

American Completion Tools

Global Partners for Oilfield Equipment

Wellheads & X-Mas Trees, Gate Valves,
Chokes, Manifolds

American Completion Tools

American Completion Tools (ACT) is a joint venture, started by acquiring Allco Services Inc., at Burleson, Texas, to manufacture high quality oilfield equipment in the USA. In 2010, American Completion Tools, Houston, was set up to serve customers more closely the complete line of American Completion Tools products for stock-n-sale.

The Houston office with a warehouse helps in providing quality customer service to their clients by enabling prompt delivery, easy billing and after sales service. Since its inception, American Completion Tools has been providing high quality products worldwide to distributors and service companies.

At American Completion Tools, quality and customer service are given utmost importance.



Flow Product Division Office, at Houston



Houston, TX Office



Opening by March 2015, Plant at Houston



Burleson, TX Office

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Upcoming Plant at Houston by, March 2015:

American Completion Tools

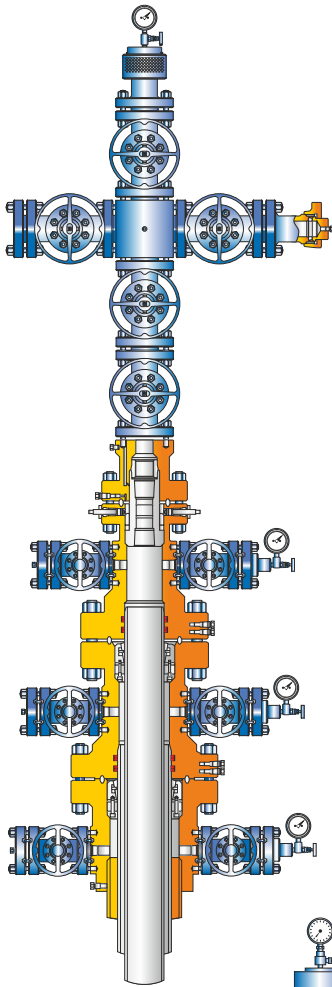
1255 Grand Plaza Drive, Houston, Texas 77067, USA

Note: Elder, Baker, Alpha, Viton, Aflas, Otis, Go, and/or any other trade name mentioned in this catalogue are for reference purpose only.

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CONVENTIONAL WELLHEAD & X-MAS TREE ASSEMBLIES



A wellhead is used at the surface of an oil & gas well that provides the structural and pressure containing interface for the drilling and production equipment.

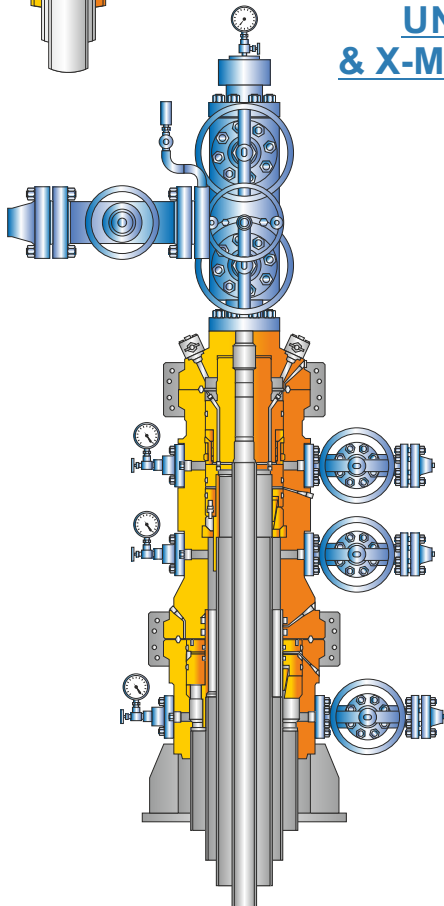
Christmas Tree is an assembly of valves, spool, pressure gauges and chokes fitted to the wellhead of a completed well to control production. ACT offers these in a wide range of sizes and configurations.

ACT offers the field proven surface wellheads, gate valves, actuators, casing heads, tubing hangers, spools and adapters, bushing and annulus seal, tees, crosses, tree caps and miscellaneous equipment required for surface well completions from 2,000 PSI to 15,000 PSI with maximum flexibility and user convenience.

Installation training and field support is available.

ACT also offers ESP Wellhead systems and unitized Wellheads and X-Mas Trees and repair and services.

UNITIZED WELLHEAD & X-MAS TREE ASSEMBLIES



Description: ACT Unitized body is designed to reduce rig time caused due to BOP removal while installing conventional wellhead. Only one body piece is used instead of casing flange, casing spools and tubing spools.

Unitized wellhead bodies are provided with an API flange top connection or with a clamp hub profile. These systems are available upto 15,000 psi.

Advantages:

- Simple internal components reduce installation time
- Compact design reduces height requirement
- Systems available to 15,000 psi
- Anchor screws are eliminated reducing potential leak-paths
- Casing and tubing load paths are independently supported allowing up to 2 million pounds on each string if required
- Safety as the blowout preventer remains in place for all “in-well” work after surface casing is installed

CASING HEADS



The casing head is the lowest part of the wellhead assembly and is connected to the surface casing string. It supports subsequent drilling wellhead and completion equipment.

Functions:

- Provides for attachment to surface casing string
- Supports blowout preventers while hole is drilled for next casing string
- Provides for suspending and packing off the next casing string
- Provides outlets for annular access
- Provides for testing BOP's while drilling

Type C-22 Bowl - Features:

- Type C-22 accepts Type C-21 non-automatic sealing casing hanger w/ type H seal ring
- Type C-22-BP-ET has bowl-protector lockdown screws in the top flange
- Type C-22-EG eliminates the need for lockdown screws to retain bowl protectors
- Bottom preparation can be either male-threaded, female-threaded, slip-on weld or Slip Loc Type
- Line Pipe Threaded, Flanged or Studded Flange outlets are available

Benefits:

- Straight bowl prevents wedge-locking of bowl protectors, casing hangers and test plugs
- Seal bore less likely to be damaged during drilling
- Detachable base plate available for casing heads which provides time savings and adds value due to better utilization of customer owned property
- Type C-22 reduces number of leak paths, lowers cost and increases safety as there is no need to work beneath the BOP's

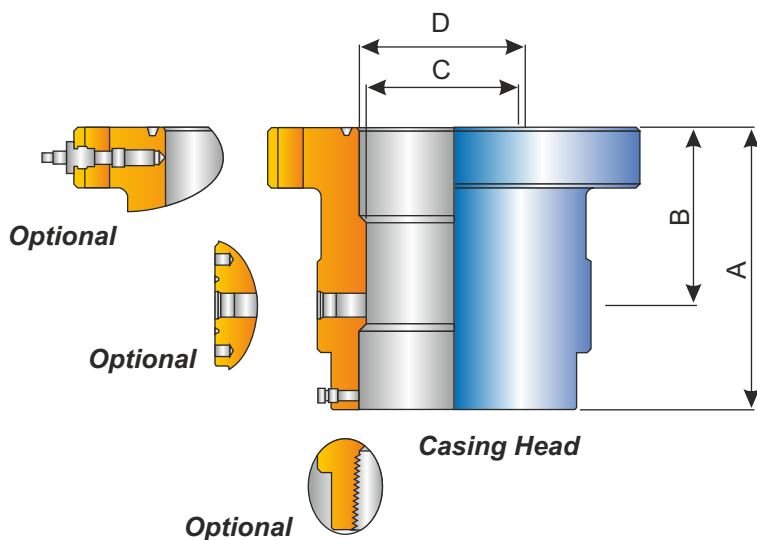
WHEN ORDERING Casing Heads, specify the following:

- A. ACT Model
- B. Bottom Connection - 1. Flange Size, 2. Working Pressure
- C. Top Connection - 1. Flange Size, 2. Working Pressure
- D. Side Outlets - 1. Threaded, Studded or Flanged, 2. Size, 3. Working Pressure
- E. Options - 1. With or Without Lockdown Screws, 2. Bottom Seal Size and Configuration
- F. API 6A Requirements - 1. PSL, 2. Temperature Class, 3. Material Class, 4. With or without monogram

Notes:

- Type H Standard seal rings cannot be installed in Type C-22-BP-ET or Type C-29 ET heads
- Type C-121-S nonautomatic-sealing casing hanger cannot be used in a Type C-22 bowl

CASING HEADS



CASING HEADS						
Bottom Casing Thread Size, Inch	Size, Inch	Top Flange Working Pressure psi	Dimensions, Inch			
			A	B	C	D
7	7.1/16	2,000	18	9.3/4	6.3/8	7
7	7.1/16	3,000	18	9.3/4	6.3/8	7
7	7.1/16	2,000	18	9.3/4	6.3/8	7
7.5/8	9	2,000	18.3/4	9.3/4	7	8.3/4
7.5/8	9	3,000	18.3/4	9.3/4	7	8.3/4
8.5/8	9	2,000	18.3/4	9.3/4	8	8.3/4
8.5/8	9	3,000	18.3/4	9.3/4	8	8.3/4
8.5/8	9	5,000	18.3/4	9.3/4	8	8.3/4
8.5/8	11	2,000	20.3/8	12.5/8	8	10.7/8
8.5/8	11	3,000	20.3/8	12.5/8	8	10.7/8
8.5/8	11	5,000	20.3/8	12.5/8	8	10.7/8
9.5/8	11	2,000	20.5/8	12.5/8	9	10.7/8
9.5/8	11	3,000	20.5/8	12.5/8	9	10.7/8
9.5/8	11	5,000	20.5/8	12.5/8	9	10.7/8
10.3/4	11	2,000	20.5/8	12.5/8	10	10.7/8
10.3/4	11	3,000	20.5/8	12.5/8	10	10.7/8
10.3/4	11	5,000	20.5/8	12.7/8	10	10.7/8
11.3/4	13.5/8	2,000	20.3/8	12.7/8	11	13.1/2
11.3/4	13.5/8	3,000	20.3/8	12.7/8	11	13.1/2
13.3/8	13.5/8	2,000	20.3/8	12.7/8	12.1/2	13.1/2
13.3/8	13.5/8	3,000	20.3/8	12.7/8	12.1/2	13.1/2
13.3/8	13.5/8	5,000	20.3/8	12.7/8	12.1/2	13.1/2
16	16.3/4	2,000	21	13.5/16	15.1/4	16.5/8
16	16.3/4	3,000	21	13.5/16	15.1/4	16.5/8
16	16.3/4	5,000	21	13.5/16	15.1/4	16.5/8
20	21.1/4	2,000	21.3/4	13.5/16	19	20.1/8
20	20.3/4	3,000	21.3/4	13.5/16	19	20.1/8

2,000psi = 138 bar

3,000 psi = 207 bar

5,000 psi = 345 bar

LPO is line-pipe outlet

FLG is flanged

CASING SPOOLS



Description: The casing spool has a top bowl to accommodate the casing hanger. The spool also has a bottom bowl with a pack-off seal and a flange or clamp hub for mounting it on top of a casing head or previous spool. Outlets are provided for annular access. Multiple casing spools may be stacked to hang intermediate and production casing strings.

Functions:

- Provides a load shoulder in the top bowl to support a casing hanger
- Provides a controlled bore in the top bowl for the casing hanger seal
- Provides a seal in the bottom bowl to pack off the previous casing string and isolate flange or clamp hub seals and casing hanger seals from internal casing pressure
- Provides side outlets for annular access
- Provides a port for pressure-testing casing seals and flange connections
- Provides for supporting and testing BOP's while drilling
- Provides retention for bowl protector while drilling

Features:

- Has a straight bowl
- Accepts type C-21 nonautomatic-sealing casing hanger w/type H seal ring
- Casing spool is available with no lockdown screw or with two lockdown screws in the top flange
- Accepts ACT Surface Wellhead type C-22 BOP test plugs
- Bottom bowl preparations available are: FS / P / Bushing / Metal-to-metal seal
- Line pipe threaded, studded or flanged outlets are also available

Benefits:

- Straight bowl prevents wedge-locking of bowl protectors, casing hangers and test plugs
- Type C-22-EG reduces number of leak paths, lowers cost and increases safety

WHEN ORDERING Casing Spools, specify the following:

A. ACT Model

B. Bottom Connection: 1. Flange Size, 2. Working Pressure

C. Top Connection: 1. Flange Size, 2. Working Pressure

D. Side Outlets: 1. Threaded, Studded or Flanged, 2. Size, 3. Working Pressure

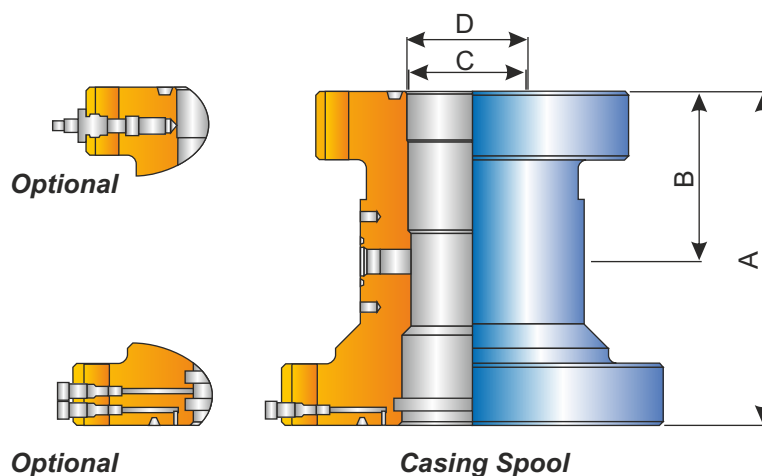
E. Options: 1. With or Without Lockdown Screws, 2. Bottom Seal Size and Configuration

F. API 6A Requirements: 1. PSL, 2. Temperature Class, 3. Material Class, 4. With or without monogram

Notes:

- Type H Standard seal rings cannot be installed in type C-22-BP-ET or type C-29 ET heads
- The type C-121-S nonautomatic-sealing casing hanger cannot be used in a C-22 bowl

CASING SPOOLS



Casing Spools								
Size, Inch	Bottom Flange Working Pressure psi	Size, Inch	Top Flange Working Pressure psi	Outlets	Dimensions, Inch			
					A	B	C	D
11	2,000	11	2,000	2-in. LPO	22	12.1/2	9	10.7/8
11	3,000	11	3,000	2-in. LPO	22	12.1/2	9	10.7/8
11	3,000	11	3,000	2-in. / 5000 FLG	22	12.1/2	9	10.7/8
11	5,000	11	5,000	2-in. / 5000 FLG	24.3/4	12.1/2	9	10.7/8
13.5/8	2,000	11	2,000	2-in. LPO	24.3/4	12.1/2	9	10.7/8
13.5/8	2,000	11	3,000	2-in. LPO	24.3/4	12.1/2	9	10.7/8
13.5/8	2,000	11	3,000	2-in. / 5000 FLG	24.3/4	12.1/2	9	10.7/8
13.5/8	3,000	11	3,000	2-in. LPO	24.3/4	12.1/2	9	10.7/8
13.5/8	3,000	11	3,000	2-in. LPO	24.3/4	12.1/2	9	10.7/8
13.5/8	3,000	11	3,000	2-in. / 5000 FLG	24.3/4	12.1/2	9	10.7/8
13.5/8	3,000	11	3,000	2-in. / 5000 FLG	24.3/4	12.1/2	9	10.7/8
13.5/8	3,000	11	3,000	2-in. LPO	24.3/4	12.1/2	9	10.7/8
13.5/8	3,000	11	5,000	2-in. / 5000 FLG	24.3/4	12.1/2	9	10.7/8
13.5/8	5,000	11	5,000	2-in. LPO	24.3/4	12.1/2	9	10.7/8
13.5/8	5,000	11	5,000	2-in. / 5000 FLG	24.3/4	12.1/2	9	10.7/8
13.5/8	5,000	11	10,000	1.13/16/10,000 FLG	28.15/16	14.11/16	9	10.7/8
16.3/4	2,000	11	3,000	2-in. LPO	24.3/4	12.1/2	10	10.7/8
16.3/4	2,000	11	3,000	2-in. LPO	24.3/4	12.1/2	10	10.7/8
16.3/4	2,000	11	3,000	2-in. / 5000 FLG	24.3/4	12.1/2	10	10.7/8
16.3/4	2,000	11	3,000	2-in. / 5000 FLG	24.3/4	12.1/2	10	10.7/8
16.3/4	3,000	11	3,000	2-in. LPO	24.3/4	12.1/2	10	10.7/8
16.3/4	3,000	11	3,000	2-in. LPO	24.3/4	12.1/2	10	10.7/8
16.3/4	3,000	11	3,000	2-in. / 5000 FLG	24.3/4	12.1/2	10	10.7/8
16.3/4	3,000	11	3,000	2-in. / 5000 FLG	24.3/4	12.1/2	10	10.7/8
16.3/4	3,000	11	5,000	2-in. LPO	24.3/4	12.1/2	10	10.7/8
16.3/4	3,000	11	5,000	2-in. LPO	24.3/4	12.1/2	10	10.7/8
16.3/4	3,000	11	5,000	2-in. / 5000 FLG	24.3/4	12.1/2	10	10.7/8
16.3/4	3,000	11	5,000	2-in. / 5000 FLG	24.3/4	12.1/2	10	10.7/8
16.3/4	3,000	13.5/8	3,000	2-in. LPO	24.1/2	13.1/2	12.1/2	13.1/2
16.3/4	3,000	13.5/8	3,000	2-in. LPO	24.1/2	13.1/2	12.1/2	13.1/2
16.3/4	3,000	13.5/8	3,000	2-in. / 5000 FLG	24.1/2	13.1/2	12.1/2	13.1/2
16.3/4	3,000	13.5/8	3,000	2-in. / 5000 FLG	24.1/2	13.1/2	12.1/2	13.1/2
20.3/4	3,000	13.5/8	5,000	2-in. LPO	24.1/2	12.1/2	12.1/2	13.1/2
21.1/4	2,000	13.5/8	3,000	2-in. LPO	26.3/4	14.3/8	12.1/2	13.1/2
21.1/4	2,000	13.5/8	3,000	2-in. / 5000 FLG	26.3/4	14.3/8	12.1/2	13.1/2

2,000psi = 138 bar
3,000 psi = 207 bar
5,000 psi = 345 bar
LPO is line-pipe outlet
FLG is flanged

SLIP TYPE CASING HANGERS

Description: Slip-type casing hangers provide a method to transfer the weight or tension load of a casing string to a casing head or casing spool. Slip-type hangers are available in automatic-sealing and nonautomatic-sealing varieties. Automatic hangers have seals which are energized by casing weight, while nonautomatic hangers have seals which require means other than casing weight to be energized. Nonautomatic hangers are typically used when insufficient casing load is available or when cementing back to the surface.

Functions:

- Provides for easy wraparound or split installation at any location on the casing string
- Provides for suspension of the casing load from a casing head or spool
- Provides a means to center the casing string in the head or spool
- Provides an annular seal

Type C-22 Features:

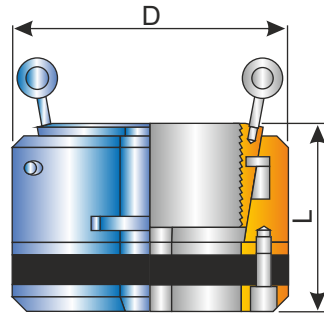
- Fits type C-22 casing heads and spools
- Is designed to suspend casing loads
- Provides automatic packoff sealing
- Only 50,000 to 60,000 pounds of casing load is normally needed to energize the annulus seal
- Hangers can be lowered through blowout preventers and landed before or after cement has set
- Incorporates spring-loaded latch and heavy-duty hinge
- Has interlocking slip segments

Benefits:

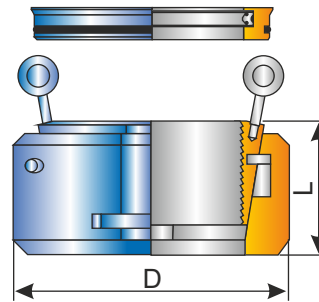
- Industry-standard hanger maximizes use of customer property
- Saves installation time and eliminates working in hazardous cellar conditions
- Is suitable for short casing or lightly loaded applications
- Provides flexibility and safety of installation
- No separate screws or latches are needed, allowing for ease of installation; has rugged, extensively tested, field-proven design
- Slips engage casing evenly

Type C-21 Hanger with Type H Seal Ring is also available

SLIP TYPE CASING HANGERS



Type C-22 Casing Hanger



Type C-21 Casing Hanger

CASING HANGERS					
Head or Spool Top Flange, Inch	Casing Size, Inch	Type C-22 Casing Hangers Dimensions, Inch		Type C-21 Casing Hanger Dimensions, Inch	
		D	L	D	L
9	4.1/2	8.11/16	8.1/16	8.11/16	5.1/8
9	5	8.11/16	8.1/16	8.11/16	5.1/8
9	5.1/2	8.11/16	8.1/16	8.11/16	5.1/8
11	4.1/2	10.13/16	8.1/16	10.13/16	4.13/32
11	5	10.13/16	8.1/16	10.13/16	4.7/16
11	5.1/2	10.13/16	8.1/16	10.13/16	4.7/16
11	6.5/8	10.13/16	8.1/16	-	-
11	7	10.13/16	8.1/16	10.13/16	4.15/32
11	7.5/8	10.13/16	8.1/16	10.13/16	4.13/16
11	8.5/8	10.13/16	8.1/16	-	-
13.5/8	5.1/2	13.7/16	8.1/16	13.7/16	4.13/16
13.5/8	7	13.7/16	8.1/16	13.7/16	4.3/16
13.5/8	7.5/8	13.7/16	8.1/16	13.7/16	4.3/16
13.5/8	8.5/8	13.7/16	8.1/16	13.7/16	4.3/16
13.5/8	9.5/8	13.7/16	8.1/16	13.7/16	4.3/16
13.5/8	10.3/4	13.7/16	8.1/16	13.7/16	4.3/16
16.3/4	9.5/8	16.9/16	9	-	-
16.3/4	10.3/4	16.9/16	9	16.9/16	5.11/16
16.3/4	11.3/4	16.9/16	9	-	-
20.3/4-21.1/4	10.3/4	20.1/16	9	-	-
20.3/4-21.1/4	13.3/8	20.1/16	9	20.1/16	5.11/16
20.3/4-21.1/4	16.3/4	20.1/16	9	-	-

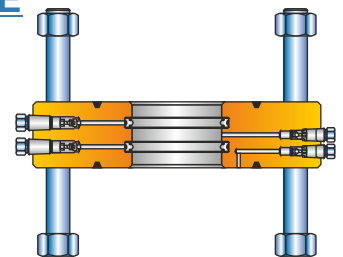
When ordering Casing Hangers, specify the following:

- A. ACT Model, B. ACT Casing Head/Spool Type, C. Top Flange or Clamp-Hub Size, D. Casing Size, E. Casing Weight, F. Casing Grade, G. API 6A Requirements - 1. PSL, 2. Temperature Class, 3. Material Class, 4. With or without monogram

NOTE: Type C-21 casing hanger cannot be used in casing heads or spools that have lockdown screws.

DOUBLE STUDDED PACKOFF FLANGE

Double Studded Packoff Flange, provides double "P" or "FS" seal for sealing the casing. The double studded packoff flange is also used as an intermediate crossover flange when a restricted area is used in the smaller diameter top groove. When a crossover is used, the top connection can be exposed to a higher pressure than the original rated working pressure. The double moulded elastomer P seals are energized by injecting the high pressure grease / plastic packing.



TUBING HEADS

Description: The tubing head is the top spool on a surface wellhead assembly. It is installed after the last casing string to provide a load shoulder to support the tubing string and a seal bore for the tubing hanger or production casing/tubing annulus seal. When the well is completed, the tree is installed on top of the tubing head with a tubing head adapter.

Functions:

- Provide a load shoulder inside the head to support tubing hangers and packoffs
- Provide a controlled bore against which the hanger or packoff can seal
- Provide for a secondary annulus seal around the top of the previous casing string. (See Bottom-Bowl Packoffs in this section.)
- Provide access to the annulus between the tubing string and the production casing
- Provide a means to support and test BOP's while completing the well

Type TC-Series Tubing Heads

ACT type TC-Series tubing heads have a straight-bore profile which is compatible with all ACT single and multiple-string tubing hangers and packoffs. These heads are available in four basic styles, the only functional difference between the styles is the number and type of aligning pins, which are used to align multiple-string or specialty tubing hangers.

Features:

- Has a straight-bore design compatible with all type TC-Series tubing hangers
- All type TC-Series tubing heads with a 9-inch or larger top flange also accept type C-29 casing hanger for casing completions
- Valve removal (VR) threads are standard on all flanged or studded outlets
- Line pipe threaded, flanged and studded flange outlets are also available

Benefits:

- "Wedge locking" of bowl protector, BOP test plugs and tubing hangers is eliminated
- Seal bore is less likely to be damaged during drilling
- Straight bore is more economical to recondition after abandon

Type TCM-ET

The type TCM-ET tubing head has no aligning pins. It is compatible only with single-string type TC series tubing hangers and packoffs. The type TCM can be upgraded to a type TC-60-ET or type TC-ET head by adding the necessary aligning pins at ACT facility.

WHEN ORDERING Tubing Spools, specify the following:

A. ACT Model

B. Bottom Connection: 1. Flanged, studded, 2. Size, 3. Working pressure

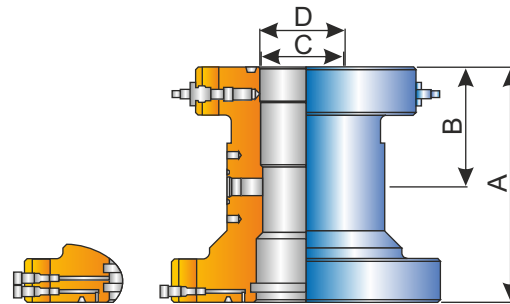
C. Top connection: 1. Flanged, studded, 2. Size, 3. Working pressure

D. Side Outlets: 1. Threaded or studded, 2. Size, 3. Working pressure, 4. Number of aligning pins

E. Service: 1. Regular or H2S

F. Options: 1. Type of secondary seal, 2. Casing sizes

TUBING HEADS



Optional

Tubing Heads

Type TC Series Tubing Heads

Size, Inch	Bottom Flange Working Pressure psi	Size, Inch	Top Flange Working Pressure psi	Outlets	Dimensions, Inch			
					A	B	C	D
9	2,000	7.1/16	2,000	2-in. LPO	20.3/4	11.1/16	6.3/8	7
9	2,000	7.1/16	2,000	2-in. / 2000 FLG	20.3/4	11.1/16	6.3/8	7
9	2,000	7.1/16	3,000	2-in. LPO	20.3/4	11.1/16	6.3/8	7
9	2,000	7.1/16	3,000	2-in. / 5000 FLG	20.3/4	11.1/16	6.3/8	7
9	3,000	7.1/16	3,000	2-in. LPO	21.1/4	11.1/16	6.3/8	7
9	3,000	7.1/16	3,000	2-in. / 5000 FLG	21.1/4	11.1/16	6.3/8	7
9	3,000	7.1/16	5,000	2-in. / 5000 FLG	22.3/8	11.1/16	6.3/8	7
11	2,000	7.1/16	2,000	2-in. LPO	21.1/4	11.1/16	6.3/8	7
11	2,000	7.1/16	2,000	2-in. / 2000 FLG	21.1/4	11.1/16	6.3/8	7
11	2,000	7.1/16	3,000	2-in. LPO	20.3/4	11.1/16	6.3/8	7
11	2,000	7.1/16	3,000	2-in. / 5000 FLG	20.3/4	11.1/16	6.3/8	7
11	3,000	7.1/16	3,000	2-in. LPO	20.7/8	11.1/16	6.3/8	7
11	3,000	7.1/16	3,000	2-in. / 5000 FLG	20.7/8	11.1/16	6.3/8	7
11	5,000	7.1/16	5,000	2-in. / 5000 FLG	24.7/16	11.1/16	6.3/8	7
11	5,000	7.1/16	10,000	2.1/16/10,000 FLG	26.1/2	14.5/8	6.3/8	7
11	10,000	7.1/16	10,000	2.1/16/10,000 FLG	26.7/16	12.3/4	6.3/8	7
11	10,000	7.1/16	15,000	2.1/16/10,000 FLG	26.1/2	12.13/16	6.3/8	7
11	3,000	9	3,000	2-in. / 5000 FLG	22.3/8	11.3/4	8.1/4	8.1/4
11	3,000	9	5,000	2-in. / 5000 FLG	23.1/4	11.5/8	8.1/4	8.3/4
11	5,000	9	10,000	2.1/16/10,000 FLG	24.1/4	13.3/8	8.1/4	8.3/4
11	10,000	9	10,000	2.1/16/10,000 FLG	28	14	8.1/4	8.3/4
13.5/8	2,000	7.1/16	2,000	2-in. LPO	20.3/4	11.1/16	6.3/8	7
13.5/8	2,000	7.1/16	2,000	2-in. / 2000 FLG	20.3/4	11.1/16	6.3/8	7
13.5/8	2,000	7.1/16	3,000	2-in. LPO	20.3/4	11.1/16	6.3/8	7
13.5/8	2,000	7.1/16	3,000	2-in. / 5000 FLG	20.3/4	11.1/16	6.3/8	7
13.5/8	3,000	7.1/16	3,000	2-in. LPO	24.3/8	11.1/16	6.3/8	7
13.5/8	3,000	7.1/16	3,000	2-in. 75000 FLG	24.1/8	11.1/16	6.3/8	7
13.5/8	3,000	7.1/16	5,000	2-in. LPO	24.1/4	11.1/16	6.3/8	7
13.5/8	3,000	7.1/16	5,000	2-in. / 5000 FLG	24.1/4	11.1/16	6.3/8	7
13.5/8	2,000	9	2,000	2-in. LPO	23.5/8	12.1/16	8.1/4	8.3/4
13.5/8	2,000	9	2,000	2-in. / 2000 FLG	23.5/8	12.1/16	8.1/4	8.3/4
13.5/8	2,000	9	3,000	2-in. LPO	23.5/8	12.1/16	8.1/4	8.3/4
13.5/8	2,000	9	3,000	2-in. / 5000 FLG	23.5/8	12.1/16	8.1/4	8.3/4
13.5/8	3,000	9	3,000	2-in. LPO	23.5/8	12.1/16	8.1/4	8.3/4
13.5/8	3,000	9	3,000	2-in. / 5000 FLG	23.5/8	12.1/16	8.1/4	8.3/4
13.5/8	3,000	9	5,000	2-in. LPO	23.5/8	12.1/16	8.1/4	8.3/4
13.5/8	3,000	9	5,000	2-in. / 75000 FLG	23.5/8	12.1/16	8.1/4	8.3/4
13.5/8	3,000	11	5,000	2-in. / 75000 FLG	23.5/8	12.1/2	9	10.7/8
13.5/8	5,000	11	10,000	2.1/16/10,000 FLG	27.1/16	14.3/4	9	10.7/8
13.5/8	5,000	11	10,000	2.1/16/10,000 FLG	27.1/16	14.3/4	9	10.7/8

*2,000 psi = 138 bar, 3,000 psi = 207 bar, 5,000 psi = 345 bar, 10,000 psi = 690 bar, 15,000 psi = 1035 bar

TCM-ET: The TCM-ET tubing head has no aligning pins. It is compatible only with single-string TC-Series tubing hangers and packoffs. The TCM can be upgraded to a TC-60-ET or TC-ET head by adding the necessary aligning pins at ACT facility.

TUBING HANGERS

Tubing hangers are installed in the top bowl of a tubing head. Tubing hangers both suspend tubing and provide a primary annulus seal between the tubing and production casing. Hangers are run through the blowout preventers and are landed in the top bowl of the tubing head. Tubing hangers also act as a means to access and manipulate additional smaller tubing lines that are utilized downhole and extended to the surface on the outside of the tubing string or strings.

ACT Surface Wellhead type TC-Series tubing hangers are available for any type of single- or multiple-string tubing completion, including those requiring packers, subsurface safety valves, gas-lift valves and electric submersible pumps. All ACT Surface Wellhead hangers can be run through the blowout preventers, allowing the well to be secured before the preventers are removed. Most type TC-Series tubing hangers accept a back-pressure valve, which seals the tubing bore. Some hangers are ported for hydraulic control lines, downhole safety valves or other equipment as required by the customer.

Type TC-1A

The type TC-1A is a threaded tubing hanger with an integral compression-type annulus seal which is actuated by string weight and or by lockdown screws. This hanger is also known as a threaded mandrel-type hanger.

Features and Benefits

- Extended-seal neck with interference-type seals isolates the tubing head/adapter connection from well pressure and provides for control-line porting if required.
- ACT Surface Wellhead back-pressure valve preparation is standard.
- Interference-type annulus seals instead of compression-type for 5,000 psi working pressure or below.
- Has porting for SCSSV control lines, chemical injection, etc.

Type TC-1A with metal to metal seal

Type TC-1A is a threaded mandrel-type tubing hanger with an Externally Energized Metal annular seal energized with lockdown screws. The extended neck of the tubing hanger assembly is sealed at the top by the ACT Straight-Bore Metal Seal (SBMS), completing the full metal seal capability. This hanger is available with an external ACME landing thread or with internal landing thread.

Features and Benefits

- Continuous SCSSV control and or inhibitor line; eliminates interruptions in the line and requires neither elastomer seals nor hanger orientation.
- Provides back-pressure valve preparation.
- Has elastomer annular seal.

Type TC ESP

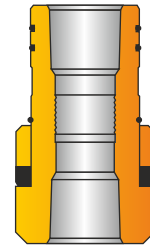
Type TC ESP hanger is dual-ported, with one port designed to accept a single production tubing string. The second port is designed to accommodate the electrical conductors that pass the current between the surface cable and the subsurface cable that goes to the pump. Type TC ESP hanger is designed for 7 1/16"- 3,000/5,000 and 11"- 3,000/5,000 flange sizes. We standardized on EUE thread configurations. Additional thread profiles and different configurations can be supplied. While configurations and designs may differ with customer requirements, the basic design concepts stay the same.

Multiple-String Tubing Hangers and Packoffs

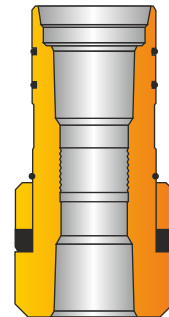
Type TC-Series multiple-string hangers and packoffs permit the independent suspension and sealing of multiple-tubing strings, allowing simultaneous production or injection to or from separate zones. They require one or two aligning pins in the tubing head bowl and are compatible with type TC.

Type TC-2C Dual Completion

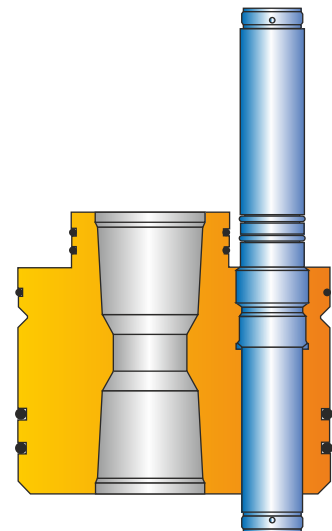
- Has threaded, coupling-type multi string hanger.
- Allows tubing strings to be run separately or simultaneously; tubing can be rotated to manipulate packers.
- Each accepts a back-pressure valve.
- Annulus and sleeve seals are interference-type.
- Tubing head must have the single aligning pin.



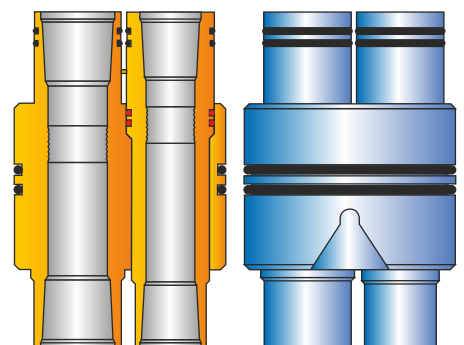
Type TC-1A



Type TC-1A With Metal To Metal Seal



Type TC ESP



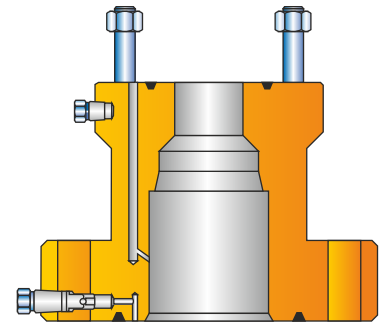
Type TC-2C Dual Completion

TUBING HEAD ADAPTERS

The tubing head adapter provides a transition between the Christmas tree and the tubing head. The bottom adapter connection matches the tubing head and the top adapter connection matches the tree. Tubing head adapters are available for all types of single- and multiple-string completions, including those using electric submersible pumps, packers, downhole control valves and gas lift valves. These adapters come with threaded, flanged or studded-flanged top connections. Most tubing head adapters are available with hydraulic supply inlets for downhole control lines. If the customer requires, ACT also supplies various types of adapters that will accommodate continuous control-line capabilities.

Basic Tubing Head Adapters

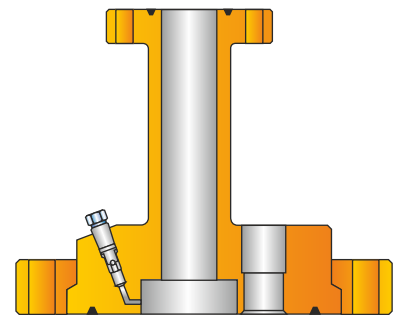
These are used with type TC-1A tubing hanger to provide transition between the tubing head and the tree. These adapters do not hang the tubing or provide a controlled seal bore. Basic tubing head adapters have a smooth seal bore and are used when tubing is suspended from the tubing hanger. They are designed for low-pressure completions where downhole line or tubing strings manipulation are not required. The basic adapter is normally installed with the tree after tubing is run.



Basic Tubing Head Adapters

ESP Tubing Head Adapters

ESP tubing head adapters have seal bores to accommodate both a tubing hanger neck seal and an electrical power feed-thru device. Standard ESP tubing head adapters are equipped with rotating flanges to mate to the tubing head, minimizing concerns over alignment issues. Positive alignment can be obtained through the use of optional features in the mating ESP hanger. ESP tubing head adapters can be supplied to match standard tubing heads rated to 3,000 and 5,000 psi working pressure.



ESP Tubing Head Adapters

Features and Benefits

- Provides sealing bore for a variety of electrical feed-thru configurations, including penetrators, cable packoffs and continuous feed-thru penetrator mandrels.
- Provides reliable seal bores for tubing hanger neck or seal sleeves.
- Provides rotating attachment flange for ease of alignment to ESP hanger and tubing head flange.

SEALS

Type 'FS' Seals (Secondary Seals)

Type FS Casing & Tubing Seal has been developed for arduous duties where there are large clearances between mating parts of wellhead and associated assemblies. It has been tested in accordance with API requirements for use on surface wellhead to casing systems, where the seal can readily replace metal end cap and plastic pack sealing arrangement.

Operating features :

The combination of design, materials and construction ensures that high-performance and retain their sealing integrity under adverse conditions, including:

- Stab-in operations
- Chemically aggressive and highly abrasive oilfield media.

Type 'P' Seals (Secondary Seals)

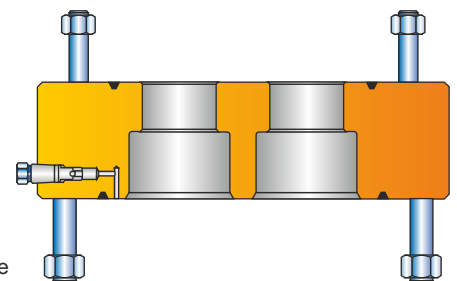
Type P-Seal is an elastomer seal comprised of an injectable, formed seal ring flanked by two anti-extrusion rings. A single seal is recommended for pressures up to 5,000 psi. Used in a double seal configuration, and depending on the size of the seal, the Double P seal can be rated up to 15,000 psi. This easy to install, reliable, and field-proven design is one of ACT's standard, integral, elastomer seals offered with conventional equipment.

Typical applications: Used in casing and tubing heads to seal rough casing and production tubing.

Specifications: Type P-Seals have been tested in accordance with API 6A specification.

Features :

- Metal anti-extrusion rings on each side:
Protect the seal from high pressure loads
Hold the ring in position for easy installation over casing
- Bidirectional seal



Dual Seal Bore Tubing Head Adapters



**Type 'FS' Seals
(Secondary Seals)**



**Type 'P' Seals
(Secondary Seals)**

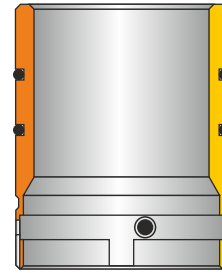
WELLHEAD TOOLS & SERVICE EQUIPMENT

Wear Bushing

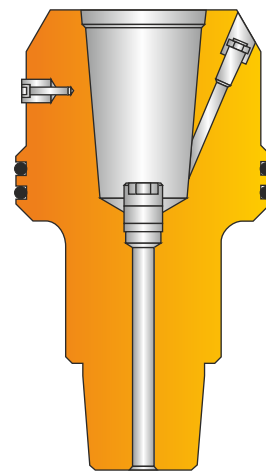
These Retrievable Wear Bushings protect the inner containers of Casing Head Bodies or Spools during drilling operations.

Wear Bushings used as below:

- 1) To hold down screw provision on the top flange of the CH/CHS body. It is called as hold down screw type design on top flange of CH/CHS.
- 2) To hold down screw provision on the separate flange which will be installed over body of CH/CHS. It is called as locking flange type design.
- 3) To provide O-Ring on the wear bushing. It is called as O-Ring type design.



Wear Bushing



Combination Tool (Wear Bushing Running / Retrieving Tool and BOP Test Plug)

Combination tool (Wear Bushing Running / Retrieving Tool and BOP Test Plug)

Combination tool runs with pin conn. to install or retrieve wear bushing.

It runs with pin down to seal against ID of bowl for pressure test-up of BOP Stack or Manifold.

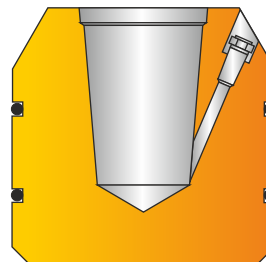
Drill pipe can be suspended below the test plug, eliminating need to trip all pipe out of the hole.

Runs on drill pipe.

BOP Test Plug (PTP)

Runs with drill pipe or tubing.

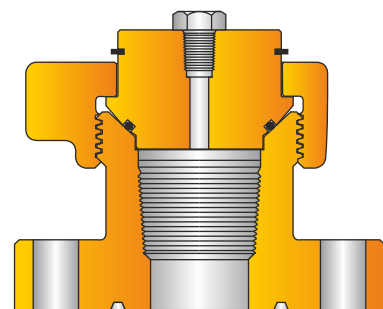
Lands and seals in bowl of casing heads, casing spools & tubing heads.



BOP Test Plug (PTP)

ACT X-Mas Tree Cap

It is a top connector, which is used on the top of the X-Mas Tree. It's main function is to provide access to the X-Mas Tree bore. It consists of a Flanged body, Blanking Plug, Hammer Nut as principal parts and Circlip & O-ring as secondary parts. Blanking Plug has a provision to accommodate pressure gauge to ascertain inside pressure of the well. The inside of the Flanged body has API-UP TBG thread as lift thread.

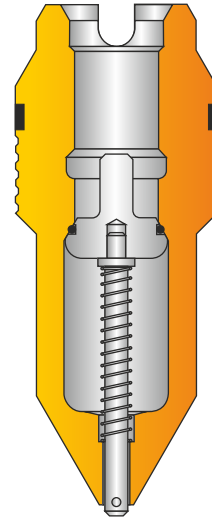


Single Christmas Tree Cap

WELLHEAD TOOLS & SERVICE EQUIPMENT

Back Pressure Valve (BPV)

ACT type 'H' Back Pressure Valve are used extensively in ACT Hangers to safety seal off well pressure during removal of the blowout preventer and installation of christmas tree. Fluid may be circulated down the tubing through the Back Pressure Valve with assurance of automatic reclosure against the tubing hanger is to be pressure tested.



Back Pressure Valve (BPV)

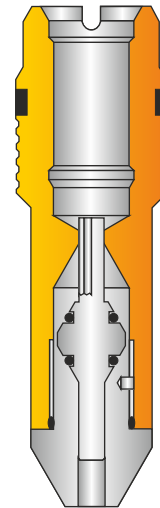
Two Way Check Valve (TWCV)

Two way Check Valve may be landed in the tubing hanger. These are available up to 20,000 PSI in materials to resist sulfide stress cracking and other hostile environment encountered in oil and gas production.

The ACT special shallow threads on type 'H' Back Pressure Valves and plugs provide strength for extreme pressures and long service life with minimum reduction in bore through the threaded portion of the tubing hanger.

ACT tubing hangers threaded for type 'H' valves will pass API drift for the size of tubing suspended.

Removal or Installation of type 'H' valves through installed tree assemblies may be accomplished quickly and safely against full well pressure eliminating the need for downhole plugs or killing the well.



Two Way Check Valve (TWCV)

DIMENSIONAL DATA FOR BACK PRESSURE VALVE & TWO WAY CHECK VALVE							
TYPE 'H' BACK PRESSURE VALVE PLUG AND CHECK VALVE				TUBING HANGER		X MAS TREE	
NOMINAL SIZE	MAX. O.D.	PART NUMBERS		TUBING O.D.	MIN. BORE BPV THRDS.	MIN. VERTICAL BORE	X MAS TREE MIN. DRIFT DIA.
		BACK PRESSURE VALVE	TWO - WAY CHECK VALVE				
1.1/4"	1.356"	BPV-1255-00	TWCV-1255-00	1.660"	1.286"	-	-
1.1/2"	1.605"	BPV-1505-00	TWCV-1505-00	1.900"	1.525"	1.5/8"	1.610"
1.3/4"	1.775"	BPV-1755-00	TWCV-1755-00	2.1/16"	1.695"	1.13/16"	1.795"
2.0"	2.020"	BPV-2005-00	TWCV-2005-00	2.3/8"	1.940"	2.1/16"	2.030"
2.1/2"	2.485"	BPV-2505-00	TWCV-2505-00	2.7/8"	2.405"	2.9/16"	2.500"
3.0"	3.030"	BPV-3005-00	TWCV-3005-00	3.1/2"	2.950"	3.1/8"	3.060"
3.1/2"	3.530"	BPV-3505-00	TWCV-3505-00	4.0"	3.450"	4.1/16"	3.580"
4.0"	3.980"	BPV-4005-00	TWCV-4005-00	4.1/2"	3.900	4.1/16"	4.020"

WELLHEAD TOOLS & SERVICE EQUIPMENT



Lubricator (PL)

ACT's Lubricators which connect directly to the top of an X-Mas tree above the master valve are available in various sizes and end connections and pressure ratings varying from 5,000 to 20,000 PSI both for standard and sour service.

Operating a Lubricator is by far the most dangerous aspect of well head service work. Therefore extreme caution has to be exercised while operating this tool.

Measurement of rod travel is done as follows:

- a. Measure from the tie down piece on the Tubing Head to the tree cap
- Or
- b. Measure from the top of the Tubing Head Adaptor bottom flange to the tree cap on a hanger bushing completion

In each case, the window section of the lubricator must also be measured. This will ensure that the proper length of the rod will be used. Most lubricator rods are marked in 5 such increments:

a. Needle Valve A

Valve located in Manifold Bypass assembly closest to adapter flange.

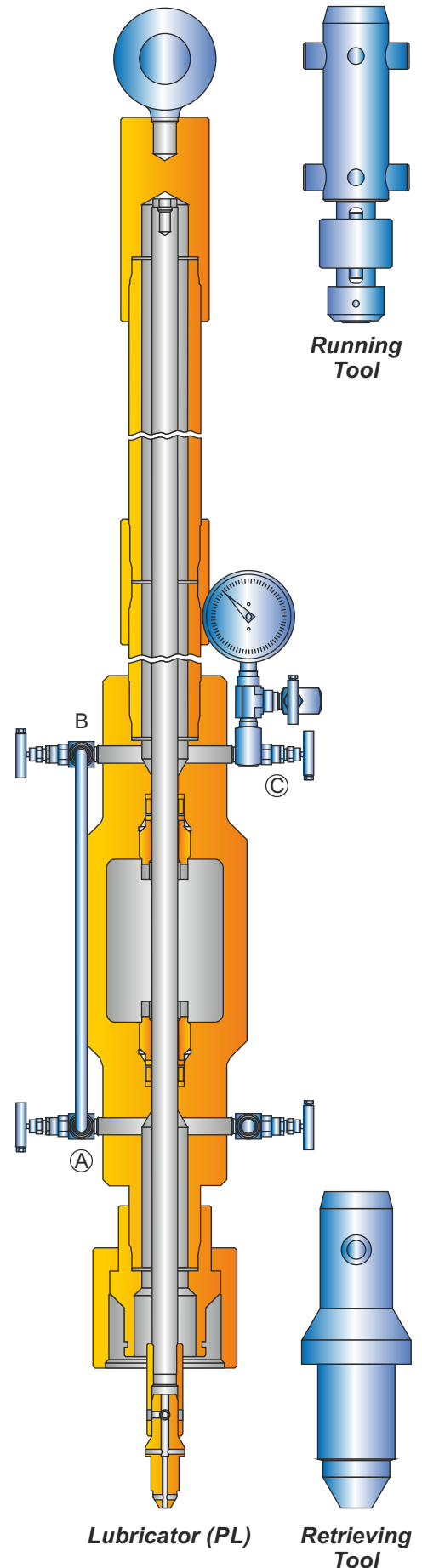
b. Needle Valve B

Valve located on Manifold Bypass assembly closest to the first UNION connection.

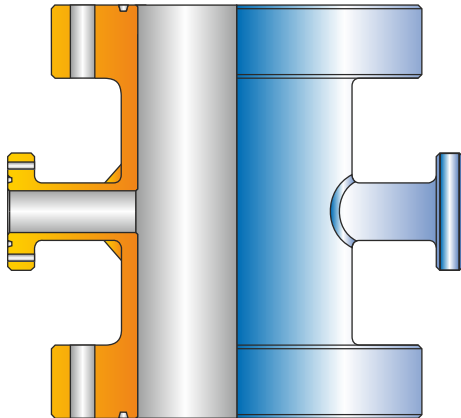
(NOTE: In lubricators upto 5,000 PSI, needle valve B is also used as a bleed down valve. Needle valve C is used in 10,000, 15,000 & 20,000 PSI lubricators to equalize pressure throughout the tool and not as bleed down valves.)

c. Needle Valve C

It is the only valve with a pressure gauge attached. Available in 10,000, 15,000 & 20,000 PSI lubricators.



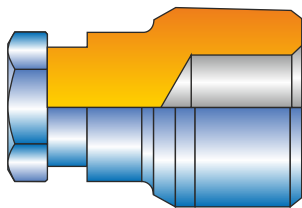
WELLHEAD TOOLS & SERVICE EQUIPMENT



Flanged Drilling Spool (PFDS)

Flanged Drilling Spool (PFDS)

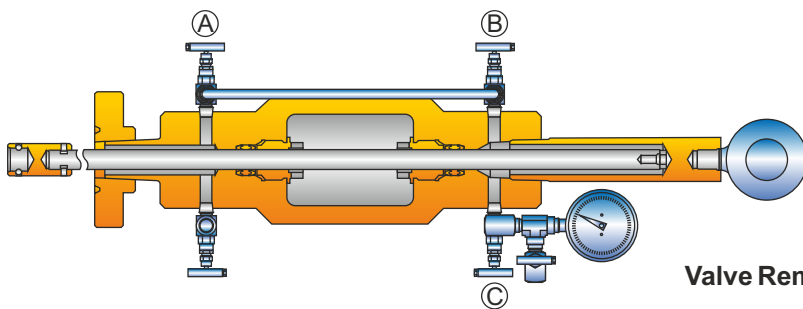
These are designed to allow unrestricted circulation of mud in the well and provide flexibility in arranging flow line openings in blowout preventor hookups. Studded or open faced ends and outlet connections can be provided. Generally hub of the flanged outlet is welded. Height of spool will vary from 24" -36". However spools as per specific need of customers can also be provided.



Valve Removal Plug (PVRP)

Valve Removal Plugs (PVRP)

All flanged or studded outlets on ACT's casing heads, casing spools and tubing heads are threaded for valve removal plugs. All plugs have standard API Line Pipe Threads and are small enough to pass thru the valve to be removed. The plug is installed when the valve is to be removed.



Valve Removal Lubricator (PVRL)

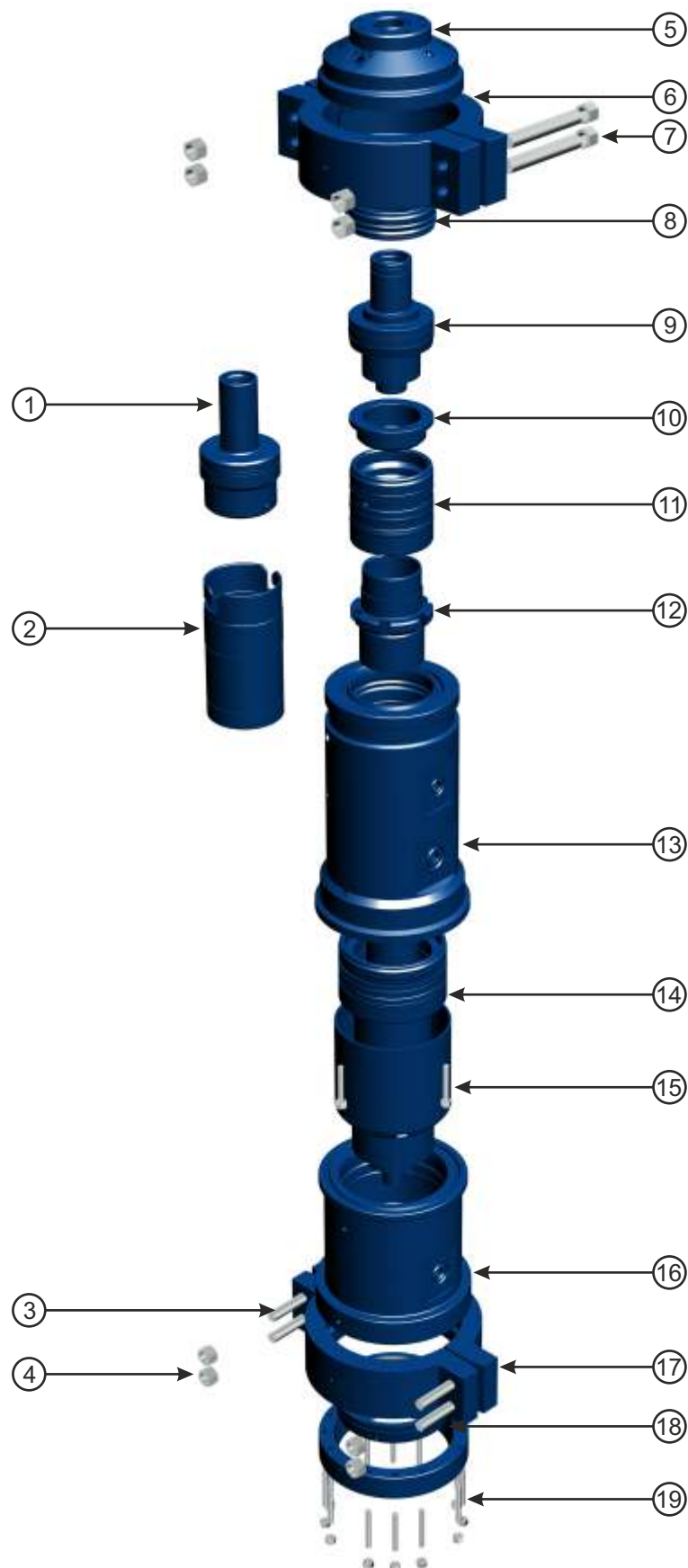
Valve Removal Lubricator (PVRL)

These are generally pressure-balanced manual hydraulic tool designed for safe and reliable operations in the installation and removal of valve removal plugs, in order to install or replace a well-head outlet valve under pressure conditions.

This tool is also designed to accommodate 2 1/16", 2 9/16", 3 1/8" Valve upto 10,000 PSI WP. Adapter may be provided for use with 1 13/16", 2 1/16", 2 9/16", 3 1/8" flanged valves and screwed end valves. Various sizes of valve removal plug sockets are also provided for the respective sizes of plugs.

In the figure, Needle Valve 'A' is located on Manifold Bypass assembly and needle valve 'B' is connected to 1/2" NPT TEE on far end of Manifold Bypass assembly. Needle Valve 'C' is a bleeder valve located near pressure gauge.

UNITIZED WELLHEAD ASSEMBLY



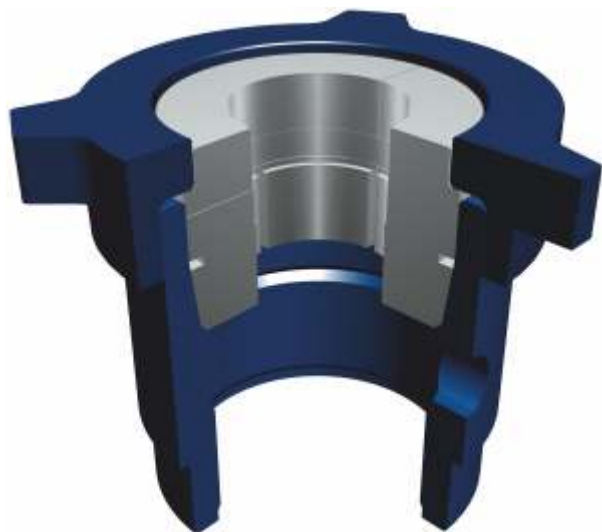
UNITIZED WELLHEAD ASSEMBLY

1. **Test Plug / Running & Retrieving Tool Of Wear Bushing (Combination Tool)** – Drill pipe tool runs and retrieves nominal bore protector and all wear bushings within a given wellhead size. Tests the BOP stack with or without wear bushings installed. Cup tester accessories allow tool to test the seal assembly and BOP stack with wear bushing installed.
2. **Wear Bushing (Bore Protector)** – The ACT Wear Bushing / Bore Protector protects the wellhead ID during the drilling operation. The Bore Protector is retained into the wellhead and starter head with a friction bind O-ring seal. The Wear Bushing is rest on bowl chamfer. Tool has J-Slot provision to engage running tool.
3. **Clamp Bolts**
4. **Nuts**
5. **Tubing Head Adapter / Bonnet** – The ACT Tubing Head Adapter / Bonnet provides the connection point for the Christmas Tree. It is available in several types to fit specific applications.
6. **Clamp**
7. **Clamp Bolts and Nuts**
8. **Tubing Hanger Pack-Off Assembly**
9. **Tubing Hanger** – The ACT Tubing Hanger can be installed on the top of the production casing hanger or can be rested on support ring. The Tubing Hanger accommodates either single-string or multi-string tubing completions.
10. **Support Ring**
11. **Mandrel Casing Hanger Pack-Off Assembly** – The ACT Pack-Off seal Assembly incorporates a metal-to-metal sealing for Wellhead. Metal-to-metal seals located on the seal assembly ID and OD are driven over a radial surface to energize the annulus seal. Each seal assembly has two sealing systems and to allow testing of the annulus seal from top end thread to engaged running tool.
12. **Mandrel Casing Hanger**
13. **Multibowl Head** – The wellhead provides a means of suspending and sealing multiple strings of casing and tubing inside a single wellhead using mandrel hangers. The spool is available with studded outlets.
14. **Mandrel Casing Hanger Pack-Off Assembly**
15. **Mandrel Casing Hanger** – The ACT Unitized Wellhead Systems utilize mandrel type casing hangers. These casing hangers for landing, sealing and locking casing hangers to the wellhead. These operation are performed through the BOP stack. Casing hanger has the thread provision on tool run and retrieve the running tool.
16. **Casing Head** – The ACT Wellhead System is available in a single or multiple BOP stack configuration. Casing Heads are designed to configuration. Casing Heads are designed to provide technical and operational flexibility without sacrificing the pressure-containing or load-carrying of the system.
17. **Clamp**
18. **Slips**
19. **Studs & Nuts**

CASING PROGRAM	TOP CONNECTION (FLANGE / HUB CLAMP)	BOTTOM CONNECTION (SOW / THRD / SLIP LOCK)
20" x 13.3/8" x 9.58"	13.5/8" - 10,000 psi	20" - 3,000 psi
13.3/8" x 9.5/8" x 5.1/2"	13.5/8" - 10,000 psi	13.3/8" - 3K / 5K
13.3/8" x 9.5/8" x 7"	13.5/8" - 10,000 psi	13.3/8" x 3K / 5K

- Other sizes are available on request.

CASING HEAD FOR CBM WELLS

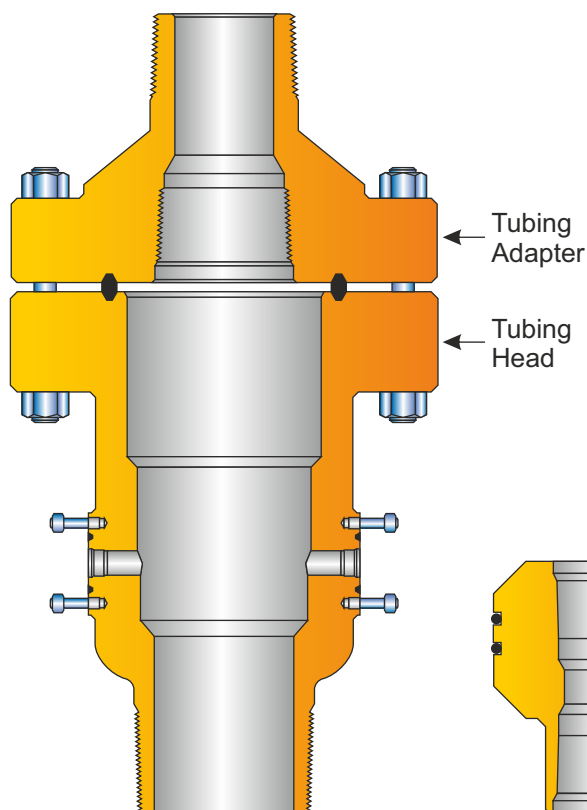


Coal bed methane (CBM), coal seam gas ((CSG) or coal mine methane (CMM) is a form of natural gas extracted from coal beds. It is generally sweet but may contain a few percent of carbon dioxide.

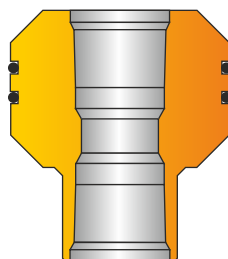
ACT manufacture and supply surface well heads and other surface equipment for the extraction of CBM. The ACT Casing Head is made from steel and uses three packing rings. These heads are suited for wells with working pressure up to 2000 PSI and allow string suspensions, with all sizes being full opening.

CASING HEAD SPECIFICATION				
CASING HEAD	7"	8.5/8"	9.5/8"	10.3/4"
WORKING PRESSURE	2,000 psi			
INNER STRING	4.1/2" - 5.1/2"	4.1/2" - 7"		4.1/2" - 8.5/8"
BOTTOM CASING THREAD	LTC / STC / BTC			
BORE (MAX.)	6.538"	8"	9"	10"
SIDE OUTLET SIZE	2" - LP / 2.1/16" - 10,000 psi Studded Flange			
SUSPENSION	Slip / Mandrel			
MATERIAL	Carbon Steel / Low Alloy Steel			

TUBING HEAD FOR CBM WELLS



The ACT Tubing Head is made from steel and uses tubing hanger w/o-rings, & top end tubing adapter. These heads are suited for wells with working pressure up to 5000 PSI and allow string suspensions, with all sizes being full opening.



Tubing Hanger

TUBING HEAD SPECIFICATION			
BOTTOM THREAD	4.1/2" LTC / BTC / STC	5.1/2" LTC / BTC / STC	7" LTC / BTC / STC
BOTTOM CONNECTION	Female / SOW / Male		
WORKING PRESSURE	2,000, 3,000 or 5,000 psi		
INNER STRING	2.1/16", 2.3/8" & 2.7/8"	2.1/6", 2.3/8", 2.7/8" & 3.1/2"	2.1/16", 2.3/8", 2.7/8" & 3.1/2"
SUSPENSION	Thread / Slips / Mandrel		
SIDE OUTLET SIZE	2" LP / 2.1/16" - 2,000 / 3,000 / 5,000 Studded Flange		
BORE. (MAX.)	4.090"	5.012"	6.538"
MATERIAL	Carbon Steel / Low Alloy Steel		

EXPANDING STYLE GATE VALVE

EXPANDING STYLE GATE VALVE

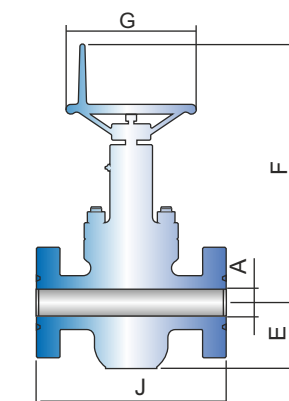
ACT manufactured Gate Valves required for drilling and production operation.

ACT EXPANDING GATE VALVE MODEL 'M':

EXPANDING STYLE GATE VALVES FOR 2000-5000 PSI. WP. APPLICATION

- Full bore through conduit
- Block and Bleed Mechanism
- Long-life seat
- Positive Seal by Expand Mechanism
- In-line maintenance
- Non- Rising and Non- Balanced Stem
- Thrust bearing for the low torque operation

FLANGED GATE VALVES OVERALL DIMENSIONS (As per API-6A Standard)								
Size	Working Pressure (PSI)	A	E	F	G	J	N	Wt (lbsf)
2 1/16	2000	2 1/16	4 13/16	19 1/4	11	11 5/8	13	91
	3000/5000		5 1/16	19 7/16	13	14 5/8		150
2 9/16	2000	2 9/16	5 5/8	20 3/16	13	13 1/8	15 1/2	125
	3000/5000		5 15/16	20 7/16	16	16 5/8		205
3 1/8	2000	3 1/8	6 15/16	22 1/2	13	14 1/8	20	181
	3000		7 5/16	22 3/4	16	17 1/8		265
	5000		7 5/16	22 3/4	16	18 5/8		296
4 1/16	2000	4 1/16	8 5/8	25 15/16	16	17 1/8	24 1/2	345
	3000		9 1/16	26 3/8	20	20 1/8		515
	5000		9 1/16	26 3/8	20	21 5/8		530
5 1/8"	2000	5 1/8	11 1/4		19 1/2	22 1/8	30 1/4	965
	3000		11 1/2	28	24	24 1/8		990
	5000		11 3/4		24	28 5/8		1056
7 1/16"	5000	7 1/16	14	29	24	32	-	1342



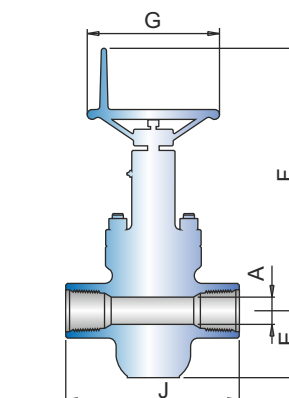
Flanged Gate Valves (Model - M)

ACT FLANGED GATE VALVE MODEL 'M':

The ACT Flanged End Gate Valves are of the same standards as threaded end valves.

Flanged end will conform to API-6A Spec . For Trims refer Trim Chart .

THREADED GATE VALVES OVERALL DIMENSIONS								
Size	Working Pressure (PSI)	A	E	F	G	J	N	Wt (lbsf)
2 1/16	2000	2 1/16	4 13/16	19 1/4	11	9 5/8	13	71
	3000/5000		5 1/16	19 7/16	13			99
2 9/16	2000	2 9/16	5 5/8	20 3/16	13	10 1/4	15 1/2	92
	3000/5000		5 15/16	20 7/16	16			125
3 1/8	2000	3 1/8	6 15/16	22 1/2	13	11 3/8	20	152
	3000/5000		7 5/16	22 3/4	16			195
4 1/16	2000	4 1/16	8 5/8	25 15/16	16	13	24 1/2	265
	3000/5000		9 1/16	26 3/8	20			379



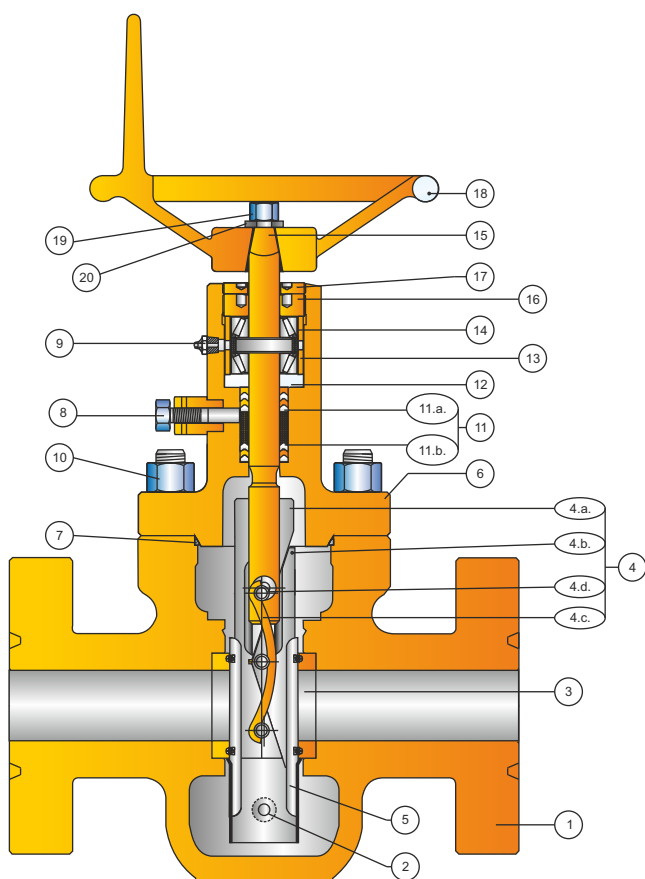
Threaded Gate Valves (Model - M)

NOTE:

Standard Temperature Rating: -20° F to +250° F N = Numbers of Turns open.

All Dimensions are in Inches.

EXPANDING STYLE GATE VALVE



Expanding Gate Valve (Model - M)

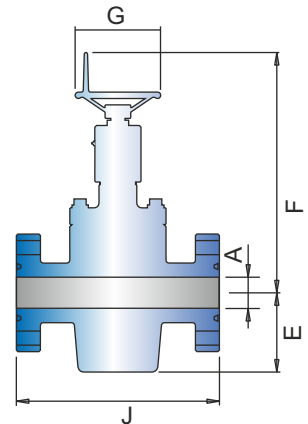
Part List Flanged Gate Valve (Model - M)		
ITEM	DESCRIPTION	Qty.
1	BODY	1
2	BODY GREASE FITTING	2
3	SEAT ASSY.	2
3a	SEAT	2
3b	TEFLON/T.F.E. RING	2
4	GATE SEGMENT ASSY.	1
4a	GATE	1
4b	SEGMENT	1
4c	SPRING	2
4d	GATE PIN	6
5	GATE GUIDE	2
6	BONNET	1
7	BONNET SEAL RING	1
8	PACKING FITTING	1
9	BONNET GREASE FITTING	1
10	STUD WITH NUT	8
11	PACKING SET6	
11a	HEADER PACKING RING	2
11b	'V' PACKING RING	4
12	PACKING RETAINER BUSHING	1
13	BEARING SPACER SLEEVE	1
14	THRUST BEARING	2
15	STEM	1
16	BEARING RETAINER NUT	1
17	BEARING RETAINER LOCK NUT	1
18	HANDWHEEL 1	
19	HANDWHEEL NUT	1
20	WASHER FOR HANDWHEEL NUT	1

SLAB STYLE GATE VALVE

SLAB STYLE GATE VALVES FOR 2000-10,000 PSI W.P. APPLICATION

Main features:

- Full bore through conduit
- Block and Bleed Mechanism
- Floating seat with self relief function
- In-line maintenance
- Metal to Metal sealing
- Metal to Metal stem back seat
- Heavy duty bearing for low torque and easy operation
- Non-Rising and Non-Balanced Stem
- Forged Body and Bonnet Construction



Slab Flanged Gate Valve (Model - S)

FLANGED GATE VALVE OVERALL DIMENSIONS (As per API. 6A Standard)								
Size	Working Pressure (PSI)	A	E	F	G	J	N	Wt (lbsf)
2 1/16	2000 3000/5000	2 1/16	5 5/8	21 1/8	14	11 5/8 14 5/8	12 1/2	110 182
2 9/16	2000 3000/5000	2 9/16	6 1/2	21 7/8	14	13 1/8 16 5/8	15 1/4	137 255
3 1/8	2000 3000 5000	3 1/8	7 3/8	22 13/16	14 14 18 1/2	14 1/8 17 1/8 18 5/8	18 1/4	193 282 360
4 1/16	2000 3000 5000	4 1/16	9 1/8	24 7/16	16 18 1/2	17 1/8 20 1/8 21 5/8	23 1/2	395 450 545
1 13/16	10,000	1 13/16	5 3/4	21 1/8	14	18 1/4	12 1/2	270
2 1/16	10,000	2 1/16	5 7/8	21 1/8	18 1/2	20 1/2	12 1/2	275
2 9/16	10,000	2 9/16	6 13/16	21 7/8	18 1/2	22 1/4	15 1/4	485
3 1/16	10,000	3 1/16	8 1/16	21 13/16	24	24 3/8	18 1/4	680
4 1/16	10,000	4 1/16	10 1/16	24 11/16	24	26 3/8	23 1/2	1050
5.1/8"	5000	5 1/8	11 3/8	33.9	24	28 5/8	-	1350
7.1/16"	5000	7 1/16	15.00	37 5/8	24	32.00	-	-

NOTE:

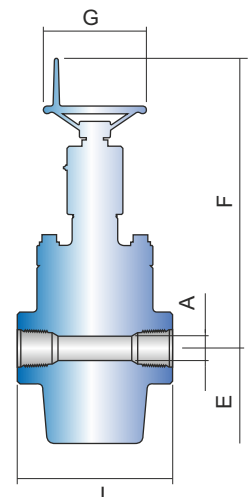
Standard Temperature Rating: - 20° F to + 250° F. N = Numbers of turn open.

THREADED GATE VALVE OVERALL DIMENSIONS								
Size	Working Pressure (PSI)	A	E	F	G	J	N	Wt (lbsf)
2 1/16	3000/5000	2 1/16	5 5/8	21 1/8	14	9 5/8	12 1/2	130
2 9/16	3000/5000	2 9/16	6 1/2	21 7/8	14	10 1/4	15 1/4	190
3 1/8	3000	3 1/8	7 3/8	22 13/16	14	11 3/8	18 1/4	210

NOTE:

Standard Temperature Rating: - 20° F to + 250° F. N = Numbers of turn open.

All Dimensions are in inches.



Slab Threaded Gate Valve (Model - S)

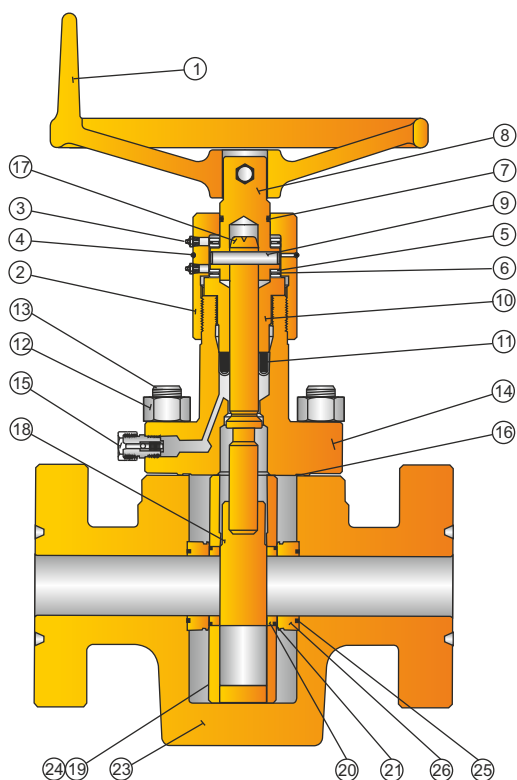
SLAB STYLE GATE VALVE



Flanged Gate Valve



Threaded Gate Valve



Slab Gate Valve (Model - S)

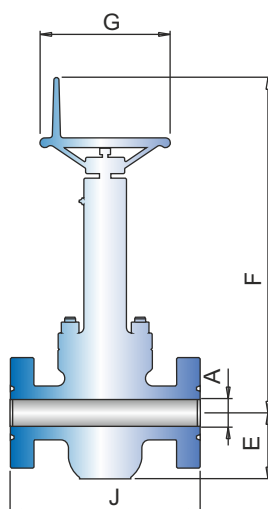
Part List Slab Gate Valve (Model - S)		
ITEM	DESCRIPTION	Qty.
1	HANDWHEEL ASSEMBLY	1
2	BEARING CAP	1
3	GREASE FITTING	2
4	O-RING	1
5	BEARING RACE	4
6	THRUST BEARING	2
7	O-RING	1
8	STEM ADAPTER	1
9	STEM PIN	1
10	PACKING GLAND	1
11	'J' PACKING	1
12	NUT	8
13	STUD	8
14	BONNET	1
15	GREASE FITTING	1
16	GASKET	1
17	STEM	1
18	GATE	1
19	RETAINER PLATE	2
20	SEAT RING	2
21	SEAL RING (SEAT RING)	2
22	PIN (Not shown)	2
23	BODY	1
24	GUIDE	2
25	SEAL RING (BODY BUSHING)	2
26	BODY BUSHING	2
27	NAME PLATE (Not shown)	1

HIGH TEMPERATURE GATE VALVE

ACT High Temperature Service : (Model T)

The ACT High Temperature Gate Valve uses parallel expanding gate to obtain perfect shut off. The sealing is metal - to metal, both on the up and down stream of the valve, and unaffected by vibration and heat. The valve is the standard Model 'E' gate valve, modified with extended bonnet and stem to place the stem packing outside the critical heat zone. Other features and trim chart shall remain the same for model 'E' gate valves.

Pressure Derating Table : (As recommended by API 6A)								
-20 to 250 F	300 F	650 F	400 F	450 F	500 F	550 F	600 F	650 F
2000	1955	1905	1860	1810	1735	1635	1540	1430
3000	2930	2860	2785	2715	2605	2455	2310	2145
5000	4880	4765	4645	4525	4340	4090	3850	3575



DIMENSIONAL DATA FOR HIGH TEMPERATURE VALVE, UPTO 650 F								
Size	Working Pressure	A	E	F	G	J	N	WT IN LBS
2.1/16"	2000	2.1/16	4.13/16	25.1/4"	11	11.5/8	13	96
	3000/5000		5.1/16	25.7/16	13	14.5/8		165
2.9/16	2000	2.9/16	5.5/8	26.3/16	13	13.1/8	15.1/2	130
	3000/5000		5.15/16	26.7/16	16	16.5/8		220
3.1/8	2000	3.1/8	6.15/16	28.1/2	13	14.1/8	20	186
	3000		7.5/16	28.3/4	16	17.1/8		273
	5000		7.5/16	28.3/4	16	18.5/8		311
4.1/16	2000	4.1/8	8.5/8	31.15/16	16	17.1/8	24.1/2	351
	3000		9.1/16	32.3/8	20	20.1/8		523
	5000		9.1/16	32.3/8	20	21.5/8		545

Flange specification conforms to API Standard 6A

SURFACE SAFETY VALVE WITH HYDRAULIC ACTUATOR (SSV)



ACT type actuator is a fail close hydraulic actuator. The actuator is operated by hydraulic pressure applied through a static piston on a translating cylinder. The cylinder actuated by hydraulic pressure, compresses the spring by a upper spring retainer plate and directs the bonnet stem and gate into the open position. Should the hydraulic pressure within cylinder/piston be vented, the spring arrangement ensures an instantaneous valve closure regardless of line pressure.

Spring arrangement, piston & hydraulic cylinder are assembled in a single package enclosed in housing by dual spring plates positioned within a flange and a location shoulder. The actuator assembly is easily removable from the valve for maintenance, actuator replacement or transportation. Hexagonal screws on the lower plate & a threaded connection between the travelling cylinder & stem, keep the actuator connected to the valve.

Only a wrench is required to remove the actuator from the valve.

ESD Control Panels available for actuators upon request.

PNEUMATIC DIAPHRAGM OPERATED GATE VALVE



Pneumatic Diaphragm Gate Valve have less friction, close-open quickly, long life and dependable sealing. It could be a SSV (Surface Safety Valve) with Induction System, driven by compressed air. When fluid pressure in pipeline has some troubles, it will be auto off, and it could auto off main valve while controlling system pressure blabbed. This valve has been installed with the manual pressure relief device, over pressure auto protector and manual operated device.

CHOKE VALVE



H2 TYPE CHOKE VALVE

ACT manufactures both Positive and Adjustable Chokes in pressure rating up to 15,000 PSI WP., with different styles of end connection.

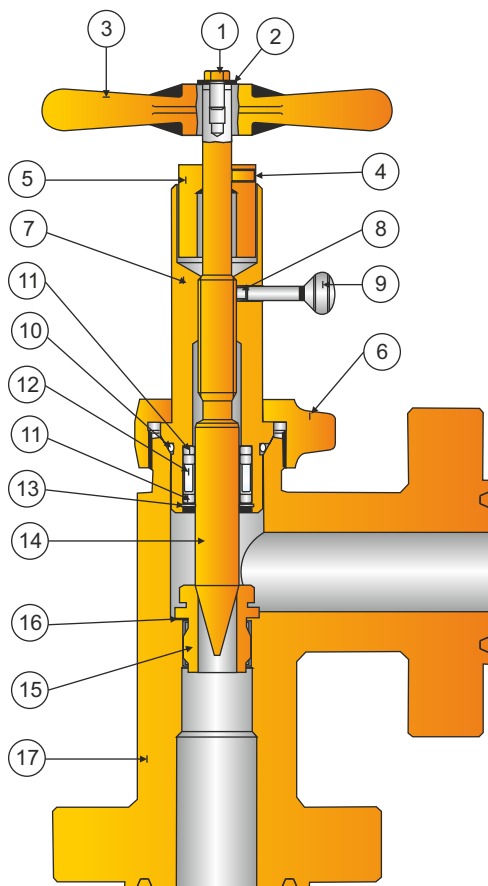
Adjustable Chokes are meant for variable flow. They have externally controlled indicator showing orifice size in the increment of 1/64th inch. The variation in choke size is achieved by rotating hand wheel to obtain desired flow rate at down stream side



ACT Adjustable Chokes contain the following features:

- Interchangeability of parts to construct a positive, adjustable, or combination choke
- Bonnet nut has rugged, integrally forged lugs for hammering nut loose
- Built-in safety feature which releases residual pressure in the choke body before the nut is fully removed. The inside of the choke body is vented to atmosphere after the bonnet nut is partially removed
- Interchangeability of component parts for a particular pressure range. For example, the same blanking plugs and bonnet assemblies are used in nominal 2" 2000 through 10,000 PSI WP.
- Stainless steel adjustable choke needle and seat (Tungsten Carbide/ Ceramic lining needle and seat also available for severe service applications)

Different end connections (API / ANSI, Flanged / Threaded) are available upon request.



Adjustable Choke

Size & WP	Max Orifice Dia
2 1/16 x 2000	25.4 MM
2 9/16 x 2000	50.8 MM
3 1/8 x 2000	50.8 MM
4 1/16 x 2000	76.2 MM
2 1/16 x 3000	25.4 MM
2 9/16 x 3000	50.8 MM
3 1/8 x 3000	50.8 MM
4 1/16 x 3000	76.2 MM
2 1/16 x 5000	25.4 MM
2 9/16 x 5000	50.8 MM
3 1/8 x 5000	50.8 MM
4 1/16 x 5000	76.2 MM
2 1/16 x 10000	25.4 MM
2 9/16 x 10000	50.8 MM
3 1/16 x 10000	50.8 MM
2 1/16 x 15000	25.4 MM
3 1/16 x 15000	50.8 MM

Part List		
ITEM	DESCRIPTION	QTY.
1	HEX BOLT	1
2	WASHER	1
3	HANDLE	1
4	HEX. SOC.	
	SET SOCIETY	1
5	INDICATOR	1
6	BONNET NUT	1
7	BONNET	1
8	NYLON PLUG	1
9	THUMB SCREW	1
10	O-RING - BONNET	1
11	JUNK RING	2
12	'J' PACKING +	
	BACK-UP RING	1
13	INT. RETAINER RING	1
14	NEEDLE	1
15	SEAT	1
16	GASKET	1
17	BODY	1

EXTERNAL SLEEVE CHOKE VALVE

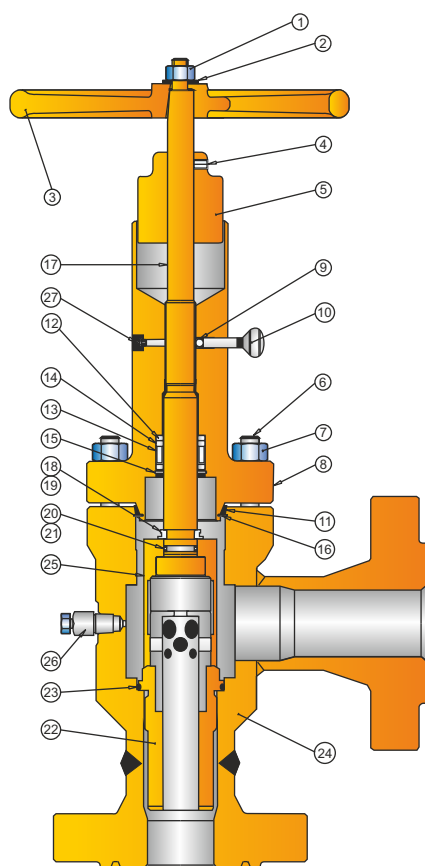


ACT External sleeve control choke, (Model-ES)

ACT External Sleeve Control Chokes minimize erosion and improve flow characteristics suitably for erosive service and under high pressure drop, with sand concentration. It applies the principle of "Flow Impingement" to dissipate and contain the destructive forces of cavitation, within the heavy duty thick walled cage of Tungsten Carbide .

Other features :

- Spring loaded pressure energized stem seal
- Field proven metal bonnet seal
- Dependable positive shut-off



External Sleeve Control Choke

Part List		
ITEM	DESCRIPTION	QTY.
1	HEX NUT	1
2	WASHER	1
3	HANDWHEEL	1
4	HEX, SOC. SET SCREW	1
5	INDICATOR	1
6	STUD	8
7	NUT	8
8	BONNET	1
9	NYLON BALL	1
10	THUMB SCREW	1
11	RING-BONNET	1
12	JUNK RING	2
13	SEAL	1
14	BACK - UP RING - SEAL	1
15	INT. RETAINER RING	1
16	RETAINER RING - COIL TYPE	1
17	STEM	1
18	RING (2 HALVES) - STEM	1
19	INT. RETAINER RING	1
20	O-RING	1
21	BACK-UP RING (SCARF CUT)	1
22	SEAT	1
23	SEAT SEAL	1
24	BODY	1
25	FLOW RING	1
26	BODY VENT FITTING	1
27	GREASE NIPPLE	1
28	RIVET TAG (NOT SHOWN)	4
29	NAME PLATE (NOT SHOWN)	1
30	FLANGE PROTECTOR (NOT SHOWN)	2

Size & WP	Max Orifice Dia
2.1/16 x 2000	25.4 mm
2.9/16 x 2000	50.8 mm
3.1/8 x 2000	50.8 mm
4.1/16 x 2000	76.2 mm
2.1/16 x 3000	25.4 mm
2.9/16 x 3000	50.8 mm
3.1/8 x 3000	50.8 mm
4.1/16 x 3000	76.2 mm
2.1/16 x 5000	25.4 mm
2.9/16 x 5000	50.8 mm
3.1/8 x 5000	50.8 mm
4.1/16 x 5000	76.2 mm
2.1/16 x 10000	25.4 mm
2.9/16 x 10000	50.8 mm
3.1/16 x 10000	50.8 mm
2.1/16 x 15000	25.4 mm
3.1/16 x 15000	50.8 mm

POSITIVE CHOKE VALVE

Positive Chokes & Beans

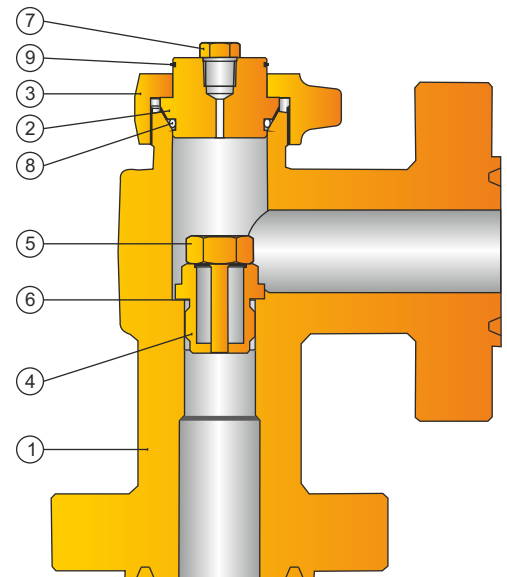
Positive Chokes accommodate fixed orifice dimensions. All ACT Adjustable Chokes can be converted into Positive Chokes by replacing the bonnet assembly with an appropriate blanking plug assembly and choke bean . These are manufactured up to 7", 15,000 PSI with all types of end connections.

CHOKE BEANS:

- ACT Choke Beans are suitably hardened to maintain accuracy level for longer period
- Tungsten Carbide lined Choke Beans are available for high pressure drop and severe application

BEAN WRENCH:

ACT Bean Wrench comes with Hexagonal Socket Box for Bean Adapter and Bean separately. The Adjustable Choke Seat and Bean Adapter are accommodated in same wrench for a particular size .



Positive Choke



Bean Adaptor (HJC Type)



Bean Adaptor Positive (CH Type)



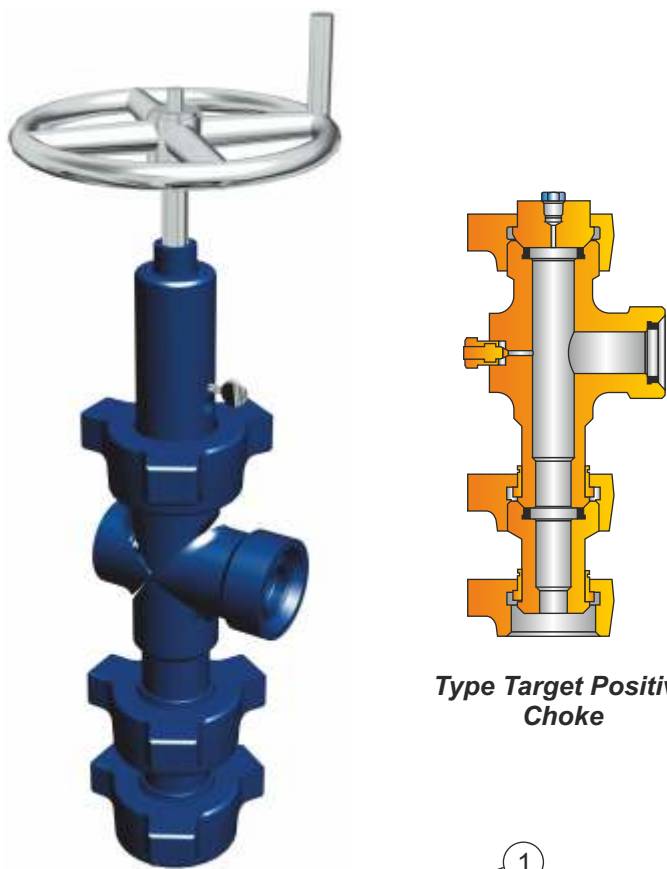
Flow Bean



Choke Bean

Part List		
ITEM	DESCRIPTION	QTY.
1	BODY	1
2	BONNET	1
3	BONNET NUT	1
4	BEAN ADAPTER	1
5	CHOKE BEAN	1
6	GASKET	1
7	PLUG (1/2" NPT)	1
8	O-RING-BONNET	1
9	EXT. RETAINER RING	1

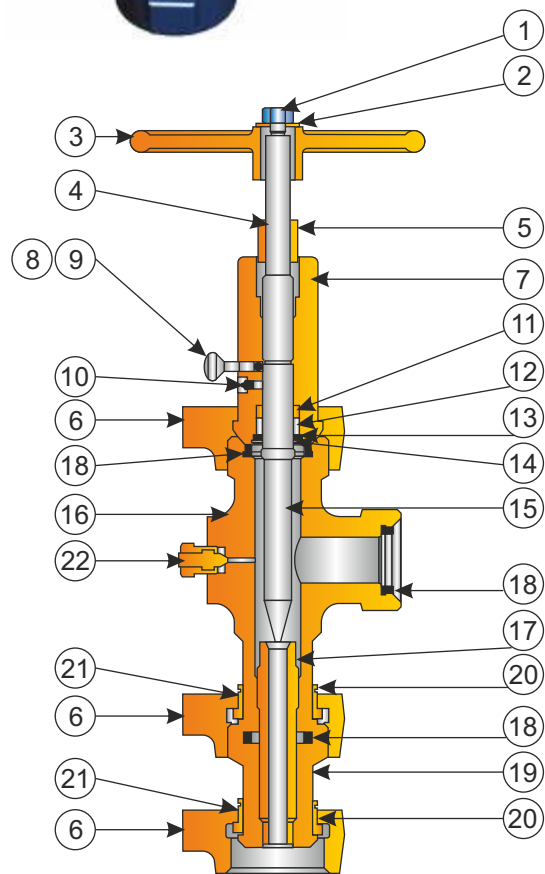
TYPE TARGET CHOKE VALVE



Type Target Positive Choke

These are used in many oilfield applications to control the rate of flow. Usually an adjustable choke is used as part of a manifold installed downstream of the wellhead. The choke is adjusted during flow back of the well to control downstream pressure and flow rates. The ACT adjustable choke is comprised of three main sub-assemblies. These sub-assemblies are the bonnet, tee, and nipple assemblies.

ACT chokes are available in 3/4", 1", and 2" maximum orifice sizes with Fig. 602-1502 hammer union connection. The components that comprise the choke are made from various materials. The bonnet, tee, and nipple are made from forged alloy steel. The stem is manufactured from stainless steel and utilizes a solid carbide tip. The choke seat is also made from stainless steel that has been fitted with a carbide liner.



Type Target Choke Assembly

Part List		
ITEM	DESCRIPTION	QTY.
0	ASSEMBLY	1
1	HEX NUT	1
2	WASHER	1
3	HANDLE	1
4	HEX, SOC. SET SCREW	1
5	INDICATOR	1
6	HAMMER UNION NUT	3
7	BONNET	1
8	NYLON PLUG	1
9	THUMB SCREW	1
10	GREASE FITTING	1
11	PACKING STEM GUIDE	1
12	PACKING ASSLY.	1
13	PACKING RETAINER	1
14	INT. RETAINER RING	1
15	CHOKE STEM	1
16	CHOKE BODY	1
17	SEAT	1
18	SEAL RING	3
19	CHOKE NIPPLE BODY	1
20	EXT. RETAINER RING (CIRCLIP)	2
21	SPLIT RING	2
22	BODY VENT FITTING	1
23	NAME PLATE (NOT SHOWN)	1
24	RIVET TAG (NOT SHOWN)	4
25	THRD. PROTECTOR FOR BOX	1
26	THRD. PROTECTOR FOR PIN	1
27	5/32" HEX. ALLEN KEY (NOT SHOWN)	1

PHDC 01 HYDRAULIC DRILLING CHOKE WITH CONTROL PANEL

Features: The Hydraulic Choke is a hydraulically operated variable choke providing any opening from a maximum of 1.93 square inches (1 9/16" equivalent bean diameter) to full shut off. Working pressure rating of the choke is 10,000 PSI. Two Tungsten Carbide discs, each with a semi-circular opening, form the choke. Various openings are obtained by rotating the upstream disc against the stationary downstream disc.

Operator Control Panel: The operator console is built with stainless steel machine engraved English letters, coded and is equipped with following controls:

The main choke operating lever marked OPEN, HOLD and CLOSE, controls the movement of the upstream disc. Speed of operation is controlled by the HYDRAULIC REGULATOR valve in the lower right corner of the panel.

The AIR SUPPLY valve on the left side of the control panel controls the flow of rig air to the air-powered hydraulic pump and to the position indicator. (A minimum of 100 PSI air pressure required.)

Moving the choke control lever to the CLOSE position directs hydraulic pressure to the hydraulic pistons which rotate the choke towards "closed" and moving the lever to the OPEN position reverses the operation. When the control lever is released, it will return to the HOLD position and the upstream disc will remain where it is.

The POSITION INDICATOR gauge located on the right side of the control panel shows the approximate position of the choke in terms of degree of closure.

Third Party Inspection /Certification: Unit will be certified by third party BV, DNV, ABS, Lloyds, Vetco Tuboscope etc as per the requirement of customer

Painting: All steel materials are sandblasted and organic zinc primer coated and painted to customer supplied color code.

Signs & Decals: Wherever applicable signs & decals required will be placed.

- Starting procedure
- Safety instructions
- All hydraulic connections will be tagged with proper identification
- SWL of the unit

Documentation: Operations & Maintenance Manual provided in hard copy and soft copy (in CD format) for complete set unit in (English).



CHOKE AND KILL MANIFOLDS



ACT fabricates custom designed Choke and Kill Manifold :

- 1) In oil / gas well drilling operation, drilling fluids (Muds) of designed gravity are used to overcome sub-surface pressure or the influx of formation fluid. On some occasions, kicks are experienced with change in pressure of formation while drilling. This is necessary to build up drilling fluid density to prevent influx of formation fluid. The Choke and Kill Manifold allows the driller to regulate back-pressure on the formation while gradually density of the drilling fluid is built up by circulation with closed B.O.P., till the well is stabilized and drilling is resumed.
The Choke and Kill Manifold are available up to 15,000 PSI in sizes of 2" to 4" for standard and sour services. Other types of Manifold (stand pipe, cementing etc.) can also be made available.

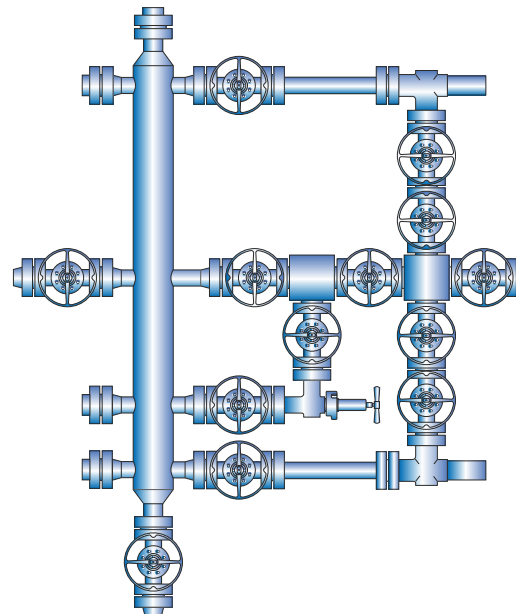
- 2) For Well Testing / Completion / Intervention, industry uses varies configuration of Manifold, as per requirement of Service / Operating Companies, ACT designs and fabricates custom made Manifold in sizes of 2" to 4" up to 15,000 PSI for standard and sour services for the following applications:

- (a) Choke Manifold for flow back/work over
- (b) Production Manifold for diverting flow through test separator or vent or burner
- (c) Gas Manifold for diverting gas through orifice meter or burner
- (d) Data Recorder for recording flowing pressure and temperature
- (e) Stimulation/Treatment for Well stimulation/treatment service.

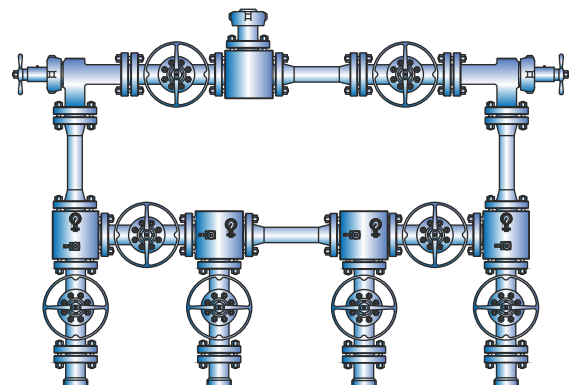
2" / 3" / 4" / 5" / 6" 5000 PSI & 10000 PSI WP 3' to 8' Length

Material :

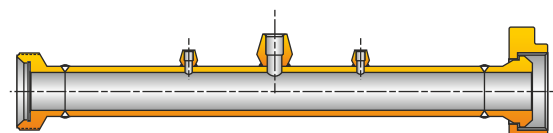
Suitable for H₂S Service as per NACE MR-01-75. With Union / Gray Lock End Connections. Supplied with multiple ports, Plugged or Flanged at specified intervals and degrees. Supplied with Thermowell, Pressure Gauges as required by customer.



Choke & Kill Manifold



Eruption Manifold



Data Header

FRAC EQUIPMENT

Features:

ACT Frac Equipment are designed to deliver efficient and safe fluid flow when pumping high volumes at extreme pressures during frac operations. These are available with wide range of sizes and pressures up to 15,000 PSI WP.

General:

These are the equipment often used on frac tree and frac stack during fracturing work, which is often in studded and flange-end connections. The Frac Head reduces the risks normally associated with using substandard equipment.

For sour gas services and to withstand the damaging effects due to both Hydrogen Sulfide (H₂S) and Carbon Dioxide (CO₂) gases these are provided to assemble with stainless steel ring gaskets. In addition; the ACT Frac Head is machined from solid raw material and hardened alloy steel, making it more durable and safer for high-pressure service.

Availability: These are available in three wellhead connection sizes and two pressure ranges with 4", 3", 2" frac inlets and constructed with 15,000 psi or 10,000 psi working pressure flanges. To facilitate more efficient fluid flow, the frac head is designed to give frac companies access to at least four inlets. In addition, full bore on the 4". Inlets allows for unrestricted pump rates. We can also offer many type of the Frac Head, Ball Screw valves as per the client's requirements, some of which are listed below.

Key Benefits:

- Machined from solid hardened steel raw material for enhanced durability
- Availability in wider range with variable pressure rating up to 15,000 PSI WP
- Assembled with stainless steel ring gaskets to withstand the effects of sour gas
- Available in Integral type
- Available in 1502 Weco connections to accommodate frac inlet sizes of 4", 3" 2"

Third Party Inspection /Certification: Product will be certified by third party BV, DNV, ABS, Lloyds, Vetco Tuboscope etc as per the requirement of customer



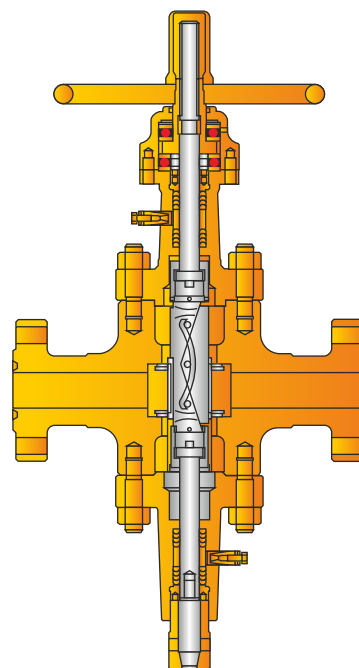
Frac Head



Frac Head



FRC HEAD GATE VALVE SIZES	
SIZE	WORKING PRESSURE (PSI)
4.1/16"	10,000
4.1/16"	15,000
5.1/8"	10,000
5.1/8"	15,000
7.1/16"	10,000
7.1/16"	15,000



Frac Gate Valve

FRAC TREE



ACT tree is built to reduce bending stress at the tree connection and can be operated with pneumatic, hydraulic or electric actuation.

The horizontal tree represents more than 50% reduction in size and about 25% in weight from our first conventional frac tree. It is short, stable, and easily anchored – an ideal configuration for frac-tree service. The 90° goat head is located at the end of the horizontal section, resulting in the distance across which the bending loads act being less than half of that of a conventional stacked-valve frac tree.

FRAC MANIFOLD



Typical components of a frac manifold include spools, tees, crosses, gate valves and goat heads. These are assembled into various configurations to suit the number and spacing of wells being simultaneously serviced, the planned arrangement of the frac lines, the extent to which actuation is desired, etc. ACT's frac manifolds may also be equipped with a safety ladder and platform to provide safe access to the valves.

SINGLE COMPLETION COMPONENT

ACT also manufactures different types of Single Completion Components as per API-6A or customer specification.



Stud With Nuts



Octagonal Ring Gasket



Oval Ring Gasket



Threaded Flange



Double Studded Adaptor Flange



Blind Flange



Threaded Nipple



Tapped Bull-Plug



Solid Bull-Plug



Solid Bull-Plug



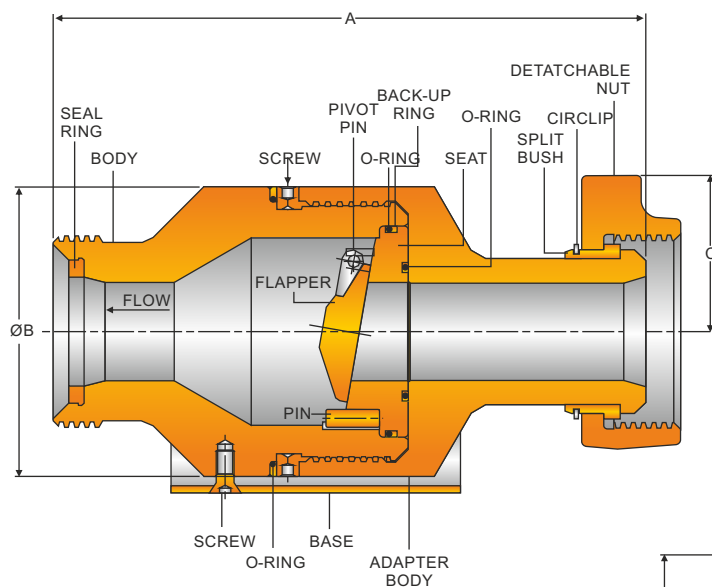
Spacer Spool

NOTE:

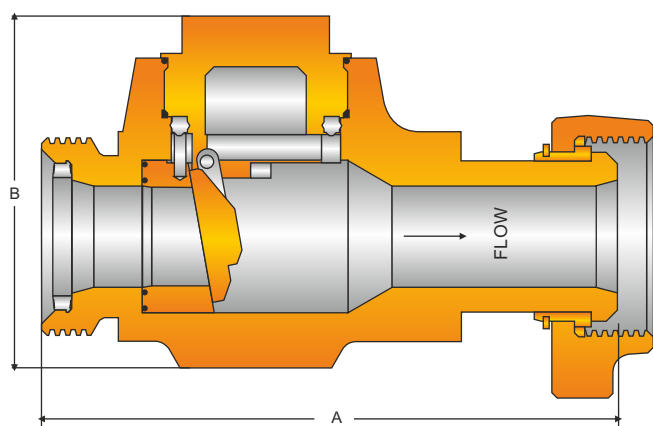
Multiple Completion Components (e.g. Dual Manifold Tee, Dual Adapter Flange, Dual Completion Flanges, Multiple Completion Sub Seal etc.) can also be provided upon request.

CHECK VALVES

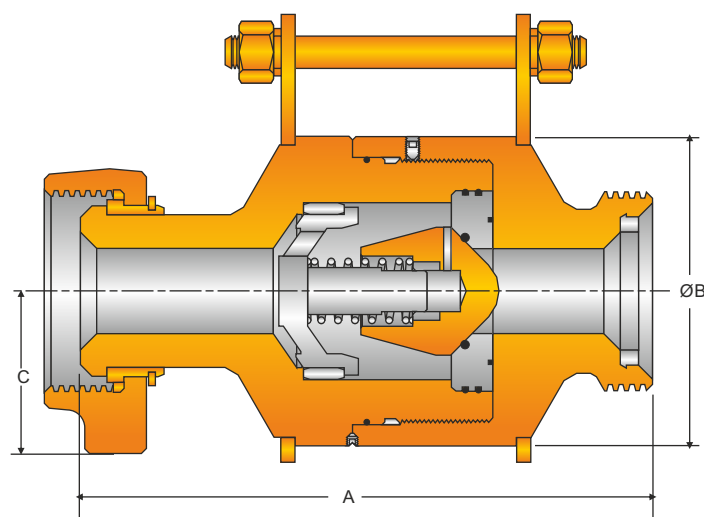
ACT Check Valves are flow control devices that permit flow in one direction, but stop flow in the opposite direction. These valves are used generally in well service applications and are placed in the treating line to allow flow to the well, but isolate any back flow.



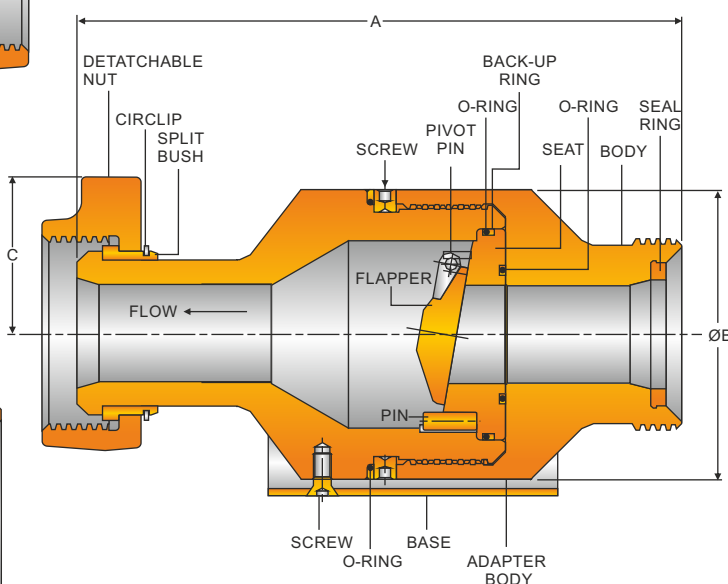
Flapper Type Check Valve (Reverse)



Top Entry Check Valve



Dart Type Check Valve



Flapper Type Check Valve (Standard)

Flapper Type Check Valve

NOMINAL SIZE	A (INCH)	ØB (INCH)	C (INCH)	WEIGHT(LBSF)	
				STANDARD	REVERSE
2" x Fig. 1502 (MxF)	10.1	7.0	3.8	88	88
3" x Fig. 1502 (MxF)	15.6	8.1	4.4	121	121
4" x Fig. 1502 (MxF)	22.7	12.2	-	385	385

Top Entry Check Valve

NOMINAL SIZE	A (INCH)	B (INCH)	WEIGHT (LBS)
3" x Fig. 1502 (MxF)	15.66	9.60	115
4" x Fig. 1502 (MxF)	19.76	12.00	275

Dart Type Check Valve

NOMINAL SIZE	A (INCH)	ØB (INCH)	C (INCH)	WEIGHT (in LBS)
2" x Fig. 1502 (MxF)	14.0	6.9	3.74	112.5
3" x Fig. 1502 (MxF)	15.4	8.3	4.5	144.8

PLUG VALVES

Special Design Features

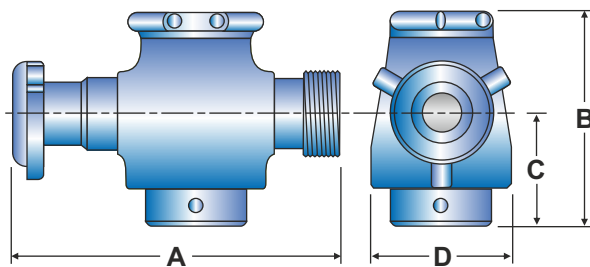
1. ACT valve bodies are made from alloy steel forgings which are designed to variety of end connections to be integrally machined
2. ACT plug and inserts are designed to resist abrasion and corrosion
3. ACT valves can be easily adopted for hydraulic or pneumatic actuation. These configurations are designed for integration with complete manifold systems
4. We manufacture in compliance with API-6A&API-Q1
5. Our range is up to 15000 PSI WP.
6. 3" & 4" Fig-1502 Plug Valves can be supplied with gear operated handel



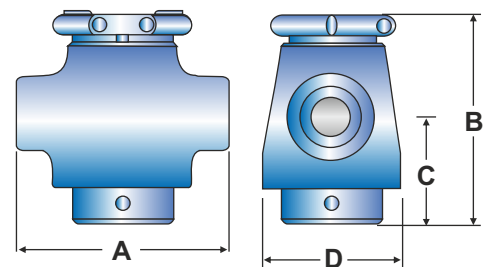
LOW TORQUE

Operating Principle

1. The plug rotates 90° (1/4 turn) for rapid full open or close operation. This reduces erosion due to throttling action
2. To ensure a uniform clamping action for the initial pressure seal, the valve body is tapered
3. To ensure a continuous seal becomes more effective as differential pressure increases, the plug and inserts float downstream with pressure differential caused by the initial seal
4. The relationship between the seal and the bearing areas is such that the torque required to operate the valve is minimized
5. To eliminate the need for thrust bearing to reduce friction, the plug is balanced by identical stem seals

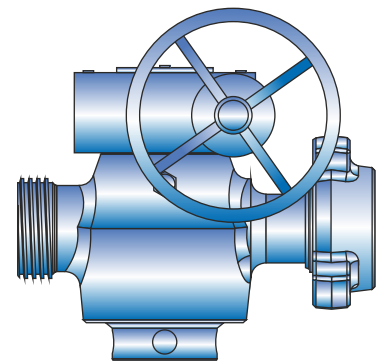


M X F Union End Type

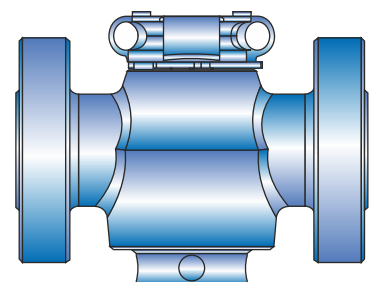


L.P. Female Type (threaded)

VALVE DESCRIPTION	PART NOS	DIMENSION				W.P. PSIG	APPROXIMATE WEIGHT (lbs)
		A	B	C	D		
1" x 2" LP FEMALE	40000500	8.1/2	9.1/4	4.9/16	5.3/8	6000 10000	39
1" x 2" 1502 UNION	40000300	10.9/16	9.1/4	4.9/16	5.3/8	6000 10000 15000	60
2" x 2" LP FEMALE	40000200	8.1/2	10.5/8	5.1/2	5.3/8	6000 10000	61
2" x 2" 1502 UNION	40000100	13.7/8	10.5/8	5.1/2	7.1/8	6000 10000 15000	90
3" x 3" LP FEMALE	40000600	11.1/8	13.0	7.1/8	9.3/8	6000 10000	148
3" x 3" 1502 UNION	40000700	17.0	13.0	7.1/8	9.3/8	6000 10000 15000	188
4" x 4" 1502 UNION	40000800	25.0	16.59/64	7.43/64	10.11/16	10000 15000	352



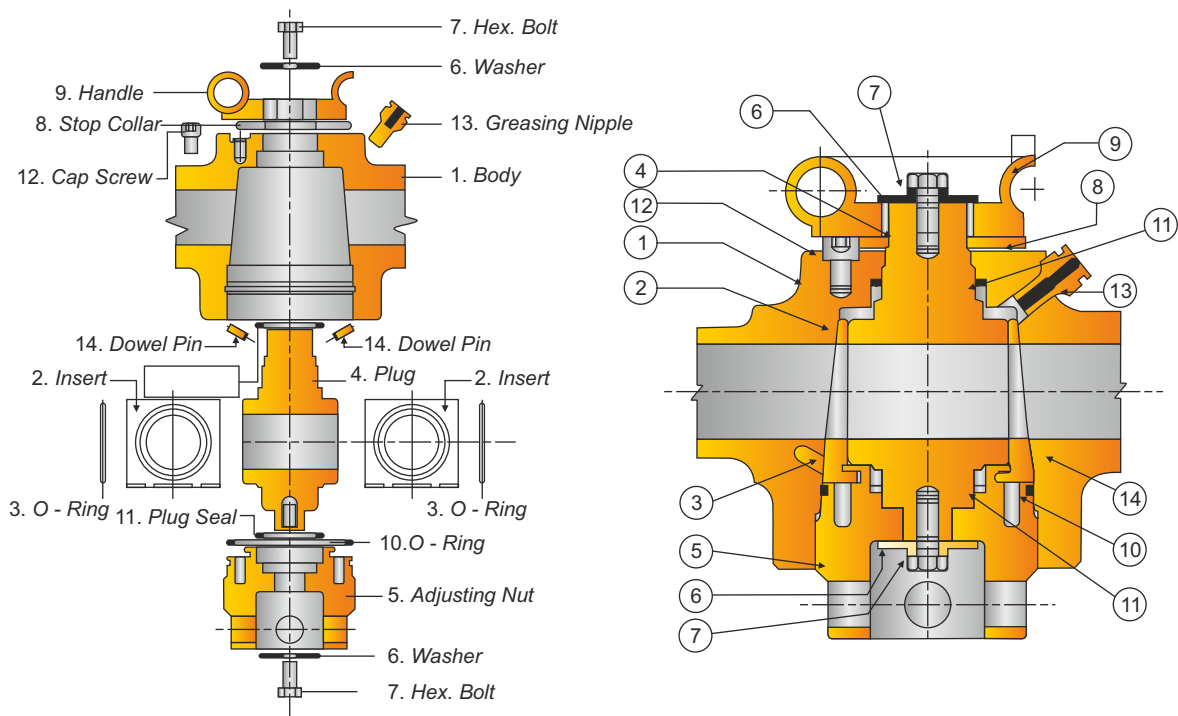
M X F Gear Operated



Flange End Type

- All dimensions are in inches
- Special plug valve can be provided to suit customer requirements

PLUG VALVES

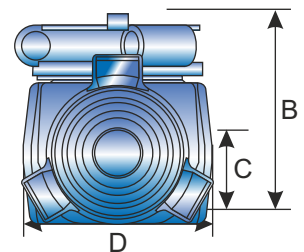
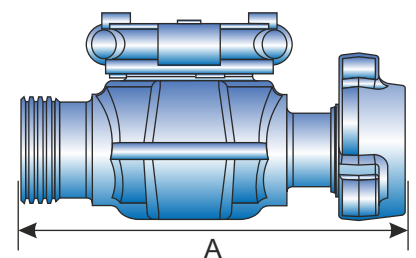
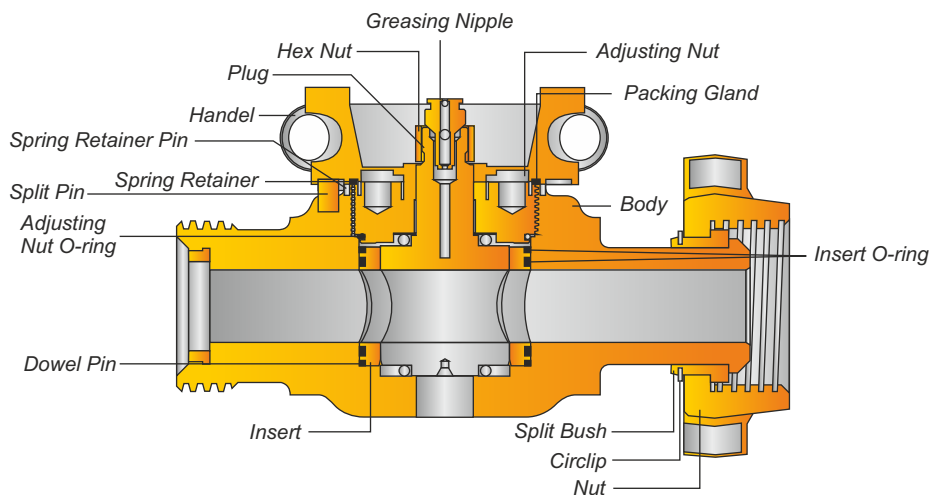


TOP ENTRY

Operating Principle

The ACT TE Plug Valve is a lubricated, straight pocket, quarter-turn plug valve for rapid full open or close operation. The valve cavity is straight to ensure low-torque operation and uniform sealing of the components at the full range of pressures. Inserts are provided with dual seal. The ACT TE Plug Valve and replacement parts are engineered to provide low operating torque and resistance to the toughest abrasive and corrosive conditions.

VALVE DESCRIPTION	PART NOS	DIMENSION				W.P. PSIG	APPROXIMATE WEIGHT (lbs)
		A	B	C	D		
1" x 2" 1502 UNION	PIK/PLV/1/TP-A	10.1/2	6.35	1.9	4.3/4	10000 15000	60
2" x 2" 1502 UNION	PIK/PLV/2/TP-A	14	8	2.5/8	7.1/5	10000 15000	90



MUD VALVES

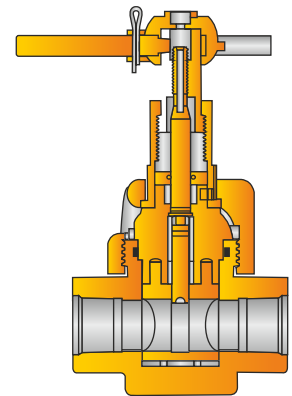
ACT Mud Valves are Forged/Cast exclusively made for mud, cement, fracturing water and steam abrasive applications. All valves are hydrostatic shell and seat tested in accordance with the API 6A /API 6D specifications. Valves are specially designed for oil-field applications like Manifolds, Pipe Line, Crude Oil and Sour Gas Line, Well Treating Chemical, Drilling Chemical, Water Flood Lines, Abrasive Drilling Mud etc.

Model - I

Features

- Designed specifically for abrasive and erosive use
- Non directional seating and positive sealing between gate and seat
- Easily replaceable parts without any use of accessories
- Can be supplied with Flanged End, Hammer Union End, Threaded or Butt Weld End
- Stainless and carbon steel insert with Nitrite/Viton elastomer in seat
- Protected raising stem
- Available from 2" to 6" with all temperature and pressure rating, up to 10,000 PSI, services as per API - 6A

Part No. & Weight						
FULL PORT		2"	3"	4"	5"	6"
FLANGED END	PART NO.	412-2065-00	412-3125-00	412-4065-00	412-5125-00	-N.A.-
	WT (LBS)	70	100	110	330	-N.A.-
SCREWED END	PART NO.	412-4385-02	412-4805-02	412-4795-02	-N.A.-	-N.A.-
	WT (LBS)	48	53	61	-N.A.-	-N.A.-
WELD END	PART NO.	412-0025-03	412-0035-03	412-0045-03	412-0055-03	412-0065-03
	WT (LBS)	48	53	61	265	221



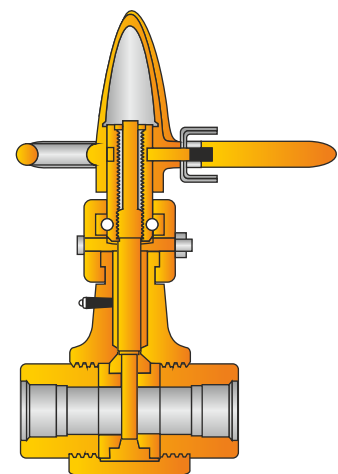
Mud Valve (Model - I)

Model - S

Features

- Designed for rigorous oil field services
- Different end connection can be obtained without changing the main body or assembly
- Through conduit with wear plate, both sizes provide longer services
- Heavy duty bearing at stem provides easy operation
- Single gate stem
- Available with all pressure and temperature class and services as per API-6A

Part No. & Weight				
FULL PORT		2"	3"	4"
FLANGED END	PART NO.	412-2065-00	413-3125-00	413-4065-00
	WT (LBS)	125	254	384
SCREWED END	PART NO.	413-4385-02	413-4805-02	413-4795-02
	WT (LBS)	85	168	250
WELD END	PART NO.	413-0025-03	413-0035-03	413-0045-03
	WT (LBS)	87	170	252



Mud Valve (Model - S)

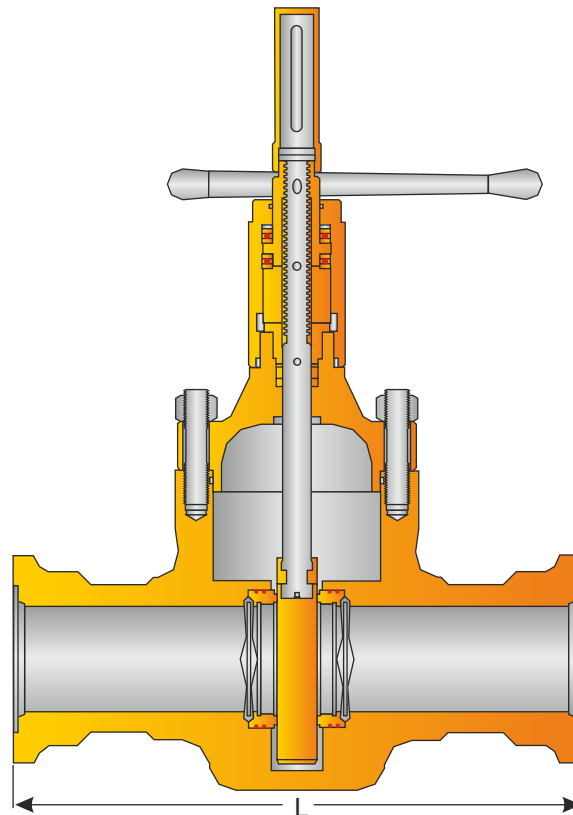
MUD GATE VALVES

ACT Mud Gate Valves are Forged exclusively made for mud, cement, fracturing, water & steam abrasive and shipyard applications. All valves are hydrostatic shell and seat tested in accordance with the API 6A specifications. Valves are specially designed for oil-field applications like Well heads, Manifolds, Pipe Line, Crude oil and Sour gas line, Well treating chemical, Drilling Chemical, Water flood lines, Abrasive drilling mud & shipyard etc. Valves are available up to 10,000 PSI WP.

These can be certified by ABS / DNV offshore or any other third party inspection.

Features

- Designed specifically for abrasive and erosive use
- Positive sealing between gate and seat
- Easily replaceable parts without any use of accessories
- Can be supplied with Flanged End, Hammer Union End, Threaded, Butt Weld End & Gray Lock Hub / Clamp or API 16A Hub / Clamp Type end connection
- Protected rising stem
- Available from 2" to 6" with all temperature and pressure rating, service as per API 6A
- Single gate stem
- Low Torque Bearing
- Long Life Seat



Clamp Hub Mud Gate Valve

Part No.					
	2"	3"	4"	5"	6"
PART NO.	412-1.5X85-GL	412-2X85-GL	412-3X85-GL	412-4X65-GL	412-5127-GL
LENGTH (L ^{±4"}) (inch)	14.5"	15.5"	18.25"	21.75"	25.5"

CEMENTING HEAD

ACT Cementing Head is used for cementing the annular space between casing and bore hole during 2nd stage of well construction cycle. The Cementing Head is employed to connect the pumps of the cementing trucks to the casing string and provides access for insertion of the cementing plugs.

ACT's Cementing Heads are available in sizes 4 1/2 " to 20", for working pressure of 2,000 to 10,000 PSI. Cementing Head sizes & working pressures are inversely related. Generally for smaller sizes, more working pressure and for larger sizes, less working pressure are the requirements. Cementing Heads could be of single plug or double plug type. Caps are Acme threaded or quick lock type and fitted with Swivel Chain Assembly. The double plug cementing head has a three valve manifold and two plunger assembly. Cementing Heads are manufactured from solid forged rounds of alloy steels AISI 4130/4140/ 4145 HEN-19 or equivalent material and are fully heat treated.

CEMENTING OPERATIONS

ACT Cementing Head is suitable for carrying out single stage as well as double stage cementing operations. It is provided with the following features:

- Indicators that show when the top plug passes into the casting
- Simple in operation and provides easy loading of plugs
- Having manifold with low-torque plug valve
- Provides continuous operation
- The plug container holds one or two plugs, the top plug and the bottom plug. The double plug container has a three in-torque valve manifold and a two plunger assembly
- The length of plug containers are made to accommodate the standard length of plugs
- The cap is available with ACME thread and with lifting chain for lifting the plug container.
- Adapters are available with all casing threads and buttress threads
- The standard adapters have a 6 inch tong space with thread protectors
- The Hammer Unions used in manifolds are ACT's make

CEMENTING MANIFOLDS

Cementing Manifolds are supplied with Cementing Heads or alone as per customer preference. It is an assembly of unions, plug valves, tee, nipples etc. These can be supplied in any size up to pressure ratings of 10,000 PSI pressure.



DIMENSIONAL DATA FOR DOUBLE PLUG CEMENTING HEAD

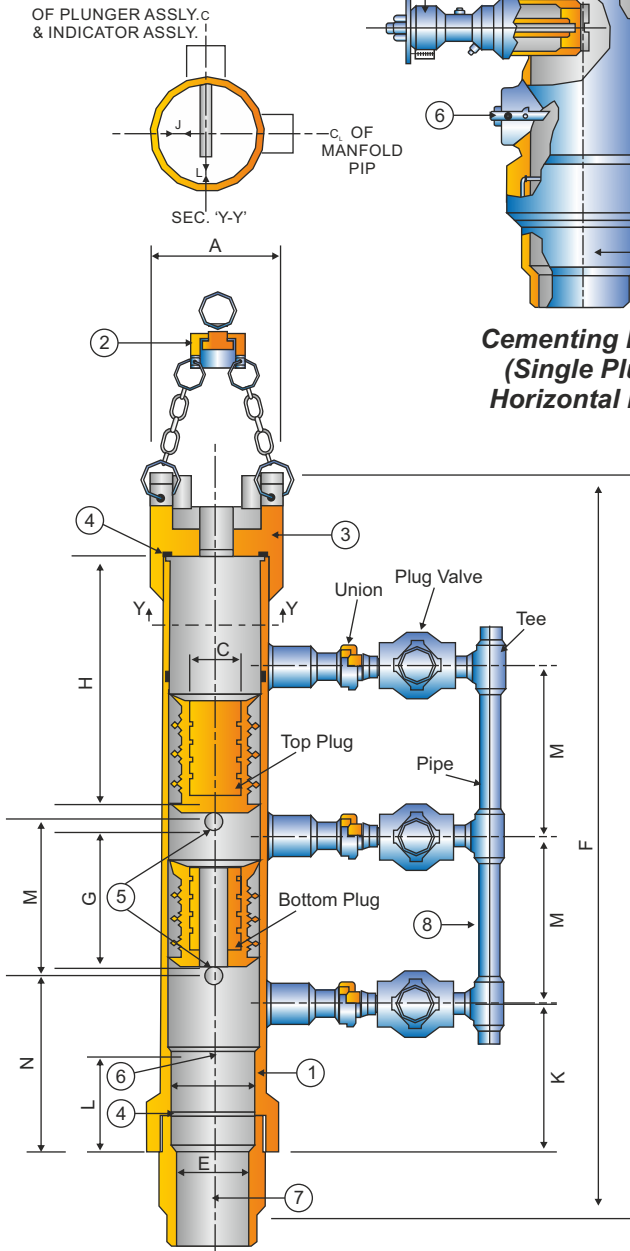
PART NO.	Casing SIZE O. D.	A ± 1/2 CAP O.D.	B ± 1/8 PLUG CENTER I.D.	C ± 3/8 PLUG INSERT O.D.	D ± 1/8 THROAT I.D.	E ± 1/8 NIPPLE I.D.	F ± 6.0 MADE UP LENGTH	G ± 1.5 DISTANCE BETWEEN PLUNGER	H ± 4.0 CLEARANCE ABOVE TOP PLUNGER	I ± 1/2 PLUNGER CLEARANCE	J ± 1/2 PLUNGER CLEARANCE	± 1.5 K	± 1.5 L	± 1.5 M	± 1.5 N
50511900	4.1/2	8.0	4.81	2.50	4.92	3.92	59.00	10.62	19.53	1.56	1.47	11.50	9.0	12.5	14.00
50509700	5.1/2	8.66	5.75	3.25	5.25	4.67	60.12	11.12	20.19	2.50	1.94	11.81	9.29	13.0	14.33
50509900	7	11.0	7.20	4.25	6.70	5.92	60.12	11.12	20.19	2.07	2.66	11.81	9.29	13.0	14.33
50511600	7.5/8	11.5	7.81	4.75	7.25	6.37	60.12	11.62	20.19	2.73	2.97	11.81	9.00	12.5	14.33
50511400	8.5/8	12.5	8.81	5.50	8.25	7.51	60.12	11.62	20.19	3.73	3.47	11.5	9.50	13.50	14.50
50510100	9.5/8	13.80	9.76	6.75	9.20	8.53	63.74	12.60	20.43	4.65	3.94	12.00	10.00	14.48	15.00
50511200	10.3/4	14.5	10.87	8.00	10.31	9.56	63.74	13.62	20.50	5.83	4.50	12.50	10.5	15.5	16.00
50511000	11.3/4	15.5	11.87	7.75	11.31	10.77	64.00	13.62	21.00	6.89	5.00	12.50	10.5	15.5	16.00
50510300	13.3/8	16.92	13.41	10.00	12.88	12.35	69.80	14.25	22.95	8.31	5.77	14.17	10.50	16.14	16.65
50510700	16	19.68	15.90	12.50	15.34	15.00	83.97	20.40	29.40	9.56	7.01	14.97	12.29	22.28	17.97
50510500	18.5/8	23.0	18.62	15.0	18.0	17.25	93.0	21.50	30.20	9.76	8.31	16.50	14.0	23.50	19.50
50510900	20	24.0	20.0	16.5	19.44	18.73	93.0	21.50	30.20	9.76	9.00	16.50	14.0	23.50	19.50

- NOTE:**
- ACT reserves right to alter the design data if required
 - All dimensions are in inches
 - For other sizes & for single plug Cementing Head sizes please contact ACT
 - For nomenclature refer to the diagram on the next page

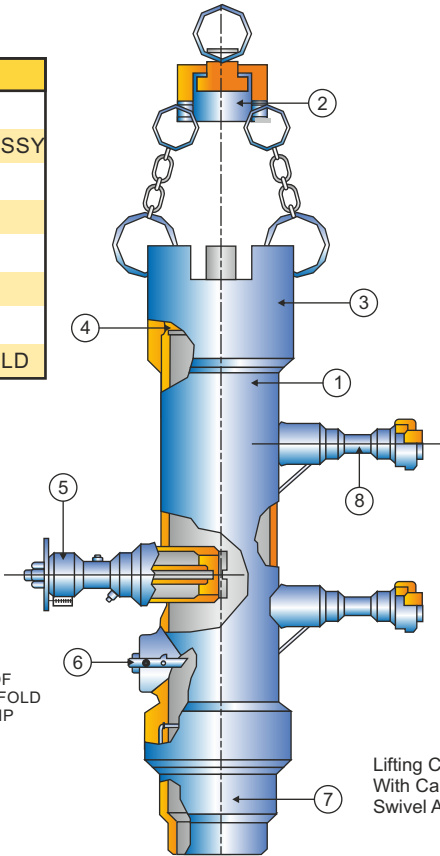
CEMENTING HEAD

NO.	DESCRIPTION
1	BODY
2	CHAIN WITH SWIVEL ASSY
3	CAP
4	SEAL METAL SEAL
5	PLUNGER ASSY
6	INDICATOR ASSY
7	ADAPTOR
8	CEMENTING MANIFOLD

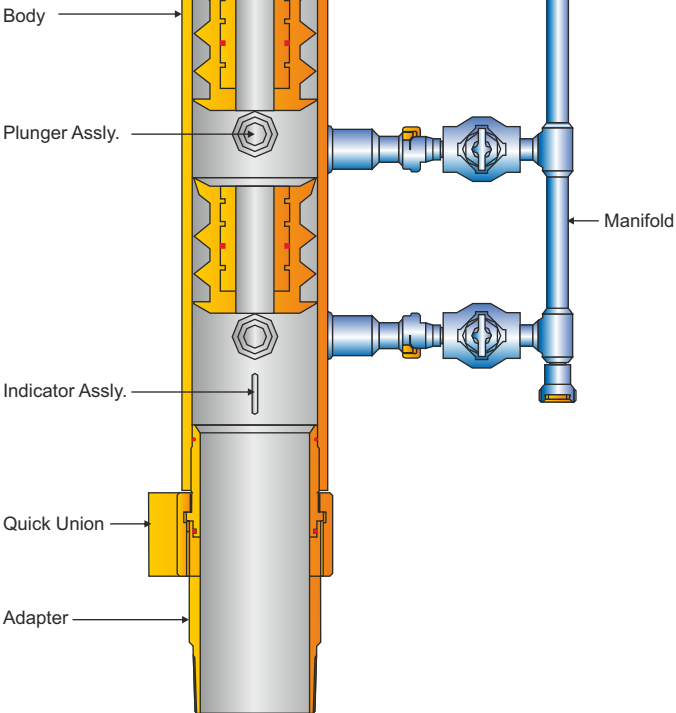
CEMENTING HEAD
(DOUBLE PLUG)
HORIZONTAL INLET



Cementing Head
(Single Plug)
Horizontal Inlet



Lifting Chain
With Cap
Swivel Assly.



Cementing Head
(Double Plug)
Quick Union Type

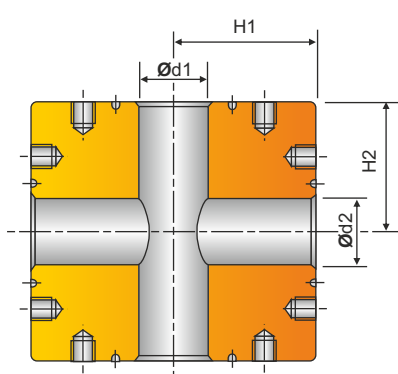
FLANGED STUDDED CROSSES AND TEES (AS PER API-6A)

*All dimensions are in inches.

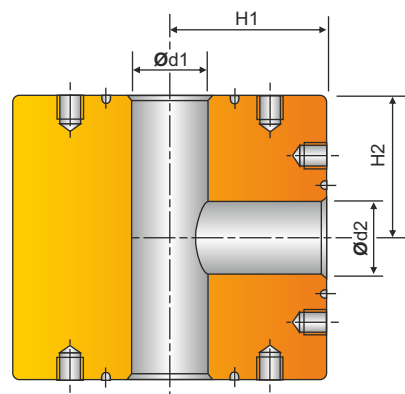
(1-1) PRESSURE RATING:- 2,000 PSI			
NOMINAL SIZE & BORE		CENTER TO FACE	
Ød1 (VERTICAL)	Ød2 (OUTLET)	H2 (VERTICAL)	H1 (HORIZONTAL)
2 1/16	2 1/16	3.50	3.50
2 9/16	2 1/16	3.50	4.00
2 9/16	2 9/16	4.50	4.50
3 1/8	2 1/16	3.50	4.50
3 1/8	2 9/16	4.50	4.50
3 1/8	3 1/8	4.50	4.50
4 1/16	2 1/16	4.50	5.50
4 1/16	2 9/16	4.50	5.50
4 1/16	3 1/8	4.50	5.50
4 1/16	4 1/16	5.50	5.50

(1-2) PRESSURE RATING:- 3,000 PSI			
NOMINAL SIZE & BORE		CENTER TO FACE	
Ød1 (VERTICAL)	Ød2 (OUTLET)	H2 (VERTICAL)	H1 (HORIZONTAL)
3 1/8	2 1/16	4.50	5.00
3 1/8	2 9/16	5.00	5.00
3 1/8	3 1/8	5.00	5.00
4 1/16	2 1/16	4.50	6.12
4 1/16	2 9/16	5.00	6.12
4 1/16	3 1/8	5.00	6.12
4 1/16	4 1/16	6.12	6.12

(1-3) PRESSURE RATING:- 5,000 PSI			
NOMINAL SIZE & BORE		CENTER TO FACE	
Ød1 (VERTICAL)	Ød2 (OUTLET)	H2 (VERTICAL)	H1 (HORIZONTAL)
2 1/16	2 1/16	4.50	4.50
2 9/16	2 1/16	4.50	5.00
2 9/16	2 9/16	5.00	5.00
3 1/8	2 1/16	4.50	5.50
3 1/8	2 9/16	5.50	5.50
3 1/8	3 1/8	5.50	5.50
4 1/16	2 1/16	4.50	6.50
4 1/16	2 9/16	5.00	6.50
4 1/16	3 1/8	5.50	6.50
4 1/16	4 1/16	6.50	6.50



API Studded Cross



API Studded Tee

(1-4) PRESSURE RATING:- 10,000 PSI			
NOMINAL SIZE & BORE		CENTER TO FACE	
Ød1 (VERTICAL)	Ød2 (OUTLET)	H2 (VERTICAL)	H1 (HORIZONTAL)
1 13/16	1 13/16	4.38	4.38
2 1/16	1 13/16	4.38	4.38
2 1/16	2 1/16	4.38	4.38
2 9/16	1 13/16	4.50	5.12
2 9/16	2 1/16	4.50	5.12
2 9/16	2 9/16	5.12	5.12
3 1/16	1 13/16	4.50	5.88
3 1/16	2 1/16	4.50	5.88
3 1/16	2 9/16	5.12	5.88
3 1/16	3 1/16	5.88	5.88
4 1/16	1 13/16	4.50	6.88
4 1/16	2 1/16	4.50	6.88
4 1/16	2 9/16	5.12	6.88
4 1/16	3 1/16	5.88	6.88
4 1/16	4 1/16	6.88	6.88

(1-5) PRESSURE RATING:- 15,000 PSI			
NOMINAL SIZE & BORE		CENTER TO FACE	
Ød1 (VERTICAL)	Ød2 (OUTLET)	H2 (VERTICAL)	H1 (HORIZONTAL)
1 13/16	1 13/16	5.00	5.00
2 1/16	1 13/16	5.00	5.00
2 1/16	2 1/16	5.00	5.00
2 9/16	1 13/16	5.50	5.50
2 9/16	2 1/16	5.50	5.50
2 9/16	2 9/16	5.50	5.50
3 1/16	1 13/16	6.31	6.31
3 1/16	2 1/16	6.31	6.31
3 1/16	2 9/16	6.31	6.31
3 1/16	3 1/16	6.31	6.31
4 1/16	1 13/16	7.62	7.62
4 1/16	2 1/16	7.62	7.62
4 1/16	2 9/16	7.62	7.62
4 1/16	3 1/16	7.62	7.62
4 1/16	4 1/16	7.62	7.62

(1-6) PRESSURE RATING:- 20,000 PSI			
NOMINAL SIZE & BORE		CENTER TO FACE	
Ød1 (VERTICAL)	Ød2 (OUTLET)	H2 (VERTICAL)	H1 (HORIZONTAL)
1 13/16	1 13/16	6.47	6.47
2 1/16	1 13/16	6.47	6.47
2 1/16	2 1/16	6.47	6.47
2 9/16	1 13/16	7.28	7.28
2 9/16	2 1/16	7.28	7.28
2 9/16	2 9/16	7.28	7.28
3 1/16	1 13/16	7.97	7.97
3 1/16	2 1/16	7.97	7.97
3 1/16	2 9/16	7.97	7.97
3 1/16	3 1/16	7.97	7.97
4 1/16	1 13/16	9.97	9.91
4 1/16	2 1/16	9.91	9.91
4 1/16	2 9/16	9.91	9.91
4 1/16	3 1/16	9.91	9.91
4 1/16	4 1/16	9.91	9.91

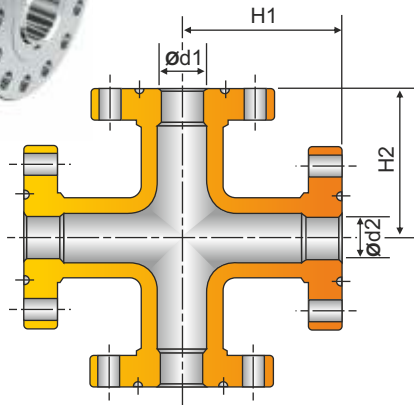
FLANGED CROSSES AND TEES (AS PER API-6A)

*All dimensions are in inches.

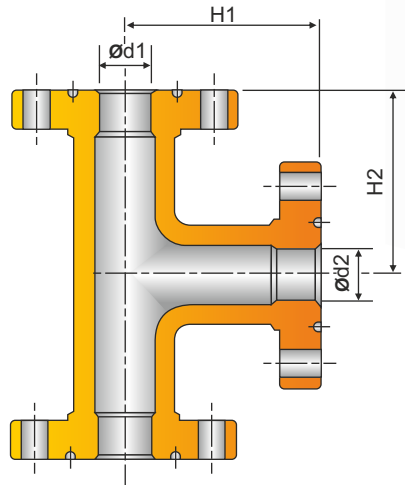
(1-1.) PRESSURE RATING:- 2,000 PSI			
NOMINAL SIZE & BORE		CENTER TO FACE	
Ød1 (VERTICAL)	Ød2 (OUTLET)	H2 (VERTICAL)	H1 (HORIZONTAL)
2 1/16	2 1/16	5.81	5.81
2 9/16	2 1/16	5.94	6.31
2 9/16	2 9/16	6.56	6.56
3 1/8	2 1/16	6.06	6.69
3 1/8	2 9/16	6.56	6.81
3 1/8	3 1/8	7.06	7.06
4 1/16	2 1/16	6.31	7.94
4 1/16	2 9/16	6.81	8.06
4 1/16	3 1/8	7.19	8.19
4 1/16	4 1/16	8.56	8.56

(1-2.) PRESSURE RATING:- 3,000 PSI			
NOMINAL SIZE & BORE		CENTER TO FACE	
Ød1 (VERTICAL)	Ød2 (OUTLET)	H2 (VERTICAL)	H1 (HORIZONTAL)
3 1/8	2 1/16	7.31	7.81
3 1/8	2 9/16	7.88	7.94
3 1/8	3 1/8	7.56	7.56
4 1/16	2 1/16	7.56	8.81
4 1/16	2 9/16	8.12	8.94
4 1/16	3 1/8	8.06	8.81
4 1/16	4 1/16	9.06	9.06

(1-3.) PRESSURE RATING:- 5,000 PSI			
NOMINAL SIZE & BORE		CENTER TO FACE	
Ød1 (VERTICAL)	Ød2 (OUTLET)	H2 (VERTICAL)	H1 (HORIZONTAL)
2 1/16	2 1/16	7.31	7.31
2 9/16	2 1/16	7.44	7.88
2 9/16	2 9/16	8.31	8.31
3 1/8	2 1/16	7.69	8.31
3 1/8	2 9/16	8.25	8.44
3 1/8	3 1/8	9.31	9.31
4 1/16	2 1/16	7.94	9.19
4 1/16	2 9/16	8.50	9.31
4 1/16	3 1/8	8.94	9.56
4 1/16	4 1/16	10.81	10.81



API Flanged Cross



API Flanged Tee



(1-4.) PRESSURE RATING:- 10,000 PSI			
NOMINAL SIZE & BORE		CENTER TO FACE	
Ød1 (VERTICAL)	Ød2 (OUTLET)	H2 (VERTICAL)	H1 (HORIZONTAL)
2 1/16	1 13/16	6.67	6.84
2 1/16	2 1/16	6.92	6.92
2 9/16	1 13/16	6.95	7.47
2 9/16	2 1/16	7.20	7.55
2 9/16	2 9/16	7.83	7.83
3 1/16	1 13/16	7.23	8.22
3 1/16	2 1/16	7.48	8.30
3 1/16	2 9/16	8.11	8.58
3 1/16	3 1/16	8.86	8.86
4 1/16	1 13/16	7.81	9.25
4 1/16	2 1/16	8.06	9.33
4 1/16	2 9/16	8.69	9.61
4 1/16	3 1/16	9.44	9.89
4 1/16	4 1/16	10.34	10.34

(1-5.) PRESSURE RATING:- 15,000 PSI			
NOMINAL SIZE & BORE		CENTER TO FACE	
Ød1 (VERTICAL)	Ød2 (OUTLET)	H2 (VERTICAL)	H1 (HORIZONTAL)
2 1/16	1 13/16	7.34	7.41
2 1/16	2 1/16	7.62	7.62
2 9/16	1 13/16	7.59	8.03
2 9/16	2 1/16	7.88	8.25
2 9/16	2 9/16	8.50	8.50
3 1/16	1 13/16	7.86	8.69
3 1/16	2 1/16	8.16	8.91
3 1/16	2 9/16	8.78	9.16
3 1/16	3 1/16	9.44	9.44
4 1/16	1 13/16	8.69	10.25
4 1/16	2 1/16	8.97	10.47
4 1/16	2 9/16	9.59	10.72
4 1/16	3 1/16	10.25	11.00
4 1/16	4 1/16	11.69	11.69

(1-6.) PRESSURE RATING:- 20,000 PSI			
NOMINAL SIZE & BORE		CENTER TO FACE	
Ød1 (VERTICAL)	Ød2 (OUTLET)	H2 (VERTICAL)	H1 (HORIZONTAL)
1 1/16	1 1/16	8.94	8.94
2 1/16	1 13/16	9.25	9.53
2 1/16	2 1/16	9.84	9.84
2 9/16	1 13/16	9.56	10.28
2 9/16	2 1/16	10.16	10.59
2 9/16	2 9/16	10.91	10.91
3 1/16	1 13/16	9.94	10.91
3 1/16	2 1/16	10.53	10.22
3 1/16	2 9/16	11.28	11.53
3 1/16	3 1/16	11.91	11.91
4 1/16	1 13/16	11.12	12.66
4 1/16	2 1/16	11.72	12.66
4 1/16	2 9/16	12.47	13.28
4 1/16	3 1/16	13.09	13.66
4 1/16	4 1/16	14.84	14.84

FLANGES - INTRODUCTION

ACT is a manufacturer of various types of Flanges and Pipe Fittings required by the oil field, petrochemical and different process industries.

Our name is synonymous with high quality manufacture, precision machining and unparalleled dedication to quality. Excellence which has kept us in the forefront of the oil industry.

Flanges / Boltings / Gaskets / Flanged Fittings

Flanges

ACT manufactures all types of Forged Flanges such as Weldneck, Slip-on, Socket Weld, Threaded, Lapped and Blind as per ANSI B-16.5 & ASA B-16.5, covering sizes from 1/2" to 24", pressure ratings from class 150 to 2,500 and temperature rating -20° F to 1500°. Studs, Nuts and Gaskets for these Flanges are also provided.

Flanges to API specifications 6A such as 6B and 6BX (Threaded, Weldneck, Blind, Test, Integral, Adapter & Companion Flanges) for any size & pressure ratings from 2,000 PSI to 20,000 PSI can be catered to. Large dia flanges to API 605, from size NPS 26" to 48" and ratings 150 to 900 are also manufactured and supplied. Slipon and Weld Neck Flanges as per BS 3293, of class 150, 300, 400, 600 from size NPS 26" to 48" can also be manufactured. Ring Joint Gaskets and Grooves are provided as per ASME B 16.20, ANSI B 16.5 & API-6A.

Orifice Flanges/Meter Runs as per ANSI B-16.36, API 2530 and AGA-3 specifications with orifice plates can also be provided for any class and size. Flanges in other standards such as BIS, BS, DIN, ISO, JIS, can also be manufactured to meet the customer's requirements.

Studs & Nuts

ACT manufactures Studs & Nuts to API 6A & ANSI B 16.5, in various materials and sizes.

Gaskets

ACT manufactures Ring Joint Gaskets in all sizes and materials to ASME B 16. 20 & API6A.

Flanged Fittings

Flanged, Studded Crosses and Tees from sizes 1.13/16" to 4.1/16" and for pressure ratings from 2000 PSI to 20000 PSI are manufactured and supplied.

Pipe Fittings (Butt Welded)

ACT manufactures Pipe Fittings, Butt-Welded, such as Elbows, Returns, Tees, Reducers etc. as per ASME B-16.9. The Butt -Welded Ends are prepared as per ANSI B-16.25.

Forged Socket Welded & Threaded Fittings

Forged, Socket Welded & Threaded Fittings can also be supplied to specifications ASME B-16.11 in pressure ratings of 2000, 3000 & 6000 PSI.

Steel Pipe Fittings, Screwed and Socket Welded Fittings as per BS 3799 for pressure rating of 3000 PSI and 6000 PSI and as per IS:1239, and Bends to BS 534 & IS:1239 are also manufactured and supplied.

Seamless Pipes

ACT can also supply Line Pipes as per AP 5L, Seamless Tubings and Casings as per API 5CT and also Pipes as per ASTM standard in Carbon Steel, Alloy Steel and Stainless Steel.

Specially Forged Products

Following forged products can also be supplied in machined / un-machined condition:

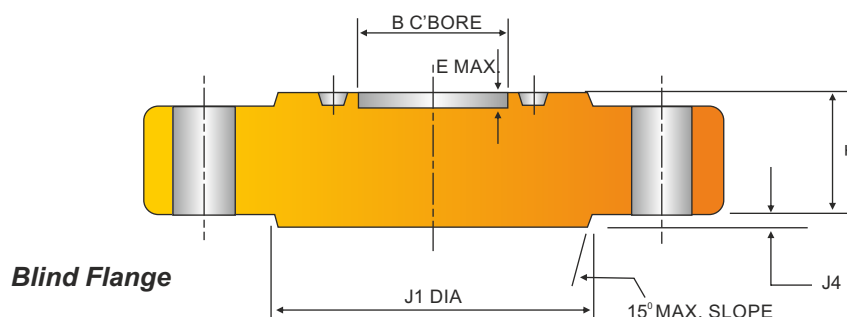
- A. Any closed die forging to single piece weight upto 200 Kg. and open forging to single piece weight upto 2000 Kg.
- B. Forgings for oil field products, automobile products, piping products, products for nuclear applications and special engineering products

Material

The above items can be supplied in Carbon Steel, Low Alloy Steel, Alloy Steel, Super Alloys as 17-4 PH, MONEL, INCONEL etc., meeting any International Standards e.g. ASTM, API, BIS, JIS, DIN, AISI, ISO, BS & IS etc.



FLANGES

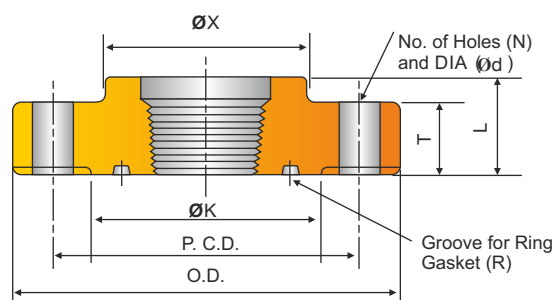


5 BLIND FLANGES. (AS PER API - 6A)

*All dimensions are in inches.

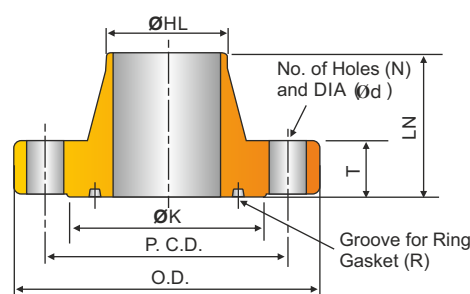
(5-1.) PRESSURE RATING:- API 6BX-2000 PSI W.P. (WITH BX TYPE RING GASKET)				
NOMINAL SIZE B	FLANGE THICKNESS T	HUB DIAMETER J1	GROOVE DEPTH E	ADDED HUB THICKNESS, J4
26 3/4	4.97	32.91	0.844	0.38
30	5.28	36.69	0.906	0.69
(5-2.) PRESSURE RATING:- API 6BX-3000 PSI W.P. (WITH BX TYPE RING GASKET)				
26 3/4	6.34	34.25	0.844	0.00
30	6.58	38.19	0.906	0.50
(5-3.) PRESSURE RATING:- API 6BX-5000 PSI W.P. (WITH BX TYPE RING GASKET)				
13 5/8	4.44	18.94	0.562	0.94
16 3/4	5.12	21.88	0.328	0.69
18 3/4	6.53	26.56	0.719	0.75
21 1/4	7.12	29.88	0.75	0.88
(5-4.) PRESSURE RATING:- API 6BX-10000 PSI W.P. (WITH BX TYPE RING GASKET)				
5 1/8	3.12	8.81	0.375	0.25
7 1/16	4.06	11.88	0.438	0.38
9	4.88	14.75	0.500	0.38
11	5.56	17.75	0.562	0.56
13 5/8	6.62	21.75	0.625	0.69
16 3/4	6.62	25.81	0.328	1.19
18 3/4	8.78	29.62	0.719	1.00
21 1/4	9.50	33.38	0.750	1.25
(5-5.) PRESSURE RATING:- API 6BX-15000 PSI W.P. (WITH BX TYPE RING GASKET)				
7 1/16	4.69	12.81	0.438	0.31
9	5.75	17.00	0.500	0.56
11	7.38	23.00	0.562	0.5
13 5/8	8.06	23.44	0.625	0.69
18 3/4	10.06	32.00	0.719	1.38
(5-6.) PRESSURE RATING:- API 6BX-20,000 PSI W.P. (WITH BX TYPE RING GASKET)				
7 1/16	6.5	15.19	0.438	0.31
9	8.06	18.94	0.500	0.25
11	8.81	22.31	0.562	0.5
13 5/8	11.50	27.31	0.625	0.56

FLANGES



Threaded Flange

(Fig. 1)



Weld Neck Flange

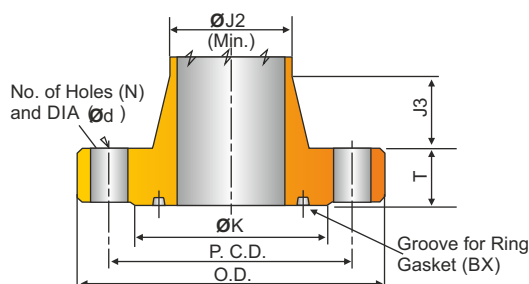
(Fig. 2)

1 THREADED FLANGES & WELD NECK FLANGES. (AS PER API - 6A)

*All dimensions are in inches.

(1-1.) PRESSURE RATING:- API 6B-2000 PSI W.P. (WITH R OR RX TYPE RING GASKET)											
SIZE	O.D	T	ØK	P. C.D.	N	Ød	L	ØX	LN	ØHL	R/RX
2 1/16	6.50	1.31	4.25	5	8	0.75	1.75	3.31	3.19	2.38	23
2 9/16	7.50	1.44	5	5.88	8	0.88	1.94	3.94	3.44	2.88	26
3 1/8	8.25	1.56	5.75	6.62	8	0.88	2.12	4.62	3.56	3.50	31
4 1/16	10.75	1.81	6.88	8.50	8	1.00	2.44	6.00	4.31	4.50	37
5 1/8	13	2.06	8.25	10.50	8	1.12	2.69	7.44	4.81	5.56	41
7 1/16	14	2.19	9.5	11.50	12	1.12	2.94	8.75	4.94	6.63	45
9	16.5	2.50	11.88	13.75	12	1.25	3.31	10.75	5.56	8.63	49
11	20	2.81	14	17	16	1.38	3.69	13.50	6.31	10.75	53
13 5/8	22	2.94	16.25	19.25	20	1.38	3.94	15.75			57
16 3/4	27	3.31	20	23.75	20	1.62	4.50	19.50			65
21 1/4	32	3.88	25	28.50	24	1.75	5.38	24.00			73
(1-2.) PRESSURE RATING:- API 6B-3000 PSI W.P. (WITH R OR RX TYPE RING GASKET)											
SIZE	O.D	T	ØK	P. C.D.	N	Ød	L	ØX	LN	ØHL	R/RX
2 1/16	8.50	1.81	4.88	6.50	8	1.00	2.56	4.12	4.31	2.38	24
2 9/16	9.62	1.94	5.38	7.50	8	1.12	2.81	4.88	4.44	2.88	27
3 1/8	9.50	1.81	6.12	7.50	8	1.00	2.44	5.00	4.31	3.50	31
4 1/16	11.50	2.06	7.12	9.25	8	1.25	3.06	6.25	4.81	4.50	37
5 1/8	13.75	2.31	8.50	11.0	8	1.38	3.44	7.50	5.31	5.56	41
7 1/16	15.00	2.50	9.50	12.50	12	1.25	3.69	9.25	5.81	6.63	45
9	18.50	2.81	12.12	15.50	12	1.50	4.31	11.75	6.69	8.63	49
11	21.50	3.06	14.25	18.50	16	1.50	4.56	14.50	7.56	10.75	53
13 5/8	24.00	3.44	16.50	21.00	20	1.50	4.94	16.50			57
16 3/4	27.75	3.94	20.62	24.25	20	1.75	5.06	20.00			66
21 1/4	33.75	4.75	25.50	29.25	20	2.12	6.75	24.50			74
(1-3.) PRESSURE RATING:- API 6B-5000 PSI W.P. (WITH R OR RX TYPE RING GASKET)											
SIZE	O.D	T	ØK	P. C.D.	N	Ød	L	ØX	LN	ØHL	R/RX
2 1/16	8.50	1.81	4.88	6.50	8	1.00	2.56	4.12	4.31	2.38	24
2 9/16	9.62	1.94	5.38	7.50	8	1.12	2.81	4.88	4.44	2.88	27
3 1/8	10.50	2.19	6.62	8.00	8	1.25	3.19	5.25	4.94	3.50	35
4 1/16	12.25	2.44	7.62	9.50	8	1.38	3.88	6.38	5.19	4.50	39
5 1/8	14.75	3.19	9.00	11.50	8	1.62	4.44	7.75	6.44	5.56	44
7 1/16	15.50	3.62	9.75	12.50	12	1.50	5.06	9.00	7.13	6.63	46
9	19	4.06	12.50	15.50	12	1.75	6.06	11.50	8.81	8.63	50
11	23	4.69	14.63	19.00	12	2.00	6.69	14.50	10.44	10.75	54

FLANGES



Integral Flange

(Fig. 3)

2 INTEGRAL FLANGES. (AS PER API - 6A)

*All dimensions are in inches.

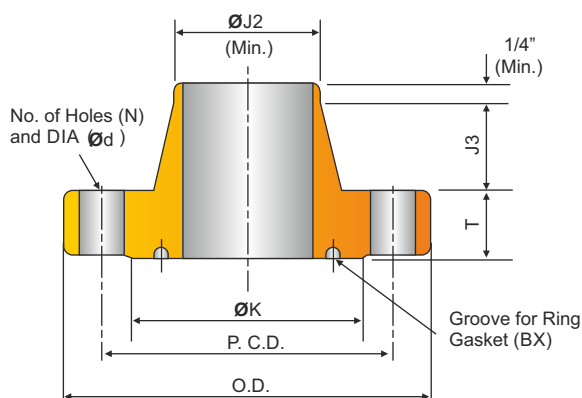
(2-1.) PRESSURE RATING:- API 6BX-2000 PSI W.P. (WITH BX TYPE RING GASKET)									
SIZE	O.D	T	ØK	P. C.D.	N	Ød	ØJ2	J3	BX
26 3/4	41.00	4.97	31.69	37.50	20	1.88	29.25	7.31	167
30	44.19	5.28	35.75	40.94	32	1.75	32.80	7.75	303
(2-2.) PRESSURE RATING:- API 6BX-3000 PSI W.P. (WITH BX TYPE RING GASKET)									
26 3/4	43.38	6.34	32.75	39.38	24	2.12	30.56	7.31	168
30	46.68	6.58	36.31	42.94	32	2.00	34.30	7.75	303
(2-3.) PRESSURE RATING:- API 6BX-5000 PSI W.P. (WITH BX TYPE RING GASKET)									
13 5/8	26.50	4.44	18.00	23.25	16	1.75	16.69	4.50	160
16 3/4	30.38	5.13	21.06	26.62	16	2.00	20.75	3.00	162
18 3/4	35.62	6.53	24.69	31.82	20	2.12	23.56	6.00	163
21 1/4	39.00	7.12	27.62	34.88	24	2.12	26.75	6.50	165
(2-4.) PRESSURE RATING:- API 6BX-10000 PSI W.P. (WITH BX TYPE RING GASKET)									
1 13/16	7.38	1.66	4.12	5.75	8	0.88	2.56	1.91	151
2 1/16	7.88	1.73	4.38	6.25	8	0.88	2.94	2.03	152
2 9/16	9.12	2.02	5.19	7.25	8	1.00	3.62	2.25	153
3 1/16	10.62	2.30	6.00	8.50	8	1.12	4.34	2.50	154
4 1/16	12.44	2.77	7.28	10.19	8	1.25	5.75	2.88	155
5 1/8	14.06	3.12	8.69	11.81	12	1.25	7.19	3.19	169
7 1/16	18.88	4.06	11.88	15.88	12	1.62	10.00	3.75	156
9	21.75	4.88	14.12	18.75	16	1.62	12.88	3.69	157
11	25.75	5.56	16.88	22.25	16	1.88	15.75	4.06	158
13 5/8	30.25	6.62	20.38	26.50	20	2.00	19.50	4.50	159
16 3/4	34.31	6.62	22.69	30.56	24	2.00	23.66	3.00	162
18 3/4	40.94	8.78	27.44	36.44	24	2.38	26.59	6.12	164
21 1/4	45	9.50	30.75	40.25	24	2.62	30.00	6.50	166
(2-5.) PRESSURE RATING:- API 6BX-15000 PSI W.P. (WITH BX TYPE RING GASKET)									
1 13/16	8.19	1.78	4.19	6.31	8	1.00	2.81	1.88	151
2 1/16	8.75	2.00	4.50	6.88	8	1.00	3.25	2.12	152
2 9/16	10.00	2.25	5.25	7.88	8	1.12	3.94	2.25	153
3 1/16	11.31	2.53	6.06	9.06	8	1.25	4.81	2.50	154
4 1/16	14.19	3.09	7.62	11.44	8	1.50	6.25	2.88	155
7 1/16	19.88	4.69	12.00	16.88	16	1.62	10.88	2.62	156
9	25.50	5.75	15.00	21.75	16	2.00	13.75	4.88	157
11	32.00	7.38	17.88	28.00	20	2.12	16.81	9.28	158
13 5/8	34.88	8.06	21.31	30.38	20	2.38	20.81	4.50	159
18 3/4	45.75	10.06	28.44	40.00	20	3.12	28.75	6.12	164

FLANGES

2 INTEGRAL FLANGES. (AS PER API - 6A)

*All dimensions are in inches.

(2-6.) PRESSURE RATING:- API 6BX-20000 PSI W.P. (WITH BX TYPE RING GASKET)									
SIZE	O.D.	T	ØK	P. C.D.	N	Ød	ØJ2	J3	BX
1 13/16	10.12	2.5	4.62	8.00	8	1.12	4.31	1.94	151
2 1/16	11.31	2.81	5.19	9.06	8	1.25	5.00	2.06	152
2 9/16	12.81	3.12	5.94	10.31	8	1.38	5.69	2.31	153
3 1/16	14.06	3.38	6.75	11.31	8	1.50	6.31	2.50	154
4 1/16	17.56	4.19	8.62	14.06	8	1.88	8.12	2.88	155
7 1/16	25.81	6.50	13.88	21.81	16	2.12	13.31	3.81	156
9	31.69	8.06	17.38	27.00	16	2.62	16.88	4.25	157
11	34.75	8.81	19.88	29.50	16	2.88	20.00	4.06	158
13 5/8	45.75	11.50	24.19	40.00	20	3.12	24.75	5.25	159



Weld Neck Flange
(Fig. 4)

3 WELD NECK FLANGES. (AS PER API - 6A)

*All dimensions are in inches.

(3-1.) PRESSURE RATING:- API 6BX-10000 PSI W.P. (WITH BX TYPE RING GASKET)									
SIZE	O.D.	T	ØK	P. C.D.	N	Ød	ØJ2	J3	BX
1 13/16	7.38	1.66	4.12	5.75	8	0.88	2.56	1.91	151
2 1/16	7.88	1.73	4.38	6.25	8	0.88	2.94	2.03	152
2 9/16	9.12	2.02	5.19	7.25	8	1.00	3.62	2.25	153
3 1/16	10.62	2.30	6.00	8.50	8	1.12	4.34	2.50	154
4 1/16	12.44	2.77	7.28	10.19	8	1.25	5.75	2.88	155
5 1/8	14.06	3.13	8.69	11.81	12	1.25	7.19	3.19	169
7 1/16	18.88	4.06	11.88	15.88	12	1.62	10.00	3.75	156
9	21.75	4.88	14.12	18.75	16	1.62	12.88	3.69	157
11	25.75	5.56	16.88	22.25	16	1.88	15.75	4.06	158
13 5/8	30.25	6.62	20.38	26.50	20	2.00	19.50	4.50	159
16 3/4	34.31	6.62	22.69	30.56	24	2.00	23.69	3.00	162

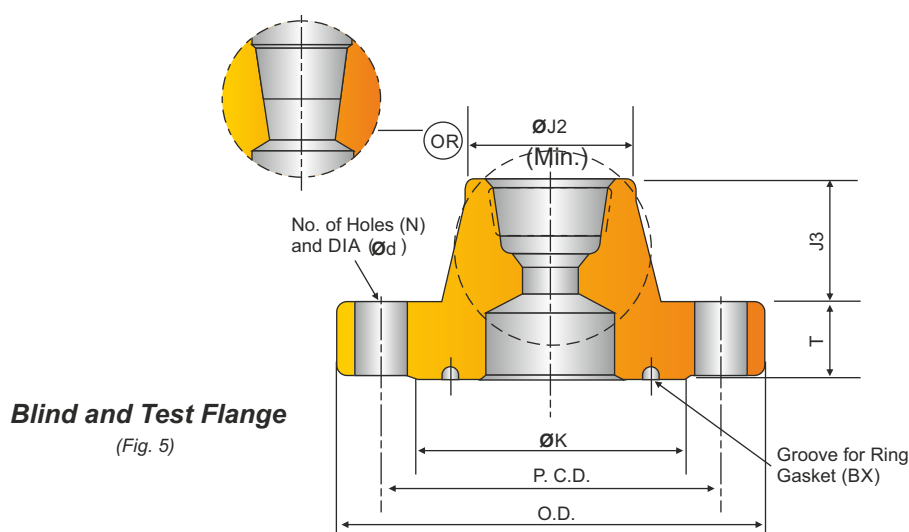
(3-2.) PRESSURE RATING:- API 6BX-15000 PSI W.P. (WITH BX TYPE RING GASKET)									
SIZE	O.D.	T	ØK	P. C.D.	N	Ød	ØJ2	J3	BX
1 13/16	8.19	1.78	4.19	6.31	8	1.00	2.81	1.88	151
2 1/16	8.75	2.00	4.50	6.88	8	1.00	3.25	2.12	152
2 9/16	10.00	2.25	5.25	7.88	8	1.12	3.94	2.25	153
3 1/16	11.31	2.53	6.06	9.06	8	1.25	4.81	2.50	154
4 1/16	14.19	3.09	7.62	11.44	8	1.50	6.25	2.88	155
7 1/16	19.88	4.69	12.00	16.88	16	1.62	10.88	3.62	156

FLANGES

3 WELD NECK FLANGES. (AS PER API - 6A)

*All dimensions are in inches.

(3-3.) PRESSURE RATING:- API 6BX-20000 PSI W.P. (WITH BX TYPE RING GASKET)									
SIZE	O.D	T	ØK	P. C.D	N	Ød	ØJ2	J3	BX
1 13 /16	10.12	2.5	4.62	8.00	8	1.12	4.31	1.94	151
2 1 /16	11.31	2.81	5.19	9.06	8	1.25	5.00	2.06	152
2 9 /16	12.81	3.12	5.94	10.31	8	1.38	5.69	2.31	153
3 1 /16	14.06	3.38	6.75	11.31	8	1.50	6.31	2.50	154
4 1 /16	17.56	4.19	8.62	14.06	8	1.88	8.12	2.88	155
7 1 /16	25.81	6.50	13.88	21.81	16	2.12	13.31	3.81	156



4 BLIND AND TEST FLANGES. (AS PER API - 6A)

*All dimensions are in inches.

(4-1.) PRESSURE RATING:- API 6BX-10000 PSI W.P. (WITH BX TYPE RING GASKET)									
SIZE	O.D	T	ØK	P. C.D	N	Ød	ØJ2	J3	BX
1 13 /16	7.38	1.66	4.12	5.75	8	0.88	2.56	1.91	151
2 1 /16	7.88	1.73	4.38	6.25	8	0.88	2.94	2.03	152
2 9 /16	9.12	2.02	5.19	7.25	8	1.00	3.62	2.25	153
3 1 /16	10.62	2.30	6.00	8.50	8	1.12	4.34	2.50	154
4 1 /16	12.44	2.77	7.28	10.19	8	1.25	5.75	2.88	155
(4-2.) PRESSURE RATING:- API 6BX-15000 PSI W.P. (WITH BX TYPE RING GASKET)									
1 13 /16	8.19	1.78	4.19	6.31	8	1.00	2.81	1.88	151
2 1 /16	8.75	2.00	4.50	6.88	8	1.00	3.25	2.12	152
2 9 /16	10.00	2.25	5.25	7.88	8	1.12	3.94	2.25	153
3 1 /16	11.31	2.53	6.06	9.06	8	1.25	4.81	2.50	154
4 1 /16	14.19	3.09	7.62	11.44	8	1.50	6.25	2.88	155
(4-3.) PRESSURE RATING:- API 6BX-20000 PSI W.P. (WITH BX TYPE RING GASKET)									
1 13 /16	10.12	2.50	4.62	8.00	8	1.12	4.31	1.94	151
2 1 /16	11.31	2.81	5.19	9.06	8	1.25	5.00	2.06	152
2 9 /16	12.81	3.12	5.94	10.31	8	1.38	5.69	2.31	153
3 1 /16	14.06	3.38	6.75	11.31	8	1.50	6.31	2.50	154
4 1 /16	17.56	4.19	8.62	14.06	8	1.88	8.12	2.88	155

TERMS & CONDITIONS OF SALE

Note: These Terms & Conditions of Sales control the rights and responsibilities of the parties in connection with goods and/or services sold to any customer or purchaser of goods or service hereunder (hereinafter, "Buyer") by ACT. and its affiliates (individually and/or collectively "Seller"). Please read this document carefully because of its significant legal consequences.

1. ACCEPTANCE: Acceptance by Seller of Buyer's order or proposal is expressly made conditional on assent to these Terms & Conditions of Sales, either by written acknowledgment or by conduct by Buyer that recognizes the existence and controlling nature of these Terms & Conditions of Sales.

2. FORM OF CONTRACT AND NO WAIVER: Seller will not be deemed to have accepted any proposal or sales order through course of dealing, performance, implied consent, or waiver specifically, but without limitation, Seller's (i) supplying products or performing services in response to Buyer's purchase order or proposal, and/or (ii) failing to complain of Buyer's noncompliance with these Terms & Conditions of Sales or the presence of any conflicting terms and condition in any other purchase order or similar document and/or (iii) accepting payment for products or services, shall not be construed as acceptance of any terms and conditions proposed by Buyer. No attempted modification by Buyers of these Terms & Conditions of Sales will be effective against Seller unless expressly in a writing signed by Seller's competent authority with the express authority of Seller to make such agreements.

3. CONFLICTING PROVISION VOID: Seller hereby objects to and rejects any terms & conditions included in Buyer's purchase order or other writing or modification that conflict with these Terms & Conditions of Sales. Any inconsistent terms and conditions contained in Buyer's purchase order, terms & conditions, or any other writing that represents Buyer's offer are not a part of the agreement between Seller and Buyer and shall have no effect.

4. PAYMENT STANDARD: Payment terms are 30% advance and balance before delivery at ex-works days from the date of Seller's invoice. Seller at its sole discretion reserve the right to require progress payments or payment in advance. If payment is not made when due the unpaid balance will be subject to a finance charge of 1½% of the unpaid balance per month or at the highest interest rate allowed by law, whichever is less. The amount of finance charges will be added to the balance owed to Seller. If Buyer fails to pay any invoice when due, or if the financial condition or credit of Buyer becomes unsatisfactory to Seller, Seller, at its sole discretion and without affecting any other lawful remedy, may change the terms of payment or suspend work and further deliveries, or both, until Buyer provides security or other assurance of performance as demanded by Seller. In the event Seller institutes legal or collection action against Buyer for non-payment, Buyer shall be liable to Seller for all reasonable costs and attorney's fees incurred by Seller in connection therewith. In the event of a dispute between Seller and Buyer regarding any separate sale(s), purchase(s), project(s), or service(s), Buyer shall not be entitled to withhold payments due Seller as a setoff for claims based on separate sale(s), purchase(s), project(s), or service(s).

5. LIMITED WARRANTY: Subject to limitations contained below, Seller warrants that services performed by Seller will be free from defects in workmanship under normal care and use until the expiration of the applicable warranty periods hereafter set forth said services are warranted for a period of ninety (90) days from the date of services. If Buyer discovers any warranty defects and notifies Seller thereof in writing and during the applicable warranty period, Seller shall at its sole discretion, promptly correct any errors that are found by the Seller in the services or refund the purchase price of the defective services. All replacements or repairs necessitated by inadequate maintenance, normal wear and usage, unsuitable environmental conditions, accident, misuse, or by improper installation, modification, repair, storage, or handling or any other cause not the fault of Seller, are not covered by this limited warranty, and shall be at Buyer's expense. Seller shall not be obligated to pay any costs or charges incurred by Buyer or any other party except as may be agreed upon in writing and in advance by an authorized representative of Seller. All cost of transportation and time and expenses of Seller's personnel for site travel and diagnosis under this warranty clause will be borne by Buyer. Warranty services rendered during the warranty period shall be warranted for the remainder of the original warranty period. This limited warranty is the sole warranty made by Seller and can be amended only in writing signed by an authorized representative of Seller.

OTHER THAN AS EXPRESSED ABOVE, THERE ARE NO REPRESENTATIONS OR WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, AT LAW, BY CONTRACT, OR OTHERWISE, AS TO THE MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, OR ANY OTHER MATTER WITH RESPECT TO ANY OF THE GOODS OR SERVICE.

6. LIMITATION OF REMEDY AND LIABILITY: In no event, regardless of the form of the claim or cause of action (including but not limited to claims based in contract, patent or trademark infringement, negligence, strict liability, other tort, or otherwise), shall Seller's liability to Buyer and/or its affiliates exceed the contract price. The parties agree that in no event shall either party's liability to the other and/or their affiliates extend to include incidental, consequential, punitive or exemplary damages. The term "consequential damages" shall include, but not be limited to, lost or deferred production, loss of anticipated profits, loss of use, loss of revenue, and cost of capital.

7. DELIVERY: Seller's obligation is to deliver the goods F.O.B. Seller's warehouse, place of manufacture, or other place from which the goods are actually shipped within INDIA, at which point risk of loss shall pass to Buyer. Freight will be prepaid and added to invoice unless otherwise agreed to by Seller in writing. Delivery dates give to Buyer in any manner are approximate. Seller will not be liable for failure to make delivery or delay in making delivery that directly or indirectly results from or is contributed to by any cause beyond Seller's reasonable control, including but not limited to fire, flood or other acts of God, strikes or other labor disagreements, accidents, acts or requirements of government or civil authorities, riot, war, embargo, shortages of labor, material or energy, delay in transportation, failure or delay by subcontractors or suppliers, or necessary changes in production or shipment schedules. In the event of such delay, Seller, at its sole discretion, will have the right to apportion supplies among its customers, including Buyer, in any manner that Seller determines, and any delivery date will be postponed for a period of time equal to the delay. If shipments are held at Seller's premises at request of Buyer, invoices will be rendered for all completed goods as though actually shipped, and Buyer will also pay Seller for all extra expenses incurred.

8. CANCELLATION BY BUYER: Buyer may cancel its order, or any part of it, by sending written notice of cancellation to Seller and by paying Seller a reasonable cancellation fee. The reasonable cancellation fee will be determined by Seller and will reflect, among other factors: the expenses already incurred, other commitments made by Seller, sales and administrative overheads, and profits. Goods may not be returned without Seller's prior written consent. Restocking charges may be assessed at the sole discretion of Seller.

9. PRICES: Unless otherwise specified by Seller, Seller's prices for the goods or services shall remain in effect for thirty (30) days from the date of Seller's quotation or acceptance of the order for the goods, whichever occurs first, provided an unconditional, complete authorization for the immediate procurement and shipment of the goods pursuant to Seller's standard invoicing procedures is received and accepted by the Seller from the Buyer within such time period. After such thirty (30) days period, Seller shall have the right to revise the price of the goods or services up to Seller's price in effect for the goods at the time the order is released by Buyer and Seller prior to shipment. The price for any Resale Goods or Services shall be Seller's price in effect at the time of shipment to Buyer.

10. INSTALLATION: All goods shall be installed by and at the expense of the Buyer.

11. TAXES: Buyer is responsible for any taxes, charges or other fees presently or subsequently imposed by any law, order, regulation or ordinance of the Federal, State or municipal governments for production sale, use, transportation, delivery or servicing of the products sold hereby. The foregoing shall not apply to taxes based upon Seller's net income.

12. ASSIGNMENT: Buyer shall not (by operation of law or otherwise) assign its rights or delegate its performance hereunder without the prior written consent of Seller, and any attempted assignment or delegation without such consent shall be void.

13. GOVERNING LAW: All sales shall be governed by and construed for all purpose, including without limitation, Seller's obligations or liabilities respecting its products, according to the laws of the Government Of India at New Delhi.

14. ENTIRE AGREEMENT: These Terms & Conditions of Sale (and any of Seller's purchase or work orders in connection therewith) constitute a complete and exclusive statement of the agreement between Seller and Buyer. There are no understandings, agreements or representations, express or implied, not specified in the Agreement. These Terms & Conditions of Sale control over any conflicting provision in any purchase or work order issued by Buyer. There are no other promises, conditions, understandings, representations or warranties. All provisions are severable, and if any of these Terms & Conditions of Sales are found by a court of competent jurisdiction to be unenforceable, then the Terms & Conditions of Sale shall be deemed modified only to the extent necessary to make them enforceable.

15. CREDIT BALANCES: Buyer agrees that any credit balances issued will be applied within one (1) year of its issuance. IF NOT APPLIED OR REQUESTED WITHIN ONE (1) YEAR, ANY BALANCE REMAINING WILL BE SUBJECT TO CANCELLATION, AND SELLER SHALL HAVE NO FURTHER LIABILITY.

16. GENERAL PROVISION: (a) No action, regardless of form, arising out of transactions under the Agreement, may be brought by either party more than one (1) year after the cause of action has accrued. (b) UNLESS OTHERWISE SPECIFICALLY PROVIDED IN SELLER'S QUOTATION, GOODS AND SERVICES HEREUNDER ARE NOT INTENDED FOR USE IN ANY NUCLEAR OR NUCLEAR RELATED APPLICATIONS. Buyer (i) accepts Goods and Services in accordance with the restriction set forth in the immediately preceding sentence, (ii) agrees to communicate such restriction in writing to any and all subsequent purchasers or users and (iii) agrees to defend, indemnify and hold harmless Seller from any and all claims, losses, liabilities, suits, judgments and damages, including incidental and consequential damages, arising from use of Goods and Services in any nuclear or nuclear related applications, whether the cause of action be based in tort, contract or otherwise, including allegations that the Seller's liability is based on negligence or strict liability. (c) The 1980 United Nation Convention on Contracts for the International Sale of Goods does not apply to this Agreement. (d) Seller specifically objects to the application of any Federal Acquisition Regulation ("FAR") provision or clause to the Agreement.



American Completion Tools

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Upcoming Plant at Houston by, March 2015:

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