical or horizontal run.

NOTE: Specify tap diameter (B) when ordering.
NOTE: Tap can be reduced by 1-4 steps as standard.
NOTE: For dimensional information see tables on pages 26-31.



COMPONENTS

DOUBLE LATERAL (DL)

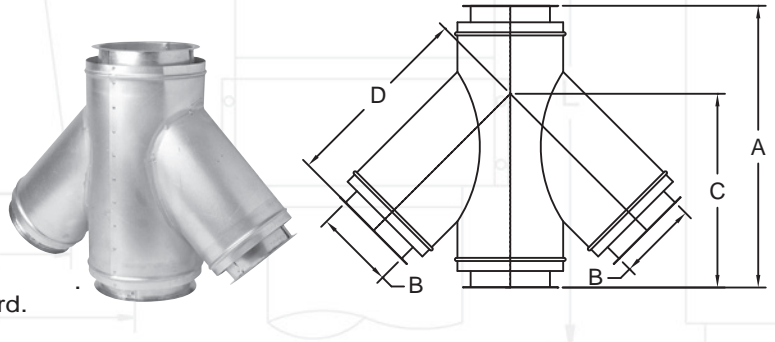
Flow Resistance K = 0.4

For use when centrally connecting two appliances being manifolded into a common chimney.

NOTE: Specify tap diameter (B) when ordering, tap diameter must be less than body diameter.

NOTE: For dimensional information see tables on pages 26-31.

NOTE: Tap can be reduced by 1-4 steps as standard.



DRAIN TEE CAP W/CASING END CLOSURE (TC)

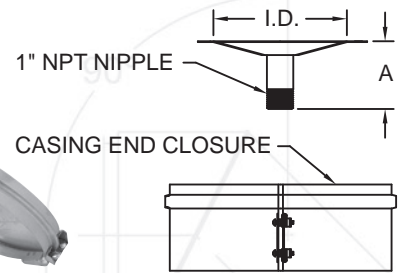
Provides drain port for rain or condensation.

NOTE: To compute length:

$$A = \frac{(I.D. - 1.343)}{2} \times .268 + \text{Nipple Length}$$

Add 3" for Nipple on PSW/PIC/IPIC-1/IPIC-2

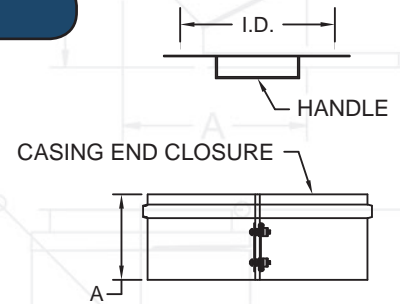
Add 5" for Nipple on IPIC-4



TEE CAP LESS DRAIN W/ CASING END CLOSURE (TCN)

Closes and seals unused port of Tees, Wyes, and Laterals.

NOTE: A = 5.375" PIC/IPIC-1
6.375" IPIC-2
8.375" IPIC-4



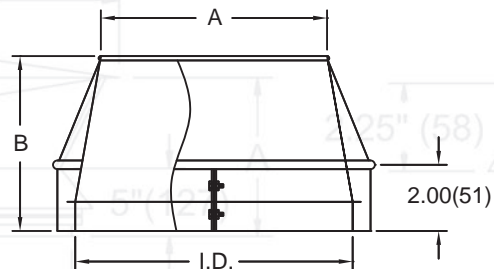
EXIT CONE (EC)

Flow resistance K = 1.25

Increases velocity of exiting flue gases. Provide for moisture removal with Tee Cap or Drain Section.



PIPE I.D.	A	B	PIPE I.D.	A	B
6" (152)	4.87" (124)	2.25" (57)	28" (711)	22.87" (581)	10.25" (260)
8" (203)	6.50" (165)	3.00" (76)	30" (762)	24.75" (629)	11.00" (279)
10" (254)	8.12" (206)	3.75" (95)	32" (813)	26.37" (670)	11.75" (298)
12" (305)	9.75" (248)	4.37" (111)	34" (864)	28.00" (711)	12.12" (308)
14" (356)	11.37" (289)	5.12" (130)	36" (914)	29.62" (752)	13.12" (333)
16" (406)	13.00" (330)	5.87" (149)	38" (965)	30.87" (784)	14.25" (362)
18" (457)	14.75" (375)	6.62" (168)	40" (1016)	32.50" (826)	15.00" (381)
20" (508)	16.37" (416)	7.37" (187)	42" (1067)	34.12" (867)	15.75" (400)
22" (559)	17.87" (454)	8.12" (206)	44" (1118)	35.75" (908)	16.50" (419)
24" (610)	19.62" (498)	8.87" (225)	46" (1168)	37.37" (949)	17.25" (438)
26" (660)	21.12" (536)	9.50" (241)	48" (1219)	39.00" (991)	18.00" (457)



COMPONENTS

STACK CAP (C/CB)

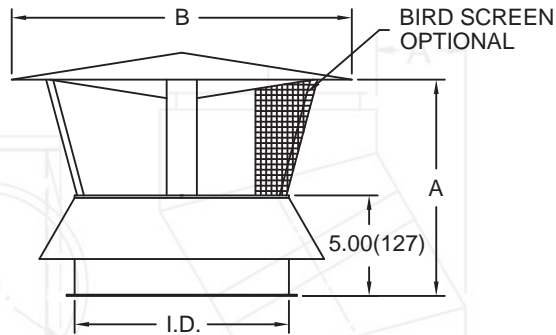
6" - 36" Diameters

Flow resistance $K = 0.5$

Provides partial rain protection.
Use of Tee Cap or Drain
Section is recommended.

NOTE: Also available with bird
screen; order as (CB).

PIPE I.D.	A	B	PIPE I.D.	A	B
6" (152)	8.00" (203)	11.00" (279)	22" (559)	20.00" (508)	38.00" (965)
8" (203)	10.00" (254)	14.00" (356)	24" (610)	22.00" (559)	41.00" (1041)
10" (254)	12.00" (305)	17.00" (432)	26" (660)	23.00" (584)	44.00" (1118)
12" (305)	13.00" (330)	21.00" (533)	28" (711)	25.00" (635)	48.00" (1219)
14" (356)	14.00" (356)	24.00" (610)	30" (762)	27.00" (686)	52.00" (1321)
16" (406)	16.00" (406)	28.00" (711)	32" (813)	28.00" (711)	56.00" (1422)
18" (457)	17.00" (432)	31.00" (787)	34" (864)	30.00" (762)	60.00" (1524)
20" (508)	19.00" (483)	34.00" (864)	36" (914)	31.00" (787)	64.00" (1626)

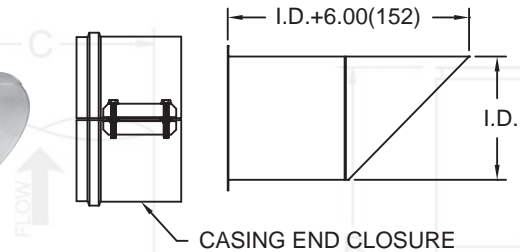
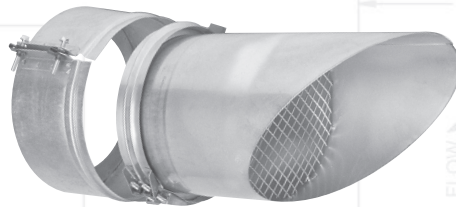


MITER CUT (MC)

6" - 36" Diameters

Horizontal termination;
standard with bird screen.

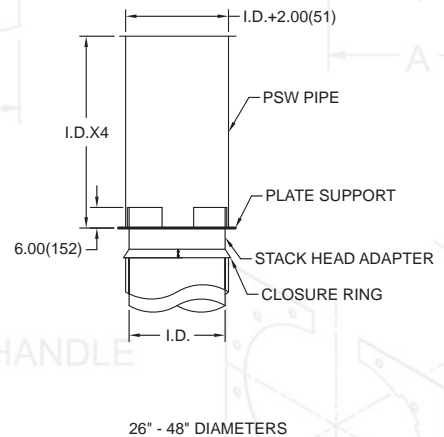
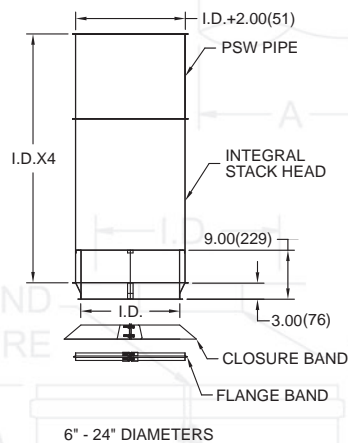
NOTE: Please contact factory
for larger diameters.



STACK HEAD ASSEMBLY (SHA)

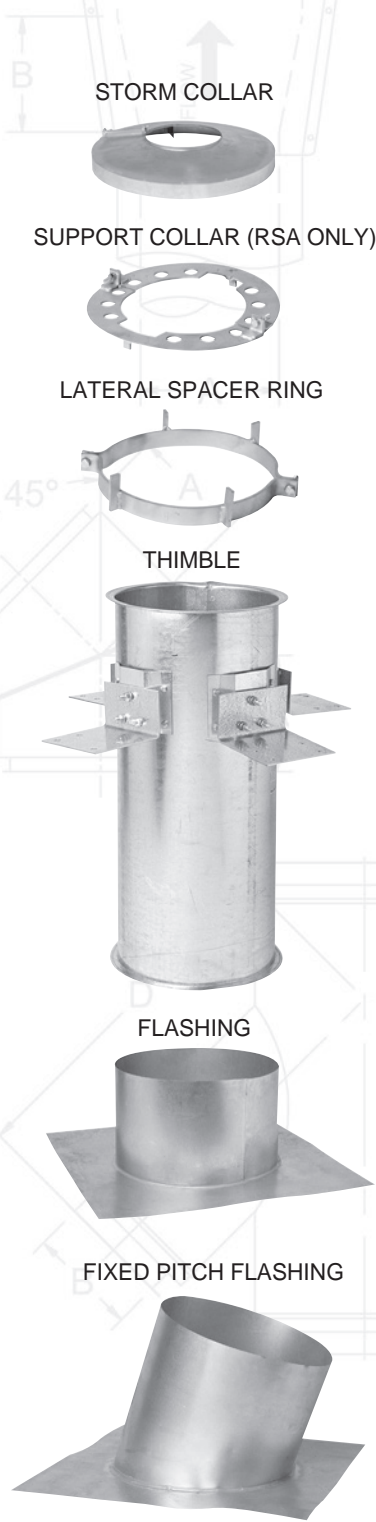
Low loss stack termination to
reduce rain entry.

NOTE: Conforms to Industrial
Ventilation Handbook Standards.
26" - 48" requires field-fabricated
support.



COMPONENTS

VENTILATED THIMBLE ASSEMBLIES (VTA-FPVTA) ROOF SUPPORT ASSEMBLIES (RSA-FPRSA)



For use when pipe passes through a combustible roof structure to reduce clearance to combustibles. The VTA allows for pipe expansion and contraction through the roof. The RSA will support up to 30 ft. of pipe from the roof structure.

Framing Dimensions:

- PIC/IPIC-1: I.D. + 8"
- IPIC-2: I.D. + 10"
- IPIC-4: I.D. + 14"

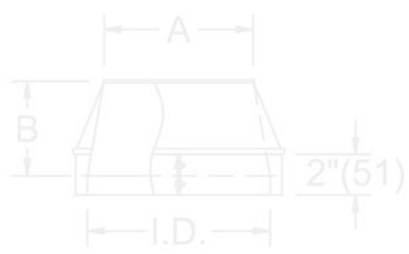
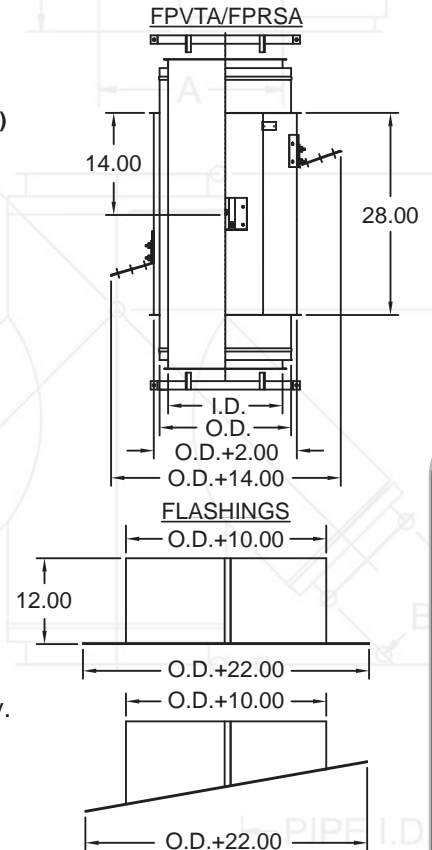
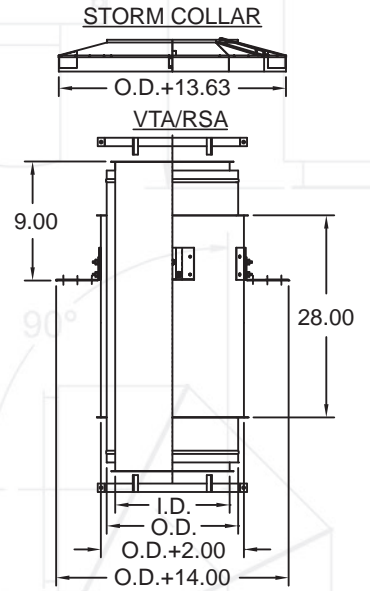
NOTES:

1. Thimble for flat roof extends 9" into flashing.
2. Use VTA / RSA on flat to 1/12 pitch applications.
3. Use FPVTA / FPRSA on 1/12 - 12/12 pitch applications.
4. Specify pitch when ordering

MAXIMUM PITCH FOR FPVTA & FPRSA (28" LENGTH THIMBLE)

	PIC	IPIC 4A1	IPIC 4A2	IPIC 4A4
6PICFPVTA & RSA	12/12	12/12	12/12	11/12
8PICFPVTA & RSA	12/12	12/12	12/12	10/12
10PICFPVTA & RSA	12/12	12/12	11/12	9/12
12PICFPVTA & RSA	11/12	11/12	10/12	9/12
14PICFPVTA & RSA	10/12	10/12	9/12	8/12
16PICFPVTA & RSA	9/12	9/12	9/12	8/12
18PICFPVTA & RSA	9/12	9/12	8/12	7/12
20PICFPVTA & RSA	8/12	8/12	8/12	7/12
22PICFPVTA & RSA	8/12	8/12	7/12	7/12
24PICFPVTA & RSA	7/12	7/12	7/12	6/12
26PICFPVTA & RSA	7/12	7/12	7/12	6/12
28PICFPVTA & RSA	7/12	7/12	6/12	6/12
30PICFPVTA & RSA	6/12	6/12	6/12	5/12
32PICFPVTA & RSA	6/12	6/12	6/12	5/12
34PICFPVTA & RSA	6/12	6/12	5/12	5/12
36PICFPVTA & RSA	5/12	5/12	5/12	5/12

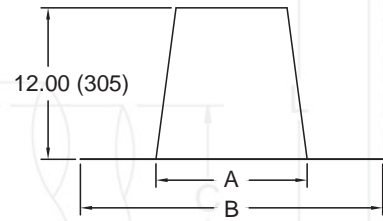
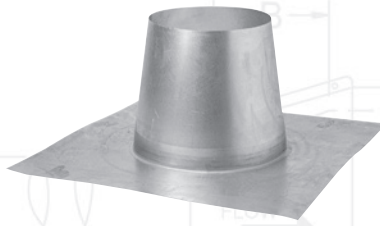
NOTE: For pitches not listed, please contact factory.



COMPONENTS

TALL CONE FLASHING (F)

Flat roof applications.



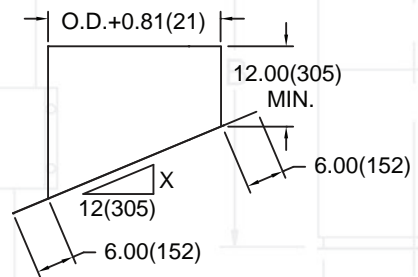
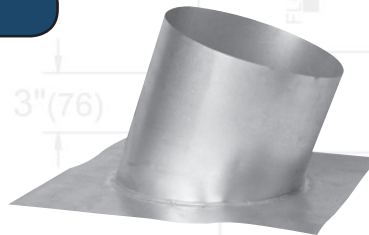
PIPE I.D.	PSW		PIC / IPIC-1		IPIC-2		IPIC-4	
	A	B	A	B	A	B	A	B
6" (152)	10.00" (254)	22.00" (559)	12.00" (305)	24.00" (610)	14.00" (356)	26.00" (660)	18.00" (457)	30.00" (762)
8" (203)	12.00" (305)	24.00" (610)	14.00" (356)	26.00" (660)	16.00" (406)	28.00" (711)	20.00" (508)	32.00" (813)
10" (254)	14.00" (356)	26.00" (660)	16.00" (406)	28.00" (711)	18.00" (457)	30.00" (762)	22.00" (559)	34.00" (864)
12" (305)	16.00" (406)	28.00" (711)	18.00" (457)	30.00" (762)	20.00" (508)	32.00" (813)	24.00" (610)	36.00" (914)
14" (356)	18.00" (457)	30.00" (762)	20.00" (508)	32.00" (813)	22.00" (559)	34.00" (864)	26.00" (660)	38.00" (965)
16" (406)	20.00" (508)	32.00" (813)	22.00" (559)	34.00" (864)	24.00" (610)	36.00" (914)	28.00" (711)	40.00" (1016)
18" (457)	22.00" (559)	34.00" (864)	24.00" (610)	36.00" (914)	26.00" (660)	38.00" (965)	30.00" (762)	42.00" (1067)
20" (508)	24.00" (610)	36.00" (914)	26.00" (660)	38.00" (965)	28.00" (711)	40.00" (1016)	32.00" (813)	44.00" (1118)
22" (559)	26.00" (660)	38.00" (965)	28.00" (711)	40.00" (1016)	30.00" (762)	42.00" (1067)	34.00" (864)	46.00" (1168)
24" (610)	28.00" (711)	40.00" (1016)	30.00" (762)	42.00" (1067)	32.00" (813)	44.00" (1118)	36.00" (914)	48.00" (1219)
26" (660)	30.00" (762)	42.00" (1067)	32.00" (813)	44.00" (1118)	34.00" (864)	46.00" (1168)	38.00" (965)	50.00" (1270)
28" (711)	32.00" (813)	44.00" (1118)	34.00" (864)	46.00" (1168)	36.00" (914)	48.00" (1219)	40.00" (1016)	52.00" (1321)
30" (762)	34.00" (864)	46.00" (1168)	36.00" (914)	48.00" (1219)	38.00" (965)	50.00" (1270)	42.00" (1067)	54.00" (1372)
32" (813)	36.00" (914)	48.00" (1219)	38.00" (965)	50.00" (1270)	40.00" (1016)	52.00" (1321)	44.00" (1118)	56.00" (1422)
34" (864)	38.00" (965)	50.00" (1270)	40.00" (1016)	52.00" (1321)	42.00" (1067)	54.00" (1372)	46.00" (1168)	58.00" (1473)
36" (914)	40.00" (1016)	52.00" (1321)	42.00" (1067)	54.00" (1372)	44.00" (1118)	56.00" (1422)	48.00" (1219)	60.00" (1524)
38" (965)	42.00" (1067)	54.00" (1372)	44.00" (1118)	56.00" (1422)	46.00" (1168)	58.00" (1473)	50.00" (1270)	62.00" (1575)
40" (1016)	44.00" (1118)	56.00" (1422)	46.00" (1168)	58.00" (1473)	48.00" (1219)	60.00" (1524)	52.00" (1321)	64.00" (1626)
42" (1067)	46.00" (1168)	58.00" (1473)	48.00" (1219)	60.00" (1524)	50.00" (1270)	62.00" (1575)	54.00" (1372)	66.00" (1676)
44" (1118)	48.00" (1219)	60.00" (1524)	50.00" (1270)	62.00" (1575)	52.00" (1321)	64.00" (1626)	56.00" (1422)	68.00" (1727)
46" (1168)	50.00" (1270)	62.00" (1575)	52.00" (1321)	64.00" (1626)	54.00" (1372)	66.00" (1676)	58.00" (1473)	70.00" (1778)
48" (1219)	52.00" (1321)	64.00" (1626)	54.00" (1372)	66.00" (1676)	56.00" (1422)	68.00" (1727)	60.00" (1524)	72.00" (1829)

FIXED PITCH FLASHING (FPF)

6" - 36" Diameters

NOTES:

1. $X = \text{Pitch} \left(\frac{\text{Rise}}{\text{Run}} \right)$; Available in 1/12 - 12/12
2. Please specify pitch when ordering.
3. Storm Collar is included with Flashing.

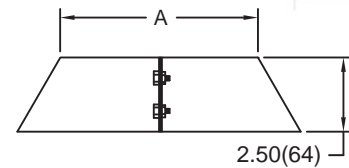
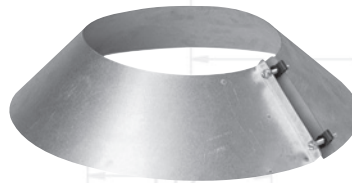


STACK CLOSURE RING (CR)

A = Pipe Diameter (I.D.)

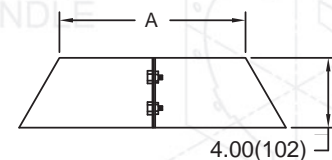
Attaches to flue and shields insulation from the weather when open stack is desired.

NOTE: Provide a Tee Cap or Drain Section for moisture removal.



STORM COLLAR (SC)

A = Pipe Diameter (O.D.)



COMPONENTS

FULL ANGLE RING (FAR)

Provides lateral support for vertical runs. (Zinc Plated)

NOTE: Allows pipe movement for thermal expansion.

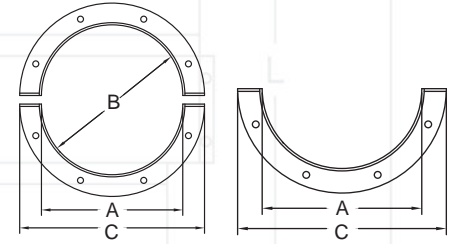
HALF ANGLE RING (HAR)

Provides support for horizontal runs. (Zinc Plated)



FULL ANGLE RING

HALF ANGLE RING



PRODUCT				DIMENSIONS			
PIPE I.D.				Inside	Hole Centerline	Outside	Hole Qty.
PSW	PIC/IPIC	IPIC-2	IPIC-4	A	B	C	D
6" (152)	-	-	-	6.12" (155)	7.50" (191)	8.62" (219)	8
8" (203)	6" (152)	-	-	8.12" (206)	9.50" (241)	10.62" (270)	8
10" (254)	8" (203)	6" (152)	-	10.19" (259)	11.56" (294)	12.69" (322)	8
12" (305)	10" (254)	8" (203)	-	12.19" (310)	13.81" (351)	15.19" (386)	12
14" (356)	12" (305)	10" (254)	6" (152)	14.19" (360)	15.81" (402)	17.19" (437)	12
16" (406)	14" (356)	12" (305)	8" (203)	16.25" (413)	18.12" (460)	19.75" (502)	16
18" (457)	16" (406)	14" (356)	10" (254)	18.25" (464)	20.12" (511)	21.75" (552)	16
20" (508)	18" (457)	16" (406)	12" (305)	20.25" (514)	22.12" (562)	23.75" (603)	20
22" (559)	20" (508)	18" (457)	14" (356)	22.25" (565)	24.12" (613)	25.75" (654)	20
24" (610)	22" (559)	20" (508)	16" (406)	24.25" (616)	26.12" (663)	27.75" (705)	20
26" (660)	24" (610)	22" (559)	18" (457)	26.25" (667)	28.50" (724)	30.25" (768)	24
28" (711)	26" (660)	24" (610)	20" (508)	28.25" (718)	30.50" (775)	32.25" (819)	24
30" (762)	28" (711)	26" (660)	22" (559)	30.25" (768)	32.50" (826)	34.25" (870)	28
32" (813)	30" (762)	28" (711)	24" (610)	32.25" (819)	34.50" (876)	36.25" (921)	28
34" (864)	32" (813)	30" (762)	26" (660)	34.25" (870)	36.50" (927)	38.25" (972)	32
36" (914)	34" (864)	32" (813)	28" (711)	36.25" (921)	38.50" (978)	40.25" (1022)	32
38" (965)	36" (914)	34" (864)	30" (762)	38.25" (972)	40.50" (1029)	42.25" (1073)	36
40" (1016)	38" (965)	36" (914)	32" (813)	40.25" (1022)	42.50" (1080)	44.25" (1124)	36
42" (1067)	40" (1016)	38" (965)	34" (864)	42.25" (1073)	44.50" (1130)	46.25" (1175)	40
44" (1118)	42" (1067)	40" (1016)	36" (914)	44.25" (1124)	46.50" (1181)	48.25" (1226)	40
46" (1168)	44" (1118)	42" (1067)	38" (965)	46.25" (1175)	48.50" (1232)	50.25" (1276)	44
48" (1219)	46" (1168)	44" (1118)	40" (1016)	48.25" (1226)	50.50" (1283)	52.25" (1327)	44
-	48" (1219)	46" (1168)	42" (1067)	50.25" (1276)	52.50" (1334)	54.25" (1378)	48
-	-	48" (1219)	44" (1118)	52.25" (1327)	54.50" (1384)	56.25" (1429)	48
-	-	-	46" (1168)	54.25" (1378)	56.50" (1435)	58.25" (1480)	48
-	-	-	48" (1219)	56.25" (1429)	58.50" (1486)	60.25" (1530)	50

WALL PENETRATOR (WP)

Horizontal wall penetration designed for non-fire rated walls. (Zinc Plated)

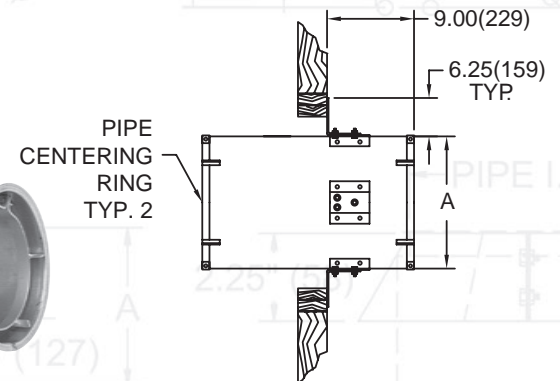
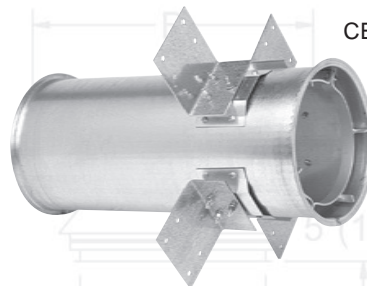
LENGTH = 30"

PIC/IPIC-1: A=PIPE I.D.+ 4"

IPIC-2: A=PIPE I.D.+ 6"

IPIC-4: A=PIPE I.D.+10"

NOTE: Not available for PSW.

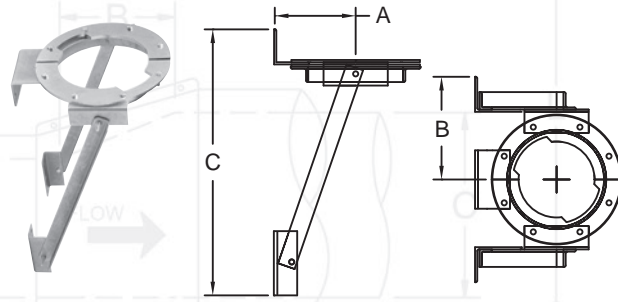


COMPONENTS

WALL SUPPORT ASSEMBLY (WSA)

Provides vertical or horizontal rigid support

NOTE: Does not allow pipe movement for thermal expansion. (Zinc Plated)



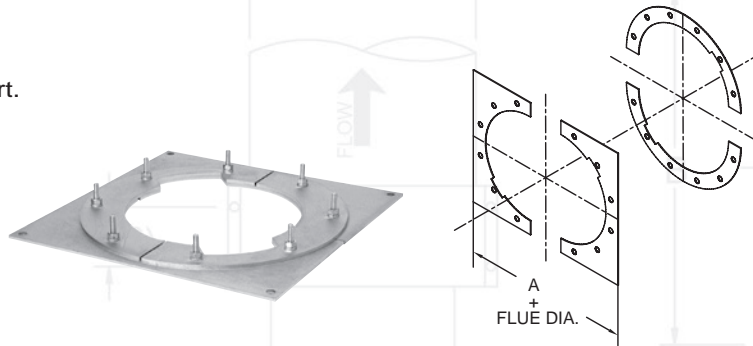
PIPE I.D.	PSW / PIC / IPIC-1			IPIC-2			IPIC-4		
	A	B	C	A	B	C	A	B	C
6" (152)	7.87" (200)	7.25" (184)	26.25" (667)	8.87" (225)	8.12" (206)	26.00" (660)	11.12" (282)	10.50" (267)	29.00" (737)
8" (203)	8.87" (225)	8.12" (206)	26.00" (660)	10.12" (257)	9.50" (241)	29.50" (749)	12.37" (314)	11.75" (298)	28.50" (724)
10" (254)	10.12" (257)	9.50" (241)	29.50" (749)	11.12" (282)	10.50" (267)	29.00" (737)	13.37" (340)	12.75" (324)	31.25" (794)
12" (305)	11.12" (282)	10.50" (267)	29.00" (737)	12.37" (314)	11.75" (298)	28.50" (724)	14.37" (365)	13.75" (349)	30.75" (781)
14" (356)	12.37" (314)	11.75" (298)	28.50" (724)	13.37" (340)	12.75" (324)	31.25" (794)	15.37" (390)	14.75" (375)	34.75" (883)
16" (406)	13.37" (340)	12.75" (324)	31.25" (794)	14.37" (365)	13.75" (349)	30.75" (781)	16.37" (416)	15.75" (400)	34.25" (870)
18" (457)	14.37" (365)	13.75" (349)	30.75" (781)	15.37" (390)	14.75" (375)	34.75" (883)	17.62" (448)	17.00" (432)	33.75" (857)
20" (508)	15.37" (390)	14.75" (375)	34.75" (883)	16.37" (416)	15.75" (400)	34.25" (870)	18.62" (473)	18.00" (457)	38.75" (984)
22" (559)	16.37" (416)	15.75" (400)	34.25" (870)	17.62" (448)	17.00" (432)	33.75" (857)	19.62" (498)	19.00" (483)	38.25" (972)
24" (610)	17.62" (448)	17.00" (432)	33.75" (857)	18.62" (473)	18.00" (457)	38.75" (984)	20.62" (524)	20.00" (508)	37.75" (959)
26" (660)	18.62" (473)	18.00" (457)	38.75" (984)	19.62" (498)	19.00" (483)	38.25" (972)	21.62" (549)	21.00" (533)	45.25" (1149)
28" (711)	19.62" (498)	19.00" (483)	38.25" (972)	20.62" (524)	20.00" (508)	37.75" (959)	23.12" (587)	22.50" (572)	44.75" (1137)
30" (762)	20.62" (524)	20.00" (508)	37.75" (959)	21.62" (549)	21.00" (533)	45.25" (1149)	24.12" (613)	23.50" (597)	44.00" (1118)
32" (813)	21.62" (549)	21.00" (533)	45.25" (1149)	23.12" (587)	22.50" (572)	44.75" (1137)	25.12" (638)	24.50" (622)	53.75" (1365)
34" (864)	23.12" (587)	22.50" (572)	44.75" (1137)	24.12" (613)	23.50" (597)	44.00" (1118)	26.12" (663)	25.50" (648)	53.25" (1353)
36" (914)	24.12" (613)	23.50" (597)	44.00" (1118)	25.12" (638)	24.50" (622)	53.75" (1365)	27.12" (689)	26.50" (673)	52.75" (1340)

PLATE SUPPORT (PS)

Provides vertical or horizontal rigid support. Includes split plates (Zinc Plated), clamp flanges, and 1/2 closure bands.

PSW/PIC/IPIC-1 A=6"
 IPIC-2 A=8"
 IPIC-4 A=12"

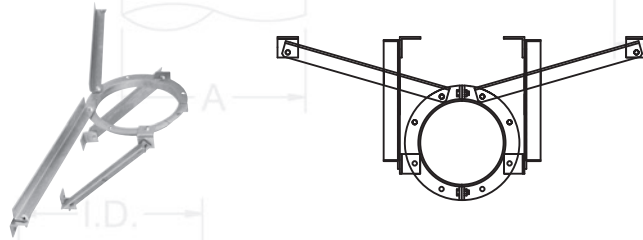
NOTE: Does not allow pipe movement for thermal expansion.



WALL GUIDE (WG)

Provides lateral support. (Zinc Plated)

NOTE: Allows pipe movement for thermal expansion.



FLOOR GUIDE (FG)

For use at each floor to ensure correct alignment through floor opening. (Zinc Plated)



COMPONENTS

STACK SUPPORT ASSEMBLY (SSA)

Supports vertical stack at floor level; includes moisture drain.

PSW / PIC / IPIC-1 / IPIC-2 / IPIC-4

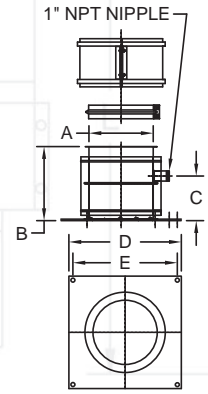
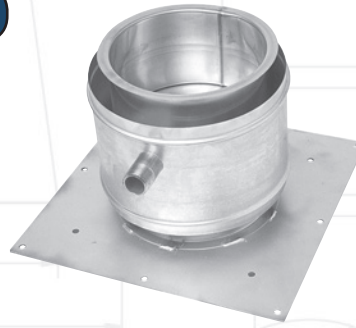
A = PIPE I.D.

B = 9" (229)

C = 5.5" (140)

D = A+7" (178)

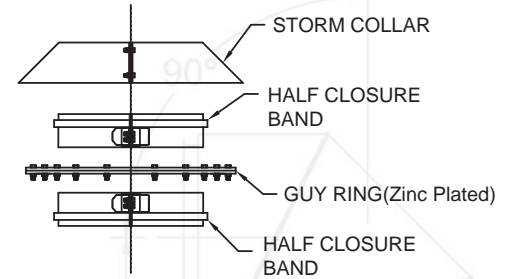
E = A+6" (152)



GUY RING (GR)

Installed at the flange to flange joint of two sections of pipe. Storm Collar and half closure bands are included.

NOTE: See installation instructions for correct location.

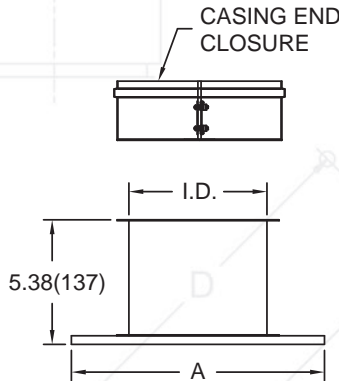


FLANGE ADAPTER (FA)

6" - 36" Diameters

Flow Resistance K= same as pipe

Attaches flue components incorporating flanged connections, i.e. engine exhaust, mufflers, etc. Includes Casing End Closure.



PIPE I.D.	A
6" (152)	11.00" (279)
8" (203)	13.50" (343)
10" (254)	16.00" (406)
12" (305)	19.00" (483)
14" (356)	21.00" (533)
16" (406)	23.50" (597)
18" (457)	25.00" (635)
20" (508)	27.50" (699)
22" (559)	29.50" (749)
24" (610)	32.00" (813)
30" (762)	38.75" (984)
36" (914)	46.00" (1168)

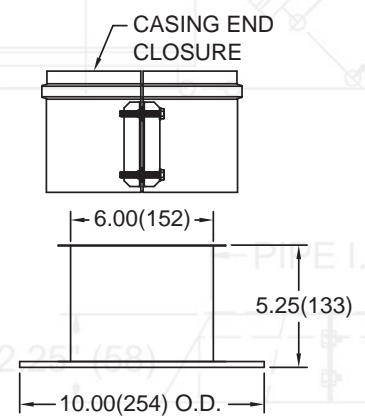
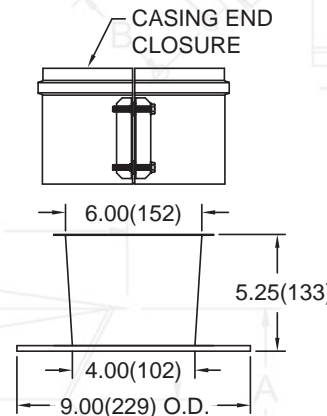
NOTE: Bolt hole pattern, and hole quantity per 125 lb. ANSI.

FLANGE ADAPTER (4FA & 5FA)

6" Diameter Only

Flow Resistance K= same as pipe

Attaches flue components incorporating flanged connections, i.e. engine exhaust, mufflers, etc. Includes Casing End Closure.



NOTE: Bolt hole pattern, and hole quantity per 125 lb. ANSI.

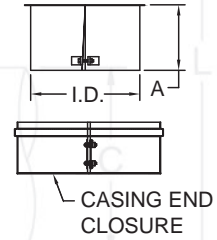
COMPONENTS

SINGLE WALL BOILER ADAPTER (SBA/SBA4)

Flow Resistance K= same as pipe
 Attaches pipe to straight collar outlets.
 PIC and IPIC applications include Casing
 End Closure.

A = 6" or 4" (opt.), specify when ordering
 e.g. 6PICSBA - A=6" or 6PICSBA4 - A=4"

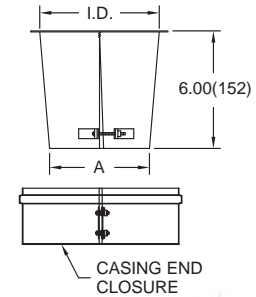
NOTE: Casing End Closure not used on PSW applications.



REDUCER COLLAR (RC)

Flow Resistance K= same as pipe
 Attaches pipe to an outlet source of
 smaller diameter. Specify "A" dimension
 when ordering e.g. 6PIC4RC

NOTE: Maximum of 2" reduction recommended.

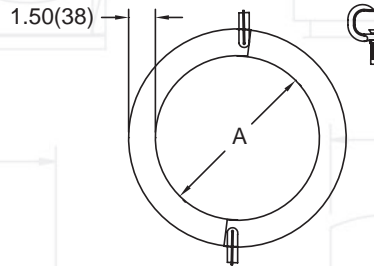


BOILER FLANGE ADAPTER (BFA)

Flow Resistance = N/A
 Secures pipe flange to heating equipment.
 (Zinc Plated)

A= Pipe I.D.

NOTE: Clamps included.

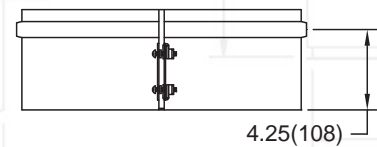


CLAMP QUANTITY			
PIPE I.D.	QUANTITY	PIPE I.D.	QUANTITY
6" (152)	4	28" (711)	14
8" (203)	4	30" (762)	14
10" (254)	5	32" (813)	16
12" (305)	6	34" (864)	16
14" (356)	7	36" (914)	18
16" (406)	8	38" (965)	18
18" (457)	9	40" (1016)	18
20" (508)	10	42" (1067)	18
22" (559)	10	44" (1118)	18
24" (610)	12	46" (1168)	18
26" (660)	12	48" (1219)	18

CASING END CLOSURE (CEC)

For use as an end cover when transitioning
 from double wall to single wall.

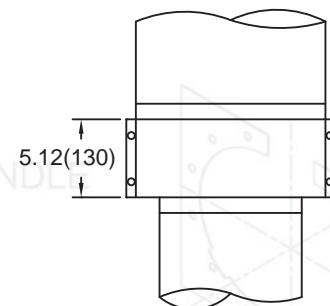
NOTE: When ordering, specify
 PICCEC
 IPICCEC-1
 -2
 -4



TRANSITION BAND (TB)

For use as a joint closure when transitioning
 from one insulation thickness to another.

NOTE: When ordering, specify
 PICTB-1-2
 -1-4
 -2-4



COMPONENTS

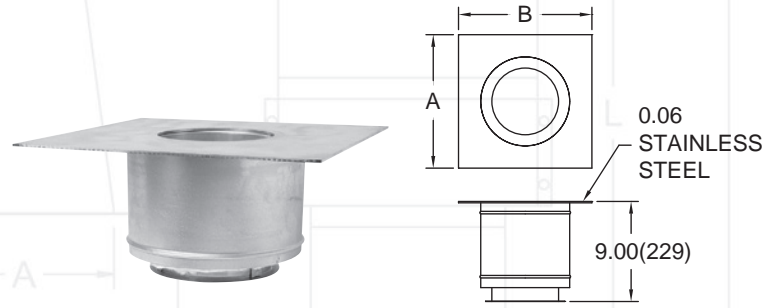
FAN ADAPTER PLATE (FAP)

6" - 36" Diameters

Connects to the inlet of an upblast fan.

Plate dimensions (A by B) = outside dimensions of curb less .25".

NOTE: Provide dimensions at order entry. Specify O.D. of curb or plate.

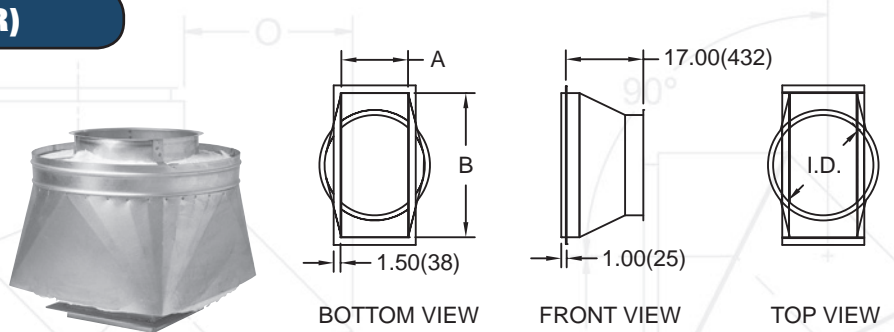


SQUARE TO ROUND (STR)

Transitions from square duct to round duct.

NOTES:

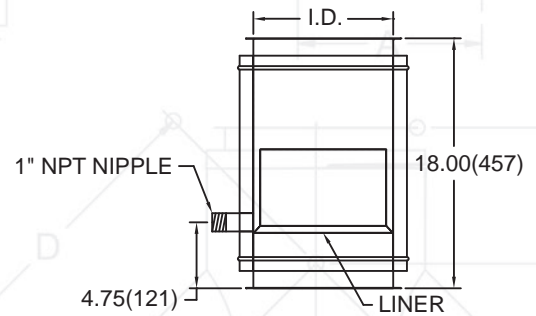
1. Specify dimensional data when ordering.
2. Eccentric and Offset STR's available as custom options upon request.



DRAIN SECTION (DS)

Flow Resistance $K = 0.25$

Drains rain water or condensation from inside the stack.

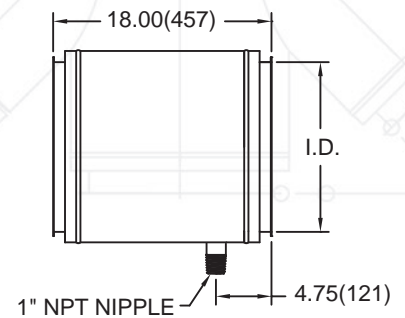


NOZZLE SECTION (NS)

6" - 36" Diameters

For use with wash down nozzles, fire suppression systems or as a drain section in a horizontal run.

NOTE: Please contact factory for larger diameters.



COMPONENTS

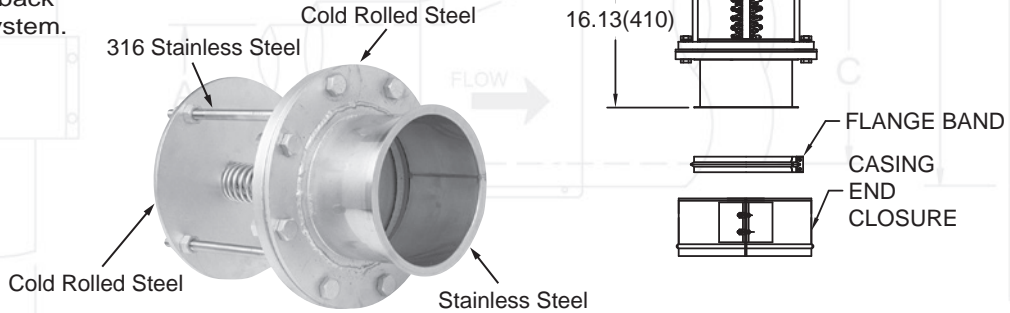
RELIEF VALVE ASSEMBLY (RV)

6" - 24" Diameters

Aids to relieve excessive back pressure in an exhaust system.

Assembly includes:

- Relief Valve
- Flange band
- Casing End Closure

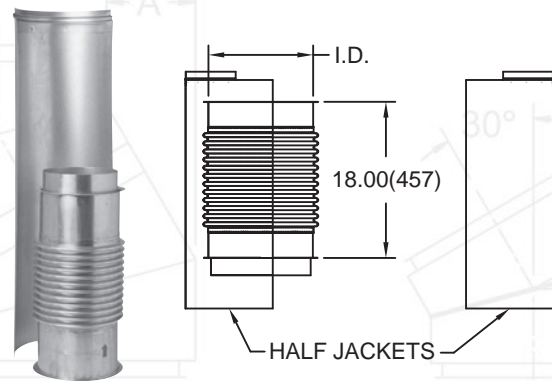


LINED BELLOWS JOINT (BJ)

Flow Resistance $K = 0.08$

Recommended for engine/turbine exhausts. Expansion joint to compensate for linear thermal expansion in generator exhaust systems. Maximum compressive travel is 3". Liner extends 2" beyond the installed length of the Bellows Joint.

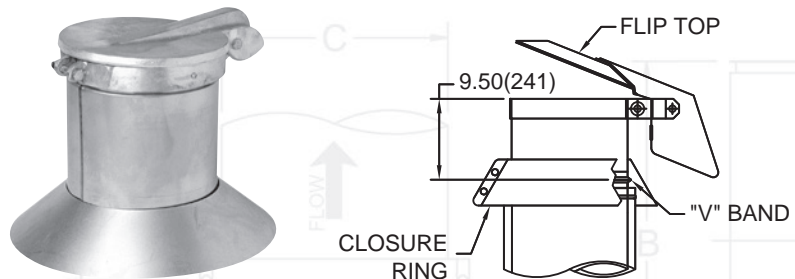
NOTE: PSW/PIC/IPIC-1 (6" - 48" Diameters)
IPIC-2/IPIC-4 (6" - 36" Diameters)



FLIP TOP (FT)

6" - 22" Diameters

Prevents rain from entering generator exhaust pipe. Opens with internal pressure.



SEAL CLIPS (SCK)

6" - 10" Diameters

Order Seal Clips when installing engine exhaust and other high pressure applications.

NOTE: Refer to Metal-Fab installation instructions L2592 (PIC & IPIC) and L2609 (PSW) for additional information.

SEAL CLIPS PER JOINT

Part Number	Number of Clips
SCK6-8	2ea.
SCK10	1ea.

COMPONENTS

SEALANT REQUIREMENTS

P077 Joint Sealant, use for temperatures up to 600°F.

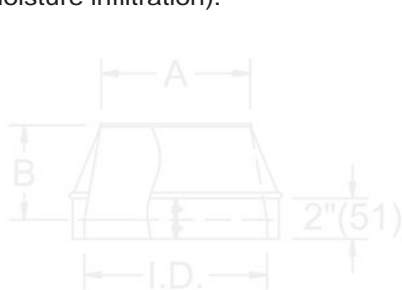
P071 Joint Sealant, use for flue temperatures above 600°F and high pressure applications.

NOTE: Refer to the Installation Instructions for additional information relating to proper sealant selection and special requirements for high pressure applications.

Flue Diameter	Tubes / Joint	Joints / Tube	Tubes / Joint	Joints / Tube
			High Pressure	High Pressure
6"	0.20	5	0.60	1.70
8"	0.20	5	0.70	1.40
10"	0.20	5	0.90	1.10
12"	0.25	4	1.00	1.00
14"	0.25	4	1.10	0.90
16"	0.25	4	1.33	0.75
18"	0.33	3	1.50	0.70
20"	0.33	3	1.67	0.60
22"	0.33	3	1.80	0.60
24"	0.50	2	2.10	0.50
26"	0.50	2	2.20	0.50
28"	0.50	2	2.40	0.40
30"	0.67	1 1/2	2.67	0.40
32"	0.67	1 1/2	2.90	0.30
34"	0.67	1 1/2	3.00	0.30
36"	0.67	1 1/2	3.20	0.30
38"	1.00	1	3.60	0.30
40"	1.00	1	3.70	0.25
42"	1.00	1	3.80	0.25
44"	1.00	1	4.10	0.25
46"	1.20	4/5	4.30	0.20
48"	1.20	4/5	4.50	0.20

JOINT ASSEMBLY

1. Apply continuous bead of sealant 1/4" wide to one flange.
2. Join to next section.
3. Fill the flange vee band with sealant and install around flanges.
4. Gently tap flange vee band with a soft mallet while tightening band to assure tight seal.
5. Insert insulation strips (IPIC-1, -2, -4) between pipe sections.
6. Install casing closure band. (Seal if external to structure to prevent moisture infiltration).



DESIGN CHECKLIST

In order to quickly and accurately design a chimney installation, Metal-Fab's Engineering Department needs basic information about the system. Listed below are those items about which information is needed:

1. Application (Boilers, Exhaust, Diesel Engine Exhaust, etc.).
2. Type of fuel to be used (LP Gas, Natural Gas, Number 2 Oil, etc.).
3. BTU Input or Boiler H.P.
4. Equipment Outlet Pressure:
 - a. Draft hood
 - b. Forced draft with positive, negative or zero inches of water at appliance outlet.
 - c. Induced draft capability and how much.
 - d. Barometric damper
5. Total Vertical Stack Height figured from:
 - a. Top of the draft hood.
 - b. Flue outlet top of boiler (direct connect).
 - c. At barometric damper.
6. Connector rise (piping from the appliance to the center line of breeching).
7. The total length of breeching for one appliance application, or the system length between the flue outlet center line for multiple boiler installations.
8. Single wall or double wall breeching.
9. Type of roof penetration or chase installation.
10. Type of construction - combustible, noncombustible, or fire-rated.
11. Type of chimney support.
12. Obstructions or dimensional restrictions that may exist.

Receipt of this information will speed the design process.

Thank you.

WARRANTIES

ONE YEAR

Metal-Fab warrants PSW, PIC, IPIC-1, -2, and -4 when used in chimney, and exhaust systems for a period of one (1) year from date of original installation when designed, installed, and maintained in accordance with Metal-Fab specifications.

TWELVE YEAR

Metal-Fab further warrants PSW, PIC, IPIC-1, -2, and -4 when used in chimney and exhaust systems for a period of twelve (12) years from date of original application when designed, installed, maintained, and registered as defined in the full warranty with Metal-Fab in accordance with Metal-Fab specifications.

Refer to Metal-Fab Warranty forms L865 and L961 for complete information on claim procedures, exclusions, and limitations. Visit www.metal-fabcommercial.com.



800-835-2830