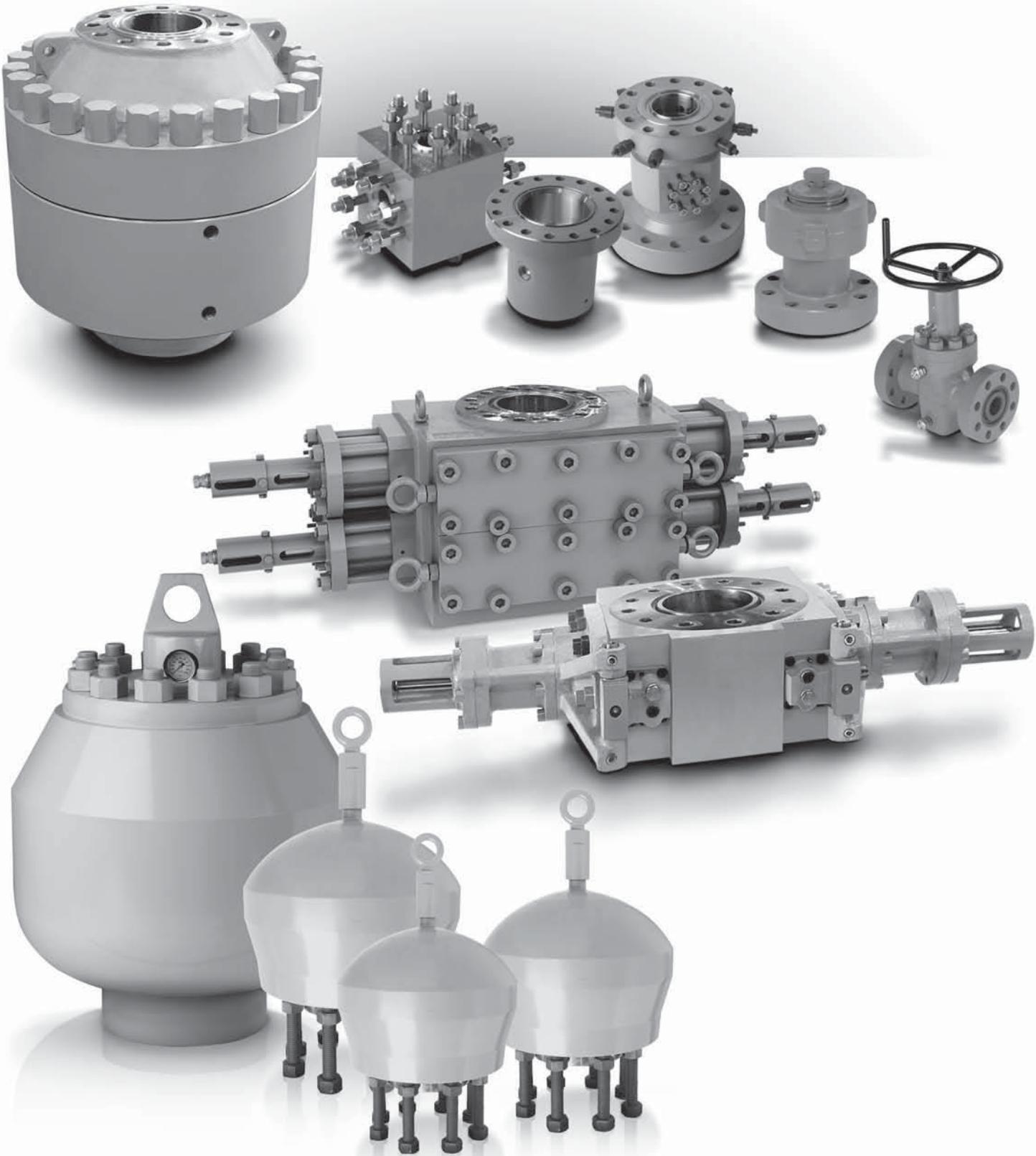


# General Product Catalog



**INTEGRATED**  
EQUIPMENT

Integrated Equipment Inc. reserves the right to open, close or otherwise modify the capabilities offered herein. Further, Integrated Equipment Inc. also reserves the right to add, delete or otherwise change any and all products offered.

Sales of Integrated Equipment Inc. products and services will be in accord solely with the terms and conditions contained in the contract between Integrated Equipment Inc. and the customer that is applicable to the sale.

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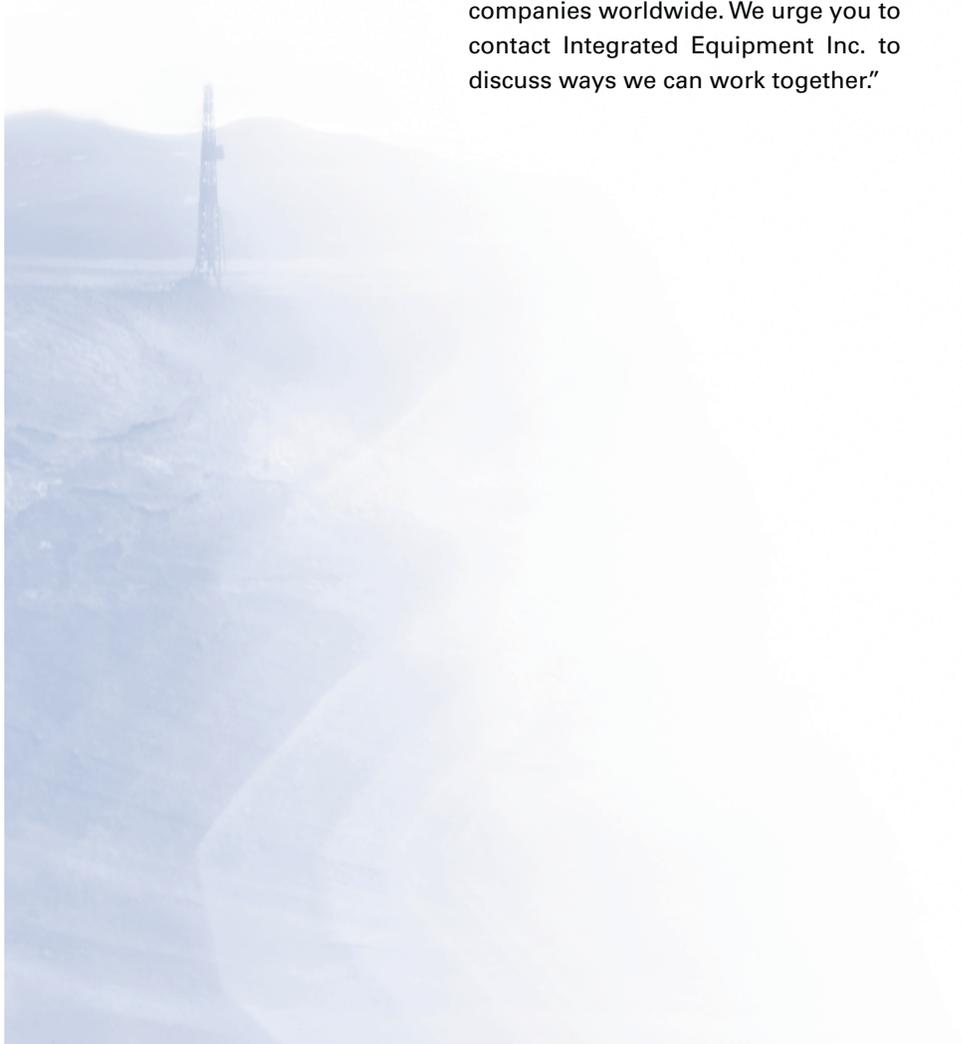
## OVERVIEW

Integrated Equipment, Inc. based in Houston, Texas designs, manufactures and markets equipment used in the drilling and production of oil and gas worldwide. IEi's standard product line includes API Coupling Products, Annular and Ram Blowout Preventers, Elastomer Products, Pulsation Dampeners and Wellhead Equipment.

IEi's products are used worldwide by Well Servicing Contractors, Drilling Contractors (land and offshore), Rental Tool Companies, independent producers and major oil companies.

All Integrated Equipment, Inc. products meet or exceed all API, ASME and NACE requirements. Our Manufacturing and Quality Standards conform to and are accredited by ISO 9001. Each IEi product has unique design features, based on years of operational experience. This benefits our customers by giving them the most flexible, efficient and cost effective products in the industry.

"IEi strives to broaden and strengthen our existing relationships. We also want to establish lasting and beneficial associations with individuals and new companies worldwide. We urge you to contact Integrated Equipment Inc. to discuss ways we can work together."

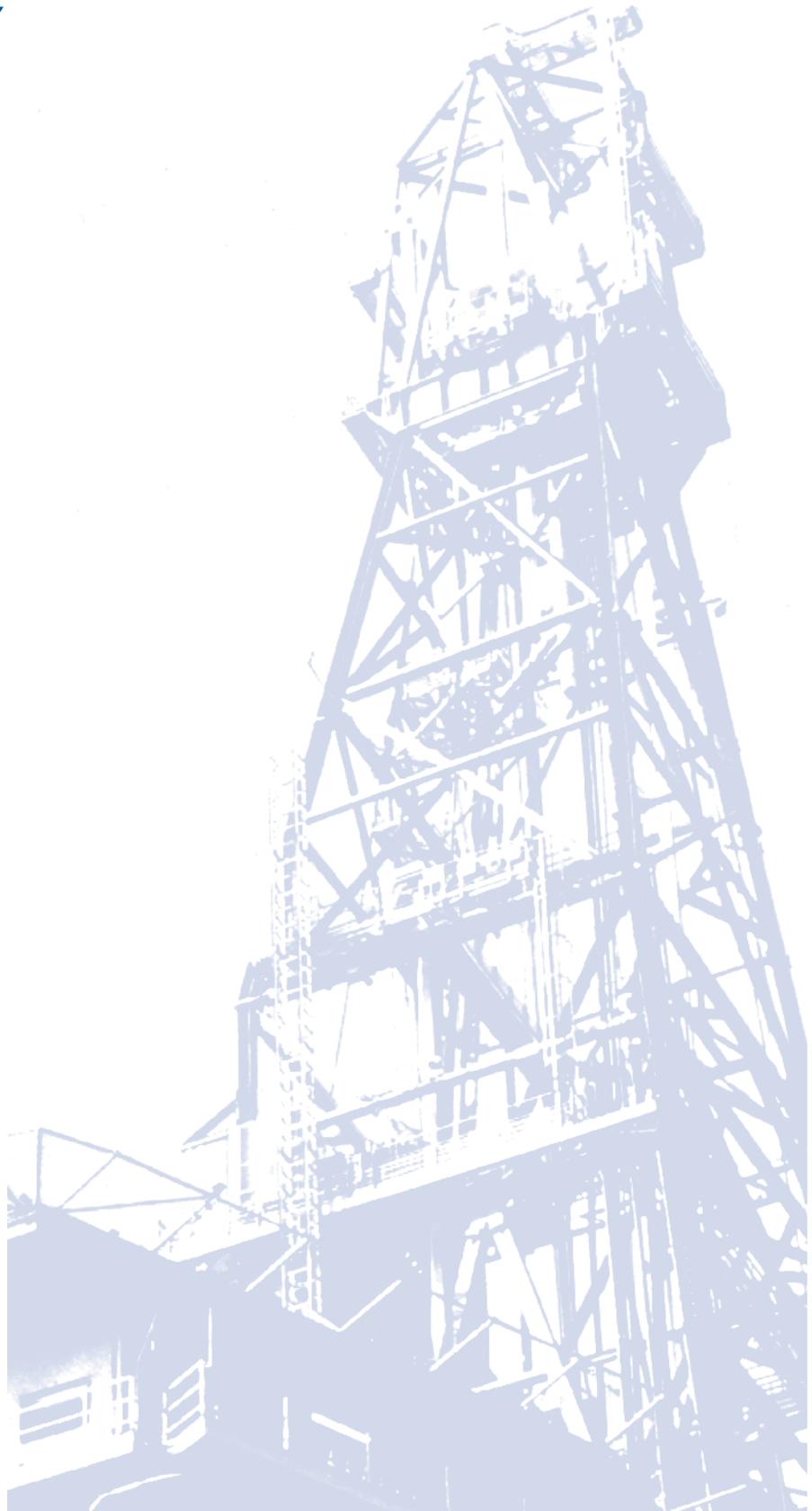


## ***DESIGN PHILOSOPHY***

Integrated Equipment Inc. products are developed, engineered, designed and tested in the United States. The equipment, rubber product specifications and manufacturing requirements are controlled by the IEI Engineering Department located in Houston, Texas.

In this era of globalization, like many other suppliers who manufacture equipment for the oil industry, as well as other industries, IEI has developed manufacturing sources around the world. Integrated Equipment Inc., at the present time, has the capability to produce their product line in China, India, Mexico and the USA. They continue to look for sources that can meet their design and quality requirements while also meeting their delivery needs.

This allows IEI to deliver to their customers a quality product on a reasonable schedule and at a competitive price.



## API 5CT & 5L COUPLING PRODUCTS

Integrated Equipment Inc (IEi) is a major distributor of API 5CT and 5L couplings in the Americas and worldwide. We stock and distribute API 5CT Tubing and Casing Couplings in various sizes and grades from a 1.315"OD up

to a 5.00" OD in J55/K55 and N80 and L80 grades. In addition, we stock and distribute API 5L Line Pipe Couplings in 2.00", 3.00" and 4.00" OD and other specialty tubing couplings. With years of commitment to customer satisfac-

tion, providing high quality products and timely deliveries, IEi has built an excellent global distribution network and the capability of providing value added services to end users.

### FEATURES

- ISO 9001, API 5CT and API 5L certification
- Experienced in managing customer supply chain and providing other value added services to the end users
- OD turned down, on all couplings, to ensure a higher degree of quality and durability to end user
- Proven track record for on-time deliveries
- 100% Customer Satisfaction for Quality and Reliability
- Superior Plating, Painting, and Packaging Processes
- Worldwide Stocking points
- Products sold and accepted by all major US and worldwide customers

### COUPLINGS FOR SPECIAL APPLICATIONS

- API 5CT Special Clearance tubing couplings
- Modified Couplings with ready to use fitted seal rings
- API 5L Line Pipe HALF Couplings for special applications

### API 5CT TUBING COUPLINGS

	Tubing Size OD	Coupling Size OD	Length	Weight per Piece	Palletized Carton Quantity	Palletized Carton Weight
	Inches	Inches	Inches	lbs		
API EUE Tubing Couplings	1.315	1.66	3.25	0.84	4880	4100
	1.66	2.054	3.5	1.29	3240	4205
	1.9	2.2	3.75	1.23	3240	4010
API NUE Tubing Couplings	2 3/8	3.063	4.875	3.42	1248	4300
	2 7/8	3.668	5.25	5.29	800	4260
	3 1/2	4.5	5.75	9.02	486	4409



## API 5CT CASING SHORT THREAD COUPLINGS

API Casing Couplings Short Thread	Casing Size OD	Coupling Size OD	Length	Weight per Coupling	Palletized Carton Quantity	Palletized Carton Weight
	Inches	Inches	Inches	lbs		
	4 1/2	5.000	6.250	8.00	512	4120
5 1/2	6.050	6.750	10.26	343	3545	



## API 5CT CASING LONG THREAD COUPLINGS

API Casing Couplings Long Thread	Casing Size OD	Coupling Size OD	Length	Weight per Coupling	Palletized Carton Quantity	Palletized Carton Weight
	Inches	Inches	Inches	lbs		
	4 1/2	5.000	6.250	9.15	448	4125
5 1/2	6.050	6.750	14.14	294	418	



## API 5L BLACK LINE PIPE COUPLING

API Line Pipe Couplings	Size OD	Coupling Size OD	Length	Weight per Piece	Palletized Carton Quantity	Palletized Carton Weight
	Inches	Inches	Inches	lbs		
	2	2.875	2.875	1.86	2366	4425
3	4.000	4.250	4.09	1053	4331	
4	5.200	4.500	7.59	580	4427	



# ANNULAR BLOWOUT PREVENTERS

The Integrated Equipment Inc. Annular Blowout Preventers are compact BOP's which can reliably seal on most any shape or size in the preventer. It has proven to be able to seal on kelleys, drill pipe, tool joints, drill collars and casing. The IEi Annular also provides the ability to safely strip drill pipe in and out of the hole.

## FEATURES

- Strong and simple construction
- Compact body saves between 15% and 20% in height over some competitive annular BOP's
- Only two hydraulic connections are required making the hydraulic system extremely simple
- Wear rings on moving parts reduce metal to metal contact thus improving preventer life
- Hydrogen Sulfide service is standard
- Reliable and field proven packing element provides long sealing life
- Trash ring prevents debris from dropping into the operating chambers during field replacement of packing rubber
- Meets all API 16A and NACE requirements

*Wear rings on moving parts reduce metal to metal contact thus improving preventer life*

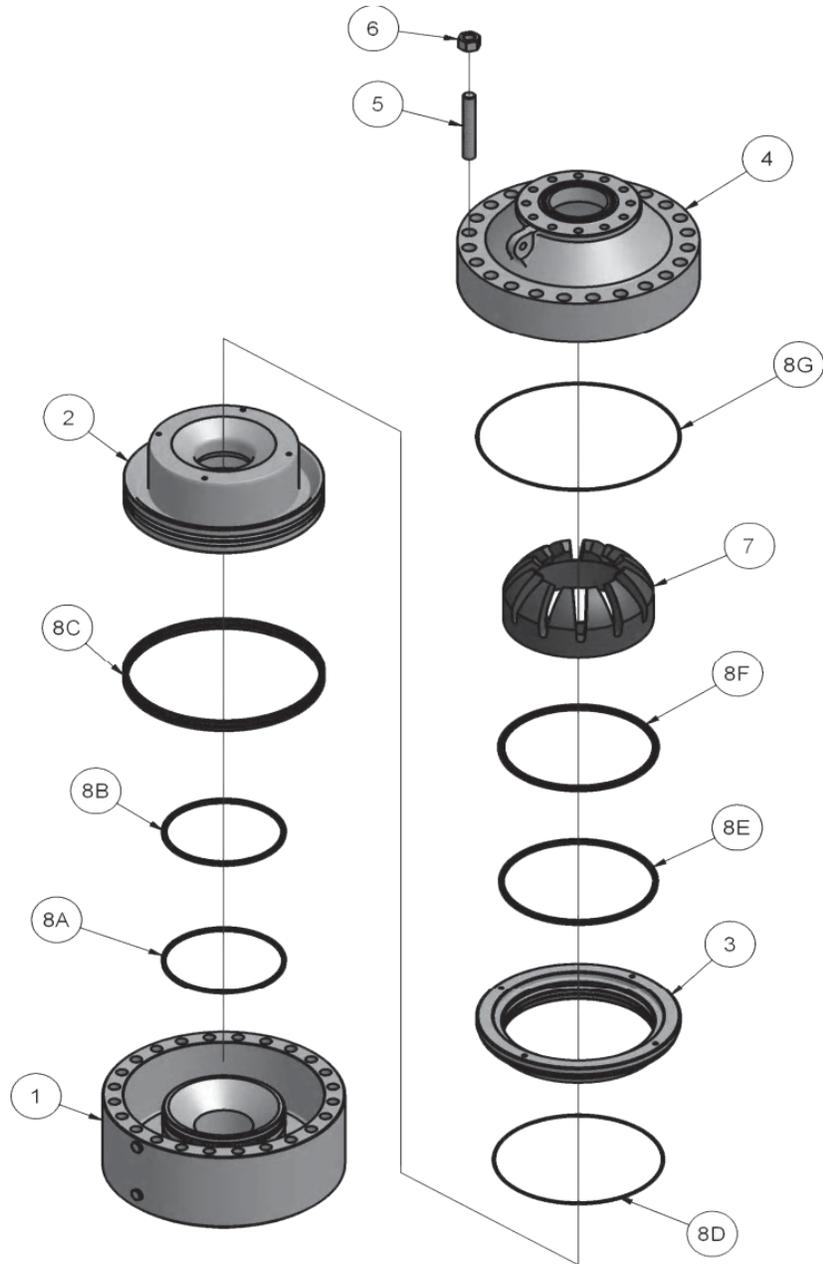
### IEi 7 1/16", 9", 11" & 13 5/8" Annular Blowout Preventers

Bore Size		7 1/16 in				9 in		11 in		13 5/8 in	
Pressure Rating		3000 psi	20.7 MPa	5000 psi	34.5 MPa	3000 psi	20.7 MPa	5000 psi	34.5 MPa	5000 psi	34.5 MPa
Width		29.3 in	745 mm	29.3 in	745 mm	35.5 in	902 mm	45.12 in	1146 mm	50.04 in	1271 mm
Height		31.4 in	797 mm	31.4 in	797 mm	32.9 in	838 mm	42.68 in	1084 mm	45.28 in	1150 mm
Weight		3351 lbs	1520 kg	3351 lbs	1520 kg	5287 lbs	2398 kg	10,060 lbs	4560 kg	14,680 lbs	6660 kg
Hydraulic Fluid	Open	4 gal	15 liters	4 gal	15 liters	6 gal	22.7 liters	14.8 gal	56 liters	18.23 gal	69 liters
	Close	5.5 gal	21 liters	5.5 gal	21 liters	9 gal	34 liters	19.0 gal	72 liters	24.83 gal	94 liters
Operating Pressure		1500 psi	10.4 MPa	1500 psi	10.4 MPa	1500 psi	10.4 MPa	1500 psi	10.4 MPa	1500 psi	10.4 MPa
Seal Ring		R-45	R-45	R-45	R-45	R-49	R-49	R-54	R-54	B-160	B-160
Test Pressure		Per API 16 A									

# ANNULAR BOP PARTS LIST

Item	Qty	Description
1	1	Lower Housing
2	1	Piston
3	1	Adapter Ring
4	1	Upper Housing
5	24	Stud
6	24	Nut
7	1	Packing Unit
8	1	Seal Repair Kit
8A*	1	Lower Piston Seal
8B*	1	Upper Piston Seal
8C*	2	Piston Seal
8D*	1	Top Adapter O-Ring
8E*	1	Lower Adapter Seal
8F*	1	Upper Adapter Seal
8G*	1	Upper Housing O-Ring

\* Included in Seal Repair Kit (item 8.)



## 7 1/16" SINGLE AND DOUBLE RAM BOP

Integrated Equipment Inc. 7" Ram BOP's are available in single and double ram configurations with pressure ratings of 2000 / 5000 psi (13.8 / 34.5 MPa) and adaptable to 3000 psi (20.7 MPa). The double ram BOP is less than 2 feet (610 mm) in height and weighs under 2300 pounds (1034 kilos) allowing use in the smallest rig cellars / sub structures.. Ram blocks are available, as standard, from Blind thru 4 1/2" (114.3 mm).

### FEATURES

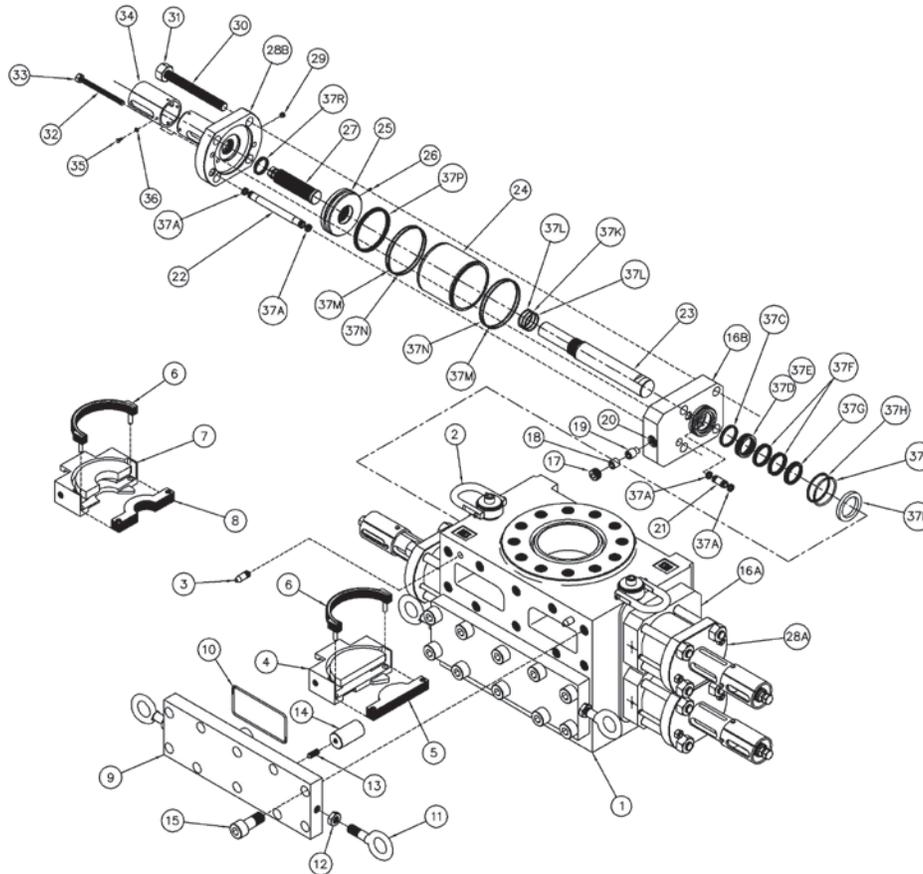
- All wetted wellbore surfaces comply with the latest revision of NACE MR-01-75
- Field-proven design
- Oversized operators
- Short height
- Light weight
- All hydraulics ported internally
- Only standard tools required for maintenance
- Double drilled 2000 / 5000 psi (13.8 / 34.5 MPa) and adaptable to 3000 psi (20.7 MPa).
- Standard end connections

*End connections are double drilled to accept 2000 / 5000 psi (13.8 / 34.5 MPa) and adaptable to 3000 psi (20.7 MPa) mating flanges for ease of installation during rig up*

#### IEi 7 1/16" 2000 and 5000 Single and Double Ram BOP

		Double Ram		Single Ram	
Bore Size		7 1/16 in	179.4 mm	7 1/16 in	179.4 mm
Pressure Rating		2000/5000 psi	13.8/34.5 MPa	2000/5000 psi	13.8/34.5 MPa
End Connections		Studded top & bottom, double drilled for 2000/5000 (13.8 MPa/34.5 MPa) bolt hole pattern			
Working Pressure		2000 psi/ 13.8 MPa when used with exact same bolt hole pattern 5000 psi/ 34.5 MPa when used with exact same bolt hole pattern			
Test Pressure		Per API 16 A			
Operating Pressure		1500 psi	10.4 MPa	1500 psi	10.4 MPa
Hydraulic Fluid	Open	.33 gal	1.25 liters	.33 gal	1.25 liters
	Close	.35 gal	1.32 liters	.35 gal	1.32 liters
Piston Stroke		4.00 in	101.6 mm	4.00 in	101.6 mm
Weight		2250 lbs	1020.6 kg	1350 lbs	612.4 kg
Ring Joint		R-46	R-46	R-46	R-46
Width		20.75 in	527.1 mm	20.75 in	527.1 mm
Height		20.19 in	512.8 mm	10.50 in	266.7 mm
Length		65.50 in	1663.7 mm	65.50 in	1663.7 mm
Ram Block Sizes		Blind, 1.9" (48.3 mm); 2.37" (60.3 mm); 2.87" (73.0 mm); 3.50" (88.7 mm); 4.00" (101.6) and 4.50" (114.3 mm)			

# 7 1/16" RAM BOP PARTS LIST



Item	Qty	Description
1	1	BOP Body
2	2	Hoist Ring
3	4	Locator Pin
4	2	Blind Ram Body
5	2	Blind Ram Front Packer
6	2	Ram Top Seal
7	2	Pipe Ram Body
8	2	Pipe Ram Front Packer
9	2	Pressure Door
10	4	O-Ring
11	4	Eye Bolt
12	4	Hex Nut
13	4	Guide Pin Stud
14	4	Guide Pin
15	20	Pressure Door Cap Screw
16A	2	Bonnet Body, RH
16B	2	Bonnet Body, LH
17	4	Injection Port Pipe Plug

Item	Qty	Description
18	4	Injection Port Set Screw
19	4	Injection Port Check Valve
20	4	Plastic Packing Stick (Not Shown)
21	4	Seal Sleeve, Short
22	4	Seal Sleeve, Long
23	4	Piston Rod
24	4	Cylinder
25	4	Piston Body
26	4	Piston Set Screw
27	4	Lockscrew
28A	4	End Cover, RH
28B	4	End Cover, LH
29	4	Pipe Plug
30	16	Bonnet Stud
31	16	Heavy Hex Stud
32	8	End Cover Stud
33	8	Heavy Hex Nut
34	4	Lockscrew Protector

Item	Qty	Description
35	16	Cap Screw
36	16	Lock Washer
37	4	Seal Repair Kit
37A*	8	Seal Sleeve O-Ring
37B*	1	Teflon Ring
37C*	1	Bonnet I.D. T-Seal
37D*	1	Injection Energizing Ring
37E*	1	Injection Packing Ring
37F*	2	Polypak Ring
37G*	1	Wiper Ring
37H*	1	Bonnet O-Ring
37J*	1	Non-Extrusion Ring
37K*	1	Piston Rod O-Ring
37L*	2	Non-Extrusion Ring
37M*	2	Cylinder O-Ring
37N*	2	Non-Extrusion Ring
37P*	1	Piston T-Seal
37R*	1	End Cover T-Seal

\* Included in Seal Repair Kit (item 37.)

## 9" SINGLE AND DOUBLE RAM BOP

Integrated Equipment Inc. 9" Single Ram BOP is offered at 3000 psi (20.7 MPa). The Ram BOP has a height of less than 12 in (305 mm) and a weight of less than 1500 pounds (680 kilos). This height and weight makes it ideal

for use in workover and smaller drilling rig operations. "Ram blocks are available, as standard, from Blind thru 5.5" (139.7 mm).

### FEATURES

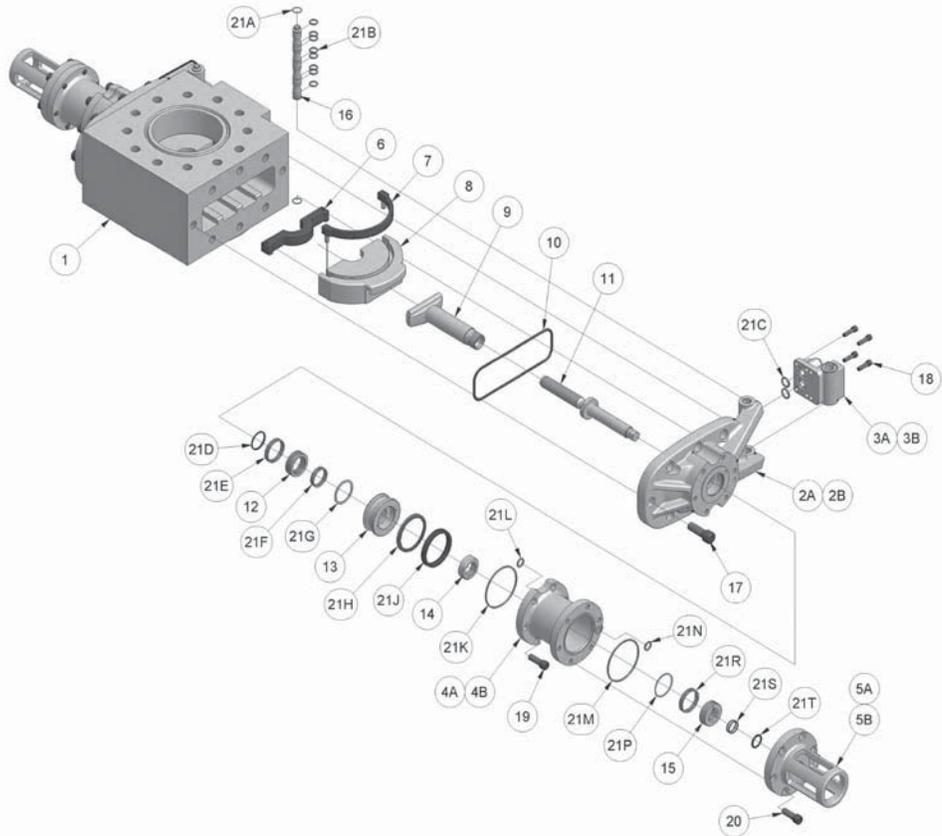
- All wetted wellbore surfaces comply with the latest revision of NACE MR-01-75
- Field-proven design
- Short height
- Light weight
- All hydraulics ported internally
- Only standard tools required for maintenance
- Standard end connections

*Light weight and minimum height make this ram BOP ideal for the majority of workover and drilling rig applications*

#### IEi 9" 3000 Single and Double Ram BOP

		Double Ram		Single Ram	
Bore Size		9 in	228.6 mm	9 in	228.6 mm
Pressure Rating		3000 psi	20.7 MPa	3000 psi	20.7 MPa
End Connections		Studded top & bottom			
Test Pressure		Per API 16A			
Operating Pressure		1500 psi	10.4 MPa	1500 psi	10.4 MPa
Hydraulic Fluid	Open	.68 gal	2.57 liters	.68 gal	2.57 liters
	Close	.77 gal	2.91 liters	.77 gal	2.91 liters
Piston Stroke		6.00 in	152.4 mm	6.00 in	152.4 mm
Weight		3300 lbs	1500 kg	1950 lbs	885 kg
Ring Joint		R-49	R-49	R-49	R-49
Width		22 in	559 mm	22 in	559 mm
Height		33.75 in	857 mm	11 in	279.4 mm
Length		60.00 in	1524 mm	60.00 in	1524 mm
Ram Block Sizes		Blind, 1.9" (48.3 mm); 2.37" (60.3 mm); 2.87" (73.0 mm); 3.50" (88.7 mm); 4.00" (101.6 mm) and 4.50" (114.3 mm), 5.00" (127 mm), 5.50" (139.7 mm)			

# 9" RAM BOP PARTS LIST



Item	Qty	Description
1	1	Body
2A	2	RH Door
2B	2	LH Door
3A	2	RH Door Hinge
3B	2	LH Door Hinge
4A	2	RH Cylinder
4B	2	LH Cylinder
5A	2	RH Cylinder Head
5B	2	LH Cylinder Head
6	4	Front Packer
7	4	Top Seal
8	4	Ram Block
9	4	Ram Shaft
10	4	Door Seal
11	4	Locking Shaft
12	4	Packing Adapter
13	4	Piston
14	4	Piston Locknut
15	4	Locking Shaft Thrust Bushing
16	4	Hinge Pin
17	32	Door Cap Screw

Item	Qty	Description
18	16	Hinge Bracket Cap Screw
19	12	Cylinder Cap Screw
20	12	Cylinder Head Cap Screw
21	4	Seal Repair Kit
21A*	8	Hinge Pin Retainer Ring
21B*	32	Hinge Pin O-Ring
21C*	4	Door Hinge Bracket O-Ring
21D*	4	Ram Shaft Wiper
21E*	8	External Adapter O-Ring
21F*	8	Internal Adapter O-Ring
21G*	4	Adapter Retainer Ring
21H*	4	Piston OD Wiper
21J*	4	Piston OD Seal
21K*	4	Front Cylinder O-Ring
21L*	4	Front Manifold O-Ring
21M*	4	Rear Cylinder O-Ring
21N*	4	Rear Manifold O-Ring
21P*	4	Locking Shaft Thrust Bushing Retainer
21R*	8	Locking Shaft Thrust Bushing External O-Ring
21S*	8	Locking Shaft Thrust Bushing Internal O-Ring
21T*	4	Locking Shaft Wiper

\* - Included in Seal Repair Kit (item 21.)

# 11" SINGLE AND DOUBLE RAM BOP

Integrated Equipment Inc. 11" Ram BOP's are available in single and double ram configurations with pressure ratings of 5,000 / 10,000 psi (34.5 / 69.0 MPa). The 5M double ram BOP is less than 3 feet (857 mm) in height

and weighs under 9500 pounds (4255 kilos) allowing use in workover and mid-sized drilling rig operations. Ram blocks are available, as standard, from Blind thru 8.63" (219.2 mm).

## FEATURES

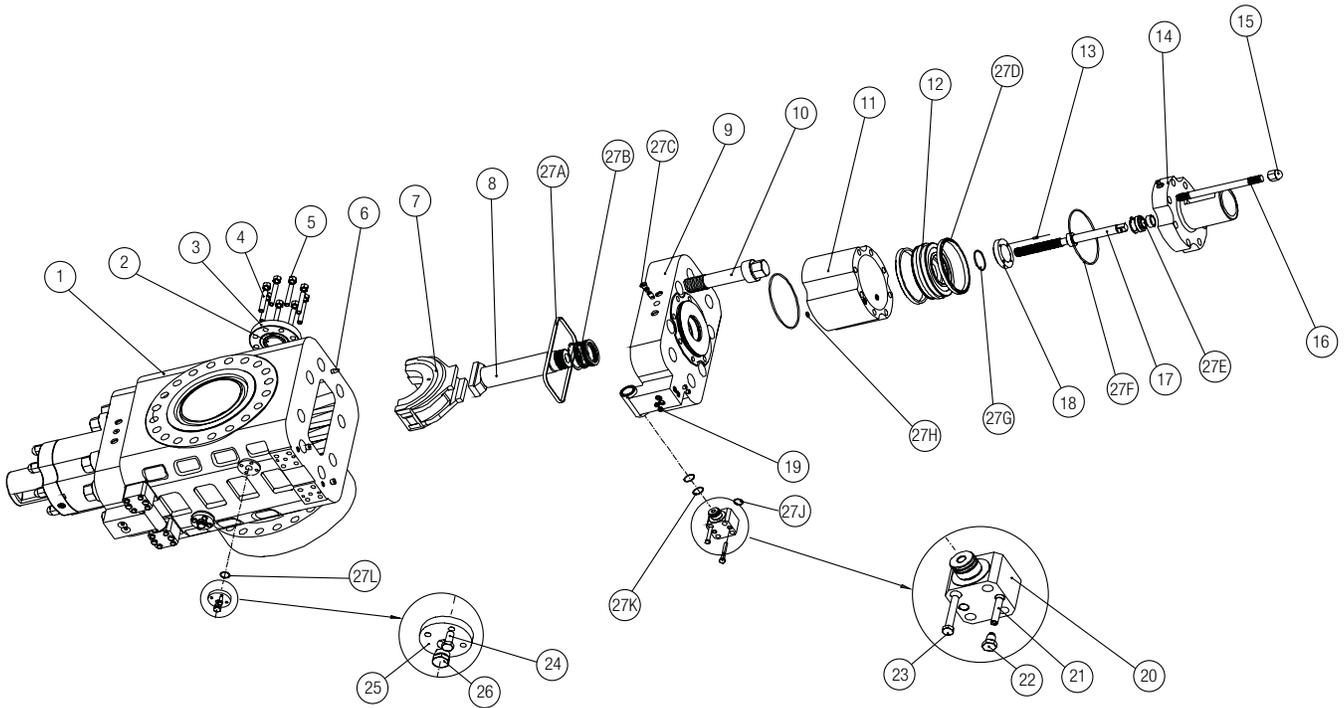
- All wetted wellbore surfaces comply with the latest revision of NACE MR-01-75
- Field-proven design
- Short height
- Light weight
- All hydraulics ported internally
- Only standard tools required for maintenance
- Standard end connections

*A field proven design makes this Ram BOP ideal for any drilling application*

### IEi 11" 5000 and 10,000 Single and Double Ram BOP

		5000 Double Ram		5000 Single Ram		10,000 Double Ram		10,000 Single Ram	
Bore Size		11 in	279.4 mm	11 in	279.4 mm	11 in	279.4 mm	11 in	279.4 mm
Pressure Rating		5000 psi	34.5 MPa	5000 psi	34.5 MPa	10000 psi	69 MPa	10000 psi	69 MPa
End Connections		Studded top and flanged bottom				Flanged top and bottom			
Test Pressure		Per API 16A				Per API 16A			
Operating Pressure		1500 psi	10.4 MPa	1500 psi	10.4 MPa	1500 psi	10.4 MPa	1500 psi	10.4 MPa
Hydraulic Fluid	Open	2.8 gal	16.7 liters	4.4 gal	16.7 liters	7.6 gal	28.3 liters	7.6 gal	28.3 liters
	Close	3.2 gal	18.2 liters	4.8 gal	18.2 liters	8.8 gal	33.3 liters	8.8 gal	33.3 liters
Piston Stroke		8.67 in	220 mm	8.67 in	220 mm	9.843 in	250 mm	9.843 in	250 mm
Weight		10,840 lbs	4928 kg	5740 lbs	2610 kg	23,240 lbs	10,564 kg	13,000 lbs	5910 kg
Ring Joint		R-54	R-54	R-54	R-54	BX-158	BX-158	BX-158	BX-158
Width		34.06 in	865 mm	34.06 in	865 mm	40.16 in	1110 mm	40.16 in	1020 mm
Height		32.68 in	830 mm	25.98 in	659.9 mm	57.87 in	1470 mm	40.94 in	1040 mm
Length		83.46 in	2120 mm	83.46 in	2120 mm	88.58 in	2250 mm	88.58 in	2250 mm
Ram Block Sizes		Blind, 1.9" (48.3 mm); 2.37" (60.3 mm); 2.87" (73.0 mm); 3.50" (88.7 mm); 4.00" (101.6 mm), 4.50" (114.3 mm), 5.00" (127 mm), 5.50" (139.7 mm), 6.63" (168.4 mm), 7" (177.8 mm), 7.63" (193.8 mm), 8.63" (219.2 mm)							

# 11" RAM BOP PARTS LIST



Item	Qty	Description
1	1	Body (Single)
1A	1	Body (Double)
2	1	Gasket
3	1	Blind flange
4	8	Bolt
5	8	Nut
6	2	Cone pin
7	1	Ram assembly
8	2	Ram shaft
27A	2	Seal ring, bonnet
27B	2 pair	Ram shaft seal
27C	2 pair	Secondary seal
9	1	Right bonnet
9A	1	Left bonnet
10	16	Bolt, bonnet
11	2	Cylinder
12	2	Piston
27D	4	Seal ring, piston
13	4	Screw
14	1	Right cylinder head
14A	1	Left cylinder head

Item	Qty	Description
15	16	Nut
16	16	Bolt
27E	2 pair	Locking shaft seal
17	2	Locking shaft
27F	4	O-ring
18	2	Piston locking head
27G	2	O-ring
27H	4	O-ring
19	1	Plug R1/2
27J	4	O-ring
20	4	Hinge bracket
21	8	Locating pin
22	8	Screw
23	16	Screw
27K	8	O-ring
27L	2	O-ring
24	8	Screw
25	2	Oil pipe bracket
26	12	Plug MPT
27	1	Repair Kit
28	2 set	Manual control assembly

\* - Included in Seal Repair Kit (item 21.)

# 13 5/8" SINGLE AND DOUBLE RAM BOP

Integrated Equipment Inc. 13" Ram BOP's are available in single and double ram configurations with pressure ratings of 5000 / 10,000 psi (34.5 / 69.0 MPa). The 5M double ram BOP is just over 4 feet (1340 mm) in height and

weighs under 14,000 pounds (6019 kilos) allowing use in workover and the largest drilling rig operations. Ram blocks are available, as standard, from Blind thru 8.63" (219.2 mm).

*A field proven design for use in workover and large drilling applications*

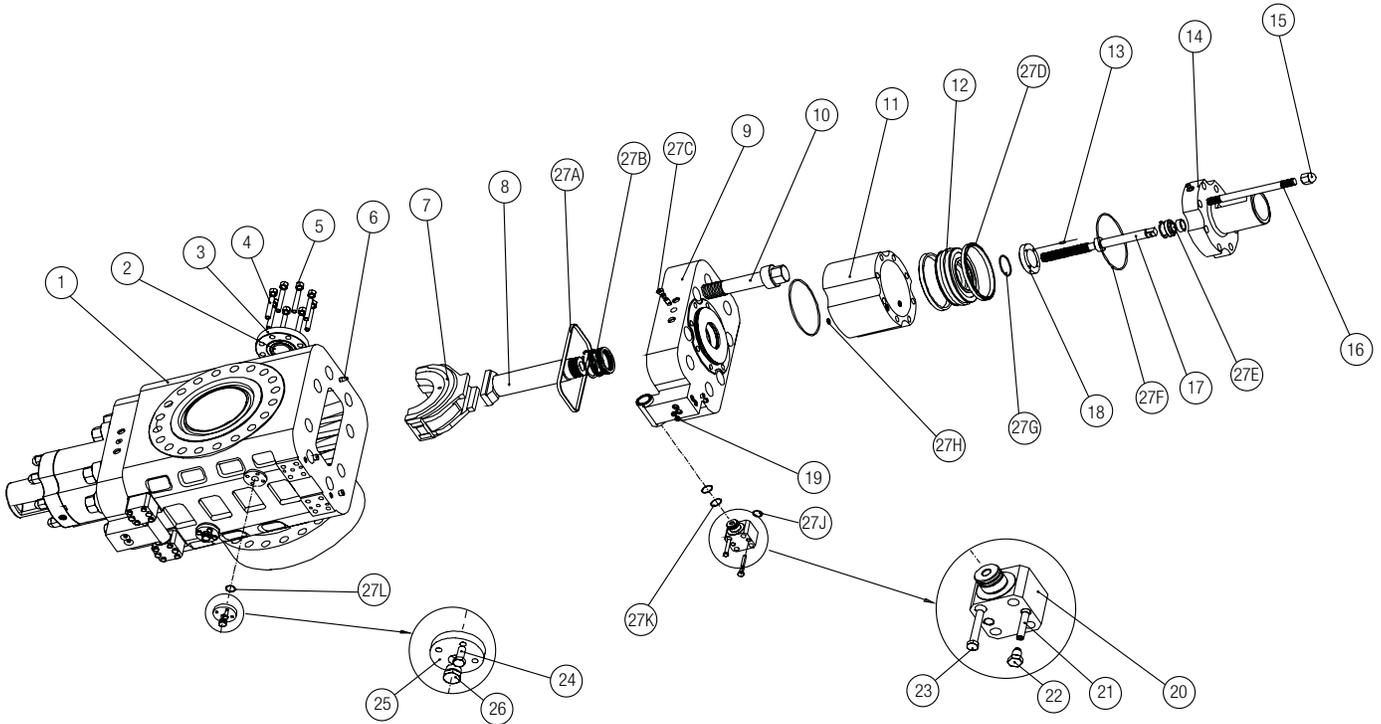
## FEATURES

- All wetted wellbore surfaces comply with the latest revision of NACE MR-01-75
- Field-proven design
- Short height
- Light weight
- All hydraulics ported internally
- Only standard tools required for maintenance
- Standard end connections

### IEi 13 5/8" 5000 and 10,000 Single and Double Ram BOP

		5000 Double Ram		5000 Single Ram		10,000 Double Ram		10,000 Single Ram	
Bore Size		13 5/8 in	346.1 mm	13 5/8 in	346.1 mm	13 5/8 in	346.1 mm	13 5/8 in	346.1 mm
Pressure Rating		5000 psi	34.5 MPa	5000 psi	34.5 MPa	10000 psi	69 MPa	10000 psi	69 MPa
End Connections		Flanged top and bottom				Studded top and flanged bottom			
Test Pressure		Per API 16A				Per API 16A			
Operating Pressure		1500 psi	10.4 MPa	1500 psi	10.4 MPa	1500 psi	10.4 MPa	1500 psi	10.4 MPa
Hydraulic Fluid	Open	2.8 gal	16.7 liters	4.4 gal	16.7 liters	7.6 gal	28.3 liters	7.6 gal	28.3 liters
	Close	3.2 gal	18.2 liters	4.8 gal	18.2 liters	8.8 gal	33.3 liters	8.8 gal	33.3 liters
Piston Stroke		9.8 in	249 mm	9.8 in	249 mm	13.39 in	340 mm	13.39 in	340 mm
Weight		10,200 lbs	6910 kg	8640 lbs	3928 kg	30,400 lbs	13,820 kg	12,620 lbs	5737 kg
Ring Joint		BX-160	BX-160	BX-160	BX-160	BX-159	BX-159	BX-159	BX-159
Width		36.22 in	920 mm	36.22 in	920 mm	43.7 in	1110 mm	43.7 in	1110 mm
Height		52.75 in	1340 mm	34.85 in	885 mm	58.5 in	1485 mm	37.8 in	960 mm
Length		94.49 in	2400 mm	94.49 in	2400 mm	105.12 in	2672 mm	105.12 in	2672 mm
Ram Block Sizes		Blind, 1.9" (48.3 mm); 2.37" (60.3 mm); 2.87" (73.0 mm); 3.50" (88.7 mm); 4.00" (101.6 mm), 4.50" (114.3 mm), 5.00" (127 mm), 5.50" (139.7 mm), 6.63" (168.4 mm), 7" (177.8 mm), 7.63" (193.8 mm), 8.63" (219.2 mm)							

# 13 5/8" RAM BOP PARTS LIST



Item	Qty	Description
1	1	Body (Single)
1A	1	Body (Double)
2	1	Gasket
3	1	Blind flange
4	8	Bolt
5	8	Nut
6	2	Cone pin
7	1	Ram assembly
8	2	Ram shaft
27A	2	Seal ring, bonnet
27B	2 pair	Ram shaft seal
27C	2 pair	Secondary seal
9	1	Right bonnet
9A	1	Left bonnet
10	16	Bolt, bonnet
11	2	Cylinder
12	2	Piston
27D	4	Seal ring, piston
13	4	Screw
14	1	Right cylinder head
14A	1	Left cylinder head

Item	Qty	Description
15	16	Nut
16	16	Bolt
27E	2 pair	Locking shaft seal
17	2	Locking shaft
27F	4	O-ring
18	2	Piston locking head
27G	2	O-ring
27H	4	O-ring
19	1	Plug R1/2
27J	4	O-ring
20	4	Hinge bracket
21	8	Locating pin
22	8	Screw
23	16	Screw
27K	8	O-ring
27L	2	O-ring
24	8	Screw
25	2	Oil pipe bracket
26	12	Plug MPT
27	1	Repair Kit
28	2 set	Manual control assembly

\* - Included in Seal Repair Kit (item 21)

## BOP HYDRAULIC CONTROL SYSTEMS

Integrated Equipment BOP Control Units are manufactured in the USA utilizing components which are standard within the industry. All skids and tanks are manufactured from heavy duty structural steel.

### Accumulator Bottle:

ASME – "U" stamped, seamless non-welded, bottom or top loading with 1-1/4" or 2" NPT ports and rated @ 3000 psi.

### Manifold Headers:

Both accumulator and control valve headers are machined complete from non-welded mechanical tubing and are rated @ 5,000 psi.

### Pumps:

Options include electric, gasoline, diesel, air powered or manual hand operated. All pump systems come with suction strainer and check valves on discharge manifolds.

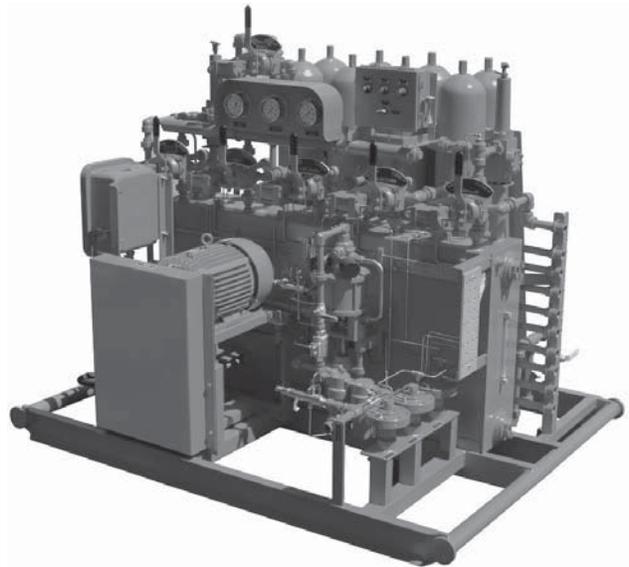
### Hydraulic Control Manifold:

Valves and regulators are stainless steel internal trim fitted. The control valves may be fitted with air or hydraulic cylinders for remote control. The regulator operators are either manual, air diaphragm, hydraulic pilot or KR-failsafe motor drive (air or hydraulic).

### Remote Control Panels:

Conventional panels are air remote with optional KT-3600 type diaphragm transmitters. Panel size options are free standing driller's and auxiliary and the mini-remote which is wall or hand rail mounted.

Electric control panels utilizing PLC's offer low voltage explosion proof driller's panel and light weight small diameter electric cable for ease for handling and transport. They are available as electro pneumatic or electro hydraulic systems.



Unit Size	Tank Size	All Bottles		Valve Stations	
		Gallon	Quantity	Quantity	Inches
5	10	5	1	1	1/2
5	10	5	1	2	1/2
20	30	10	2	1	1/2
30	50	10	3	1	1/2 + 1
30	50	10	3	2	1/2
33	50	11	3	3	1/2 + 1
60	90	10	6	1	1
80	120	10	8	3	1

## ***CAPACITIES FROM 20 TO 80 GALLONS***

- Heavy-Duty skid or trailer mounted.
- Pump options: Air, electric, diesel, gasoline, manual (hand) or rig hydraulics
- C-SERIE TRI-PLEX is powered by direct drive electric, diesel or gasoline engine with maximum output of 4.9 gpm. This system is well suited for work-over applications.
- Control valves and regulators are available in 1/4" to 1" sizes.



20 Gallon Air Powered Workover Unit

## ***HYDRAULIC TEST UNITS***

- High pressure test systems allow on-location testing of BOP stacks, choke and kill manifolds and well-heads.
- Working pressure range is 3,000 to 30,000 psi.
- Standard models are wheel mounted without a tank or skid mounted with or without a tank.
- A Chart Recorder may be added as unit mounted or on a separate stand.
- Test Hose Assemblies are available in lengths of 50 feet and working pressures from 10,000 to 36,000 psi.



20,000 psi Unit, Skid Mounted with Tank

Chart Recorder - Stand Mounted

## **ANNULAR BOP PACKING UNITS (GK STYLE)**

Part Number	Description	Material
82-220-075-01	GK 7 1/16"-5000	NR
82-220-075-02	GK 7 1/16"-5000	NBR
82-220-135-02	GK 13 5/8"-5000	NBR



## **ANNULAR BOP PACKING UNITS (SPHERICAL)**

Part Number	Description	Material
82-221-735-01	7 1/16"-3/5000 Spherical	NR
82-221-735-02	7 1/16"-3/5000 Spherical	NBR
82-221-115-02	11"-5000 Spherical	NBR
82-221-135-02	13 5/8"-5000 Spherical	NBR

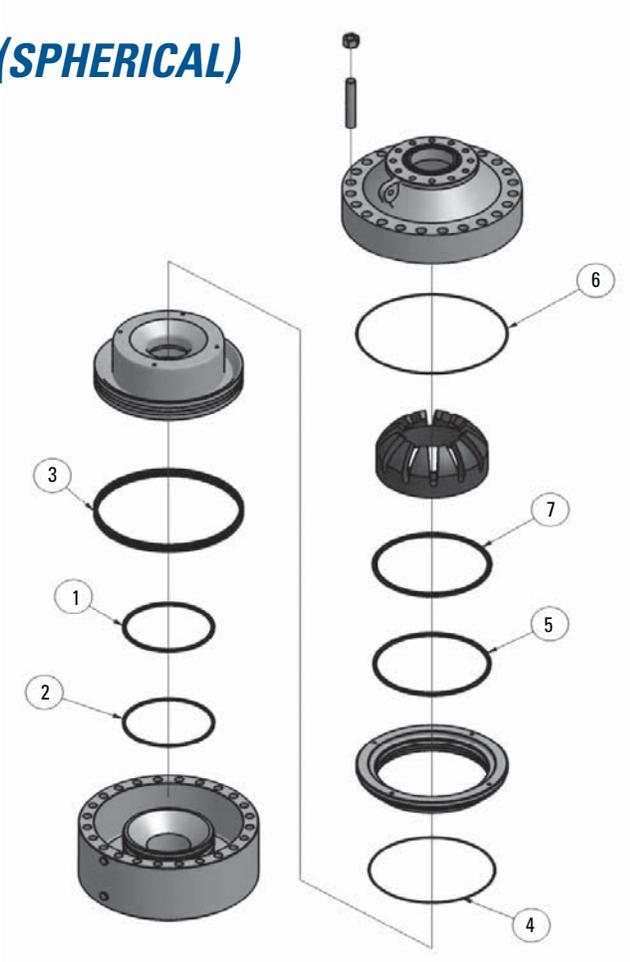


## ANNULAR BOP SEAL KITS (SPHERICAL)

Item	Qty	Description
1	1	Upper ID Piston Seal
2	1	Lower ID Piston Ring
3	2	OD Piston Seal
4	1	Upper ID Adapter Seal
5	1	Lower ID Adapter Seal
6	1	OD Adapter Seal
7	1	Top Adapter Seal
	1	Complete Kit
	2	Piston Wear Bands **

\*\* Not Included in Seal Kit

Kit P/N	Description
82-221-55079	7-1/6"-3/5000 Spherical S/K
82-55079WB	7-1/16:3/5000 Spherical Wear Bands
82-221-55030	11"-5000 Spherical S/K
82-55030WB	11"-5000 Spherical Wear Bands
82-221-55070	13-5/8"-5000 Spherical S/K
82-55070WB	13-5/8"-5000 Spherical Wear Bands

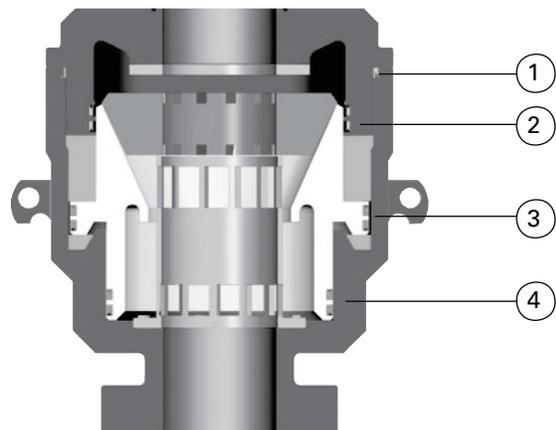


## ANNULAR BOP SEAL KITS (GK STYLE)

Item	Qty	Description
1	1	Head Gasket Seal
2	2	Upper Piston Seal
3	2	Piston Head Seal
4	2	Lower Piston Seal
	1	Complete Kit
	1	Piston Indicator Seal **

\*\* Not Included In Kit

Kit P/N	Description
82-200-50684	GK 7 1/16"-5000 S/K
82-200-50688	GK 11"-5000 S/K
82-200-50690	GK 13 5/8"-5000 S/K



## RAM BOP SPARE PARTS

### IEi Ram Type BOP Front Packers, Top Seals & Seal Kits

Part Number	Description
70-102-041	7 1/16"-5000 Single Ram, Seal Kit
70-100-001	7 1/16"-5000 Ram Door Seal
70-101-000	7 1/16"-5000 Ram Top Seal
70-101-001-1	7 1/16"-5000 Ram Packer, Blind
70-101-002-2	7 1/16"-5000 Ram Packer, 2-3/8"
70-101-002-3	7 1/16"-5000 Ram Packer, 2-7/8"
70-101-002-5	7 1/16"-5000 Ram Packer, 3-1/2"
70-101-002-7	7 1/16"-5000 Ram Packer, 4-1/2"



# PULSATION DAMPENER REPLACEMENT PARTS

## Type "K" Drilling Pulsation Dampeners

Part Number	Description
73-101004	10 Gallon, DPD Diaphragm, NBR*
73-102004	10 Gallon, DPD Diaphragm, HNBR**
73-101005	10 Gallon, DPD Diaphragm, Stabilizer
73-100005	10 / 20 Gallon DPD Stabilizer Plate
71-200-014	10 / 20 Gallon, DPD Charging Valve
71-200-013	10 / 20 Gallon, DPD Gauge, 0-6000 psi
26-016-000	10 Gallon, DPD Screw
26-017-001	10 Gallon, DPD Lock Washer
71-100-002	10 Gallon, DPD Bottom Gasket, HNBR**
73-201004	20 Gallon DPD Diaphragm, NBR*
73-202004	20 Gallon DPD Diaphragm, HNBR**
73-201005	20 Gallon DPD Stabilizer, NBR*
73-100005	10 / 20 Gallon DPD Stabilizer Plate
71-200-014	10 / 20 Gallon, DPD Charging Valve
71-200-013	10 / 20 Gallon, DPD Gauge, 0-6000 psi
26-012-151	20 Gallon DPD Screw
26-017-000	20 Gallon DPD Lock Washer
71-100-004	20 Gallon DPD Bottom Gasket, HNBR**
71-200-020	10 / 20 Gallon DPD Charging Hose Assy



## Production Pulsation Dampeners

Part Number	Description
73-011004	PPD 1 Gallon Diaphragm, NBR*
73-012004	PPD 1 Gallon Diaphragm, HNBR**
73-251004	PPD 2 1/2 Gallon Diaphragm, NBR*
73-252004	PPD 2 1/2 Gallon Diaphragm, HNBR**
73-051004	PPD 5 Gallon Diaphragm, NBR*
73-052004	PPD 5 Gallon Diaphragm, HNBR**
73-101004	10 Gallon, PPD Diaphragm, NBR*
73-102004	10 Gallon, PPD Diaphragm, HNBR**
73-201004	20 Gallon, PPD Diaphragm, NBR*
73-202004	20 Gallon PPD Diaphragm, HNBR**
71-210-014	PPD Charging Valve
71-200-021	PPD Charging Hose Assy.
71-302-051	Teflon B/U for 1 Gallon Diaphragm
71-302-055	Teflon B/U for 2 1/2 & 5 Gallon Diaphragm

## CECO Type Pulsation Dampeners

Part Number	Description
71-6922-4503	P-45 PD Diaphragm, NBR*
71-6922-4507	P-45 PD Diaphragm, HNBR**
71-6922-5503	P-55 PD Diaphragm, NBR*
71-6922-5503A	P-55A PD Diaphragm,with Insert, NBR*
71-6922-5507	P-55 PD Diaphragm, HNBR**
71-6922-5507A	P-55A PD Diaphragm,with Insert, HNBR**
71-6922-0109	P-55A PD Stabilizer, NBR*
71-6922-402FMAC	PD-45/PD-55 Charging Valve
71-6922-040	PD-45/PD-55 Charging Hose Assy.



\* NBR = Nitrile Buna-N

\*\* HNBR = Hydrogenated Nitrile

## ***PULSATION DAMPENER REPLACEMENT PARTS***

### **Type "K" Drilling Pulsation Dampeners**



### **Production Pulsation Dampeners**



### **CECO Type Pulsation Dampeners**



# K-STYLE PULSATION DAMPENER DIAPHRAGM KITS

## 10 Gallon

Part Number	Description
<b>73-1010041</b>	<b>10 Gallon, Diaphragm Kit, NBR*</b>
73-101004	10 Gallon, PD Diaphragm, NBR
73-101005	10 Gallon PD Diaphragm Stabilizer
73-100005	10 Gallon, PD Diaphragm Stabilizer Plate
26-016-000	10 Gallon, Stabilizer Plate Screw
26-017-001	10 Gallon, Stabilizer Plate Lock Washer
<b>73-1020041</b>	<b>10 Gallon, Diaphragm Kit, HNBR**</b>
73-102004	10 Gallon, PD Diaphragm, HNBR
73-101005	10 Gallon PD Diaphragm Stabilizer
73-100005	10 Gallon, PD Diaphragm Stabilizer Plate
26-016-000	10 Gallon, Stabilizer Plate Screw
26-017-001	10 Gallon, Stabilizer Plate Lock Washer



## 20 Gallon

Part Number	Description
<b>73-2010041</b>	<b>20 Gallon, Diaphragm Kit, NBR*</b>
73-201004	20 Gallon, PD Diaphragm, NBR
73-201005	20 Gallon PD Diaphragm Stabilizer
73-100005	20 Gallon, PD Diaphragm Stabilizer Plate
26-012-151	20 Gallon, Stabilizer Plate Screw
26-017-000	20 Gallon, Stabilizer Plate Lock Washer
<b>73-2020041</b>	<b>20 Gallon, Diaphragm Kit, HNBR**</b>
73-202004	20 Gallon, PD Diaphragm, HNBR
73-201005	20 Gallon PD Diaphragm Stabilizer
73-100005	20 Gallon, PD Diaphragm Stabilizer Plate
26-012-151	20 Gallon, Stabilizer Plate Screw
26-017-000	20 Gallon, Stabilizer Plate Lock Washer



\* NBR = Nitrile Buna-N

\*\* HNBR = Hydrogenated Nitrile

# K-STYLE PULSATION DAMPENER REPAIR KITS

## 10 Gallon

Part Number	Description
<b>73-1010042</b>	<b>10 Gallon, 5000 PSI, PD Repair Kit (NBR)*</b>
73-1010041	10 Gallon, Diaphragm Kit, NBR
71-100-002	Bottom Plate Gasket
71-200-014	Charging Valve
71-200-013	Pressure Guage (0-6000 psi)
<b>73-1020042</b>	<b>10 Gallon, 5000PSI, PD Repair Kit (HNBR)**</b>
73-1020041	10 Gallon, Diaphragm Kit, HNBR
71-100-002	Bottom Plate Gasket
71-200-014	Charging Valve
71-200-013	Pressure Guage (0-6000 psi)



## 20 Gallon

Part Number	Description
<b>73-2010042</b>	<b>20 Gallon, 5000PSI, PD Repair Kit (NBR)*</b>
73-2010041	20 Gallon, Diaphragm Kit, NBR
71-100-004	Bottom Plate Gasket
71-200-014	Charging Valve
71-200-013	Pressure Guage (0-6000 psi)
<b>73-2010043</b>	<b>20 Gallon, 7500 PSI, PD Repair Kit (NBR)*</b>
73-2010041	20 Gallon, Diaphragm Kit, NBR
71-100-004	Bottom Plate Gasket
71-210-014	Charging Valve
71-210-013	Pressure Guage (0-6000 psi)
<b>73-2020042</b>	<b>20 Gallon, 5000PSI, PD Repair Kit (HNBR)**</b>
73-2020041	20 Gallon, Diaphragm Kit, NBR
71-100-004	Bottom Plate Gasket
71-200-014	Charging Valve
71-200-013	Pressure Guage (0-6000 psi)
<b>73-2020043</b>	<b>20 Gallon, 7500 PSI, PD Repair Kit (HNBR)**</b>
73-2020041	20 Gallon, Diaphragm Kit, NBR
71-100-004	Bottom Plate Gasket
71-210-014	Charging Valve
71-210-013	Pressure Guage (0-6000 psi)



\* NBR = Nitrile Buna-N

\*\* HNBR = Hydrogenated Nitrile

## **JEMEL PIPE WIPERS**

JEMEL Pipe Wipers are manufactured from a proprietary engineered rubber compound. This material is extremely resistant to both water and oil-based drilling mud's giving it a long life. The

compound has excellent wear properties including resistance cutting, tearing and abrasion. They are available, as a standard, in red or black.

*...extremely resistant to both water and oil-based drilling mud's giving it a long life*

## **JEMEL REGULAR DUAL WIPERS**

The Regular Dual Wipers are molded as single unit to provide a flexible, double wiping action on drill strings where oversize tool joint and pipe protectors are used. They are light and easy to install. Top and bottom wiping

elements are spaced in such a way as to prevent mud caking yet the complete unit is still thin enough not to interfere with operation of the master bushing. Two steel reinforcing rings are used to prevent collapsing.

## **JEMEL SPLIT DUAL WIPERS**

Designed for applications on drill pipe where a solid master bushing is used the Jemel Split Dual Wiper is molded with split spring-steel reinforcing rings. Tear-proof slots are cut through the outer edge of the wiper for ease

of installation. This feature allows the wiper to be opened up and threaded around the pipe under the raised master bushing prior to removing the drill pipe from the hole.

## **JEMEL TYPE F WIPERS**

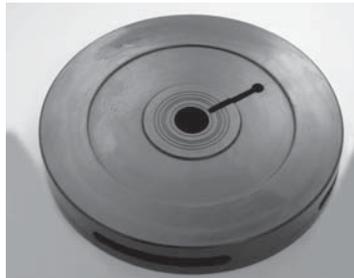
Jemel Type "F" wipers are especially designed for use on drilling or work-over rigs which have little room below the master bushing. As with all Jemel wipers, regardless of style, operators

report that the Type "F" wiper gives exceptionally long service under severe operating conditions. Type "F" wipers are available in pipe sizes ranging from 9" through 26".

## JEMEL PIPE WIPERS

### JEMEL Regular Dual Wipers

Part Number	Description	Weight (lbs)
80-100-RD-14	14" Regular Dual	16
80-100-RD-17	17" Regular Dual	23
80-100-RD-19	19" Regular Dual	30
80-100-RD-22	22" Regular Dual	48



### JEMEL Split Dual Wipers

Part Number	Description	Weight (lbs)
80-100-SD-14	14" Split Dual	16
80-100-SD-17	17" Split Dual	23
80-100-SD-19	19" Split Dual	30
80-100-SD-22	22" Split Dual	48
80-100-SD14R	14" Split Dual, Red	16
80-100-SD17R	17" Split Dual, Red	23
80-100-SD19R	19" Split Dual, Red	30
80-100-SD22R	22" Split Dual, Red	48



### JEMEL Type F Wipers

Part Number	Description	Weight (lbs)
80-100-TF09	9" Type "F"	3
80-100-TF09 W/O	9" Type "F", W/O Insert	3
80-100-TF12	12" Type "F"	5
80-100-TF12 W/O	12" Type "F", W/O Insert	5
80-100-TF14	14" Type "F"	6
80-100-TF14 W/O	14" Type "F", W/O Insert	6
80-100-TF17	17" Type "F"	12
80-100-TF19	19" Type "F"	18
80-100-TF22	22" Type "F"	19
80-100-TF26	26" Type "F"	26
80-100-TF14R	14" Type "F", Red	6
80-100-TF17R	17" Type "F", Red	12
80-100-TF19R	19" Type "F", Red	18
80-100-TF22R	22" Type "F", Red	19
80-100-TF26R	26" Type "F", Red	26



**NOTE: All pipe wipers molded to fit 2 3/8" pipe wiper cutter assembly available upon request**

## WIPER CUTTER ASSEMBLY

Part Number	Description
81-100-7005A	Complete Wiper Cutter Assembly
81-100-70051	Aluminum Base
81-100-70052	Stationary Spindle
81-100-70053	Rotating Spindle
81-100-70054	Handle & Blade Holder
81-100-70055	Blade
81-100-70056	Handle Screw
81-100-70057	Base Plate Pad
81-100-70058	Paddle for Dual Wiper
81-100-70059	Wooden Spacer for Type "F" Style Wiper
81-100-70060	Aluminum Blade Setting Jig



### NOTE:

The aluminum jig makes setting up to cut pipe wipers accurately. Simply place the aluminum jig over the spindle. Set the blade in the appropriate groove and tighten the spindle bolt. The jig takes the guess work out of cutting wipers and can be used in the field as well as the shop or warehouse.

Weight: 30 lbs

# DRILL PIPE PROTECTORS

## Smooth Style

Part Number	Description	Compound
80-3552R-02	3-1/2" X 5-1/4" Smooth	300-70
80-4572R-02	4-1/2" X 7-1/4" Smooth	300-70
80-5072R-02	5" X 7-1/4" Smooth	300-70



## Fluted Style

Part Number	Description	Compound
80-3552F-02*	3-1/2" X 5-1/4" Fluted	300-70
80-3552F-03**	3-1/2" X 5-1/4" Fluted (GR)	446-90
80-4572F-02	4-1/2" X 7-1/4" Fluted	300-70
80-4572F-03	4-1/2" X 7-1/4" Fluted (GR)	446-90
80-5073F-02	5" X 7-3/8" Fluted	300-70
80-5073F-03	5" X 7-3/8" Fluted (GR)	446-90
80-100-7000	"Clamp" Installation Tool	
80-100-7001	"Pullit" Pin Puller	
80-100-7002	"PIN" Spare Pins	
80-100-7003	"Drive-It" Pin Driver	



\* **CMPD. 300-70 - Standard Nitrile, 70 Duro**

\*\* **CMPD. 446-90 - Gas Resistant, 85 Duro**

## TONG & ELEVATOR STRAPS

Part Number	Description
80-51000-01	Tong Pull Back Strap
80-51500-01	Elevator Stabilizer Strap



## AERO UNION TUBES

Part Number	Description
80-200-7008	8" Nominal Air Tube
80-200-7010	10" Nominal Air Tube
80-200-7012	12" Nominal Air Tube
80-200-7016	16" Nominal Air Tube



Mud Tank Union Air Tubes are molded from Nitrile Rubber. The use of Union Tubes allows quick installation of plain end pipe between mud pumps and tanks. They also assist in absorbing pulsations.

## PULSATION DAMPENERS

Integrated Equipment, Inc. (IEi) offers a range of Drilling and Production Pulsation Dampeners that are unique in design and construction. IEi Dampeners are available from 1 gallon to 20 gallon capacities and in pressure ranges from 285 psi to 7500 psi.

The bodies for both styles are of single piece construction which eliminates the possibility of weld failures in the field. The charging valve for both the Drilling Dampener and the Production Dampener are protected by heavy duty impact resistant protective covers.

### Sizing/Selection of Pulsation Dampeners

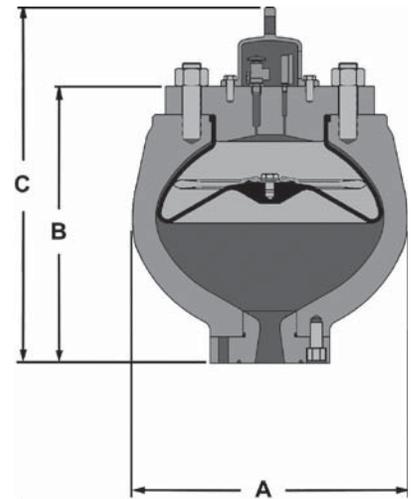
Pulsation Dampener selection is a critical process which requires a thorough knowledge of a pressure system, the system components and the fluid characteristics. Please consult your IEi

representative for assistance in making sure the Pulsation Dampener you select is right for your specific application.

## DRILLING PULSATION DAMPENER

### Features

- Single piece construction with no girth welds.
- Inside surface machined for smooth diaphragm movement.
- Field-replaceable top and bottom plates reducing downtime.
- Nitrile (NBR) and Hydrogenated Nitrile (HNBR) diaphragms standard.
- Diaphragm equipped with stabilizer to eliminate possible folding and entrapment of fluids resulting in increased diaphragm life.
- Field replaceable diaphragms reduce maintenance time.
- Diaphragms can be replaced without removing the unit from the line.



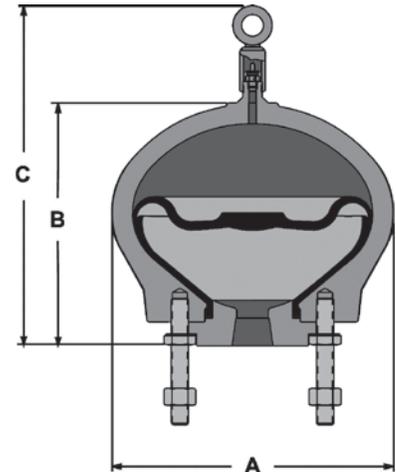
Model	Volume Gallons	MAWP psig	Weight Pounds	Dimensions					
				A		B		C	
				inches	mm	inches	mm	inches	mm
IEi-10-3000	10	3000	950	23.75	603	22.68	576	29.44	748
IEi-10-5000	10	5000	950	23.75	603	22.68	576	29.44	748
IEi-20-3000	20	3000	2500	28.25	718	29.00	737	38.50	978
IEi-20-5000	20	5000	2500	28.25	718	29.00	737	38.50	978
IEi-20-7500	20	7500	2500	28.25	718	29.00	737	38.50	978

# PRODUCTION PULSATION DAMPENER

## Features

- Short, compact design requires no external bracing or other support structures.
- Isolated body cavity keeps the fluid in the diaphragm.
- Nitrile (NBR) and Hydrogenated Nitrile (HNBR) diaphragms standard.
- Replaceable CS or SS jam-nut style bottom plate standard.
- Sizes range from 1 gallon to 20 gallon.
- Pressure rating from 285 psig to 6170 psig.
- Fully enclosed and protected charging valve assembly.
- Standard applications include waste disposal, salt water injection, caustic products and other corrosive liquids.
- High pre-charge capability delivers excellent dampening performance. A minimum of 85% reduction in peak-to-peak pressure performance is achieved.
- All rubber components supplied with IEi pulsation dampeners as original equipment and / or furnished as replacement parts are under IEi design and quality control and carry IEi's standard manufacturers warranty.

Model	Volume Gallons	MAWP psig	Weight Pounds	Dimensions					
				A		B		C	
				inches	mm	inches	mm	inches	mm
IEI-1-285	1	285	118	11.44	291	9.81	249	17.31	440
IEI-1-1480	1	1480	124	11.44	291	10.04	255	17.54	445
IEI-1-3705	1	3705	150	11.44	291	10.12	257	17.82	453
IEI-1-6170	1	6170	240	12.50	318	11.00	279	17.50	445
IEI-2 1/2-285	2 1/2	285	173	14.25	362	11.45	291	19.73	501
IEI-2 1/2-1480	2 1/2	1480	226	14.25	362	11.92	303	20.20	513
IEI-2 1/2-3705	2 1/2	3705	237	14.25	362	12.16	309	20.44	519
IEI-2 1/2-6170	2 1/2	6170	440	15.63	397	14.46	367	22.74	578
IEI-5-285	5	285	120	16.00	406	13.75	349	20.75	527
IEI-5-1480	5	1480	300	18.00	457	15.50	394	22.50	572
IEI-5-3705	5	3705	300	18.00	457	15.50	394	22.50	572
IEI-5-6170	5	6170	744	20.10	511	18.43	468	26.71	678
IEI-10-285	10	285	400	20.50	521	19.25	489	26.00	660
IEI-10-1480	10	1480	400	20.50	521	19.25	489	26.00	660
IEI-10-3705	10	3705	700	21.50	546	21.25	540	28.00	711
IEI-20-285	20	285	440	24.00	610	21.00	533	27.50	699
IEI-20-2250	20	2250	870	25.50	648	24.00	610	30.75	781



## TYPICAL APPLICATIONS

### Suction Stabilization



When installed on the upstream side of positive displacement pumps, suction stabilizers help in eliminating cavitation problems by smoothing out the flow of the fluids into the pump cylinders. Cavitation can cause premature wear to valves, seats, plungers and other pump components.

IEi Pulsation Dampener's when mounted close to the inlet or suction flange of the pump ensure complete filling of the cylinders during each stroke.

### Pulsation Dampening



Pressure surges or pulsations on the discharge side of positive displacement pumps cause vibrations and fatigue failures of major pump parts such as valves, seats and plungers. If not addressed, these vibrations can cause fatigue failure of downstream pipe, pipe supports and other critical components and equipment.

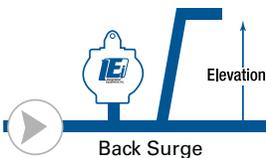
An IEi Pulsation Dampener, appropriately-sized and mounted near the discharge flange, will assist in dampening the pressure surges/pulses on the discharge side of the pump prolonging the life of the pump fluid end components as well as critical downstream equipment.

### Surge Absorption



Surges in fluid systems caused as a result of sudden valve closures, pump shut-downs or start-ups, can lead to pressure build-ups that are large enough to rupture piping, piping supports and damage downstream equipment. This phenomenon, also known as water hammer, results from the sudden change of kinetic energy (of the flowing fluid) to pressure energy.

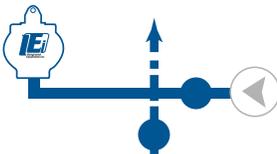
An IEi Pulsation Dampener, mounted at an appropriate location, can assist in absorbing these surges thereby saving costly equipment failures or replacements.



When the elevation heads of pumps are high, back surges can be caused as a result of sudden pump shut-downs when the fluid flows back slamming into the pump or check valve.

IEi Pulsation Dampeners installed close to the valves, help in absorbing the surge.

### Energy Storage



Due to the design of the IEi Pulsation Dampener it can be used as an energy storage device (Accumulator) in a hydraulic system. An IEi Pulsation Dampener, appropriately-sized, can be used to supply hydraulic power for a short period of time. This is critical in lube oil systems which must supply lube oil to critical rotating equipment where an interruption can cause costly failure not only to the equipment but also the potential shutdown of the downstream operation.

### Special Applications

*IEi Pulsation Dampeners/Accumulators can also compensate for leakages in a hydraulic system as well as compensate for any pressure change due to thermal expansion.*

# DIAPHRAGMS

Material	Temperature Range	Recommended For:	Not Recommended For:
HYDRO-GENATED NITRILE (HSN) Standard	0° F to 250°F (-18°C to 121°C) Intermittent: Up to 300°F (149°C)	Hydrogen sulfide (<3%), carbon dioxide, non-polar hydrocarbons, crude oil, grease, diesel oil, jet fuels, leaded gasoline, alcohols, petroleum base hydraulic fluids, salt solutions, water, allyl alcohol, ammonium sulfide, amyl ether, ASTM Oils #1, 2, 3, barium salts, boric acid, brines, butane, calcium, salts, carbonic acid, castor oil, copper chloride, cyclohexane, denatured alcohol, methanol, ethyl chloride, ethylene, ethylene glycol, fuel oil, glucose, glycerin, glycerol, lime, LPG, petroleum based lubrication oils, methane, mineral oil, mineral spirits, naphtha, potassium bromide, potassium chloride, propane, salt water, sewage, sodium carbonate, sodium sulfide, stearic acid, tannic acid, tetrachloroethylene, transformer oil, turbine oil, turpentine, urea, zinc sulfate, stoddard solvent, sour crude oil and gas.	Ozone, ketones, esters, aldehydes, chlorinated solvents, sour gasoline, gasohol, creosote, aniline, Skydrol 500 & 7000, Pydraul, Benzyl alcohol, acetic acid, acetone, ammonium carbonate, amyl acetate, benzene, bleach solutions, bromines, butyl acetate, carbon disulfide, chlorinated solvents, chlorine (wet or dry), chloroform, chrome plating solutions, diethyl ketone, Dowtherm A, ethyl formate, ethylene chloride, ethylene bromide, hydrochloric acid (hot or cold), hydrofluoric acid, methyl chloride, nitric acid, phosphoric acid, steam, molten sulfur, sulfuric acid, toluene.
BUNA-N (Nitrile) Optional	0° F to 212°F (-18°C to 100°C) Intermittent: Up to 250°F (121°C)	Non-polar hydrocarbons, crude oil, grease, diesel oil, jet fuels, leaded gasoline, alcohols, petroleum base hydraulic fluids, salt solutions, water allyl alcohol, ammonium sulfide, amyl ether, animal fats, anti-freeze, ASTM Oils # 1, 2, 3, barium salts, boric acid, brines, butane, calcium salts, carbonic acid, castor oil, copper chloride, cyclohexane, denatured alcohol, methanol, ethyl chloride, fuel oil, glucose, glycerin, lime, linseed oil, LPG, petroleum based lubrication oils, methane, mineral oil, naphtha, potassium bromide, potassium chloride, propane, salt water, sewage, sodium carbonate, sodium sulfide, soybean oil, stearic acid, tannic acid, stoddard solvent, tetrachloroethylene, transformer oil, turbine oil, turpentine, zinc sulfate.	Ozone, ketones, esters, aldehydes, chlorinated solvents, sour gasoline, gasohol, sour (H <sub>2</sub> S) crude oil and gas, creosote, aniline, Skydrol 500 & 7000, Pydraul, Benzyl alcohol, acetic acid, acetone, ammonium carbonate, amyl acetate, benzene, bleach solutions, bromines, butyl acetate, carbon disulfide, chlorinated solvents, chlorine (wet or dry), chloroform, chrome plating solutions, diethyl ketone, Dowtherm A, ethyl formate, ethyl formate, ethylene chloride, ethylene bromide, hydrochloric acid (hot or cold), hydrofluoric acid, methyl chloride, nitric acid, phosphoric acid, steam, molten sulfur, sulfuric acid, toluene, anhydrous ammonia, zinc bromide.

# CASING HEADS

## Top Connections

All IEC-22 and IEC-29 heads have standard API Flanges. Optional lockdown screws (two) for bowl protectors or (multiple) for annular seal compression can be provided on request.

## Bottom Connections

The standard bottom preparation is the most commonly used Slip On Weld Socket (SOW). API female, BTC and proprietary casing threads can be provided on request.

### IEC-22 Casing Heads

Top Flange inches	Top Flange Rating psi	Bottom Casing inches	Outlets
11	2000	8-5/8 - 9-5/8 - 10-3/4	2" LP
11	3000	8-5/8 - 9-5/8 - 10-3/4	2" LP
11	5000	8-5/8 - 9-5/8 - 10-3/4	2" LP
13-5/8	2000	13-3/8	2" LP
13-5/8	3000	13-3/8	2" LP
13-5/8	5000	13-3/8	2" LP

Other sizes available on request



### IEC-29 Casing Heads

Top Flange inches	Top Flange Rating psi	Bottom Casing inches	Outlets
9	2000	7-5/8 - 8-5/8	2" LP
9	3000	7-5/8 - 8-5/8	2" LP
9	5000	7-5/8 - 8-5/8	2" LP
11	3000	8-5/8 - 10-3/4	2" LP
11	5000	8-5/8 - 10-3/4	2" LP
13-5/8	3000	13-3/8	2" LP
13-5/8	5000	13-3/8	2" LP

Other sizes available on request



## Notes

API 6-A limits the MWP for threaded joints as follows:

4-1/2 to 10-3/4 5000 psi

11-3/4 to 13-3/8 3000 psi

Studded outlets available on request

# CASING SPOOLS

## IEC-22/29

### Spool Bowls and Outlets

The 22 Type Bowl has been a field proven universally accepted design. The 45° load shoulder in the straight bowl, accepts the C-21 and C-22 casing hangers which have been an industry standard for many years.

Standard outlets are 2-1/16, 2000 to 5000 psi WP. Housings rated 10,000 psi have 1-13/16" outlets. Studded or flanged outlets have internal VR threads. API line pipe outlets are also available.

### Top Connections

All IEC spools have standard API flanges. Optional lockdown screws (two) for bowl protectors or (multiple) for annular seal compression can be provided on request.

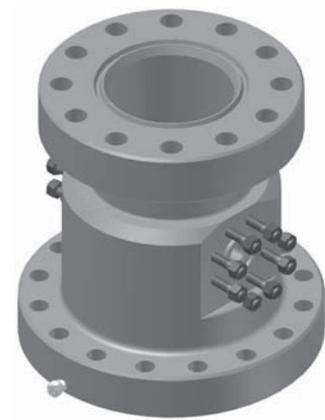
### Bottom Connections

The bottom connections are API Flanges and accept standard PE pack off bushings.

### IEC-22 Casing Spools

Bottom Flange inches	Bottom Flange Rating psi	Top Flange inches	Flange Rating psi	Bottom Preparation	Outlets
11	3000	11	3000	9BG	2" LP
11	3000	11	3000	9BG	2-1/16" 5M - SSO
11	5000	11	5000	9BG	2-1/16" 5M - SSO
13-5/8	3000	11	3000	10-3/4BG	2" LP
13-5/8	3000	11	3000	10-3/4BG	2-1/16" 5M - SSO
13-5/8	3000	11	5000	10-3/4BG	2-1/16" 5M - SSO
13-5/8	5000	11	5000	10-3/4BG	2-1/16" 5M - SSO
13-5/8	5000	11	10000	9-5/8 -"00"	1-13/16"x10M - SSO

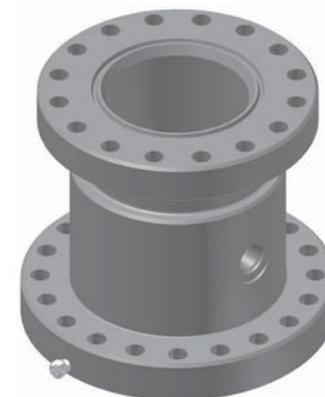
Other sizes available on request



### IEC-29 Casing Spools

Bottom Flange inches	Bottom Flange Rating psi	Top Flange inches	Flange Rating psi	Bottom Preparation	Outlets
11	3000	11	3000	9BG	2" LP
11	3000	11	3000	9BG	2-1/16" 5M - SSO
11	3000	11	5000	9BG	2" LP
11	3000	11	5000	9BG	2-1/16" 5M - SSO
13-5/8	3000	11	3000	10-3/4BG	2" LP
13-5/8	3000	11	3000	10-3/4BG	2-1/16" 5M - SSO
13-5/8	3000	11	5000	10-3/4BG	2" LP
13-5/8	3000	11	5000	10-3/4BG	2-1/16" 5M - SSO
13-5/8	5000	11	5000	10-3/4BG	2-1/16" 5M - SSO
13-5/8	5000	11	10000	9-5/8 -"00"	1-13/16"x10M - SSO
13-5/8	10000	11	10000	9-5/8 -"00"	1-13/16"x10M - SSO

Other sizes available on request



## TUBING HEADS & SPOOLS

### IEi Spool bowls and outlets

The IEi-TCM Tubing head and tubing spool bowl profile is designed with a straight bowl profile to accept the popular range of industry standard tubing hanger designs. These hangers include wrap around hangers, mandrel hangers and extended neck hangers.

### Outlet Connections

Tubing spools are equipped with API studded outlets as the standard. All studded outlet connections are threaded for VR plugs. Threaded outlet connections are available upon request.

### Top connections

All IE-TCM tubing spools have a complete set of ET style lockdown screws for tubing hanger retention as required by API-6A.

### Bottom Preparation

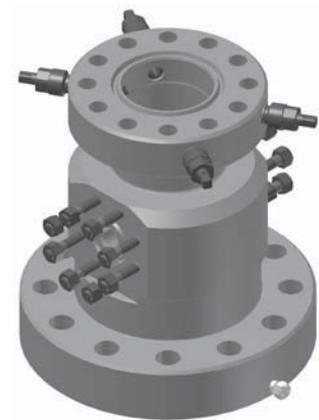
All tubing spools are designed to receive our standard PE secondary seal. Other secondary seal preparations are available upon request.

Our standard range of tubing spools are offered in the following sizes.

### IE-TCM Tubing Spools

Bottom Flange inches	Bottom Flange Rating psi	Top Flange inches	Flange Rating psi	Bottom Preparation	Outlets
9	2000	7-1/16	2000	7-"00"	2"LP
9	2000	7-1/16	3000	7-"00"	2"LP
9	3000	7-1/16	3000	7-"00"	2"LP
9	3000	7-1/16	5000	7-"00"	2"LP
9	5000	7-1/16	5000	7-"00"	2"LP
11	2000	7-1/16	2000	7-"00"	2"LP
11	2000	7-1/16	2000	7-"00"	2-1/16 - 2M SSO
11	2000	7-1/16	3000	7-"00"	2"LP
11	2000	7-1/16	3000	7-"00"	2-1/16 - 5M SSO
11	3000	7-1/16	3000	9BG	2"LP
11	3000	7-1/16	3000	9BG	2-1/16 - 5M SSO
11	3000	7-1/16	5000	9BG	2-1/16 - 5M SSO
11	5000	7-1/16	5000	9BG	2-1/16 - 5M SSO
11	5000	7-1/16	10000	9BG	1-13/16 - 10M SSO
11	10000	7-1/16	10000	9BG	1-13/16 - 10M SSO
11	10000	7-1/16	15000	9BG	1-13/16 - 15M SSO
11	3000	9	3000	9BG	2-1/16 - 5M SSO
11	3000	9	5000	9BG	2"LP
11	3000	9	5000	9BG	2-1/16 - 5M SSO
11	5000	9	10000	9BG	1-13/16 - 10M SSO

Other sizes available on request



# CASING AND TUBING HANGER COMPONENTS

## C22 Casing Hanger

Head or Spool Top Flange (inches)	Casing Size (inches)
11	4-1/2
11	5-1/2
11	7
11	7-5/8
13-5/8	7-5/8
13-5/8	8-5/8
13-5/8	8-5/8

### Features

- Fits all C-22 & C-29 Casing Heads and Spools
- Only 50,000 to 60,000 casing load is needed to energize annulus seal
- Provides automatic packoff sealing
- Hanger can be lowered through BOP
- Has interlocking slips



## TC-1W Tubing Hangers

Bowl Size (inches)	Tubing Size (inches)
7-1/16	2-3/8
7-1/16	2-7/8
7-1/16	3-1/2

### Features

- A split, wrap around packoff
- Allows tubing string manipulation to displace fluids while maintaining annular pressure
- Compression type seal actuated by lockdown screws

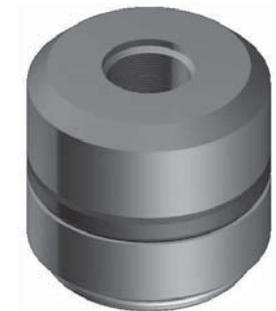


## TC-1A Tubing Hangers

Bowl Size (inches)	Tubing Size (inches)
7-1/16	2-3/8
7-1/16	2-7/8
7-1/16	3-1/2

### Features

- Known as a threaded mandrel-type hanger
- Compressor type seal actuated by lockdown screws or string weight



## PE Packoff Assemblies

Size (inches)	Weight (pounds)
9 X 4-1/2	60
9 x 5-1/2	50
9 x 7	30
10-3/4 x 8-5/8	40
10-3/4 X 9-5/8	20

### Features

- Install on BG bottom prep of all C-22 and C-29 Casing Spools and TCM Tubing Spools
- Held in place by a snap ring
- Provides a pressure energized secondary seal
- Serves as a reducer bushing to adapt to different casing sizes
- Available in various OD and ID configurations



# TUBING HEAD ADAPTERS

## B-1 Adapter

Flange	Upper Pin Connection	Thread Description
7-1/16" - 2000	2-3/8" API UP Tbg	2-3/8" API UP Tbg
7-1/16" - 2000	2-7/8" API UP Tbg	2-7/8" API UP Tbg
7-1/16" - 2000	3-1/2" API UP Tbg	3-1/2" API UP Tbg
7-1/16" - 3000	2-3/8" API UP Tbg	2-3/8" API UP Tbg
7-1/16" - 3000	2-7/8" API UP Tbg	2-7/8" API UP Tbg
7-1/16" - 5000	2-3/8" API UP Tbg	2-3/8" API UP Tbg
7-1/16" - 5000	2-7/8" API UP Tbg	2-7/8" API UP Tbg
7-1/16" - 5000	3-1/2" API UP Tbg	3-1/2" API UP Tbg



- *Tubing Head Adapters*

## B-2 Adapter

Size	Thread Description
7-1/16" - 2000 x 2-1/16" - 2000	2-3/8" API UP Tbg
7-1/16" - 3000 x 2-1/16" - 5000	2-3/8" API UP Tbg
7-1/16" - 5000 x 2-1/16" - 5000	2-3/8" API UP Tbg



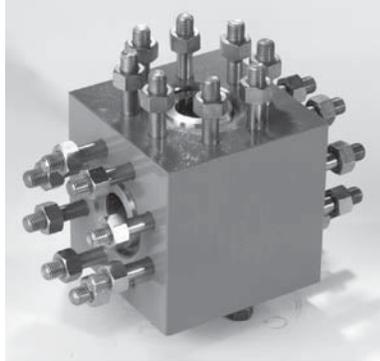
## B-3 Adapter

Size	Thread Description
7-1/16" - 3000 x 2-9/16" - 3000	2-7/8" API UP Tbg
7-1/16" - 3000 x 2-9/16" - 5000	2-7/8" API UP Tbg
7-1/16" - 3000 x 3-1/8" - 3000	3-1/2" API UP Tbg
7-1/16" - 5000 x 2-9/16" - 5000	2-7/8" API UP Tbg
7-1/16" - 5000 x 3-1/8" - 5000	3-1/2" API UP Tbg



## STUDDED TEES AND CROSSES

Run	Outlets
2-1/16 - 2000	2-1/16 - 2000
2-1/16 - 5000	2-1/16 - 5000
2-9/16 - 2000	2-9/16 - 2000
2-9/16 - 5000	2-9/16 - 5000
2-9/16 - 5000	2-1/16 - 5000
3-1/8 - 2000	3-1/8 - 2000
3-1/8 - 3000	2-9/16 - 5000
3-1/8 - 3000	3-1/8 - 3000
3-1/8 - 5000	2-9/16 - 5000
2-1/16 - 10000	1-13/16 - 10000
2-1/16 - 10000	2-1/16 - 10000
2-1/16 - 15000	1-13/16 - 15000
2-1/16 - 15000	2-1/16 - 15000
2-9/16 - 10000	1-13/16 - 10000
2-9/16 - 10000	2-1/16 - 10000
2-9/16 - 10000	2-9/16 - 10000
2-9/16 - 15000	1-13/16 - 15000
2-9/16 - 15000	2-1/16 - 15000
3-1/16 - 10000	1-13/16 - 10000
3-1/16 - 10000	2-1/16 - 10000
3-1/16 - 10000	2-9/16 - 10000



## X-MAS TREE CAPS

The X-mas Tree Cap is mounted on top of the X-mas tree and provides access to the tree plug and hammer nut. Standard API-UP Tbg lift thread

is provided in the body. The plug has a provision for mounting a pressure gauge to measure well pressure.

Type	Lower Connection	Bore	Lift Thread
B-15-A	2-1/16 - 2000	2-1/16"	2-3/8" EUE
	2-1/16 - 5000	2-1/16"	2-3/8" EUE
	2-9/16 - 2000	2-9/16"	2-7/8" EUE
	2-9/16 - 5000	2-9/16"	2-7/8" EUE
	3-1/8 - 3000	3-1/16"	3-1/2" EUE
	3-1/8 - 5000	3-1/16"	3-1/2" EUE
B-11-A0	2-1/16 - 10000	2-1/16"	2-3/8" EUE
	2-9/16 - 10000	2-9/16"	2-7/8" EUE
	3-1/16 - 10000	3-1/16"	3-1/2" EUE



## MODEL X-SEAL GATE VALVES

IEi X-Seal gate valves combine the proven expanding gate design with close machining tolerances to provide a valve that seals under virtually all conditions.

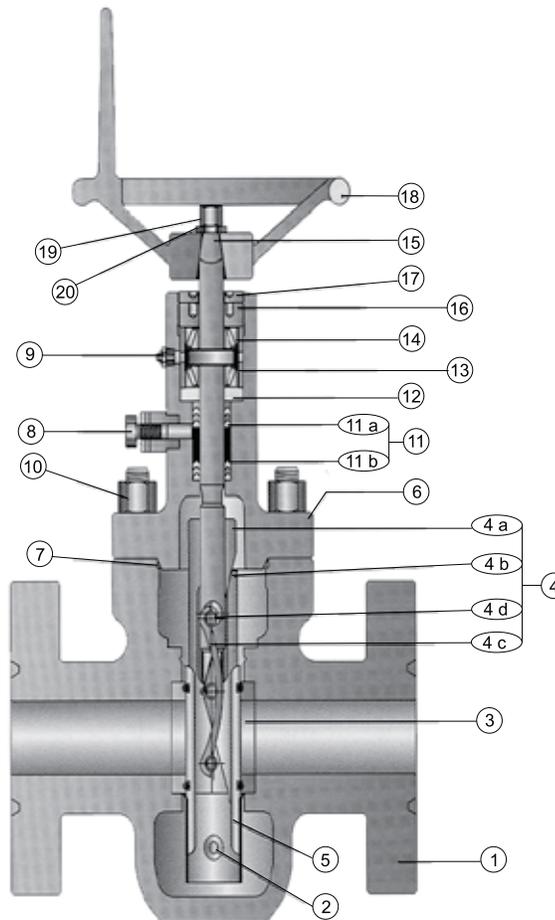
### FEATURES

- Standard trims with F-1 seats
- Expanding gate provides positive sealing
- Conforms to API 6A
- Forged/cast body in alloy or stainless steel
- Bolted bonnet for easy change out of internal parts
- Trims available for sour gas applications.

Size	Pressure Rating
1-13/16	10000
2-1/16	5000
2-1/16	10000
2-9/16	5000
2-9/16	10000
3-1/8	5000
3-1/16	10000
4-1/16	5000

### Flanged Gate Valve Model X

Item	Description	Qty
1	Body	1
2	Body Grease Fitting	2
3	Seat Assy	2
3a	Seat	2
3b	Teflon/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 Set	6
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	Hand Wheel	1
19	Hand Wheel Nut	1
20	Washer For Handwheel Nut	1



## MODEL FC STYLE GATE VALVES

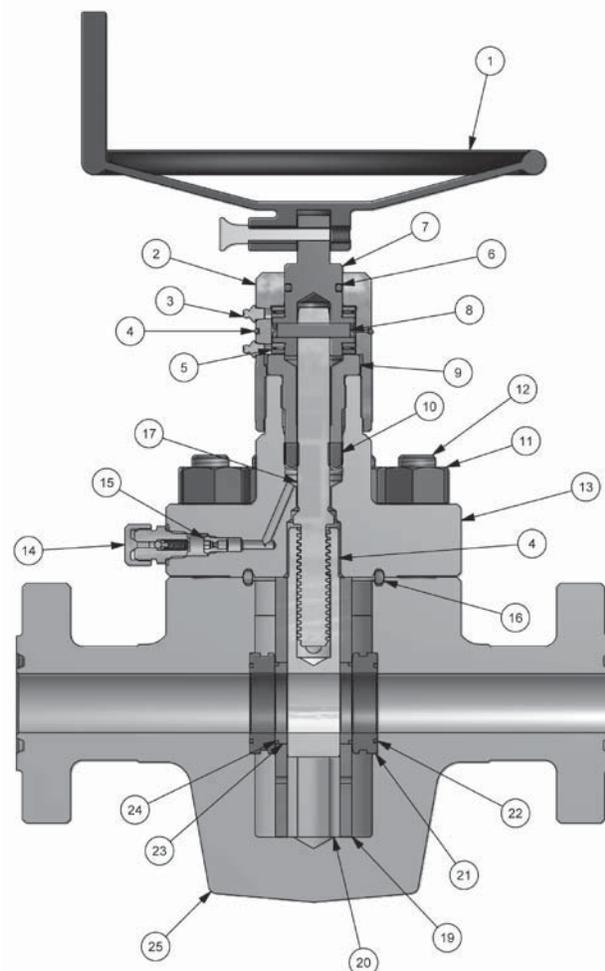
IEi FC Style gate valves combine a forged body and the proven slab-gate and floating seat design used throughout the industry. The slab-gate design provides a metal-to-metal seal on the flow stream and the bolted bonnet provides for ease of maintenance and repair.

### FEATURES

- Forged body
- Full-bore
- Non-rising stem
- Floating seats
- Self-energized stem packing
- Metal-to-metal backseat capability
- Bolted bonnet
- Easy maintenance
- Standard trims available, including sour gas applications
- API 6A certified
- Available in flanged and threaded end connections

#### Flanged Gate Valve FC Style

Item	Description	Qty
1	Handwheel Assembly	1
2	Bearing Cap	1
3	Grease Fitting	2
4	O-Ring	1
5	Bearing Assy	2
6	O-Ring	1
7	Stem Adapter	1
8	Stem Shear Pin	1
9	Packing Gland	1
10	Stem Packing	1
11	Nut	8
12	Pad Stud	8
13	Bonnet Body	1
14	Injection Fitting	1
15	Check Valve	1
16	Bonnet Gasket	1
17	Stem	1
18	Gate	1
19	Retainer Plate	2
20	Gate Guide	2
21	Seat	2
22	Seat Gasket	2
23	Seat Ring	2
24	Seat Ring Gasket	2
25	Body	1
26	Nameplate (not shown)	1



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