Your Professional Valve Solution





TIPVALVE INDUSTRIAL GROUP LTD.



Functions and Applications

PIG valve, which possesses the function of shut -off ball valve, is new for pigs launching or receiving. It is widely used in fields like petroleum industry, fuel gas, water transportation, printing and dyeing and food-processing industry. It is a special kind of device for pipeline construction of medium and inspection can be easily accomplished by using the compatible pigs. PIG valve can completely replace the complex conventional device for launching and receiving pigs.

Newly-built Pipelines: clean out the pipeline,eliminate the remains,descale the pipeline before spreading, vent air before the pressure testing ,eliminate stagnant water and dry the pipeline before putting into production and complete geometric shape inspection. Crude Oil Pipeline: after running for several hundred hours, the paraffinning in the inner pipeline can lead to the increase of pipeline, so the paraffinning must be cleaned out. PIG valve can easily sweep out the congealable oil, paraffin deposit, mixture in the inside pipeline, reduce the effect of back pressure and the corrosion, and also inspect corrosion, cracks and leakage.

Natural Gas Pipeline: eliminate stagnant water and mixture to reduce back pressure; eliminate sulphide and other corrosive materials to weaken the effect of corrosion; eliminate condensate. Realize inspection for corrosion, cracks, defects and leakage and do inside spreading for the pipeline.

Chemical Material and Supplies Pipelines: PIG valve can remove polymer, transport different medium separately transport medium and add corrosion inhibitor into the pipeline.



PIG Product Model



Add "SR"after the material code to present sulfur-resistant; "O"presents oxygen valve only; "E + meters" presents extended stem ans the meters extended.

Please indicate any of the following items when procuring PIG valves:

1.Need fireproof, anti-static and cavity cleanout or not;

- 2.Please clearly state the tubing when ordering butt welding valves; 0.D.multiplies Wall thickness pipe grade/standard.
- Please indicate power supply when ordering electrically operated valve: direct current volts or volt alternating current, phase, frequency, protection and explosion-proof.
- 4.When procure pneumatic/hydraulic operated valves please point out: pressure, solenoid valves, limit switch, pneumatic operated units, and self-safe (valve automatically open or close when air failure) or not.
- 5.Is it possible or not to order spare parts such parts such as plug-in, seat, 0-ring, gasket and bearings.





No.	Parts	Material
1	Body	ASTM A216-WCB
2	Flange	ASTM A216-WCB
3	O-ring	NBR
4	Gasket	304+Graphite
5	Stud	ASTM A193-B7
6	Handwheel	20*
7	Nut	ASTM A194-2H
8	Bonnet	ASTM A216-WCB
9	Slide Bearing	304 + PTFE
10	Bolt	35CrMoA
11	Bolt	35CrMoA

No.	Parts	Material
12	Pipeline Branches	ANSI 1045
13	Stem	ASTM A182-F6a
14	Кеу	ANSI 1045
15	Thrust Bearing	304+PTFE
16	Adaptor Plate	25*
17	Gear Box	ASTM A216-WCB
18	Port Cover	ASTM A216-WCB
19	Vent Valve	25*
20	Interlocking Pin	1Cr13
21	Operating Bar	ANSI 1045+HCr
22	Indicator	304
23	Drain Valve	25*
24	Horse	ASTM A216-WCB
25	Slide Bearing	304+PTFE
26	Bottom Cover	25*
27	O-ring	NBR
28	Gasket	304+Graphite
29	Ball	ASTM A216-WCB
30	Seat	PTFE
31	O-ring	NBR
32	Seat Retainer	ASTM A182-F6a
33	O-ring	NBR
34	O-ring	NBR
35	Nut	ASTM A194-2H
36	Spring	ANSI 9260

This table shows list for carbon steel series materials, stainless steel and special materials lists are presented in page 11.

PIG Comparison with Conventional Pig Launcher and Receiver



Process Flow Diagram of Conventional Pig Launcher and Receiver

Comparison	Conventional Pig Launcher and Receiver
System	Two shut-off ball valve, bypass pipelines, a barrel for Launching pig, a barrel for receiving pig.
Installation Space	The Pig Launcher and Receiver is about2.25meters long, the space for bypass pipeline, installation base (two cement footers 210 by 240 mm)
Operation	Need to get about 2 meters to open/close the main shut-off valve, drain valve ,vent valve and port cover and so on in turn, then insert Pig from the high barrel, it takes a skilled worker about 8 to 10 minutes.
Maintenance	Pressure vessel, shall inspect periodically and go through many procedures and certificates before putting into effect.

Taking PIG Valve or PIG Launcher and Receiver with Dn200 for example to obtain the data.



Pigging Process Flow Diagram of TIPV PIG Valve

PIG valve	Results
One pig launching valve, one receiving valve.	Simplification
Just 0.79 meters long and with installing bracket.	Save space(especially applied to offshore platform and harbors and some other limited space) Save investment.
It takes a general worker just 3 minutes to finish all the fore mentioned work.	Easy operation and save time.
Free of maintenance	Deeply reduce cost



PIG Versions of PIG Valve

C:

The standard version is the C PIG valve. In this version, the ball has a bore which is about 25 percent larger than that of the pipeline so the consecutive flow of the medium in the process of cleaning pipeline is easily achieved.

B:

For the case in which the flow is not to be completely interrupted with the ball in the closed position during launching or receiving of the PIG, the B version should be employed. In this version, two by-pass channels of elliptical cross section have been provided in the valve ball, in a direction perpendicular to the axis of the ball bore. The cross-sectional of the by-pass is about 25 percent of the undisturbed transport cross section. B version PIG valve can`t be used as shutoff valve.







S:

The S version of the PIG valve is specially designed for the purpose of keeping different media separate . The valve ball has a bore whose diameter exceeds that of the pipeline by only 3 percent. In addition, an additional sealing is situated in the ball bore of the receiving, in order to prevent of the media which have to be kept separating.

PIG Unique Design

TOP-entry Design: No need to disassembly and assembly all replacement parts while the valve body remains installed in the pipeline. The design is in accordance with ANSI/ASME B16.34 reliable strength and rigidity anti-twisting ability are all ensured.

Handy Operation: The ball id supported between the valve body and bonnet, lined with PTFE sliding bearing with good self-lubricating and wearability functions. The acting force between ball and seat is precisely controlled. Free of ball thrust, the stem can twist freely so the handy operation of the valve is achieved.

Port Cover: The port cover id easy to operate by adopting tooth-pattern embedding connection with the valve body ; for major dimensioned valve the cover id connected with the rocker gemel fixed on the valve body, so even the on-off of the port cover for quite major dimensioned valve can be completed easily.

Zero Leakage: Completely pressure testing ensuring no leakage in any sealing parts.

Inter-locking Design: The vent valve is coupled with the interlock of the bayonet closure. The port cover can not be opened only after opening the vent valve, thus ensuring the safe operation.

• Antistatic Design: Static generated by friction between ball and body, stem and can be safely conducted out by anti-static springs.

● Fire Safe Design: when the flexible seat plug-in is burned, there forms metal sealing between the ball and the seat; to ensure the reliability of sealing at high temperature, there are graphite gaskets (resist high temp).between the ball and bonnet. The fire safe test conforms to the API 6 FA and API 607.

● Cleanout Design: Flushing valve can be equipped on the valve body. When toxic media are being transported, with the aid of flushing valve with a nozzle, the toxic media can be through the drain valve to the sewage pot.

Note: "• "means users should appoint this function when order.

PIG Design Specification

Design Specification	ANSI B16.34 , API 6D
Face-to-face	NDIV A07 (or according to contract)
Flange Dimension	ANSI B16.5 , GB , JB , HG
Butt welding	ANSI B16.5, GB12224
Matarial	ASTM , GB
IVIALEITAI	(Sulfur-resistant)NACE MR01-75
Testing & Inspection	API 6D , API598 , Gb13927

PIG Main Parts Materials

As to the fact that carbon steel and low temperature steel are mainly used in oil & gas transportation, PIG valve can be divided into general and sulfur resisting series. The manufacturing of the sulfur resisting valves is in accordance with the requirements of NACE MR01-75--2002. The working temperature for carbon steel series is range from-29 °C to + 180 °C, and low temp. Steel is range form-46 °C to + 121 °C.

Porto	Carbonst	eel Series	Low Temp	Steel Series	Special	Stainless Steel	
Faits	General	Sulfur-resistant	General	Sulfur-resistant	Materials		
Body,Bonnet	A216-WCB	A216-WCB	A352-LCC	A352-LCC	2205,Hastelloy Monel	A351-CF8/CF8M/ CF3/CF3M	
Ball	A105+HCr A216-WCB+HCr	A218-F316 A105/A216-WCB+ENP	A182-LF2+HCr A352-LCC+HCr	A182-F316 A105/A352-LCC+ENP	HVOF Co-Cr-W HVOF Ni-Cr	A351-CF8/CF8M/ CF3/CF3M	
Stem	A182-F6a ANSI 1040+HCr	A182-F316 ANSI 1040+ENP	A182-F6a ANSI1040+HCr	A182-F316 ANSI 1040+HCr	2205,Hastelloy Monel	304/316/ 304L/316L	
Seat Plug-in			PTFE NYLON	VITON PPL	-		
Seat	A182-F6a	A182-F316	A182-F6a	A182-F6a	HVOF Co-Cr-W HVOF Ni-Cr	304/316/ 304L/316L	
Spring	ANSI 9260	Inconel750	F304	F304	Inconel X-750	Inconel X-750	
Bolt	A193-B7	A193-B7M	A320-L7	A320-L7	A193-B8M	A193-B8/B8M	
Nut	A194-2H	A194-2HM	A194-4 , 7	A194-4 ,7	A194-8	A194-8	

Note: Equivalent materials may be used for forging.

Non-destructive Inspection



Detecting	Applied Specification	Detecting Frequency
Permeability Inspection	ANSI B16.34 App.D	10% of Pressure Bearing Parts or according to Contract
Magnetic-particle Inspection	ANSI B16.34 App.C	10% of Pressure Bearing Parts or according to Contract
X-ray Inspection	ANSI B16.34 App.B	according to Contract
Ultrasonic Inspection	ASTM A388	according to Contract
Static Hydraulic and Air Pressure Test	API 598, API 6D, GB13927	100%
Open Torque Testing	NDIV A07	10% of Manual Valve ,100% of Electric or Pneumatic
Visual and External Dimensions	MSS-SP44/SP55, ANSI B16.34B 16.5B, 16.10 , API 6D	100%
Chemical Composition and Mechanical Property	Relevant Material Specification	100% of Pressure Bearing Parts, Main structural Parts
Hardness Detection	NACE MR01-75	Sulfur-resistant, 100% of Media Contacting Parts
High Pressure Air Sealing Test	API 6D	According to User's Request

Customer can require additional testing and inspection, adjust the scope, frequency and applied specification.Please contact us.

PIG External Dimensions





ANSI Class 150

Nominal Diameter B1 Bolt А Seal ring Number С F Е В R 0 Т D N-d Diameter G Н NPS(in) DN(mm) СВ S RF BW RJ (in) 102.5 82.55 2 50 51 64 55 330 343 92 152 1.6 15.9 4-19 5/8 6.4 102 R22 600 3 80 76 102 85 445 458 127 152.5 190 1.6 19.1 4-19 5/8 6.4 133 114.30 R29 640 6.4 4 100 102 120 108 508 521 157 190.5 229 1.6 23.9 8-19 171 149.23 R36 700 5/8 R43 6 150 152 180 162 660 673 216 241.5 279 1.6 25.4 8-22 3/4 6.4 219 193.68 885 8 200 203 235 213 794 807 270 298.5 343 1.6 28.6 8-22 3/4 6.4 273 247.65 R48 950 254 267 250 305 940 1.6 12-25 R52 1008 10 953 324 362.0 406 30.2 7/8 6.4 330 304.80 381.00 31.8 6.4 12 305 337 320 1067 1080 381 432.0 1.6 12-25 406 1238 300 483 7/4 R56 35.0 12-29 1265 14 350 337 387 356 1143 1156 413 476.0 533 1.6 6.4 425 396.88 1 R59 16 400 387 438 406 1372 1385 470 539.5 597 1.6 36.6 16-29 1 6.4 483 454.03 R64 1336 18 450 438 489 457 1524 1537 533 578.0 635 1.6 39.7 16-32 11/8 6.4 546 517.53 R68 1416 1510 20 500 489 540 508 1676 1689 584 635.0 698 1.6 42.9 20-32 11/8 6.4 597 558.80 R72 22 550 540 591 559 1829 1842 641 692.0 749 1.6 46.0 20-35 11/4 6.4 660 615.95 R80 1638 24 600 591 641 616 1981 1994 692 749.5 813 1.6 47.7 20-35 11/4 6.4 711 673.10 R76 1780

Flange according to ANSI B16.5

Flange according to ANSI B16.5

Nominal	Diameter	P	E	31	ļ	4	D	0	0	F	т	N -I	Bolt	F	D		Seal ring	
NPS(in)	DN(mm)	В	СB	S	RF BW	RJ	К	U	U	F	I	IN-d	(in)	E	D	G	Number	н
2	50	51	64	55	330	346	92	127.0	165	1.6	22.3	8-19	5/8	8	108	82.55	R23	600
3	80	76	102	85	445	356	127	168.0	210	1.6	28.6	8-22	3/4	8	146	123.83	R31	640
4	100	102	120	108	508	524	157	200.0	254	1.6	31.8	8-22	3/4	8	175	149.23	R37	700
6	150	152	180	162	660	676	216	270.0	318	1.6	36.6	12-22	3/4	8	241	211.14	R45	885
8	200	203	235	213	794	810	270	330.0	381	1.6	41.3	12-25	7/8	8	302	269.88	R49	950
10	250	254	305	267	940	956	324	387.5	444	1.6	47.7	16-29	1	8	356	323.85	R53	1008
12	300	305	337	320	1067	1083	381	451.0	521	1.6	50.8	16-32	11/8	8	413	381.00	R57	1238
14	350	337	387	356	1143	1159	413	514.5	584	1.6	54.0	20-32	11/8	8	457	419.10	R61	1265
16	400	387	438	406	1372	1388	470	571.5	648	1.6	57.2	20-35	11/4	8	508	469.90	R65	1336
18	450	438	489	457	1524	1540	533	628.5	711	1.6	60.4	24-35	11/4	8	575	533.40	R69	1416
20	500	489	540	508	1676	1695	584	686.0	775	1.6	63.5	24-35	11/4	9.6	635	584.20	R73	1510
22	550	540	591	559	1829	1851	641	743.0	838	1.6	66.5	24-42	11/2	11.2	686	635.00	R81	1638
24	600	591	641	616	1981	2003	692	813.0	914	1.6	70.0	24-42	11/2	11.2	749	692.15	R77	1780

PIG External Dimensions





ANSI Class 400

Flange according to ANSI B16.5

Nominal	Diameter	D	B1		ļ	4 p		C	0	F	т	Nd	Bolt			6	Seal ring	
NPS(in)	DN(mm)	В	СB	S	RF BW	RJ	К	L	U	F	I	IN-0	(in)	E		G	Number	н
2	50	51	64	55	330	333	92	127.0	165	6.4	25.4	8-19	5/8	8	108	82.55	R23	600
3	80	76	102	85	445	448	127	168.0	210	6.4	31.8	8-22	3/4	8	146	123.83	R31	640
4	100	102	120	108	508	511	157	200.0	254	6.4	35.0	8-25	7/8	8	175	149.23	R37	700
6	150	152	180	162	660	663	216	270.0	318	6.4	41.5	12-25	7/8	8	241	211.14	R45	885
8	200	203	235	213	794	797	270	330.0	381	6.4	48.0	12-29	1	8	302	269.88	R49	1060
10	250	254	305	267	940	943	324	387.5	444	6.4	54.0	16-32	11/8	8	356	323.85	R53	1170
12	300	305	337	320	1067	1070	381	451.0	521	6.4	57.5	16-35	11/4	8	413	381.00	R57	1238
14	350	337	387	356	1143	1146	413	514.5	584	6.4	60.5	20-35	11/4	8	457	419.10	R61	1316
16	400	387	438	406	1372	1375	470	571.5	648	6.4	63.5	20-39	13/8	8	508	469.90	R65	1418
18	450	438	489	457	1524	1527	533	628.5	711	6.4	67.0	24-39	13/8	8	575	533.40	R69	1536
20	500	489	540	508	1676	1682	584	686.0	775	6.4	70.0	24-42	11/2	9.6	635	584.20	R73	1650
22	550	540	591	559	1829	1839	641	743.0	838	6.4	73.2	24-45	15/8	11.2	686	635.00	R81	1760
24	600	591	641	616	1981	1991	692	813.0	914	6.4	76.5	24-48	13/4	11.2	749	692.15	R77	1880

Flange according to ANSI B16.5

Nominal	Diameter	D	B1 A		C	0	г	F T	Nd	Bolt	г	п	G	Seal ring				
NPS(in)	DN(mm)	D	СB	S	RF BW	RJ	n	U	U	Г	I	IN-0	(in)	E	U	G	Number	п
2	50	51	64	55	330	333	92	127.0	165	6.4	25.4	8-19	5/8	8	108	82.55	R23	600
3	80	76	102	85	445	448	127	168.0	210	6.4	31.8	8-22	3/4	8	146	123.83	R31	640
4	100	102	120	108	508	511	157	216.0	273	6.4	38.1	8-25	7/8	8	175	149.23	R37	700
6	150	152	180	162	660	663	216	292.0	356	6.4	47.7	12-29	1	8	241	211.14	R45	885
8	200	203	235	213	794	797	270	349.0	419	6.4	55.6	12-32	11/8	8	302	269.88	R49	1060
10	250	254	305	267	940	943	324	432.0	508	6.4	63.5	16-35	11/4	8	356	323.85	R53	1170
12	300	305	337	320	1067	1070	381	489.0	559	6.4	66.7	20-35	11/4	8	413	381.00	R57	1238
14	350	337	387	356	1143	1146	413	527.0	603	6.4	70.0	20-39	13/8	8	457	419.10	R61	1316
16	400	387	438	406	1372	1375	470	603.0	686	6.4	76.2	20-42	11/2	8	508	469.90	R65	1418
18	450	438	489	457	1524	1527	533	654.0	743	6.4	82.6	20-45	15/8	8	575	533.40	R69	1536
20	500	489	540	508	1676	1682	584	724.0	813	6.4	89.0	24-45	15/8	9.5	635	584.20	R73	1650
22	550	540	591	559	1829	1839	641	778.0	870	6.4	95.3	24-48	13/4	11.2	686	635.00	R81	1760
24	600	591	641	616	1981	1991	692	838.0	940	6.4	102.0	24-52	17/8	11.2	749	692.15	R77	1880

PIG External Dimensions





ANSI Class 900

Flange according to ANSI B16.5

Nominal Diameter		D	B1		A		D	C	0	Е	т	Nd	Bolt	E	П	G	Seal ring	ц
NPS(in)	DN(mm)	D	СB	S	RF BW	RJ	n	U U	U	Г	I	IN-U	(in)	L	D	G	Number	11
2	50	51	64	55	381	384	92	165.0	216	6.4	38.1	8-25	7/8	8	124	92.25	R24	618
3	80	76	102	85	470	473	127	190.5	241	6.4	38.1	8-25	7/8	8	156	123.83	R31	660
4	100	102	120	108	559	562	157	235.0	292	6.4	44.5	8-32	11/8	8	181	149.23	R37	860
6	150	152	180	162	711	740	216	317.5	381	6.4	56.0	12-32	11/8	8	241	211.14	R45	980
8	200	203	235	213	889	892	270	393.5	470	6.4	63.5	12-39	13/8	8	308	269.88	R49	1120
10	250	254	305	267	1041	1044	324	470.0	545	6.4	70.0	16-39	13/8	8	362	323.85	R53	1280
12	300	305	337	320	1194	1197	381	533.5	610	6.4	79.5	20-39	13/8	8	419	381.00	R57	1436
14	350	324	387	356	1346	1356	413	559.0	640	6.4	86.0	20-42	11/2	11.2	467	419.10	R62	1620
16	400	375	438	406	1499	1509	470	616.0	705	6.4	89.0	20-45	15/8	11.2	524	469.90	R66	1760
18	450	425	489	457	1651	1664	533	686.0	785	6.4	102.0	20-51	17/8	12.7	594	533.40	R70	1920
20	500	473	540	508	1803	1816	584	749.5	855	6.4	108.0	20-54	2	12.7	648	584.20	R74	2080
24	600	572	641	616	2159	2178	692	901.5	1040	6.4	140.0	20-67	21/2	15.9	772	692.15	R78	2220

ANSI	Class	1500
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Flange according to ANSI B16.5

Nominal	Diameter	D	E	31	А		D	C	0	E E	т	Nd	Bolt	E	п	G	Seal ring	u
NPS(in)	DN(mm)	D	СB	S	RF BW	RJ	n	U	U	Г	1	IN-U	(in)		U	G	Number	п
2	50	51	64	55	432	435	92	165.0	216	6.4	38.5	8-25	7/8	8	124	92.25	R24	660
3	80	76	102	85	559	562	127	203.0	267	6.4	48.0	8-32	11/8	8	168	123.83	R31	690
4	100	102	120	108	711	714	157	241.5	311	6.4	54.0	8-35	11/4	8	194	149.23	R37	960
6	150	146	180	162	889	895	216	317.5	394	6.4	83.0	12-29	13/8	9.6	248	211.14	R46	1239
8	200	194	235	213	1067	1077	270	393.5	483	6.4	93.0	12-45	15/8	11.2	318	269.88	R50	1360
10	250	241	305	267	1245	1255	324	482.5	585	6.4	108.0	12-51	17/8	11.2	371	323.85	R54	1520
12	300	289	337	320	1422	1438	381	571.5	675	6.4	124.0	16-54	2	14.3	438	381.00	R58	1680
14	350	318	387	356	1600	1619	413	635.0	750	6.4	133.5	16-61	21/4	15.9	489	419.10	R63	1850
16	400	362	438	406	1778	1800	470	705.0	825	6.4	146.5	16-67	21/2	17.5	546	469.90	R67	2016

We usually choose gear box because of the low torque of PIG valve, meanwhile, upon customer's request, actuators such as electrically-operated, pneumatic operated are also practical.

PIG Valve

PIG Main points of Operation

When launching of launching pigs is required, first turn the ball though an angle of 90° C to make the valve to the closed position. Open the drain valve to discharge the medium in the valve cavity, open the port vent to relieve cavity pressure, and simultaneously loosen the interlocking pin; then turn the handle until its indicator points to open position, open the port cover and insert the pig into the launching port until it stops against the stopper bars; then close the cover and turn the handle to the closed position , close the drain and vent valve and then close pig launching valve. After receiving the signal of pig's arrival, just do the similar job as PIG launching to retrieve the pig , and then the pipeline cleaning id accomplished .

PIG valve is superior to conventional devices for cleaning pipeline in its compact structure, handy operation, easy maintenance and lower cost for purchasing and running. These all advantages help PIG valve do an excellent job in offshore oil & gas field and some incapacious space.

The Sequence of Pig Inserting



























The retrieving of pig is similar to the sequence.