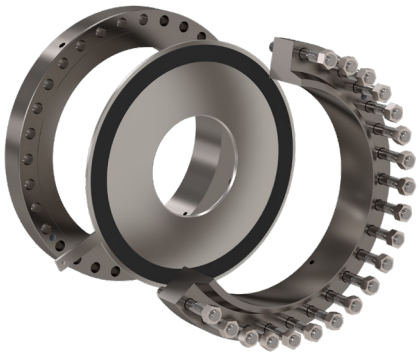


MEASUREMENT PRODUCTS



A DBM GLOBAL COMPANY

AITKENMFG.COM
SALES@AITKENMFG.COM
O: (281) 441-5438
F: (713) 699-5186

BREAKING THE MOLD

For over 80 years Aitken has partnered with clients to engineer and manufacture equipment solutions for their critical projects. Having earned trust from some of industry's iconic brands, it is our experience, expertise and willingness to challenge the norm that helps our clients, big and small, thrive.

Our team is crafted with people that drive innovation by thinking without limits. This allows us to be highly responsive to evolving needs throughout a project, manage tight fabrication schedules and maintain quality control timing to deliver products on time.

KEY PRODUCT CATEGORIES

Over the years, we have become known for working alongside our clients in helping to clearly identify the challenge so our engineering department can design custom solutions. When a more standardized product is needed, our catalogue offers a wide range of products that service heavy industrial industries. Products are available in carbon steel and most alloys ranging in size up to 72" and beyond.

- Plate Products
- Pressure Vessels
- Flow Products
- Metering Products

AREAS OF EXPERTISE



Engineering Design

Inhouse PE and application engineers with direct experience with parts



Customization

Solution-focused designs



Specialty welding

450+ welding procedures for ferrous and exotic metals



Material Sourcing

Domestic and international



Fabrication

Advanced FEA and CFD capabilities



Field Installation

Access to 1,000+ craft labor for larger installs



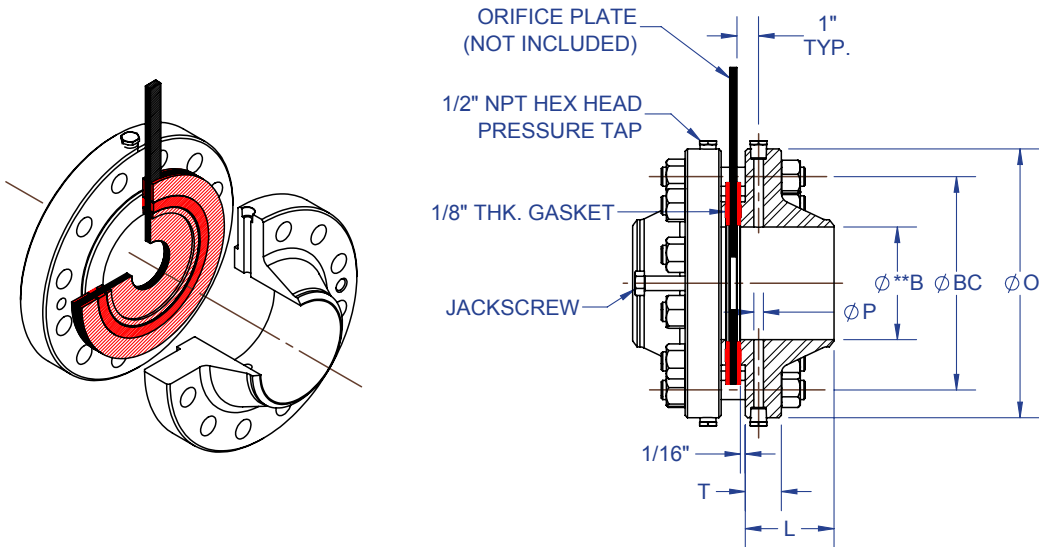
A DBM GLOBAL COMPANY

CERTIFICATIONS



Class 300
Welding
Neck
Orifice
Flanges

Raised Face



+ CUSTOM SIZES AND RATINGS AVAILABLE UPON REQUEST

See Class 600 for 3" nominal pipe size and smaller

DIMENSIONAL DATA (IN)

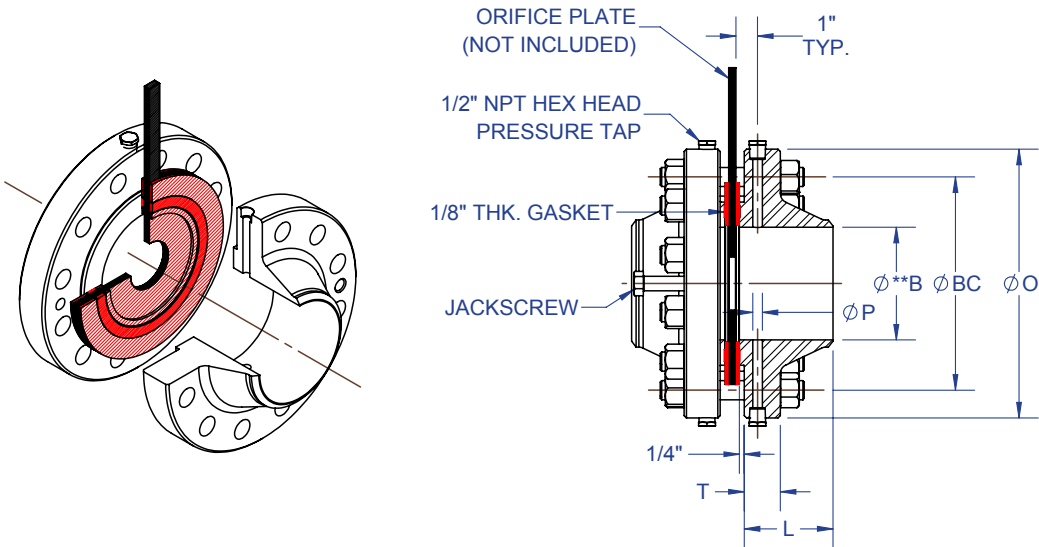
NOMINAL PIPE SIZE	DIAMETER OF FLANGE	MINIMUM FLANGE THICKNESS	DIAMETER OF RAISED FACE	LENGTH THROUGH HUB	PRESSURE TAP HOLE SIZE	DIAMETER OF BOLT CIRCLE	NUMBER OF HOLES	SIZE OF HOLES	SIZE & LENGTH OF STUDS	SIZE & LENGTH JACKSCREW	WEIGHT/ UNION (LBS)
SIZE	O	T	R#	L	P	BC	#Ø	Ø	S	J	WT
3"	8.25"	1.50"	5.00"	3.50"	0.375"	6.62"	8	0.81"	0.75"x5.25"	0.75"x3"	48
4"	10.00"	1.50"	6.19"	3.62"	0.50"	7.88"	8	0.81"	0.75"x5.25"	0.75"x3"	68
6"	12.50"	1.50"	8.50"	3.94"	0.50"	10.62"	12	0.88"	0.75"x5.25"	0.75"x3"	100
8"	15.00"	1.62"	10.62"	4.38"	0.50"	13.00"	12	1.00"	0.875"x5.75"	0.75"x3"	155
10"	17.50"	1.88"	12.75"	4.62"	0.50"	15.25"	16	1.12"	1"x6.5"	1"x4.5"	220
12"	20.50"	2.00"	15.00"	5.12"	0.50"	17.75"	16	1.25"	1.125"x7"	1"x4.5"	330
14"	23.00"	2.12"	16.25"	5.62"	0.50"	20.25"	20	1.25"	1.125"x7.25"	1"x4.5"	425
16"	25.50"	2.25"	18.50"	5.75"	0.50"	22.25"	20	1.38"	1.25"x7.75"	1"x4.5"	590
18"	28.00"	2.38"	21.00"	6.25"	0.50"	24.75"	24	1.38"	1.25"x8"	1"x4.5"	750
20"	30.50"	2.50"	23.00"	6.38"	0.50"	27.00"	24	1.38"	1.25"x8.5"	1"x4.5"	910
22"	33.00"	2.69"	25.25"	6.50"	0.50"	29.25"	24	1.62"	1.5"x9.25"	1"x5.5"	1125
24"	36.00"	2.75"	27.25"	6.62"	0.50"	32.00"	24	1.62"	1.5"x9.5"	1"x5.5"	1350
36"	50.00"	4.18"	40.25"	9.50"	0.50"	46.00"	32	2.12"	2"x13.25"	1"x6.5"	3200

*Sizes not listed in ASME/ANSI B16.36, orifice flanges. **Dimension "B" to be specified by customer.
Reference ASME B16.5 & B16.36 for material of construction, dimensions, pressure, temperature ratings and identification markings.
Each orifice union comes complete with: (2) Jackscrews (2) 1/2" plugs (2) Gaskets 1/16" thick compressed non-asbestos. Weights are approximate.



Class 400 Welding Neck Orifice Flanges

Raised Face



+ CUSTOM SIZES AND RATINGS AVAILABLE UPON REQUEST

See Class 600 for 3" nominal pipe size and smaller

DIMENSIONAL DATA (IN)

NOMINAL PIPE SIZE	DIAMETER OF FLANGE	MINIMUM FLANGE THICKNESS	DIAMETER OF RAISED FACE	LENGTH THROUGH HUB	PRESSURE TAP HOLE SIZE	DIAMETER OF BOLT CIRCLE	NUMBER OF HOLES	SIZE OF HOLES	SIZE & LENGTH OF STUDS	SIZE & LENGTH JACKSCREW	WEIGHT/ UNION (LBS)
SIZE	O	T	R#	*L	P	BC	#Ø	Ø	S	J	WT
4"	10.00"	1.50"	6.10"	3.50"	0.50"	7.88"	8	1.00"	0.875"x5.5"	0.75"x4"	83
6"	12.50"	1.62"	8.50"	4.06"	0.50"	10.62"	12	1.00"	0.875"x6.25"	0.75"x4"	135
8"	15.00"	1.88"	10.62"	4.62"	0.50"	13.00"	12	1.12"	1"x6.75"	0.75"x4"	205
10"	17.50"	2.12"	12.75"	4.88"	0.50"	15.25"	16	1.25"	1.125"x7.5"	1"x4.5"	300
12"	20.50"	2.25"	15.00"	5.38"	0.50"	17.75"	16	1.38"	1.25"x8"	1"x4.5"	420
14"	23.00"	2.39"	16.25"	5.88"	0.50"	20.25"	20	1.375"	1.25"x8.25"	1"x4.5"	555
16"	25.50"	2.50"	18.50"	6.00"	0.50"	22.50"	20	1.50"	1.375"x8.75"	1"x5.5"	710
18"	28.00"	2.62"	21.00"	6.50"	0.50"	24.75"	24	1.50"	1.375"x9.25"	1"x5.5"	865
20"	30.50"	2.75"	23.00"	6.62"	0.50"	27.00"	24	1.625"	1.5"x9.75"	1"x5.5"	1070
24"	38.00"	3.00"	27.25"	6.88"	0.50"	32.00"	24	1.875"	1.75"x11"	1"x6.5"	1560

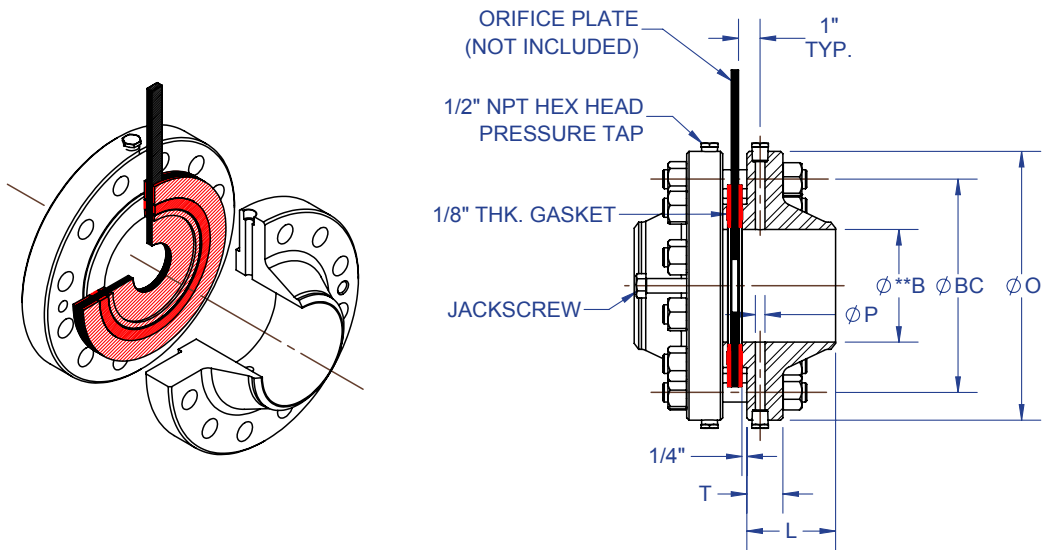
*Dimension does not include 1/4" raised face thickness. Add 1/4" to dimension "L" for overall length through hub, see detail above.

**Dimension "B" to be specified by customer. Reference ASME B16.5 & B16.36 for material of construction, dimensions, pressure, temperature ratings and identification markings. Each orifice union comes complete with: (2) Jackscrews (2) 1/2" plugs (2) Gaskets 1/16" thick compressed non-asbestos. Weights are approximate.



Class 600 Welding Neck Orifice Flanges

Raised Face



+ CUSTOM SIZES AND RATINGS AVAILABLE UPON REQUEST

DIMENSIONAL DATA (IN)

NOMINAL PIPE SIZE	DIAMETER OF FLANGE	MINIMUM FLANGE THICKNESS	DIAMETER OF RAISED FACE	LENGTH THROUGH HUB	PRESSURE TAP HOLE SIZE	DIAMETER OF BOLT CIRCLE	NUMBER OF HOLES	SIZE OF HOLES	SIZE & LENGTH OF STUDS	SIZE & LENGTH JACKSCREW	WEIGHT/ UNION (LBS)
SIZE	O	T	R#	*L	P	BC	#Ø	Ø	S	J	WT
1"	4.88"	1.50"	2.00"	3.25"	0.25"	3.50"	4	0.75"	0.625"x5"	0.625"x3"	19
1.5"	6.12"	1.50"	2.88"	3.375"	0.25"	4.50"	4	0.875"	0.75"x5.25"	0.625"x3"	23
2"	6.50"	1.50"	3.625"	3.375"	0.25"	5.00"	8	0.75"	0.625"x5"	0.625"x3"	25
2.5"	7.50"	1.50"	4.125"	3.50"	0.25"	5.875"	8	0.875"	0.75"x5.25"	0.625"x3"	33
3"	8.25"	1.50"	5.00"	3.50"	0.375"	6.625"	8	0.875"	0.75"x5.25"	0.75"x3"	45
4"	10.75"	1.50"	6.19"	4.00"	0.50"	8.50"	8	1.00"	0.875"x6"	0.75"x4"	97
6"	14.00"	1.88"	8.50"	4.62"	0.50"	11.50"	12	1.12"	1"x7"	0.75"x4"	195
8"	16.50"	2.19"	10.62"	5.25"	0.50"	13.75"	12	1.25"	1.125"x7.75"	0.75"x4.5"	285
10"	20.00"	2.50"	12.75"	6.00"	0.50"	17.00"	16	1.38"	1.25"x8.75"	1"x5.5"	450
12"	22.00"	2.62"	15.00"	6.12"	0.50"	19.25"	20	1.38"	1.25"x9"	1"x5.5"	540
14"	23.75"	2.75"	16.25"	6.50"	0.50"	20.75"	20	1.50"	1.375"x9.5"	1"x4.5"	820
16"	27.00"	3.00"	18.50"	7.00"	0.50"	23.75"	20	1.625"	1.5"x10.25"	1"x5.5"	1110
18"	29.25"	3.25"	21.00"	7.25"	0.50"	25.75"	20	1.75"	1.625"x11"	1"x5.5"	1305
20"	32.00"	3.50"	23.00"	7.50"	0.50"	28.50"	24	1.75"	1.625"x11.75"	1"x5.5"	1624
24"	37.00"	4.00"	27.25"	8.00"	0.50"	33.00"	24	2.00"	1.875"x13.25"	1"x6.5"	2322

*Dimension does not include 1/4" raised face thickness. Add 1/4" to dimension "L" for overall length through hub, see detail above.

**Dimension "B" to be specified by customer. Reference ASME B16.5 & B16.36 for material of construction, dimensions, pressure, temperature ratings and identification markings. Each orifice union comes complete with: (2) Jackscrews (2) 1/2" plugs (2) Gaskets 1/16" thick compressed non-asbestos. Weights are approximate.



Class 900 Welding Neck Orifice Flanges

Raised Face

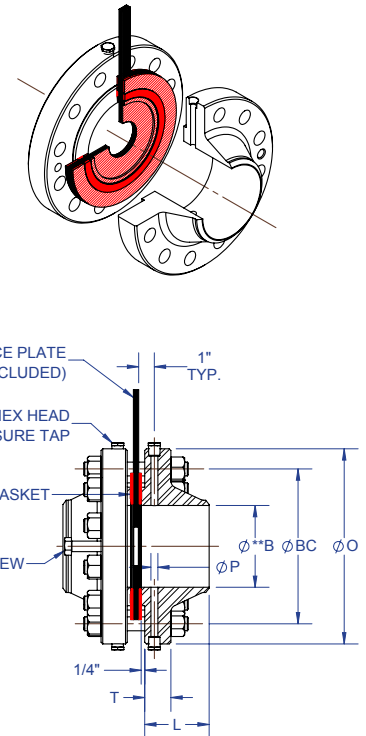
+ CUSTOM SIZES AND RATINGS AVAILABLE UPON REQUEST

DIMENSIONAL DATA (IN)

NOMINAL PIPE SIZE	OUTSIDE DIAMETER OF RAISED FACE	OUTSIDE DIAMETER OF FLANGE	MINIMUM THICKNESS OF FLANGE	LENGTH THROUGH HUB	DIAMETER OF HUB	HUB DIAMETER BEGINNING OF CHAMFER	BORE	DIAMETER OF PRESSURE CONNECTION	LENGTH STUD BOLTS
SIZE	R#	O	t	Y	X	A	B	π	(2) (3)
3"	5.00"	9.50"	1.50"	4.00"	5.00"	3.50"	(4)	3/8"	6.00"
4"	6.19"	11.50"	1.75"	4.50"	6.25"	4.50"	(4)	1/2"	7.00"
6"	8.5"	15.00"	2.19"	5.50"	9.25"	6.63"	(4)	1/2"	7.75"
8"	10.62"	18.50"	2.50"	6.38"	11.75"	8.63"	(4)	1/2"	9.00"
10"	12.75"	21.50"	2.75"	7.25"	14.50"	10.75"	(4)	1/2"	9.50"
12"	15.00"	24.00"	3.12"	7.88"	16.50"	12.75"	(4)	1/2"	10.25"
14"	16.25"	25.25"	3.38"	8.38"	17.75"	14.00"	(4)	1/2"	11.00"
16"	18.50"	27.75"	3.50"	8.50"	20.00"	16.00"	(4)	1/2"	11.50"
18"	21.00"	31.00"	4.00"	9.00"	22.25"	18.00"	(4)	1/2"	13.00"
20"	23.00"	33.75"	4.25"	9.75"	24.50"	20.00"	(4)	1/2"	14.00"
24"	27.25"	41.00"	5.50"	11.50"	29.50"	24.00"	(4)	1/2"	17.50"

DRILLING TEMPLATE

NOMINAL PIPE SIZE	DIAMETER OF BOLT CIRCLE	NUMBER OF HOLES	DIAMETER OF HOLES	DIAMETER OF BOLTS
3"	7.50"	8	1.00"	7/8"
4"	9.25"	8	1.25"	1 1/8"
6"	12.50"	12	1.25"	1 1/8"
8"	15.50"	12	1.50"	1 3/8"
10"	18.50"	16	1.50"	1 3/8"
12"	21.00"	20	1.50"	1 3/8"
14"	22.00"	20	1.62"	1 1/2"
16"	24.25"	20	1.75"	1 5/8"
18"	27.00"	20	2.00"	1 7/8"
20"	29.50"	20	2.12"	2"
24"	35.50"	20	2.62"	2 1/2"



*Dimension does not include 1/4" raised face thickness. Add 1/4" to dimension "L" for overall length through hub, see detail above.

**Dimension "B" to be specified by customer. Reference ASME B16.5 & B16.36 for material of construction, dimensions, pressure, temperature ratings and identification markings. Each orifice union comes complete with: (2) Jackscrews (2) 1/2" plugs (2) Gaskets 1/16" thick compressed non-asbestos. Weights are approximate.

Class 1500 Welding Neck Orifice Flanges

Raised Face

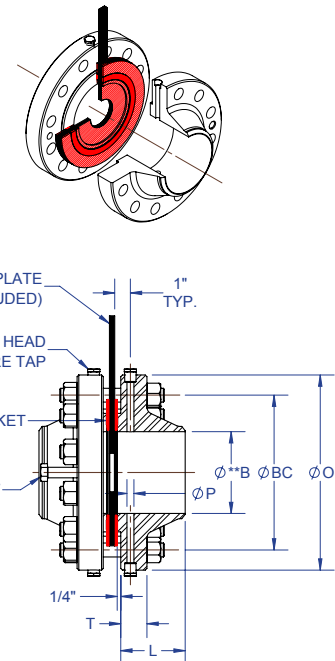
+ CUSTOM SIZES AND RATINGS AVAILABLE UPON REQUEST

DIMENSIONAL DATA (IN)

NOMINAL PIPE SIZE	OUTSIDE DIAMETER OF RAISED FACE	OUTSIDE DIAMETER OF FLANGE	MINIMUM THICKNESS OF FLANGE	LENGTH THROUGH HUB	DIAMETER OF HUB	HUG DIAMETER BEGINNING OF CHAMFER	BORE	DIAMETER OF PRESSURE CONNECTION	LENGTH STUD BOLTS
SIZE	R#	O	t	Y	X	A	B	π	(2) (3)
1"	2.00"	5.88"	1.50"	3.25"	2.06"	1.32"	(4)	1/4"	6.00"
1½"	2.88"	7.00"	1.50"	3.50"	2.75"	1.90"	(4)	1/4"	6.25"
2"	3.62"	8.50"	1.50"	4.00"	4.12"	2.38"	(4)	1/4"	6.00"
2½"	4.12"	9.62"	1.62"	4.12"	4.88"	2.88"	(4)	1/4"	6.50"
3"	5.00"	10.50"	1.88"	4.62"	5.25"	3.50"	(4)	3/8"	7.25"
4"	6.19"	12.25"	2.12"	4.88"	6.38"	4.50"	(4)	1/2"	8.00"
6"	8.50"	15.50"	3.25"	6.75"	9.00"	6.63"	(4)	1/2"	10.50"
8"	10.62"	19.00"	3.62"	8.38"	11.50"	8.63"	(4)	1/2"	11.75"
10"	12.75"	23.00"	4.25"	10.00"	14.50"	10.75"	(4)	1/2"	13.50"
12"	15.00"	26.50"	4.88"	11.12"	17.75"	12.75"	(4)	1/2"	15.00"
14"	16.25"	29.50"	5.25"	11.75"	19.50"	14.00"	(4)	1/2"	16.25"
16"	18.50"	32.50"	5.75"	12.25"	21.75"	16.00"	(4)	1/2"	17.75"
18"	21.00"	36.00"	6.38"	12.88"	23.50"	18.00"	(4)	1/2"	19.75"
20"	23.00"	38.75"	7.00"	14.00"	25.25"	20.00"	(4)	1/2"	21.50"
24"	27.25"	46.00"	8.00"	16.00"	30.00"	24.00"	(4)	1/2"	24.50"

DRILLING TEMPLATE

NOMINAL PIPE SIZE	DIAMETER OF BOLT CIRCLE	NUMBER OF HOLES	DIAMETER OF HOLES	DIAMETER OF BOLTS
1"	4.00"	4	1.00"	7/8"
1.5"	4.88"	4	1.12"	1"
2"	6.50"	8	1.00"	7/8"
2.5"	7.50"	8	1.12"	1"
3"	8.00"	8	1.25"	1 1/8"
4"	9.50"	8	1.38"	1 1/4"
6"	12.50"	12	1.50"	1 3/8"
8"	15.50"	12	1.75"	1 5/8"
10"	19.00"	12	2.00"	1 7/8"
12"	22.50"	16	2.12"	2"
14"	25.00"	16	2.38"	2 1/4"
16"	27.75"	16	2.62"	2 1/2"
18"	30.50"	16	2.88"	2 3/4"
20"	32.75"	16	3.12"	3"
24"	39.00"	16	3.62"	3 1/2"



*Dimension does not include 1/4" raised face thickness. Add 1/4" to dimension "L" for overall length through hub, see detail above.

**Dimension "B" to be specified by customer. Reference ASME B16.5 & B16.36 for material of construction, dimensions, pressure, temperature ratings and identification markings. Each orifice union comes complete with: (2) Jackscrews (2) 1/2" plugs (2) Gaskets 1/16" thick compressed non-asbestos. Weights are approximate.

Class 2500 Welding Neck Orifice Flanges

Raised Face

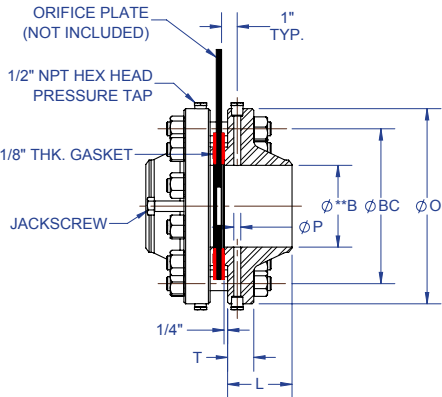
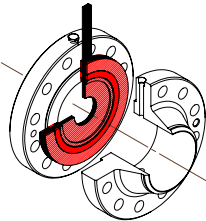
+ CUSTOM SIZES AND RATINGS AVAILABLE UPON REQUEST

DIMENSIONAL DATA (IN)

NOMINAL PIPE SIZE	OUTSIDE DIAMETER OF RAISED FACE	OUTSIDE DIAMETER OF FLANGE	MINIMUM THICKNESS OF FLANGE	LENGTH THROUGH HUB	DIAMETER OF HUB	HUG DIAMETER BEGINNING OF CHAMFER	BORE	DIAMETER OF PRESSURE CONNECTION	LENGTH STUD BOLTS
SIZE	R#	O	t	Y	X	A	B	π	(2) (3)
1"	2.00"	6.25"	1.50"	3.62"	2.25"	1.32"	(4)	1/4"	6.00"
1.5"	2.88"	8.00"	1.75"	4.38"	3.12"	1.90"	(4)	1/4"	7.00"
2"	3.62"	9.25"	2.00"	5.00"	3.75"	2.38"	(4)	1/4"	7.25"
2.5"	4.12"	10.50"	2.25"	5.62"	4.50"	2.88"	(4)	1/4"	8.00"
3"	5.00"	12.00"	2.62"	6.62"	5.25"	3.50"	(4)	3/8"	9.00"
4"	6.19"	14.00"	3.00"	7.50"	6.50"	4.50"	(4)	1/2"	10.25"
6"	8.50"	19.00"	4.25"	10.75"	9.25"	6.63"	(4)	1/2"	13.75"
8"	10.62"	21.75"	5.00"	12.50"	12.00"	8.63"	(4)	1/2"	15.25"
10"	12.75"	26.50"	6.50"	16.50"	14.75"	10.75"	(4)	1/2"	19.25"
12"	15.00"	30.00"	7.25"	18.25"	17.38"	12.75"	(4)	1/2"	21.25"

DRILLING TEMPLATE

NOMINAL PIPE SIZE	DIAMETER OF BOLT CIRCLE	NUMBER OF HOLES	DIAMETER OF HOLES	DIAMETER OF BOLTS
1"	4.25"	4	1.00"	7/8"
1½"	5.75"	4	1.25"	1 1/8"
2"	6.75"	8	1.12"	1"
2½"	7.75"	8	1.25"	1 1/8"
3"	9.00"	8	1.38"	1 1/4"
4"	10.75"	8	1.62"	1 1/2"
6"	14.50"	8	2.12"	2"
8"	17.25"	12	2.12"	2"
10"	21.25"	12	2.62"	2 1/2"
12"	24.38"	12	2.88"	2 3/4"



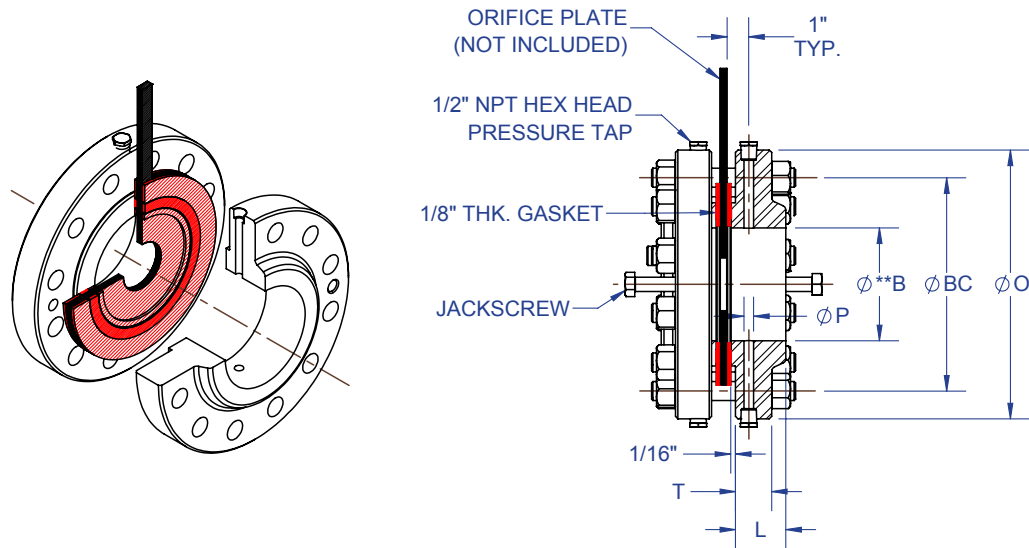
*Dimension does not include 1/4" raised face thickness. Add 1/4" to dimension "L" for overall length through hub, see detail above.

**Dimension "B" to be specified by customer. Reference ASME B16.5 & B16.36 for material of construction, dimensions, pressure, temperature ratings and identification markings. Each orifice union comes complete with: (2) Jackscrews (2) 1/2" plugs (2) Gaskets 1/16" thick compressed non-asbestos. Weights are approximate.



Class 300 Slip-On Orifice Flanges

Raised Face



+ CUSTOM SIZES AND RATINGS AVAILABLE UPON REQUEST

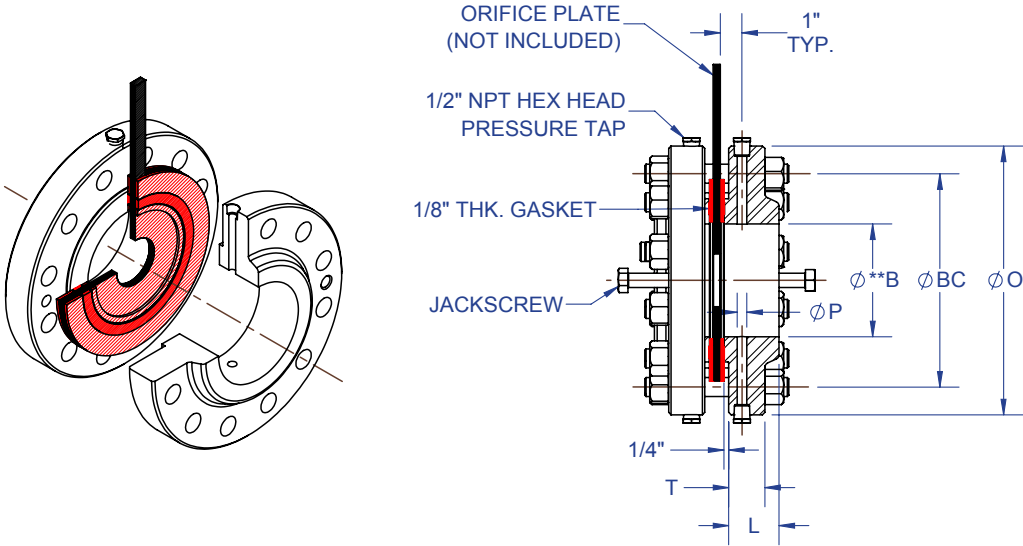
DIMENSIONAL DATA (IN)

NOMINAL PIPE SIZE	DIAMETER OF FLANGE	MINIMUM FLANGE THICKNESS	DIAMETER OF RAISED FACE	LENGTH THROUGH HUB	PRESSURE TAP HOLE SIZE	DIAMETER OF BOLT CIRCLE	NUMBER OF HOLES	SIZE OF HOLES	SIZE & LENGTH OF STUDS	SIZE & LENGTH JACKSCREW	WEIGHT / UNION (LBS)
SIZE	O	T	R#	L	P	BC	#Ø	Ø	S	x	WT
*0.5"	3.75"	1.50"	1.38"	1.81"	0.12"	2.62"	4	0.56"	0.5"x4.75"	0.5"x3"	9
*0.75"	4.62"	1.50"	1.69"	1.88"	0.12"	3.25"	4	0.69"	0.625"x5"	0.5"x3"	9
1"	4.88"	1.50"	2.00"	1.88"	0.25"	3.50"	4	0.69"	0.625"x5"	0.625"x3"	15
*1.25"	5.25"	1.50"	2.50"	1.81"	0.25"	3.88"	4	0.69"	0.625"x5"	0.625"x3"	17
1.5"	6.12"	1.50"	2.88"	1.88"	0.25"	4.50"	4	0.81"	0.75"x5.25"	0.625"x3"	19
2"	6.50"	1.50"	3.62"	1.94"	0.25"	5.00"	8	0.69"	0.625"x5"	0.625"x3"	23
2.5"	7.50"	1.50"	4.12"	2.00"	0.25"	5.88"	8	0.81"	0.75"x5.25"	0.625"x3"	31
3"	8.25"	1.50"	5.00"	2.06"	0.375"	6.62"	8	0.81"	0.75"x5.25"	0.75"x3"	39
4"	10.00"	1.50"	6.19"	2.12"	0.50"	7.88"	8	0.81"	0.75"x5.25"	0.75"x3"	60
6"	12.50"	1.50"	8.50"	2.12"	0.50"	10.62"	12	0.88"	0.75"x5.25"	0.75"x3"	100
8"	15.00"	1.62"	10.62"	2.44"	0.50"	13.00"	12	1.00"	0.875"x5.75"	0.75"x3"	135
10"	17.50"	1.88"	12.75"	2.62"	0.50"	15.25"	16	1.12"	1"x6.5"	1"x4.5"	196
12"	20.50"	2.00"	15.00"	2.88"	0.50"	17.75"	16	1.25"	1.125"x7"	1"x4.5"	281
14"	23.00"	2.12"	16.25"	3.00"	0.50"	20.25"	20	1.25"	1.125"x7.25"	1"x4.5"	380
16"	25.50"	2.25"	18.50"	3.25"	0.50"	22.25"	20	1.38"	1.25"x7.75"	1"x4.5"	530
18"	28.00"	2.38"	21.00"	3.50"	0.50"	24.75"	24	1.38"	1.25"x8"	1"x4.5"	691
20"	30.50"	2.50"	23.00"	3.75"	0.50"	27.00"	24	1.38"	1.25"x8.5"	1"x4.5"	781
24"	36.00"	2.75"	27.25"	4.19"	0.50"	32.00"	24	1.62"	1.5"x9.5"	1"x5.5"	1,201

*Sizes not listed in ASME/ANSI B16.36, orifice flanges. **Dimension "B" to accommodate nominal pipe size. Reference ASME B16.5 & B16.36 for material of construction, dimensions, pressure, temperature ratings and identification markings. Each orifice union comes complete with: (2) Jackscrews (2) 1/2" plugs (2) Gaskets 1/16" thick compressed non-asbestos. Weights are approximate.

Class 400 & 600 Slip-On Orifice Flanges

Raised Face



+ CUSTOM SIZES AND RATINGS AVAILABLE UPON REQUEST
See Class 300 for 3" nominal pipe size and smaller

CLASS 400 DIMENSIONAL DATA (IN)

NOMINAL PIPE SIZE	DIAMETER OF FLANGE	MINIMUM FLANGE THICKNESS	DIAMETER OF RAISED FACE	LENGTH THROUGH HUB	PRESSURE TAP HOLE SIZE	DIAMETER OF BOLT CIRCLE	NUMBER OF HOLES	SIZE OF HOLES	SIZE & LENGTH OF STUDS	SIZE & LENGTH JACKSCREW	WEIGHT / UNION (LBS)
SIZE	O	T	R#	*L	P	BC	#Ø	Ø	S	J	WT
4"	10.00"	1.50"	6.19"	2.00"	0.50"	7.88"	8	1.00"	0.875"x6"	0.75"x4"	65
6"	12.50"	1.62"	8.50"	2.25"	0.50"	10.62"	12	1.00"	0.875"x6.25"	0.75"x4"	110
8"	15.00"	1.88"	10.62"	2.68"	0.50"	13.00"	12	1.12"	1"x7"	0.75"x4"	170
10"	17.50"	2.12"	12.75"	2.88"	0.50"	15.25"	16	1.25"	1.125"x7.75"	1"x4.5"	239
12"	20.50"	2.25"	15.00"	3.12"	0.50"	17.75"	16	1.38"	1.25"x8.25"	1"x4.5"	333

CLASS 600 DIMENSIONAL DATA (IN)

NOMINAL PIPE SIZE	DIAMETER OF FLANGE	MINIMUM FLANGE THICKNESS	DIAMETER OF RAISED FACE	LENGTH THROUGH HUB	PRESSURE TAP HOLE SIZE	DIAMETER OF BOLT CIRCLE	NUMBER OF HOLES	SIZE OF HOLES	SIZE & LENGTH OF STUDS	SIZE & LENGTH JACKSCREW	WEIGHT / UNION (LBS)
SIZE	O	T	R#	*L	P	BC	#Ø	Ø	S	J	WT
4"	10.75"	1.50"	6.19"	2.12"	0.50"	8.50"	8	1.00"	0.875"x6"	0.75"x4"	75
6"	14.00"	1.88"	8.50"	2.62"	0.50"	11.5"	12	1.12"	1"x7"	0.75"x4"	160
8"	16.50"	2.19"	10.62"	3.00"	0.50"	13.75"	12	1.25"	1.125"x8"	0.75"x4.5"	230
10"	20.00"	2.50"	12.70"	3.38"	0.50"	17.00"	16	1.38"	1.25"x8.75"	1"x5.5"	355
12"	22.00"	2.62"	15.00"	3.62"	0.50"	19.25"	20	1.38"	1.25"x9"	1"x5.5"	430

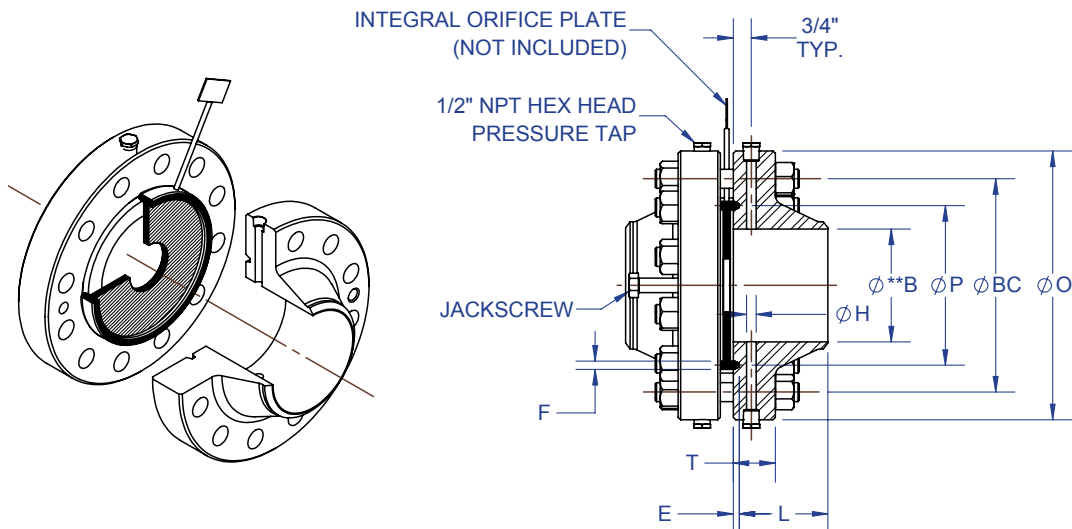
*Dimension does not include 1/4" raised face thickness. Add 1/4" to dimension "L" for overall length through hub, see detail.

**Dimension "B" to accommodate nominal pipe size. Reference ASME B16.5 & B16.36 for material of construction, dimensions, pressure, temperature ratings and identification markings. Each orifice union comes complete with: (2) Jackscrews (2) 1/2" plugs (2) Gaskets 1/16" thick compressed non-asbestos. Weights are approximate.



Class 300 Orifice Flanges

Ring Joint



CLASS 300 DIMENSIONAL DATA (IN)

+ CUSTOM SIZES AND RATINGS AVAILABLE UPON REQUEST

NOMINAL PIPE SIZE	A.P.I. RING #	ϕ FLANGE	MIN. FLANGE TH. HUB	LENGTH THROUGH HUB	PRESSURE TAP HOLE SIZE	PITCH ϕ RING & GROVE	GROVE DEPTH	GROVE WIDTH	ϕ BOLT CIRCLE	NO. OF HOLES	SIZE OF HOLES	SIZE & LENGTH STUDS	SIZE & LENGTH JACKSCREW	WEIGHT/ UNION (LBS)
SIZE	R#	O	T	*L	H	P	E	F	BC	# ϕ	ϕ	S	J	WT
0.5"	11	3.75"	1.25"	2.75"	0.12"	1.3438"	0.2188"	0.2813"	2.625"	4	0.56"	0.5"x5.25"	0.5"x3"	10
0.75"	13	4.62"	1.25"	2.88"	0.12"	1.6875"	0.25"	0.3438"	3.25"	4	0.69"	0.625"x5.5"	0.5"x3.5"	10
1"	16	4.88"	1.25"	3.00"	0.12"	2.00"	0.25"	0.3438"	3.50"	4	0.69"	0.625"x5.5"	0.625"x4"	15
1.25"	18	5.25"	1.25"	3.06"	0.12"	2.375"	0.25"	0.3438"	3.88"	4	0.69"	0.625"x5.75"	0.625"x4"	23
1.5"	20	6.12"	1.25"	3.12"	0.18"	2.6875"	0.25"	0.3438"	4.50"	4	0.81"	0.75"x5.75"	0.625"x4"	25
2"	23	6.50"	1.25"	3.12"	0.38"	3.25"	0.3125"	0.4688"	5.00"	8	0.69"	0.625"x5.5"	0.625"x4"	30
2.5"	26	7.50"	1.25"	3.25"	0.38"	4.00"	0.3125"	0.4688"	5.875"	8	0.81"	0.75"x5.75"	0.625"x4"	46
3"	31	8.25"	1.25"	3.25"	0.38"	4.875"	0.3125"	0.4688"	6.625"	8	0.81"	0.75"x5.75"	0.75"x4"	56
4"	37	10.00"	1.25"	3.38"	0.50"	5.875"	0.3125"	0.4688"	7.875"	8	0.81"	0.75"x5.75"	0.75"x4"	65
6"	45	12.50"	1.43"	3.88"	0.50"	8.3125"	0.3125"	0.4688"	10.625"	12	0.88"	0.75"x6.25"	0.75"x4"	107
8"	49	15.00"	1.62"	4.38"	0.50"	10.625"	0.3125"	0.4688"	13.00"	12	1"	0.875"x6.75"	0.75"x4"	169
10"	53	17.50"	1.88"	4.62"	0.50"	12.75"	0.3125"	0.4688"	15.25"	16	1.12"	1"x7.5"	1"x4.5"	250
12"	57	20.50"	2.00"	5.12"	0.50"	15.00"	0.3125"	0.4688"	17.75"	16	1.25"	1.125"x8"	1"x5.5"	365
14"	61	23.00"	2.12"	5.62"	0.50"	16.50"	0.3125"	0.4688"	20.25"	20	1.25"	1.12"x8.5"	1"x5.5"	491
16"	65	25.50"	2.25"	5.75"	0.50"	18.00"	0.3125"	0.4688"	22.50"	20	1.38"	1.25"x9"	1"x5.5"	640
18"	69	28.00"	2.38"	6.25"	0.50"	21.00"	0.3125"	0.4688"	24.75"	24	1.38"	1.25"x9.25"	1"x5.5"	785
20"	73	30.50"	2.50"	6.38"	0.50"	23.00"	0.375"	0.5313"	27.00"	24	1.38"	1.25"x9.5"	1"x5.5"	960
24"	77	36.00"	2.75"	6.62"	0.50"	27.25"	0.4375"	0.6563"	32.00"	24	1.62"	1.5"x10.5"	1"x6.5"	1,410

*Dimension does not include groove depth (E). Add dimension (E) to dimension (L) for overall hub length, see detail. **Dimension "B" to be specified by customer. Reference ASME B16.5 & B16.36 for material of construction, dimensions, pressure, temperature ratings and identification markings. Each orifice union comes complete with: (2) Jackscrews (2) 1/2" plugs. Customer to specify bore size (I.E. S/40). Weights are approximate.

Class 400 & 600 Orifice Flanges

Ring Joint

+ CUSTOM SIZES AND RATINGS AVAILABLE UPON REQUEST

CLASS 400 DIMENSIONAL DATA (IN)

NOMINAL PIPE SIZE	A.P.I. RING #	Ø FLANGE	MIN. FLANGE TH. HUB	LENGTH TH. HUB	PRESSURE TAP HOLE SIZE	PITCH Ø RING & GROVE	GROVE DEPTH	GROVE WIDTH	Ø BOLT CIRCLE	NO. OF HOLES	SIZE OF HOLES	SIZE & LENGTH STUDS	SIZE & LENGTH JACKSCREW	WEIGHT/ UNION (LBS)
SIZE	R#	O	T	*L	H	P	E	F	BC	#Ø	Ø	S	J	WT
4"	37	10.00"	1.50"	3.50"	0.50"	5.875"	0.312"	0.469"	7.88"	8	1.00"	0.875"x6"	0.75"x4"	92
6"	45	12.50"	1.62"	4.06"	0.50"	8.312"	0.312"	0.469"	10.62"	12	1.00"	0.875"x6.5"	0.75"x4"	145
8"	49	15.00"	1.88"	4.62"	0.50"	10.625"	0.312"	0.469"	13.00"	12	1.12"	1"x7.25"	0.75"x4.5"	225
10"	53	17.50"	2.12"	4.88"	0.50"	12.75"	0.312"	0.469"	15.25"	16	1.25"	1.125"x8"	1"x5.5"	325
12"	57	20.50"	2.25"	5.38"	0.50"	15.00"	0.312"	0.469"	17.75"	16	1.38"	1.25"x8.5"	1"x5.5"	445
14"	61	23.00"	2.38"	5.88"	0.50"	16.50"	0.312"	0.469"	20.25"	20	1.38"	1.25"x9"	1"x5.5"	595
16"	65	25.50"	2.50"	6.00"	0.50"	18.50"	0.312"	0.469"	22.511"	20	1.50"	1.375"x9.25"	1"x5.5"	750
18"	69	28.00"	2.62"	6.50"	0.50"	21.00"	0.312"	0.469"	24.75"	24	1.50"	1.375"x9.5"	1"x6.5"	915
20"	73	30.50"	2.75"	6.62"	0.50"	23.00"	0.375"	0.531"	27.00"	24	1.62"	1.5"x10.25"	1"x6.5"	1,155

CLASS 600 DIMENSIONAL DATA (IN)

NOMINAL PIPE SIZE	A.P.I. RING #	Ø FLANGE	MIN. FLANGE TH. HUB	LENGTH TH. HUB	PRESSURE TAP HOLE SIZE	PITCH Ø RING & GROVE	GROVE DEPTH	GROVE WIDTH	Ø BOLT CIRCLE	NO. OF HOLES	SIZE OF HOLES	SIZE & LENGTH STUDS	SIZE & LENGTH JACKSCREW	WEIGHT/ UNION (LBS)
SIZE	R#	O	T	*L	H	P	E	F	BC	#Ø	Ø	S	J	WT
4"	37	10.75"	1.50"	4.00"	0.50"	5.875"	0.312"	0.469"	8.50"	8	1.00"	0.875"x6.5"	0.75"x4"	110
6"	45	14.00"	1.88"	4.62"	0.50"	8.312"	0.312"	0.469"	11.50"	12	1.12"	1"x7.5"	0.75"x4.5"	210
8"	49	16.50"	2.19"	5.25"	0.50"	10.625"	0.312"	0.469"	13.75"	12	1.25"	1.125"x8.25"	0.75"x5.5"	305
10"	53	20.00"	2.50"	6.00"	0.50"	12.75"	0.312"	0.469"	17.00"	16	1.38"	1.25"x9.25"	1"x5.5"	485
12"	57	22.00"	2.62"	6.12"	0.50"	15.00"	0.312"	0.469"	19.25"	20	1.38"	1.25"x9.5"	1"x5.5"	580
14"	61	23.75"	2.75"	6.50"	0.50"	15.00"	0.312"	0.469"	20.75"	20	1.50"	1.375"x10"	1"x6.5"	825
16"	65	25.50"	2.50"	6.00"	0.50"	18.5"	0.312"	0.469"	22.50"	20	1.50"	1.375"x9.25"	1"x5.5"	750
18"	69	28.00"	2.62"	6.50"	0.50"	21.00"	0.312"	0.469"	24.75"	24	1.50"	1.375"x9.5"	1"x6.5"	915
20"	73	30.50"	2.75"	6.62"	0.50"	23.00"	0.375"	0.531"	27.00"	24	1.62"	1.5"x10.25"	1"x6.5"	1,155

Refer to Class 300 for detailed rendering.

*Dimension does not include groove depth (E). Add dimension (E) to dimension (L) for overall hub length, see detail. **Dimension "B" to be specified by customer. Reference ASME B16.5 & B16.36 for material of construction, dimensions, pressure, temperature ratings and identification markings. Each orifice union comes complete with: (2) Jackscrews (2) 1/2" plugs. Customer to specify bore size (I.E. S/40). Weights are approximate.



Class 900, 1500 & 2500 Orifice Flanges

Ring Joint

+ CUSTOM SIZES AND RATINGS AVAILABLE UPON REQUEST

CLASS 900 DIMENSIONAL DATA (IN)

NOMINAL PIPE SIZE	A.P.I. RING #	Ø FLANGE	MIN. FLANGE TH. HUB	LENGTH THROUGH HUB	PRESSURE TAP HOLE SIZE	PITCH Ø RING & GROVE	GROVE DEPTH	GROVE WIDTH	Ø BOLT CIRCLE	NO. OF HOLES	SIZE OF HOLES	SIZE & LENGTH STUDS	SIZE & LENGTH JACKSCREW	WEIGHT/ UNION (LBS)
SIZE	R#	O	T	*L	H	P	E	F	BC	#Ø	Ø	S	J	WT
3"	31	9.50"	1.50"	4.00"	0.38"	4.875"	0.312"	0.469"	7.50"	8	1.00"	0.875"x6.5"	0.75"x4"	79
4"	37	11.50"	1.75"	4.50"	0.50"	5.875"	0.312"	0.469"	9.25"	8	1.25"	1.125"x7.5"	0.75"x4"	129
6"	45	15.00"	2.19"	5.50"	0.50"	8.312"	0.312"	0.469"	12.50"	12	1.25"	1.125"x8.25"	0.75"x4.5"	263
8"	49	18.50"	2.50"	6.38"	0.50"	10.625"	0.312"	0.469"	15.50"	12	1.50"	1.38"x9.5"	1"x5.5"	445
10"	53	21.50"	2.75"	7.25"	0.50"	12.75"	0.312"	0.469"	18.50"	16	1.50"	1.38"x10"	1"x5.5"	634
12"	57	24.00"	3.12"	7.88"	0.50"	15.00"	0.312"	0.469"	21.00"	20	1.50"	1.38"x10.75"	1"x5.5"	872

CLASS 1500 DIMENSIONAL DATA (IN)

NOMINAL PIPE SIZE	A.P.I. RING #	Ø FLANGE	MIN. FLANGE TH. HUB	LENGTH THROUGH HUB	PRESSURE TAP HOLE SIZE	PITCH Ø RING & GROVE	GROVE DEPTH	GROVE WIDTH	Ø BOLT CIRCLE	NO. OF HOLES	SIZE OF HOLES	SIZE & LENGTH STUDS	SIZE & LENGTH JACKSCREW	WEIGHT/ UNION (LBS)
SIZE	R#	O	T	*L	H	P	E	F	BC	#Ø	Ø	S	J	WT
1"	16	5.88"	1.50"	3.25"	0.25"	2.00"	0.25"	0.344"	4.00"	4	1.00"	0.875"x6.25"	0.625"x4"	26
1.5"	20	7.00"	1.50"	3.50"	0.25"	2.688"	0.25"	0.344"	4.88"	4	1.12"	1"x6.5"	0.625"x4"	45
2"	24	8.50"	1.50"	4.00"	0.25"	3.75"	0.312"	0.469"	6.50"	8	1.00"	0.875"x6.5"	0.625"x4"	65
2.5"	27	9.62"	1.62"	4.12"	0.25"	4.25"	0.312"	0.469"	7.50"	8	1.12"	1"x7"	0.625"x4"	98
3"	35	10.50"	1.88"	4.62"	0.38"	5.375"	0.312"	0.469"	8.00"	8	1.25"	1.125"x7.25"	0.75"x4"	123
4"	39	12.25"	2.12"	4.88"	0.50"	6.375"	0.312"	0.469"	9.50"	8	1.38"	1.25"x8.5"	0.75"x4.5"	182
6"	46	15.50"	3.25"	6.75"	0.50"	8.312"	0.375"	0.531"	12.50"	12	1.50"	1.375"x11"	0.75"x5.5"	407

CLASS 2500 DIMENSIONAL DATA (IN)

NOMINAL PIPE SIZE	A.P.I. RING #	Ø FLANGE	MIN. FLANGE TH. HUB	LENGTH THROUGH HUB	PRESSURE TAP HOLE SIZE	PITCH Ø RING & GROVE	GROVE DEPTH	GROVE WIDTH	Ø BOLT CIRCLE	NO. OF HOLES	SIZE OF HOLES	SIZE & LENGTH STUDS	SIZE & LENGTH JACKSCREW	WEIGHT/ UNION (LBS)
SIZE	R#	O	T	*L	H	P	E	F	BC	#Ø	Ø	S	J	WT
1"	18	6.25"	1.50"	3.62"	0.25"	2.375"	0.25"	0.344"	4.25"	4	1.00"	0.875"x6.25"	0.625"x4"	26
1.5"	23	8.00"	1.75"	4.38"	0.25"	3.25"	0.312"	0.469"	5.75"	4	1.25"	1.125"x7.5"	0.75"x4"	56
2"	26	9.25"	2.00"	5.00"	0.25"	4.00"	0.312"	0.469"	6.75"	4	1.12"	1"x7.75"	0.75"x4"	84
2.5"	28	10.50"	2.25"	5.62"	0.25"	4.375"	0.375"	0.531"	7.75"	8	1.25"	1.125"x8.5"	0.75"x4.5"	104
3"	32	12.00"	2.62"	6.62"	0.38"	5.00"	0.375"	0.531"	9.00"	8	1.38"	1.25"x9.5"	0.75"x5.5"	188

Refer to Class 300 for detailed rendering.

*Dimension does not include groove depth (E). Add dimension (E) to dimension (L) for overall hub length, see detail. **Dimension "B" to be specified by customer. Reference ASME B16.5 & B16.36 for material of construction, dimensions, pressure, temperature ratings and identification markings. Each orifice union comes complete with: (2) Jackscrews (2) 1/2" plugs. Customer to specify bore size (I.E. S/40). Weights are approximate.

Orifice Flanges

Instructions

TO REMOVE ORIFICE PLATE:

1. Loosen all studs and remove the top half of the studs.
2. Spread flanges apart by turning the jackbolts clockwise.
3. Remove orifice plate for inspection or replacement.

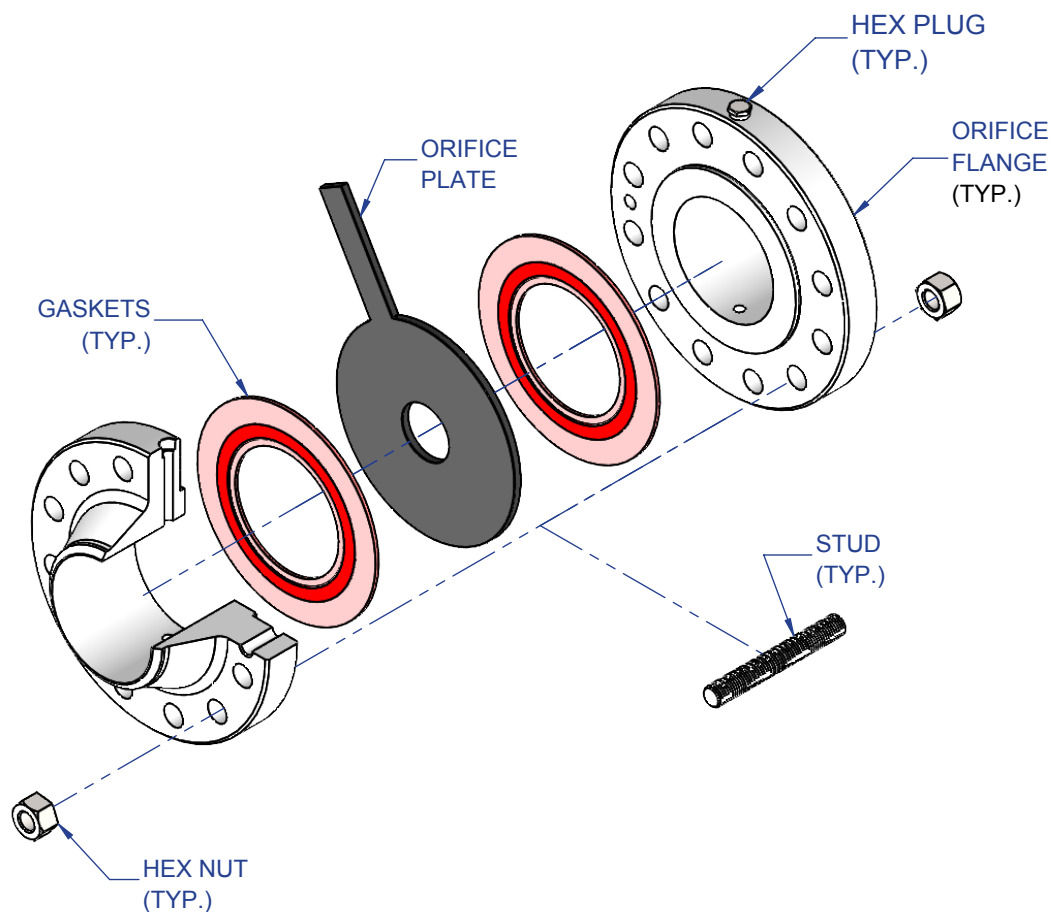
TO INSTALL ORIFICE PLATE:

1. Replace orifice plate and gaskets between flanges
2. Release the flanges by turning the two jackbolts counterclockwise.
3. Replace all studs.

WHEN INSTALLING ORIFICE PLATE:

1. Orifice bore must be centered within 3% of inside pipe diameter.
2. If bore is beveled, bevel must face downstream.
3. Pipe ends should be flush (within 1/4") with orifice plate
4. Inside diameter of gaskets* must not protrude beyond inside surface of pipe.
5. Orifice plate must be installed flat without distortion.
6. Tighten flange bolts evenly to prevent plate buckling.
7. On orifice flanges other than weld neck or corner tap, pressure tap holes must be drilled through the pipe. Holes must be free of burrs or other irregularities. Holes may be left square or rounded slightly.

*Gaskets should be replaced at each orifice plate inspection.



Corner Tap Unions

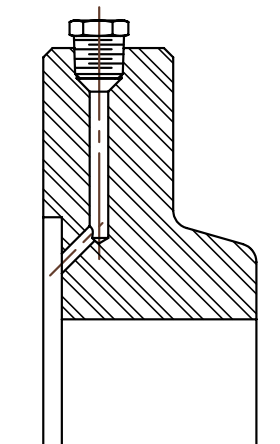
TO REMOVE ORIFICE PLATE:

- Recognized by ASME / AGA / ISA
- Dependable repeatability and accuracy
- Ideal for use in HVAC installations
- Recommended for smaller line sizes
- Available in 150# ANSI Rating
- No field drilling or tapping

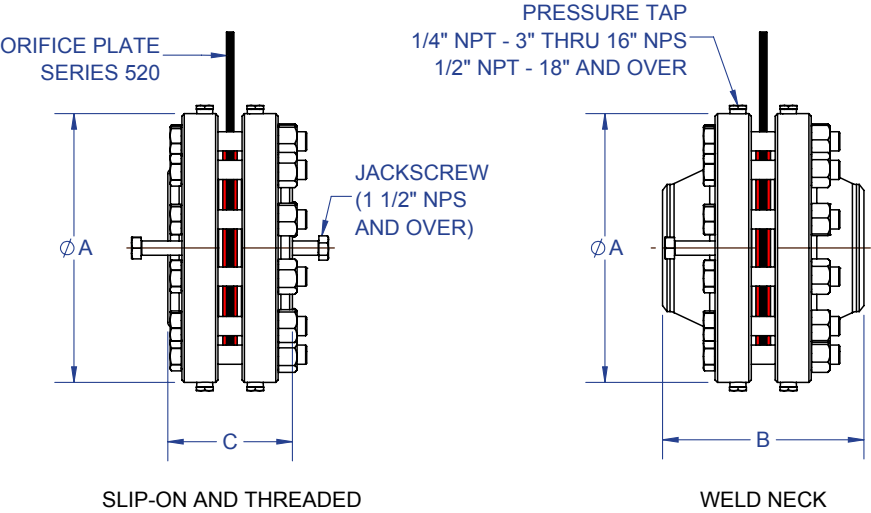
"Principals & Practices of Flow Meter Engineering" by L.K. Spink indicates that the corner tap style orifice flange is especially desirable in installation of 2" pipe size and smaller. This is because the corner tap design places the pressure signal point directly at the upstream and downstream face of the orifice plate. Other tap location (such as flange taps with fairly high beta ratios) place the downstream pressure signal point somewhere beyond the plane of the venacontracta, and in a highly turbulent region, therefore creating inaccuracy in flow measurement. The corner tap eliminates these problems in smaller sizes. Because corner taps are available in 150# ANSI rating, they are very economical in installations where #300 flange taps may not be necessary. This is desirable in HVAC installations where lighter weight piping is required.

The 45° exit pattern design makes the pressure tap

Corner hole less subject to clogging by impurities in the flow.



Corner Tap Unions



+ CUSTOM SIZES AND RATINGS AVAILABLE UPON REQUEST

150 LB

PIPE SIZE	A	B	C	MACHINE BOLTS		
				NO.	SIZE	LENGTH
3"	7.50"	5.625"	2.50"	4	0.625"	3.00"
3.5"	8.50"	5.75"	2.625"	8	0.625"	3.00"
4"	9.00"	6.125"	2.75"	8	0.625"	3.00"
5"	10.00"	7.125"	3.00"	8	0.75"	3.00"
6"	11.00"	7.125"	3.25"	8	0.75"	3.25"
8"	13.50"	8.125"	3.50"	8	0.75"	3.50"
10"	16.00"	8.125"	4.00"	12	0.875"	3.75"
12"	19.00"	9.125"	4.50"	12	0.875"	4.50"
14"	21.00"	10.125"	4.625"	12	1.00"	4.25"
16"	23.50"	10.125"	5.125"	16	1.00"	4.25"
18"	25.00"	11.25"	5.75"	16	1.125"	5.00"
20"	27.50"	11.625"	6.125"	20	1.125"	5.25"
24"	32.00"	12.25"	6.875"	20	1.25"	5.75"

300 LB

PIPE SIZE	A	B	C	MACHINE BOLTS		
				NO.	SIZE	LENGTH
3"	8.25"	6.375"	3.50"	8	0.75"	3.50"
3.5"	9.00"	6.50"	3.625"	8	0.75"	3.50"
4"	10.00"	6.875"	3.875"	8	0.75"	3.75"
5"	11.00"	7.875"	4.125"	8	0.75"	4.00"
6"	12.50"	7.875"	4.25"	12	0.75"	4.00"
8"	15.00"	8.875"	4.00"	12	0.875"	4.75"
10"	17.50"	9.375"	5.375"	16	1.00"	5.25"
12"	20.50"	10.375"	5.875"	16	1.125"	5.50"
14"	23.00"	11.375"	6.125"	20	1.125"	6.00"
16"	25.50"	11.625"	6.625"	20	1.25"	6.25"
18"	28.00"	12.75"	7.25"	24	1.25"	6.50"
20"	30.50"	13.00"	7.75"	24	1.25"	7.00"
24"	36.00"	13.5"	8.625"	24	1.50"	7.75"



Note: B & C dimensions do not include orifice plate thickness.

Orifice Flange Union Meter Tubes

Special care is taken to assure that each meter tube is manufactured to meet or exceed the recommendations of The American Gas Association (AGA), American Society of Mechanical Engineers (ASME), API/ANSI MPMS chapter 14.3, and GPA (Gas Processors Association) 8185-90. Each meter tube is individually inspected at various production points to assure adherence to quality standards. Each weld is made by code certified welders and then ground and polished smooth. Pipe and tubing are carefully inspected before purchase to guarantee quality.

TYPICAL METER TUBE CONFIGURATION:

PIPE: Commercially A-106 GRADE B SMLS

FLANGES: 300# Raised Face Weldneck Orifice

OUTER ENDS: Beveled for welding

INSPECTION: Micrometer charts

HARDWARE: 1/16" non-asbestos or spiral
wound gaskets, B-7 studs, jackscrews, plugs

COUPLINGS: None (specified by customer)

ORIFICE PLATE: Sold Separately

OPTIONS:

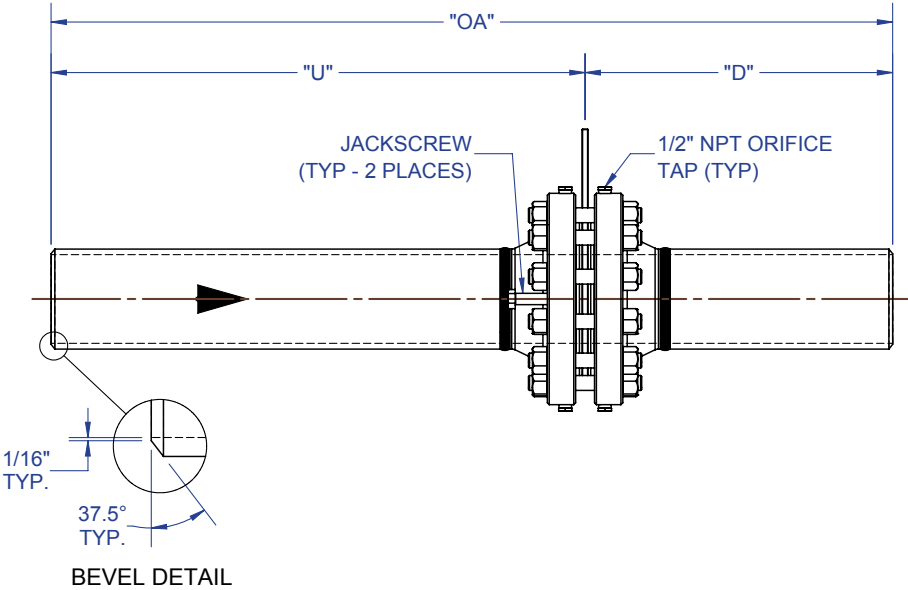
PIPE: Stainless steel, monel, hastelloy, nickel & others

OUTER ENDS: Flanged, threaded, or socketweld

STRAIGHTENING VANES: Line and flanged type

INSPECTION: Hydrostatic and all other NDE testing

Orifice Flange Meter Tube Assembly



+ CUSTOM SIZES AND RATINGS AVAILABLE UPON REQUEST

PIPE SIZE	TYPICAL APPLICATION			PIPE I.D.	
	"U"	"D"	"OA"	SCH. 40	SCH. 80
2"	5'-0"	3'-0"	8'-0"	2.067"	1.939"
3"	6'-0"	4'-0"	10'-0"	3.068"	2.900"
4"	8'-0"	4'-0"	12'-0"	4.026"	3.826"
6"	12'-0"	5'-0"	17'-0"	6.065"	5.761"
8"	15'-0"	5'-0"	20'-0"	7.981"	7.625"
10"	19'-0"	6'-0"	25'-0"	10.020"	9.564"
12"	21'-0"	7'-0"	28'-0"	11.938"	11.376"

Lengths above are Aitken standard lengths. Customer to advise length required to meet applicable code.

When ordering, please specify:

1. Line size
2. Flange rating and type
3. Pipe I.D.
4. Ends (Beveled, Flanged, Threaded, Other)
5. Inspection and testing requirements
6. Pipe length



Flow Nozzles

SERVICE:

Recommended for steam and water service.
Also suitable for other gases and liquids.

***ACCURACY:**

Uncalibrated accuracy of two percent.
Calibrated accuracy of one quarter percent.

DESIGN:

Each flow nozzle is manufactured in strict accordance with recommendations set forth in the ASME Fluid Meters Handbook and ASME piping design codes. Each flow nozzle is computer designed for optimum accuracy and performance.

FABRICATION:

Welding is accomplished by code certified welders in conformance with ASME Boiler and Pressure Vessel Codes.

MATERIALS:

In order to assure a highly polished transition and throat section, it is recommended that stainless steel be used. Upon special request, nozzles can be made out of virtually any material.

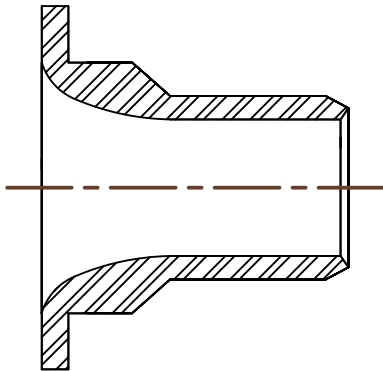
ADVANTAGES:

1. Flow capacity is 60% greater for flow nozzles than that of an orifice plate with same beta ratio.
2. Flow nozzles have a less damming effect on solids or foreign matter in the flow stream than an orifice plate.
3. Nozzles sustain accuracy and wear qualities over a longer period of time than the orifice plate.

*It is recommended that the buyer purchase the complete flow section from the same manufacturer to assure stated accuracy.

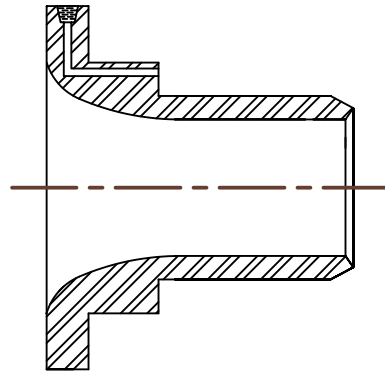
Flow Nozzles Types

Flanged Flow
Tapped Type Flanged Flow
Weld-In Flow
Holding Ring



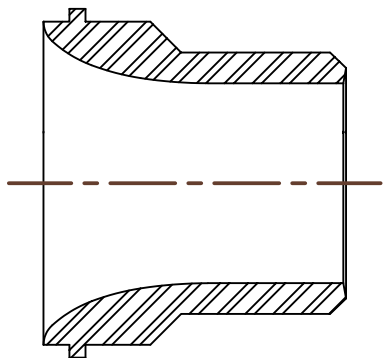
FLANGED FLOW NOZZLE

The most commonly used flow nozzle. It is designed to be inserted between pipe flanges. A specially machined shoulder on the back side of the nozzle assures the proper alignment of the nozzle with the pipe inside diameter. This style flow nozzle utilizes pipe wall taps.



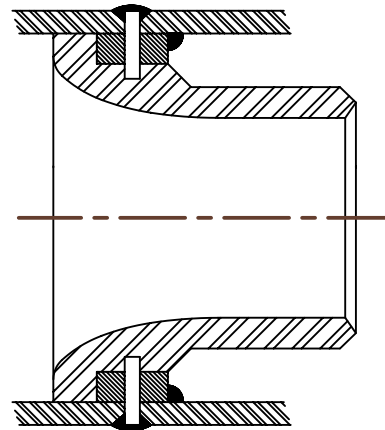
TAPPED TYPE FLANGED FLOW NOZZLE

Basically the same as the "flange" style. A downstream tap, usually a 1/2" connection, is provided in the flange of the nozzle. This style nozzle is recommended in smaller line sizes where the downstream tap usually interferes with the pipe weld or downstream holding flange.



WELD-IN FLOW NOZZLE

Designed to be installed permanently in a pipe section. This nozzle has a specially machined step on the outside diameter, that is used to align a beveled inlet and outlet bored pipe section. This type of nozzle is widely used where high temperature and pressure applications prohibit the use of pipe flanges such as in power plants and feed water installations. Pipe wall taps are utilized with this style nozzle.



HOLDING RING FLOW NOZZLE

Designed so that the welding of dissimilar materials is eliminated. The holding ring and locating pins are made of the same material as the pipe in which the nozzle is to be installed. This allows the nozzle to be offered in a wide range of materials. This style is not recommended for line sizes below 4 inches.

Order Entry Form

+ Attach appropriate completed Bore Calculation Data Sheet.

NOZZLE TYPE

☐ Flanged (Std) ☐ Flanged (Tap) ☐ Throat-Tap ☐ Weld-In ☐ Holding-Ring

FLOW NOZZLE PIPE SECTION

Manufacturing & Design Code: ☐ B31.3 ☐ B31.8
 ☐ ASME Section VIII, Div. I, "U" Stamp ☐ Other: _____

Design Temp.: _____ °F Design Pressure: _____ PSIG Corrosion Allowance: _____

Pressure Tap Connection: _____

Outer End Prep: ☐ Beveled ☐ Other _____

Surface Prep: ☐ Sand Blast ☐ Shop Primer ☐ Other _____

MATERIAL SPECIFICATIONS

Nozzle: _____ Pipe: _____

Flow Nozzles & Flow Nozzle Sections

SERVICE:

Recommended for steam and water service.
Also suitable for other gases and liquids.

***ACCURACY:**

Uncalibrated accuracy of 2%. Calibrated accuracy of 1/4%.

DESIGN:

Each flow nozzle and flow nozzle section is manufactured in strict accordance with recommendations set forth in the ASME Fluid Meters Handbook, ASME MFC-3M-1989 and ASME piping design codes. Each flow nozzle and nozzle section is computer designed for optimum accuracy and performance.

FABRICATION:

Welding is accomplished by code certified welders in conformance with ASME Boiler and Pressure Vessel Codes.

MATERIALS:

In order to assure a highly polished transition and throat section, it is recommended that stainless steel be used. Upon special request, nozzles can be made out of virtually any material.

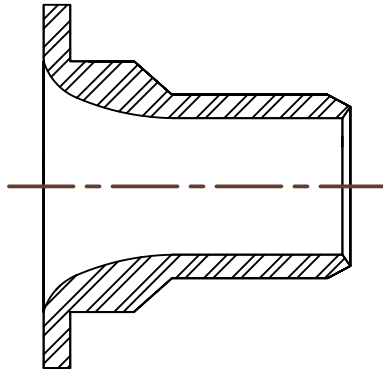
ADVANTAGES:

1. Flow capacity is 60% greater for flow nozzles, compared to an orifice plate with same beta ratio.
2. Flow nozzles have less damming effect of solids or foreign matter in the flow stream than the orifice plate.
3. Nozzles sustain accuracy and wear qualities over a longer period of time than the orifice plate.

*It is recommended that the buyer purchase the complete flow section from the same manufacturer to assure stated accuracy.

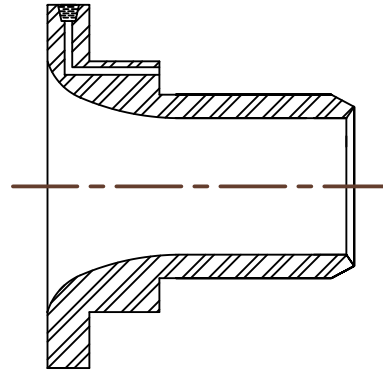
Flow Nozzle Types

Flanged Flow
Tapped Type Flanged Flow
Weld-In Flow
Holding Ring



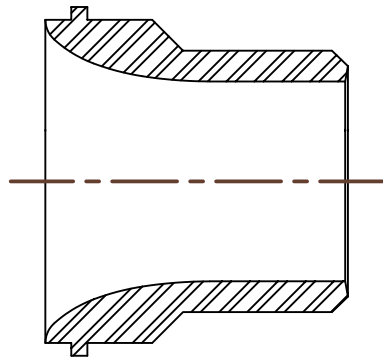
FLANGED FLOW NOZZLE

The most commonly used flow nozzle. It is designed to be inserted between pipe flanges. A specially machined shoulder on the back side of the nozzle assures the proper alignment of the nozzle with the pipe inside diameter. This style flow nozzle utilizes pipe wall taps.



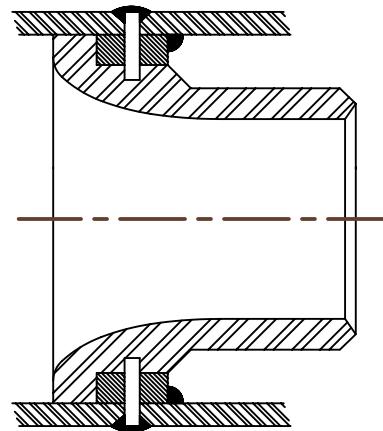
TAPPED TYPE FLANGED FLOW NOZZLE

Basically the same as the "flange" style. A downstream tap, usually a 1/2" connection, is provided in the flange of the nozzle. This style nozzle is recommended in smaller line sizes where the downstream tap usually interferes with the pipe weld or downstream holding flange.



WELD-IN FLOW NOZZLE

Designed to be installed permanently in a pipe section. This nozzle has a specially machined step on the outside diameter, that is used to align a beveled inlet and outlet bored pipe section. This type of nozzle is widely used where high temperature and pressure applications prohibit the use of pipe flanges such as in power plants and feed water installations. Pipe wall taps are utilized with this style nozzle.



HOLDING RING FLOW NOZZLE

Designed so that the welding of dissimilar materials is eliminated. The holding ring and locating pins are made of the same material as the pipe in which the nozzle is to be installed. This allows the nozzle to be offered in a wide range of materials. This style is not recommended for line sizes below 4 inches.

Flow Nozzle Meter Tubes

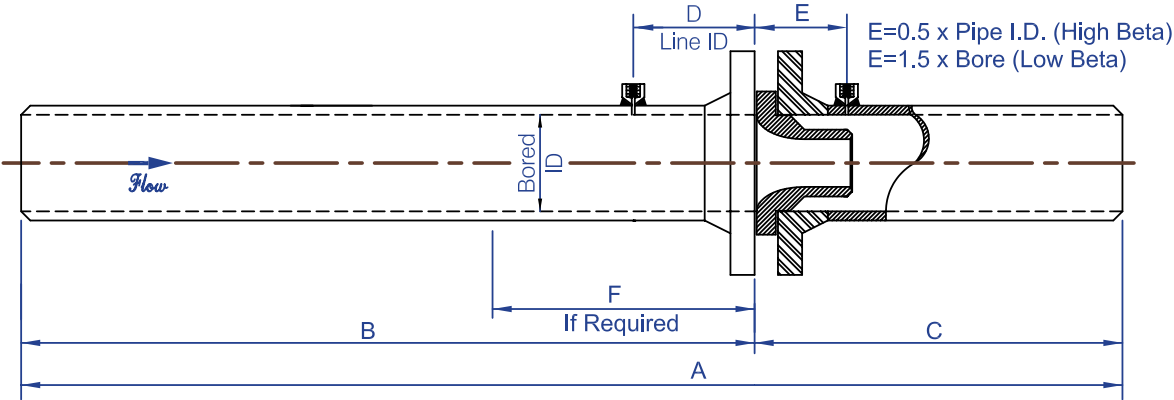
DIMENSIONAL DATA

PIPE SIZE	PIPE	SCHEDULE	BORED ID	A	B	C	F	WT
4"	40	4.026"	4.065"	6'-8"	5'-0"	1'-8"	1'-4"	87
	80	3.826"	4.026"					112
	120	3.624"	3.697"					127
	160	3.438"	3.514"					148
5"	40	5.047"	5.089"	8'-4"	6'-3"	2'-1"	1'-8"	162
	80	4.813"	4.874"					188
	120	4.563"	4.626"					238
	160	4.313"	4.408"					285
6"	40	6.065"	6.111"	10'-0"	7'-6"	2'-6"	2'-0"	244
	80	5.761"	5.805"					330
	120	5.501"	5.577"					410
	160	5.187"	5.304"					500
8"	40	7.981"	8.033"	13'-4"	10'-0"	3'-4"	2'-8"	450
	80	7.625"	7.681"					618
	120	7.187"	7.299"					846
	160	6.813"	6.97"					1,025
10"	40	10.02"	10.081"	16'-8"	12'-6"	4'-2"	3'-4"	750
	80	9.562"	9.638"					1,108
	120	9.062"	9.201"					1,500
	160	8.5"	8.707"					1,929
12"	40	11.938"	12.004"	20'-0"	15'-0"	5'-0"	4'-0"	1,100
	80	11.374"	11.467"					1,879
	120	10.75"	10.919"					2,609
	160	10.126"	10.373"					3,308
14"	40	13.124"	13.197"	23'-4"	17'-6"	5'-10"	4'-8"	1,618
	80	12.5"	12.603"					2,580
	120	11.812"	12.003"					3,575
	160	11.188"	11.455"					4,450
16"	40	15"	15.25"	26'-8"	20'-0"	6'-8"	5'-4"	2,392
	80	14.312"	14.435"					3,789
	120	13.562"	13.778"					5,240
	160	12.812"	13.122"					6,610
18"	40	16.876"	17"	30'-0"	22'-6"	7'-6"	6'-0"	3,419
	80	16.124"	16.265"					5,399
	120	15.25"	15.499"					7,563
	160	14.438"	14.788"					9,495
20"	40	18.812"	19"	33'-4"	25'-0"	8'-4"	6'-8"	4,365
	80	17.938"	18.095"					7,203
	120	17"	17.274"					10,043
	160	16.062"	16.455"					12,782
24"	40	22.624"	22.876"	40'-0"	30'-0"	10'-0"	8'-0"	7,248
	80	21.562"	21.762"					12,206
	120	20.376"	20.723"					17,526
	160	19.312"	19.794"					21,950

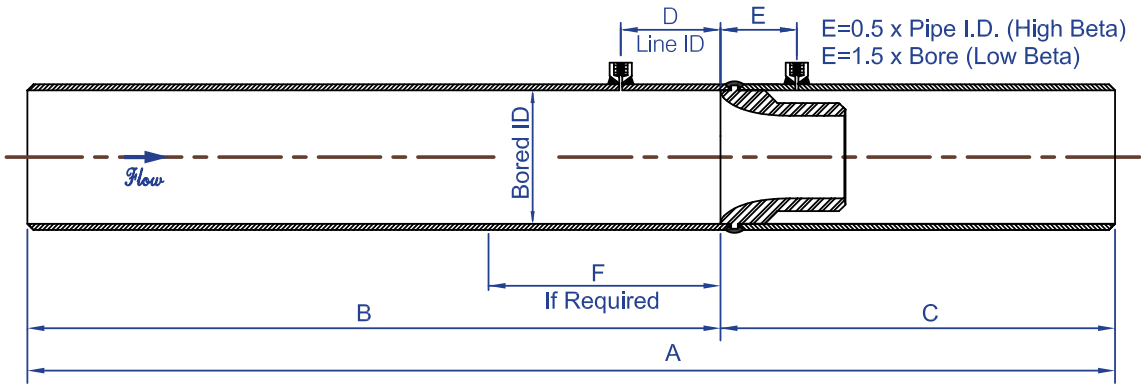
General Notes

1. Dimensions shown are based on Figure A & 0.7 Beta Ratio from ASME Fluid Meters Handbook.
2. Boring of dimension "F" is required on holding ring type nozzle section.
3. Pipe boring (Dimension F) is required if pipe is out of round by more than 0.33% of average pipe ID or if pipe surface does not maintain a 300 Micro-Inch Finish.
4. Nozzle sections are manufactured in strict accordance with Fluid Meters Handbook and ASME Piping Design Codes.
5. Dimensions are approximate and subject to change.
6. Weights are based on weld-in style flow nozzles and beveled ends.

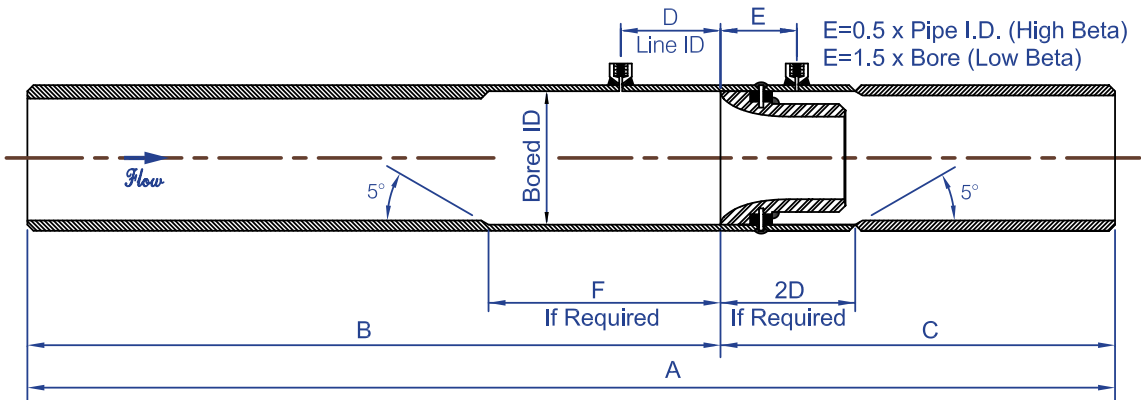
Flow Nozzle Sections



FLANGED FLOW NOZZLE



WELD-IN FLOW NOZZLE



HOLDING PIN FLOW NOZZLE

Classical Venturis

DESIGN:

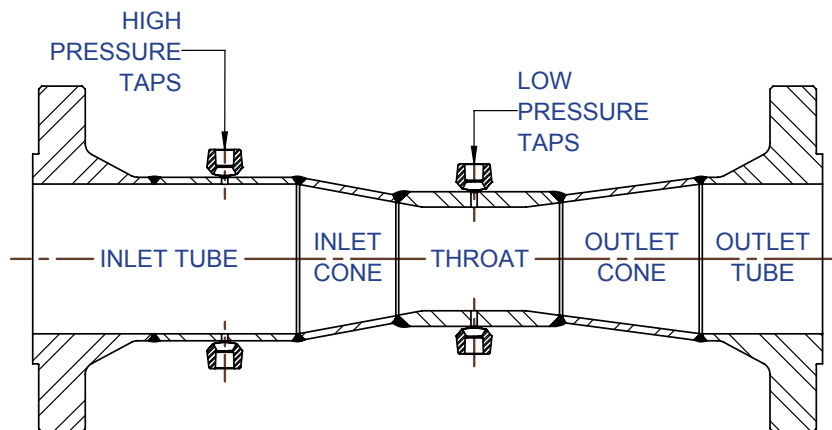
The Classical Style Venturi Tube consists of (1) a straight inlet section of the same diameter as the pipe and in which the high pressure tap is located; (2) a converging conical inlet section in which the cross section of the stream decreases and the velocity increases with a consequent increase of velocity head and decrease of pressure head; (3) a cylindrical throat which provides for the low pressure tap location of this decreased pressure in an area where flow velocity is neither increasing nor decreasing; and (4) a divergent recovery cone in which velocity decreases and the decreased velocity head is recovered as a pressure head.

ACCURACY:

The classical venturi is designed to have an uncalibrated inaccuracy of $\pm 1 - 2\%$ of actual flow. Accuracy of $\pm 0.25\%$ can be obtained when the venturi is calibrated at a recognized hydraulics laboratory.

ASME TYPICAL SPECIFICATIONS:

- The Primary Element shall produce a differential, which is proportional to the square of the flow rate through the device, utilizing static pressure sensed at the inlet tap and the throat tap.
- Shall be fabricated in accordance with the appropriate ASME Piping Code, ASME MFC-3M-2019 and ASME Fluid Meters, 6TH Edition. The inlet section shall consist of a straight pipe of like diameter to the preceding line pipe, and an entrance cone with an ASME specified 21-degree angle of convergence. The throat shall be a straight cylindrical section of at least 0.5 times the throat diameter. The outlet section shall be an exit cone with ASME specified 15-degree angle of divergence for Short Form applications and 7-degree angle for Long Form applications.
- Shall be furnished with four pressure sensing taps: two in the straight inlet pipe section (upstream tap) and two in the throat section (downstream tap). There shall be no annular chambers or slots within the primary element.
- Shall have a discharge coefficient that is constant over the normal range of flow, independent of Beta Ratio or line size.
- Shall have an uncalibrated accuracy of $\pm 1-1/2\%$ of actual flow for the range specified for fabricated venturis and 1% for machined venturis.



Venturi Tubes

Classical & Modified

MODEL NUMBER FOR CLASSICAL & MODIFIED VENTURI TUBES

Typical Number: 10 - CVT - RF 30 - F 1

Line Size	01" to 96"	←
	CVT (Classical Venturi Tube)	←
RF	Raised Face Flange Both Ends	
RJ	Ring Type Joint Flange Both Ends	
W	Beveled For Welding Both Ends	
*PSRF	Pipe, Shell, RF Flanged Both Ends	←
*PSRJ	Pipe, Shell, RJ Flanged Both Ends	
*PSW	Pipe, Shell, Beveled Both Ends for Welding	
O	Other (Special)	

OO	Unrated	
15	150 ANSI Rated	
30	300 ANSI Rated	
60	600 ANSI Rated	←
90	900 ANSI Rated	
150	1500 ANSI Rated	
250	2500 ANSI Rated	

**M	Machined Convergent	
F	Fabricated Convergent	←
***Z	Machined Venturi	

1	Carbon Steel Body / 304SS Throat	
2	Carbon Steel Body / 316SS Throat	
3	304SS Body / 304SS Throat	
4	316SS Body / 316SS Throat	
5	Fiberglass Reinforced Plastic (Standard)	←
6	Fiberglass Reinforced Plastic (High Temperature)	
7	Fiberglass Reinforced Plastic / 304SS Throat	
8	Others (Special)	

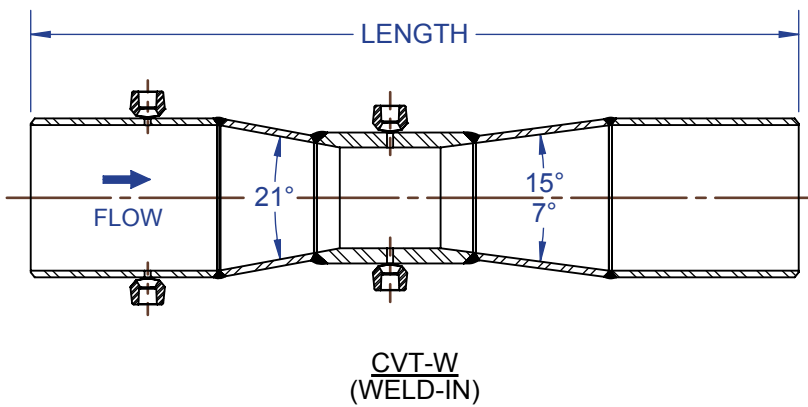
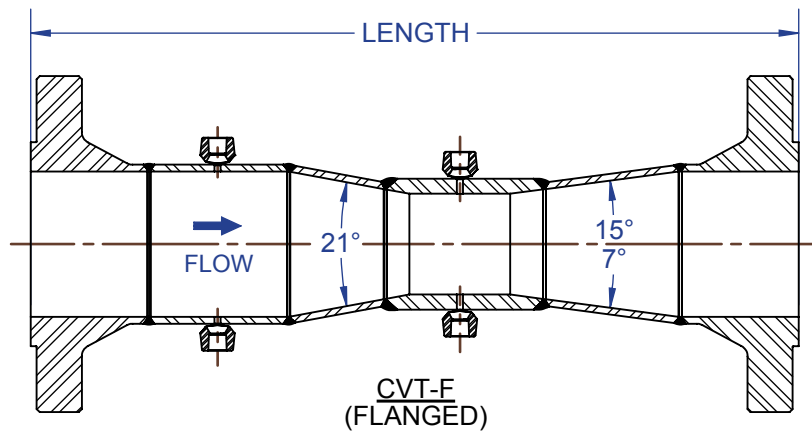
*Available in line sizes 8" and larger (for high pressure, high temperature service).

**Available in line sizes 2 1/2" through 6".

***Standard for 2" and below.



Types of Venturis



1. Lengths are based on slip-on flanges.
2. Lengths and weights are based on Std. Wt. pipe.
3. This data is for estimating only and subject to change without notice.

Straightening Vanes

Carbon Steel

+ CUSTOM SIZES AND RATINGS AVAILABLE UPON REQUEST

DIMENSIONAL DATA

LINE SIZE	BETA RATIO	LENGTH (IN)		WT (LBS)		
		CVT-F	CVT-W	CVT-W	CVT-F15	CVT-F30
4"	0.35	24"	24"	22	48	65
4"	0.55	20"	20"	20	45	62
4"	0.7	16"	16"	16	30	35
6"	0.35	34"	37"	55	113	133
6"	0.55	27"	30"	52	110	130
6"	0.7	22"	25"	50	108	128
8"	0.35	45"	48"	100	160	216
8"	0.55	36"	40"	85	145	201
8"	0.7	29"	33"	78	138	194
10"	0.35	56"	60"	160	246	322
10"	0.55	45"	50"	135	221	297
10"	0.7	37"	42"	115	201	277
12"	0.35	67"	73"	278	406	508
12"	0.55	54"	60"	226	354	456
12"	0.7	44"	50"	185	313	415
14"	0.35	74"	80"	346	516	674
14"	0.55	60"	66"	295	465	623
14"	0.7	49"	55"	250	420	528
16"	0.35	86"	92"	438	624	878
16"	0.55	70"	76"	394	580	834
16"	0.7	57"	63"	358	544	798

DIMENSIONAL DATA continued

LINE SIZE	BETA RATIO	LENGTH (IN)		WT (LBS)		
		CVT-F	CVT-W	CVT-W	CVT-F15	CVT-F30
18"	0.35	98"	106"	565	805	1,125
18"	0.55	78"	86"	445	685	1,005
18"	0.7	64"	72"	390	630	905
20"	0.35	108"	118"	734	1,044	1,384
20"	0.55	86"	96"	630	940	1,280
20"	0.7	72"	82"	536	846	1,186
24"	0.35	130"	142"	958	1,378	1,938
24"	0.55	104"	116"	820	1,240	1,800
24"	0.7	86"	98"	706	1,126	1,686
30"	0.35	164"	180"	1,660	O.A.	O.A.
30"	0.55	132"	147"	1,415	O.A.	O.A.
30"	0.7	107"	122"	1,245	O.A.	O.A.
36"	0.35	197"	215"	2,418	O.A.	O.A.
36"	0.55	158"	176"	2,080	O.A.	O.A.
36"	0.7	130"	148"	1,810	O.A.	O.A.
42"	0.35	222"	240"	3,318	O.A.	O.A.
42"	0.55	186"	204"	2,820	O.A.	O.A.
42"	0.7	150"	168"	2,341	O.A.	O.A.
48"	0.35	264"	288"	4,510	O.A.	O.A.
48"	0.55	212"	236"	4,510	O.A.	O.A.
48"	0.7	174"	198"	3,108	O.A.	O.A.



REFERENCE INFO

Standard English Conversion Tables

LENGTH

CONVERT FROM	CONVERT TO	MULTIPLY BY
Inches	Feet	0.083
Inches	Yards	0.028
Feet	Inches	12
Feet	Yards	0.333
Feet	Miles	0.000
Yards	Feet	3
Yards	Miles	0.001

AREA

CONVERT FROM	CONVERT TO	MULTIPLY BY
Sq inches	Sq feet	0.007
Sq inches	Sq yards	0.001
Sq feet	Sq inches	144
Sq feet	Sq yards	0.111
Sq yards	Sq inches	1,296
Sq yards	Sq feet	9
Sq yards	Acres	0.000
Acres	Sq feet	43,560

VOLUME

CONVERT FROM	CONVERT TO	MULTIPLY BY
Cu inches	Cu feet	0.001
Cu inches	Cu yards	0.000
Cu inches	US gal	0.004
Cu feet	Cu inches	1,728
Cu feet	Cu yards	0.037
Cu feet	US gal	7.481
Cu yards	Cu inches	46,656
Cu yards	Cu feet	27

WEIGHT

CONVERT FROM	CONVERT TO	MULTIPLY BY
Grains	Ounces	0.002
Ounces	Grains	437.5
Ounces	Pounds	0.063
Pounds	Ounces	16
Pounds	US tons	0.001
Pounds	Longtons	0.000
US tons	Pounds	2,000
Long tons	Pounds	2,240

SHEET INFORMATION

GAUGE	THICKNESS (IN)	WT/SQFT (LBS)
10	0.135	5.625
11	0.120	5
12	0.105	4.375
14	0.075	3
16	0.060	2.5
18	0.048	2
20	0.036	2
22	0.030	1
24	0.024	1

STEEL PLATE WEIGHT

THICKNESS (IN)	WT/SQFT (LBS)
3/16	7.66
1/4	10.21
5/16	12.76
3/8	15.32
1/2	20.42
5/8	25.53
3/4	30.63
7/8	35.74
1	40.84

DRILL SIZE FOR PIPE TAPS

NOMINAL PIPE SZ (IN)	TAP DRILL SZ (IN)	DECIMAL EQUIVALENT	NO OF THREADS PER IN	THREAD ENGAGEMENT
1/8	11/32	0.344	27	1/4
1/4	7/16	0.438	18	3/8
3/8	37/64	0.578	18	3/8
1/2	23/32	0.719	14	1/2
3/4	59/64	0.922	14	9/16
1	1 5/32	1.156	11.5	11/16
1 1/4	1 1/2	1.5	11.5	11/16
1 1/2	1 47/64	1.734	11.5	11/16



Standard English Conversion Tables

CONVERSION OF LIQUID MEASURES AND WEIGHTS

TO CONVERT → CONVERT FROM ↓	US GALLON	IMPERIAL GALLON	US PINT	US LB *H ₂ O	US CUBIC FT	US CUBIC IN	LITER	CUBIC METER
U.S. gallon	1	0.833	8	8.337	0.134	231	3.785	0.004
Imperial gallon	1.201	1	9.608	10	0.161	277.42	4.546	0.005
U.S. pint	0.125	0.104	1	1.042	0.017	28.875	0.473	0.000
U.S. pound *H ₂ O	0.120	0.1	0.960	1	0.016	27.708	0.454	0.000
U.S. cubic foot	7.481	6.229	59.844	62.365	1	1728	28.317	0.028
U.S. cubic inch	0.004	0.004	0.035	0.036	0.001	1	0.016	0.000
Liter	0.264	0.220	2.113	2.202	0.035	61.025	1	0.001
Cubic meter	264.17	219.969	2113.34	2202	35.314	61023.38	999.972	1

Water (H₂O) @ 60°F (15.6°C) / 1 Barrel = 42 Gallons (Petroleum measure)

CONVERSIONS OF PRESSURE AND HEAD

TO CONVERT → CONVERT FROM ↓	LB/IN ²	LB/FT ²	KG/CM ²	KG/M ²	IN *H ₂ O	FT *H ₂ O	IN **MERCURY	MM **MERCURY	†BAR	†MPA
Lb/In ²	1	144	0.070	703.07	27.728	2.311	2.306	51.715	0.069	0.007
Lb/Ft ²	0.007	1	0.000	4.882	0.193	0.016	0.014	0.359	0.000	0.000
kg/cm ²	14.223	2048.155	1	10000	394.38	32.865	28.959	735.559	0.981	0.098
kg/m ²	0.001	0.205	0.000	1	0.039	0.003	0.003	0.074	0.000	0.000
In. *H ₂ O	0.036	5.197	0.003	25.375	1	0.083	0.073	1.865	0.002	0.000
Ft. *H ₂ O	0.433	62.321	0.030	304.275	12	1	0.881	22.381	0.030	0.003
In. **Mercury	0.491	70.726	0.035	345.316	13.619	1.135	1	25.400	0.034	0.003
Mm **Mercury	0.019	2.785	0.001	13.595	0.536	0.045	0.039	1	0.001	0.000
†Bar	14.504	2088.55	1.020	10197.2	402.156	33.513	29.53	750.062	1	0.1
†Mpa	145.038	20885.5	10.197	101972	4021.56	335.13	295.3	7500.62	10	1

Water (H₂O) @ 68°F (20°C) / **Mercury @ 32°F (0°C) / †Mpa (megapascal) = 10 Bar

CONVERSION OF FLOW RATES

TO CONVERT → CONVERT FROM ↓	US GAL/MIN	IMP GAL/MIN	US MILLION GAL/DAY	CU FT/SEC (SEC-FT)	CU METERS / HOUR	LITERS / SEC	BARRELS (42 GAL/MIN)	BARRELS (42 GAL/DAY)
U.S. gal/min	1	0.833	0.001	0.002	0.227	0.063	0.024	34.286
Imp gal/min	1.201	1	0.002	0.003	0.273	0.076	0.029	41.176
US Million gal/day	694.4	578.25	1	1.547	157.7	43.8	16.53	23810
Cu ft/sec	448.83	373.7	0.646	1	101.9	28.32	10.686	15388
Cu m/sec	15852	13200	22.83	3535	3600	1000	377.4	-
Cu m/min	264.2	220	0.380	0.589	60	16.667	6.29	9058
Cu m/hr	4.403	3.67	0.006	0.009	1	0.278	0.105	151
Liters/sec	15.85	13.2	0.023	0.035	3.6	1	0.377	543.3
Liters/min	0.264	0.22	0.000	0.001	0.06	0.017	0.006	9.058
Barrels (42 gal)/min	42	34.97	0.061	0.094	9.538	2.65	1	1440
Barrels (42 gal)/day	0.029	0.024	0.000	0.000	0.007	0.002	0.001	1

To use above conversion charts, locate the unit to be converted in the left hand column. Then follow the conversion factors across the row for the desired conversion unit. Use this factor to multiply with your numerical value to convert. Example: Convert 5 psi to inches of water. From the Conversion of Pressure and Head Chart, 5 (psi) x 27.7276 (Conversion factor) = 138.638 inches of water.

SI Units and Conversion Tables

LENGTH

CONVERT FROM	CONVERT TO	SI SYMBOL	MULTIPLY BY
Feet	Meter	m	0.030
Inch	Millimeter	mm	25.4
Microinches	Micrometer	μm	0.025
Statute miles	Kilometer	km	1.609

VOLUME

CONVERT FROM	CONVERT TO	SI SYMBOL	MULTIPLY BY
Cu inches	Cu millimeter	mm ³	16387
Cu inches	Cu centimeter	cm ³	16.387
Cu inches	Cu meter	m ³	0.000
Cu feet	Cu meter	m ³	0.028
Fluid ounce	Milliliter	mL	29.57
Quarts (US)	Liter	L	0.946
Gallons (US)	Liter	L	3.785

PRESSURE

CONVERT FROM	CONVERT TO	SI SYMBOL	MULTIPLY BY
lbs/in ²	Pascal	Pa	6,895
lbs/in ²	Kilopascal	kPa	6.895
lbs/in ²	Megapascal	MPa	0.007
lbs/in ²	Bar	Bar	0.069
Bar	Kilopascal	kPa	100
Millibar	Pascal	Pa	100

AREA

CONVERT FROM	CONVERT TO	SI SYMBOL	MULTIPLY BY
Sq inches	Sq millimeter	mm ²	645.163
Sq inches	Sq centimeter	cm ²	6.452
Sq inches	Sq meter	m ²	0.001
Sq feet	Sq meter	m ²	0.093
Acres	Hectare	ha	0.405

MASS

CONVERT FROM	CONVERT TO	SI SYMBOL	MULTIPLY BY
Pounds	Kilogram	kg	0.454
Ton (short)	Metric ton	t	0.907
Ton (long)	Metric ton	t	1.016

VELOCITY

CONVERT FROM	CONVERT TO	SI SYMBOL	MULTIPLY BY
Feet/Second	Meter/Second	m/s	0.305
Feet/Second	cm/sec	cm/sec	30.48
Feet/Minute	Meter/Second	m/s	0.005
Miles/Hour	Kilometer/Hour	km/h	1.609

Conversion Temperature Tables

CONVERSION TEMPERATURE TABLE

°C		°F	°C		°F	°C		°F	°C		°F	°C		°F
-73.3	-100	-148	-3.3	26	78.8	21.1	70	158	110	230	446	354	670	1238
-67.8	-90	-130	-2.8	27	80.6	21.7	71	159.8	115	240	464	360	680	1256
-62.2	-80	-112	-2.2	28	82.4	22.2	72	161.6	121	250	482	365	690	1274
-59.5	-75	-103	-1.7	29	84.2	22.8	73	163.4	127	260	500	371	700	1292
-56.7	-70	-94	-1.1	30	86	23.3	74	165.2	132	270	518	376	710	1310
-53.9	-65	-85	-0.6	31	87.8	23.9	75	167	138	280	536	382	720	1328
-51.1	-60	-76	0	32	89.6	24.4	76	168.8	143	290	554	387	730	1346
-48.4	-55	-67	0.6	33	91.4	25	77	170.6	149	300	572	393	740	1364
-45.6	-50	-58	1.1	34	93.2	25.6	78	172.4	154	310	590	399	750	1382
-42.8	-45	-49	1.7	35	95	26.1	79	174.2	160	320	608	404	760	1400
-40	-40	-40	2.2	36	96.8	26.7	80	176	165	330	626	410	770	1418
-37.2	-35	-31	2.8	37	98.6	27.2	81	177.8	171	340	644	415	780	1436
-34.4	-30	-22	3.3	38	100.4	27.8	82	179.6	177	350	662	421	790	1454
-31.6	-25	-13	3.9	39	102.4	28.3	83	181.4	182	360	680	426	800	1472
-28.8	-20	-4	4.4	40	104	28.9	84	183.2	188	370	698	432	810	1490
-26.1	-15	5	5	41	105.8	29.4	85	185	193	380	716	438	820	1508
-23.3	-10	14	5.6	42	107.6	30	86	186.8	199	390	734	443	830	1526
-20.6	-5	23	6.1	43	109.4	30.6	87	188.6	204	400	752	449	840	1544
-17.8	0	32	6.7	44	111.2	31.1	88	190.4	210	410	770	454	850	1562
-17.2	1	33.8	7.2	45	113	31.7	89	192.2	215	420	788	460	860	1580
-16.7	2	35.6	7.8	46	114.8	32.2	90	194	221	430	806	465	870	1598
-16.1	3	37.4	8.3	47	116.6	32.8	91	195.8	226	440	824	471	880	1616
-15.6	4	39.2	8.9	48	118.4	33.3	92	197.6	232	450	842	476	890	1634
-15	5	41	9.4	49	120.2	33.9	93	199.4	238	460	860	482	900	1652
-14.4	6	42.8	10	50	122	34.4	94	201.2	243	470	878	487	910	1670
-13.9	7	44.6	10.6	51	123.8	35	95	203	249	480	896	493	920	1688
-13.3	8	46.4	11.1	52	125.6	35.6	96	204.8	254	490	914	498	930	1706
-12.8	9	48.2	11.7	53	127.4	36.1	97	206.6	260	500	932	504	940	1724
-12.2	10	50	12.2	54	129.2	36.7	98	208.4	265	510	950	510	950	1742
-11.7	11	51.8	12.8	55	131	37.2	99	210.2	271	520	968	515	960	1760
-11.1	12	53.6	13.3	56	132.8	37.8	100	212	276	530	986	520	970	1778
-10.6	13	55.4	13.9	57	134.6	43	110	230	282	540	1004	526	980	1796
-10	14	57.2	14.4	58	136.4	49	120	248	288	550	1022	532	990	1814
-9.4	15	59	15	59	138.2	54	130	266	293	560	1040	538	1000	1832
-8.9	16	60.8	15.6	60	140	60	140	284	299	570	1058	565	1050	1922
-8.3	17	62.6	16.1	61	141.8	65	150	302	304	580	1076	593	1100	2012
-7.8	18	64.4	16.7	62	143.6	71	160	320	310	590	1094	620	1150	2102
-7.2	19	66.2	17.2	63	145.4	76	170	338	315	600	1112	648	1200	2192
-6.7	20	68	17.8	64	147.2	83	180	356	321	610	1130	675	1250	2282
-6.1	21	69.8	18.3	65	149	88	190	374	326	620	1148	704	1300	2372
-5.6	22	71.6	18.9	66	150.8	93	200	392	332	630	1166	734	1350	2462
-5	23	73.4	19.4	67	152.6	99	210	410	338	640	1184	760	1400	2552
-4.4	24	75.2	20	68	154.4	100	212	413	343	650	1202	787	1450	2642
-3.9	25	77	20.6	69	156.2	104	220	428	349	660	1220	815	1500	2732

Example how to use table: Convert 70 degrees Fahrenheit to centigrade. Find your value (70) in the bold letters. To the left, under the column °C, is your conversion for centigrade. Answer: 70°F = 21.1 °C Note, for converting centigrade to Fahrenheit the same procedure would be used, except you would go to the right hand column for degrees Fahrenheit. Therefore, 70 degrees centigrade would equal to 158 degrees Fahrenheit.

Specifications

MATERIAL SPECIFICATIONS

P-NO./GROUP NO.	NOMINAL STEEL DESIGNATION	FORGINGS (FLANGES, COUPLINGS, WELDOLETS, ETC)	WROUGHT FITTINGS (ELBOWS, REDUCERS, TEES, WELD CAPS, ETC)	PIPE	PLATE	REMARKS
1/1	Carbon	SA-105	SA-234-WPB	SA-106-B	SA-516-70 or SA-36	SA-36 for Non-pressure retaining parts
		SA-350-LF2	SA-420-WPL6	SA-333 Gr. 6	SA-516-70	Cold Temperature Service
4/1	1Cr - 1/2Mo	SA-182-F12	SA-234-WP12	SA-335-P12	SA-387-12	Alloy Steel
	1 1/4Cr - 1/2Mo	SA-182-F11	SA-234-WP11	SA-335-P11	SA-387-11	-
5A/1	2 1/4Cr - 1/2Mo	SA-182-F22	SA-234-WP22	SA-335-P22	SA-387-22	Alloy Steel
5B/1	5Cr - 1/2Mo	SA-185-F5	SA-234-WP5	SA-335-P5	SA-387-5	Alloy Steel
	9Cr - 1 Mo	SA-182-F9	SA-234-WP9	SA-335-P9	SA-387-9	-
8/1	18Cr - 8Ni	SA-182-F304	SA-403-WP304	SA-312-TP304	SA-240-304	Stainless Steel
	18Cr - 8Ni	SA-182-F304H	SA-403-WP304H	SA-312-TP304H	SA-240-304H	-
	16Cr - 12Ni - 2Mo	SA-182-F316	SA-403-WP316	SA-312-TP316	SA-240-316	Stainless Steel
	16Cr - 12Ni - 2Mo	SA-182-F316H	SA-403-WP316H	SA-312-TP316H	SA-240-316H	-
	18Cr - 8 Ni	SA-182-F304L	SA-403-WP304L	SA-312-TP304L	SA-240-304L	Low Carbon Stainless Steel
	16Cr - 12Ni - 2Mo	SA-182-F316L	SA-403-WP316L	SA-312-TP316L	SA-240-316L	Low Carbon Stainless Steel
43	67Ni - 30Cu	SB164		SB-165	SB-127	Money
45	35Ni-35Fe-20Cr-Cb	SB-462	SB-366	SB-729	SB-463	Alloy 20

BOLTING MATERIAL SPECIFICATION

MATERIAL	SPECIFICATION	DESCRIPTION	REMARKS
Carbon Steel	SA-193-B7	Stud	-
Carbon Steel	SA-194-2H	Nut	-
Carbon Steel	SA-193-B7M	Stud	Nace
Carbon Steel	SA-194-2HM	Nut	Nace
Carbon Steel	SA-320-L7	Stud	Low Temp. Service (-150°F)
Carbon Steel	SA-194-4	Nut	Low Temp. Service (-150°F)
304 Stainless Steel	SA-193-B8	Stud	-
304 Stainless Steel	SA-194-8	Nut	-
316 Stainless Steel	SA-193-B8M	Stud	-
316 Stainless Steel	SA-194-8M	Nut	-

Gravity and Density

EQUIVALENTS OF API GRAVITY, BAUME GRAVITY, SPECIFIC GRAVITY, AND WEIGHT DENSITY AT 60°F / 60°F

API GRAVITY	BAUME GRAVITY	SPECIFIC GRAVITY(G)	WT DENSITY (LB/FT³)	API GRAVITY	BAUME GRAVITY	SPECIFIC GRAVITY(G)	WT DENSITY (LB/FT³)
6	4.099	1.029	64.18	54	53.53	0.763	47.57
8	2.049	1.014	63.26	56	55.51	0.755	47.07
10	10.00	1.000	62.37	58	57.49	0.747	46.57
12	11.98	0.986	61.50	60	59.47	0.739	46.08
14	13.96	0.973	60.65	62	61.45	0.731	45.61
16	15.94	0.959	59.83	64	63.43	0.724	45.14
18	17.92	0.947	59.03	66	65.41	0.717	44.68
20	19.89	0.934	58.25	68	67.39	0.709	44.23
22	21.87	0.922	57.87	70	69.36	0.702	43.79
24	23.85	0.910	56.75	72	71.34	0.695	43.36
26	25.83	0.898	56.03	74	73.32	0.689	42.94
28	27.81	0.887	55.32	76	75.30	0.682	42.53
30	29.79	0.876	54.64	78	77.28	0.675	42.12
32	31.77	0.865	53.97	80	79.26	0.669	41.72
34	33.75	0.855	53.32	82	81.24	0.663	41.33
36	35.72	0.845	52.69	84	83.22	0.657	40.95
38	37.70	0.835	52.06	86	85.19	0.651	40.57
40	39.68	0.825	51.46	88	87.17	0.645	40.20
42	41.66	0.816	50.86	90	89.15	0.639	39.84
44	43.64	0.806	50.28	92	91.13	0.633	39.48
46	45.62	0.797	49.72	94	93.11	0.628	39.13
48	50.60	0.788	49.16	96	95.09	0.622	38.79
50	50.58	0.780	48.62	98	97.07	0.617	38.45
52	51.55	0.771	48.09	100	99.05	0.611	38.12

The above table is based on the weight of oil @ 60°F in air to the same weight of water @ 60°F in air.
The relation of Degrees Baume' or API to Specific Gravity is expressed by the following formulas:

For liquids lighter than water
Degrees Baume' = 140/G - 130
Degrees A.P.I. = 141.5/G - 131.5

For liquids heavier than water:
Degrees Baume' = 145 - 145/G



Hardness Conversion

BRINELL 10mm Ball 3000 kg Dia of impression	BRINELL	ROCKWELL C Brale 150 kg Load	ROCKWELL A Brale 60 kg Load	ROCKWELL B 1/4" Brale 100 kg Load	SHORE SCIEROSCOPE
-	-	80	92	-	-
-	-	79	91.5	-	-
-	-	78	91	-	-
-	-	77	90.5	-	-
-	-	76	90	-	-
-	-	75	89.5	-	-
-	-	74	89	-	-
-	-	73	88.5	-	-
-	-	72	88	-	-
-	-	71	87	-	-
2.2	780	70	86.5	-	106
-	760	69	86	-	103
2.25	745	68	85.5	-	100
-	725	67	85	-	97
2.3	712	66	84.5	-	95
-	697	65	84	-	93
2.35	682	64	83.5	-	91
-	668	63	83	-	89
2.4	653	62	82.5	-	87
-	640	61	81.5	-	86
2.45	627	60	81	-	84
-	615	59	80.5	-	82
2.5	601	58	80	-	81
-	590	57	79.5	-	80
2.55	578	56	79	-	78
-	567	55	78.5	-	77
2.6	555	54	78	120	75
-	545	53	77.5	120	74
2.65	534	52	77	119	72
2.7	514	51	76.5	119	70
2.75	495	50	76	118	67
2.8	477	49	75.5	117	65
-	470	48	74.5	117	64
2.85	461	47	74	116	63
2.9	444	46	73.5	115	61
2.95	429	45	73	115	59
3	415	44	72.5	114	57
-	408	43	72	114	56
3.05	401	42	71.5	113	55
3.1	388	41	71	112	54
3.15	375	40	70.5	111	52
3.2	363	39	70	111	51
3.25	352	38	69.5	110	49
-	346	37	69	110	48
3.3	341	36	68.5	109	47

BRINELL 10mm Ball 3000 kg Dia of impression	BRINELL	ROCKWELL C Brale 150 kg Load	ROCKWELL A Brale 60 kg Load	ROCKWELL B 1/4" Brale 100 kg Load	SHORE SCIEROSCOPE
3.35	331	35	68	109	46
3.4	321	34	67.5	108	45
3.45	311	33	67	108	44
3.5	302	32	66.5	107	43
3.55	293	31	66	106	42
3.6	285	30	65.5	105	40
3.65	277	29	65	104	39
3.7	269	28	64.5	104	38
3.75	262	27	64	103	38
-	258	26	63.5	102	37
3.8	255	25	63	102	37
3.85	248	24	62.5	101	36
3.9	241	23	62	101	35
-	238	22	61.5	100	34
3.95	235	21	61	99	34
4	229	20	60	98	33
4.05	223	-	59.5	97	32
4.1	217	-	59	96	31
4.15	212	-	58	95	31
4.2	207	-	57.5	94	30
4.25	202	-	57	93	30
4.3	197	-	56.5	92	29
4.35	192	-	56	91	28
4.4	187	-	55.5	90	28
4.45	183	-	55	89	27
4.5	179	-	54	88	27
4.55	174	-	53.5	87	26
4.6	170	-	53	86	26
4.65	166	-	52.5	85	25
4.7	163	-	52	84	25
4.75	159	-	51	83	24
4.8	156	-	50.5	82	24
4.85	153	-	50	81	23
4.9	149	-	49.5	80	23
4.95	146	-	49	79	22
5	143	-	48.5	78	22
5.05	140	-	48	77	21
5.1	137	-	47	76	21
5.15	134	-	46.5	75	21
5.15	134	-	46	74	21
5.2	131	-	45.5	73	20
5.2	131	-	45	72	20
5.25	128	-	44.5	71	20
5.3	126	-	44	70	20
-	-	-	-	-	-



A DBM GLOBAL COMPANY

Pipe Dimensions & Weights

NOMINAL PIPE SIZE	METRIC PIPE SIZE	OD (IN)	LEGEND	5S	5	10S	10	20	30	STD & 40S	40	60	XH & 80S	80	100	120	140	160	XXH
1/8	6	0.41	WT	-	0.035	0.049	0.049	-	0.057	0.068	0.068	-	0.095	0.095	-	-	-	-	-
			ID	-	0.335	0.307	0.307	-	0.291	0.269	0.269	-	0.215	0.215	-	-	-	-	-
			LBS/FT	-	0.138	0.19	0.19	-		0.24	0.24	-	0.31	0.31	-	-	-	-	-
1/4	8	W	WT	-	0.049	0.065	0.065	-	0.073	0.088	0.088	-	0.119	0.119	-	-	-	-	-
			ID	-	0.442	0.41	0.41	-	0.364	0.364	0.364	-	0.302	0.302	-	-	-	-	-
			LBS/FT	-	0.257	0.33	0.33	-	0.36	0.42	0.42	-	0.54	0.54	-	-	-	-	-
3/8	10	0.68	WT	-	0.049	0.065	0.065	-	0.073	0.091	0.091	-	0.126	0.126	-	-	-	-	-
			ID	-	0.577	0.545	0.545	-	0.529	0.493	0.493	-	0.423	0.423	-	-	-	-	-
			LBS/FT	-	0.328	0.42	0.42	-	0.47	0.57	0.57	-	0.74	0.74	-	-	-	-	-
1/2	15	0.84	WT	0.065	0.065	0.083	0.083	-	0.95	0.109	0.109	-	0.147	0.147	-	-	-	0.188	0.294
			ID	0.71	0.71	0.674	0.674	-	0.65	0.622	0.622	-	0.546	0.546	-	-	-	0.464	0.252
			LBS/FT	0.54	0.54	0.67	0.67	-	0.76	0.85	0.85	-	1.09	1.09	-	-	-	1.31	1.71
3/4	20	1.05	WT	0.065	0.065	0.083	0.083	-	0.095	0.113	0.113	-	0.154	0.154	-	-	-	0.219	0.308
			ID	0.92	0.92	0.884	0.884	-	0.86	0.824	0.824	-	0.742	0.742	-	-	-	0.612	0.434
			LBS/FT	0.69	0.69	0.86	0.86	-	0.97	1.13	1.13	-	1.47	1.47	-	-	-	1.94	2.44
1	25	1.32	WT	0.065	0.065	0.109	0.109	-	0.114	0.133	0.133	-	0.179	0.179	-	-	-	0.25	0.358
			ID	1.25	1.25	1.097	1.097	-	1.087	1.049	1.049	-	0.957	0.957	-	-	-	0.815	0.599
			LBS/FT	0.87	0.87	1.4	1.4	-	1.46	1.68	1.68	-	2.17	2.17	-	-	-	2.84	3.66
1-1/4	32	1.66	WT	0.065	0.065	0.109	0.109	-	0.117	0.14	0.14	-	0.191	0.191	-	-	-	0.25	0.382
			ID	1.53	1.53	1.442	1.442	-	1.426	1.38	1.38	-	1.278	1.278	-	-	-	1.16	0.896
			LBS/FT	1.11	1.11	1.81	1.81	-	1.93	2.27	2.27	-	3	3	-	-	-	3.76	5.21
1-1/2	40	1.90	WT	0.065	0.065	0.109	0.109	-	0.125	0.145	0.145	-	2	2	-	-	-	0.281	0.4
			ID	1.77	1.77	1.682	1.682	-	1.65	1.61	1.61	-	1.5	1.5	-	-	-	1.338	1.1
			LBS/FT	1.28	1.28	2.09	2.09	-	2.37	2.72	2.72	-	3.63	3.63	-	-	-	4.86	6.41
2	50	2.38	WT	0.065	0.065	0.109	0.109	-	0.125	0.154	0.154	-	0.218	0.218	-	-	-	0.344	0.436
			ID	2.245	2.245	2.157	2.157	-	2.125	2.067	2.067	-	1.939	1.939	-	-	-	1.687	1.503
			LBS/FT	1.61	1.61	2.64	2.64	-	3	3.65	3.65	-	5.02	5.02	-	-	-	7.46	9.03
2-1/2	65	2.88	WT	0.083	0.083	0.12	0.12	-	0.188	0.203	0.203	-	0.276	0.276	-	-	-	0.375	0.552
			ID	2.709	2.709	2.755	2.755	-	2.499	2.469	2.469	-	2.323	2.323	-	-	-	2.125	1.771
			LBS/FT	2.48	2.48	3.53	3.53	-	5.4	5.79	5.79	-	7.66	7.66	-	-	-	10.01	13.69
3	80	3.50	WT	0.083	0.083	0.12	0.12	-	0.188	0.216	0.216	-	0.3	0.3	-	-	-	0.438	0.6
			ID	3.334	3.334	3.26	3.26	-	3.124	3.068	3.068	-	2.9	2.9	-	-	-	2.624	2.3
			LBS/FT	3.03	3.03	4.33	4.33	-	6.65	7.58	7.58	-	10.25	10.25	-	-	-	14.32	18.58
3-1/2	90	4.00	WT	0.083	0.083	0.12	0.12	-	0.188	0.226	0.226	-	0.381	0.381	-	-	-	0.438	0.6
			ID	3.334	3.334	3.26	3.26	-	3.124	3.068	3.068	-	2.9	2.9	-	-	-	2.624	2.3
			LBS/FT	3.03	3.03	4.33	4.33	-	6.65	7.58	7.58	-	10.25	10.25	-	-	-	14.32	18.58
4	100	4.50	WT	0.083	0.083	0.12	0.12	-	0.188	0.237	0.237	-	0.337	0.337	-	0.438	-	0.531	0.674
			ID	4.334	4.334	4.26	4.26	-	4.124	4.026	4.026	-	3.826	3.826	-	3.624	-	3.438	3.152
			LBS/FT	3.92	3.92	5.61	5.61	-	8.66	10.79	10.79	-	14.98	14.98	-	19	-	22.51	27.54
4-1/2	120	5.00	WT	-	-	-	-	-	-	0.247	0.247	-	0.355	0.355	-	-	-	-	0.71
			ID	-	-	-	-	-	-	4.506	4.506	-	4.29	4.29	-	-	-	-	3.58
			LBS/FT	-	-	-	-	-	-	12.53	12.53	-	17.61	17.61	-	-	-	-	32.53



Pipe
Dimensions
& Weights

NOMINAL PIPE SIZE	METRIC PIPE SIZE	OD (IN)	LEGEND	55	5	10S	10	20	30	STD & 40S	40	60	XH & 80S	80	100	120	140	160	XXH
5	125	5.56	WT	0.109	0.109	0.134	0.134	-	-	0.258	0.258	-	0.375	0.375	-	0.5	-	0.625	0.75
			ID	5.345	5.345	5.295	5.295	-	-	5.047	5.047	-	4.813	4.813	-	4.563	-	4.313	4.063
			LBS/FT	6.36	6.36	7.77	7.77	-	-	14.62	14.62	-	20.78	20.78	-	27.04	-	32.96	38.55
6	150	6.63	WT	0.109	0.109	0.134	0.134	-	-	0.28	0.28	-	0.432	0.432	-	0.562	-	0.719	0.864
			ID	6.407	6.407	6.357	6.357	-	-	6.065	6.065	-	5.761	5.761	-	5.501	-	5.187	4.897
			LBS/FT	7.6	7.6	9.29	9.29	-	-	18.97	18.97	-	28.57	28.57	-	36.39	-	45.35	53.16
7	180	7.63	WT	-	-	-	-	-	-	0.301	0.301	-	0.5	0.5	-	-	-	-	0.875
			ID	-	-	-	-	-	-	7.023	7.023	-	6.625	6.625	-	-	-	-	5.875
			LBS/FT	-	-	-	-	-	-	23.57	23.57	-	38.05	38.05	-	-	-	-	63.08
8	200	8.63	WT	0.109	0.109	0.148	0.148	0.25	0.277	0.322	0.322	0.406	0.5	0.5	0.594	0.719	0.812	0.906	0.875
			ID	8.407	8.407	8.329	8.329	8.125	8.071	7.981	7.981	7.813	7.625	7.625	7.437	7.187	7.001	6.813	2.875
			LBS/FT	9.93	9.93	13.4	13.4	22.36	24.7	28.55	28.55	35.64	43.39	43.39	50.95	60.71	67.76	74.69	72.42
9	225	9.63	WT	-	-	-	-	-	-	0.342	0.342	-	0.5	0.5	-	-	-	-	-
			ID	-	-	-	-	-	-	8.941	8.941	-	8.625	8.625	-	-	-	-	-
			LBS/FT	-	-	-	-	-	-	33.9	33.9	-	48.72	48.72	-	-	-	-	-
10	250	10.75	WT	0.134	0.134	0.165	0.165	0.25	0.307	0.365	0.365	0.5	0.5	0.594	0.719	0.844	1	1.125	1
			ID	10.482	10.482	10.42	10.42	10.25	10.136	10.02	10.02	9.75	9.75	9.562	9.312	9.062	8.75	8.5	8.75
			LBS/FT	15.19	15.19	18.65	18.65	28.04	34.24	40.48	40.48	54.74	54.74	64.43	77.03	89.29	104.13	115.64	104.13
11	275	11.75	WT	-	-	-	-	-	-	0.375	0.375	-	0.5	0.5	-	-	-	-	-
			ID	-	-	-	-	-	-	11	11	-	10.75	10.75	-	-	-	-	-
			LBS/FT	-	-	-	-	-	-	45.55	45.55	-	60.07	60.07	-	-	-	-	-
12	300	12.75	WT	0.156	0.165	0.18	0.18	0.25	0.33	0.375	0.406	0.562	0.5	0.688	0.844	1	1.125	1.312	1
			ID	12.438	14.42	12.39	12.39	12.25	12.09	12	11.938	11.626	11.75	11.374	11.062	11.75	10.5	10.126	11.75
			LBS/FT	20.98	22.18	24.17	24.17	33.38	43.77	49.56	53.52	73.15	65.42	88.63	107.32	125.49	139.67	160.27	125.49
14	350	14.00	WT	0.156	0.156	0.188	0.25	0.312	0.375	0.375	0.438	0.594	0.5	0.75	0.938	1.094	1.25	1.406	-
			ID	13.688	13.688	13.624	13.5	13.376	13.25	13.25	13.124	12.812	13	12.5	12.124	11.812	11.5	11.188	-
			LBS/FT	23.07	23.07	27.73	36.71	45.61	54.57	54.57	63.44	85.05	72.09	106.13	194.96	150.79	170.21	189.11	-
16	400	16.00	WT	0.165	0.165	0.188	0.25	0.312	0.375	0.375	0.5	0.656	0.5	0.844	1.031	1.219	1.438	1.594	-
			ID	15.67	15.67	15.624	15.5	15.376	15.25	15.25	15	14.688	15	14.312	13.938	13.562	13.124	12.812	-
			LBS/FT	27.9	27.9	31.75	42.05	51.27	93.27	93.27	82.77	107.5	82.77	136.61	164.82	192.43	223.64	245.25	-
18	450	18.00	WT	0.165	0.165	0.188	0.25	0.312	0.438	0.375	0.562	0.75	0.5	0.938	1.156	1.375	1.562	1.781	-
			ID	17.67	17.67	17.624	17.5	17.376	17.124	17.25	16.876	16.5	17	16.124	15.688	15.25	14.876	14.438	-
			LBS/FT	31.43	31.43	35.76	47.39	58.94	82.15	70.59	104.67	138.17	93.45	170.92	207.96	244.14	274.22	308.5	-
20	500	20.00	WT	0.188	0.188	0.218	0.25	0.375	0.5	0.375	0.594	0.812	0.5	1.031	1.281	1.5	1.75	1.969	-
			ID	19.624	19.624	19.564	19.5	19.25	19	19.25	18.812	18.376	19	17.938	17.438	17	16.5	16.062	-
			LBS/FT	39.78	39.78	46.27	52.73	78.6	104.13	78.6	123.11	166.4	104.13	208.87	256.1	296.37	341.09	379.17	-
22	550	22.00	WT	0.188	0.188	0.218	0.25	0.375	0.5	0.375	-	0.875	0.5	1.125	1.375	1.625	1.875	2.215	-
			ID	21.624	21.624	21.564	21.5	21.25	21	21.25	-	20.25	21	19.75	19.25	18.75	18.25	17.75	-
			LBS/FT	43.8	43.8	50.94	58.07	86.61	114.81	86.61	-	197.41	114.81	250.81	302.88	353.61	403	451.06	-
24	600	24.00	WT	0.218	0.218	0.25	0.25	0.375	0.562	0.375	0.688	0.969	0.5	1.219	1.531	1.812	2.062	2.344	-
			ID	23.564	23.564	23.5	23.5	23.25	22.876	23.25	22.624	22.062	23	21.562	20.938	20.376	19.876	19.312	-
			LBS/FT	55.37	55.37	63.41	63.41	94.62	140.68	94.62	171.29	238.35	125.49	296.58	367.39	429.39	483.12	542.13	-



Pipe Dimensions & Weights

NOMINAL PIPE SIZE	METRIC PIPE SIZE	OD (IN)	LEGEND	5S	5	10S	10	20	30	STD & 40S	40	60	XH & 80S	80	100	120	140	160	XXH
26	650	26.00	WT	-	-	-	0.312	0.5	-	0.375	-	-	0.5	-	-	-	-	-	-
			ID	-	-	-	25.376	25	-	25.25	-	-	25	-	-	-	-	-	-
			LBS/FT	-	-	-	85.6	136.17	-	102.63	-	-	136.17	-	-	-	-	-	-
28	700	28.00	WT	-	-	-	0.312	0.5	0.625	0.375	-	-	0.5	-	-	-	-	-	-
			ID	-	-	-	27.376	27	26.75	27.25	-	-	27	-	-	-	-	-	-
			LBS/FT	-	-	-	92.26	146.85	182.73	110.64	-	-	146.85	-	-	-	-	-	-
30	750	30.00	WT	0.25	0.25	0.312	0.312	0.5	0.625	0.375	-	-	0.5	-	-	-	-	-	-
			ID	29.5	29.5	29.376	29.376	29	29.75	29.25	-	-	29	-	-	-	-	-	-
			LBS/FT	79.43	79.43	98.93	98.93	157.53	196.08	118.62	-	-	157.53	-	-	-	-	-	-
32	800	32.00	WT	-	-	-	0.312	0.5	0.625	0.375	0.688	-	0.5	-	-	-	-	-	-
			ID	-	-	-	31.376	31	30.75	31.25	30.624	-	31	-	-	-	-	-	-
			LBS/FT	-	-	-	105.59	168.21	209.43	126.66	230.08	-	168.21	-	-	-	-	-	-
34	850	34.00	WT	-	-	-	0.312	0.5	0.625	0.375	0.688	-	0.5	-	-	-	-	-	-
			ID	-	-	-	33.376	33	32.75	33.25	32.624	-	33	-	-	-	-	-	-
			LBS/FT	-	-	-	112.25	178.89	222.78	134.67	244.77	-	178.89	-	-	-	-	-	-
36	900	26.00	WT	-	-	-	0.312	0.5	0.625	0.375	0.75	-	0.5	-	-	-	-	-	-
			ID	-	-	-	35.376	35	34.75	35.25	34.5	-	35	-	-	-	-	-	-
			LBS/FT	-	-	-	118.92	189.57	236.13	142.68	382.35	-	189.57	-	-	-	-	-	-
38	950	38.00	WT	-	-	-	-	-	-	0.375	-	-	0.5	-	-	-	-	-	-
			ID	-	-	-	-	-	-	37.25	-	-	-	-	-	-	-	-	-
			LBS/FT	-	-	-	-	-	-	150.82	-	-	200.43	-	-	-	-	-	-
40	1000	40.00	WT	-	-	-	-	-	-	0.375	-	-	0.5	-	-	-	-	-	-
			ID	-	-	-	-	-	-	39.25	-	-	39	-	-	-	-	-	-
			LBS/FT	-	-	-	-	-	-	158.84	-	-	211.12	-	-	-	-	-	-
42	1050	42.00	WT	-	-	-	-	-	-	0.375	-	-	0.5	-	-	-	-	-	-
			ID	-	-	-	-	-	-	41.25	-	-	41	-	-	-	-	-	-
			LBS/FT	-	-	-	-	-	-	166.86	-	-	221.81	-	-	-	-	-	-
44	1100	44.00	WT	-	-	-	-	-	-	0.375	-	-	0.5	-	-	-	-	-	-
			ID	-	-	-	-	-	-	43.25	-	-	43	-	-	-	-	-	-
			LBS/FT	-	-	-	-	-	-	174.88	-	-	232.5	-	-	-	-	-	-
46	1150	46.00	WT	-	-	-	-	-	-	0.375	-	-	0.5	-	-	-	-	-	-
			ID	-	-	-	-	-	-	45.25	-	-	45	-	-	-	-	-	-
			LBS/FT	-	-	-	-	-	-	182.89	-	-	243.19	-	-	-	-	-	-
48	1200	48.00	WT	-	-	-	-	-	-	0.375	-	-	0.5	-	-	-	-	-	-
			ID	-	-	-	-	-	-	47.25	-	-	47	-	-	-	-	-	-
			LBS/FT	-	-	-	-	-	-	190.91	-	-	253.88	-	-	-	-	-	-
54	1350	54.00	WT	-	-	-	-	-	-	0.375	-	-	0.5	-	-	-	-	-	-
			ID	-	-	-	-	-	-	53.25	-	-	53	-	-	-	-	-	-
			LBS/FT	-	-	-	-	-	-	215	-	-	286	-	-	-	-	-	-
60	1500	60.00	WT	-	-	-	-	-	-	0.375	-	-	0.5	-	-	-	-	-	-
			ID	-	-	-	-	-	-	59.25	-	-	59	-	-	-	-	-	-
			LBS/FT	-	-	-	-	-	-	239	-	-	318	-	-	-	-	-	-

**Add Aitken to your AML
and minimize downtime**



A DBM GLOBAL COMPANY

AITKENMFG.COM
SALES@AITKENMFG.COM
O: (281) 441-5438
F: (713) 699-5186

4920 Airline Drive
Houston, Texas 77022