



**KORVET JOINT STOCK COMPANY**

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**PRESSURE CONTROL EQUIPMENT  
CATALOGUE**

# OIL AND GAS PRODUCTION EQUIPMENT

## WELLHEAD EQUIPMENT

■ Conventional casing heads	6
■ Time saving casing heads	7
■ Conventional casing hangers	8
■ Types of annular seals	9
■ Water supply wellheads	10
■ Tubing heads	11
■ Tubing head with wrap-around tubing hanger	12
■ Tubing head with mandrel hanger	12
■ ESP tubing head	13
■ Tubing head with suspension in adapter	14
■ X-mas trees	15
■ Horizontal (compact) X-mas trees	17
■ Gate valves	18
■ Angle globe valves	19
■ Chokes	20
■ Ball valve choke	21
■ Switch type choke	22
■ Flow control valve	23
■ Non-freezing check valves	24
■ Axial-type flow control valve	25
■ Stuffing boxes	26
■ Blowout preventer (BOP) for polished rod	27
■ Rod rotator	27
■ Media separator	28
■ Steel needle valves (samplers)	28
■ Ball valve for pressure gauge	29
■ Hammer (wing) unions	29
■ Tools and accessories for well completion and maintenance work	30
■ Emergency protection systems	32
■ Spring pressure relief valve with manual override	36
■ Pressure relief valves switching device	37
■ Pressure relief valve unit with switching devices	38

## MANIFOLDS

■ Modular gas well manifolds	40
■ Valving and piping units (manifolds)	42
■ Choke manifolds	43
■ Water distribution for water injection (WI) systems	44
■ Hook-up manifolds for X-mas trees	44

## TANKS

■ Steel tank units, cylindrical, for gaseous and liquid hydrocarbon fluids	46
■ Underground horizontal drain tanks of EP and EPP type	47
■ Horizontal tanks for liquid oil products	47
■ Recier tanks	48

## PIPELINE EQUIPMENT

■ Pipeline gate valves	50
■ Pipeline wedge gate valves	51
■ Ball valves	52
■ Shut-off valves	53
■ Check valves	53
■ Swing check valves	54



Dear Sirs,

Joint Stock Company Korvet has the honor to present to your attention some information about our enterprise and the products being produced. Korvet was founded in 1964 .

Since 1991 the enterprise has been manufacturing equipment for construction and completion of oil and gas fields and shut-off, and control valves, using all the experience and potential of high-technology production.

Due to the high quality, innovation, and effectiveness of the attractively priced products, Korvet successfully competes with other Russian and foreign manufacturers.

All our products are certified for compliance with the requirements of Russian GOST Standards. We have been maintaining the licenses of the American Petroleum Institute (API) for manufacture of wellhead equipment according to API Spec 6A since 1997, pipeline valves according to API Spec 6D since 2003, and sucker-rod pumping equipment according to API Spec 11B since 2006.

A Quality Management System meeting the requirements of the International Standard ISO 9001 9001 has been functioning at our

enterprise since 1996. At present, an Integrated Management System (the only one in Kurgan region) is implemented and certified at Korvet JSC. It includes a Quality Management System meeting the requirements of GOST R ISO 9001-2011 and ISO 9001 : 2008, an Environmental Management System meeting the requirements of GOST R ISO 14001-2007 and ISO 14001 : 2004, and an Occupational Health and Safety Management System meeting the requirements of GOST 12.0.230-2007 and OHSAS 18001 : 2007. Since 2008, the Quality Management System of our enterprise has been certified for compliance with the requirements of the Corporate Standard STO Gazprom 9001 : 2012.

We are constantly perfecting our products and enlarging the product range.

I would like to thank our business partners for loyalty and express hope for long and mutually beneficial partnership.

**Best regards,  
Pavel Chernov  
Director General**







**Q** **qualityaustria**  
**SYSTEM CERTIFIED**

ISO 9001 : 2008 NR.06798/0  
 ISO 14001 : 2004 NR.00860/0  
 OHSAS 18001 : 2007 NR.00238/0  
 СТО ГАЗПРОМ 9001-2012  
 ГК.OC.0005.СК.000235





# WELLHEAD EQUIPMENT

- CONVENTIONAL CASING HEADS
- TIME SAVING CASING HEADS
- CONVENTIONAL CASING HANGERS
- TYPES OF ANNULAR SEALS
- WATER SUPPLY WELLHEADS
- TUBING HEADS
- TUBING HEAD WITH WRAP-AROUND TUBING HANGER
- TUBING HEAD WITH MANDREL HANGER
- ESP TUBING HEAD
- TUBING HEAD WITH SUSPENSION IN ADAPTER
- X-MAS TREES
- HORIZONTAL (COMPACT) X-MAS TREES
- GATE VALVES
- ANGLE GLOBE VALVES
- CHOKES
- BALL VALVE CHOKE
- SWITCH TYPE CHOKE
- FLOW CONTROL VALVE
- NON-FREEZING CHECK VALVES
- AXIAL-TYPE FLOW CONTROL VALVE
- STUFFING BOXES
- BLOWOUT PREVENTER (BOP) FOR POLISHED ROD
- ROD ROTATOR
- MEDIA SEPARATOR
- STEEL NEEDLE VALVES (SAMPLERS)
- BALL VALVE FOR PRESSURE GAUGE
- HAMMER (WING) UNIONS
- TOOLS AND ACCESSORIES FOR WELL COMPLETION AND MAINTENANCE WORK
- EMERGENCY PROTECTION SYSTEMS
- SPRING PRESSURE RELIEF VALVE WITH MANUAL OVERRIDE
- PRESSURE RELIEF VALVES SWITCHING DEVICE
- PRESSURE RELIEF VALVE UNIT WITH SWITCHING DEVICES

## CONVENTIONAL CASING HEADS

Conventional casing heads are designed for suspension and sealing of protection and casing strings and annular pressure control.

### Available versions:

Working pressure

МПа	14	21	35	70	105
psi	2000	3000	5000	10000	15000

Casing passage diameter:

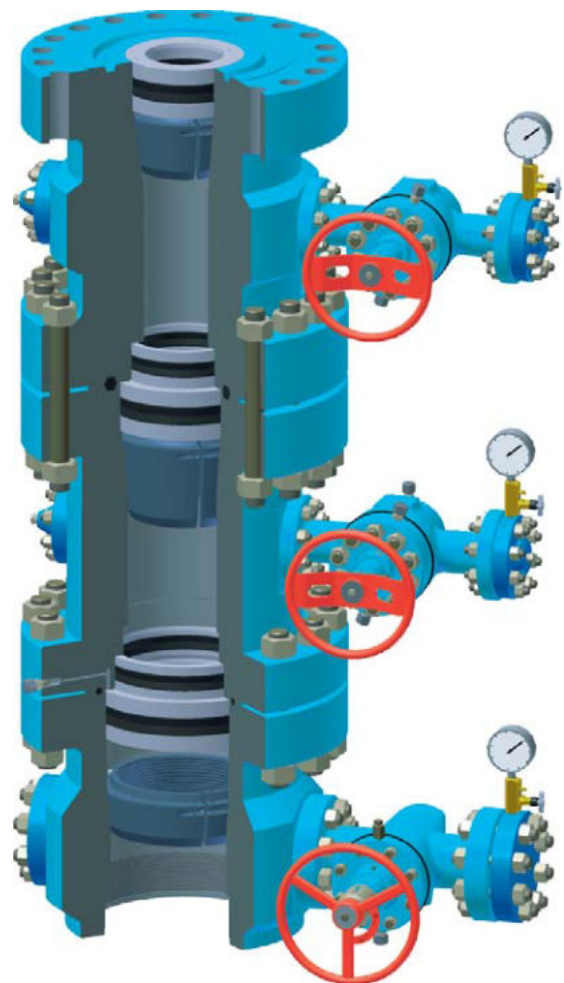
mm	140	146	168	178	193	219	245	273	299	324	340	426	508
inches	5 1/2	–	6 5/8	7	7 5/8	8 5/8	9 5/8	10 3/4	11 3/4	–	13 5/8	–	20

### Basic advantages:

- lower body is available for threaded or for welded installation
- standard API and GOST threads as well as threads according to specifications of pipe manufacturers are available
- application of different casing hanger types is available (see page 8)
- application of different annular sealing types is available (see pages 9-10)
- various tools and accessories for drilling operations are available (see pages 30-31)
- product specification level: PSL1, PSL2, PSL3, PSL3G, PSL4
- performance requirements: PR 1, PR2

Temperature classes according to API K, L, P, R, S, T, U

API material classes: AA, BB, CC, DD-NL, EE-NL, FF-NL, HH-NL



## TIME SAVING CASING HEADS



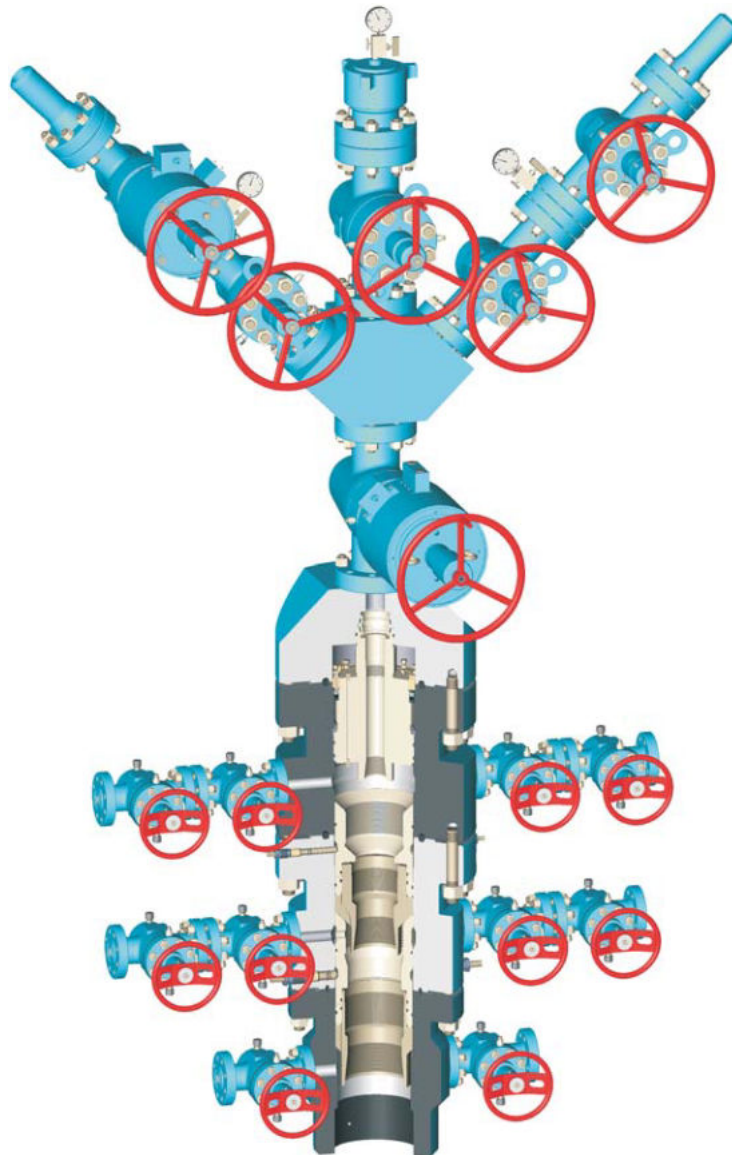
### MULTI-HANGER SPLIT WELLHEADS

Designed for suspension of protection, casing and tubing strings in one split body without BOP reinstallation.

API material classes: AA, BB, CC, DD-NL, EE-NL, FF-NL, HH-NL

### Basic advantages:

- speed-up of well construction and completion process. BOP reinstallation is not required (all strings are installed through the same preventer)
- waiting for cement hardening is not required
- advanced convenience of installation when an emergency set of protection string hangers is used (standard installation)
- product specification level according to: PSL1, PSL2, PSL3, PSL3G, PSL4
- performance requirements according to: PR 1, PR2







## CONVENTIONAL CASING HANGERS TYPES

### SLIP HANGER

Casing is suspended by slip hanger located in the casing head body.

#### Basic advantages:

- the most cost-effective version
- easy to install

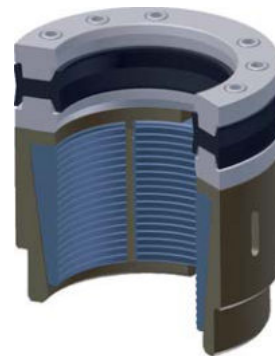


### SLIP HANGER IN THE BOWL

Casing is suspended by slip hanger located in the bowl. Slip hanger assembly is installed into the body of the casing head.

#### Basic advantages:

- is supplied assembled and prepared for installation
- allows to use all types of drilling bits acc. to API and GOST
- running through BOP
- automatic sealing of the annular space allows to continue drilling activity without waiting for cement hardening
- possible to use automatic seal and dovetail seal
- in case of casing stuck it is possible to use an emergency hanger

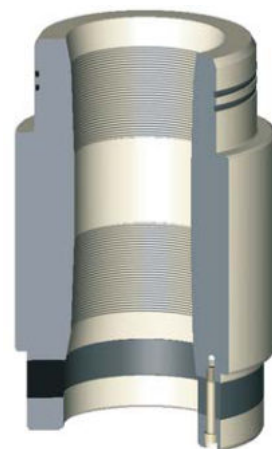


### MANDREL HANGER

Is screwed on the casing string.

#### Basic advantages:

- easy installation and reliability
- allows to use all types of drilling bits acc. to API and GOST
- running through BOP
- automatic sealing of the annular space allows to continue drilling activity without waiting on cement hardening



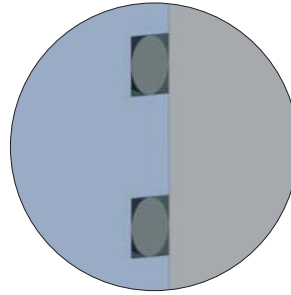
## TYPES OF ANNULAR SEALS



### RUBBER SEALING O-RINGS

#### Basic advantages:

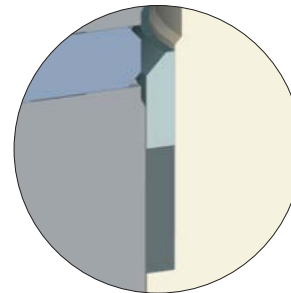
- simple and safe design
- guaranteed operation life is 20 years
- temperature range -60°C...+ 121 °C
- possible to use in low-corrosive mediums



### SOLID RUBBER SEAL

#### Basic advantages:

- simple and reliable design
- guaranteed operation life is 20 years
- temperature range -60°C...+ 121°C
- possible to use in corrosive mediums



### RUBBER SEAL, DOVETAIL TYPE

#### Basic advantages:

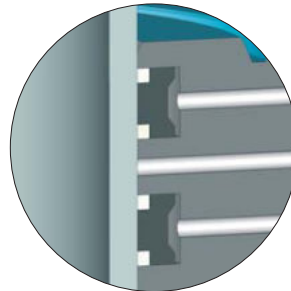
- pressure energized
- simple and reliable design
- guaranteed operation life is 20 years
- temperature range -60°C...+ 121°C
- possible to use in low-corrosive mediums



### PASTE ENERGIZED SOFT SEALING

#### Basic advantages:

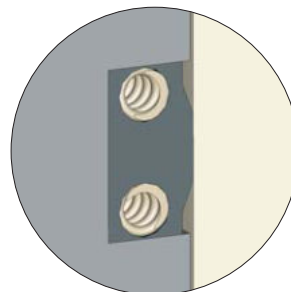
- simple and reliable design
- guaranteed operation life is 20 years
- temperature range -60°C...+ 121°C
- possible to use in low-corrosive mediums
- is most widely used on gas wellheads



### LIP-TYPE SEALS WITH ANTI-EXTRUSION RING SPRINGS

#### Basic advantages:

- simple and safe design
- guaranteed operation life is 20 years
- temperature range -60°C...+ 121°C
- is most widely used in corrosive mediums and at high pressures
- rings stay intact after running through BOP

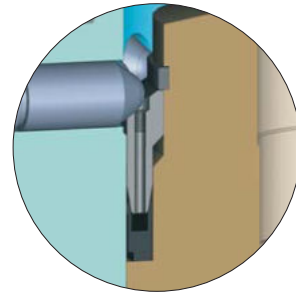




### M-TO-M SEAL (MANDREL HANGER)

#### Basic advantages:

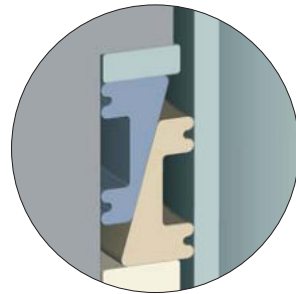
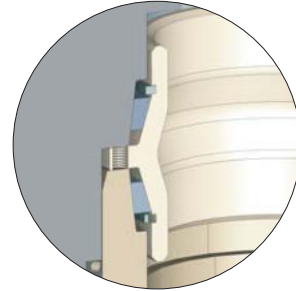
- reliability and long operation life (up to 40 years)
- possibility to operate with aggressive fluid
- resistance to extremely high temperatures (fire safety)
- is most widely used in corrosive mediums and at high pressures
- possibility of mandrel hanger sealing



### M-TO-M SEAL (CASING)

#### Basic advantages:

- seals against casing stub
- reliability and long operation life (up to 40 years)
- possibility to operate with aggressive fluid
- resistance to extremely high temperatures (fire safety)
- is most widely used in corrosive mediums and at high pressures



## WATER SUPPLY WELLHEADS



Designed for sealing of water-supply wells, suspending of well casing and tubing, and directing the well medium to the manifold.

API material classes AA, BB, CC, DD-NL, EE-NL, FF-NL, HH-NL.

#### Available versions:

##### Working pressure

МПа	1,6	21
psi	–	3000

##### Nominal bore

mm	50	65	100	130	150	180
inches	2 1/16	2 9/16	4 1/16	5 1/8	6	7 1/16

#### Basic advantages:

- allows to maintain formation pressure by cenomanian water production and further supply to injection wells
- product specification level acc. to API PSL1, PSL2, PSL3, PSL3G, PSL4
- performance requirements acc. to API: PR 1, PR2



## TUBING HEADS



Designed for suspending of tubing strings, and for pressure control.

Temperature classes acc. to API: K, L, P, R, S, T, U  
API material classes: AA, BB, CC, DD-NL, EE-NL, FF-NL, HH-NL.

### Available versions:

#### Working pressure

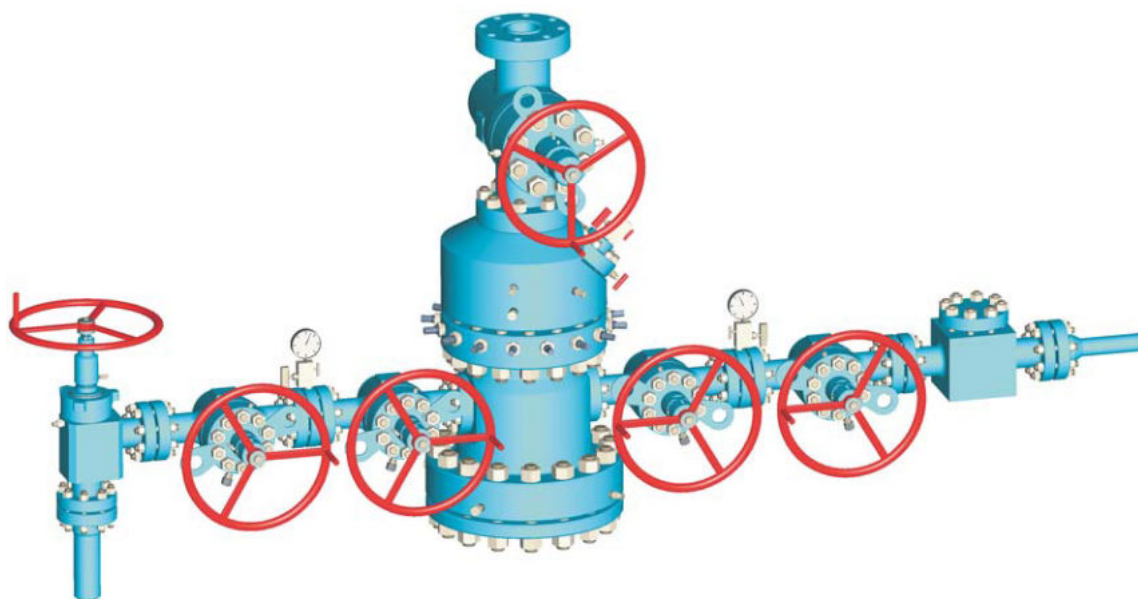
МПа	14	21	35	70	105
psi	2000	3000	5000	10000	15000

#### Nominal bore

mm	60	73	89	102	114	127	140	146	168
inches	2 3/8	2 7/8	3 1/2	4	4 1/2	5	5 1/2	-	6 5/8

### Basic advantages:

- body parts are made of forgings in full conformity to API material requirements
- standard API and GOST threads as well as threads according to specifications of the pipe manufacturers are available
- all most widely used types of tubing hangers and annular seals, including metal-to-metal sealing are available (see page 10)
- it's possible to use the most of modern options: valve removal plugs, BPV and bi-directional BPV, interface for control lines of subsurface safety valves and chemical injection line, lock-screws, test ports for pressure tests
- flanged or studded tubing head adapter installations are available
- all necessary tools and accessories for maintenance work are offered (see pages 30-31)
- material selection for corrosive and sour service available
- flow wing line and annular line availability allows to get advanced reliability and to accelerate wellhead installation
- increased to 20 years guaranteed operation life saves general production expenses
- product specification level acc. to API: PSL1, PSL2, PSL3, PSL3G, PSL4
- performance requirements acc. to API: PR 1, PR2



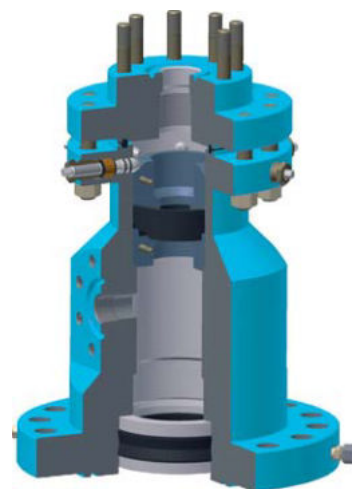


## TUBING HEAD WITH WRAP-AROUND TUBING HANGER

Used for natural flow production.  
Tubing is suspended from the tubing head adapter.  
In this tubing head version tubing mandrel hanger can be used.

### Basic advantages:

- installation through the BOP ensures work safety
- this design allows to lift the tubing string for length of one tubing under pressure before the cementation procedure and circulation beginning, which allows to protect formation fluid from kill mud
- allows to switch to ESP production

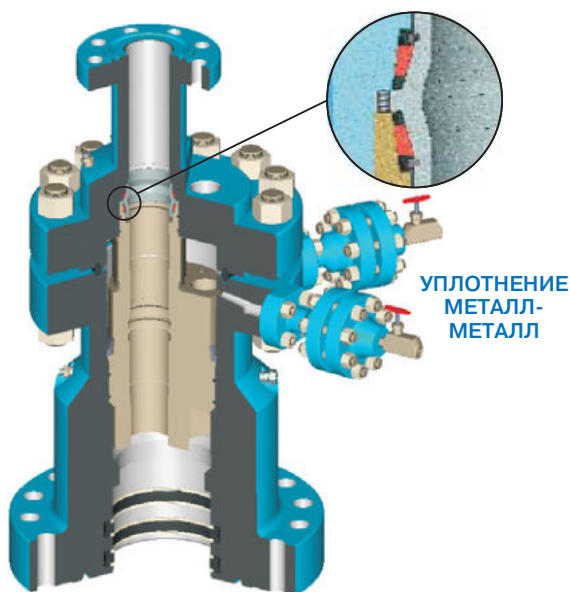


## TUBING HEAD WITH MANDREL HANGER

Is intended for natural flow production. The most widely spread type for high pressure oil and gas production.  
Tubing string is suspended from mandrel hanger.  
Mandrel hanger can be used either with or without secondary seal.

### Basic advantages:

- tubing hanger design ensures possibility of higher mechanical properties as compared with tubing suspension inside the spool
- allows to perform well completion through the previously installed BOP, providing safer working conditions
- ensures primary and secondary sealing of tubing head body with adapter flange connection
- allows to improve operation safety due to BPV installation into the tubing hanger before the BOP detachment
- BPV installation into the tubing hanger allows to remove the master valve of the X-mas tree under pressure without killing the well
- allows to use corrosion and abrasive wear resistant tubing hangers
- allows to use metal-to-metal seal for improving of safety and lifetime
- allows to install control lines for subsurface safety valve and chemical injection line
- for sour / corrosive service sealing surfaces are plated with CRAs, tubing hanger also is made of CRA



## ESP TUBING HEAD



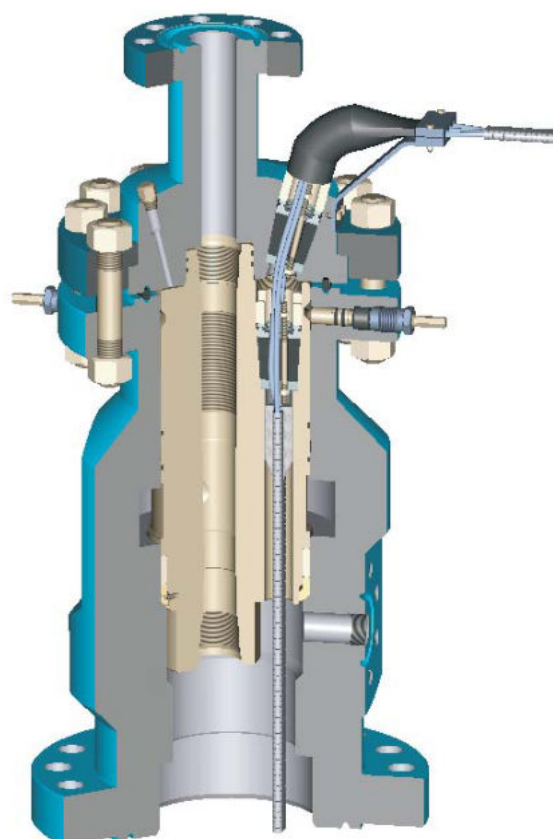
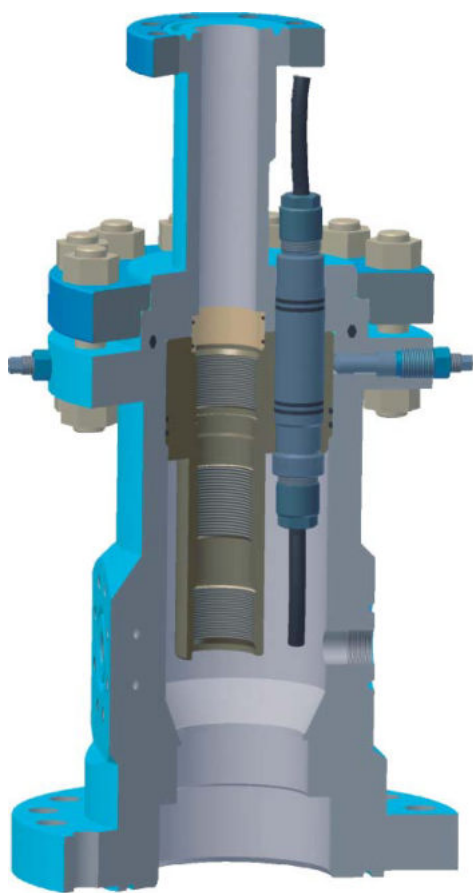
Used for oil production with ESP. The safest design for this kind of production.

Tubing string is suspended in mandrel eccentric tubing hanger.

Original cable seals as well as special cable inlet (penetrator) can be used for ESP electric cable entry.

### Basic advantages:

- safe installation through BOP
- allows to improve operation safety by installing BPV into the tubing hanger before BOP removal
- BPV installation into the tubing hanger allows to remove the master valve of the X-mas tree under pressure without killing the well
- preparation for control lines is available
- use of swivel joint in the adapter eases accurate wellhead equipment assembling in field conditions
- application of original cable seals allows to save the time of installation and raise safety and reliability of operation
- ensures minimal diameter of the tubing head upper flange, and use of smaller BOP for well workover
- unarmored cable cores can be poured with special compound protecting their external insulating material from contact with well fluid, which ensures long-term operability of the cable



## TUBING HEAD WITH SUSPENSION IN ADAPTER

Used for natural flow and ESP oil production. Tubing string is suspended in the tubing head adapter.

### Basic advantages:

- simple and reliable design
- design for low pressure oil fields which is the most widely spread in CIS
- cost-effective

### CABLE INLET WITH PRESSURE TEST POSSIBILITY

#### Cable inlet is intended for:

Sealing of cable entry into ESP wellheads with working pressure up to 5000 psi inclusively.

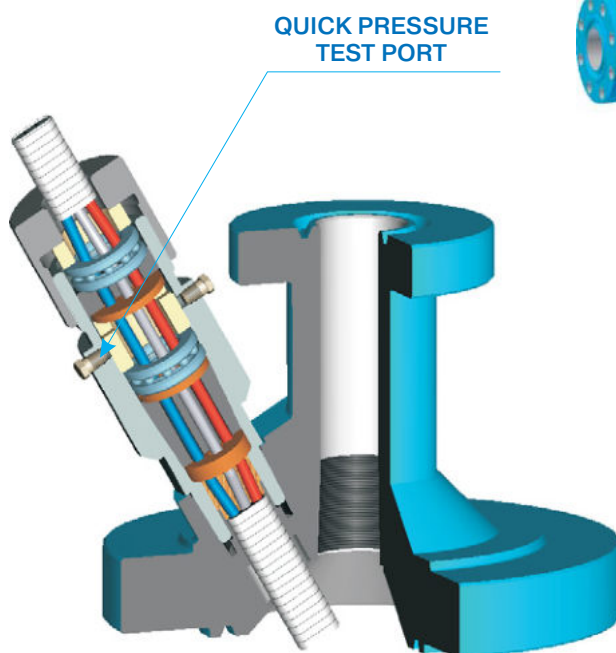
### Basic advantages:

- possibility of quick pressure testing during installation and operation
- possibility of installation on active production wells
- simple installation
- unarmored cable cores can be poured with special compound protecting their external insulating material from contact with well fluid, which ensures long-term operability of the cable

### Cable inlet design features:

Cable inlets with rubber seals, which are presently most widely used, are the weakest points of industrial safety: operator has no possibility to test them for leakage. We offer the design that solves the problem.

Sealing is provided with rubber glands with shape of truncated cone; through the glands cable wires are passed. Wire diameter is specified by purchaser. Gland pressing is provided with threaded plug via thrust bearing, this allows cable wire tightening 1.5 times as high as conventional cable inlets.



## X-MAS TREES



Are intended for controlling of produced fluid to desired direction, flow rate and pressure control as well as for well shutdown in case of repair work or other working operations, and for emergency stop in manual or automatic mode.

Depending on design and operation may contain valves, fittings, chokes, companion flanges, instrumental flanges, checkvalves, etc.

Available in any design version according to required parameters.

### Basic advantages:

- solid block construction of the X-mas tree reduces the number of splits, which improves reliability, safety and fire resistance, diminishes X-mas tree dimensions and weight
- dual construction of the X-mas tree is intended for independent production from two different strata or water injection in two different formations at the same time. Manufacture according to any scheme in compliance with specified characteristics and customer's requirements is possible
- completed with full bore gate valves, either manually operated, or electromechanically and hydraulically actuated; that allow to use in the X-mas trees systems of remote control and systems of automatic emergency shut down of produced fluid flow
- completed with adjustable and positive chokes with trim (seat, needle) made of wear-resistant materials (ceramics, tungsten carbide)
- body parts design depends on the forming method of hot plastic deformation-forging or die stamping, with obtaining of the required mechanical properties by further hot treatment
- injection X-mas trees are completed with choke special ball valves that allow to perform replacement of flow beans under pressure (patented).
- to be completed with any kind of equipment and connections, or with 'hook' manifold maintenance trestles (access platforms) are available
- product specification level acc. to API PSL1, PSL2, PSL3, PSL3G, PSL4
- performance requirements acc. to API PR 1,

### Available versions:

- according to Baku Flange Connections
- with API 6A monogram according to API Spec 6A
- according to Russian standards

### Working pressure

MPa	14	21	35	70	105
psi	2000	3000	5000	10000	15000

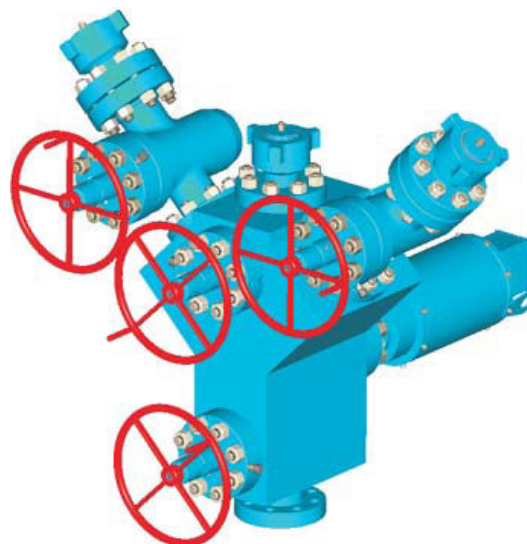
### Nominal bore

mm	50	65	80	100	130	150	180
inches	2 1/16	2 9/16	3 1/16	3 1/8	4 1/16	5 1/8	7 1/16

Versions according to GOST or API standards with API monogram

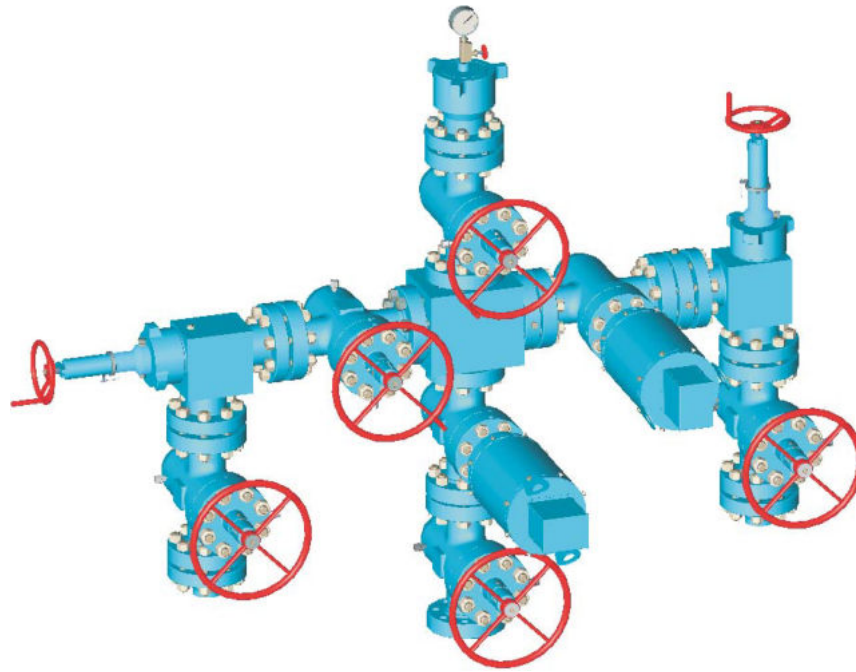
Temperature classes acc. to API K, L, P, R, S, T, U

Material versions according to medium corrosiveness are according to API classes AA, BB, CC, DD-NL, EE-NL, FF-NL, HH-NL.

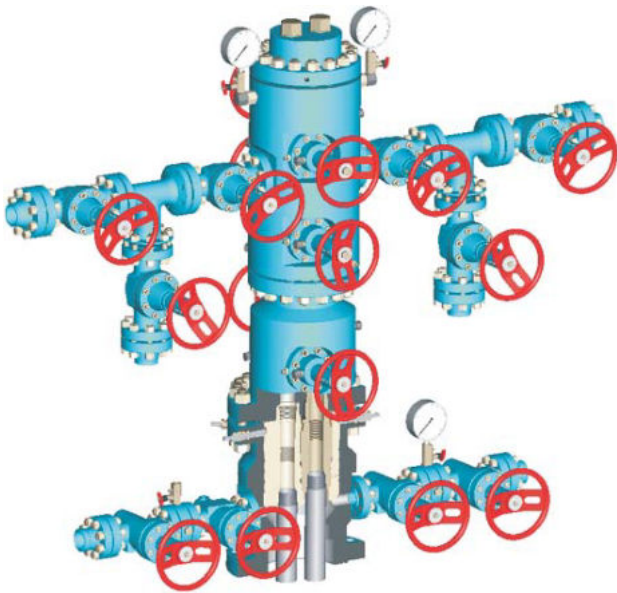


**SOLID BLOCK  
X-MAS TREE**

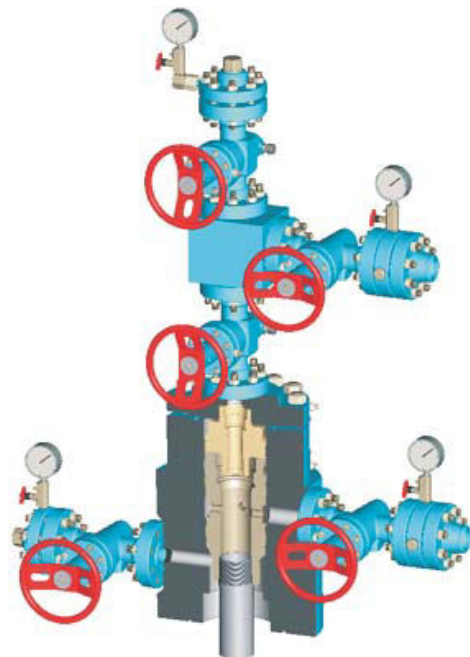




COMPOSITE X-MAS TREE



DUAL X-MAS TREE



DUAL CONCENTRIC X-MAS TREE

## HORIZONTAL (COMPACT) X-MAS TREES



For all types of wells  
Tubing is suspended from the mandrel hanger.

Material classes AA, BB, CC, DD-NL, EE-NL, FF-NL, HH-NL, according to API Spec 6A are available.

### Basic advantages:

- well workovers can be performed without X-Mas tree disassembly
- smaller dimensions make installation and maintenance easier
- decreased amount of connections improves reliability
- use of stuffing boxes offers additional advantages (see page 26)
- built-in check valve between production line and annulus
- can be delivered with a multi-hangered split body allowing to run production and tubing strings without BOP reinstallation (Fig. 2)
- product specification level acc. to API PSL1, PSL2, PSL3, PSL3G, PSL4
- performance requirements acc. to API PR 1, PR2.

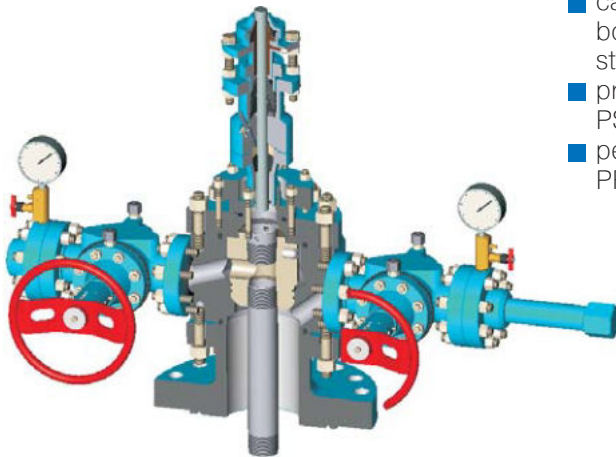


Fig. 1

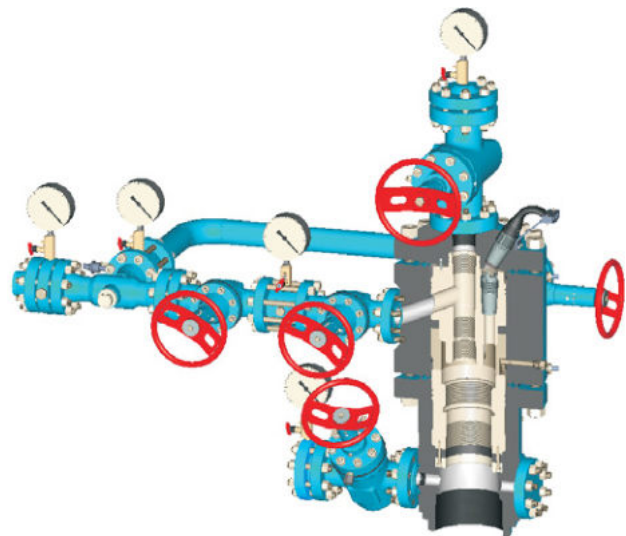


Fig. 3

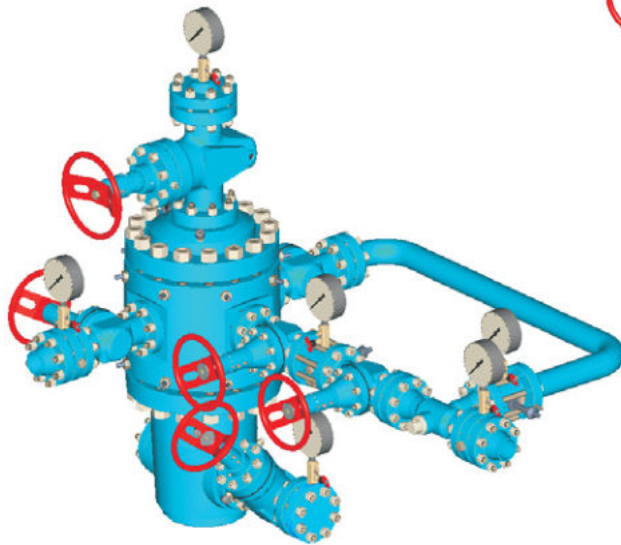


Fig. 2

## GATE VALVES

Gate valve with metal-to-metal seal is designed for installation on X-mas Tree and is used as a shutting-off device for full shutdown of produced fluid flow.

### Standards compliance:

- according to Baku Flange Connections
- with API 6A monogram according to API Spec 6A
- according to Russian standards

### Working pressure

MPa	14	21	35	70	105
psi	2000	3000	5000	10000	15000

### Nominal bore

mm	50	65	80	100	130	150	180
inches	2 1/16	2 9/16	3 1/16	3 1/8	4 1/16	5 1/8	6 7/16

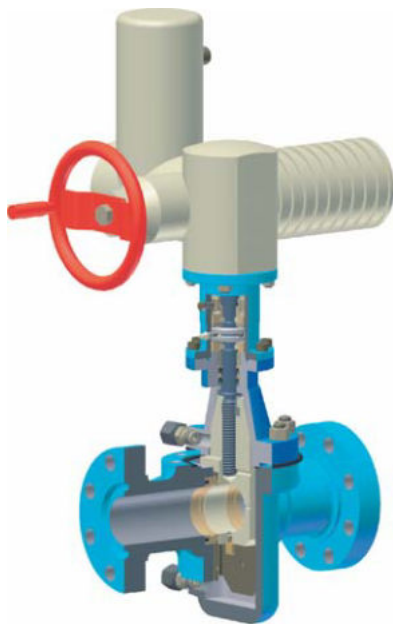
Temperature classes acc. to API K, L, P, R, S, T, U

Material versions depending on medium corrosiveness are according to API classes AA, BB, CC, DD-NL, EE-NL, FF-NL, HH-NL.

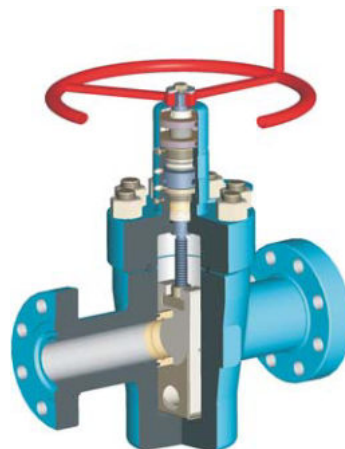
Connection design: flange, coupled.

### Basic advantages:

- gates and seats made of stainless steel with hardening (chemical-thermal treatment, corrosion resistant and wear-resistant cladding)
- gate valve has test and drain valves for lubricant injection (visual control of filling) or condensate bleeding
- fusible ring in stem packing for automatic back seating in case of fire
- full leakproofness of the shutting-off device is ensured by constant tightening of seats
- gate position indicator "open-closed"
- full-bore adjustment mechanism
- built-in mechanical gear box is available
- electric or hydraulic actuators and control stations are available
- stem leakage elimination by adding plastic into sealing is available
- backup soft seal gate-to-seat is available
- seat-body sealing of metal-to-metal type is available
- completed with hand grease gun and pressure relief device
- partial or full cladding with CRA for corrosive / sour service
- product specification level acc. to API PSL1, PSL2, PSL3, PSL3G, PSL4
- performance requirements acc. to API. PR 1, PR2.



**ELECTRICALLY-ACTUATED  
GATE VALVE**



**MANUALLY-OPERATED  
GATE VALVE**



**GATE VALVE \W  
PNEUMATIC ACTUATOR**



**GATE VALVE \W SPRING  
ENERGIZED HYDRAULIC ACTUATOR**

## ANGLE GLOBE VALVES



Angle globe valve is designed for shutting-off of liquid and gaseous mediums in the entire effective pressure range. It is installed in sucker-rod pumping or ESP wellhead assemblies (low pressure).

### Working pressure

MPa	14
psi	2000

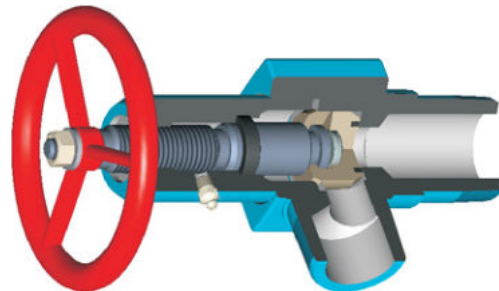
### Nominal bore

mm	50
inches	2 1/16

Connection design: coupling, flange, make-and-break couplings.

### Basic advantages:

- angle valve seat is made of high-strength hard alloy
- closure mechanism has a combined seal (fluoroplastic + stainless steel)
- seal assembly construction excludes the plug abrasion from the stem at the moment of opening, due to the sealing over the plane surface
- cost-effective option of closure mechanism
- simple in service





## CHOKES

Adjustable chokes are intended for well flow control.

### ADJUSTABLE CHOKE

#### Basic advantages:

- smooth control of produced fluid flow in the entire nominal bore range with dial scale monitoring.
- graduated dial scale
- trims of wear- and corrosion-resistant material
- stem sealing re-energizing without stopping the process of production (with sealant injection)
- possibility of adjustable choke transformation into positive choke
- body-bonnet hammer union bonnet allows quick choke bean replacement
- pressure release port improves operation safety
- product specification level acc. to API PSL1, PSL2, PSL3, PSL3G, PSL4
- performance requirements acc. to API. PR 1, PR2

#### Available versions:

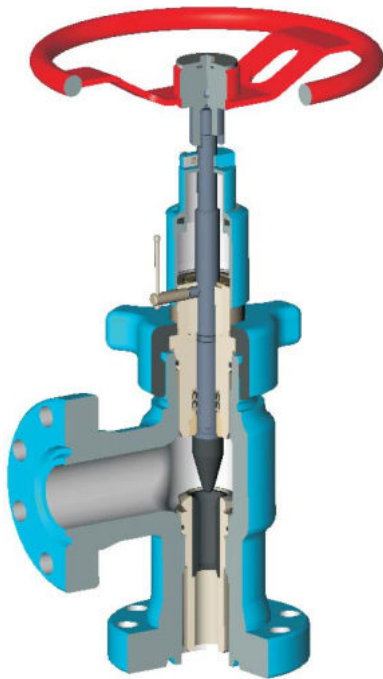
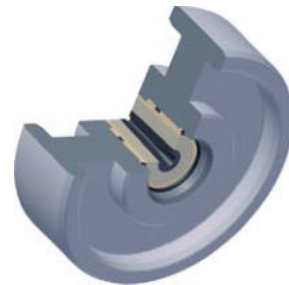
##### Working pressure

MPa	14	21	35	70	105
psi	2000	3000	5000	10000	15000

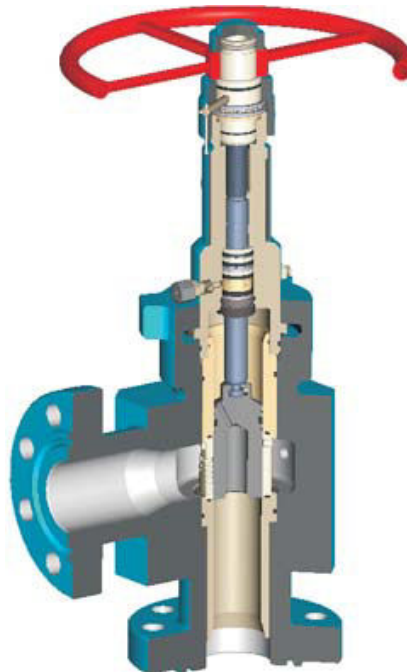
##### Nominal bore

mm	50	65	80	100	130	150	180
inches	2 1/16	2 9/16	3 1/16	3 1/8	4 1/16	5 1/8	6 7/16

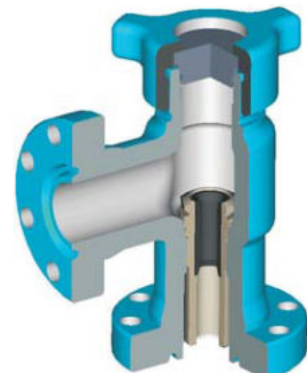
Material classes AA, BB, CC, DD-NL, EE-NL, FF-NL, HH-NL, according to API Spec 6A are available.



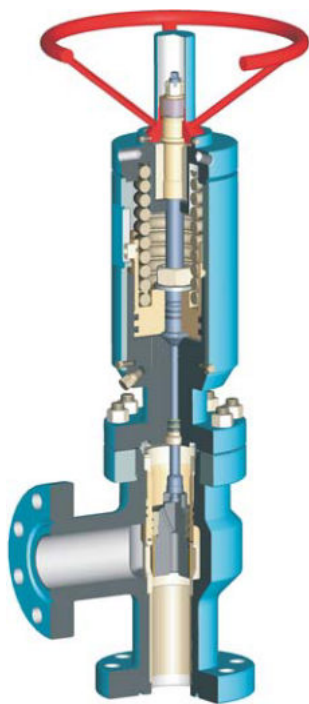
NEEDLE  
CHOKE



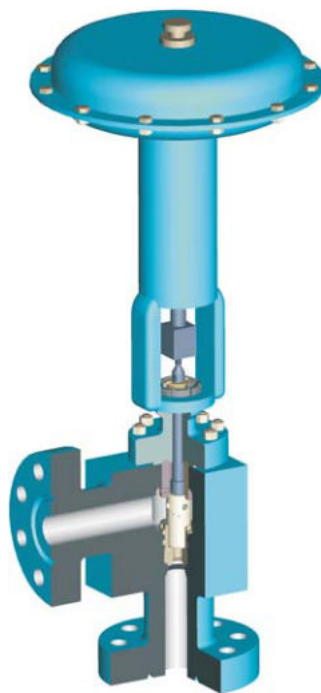
CAGE TYPE  
CHOKE



POSITIVE  
CHOKE



**CAGE-TYPE CHOKE \W  
SPRING ENERGISED  
HYDRAULIC ACTUATOR**



**CAGE-TYPE CHOKE \W  
PNEUMATIC ACTUATOR**



**CAGE-TYPE CHOKE \W  
ELECTRIC ACTUATOR**

## BALL VALVE CHOKE

Designed for fluid flow control while injecting fluid into formation and for other systems.

### Available versions:

#### Working pressure

MPa	14	21
psi	2000	3000

#### Nominal bore

mm	50	65
inches	2 1/16	2 9/16

### Basic advantages:

- possibility to replace the choke bean under pressure without additional shutting mechanisms
- choke beans replacement takes no more than 5 minutes
- metal-to-metal seal of shutting-off device is available
- works under pressure
- product specification level acc. to API PSL1, PSL2, PSL3, PSL3G, PSL4
- performance requirements acc. to API. PR1, PR2

Choke beans bore diameter, mm  
2,3,4,5,6,7,8,9,10,12,15,18  
Connection design flange (GOST, RD, API)  
Unidirectional fluid flow

Material classes AA, BB, CC, DD-NL, EE-NL, FF-NL, HH-NL, according to API Spec 6A are available.



## SWITCH TYPE CHOKE

Designed for fluid flow control while injecting of fluid into formation and for other systems.

### Available versions:

Working pressure

MPa	14	21	35
psi	2000	3000	5000

Nominal bore

mm	50	65
inches	2 1/16	2 9/16

### Basic advantages:

- unlike choke chambers in which choke replacement requires disassembling (assembling) flanges choke design allows to vary flow area due to axial turn of valve spool provided with holes of different diameters
- control devices are made of wear- and corrosion-resistant materials, that provides wear-resistance and long service life of choke device
- use of this design allows to minimize well flow changing costs and exclude well down time, that gives remarkable economic effect
- leak-tightness class

Material classes AA, BB, CC, DD-NL, EE-NL, FF-NL, HH-NL, according to API Spec 6A are available.

### Technical data:

Nominal bore diameter, mm

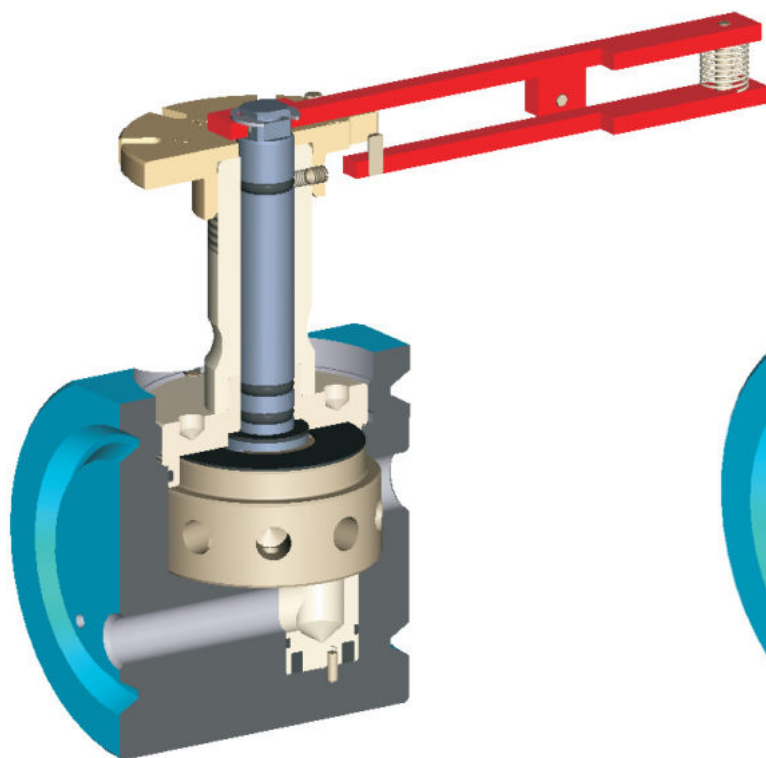
3, 4, 5, 6, 8, 10, 12,

18 Installation position

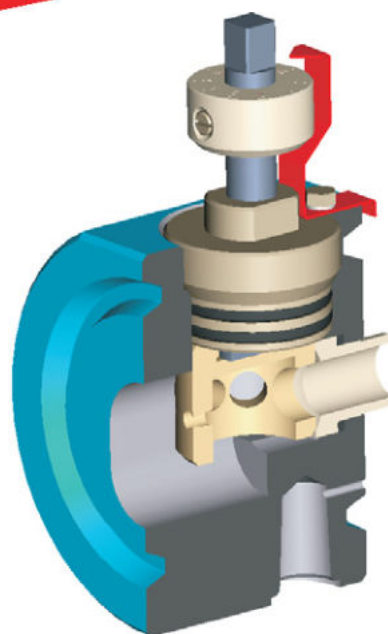
any

Connection design flange (GOST, RD, API)

Indirectional fluid flow



TYPE DDRD



TYPE DDR

## FLOW CONTROL VALVE



Designed to control the flow of natural gas, gas condensate, oil, water by changing the flow area, without ensuring shutoff leak-tightness.

### Technical data:

Installation position: any  
Connection design: flange (GOST, RD, API)  
Unidirectional fluid flow

### Available versions:

Working pressure

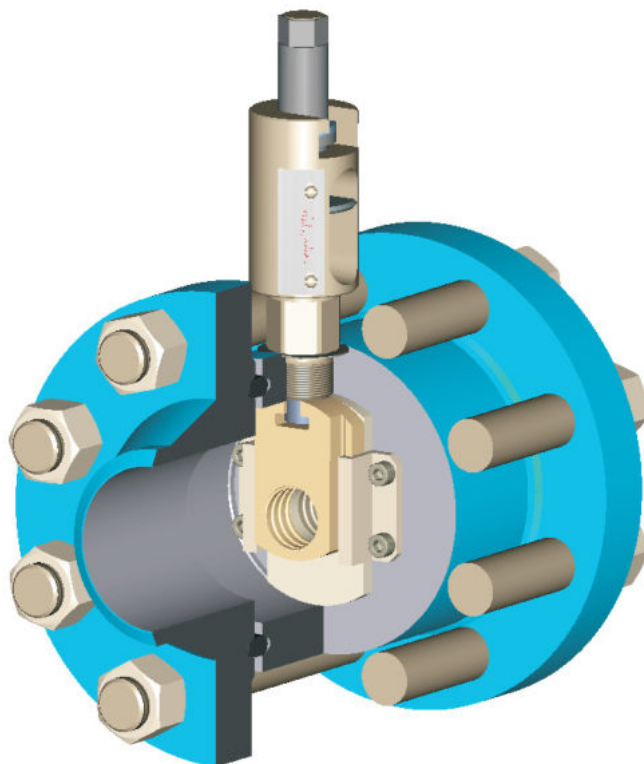
Mpa	6,3	8	12,5	14	16	21	32
-----	-----	---	------	----	----	----	----

Nominal bore

mm	50	80	100	150
----	----	----	-----	-----

### Basic advantages:

- the regulating members are manufactured from hard alloy, which significantly increases the life cycle







## NON-FREEZING CHECK VALVES

Used for gas release from X-mas tree annular space into the flow wing line and for preventing of cross-flow of the produced fluid into the annular space. Installed in the annular flow line or into the crossing of the annular line and the flow wing line.

### Available versions:

Working pressure

MPa	14	21
psi	2000	3000

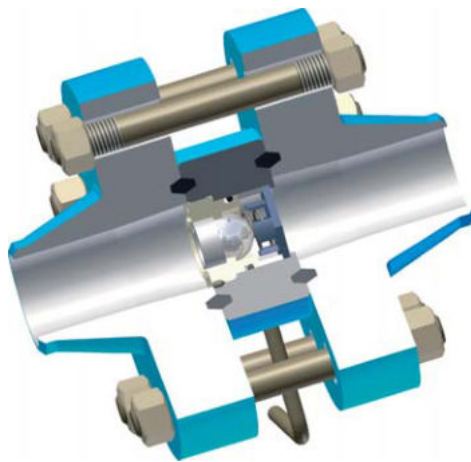
Nominal bore

mm	50	65	80	100
inches	2 1/16	2 9/16	3 1/8	4

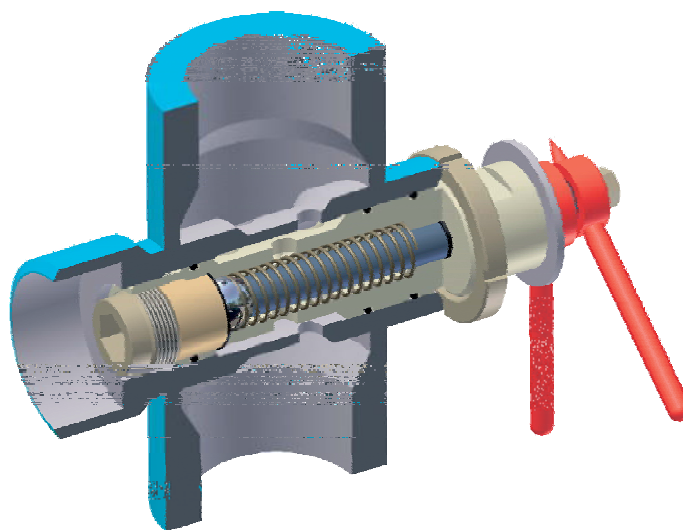
Material classes AA, BB, CC, DD-NL, EE-NL, FF-NL, HH-NL, according to API Spec 6A are available.

### Basic advantages:

- closure mechanism (ball-seat) is located in the production fluid flow (non-freezing)
- pressure control of annular space (adjustment of set pressure for the production process) is available
- ball and seat are made of stainless steel
- easy assembling and disassembling



CHECK VALVES



NON-FREEZING CHECK VALVES

## AXIAL-TYPE FLOW CONTROL VALVE



Designed to control the flow and pressure of gaseous and liquid well media, including natural gas, gas condensate, oil, water, by changing the flow area of the axial trim due to the maximum piston travel.

### Available versions:

#### Working pressure

Mpa	16	21	32	35	50
-----	----	----	----	----	----

#### Nominal bore

mm	80	100	200	300	400
----	----	-----	-----	-----	-----

### Technical data:

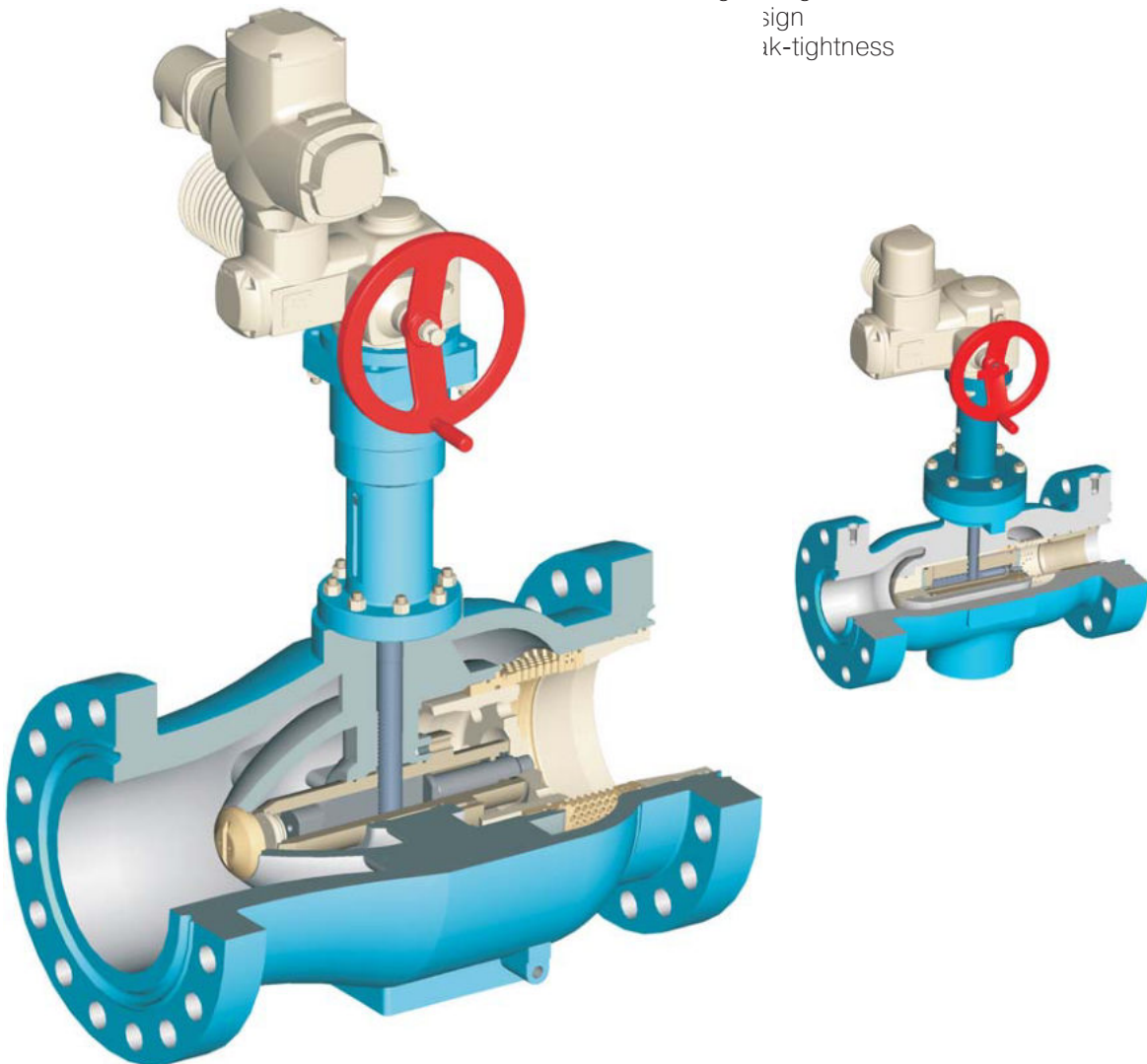
Installation position: any

Connection design: flange (GOST, RD, API)

Unidirectional fluid flow

### Basic advantages:

- axial flow excludes turbulence and energy transformation in the valve body, which ensures vibration-free and noiseless operation of the valve
- absence of static and dynamic forces on the regulating member ensures high accuracy of regulation and low-energy operation of the actuator
- straightened fluid flow eliminates erosive wear of the body parts
- high flow capacity
- wide range of regulation
- sign
- leak-tightness



## STUFFING BOXES

Designed for sealing of suck-rod pump or PCP pump polished rods.

### Available versions:

Connection design: flange or thread.

### Working pressure

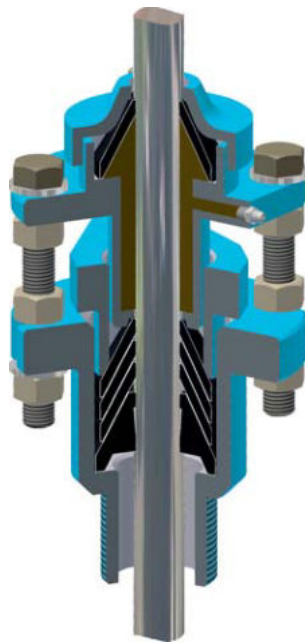
MPa	14
psi	2000

Polished rod size 19,32,38 mm.(3/4", 1 1/4", 1 1/2" inch)

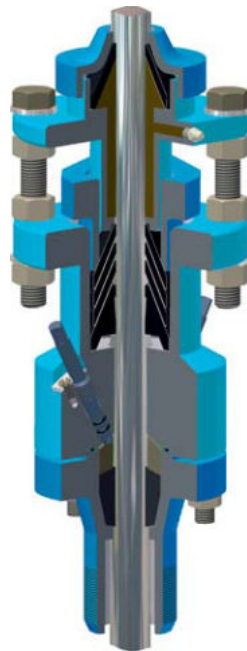
Connecting thread according to API or any other thread is available.

### Basic advantages:

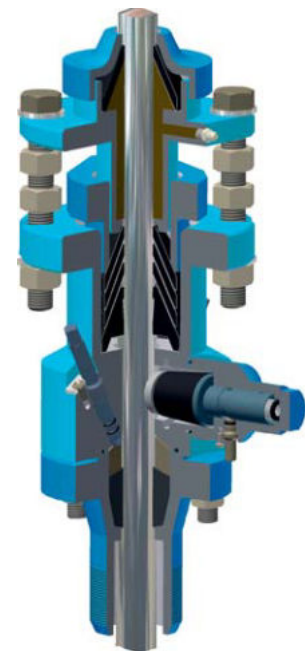
- possible replacement of the stuffing-box packing seal under pressure
- compensation of polished rod deviation up to 4 mm with full leakproofness up to 1 500 000 cycles without lip seal replacement
- completing with additional polished rod seal is available
- RAM BOP (spring energised) for case of stem breakage is available



CY-73-32XL-M



CY-73-32XL-M1



CY-73-32XL-M2

M-type stuffing boxes of special design could be used for passing of heating cable into the well and for sealing the cable while tubing string cleaning.

Possible diameter of the heating cable is 20 and 25mm.

## BLOWOUT PREVENTOR (BOP) FOR POLISHED ROD



Designed for sealing of sucker-rod pump polished rod, wellhead sealing while stuffing box replacement, and for other repair works.

### Available versions:

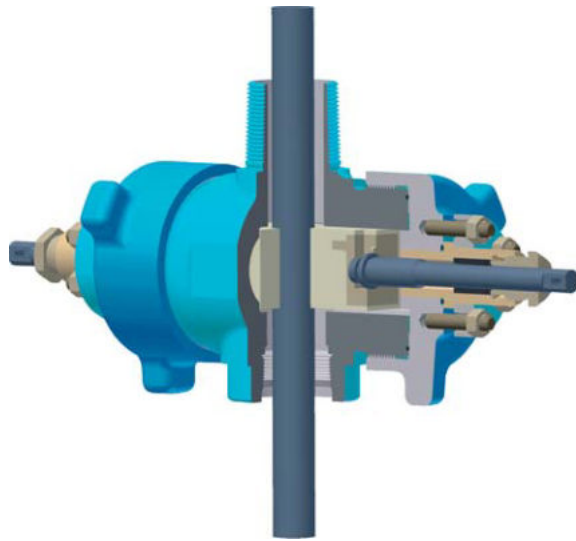
#### Working pressure

MPa	14
psi	2000

Sealed polished rod size 19,32,38mm.  
Connecting thread according to API:  
73,B73/2,7/8"TBG,2,7/8"UPTBG,3"LP,4"LP

### Basic advantages:

- possibility of continuous well shutdown in case of flooding or other acts of natural disaster; precluding the probability of environment pollution



## ROD ROTATOR



Designed for cyclic polished rod rotating while pumping to provide tubing pigging, equal wear of polished rod and pump piston.

Maximum torque: 120Nm.

Dimensions 388x182x125mm.

Weight 9kg

Number of strokes for a rod full turn: 60.

Clockwise rotation at handle upstroke.

### Basic advantages:

- application of screw-gear sufficiently enlarges transmitted torque
- high safety of service staff work



## MEDIA SEPARATOR

Designed for pressure gauge installation and protection from freezing.

### Available versions:

#### Working pressure

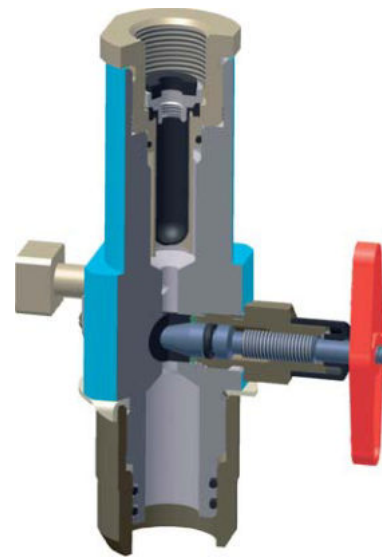
MPa	14	35
psi	2000	5000

Connecting threads: metric, tapered

Material classes AA, BB, CC, DD-NL, EE-NL, FF-NL, HH-NL, according to API Spec 6A are available.

### Basic advantages:

- complete sealing of the channels feeding operating fluid to the pressure gauge
- safety of pressure gauge and membrane replacement
- the inner cavity of the pressure gauge is filled with non-freezing liquid and separated from the operating fluid by a membrane
- product specification level acc. to API PSL1, PSL2, PSL3, PSL3G, PSL4G
- performance requirements acc. to API. PR1, PR2



## STEEL NEEDLE VALVES (SAMPLERS)

Designed for application as shutting-off devices on secondary outlets of the X-mas trees and pipelines as well as for pressure gauges attachment.

### Available versions:

#### Working pressure

MPa	16	35	70	105
psi	2000	5000	10000	15000

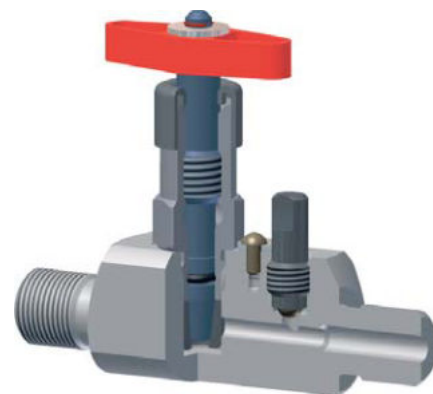
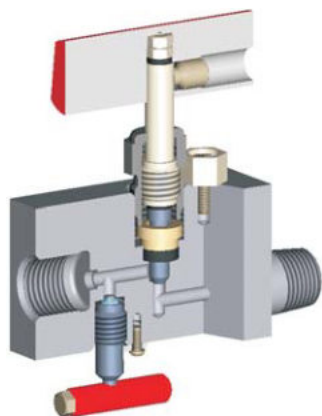
Material classes AA, BB, CC, DD-NL, EE-NL, FF-NL, HH-NL, according to API Spec 6A are available.

Nominal bore: 5mm.

Connecting threads: LP 1/2; NPT 1/2; Rc ?; K 1/2; K 3/4; M20x1,5; M22x1,5.

### Basic advantages:

- elastomeric seal ensures reliability of needle valves sealing (more than 1000 working cycles)
- additional drain valve enables safe replacement of the pressure gauge
- needle valves with female as well as with male connecting threads are available
- product specification level acc. to API PSL1, PSL2, PSL3, PSL3G, PSL4
- performance requirements acc. to API. PR1, PR2





## BALL VALVE FOR PRESSURE GAUGE



Designed for connecting pressure gauge.

### Basic advantages:

- fast open/close as compared with needle valve
- shutting-off device (ball) is made of stainless steel
- shutting-off device is sealed with composite elastomeric material
- visual control of the handle position "open closed" at a 90° angle turn
- pressure is released through a vent into the atmosphere or outlet pipe

Material classes AA, BB, CC, DD, EE, FF, HH, according to API Spec 6A are available.

### Available versions:

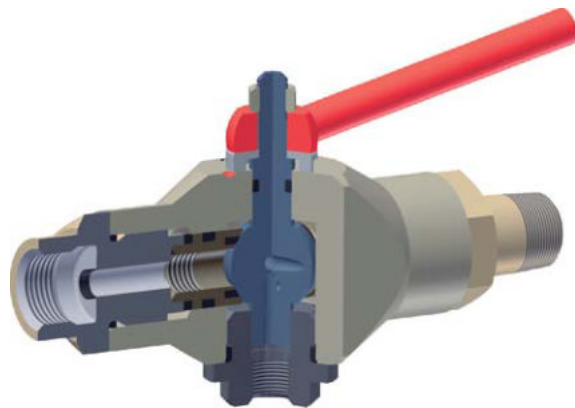
#### Working pressure

MPa	14	21	35
psi	2000	3000	5000

#### Nominal bore

mm	5
inches	3/16

Connecting thread for outlet pipe: K 1/4"



## HAMMER (WING) UNIONS



Designed for quick connection of production facilities (manifolds and pipeline connections, pumps, and drilling mud supply devices).

### Available versions:

#### Working pressure

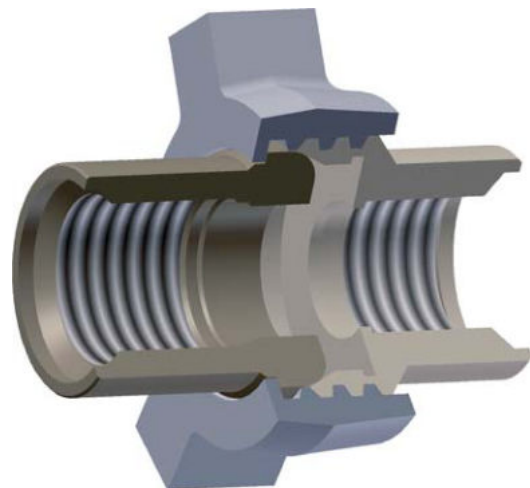
MPa	14	21	35	70	105
psi	2000	3000	5000	10000	15000

#### Nominal bore

mm	25	50	75	100
inches	1"	2"	3"	4"

### Basic advantages:

- reliable design
- quick connection
- interchangeability of components





BPV AND PLUGS FOR TUBING HANGERS



VR - PLUGS FOR  
SIDE OUTLETS



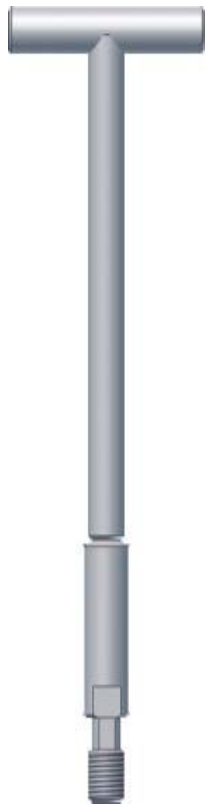
BOP TEST PLUG



WEAR-BUSHING



RUNNING TOOL



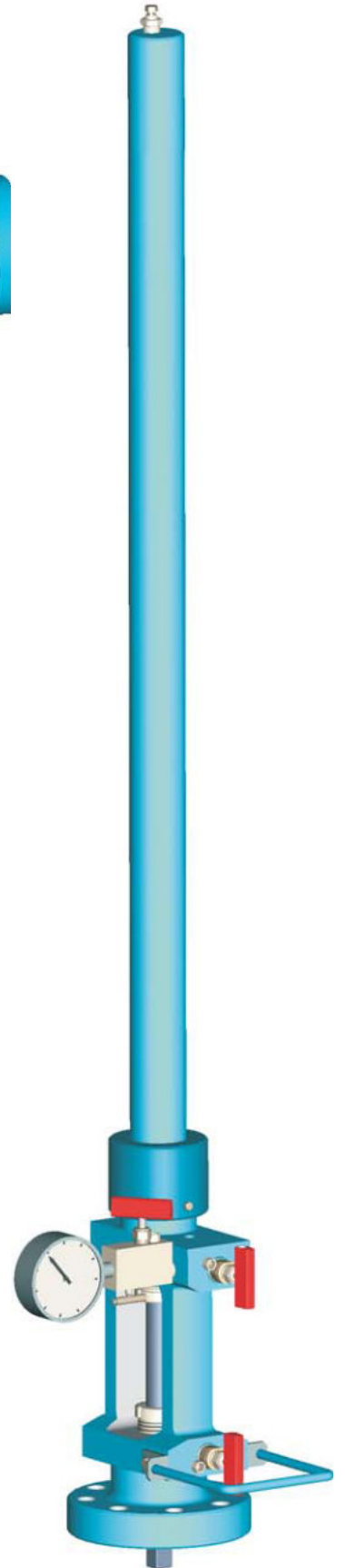
T-BAN FOR BPV



ADAPTER SPOOL



X-OVERS



LUBRICATORS

## EMERGENCY PROTECTION SYSTEMS

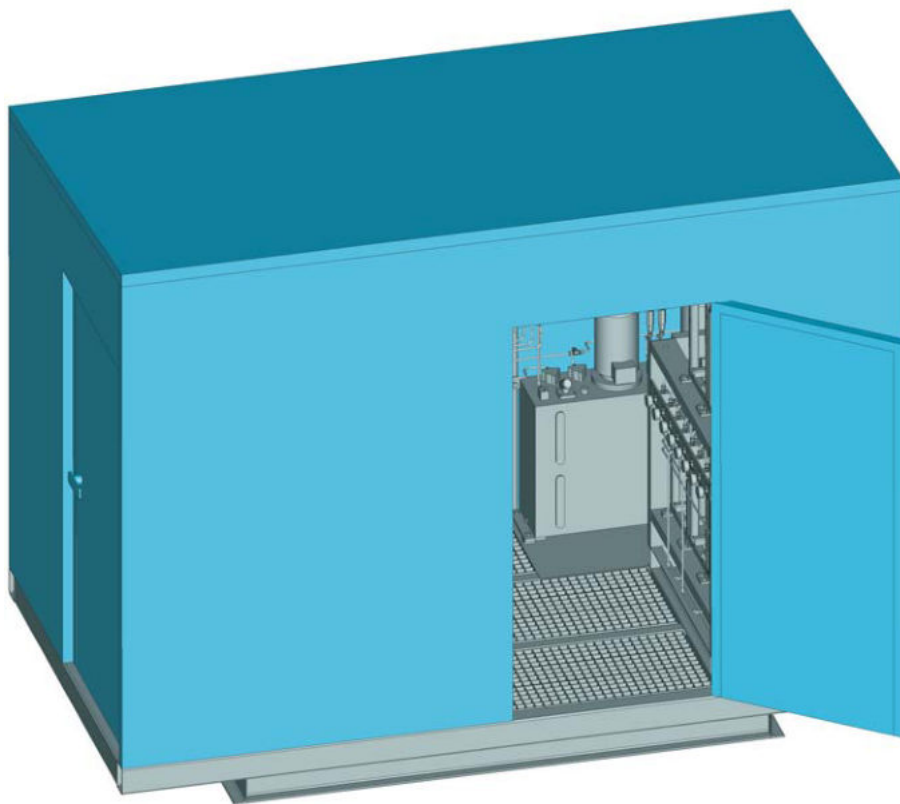
### HYDRAULIC WELL CONTROL SYSTEM

#### Working modes:

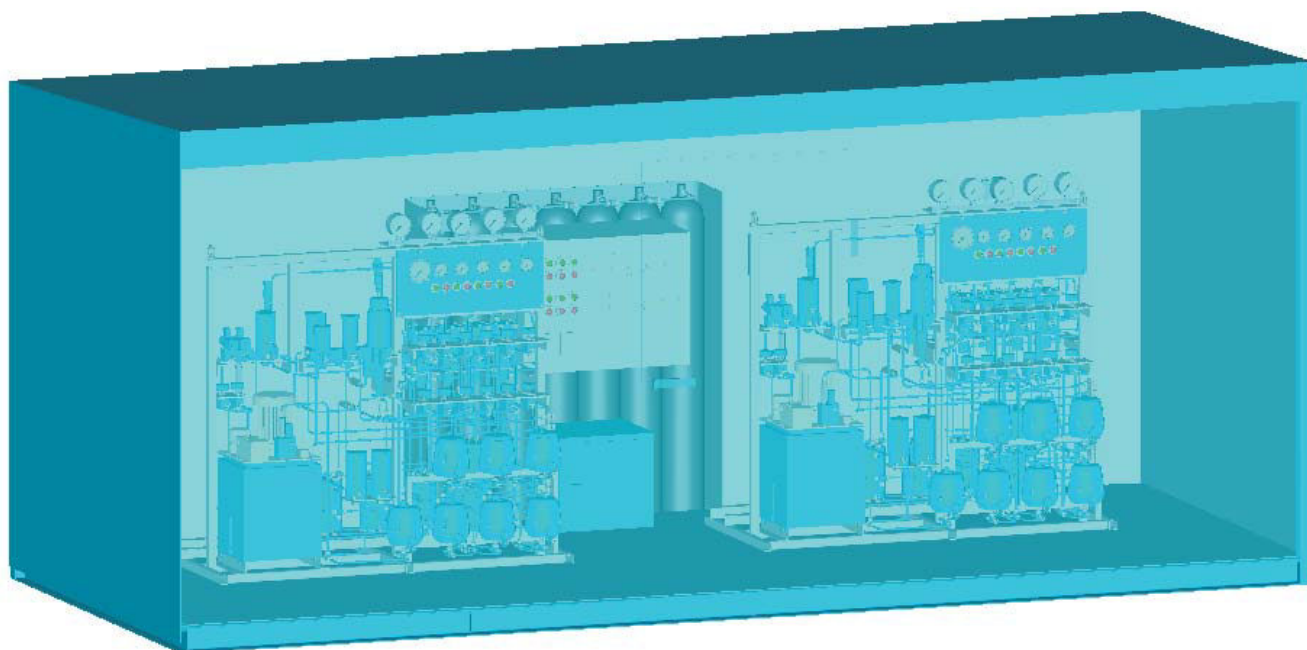
- control of well operation, with and without power supply. In emergency situations (low low or high high pressure, fire) shuts the well in automatically in the following sequence: the manifold valve / the flow wing valve / the lower master valve / the subsurface safety valve, also when power is not supplied
- local / remote well shut-in in the following sequence: the manifold valve / the flow wing valve / the lower master valve / the subsurface safety valve, also when power is not supplied
- local / remote flare valve operation
- local / remote choke operation
- local opening / shutting of any hydraulically-operated element

#### Basic advantages:

- autonomous work without power supply for up to a week, also at a temperature up to -60 C
- automatic pressure retention in hydraulic lines
- triple pumping unit: electric pump / air-hydraulic pump / hand pump
- no welded joints, no hydraulic connections
- home-produced components



CONTROL PANEL FOR WELL CONTROL



CONTROL PANEL FOR WELL CONTROL





## HYDRAULIC CONTROL SYSTEM

Used for automatic pressure control.

### Operating modes:

- controls pipeline pressure and in case of emergency pressure increase or decrease automatically closes the hydraulic gate valve
- automatically closes the gate valve in case of fire
- closes the gate valve on command from remote control console
- closes the gate valve on command from control console located on hydraulic control system (panel)

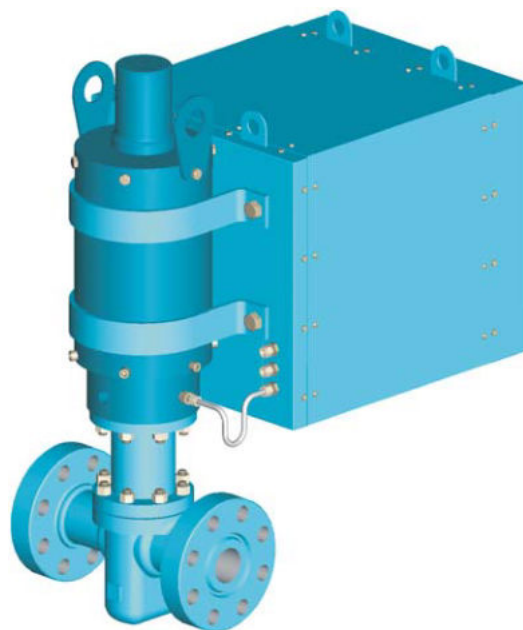
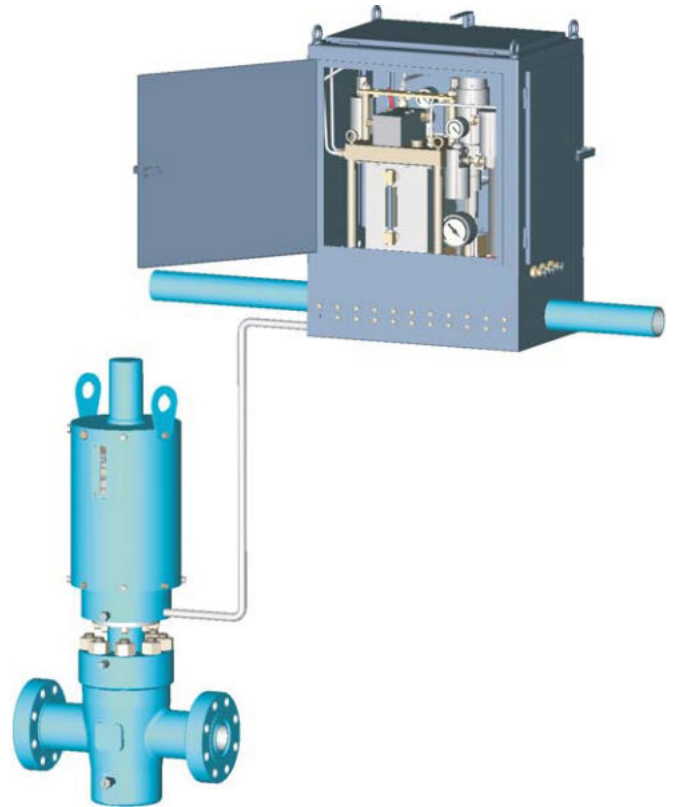
### Working pressure

Mpa	14	21	35	70	105
psi	2000	3000	5000	10000	15000

Ambient temperature: -60 ... +60°C.

### Basic advantages:

- block design provides the least of hydraulic piping (connect)
- external power supply is not required
- use of vandal-proof housing
- possibility of installation straight on pipeline provides autonomous heating increasing system operation reliability



## CUTOFF VALVE

Designed for automatic pipeline shutoff in case of line pressure increase or decrease.

### Working pressure

Mpa	14	21	35	50
psi	2000	3000	5000	7000

### Nominal bore

mm	50	65	80	100	150	
inches	2 1/16	2 9/16	3 1/16	3 7/8	4 1/16	6

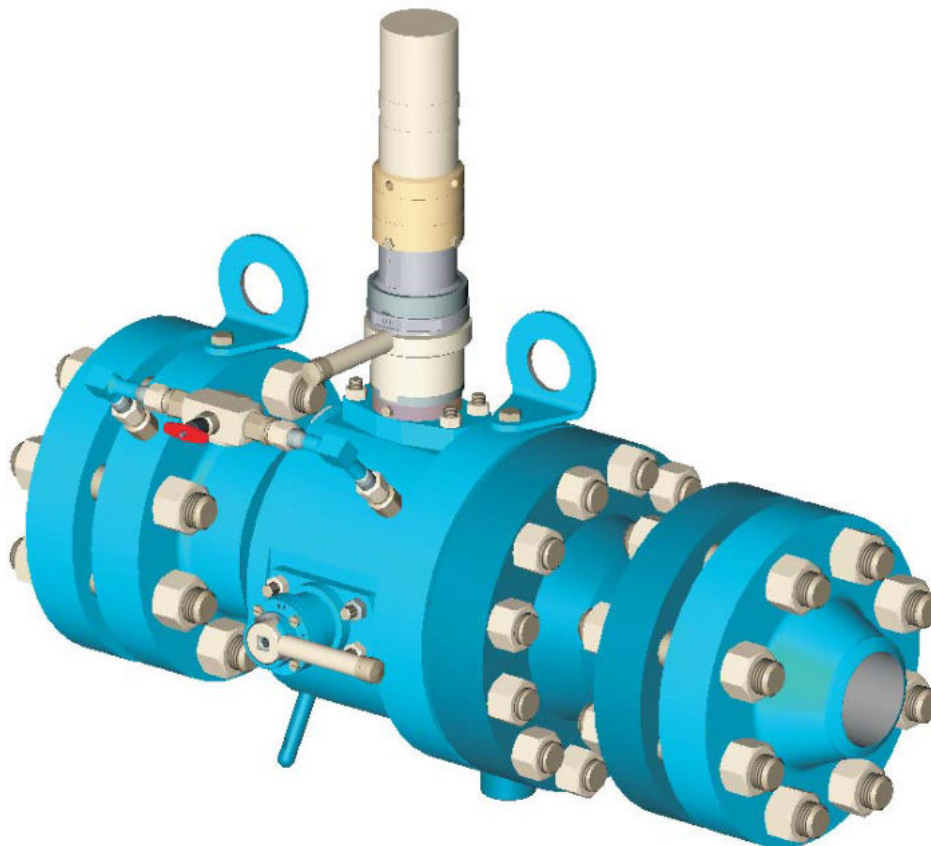
Temperature classes acc. to API: K, L, P, R, S, T, U  
API material classes: AA, BB, CC, DD-NL, EE-NL, FF-NL, HH-NL

Connection design flange

Unidirectional fluid flow

### Basic advantages:

- external power supply is not required (i.e. the system is autonomous)
- product specification level acc. to API PSL1, PSL2, PSL3, PSL3G, PSL4
- performance requirements acc. to API PR1, PR2



## SPRING PRESSURE RELIEF VALVE WITH MANUAL OVERRIDE

The pressure relief valves are intended for equipment protection against impermissible overpressure. Used in reservoirs, boilers, tanks, vessels, and pipelines, for automatic discharge of working fluid to the atmosphere or to an outlet pipeline. After pressure has dropped to the required level, the pressure relief valve stops discharging fluid.

### Available versions:

#### Working pressure

Mpa	4	16
-----	---	----

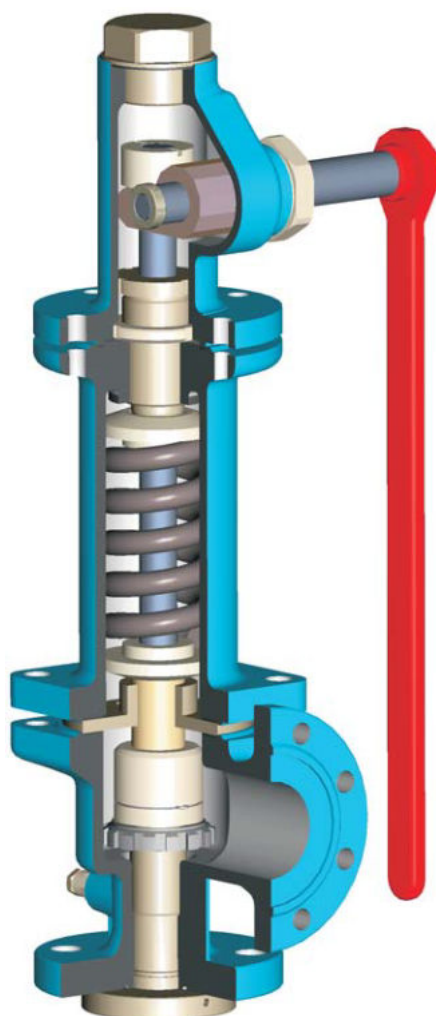
#### Nominal bore

mm	50	80
inches	2 1/16	3 1/8

Climatic version acc. to GOST: ХЛ (HL)  
Connection design: flanged.

### Basic advantages:

- possible to set actuation pressure in the range of 12 ... 16 MPa
- additional sealing of the closure member due to double seal application
- floating closure member



## PRESSURE RELIEF VALVES SWITCHING DEVICE



The switching devices are intended for fluid flow redirection among pressure relief valves without stopping the working process.

Climatic version acc. to GOST: ХЛ (HL)  
Connection design: flanged.

### Available versions:

#### Working pressure

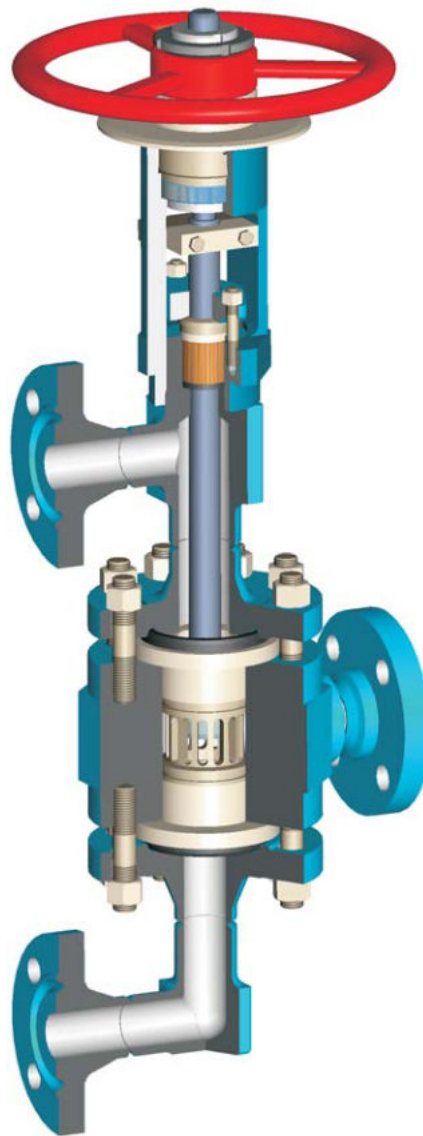
MPa	4	16
-----	---	----

#### Nominal bore

mm	50	80
inches	2 1/16	3 1/8

### Basic advantages:

- additional sealing of the closure member due to double seal application



## PRESSURE RELIEF VALVE UNIT WITH SWITCHING DEVICES

The pressure relief valve unit is a complicated system of pipeline valves that is comprised of two spring pressure relief valves and two switching devices interconnected by means of a chain transmission for simultaneous control. Designed to ensure continuous function of technological cycle on pipelines, vessels, devices, and processing plants in cases when it may be necessary, due to working conditions, to shut off (close) one of the pressure relief valves by blocking the well fluid flow; for oil-refining, oil-and-gas producing, petrochemical, gas, and power industries.

Climatic version acc. to GOST: ХЛ (HL).  
Connection design: flanged.

### Basic advantages:

- possible to set actuation pressure in the range of 12 ... 16 MPa
- additional sealing of the closure member due to double seal application
- floating closure member

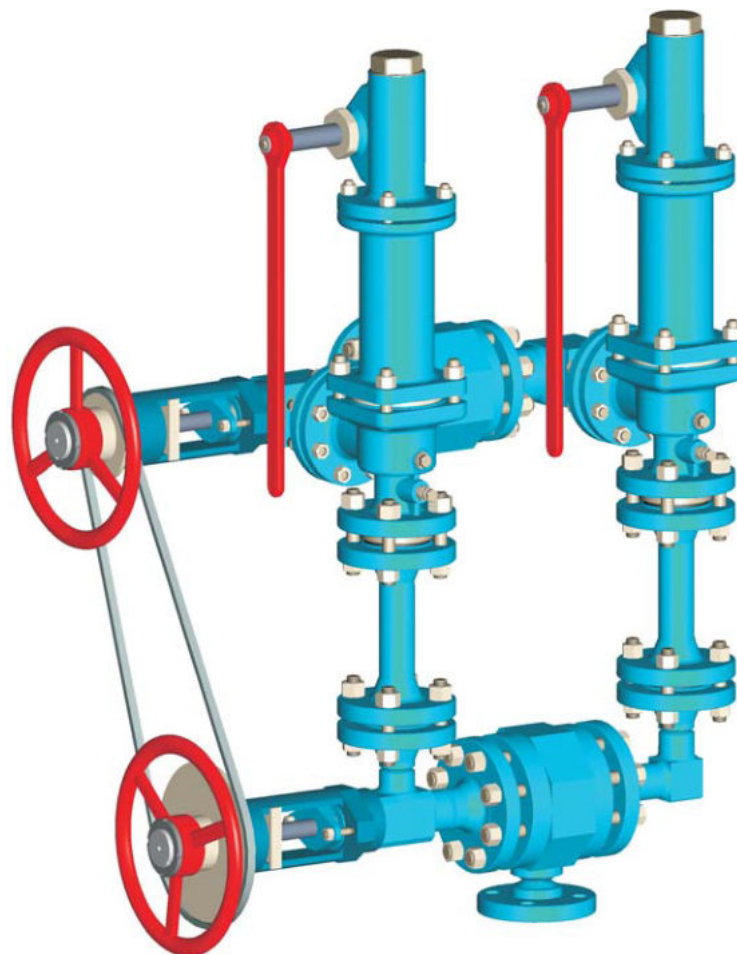
### Available versions:

#### Working pressure

MPa	4	16
psi	600	2300

#### Nominal bore

mm	50	80
inches	2 1/16	3 1/8







# COMPLETE UNITS

- MODULAR GAS WELL MANIFOLDS
- VALVING AND PIPING UNITS  
(MANIFOLDS)
- CHOKE MANIFOLDS
- WATER DISTRIBUTION UNIT FOR  
WATER INJECTION (WI) SYSTEMS
- HOOK-UP MANIFOLDS  
FOR X-MAS TREES

## MODULAR GAS WELL MANIFOLDS

The modular gas well manifolds are fully factory-assembled and ready-to-use. Depending on furnishing specified, their composition may include the following:

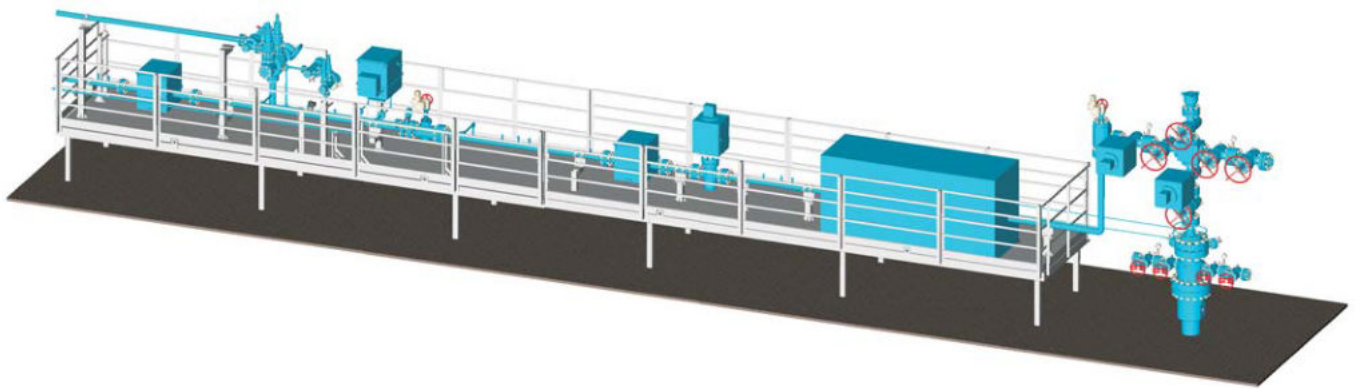
- gate valves: manually-operated, electrically-, electro hydraulically- or hydraulically-actuated
- cutoff valve
- regulating device
- flow rate meter
- inhibitor injection system
- solid particles registration sensor
- X-mas tree and tubing head control station
- instrumentation
- independent power sources:
  - ~ solar battery
  - ~ wind power generator
  - ~ thermoelectric power generator

### Basic advantages:

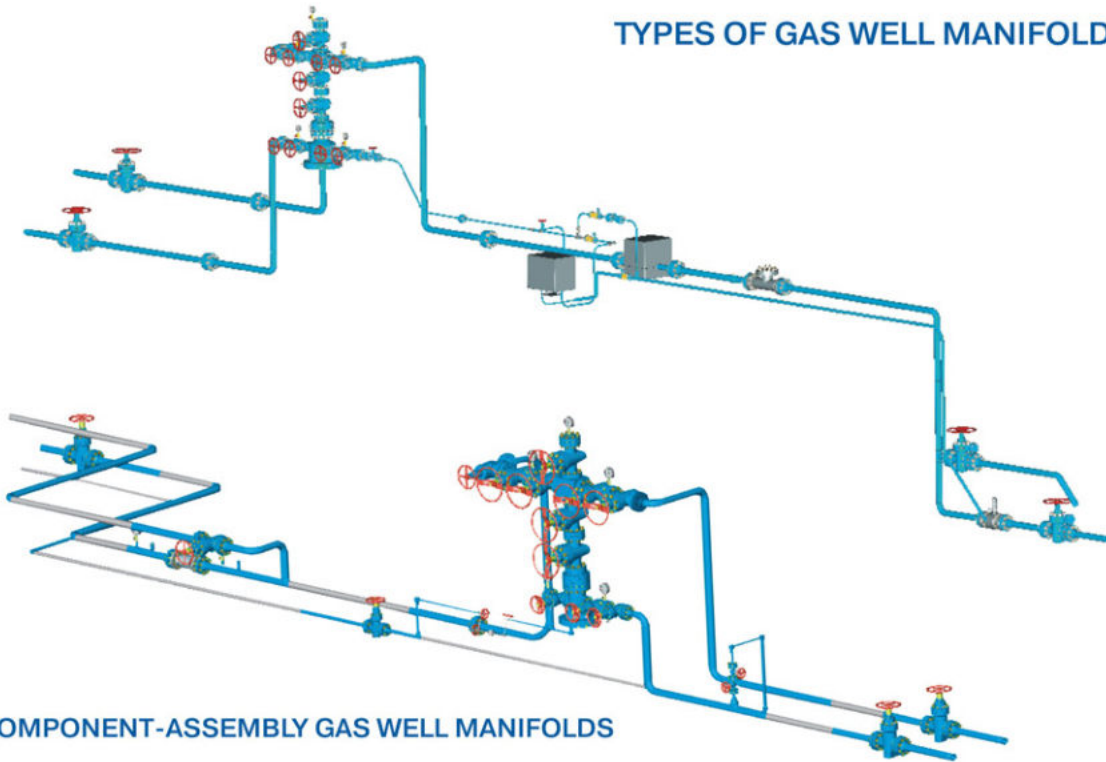
- all-inclusive supply
- installation requires minimal workse
- units can be supplied sheltered

### Technical data:

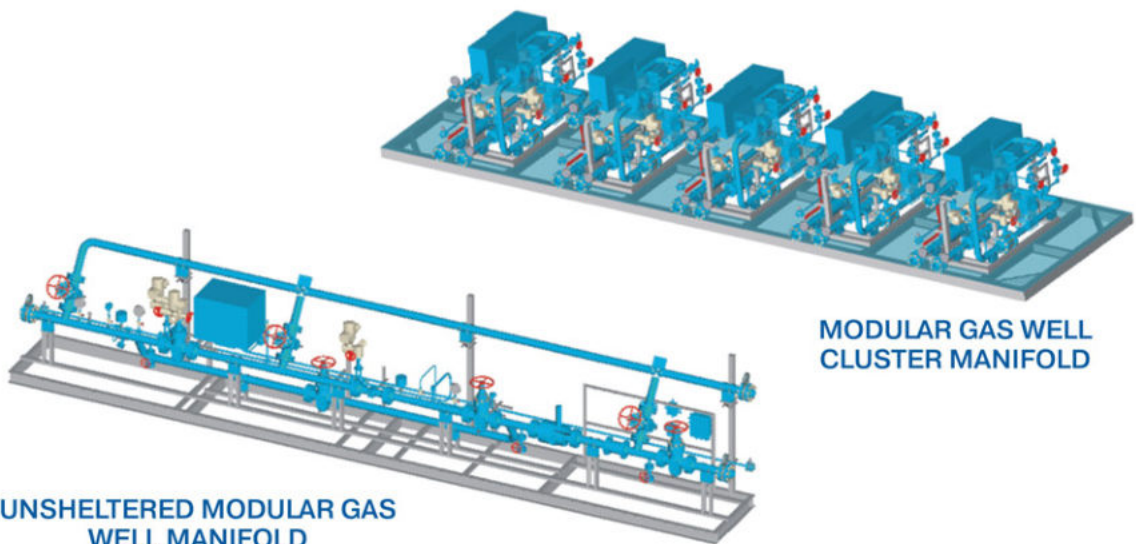
Well fluid:	gas
Rated pressure, MPa:	to 50,0
Climatic version:	HL (-60°C)
Nominal bore, DY mm	to 200



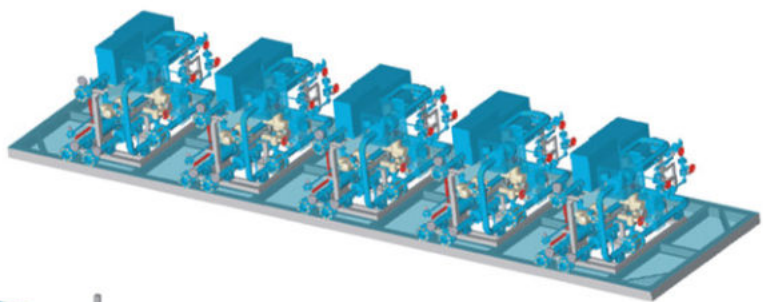
## TYPES OF GAS WELL MANIFOLDS



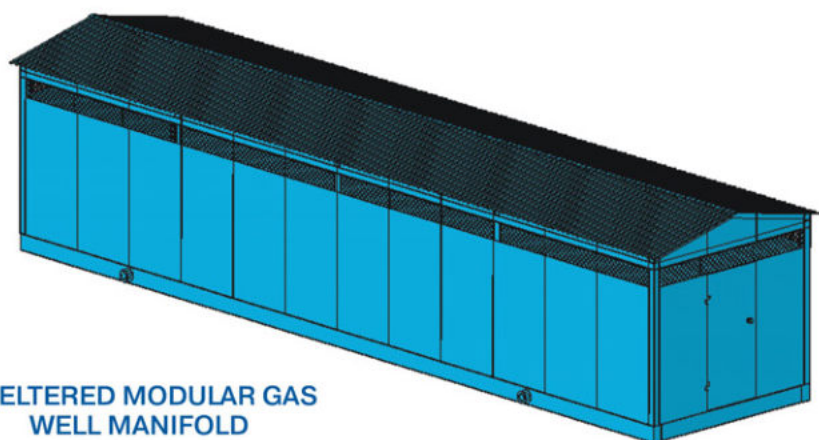
COMPONENT-ASSEMBLY GAS WELL MANIFOLDS



UNSHeltered MODULAR GAS WELL MANIFOLD



MODULAR GAS WELL CLUSTER MANIFOLD



SHELTERED MODULAR GAS WELL MANIFOLD

## VALVING AND PIPING UNITS (MANIFOLDS)

Gas well manifolds are intended for connection of well to gas tank.  
The units are intended for different working operations during well completion.

- Methanol distribution unit
- Methanol filter unit
- Separator piping unit
- Compressor station piping unit
- Oil and gas tank piping unit
- Other well cluster piping units

### Available versions:

Working pressure

MPa	1,6	2,5	4	6,3	10	16	25	50
psi	-	150	300	400	600	900	1500	-

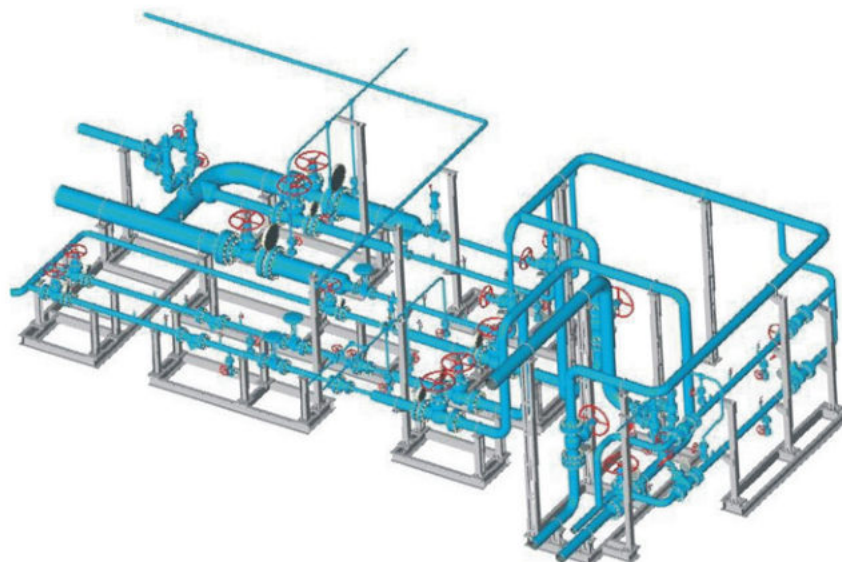
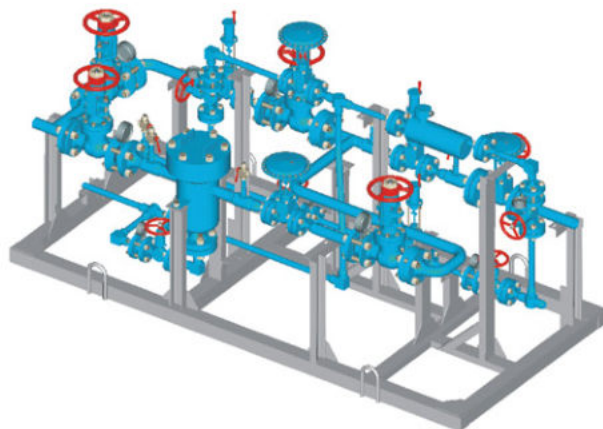
Nominal bore

mm	50	80	100	150	200	250
inches	2 1/16	3	4 1/16	5 7/8	8	10

Delivered as a complex of units, including welded piping system and other equipment: gate valves, back pressure valves, check valves, shutoff valves, fluid samplers, thermowells, flanges and fasteners.

### Basic advantages:

- acceleration of equipment kitting and installation
- amount of oilfield weld joints is considerably reduced (no more than 2% of total welding seams remain)



**GAS PRESSURE REDUCTION UNIT**



## CHOKE MANIFOLDS

Designed for flow control when circulation. Manifold versions of any design and completing are available.

### Basic advantages:

- equipped with wear resistant adjustable chokes
- equipped with wear resistant elbows (targeted tees)
- equipped with lifting jack for unit level adjustment
- product specification level acc. to API PSL1, PSL2, PSL3, PSL3G, PSL4
- performance requirements acc. to API PR1, PR2

### Available versions:

- Climatic version acc. to GOST.
- Connection design: flange.
- Versions according to GOST or API standards with API monogram

### Working pressure

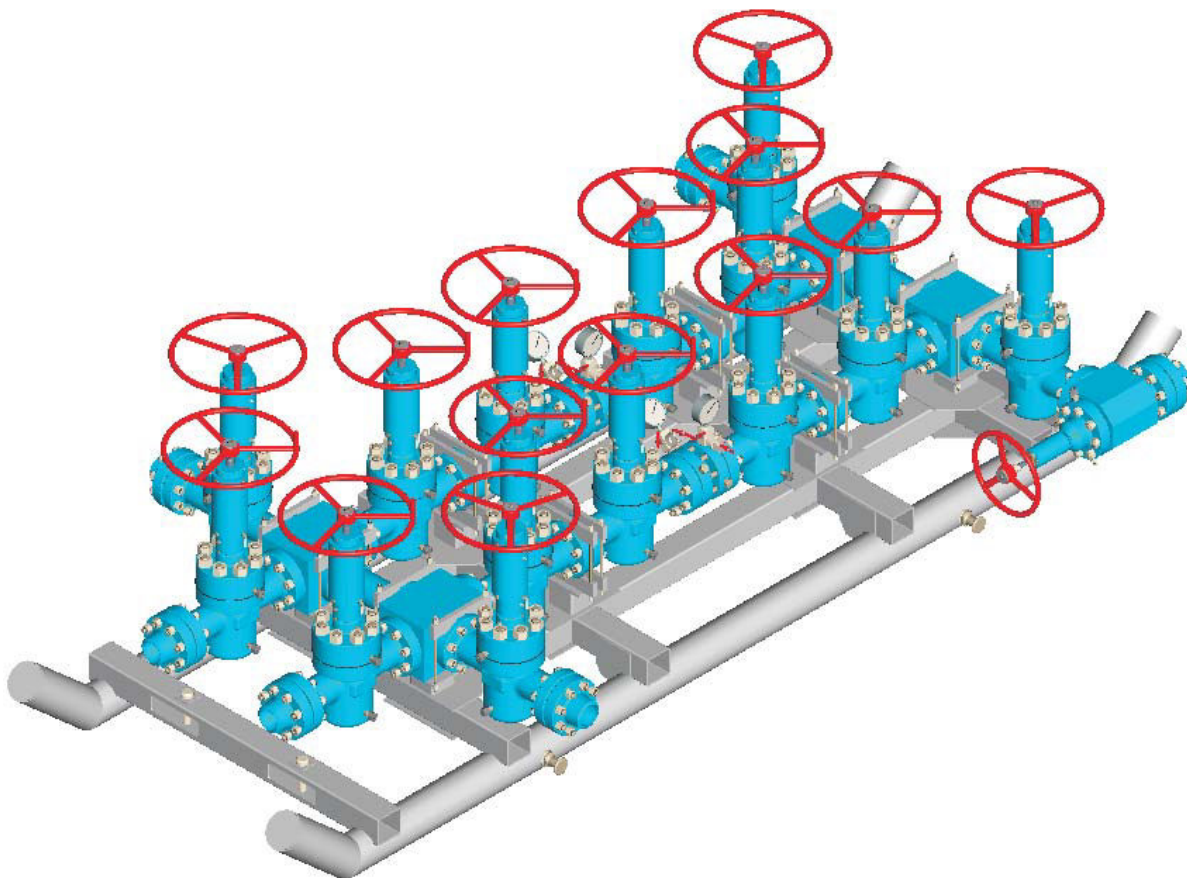
MPa	14	21	35	70
psi	2000	3000	5000	10000

### Nominal bore

mm	50	65	80	100	150	180
inches	2 1/16	2 9/16	3 1/16	3 1/8	4 1/16	7 1/16

Temperature classes: K, L, P, R, S, T, U.

Material classes: AA, BB, CC, DD-NL, EE-NL, FF-NL, HH-NL, according to API Spec 6A.





## WATER DISTRIBUTION UNIT FOR WATER INJECTION (WI) SYSTEMS

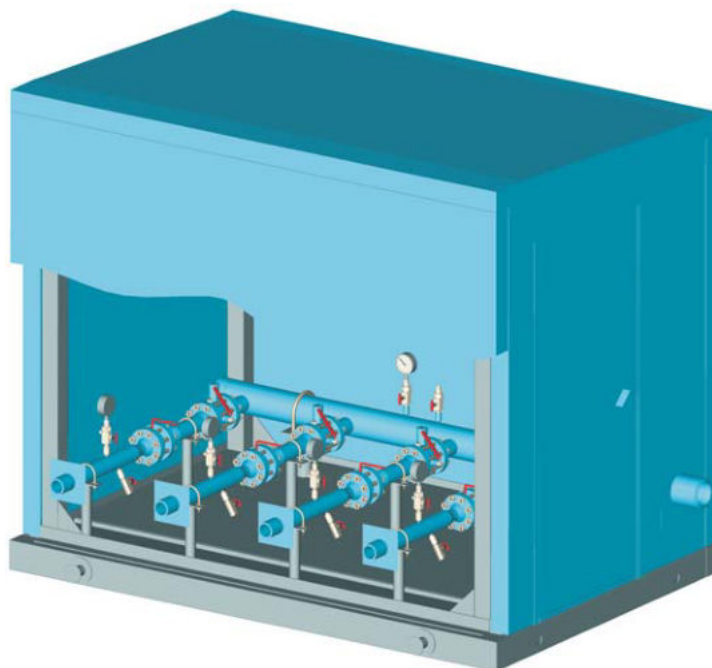
Designed to control the flow of working fluid injected into formation.

### Technical data:

Mounted at well clusters.  
 Working pressure: 14...35 MPa.  
 Nominal bore: 50...150 mm.  
 Climatic version acc. to GOST: У, ХЛ (U, HL).

### Basic advantages:

- delivered fully ready-to-use
- customized manufacturing scheme and number of injection lines



## HOOK-UP MANIFOLDS FOR X-MAS TREES

Designed for flow control. Depending on the assembling and operation schemes, the composition contains: gate valves, fittings, chokes, companion flanges, instrumental flanges, checkvalves, etc.

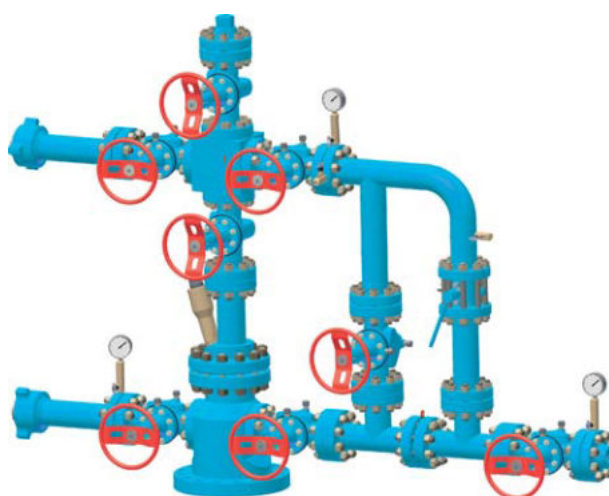
### Versions of any design and completing are available:

Working pressure

MPa	14	21	35
psi	2000	3000	5000

Nominal bore

mm	50	65	80	100	130	150	180
inches	2 1/16	2 9/16	3 1/16	3 1/8	4 1/16	5 1/8	6 7/16





# TANKS

- STEEL TANK UNITS, CYLINDRICAL, FOR GASOUS AND LIQUID HYDROCARBON FLUIDS
- UNDERGROUND HORIZONTAL DRAIN TANKS OF EP AND EPP TYPE
- HORIZONTAL TANKS FOR LIQUID OIL PRODUCTS
- RECEIVER TANKS

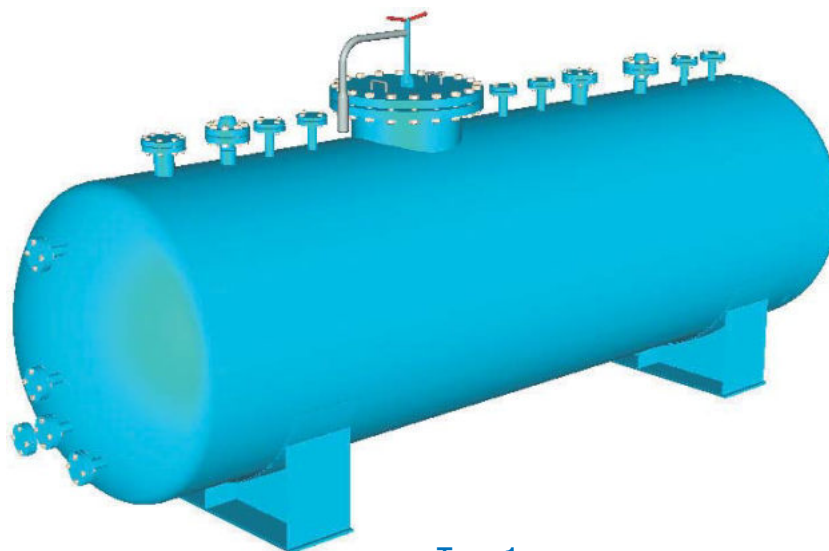
## STEEL TANK UNITS, CYLINDRICAL, FOR GASOUS AND LIQUID HYDROCARBON FLUIDS

Steel tank units, cylindrical, for gaseous and liquid hydrocarbon fluids are designed for using in processing units of chemical, gas-and-oil producing and gas-and-oil processing industries.

Volume, m <sup>3</sup>	Type 1 from 4 up to 63 Type 2 from 2 up to 63 Type 3 from 2 up to 25
Working pressure, MPa	up to 2,5
Ambient temperature, °C	from minus 60 to plus 60
Working medium temperature, °C, no more than	shall not exceed boiling temperature under working pressure and temperature at which pressure of vapor pressure does not exceed unit working pressure



Type 2, 3



Type 1

## UNDERGROUND HORIZONTAL DRAIN TANKS OF EP AND EPP TYPE



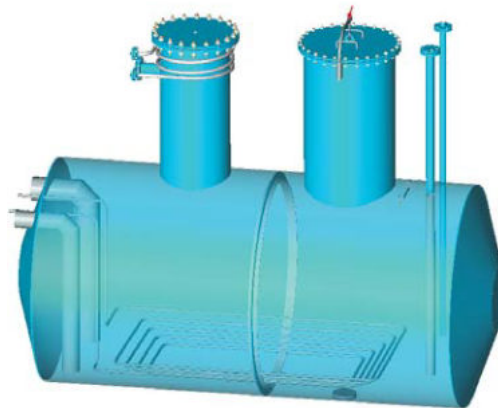
Tanks are designed for drain and storage of remains of light and black oil products, oils, condensate, including aqueous mixtures.

### Available versions:

Type EP is underground drain tank without heater.  
Type EPP is underground drain tank with heating coil.

Volume capacity, m <sup>3</sup>	3; 5; 8; 12,5; 16; 20; 25; 40; 63
Working pressure, MPa, no more than	0,07
Ambient temperature, °C	from minus 60 to plus 60
Working medium temperature, °C, no more than	80

If required, tanks can be completed with pumping unit specified by Purchaser.



## HORIZONTAL TANKS FOR LIQUID OIL PRODUCTS

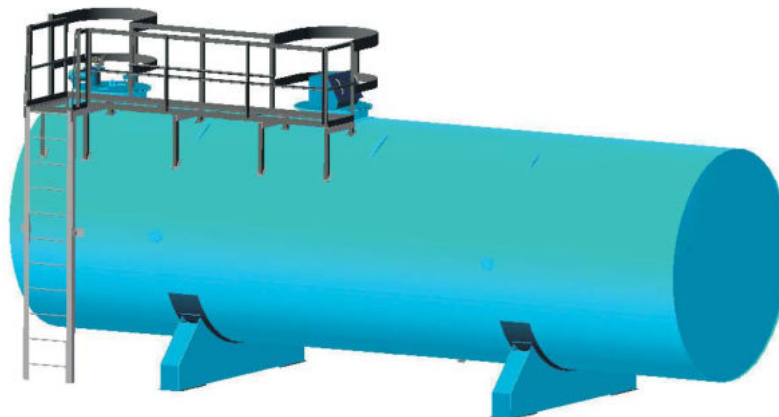


Steel horizontal tanks are designed for storage and discharge of black and white liquid products.

### Available versions:

- overland installation
- underground installation

Volume, m <sup>3</sup>	3, 5, 10, 25, 50
Working pressure, MPa	filling pressure
Ambient temperature, °C	from minus 60 to plus 60
Working medium temperature, °C, no more than	+90



## RECEIVER TANKS

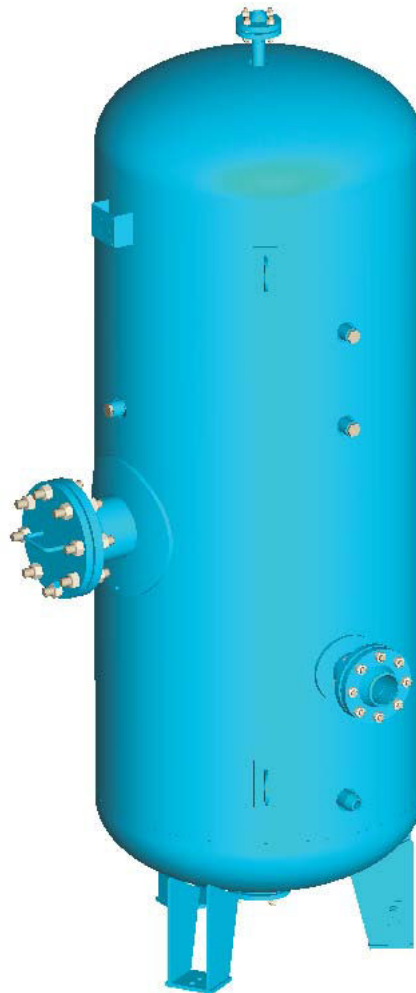
Designed for kitting of stationary compressors of general purpose. Employed to equalize pressure of compressed air, nitrogen, or other inert non-combustible gases, to dampen pulsations in air channels, and to store air, as well as to service the compressor output automatic control system. Can be operated in the areas with seismic activity up to 9 points on the Richter scale.

### Available versions:

Climatic versions available: У, УХЛ, Т (U, UHL, T), placement category is 1 according to GOST.

Volume capacity, m <sup>3</sup>	from 0,5 to 63
Working pressure, MPa, no more than	16
Ambient temperature, °C	from minus 60 to plus 40
Working medium temperature, °C, no more than	+180

Receiver tanks can be used as air collectors and, by agreement with the designer, as nitrogen, argon, and other inert non-combustible gases storage vessels.







# PIPELINE EQUIPMENT

- PIPELINE GATE VALVES
- PIPELINE WEDGE GATE VALVES
- BALL VALVES
- SHUT-OFF VALVES
- CHECK VALVES
- SCREEN FILTERS
- SWING CHECK VALVES

## PIPELINE GATE VALVES

Designed for pipeline pressure control.

### Available versions:

- according to API standards with API monogram
- according to Russian standards

### Working pressure

MPa	16	25	50
psi	900	1500	2500

### Nominal bore

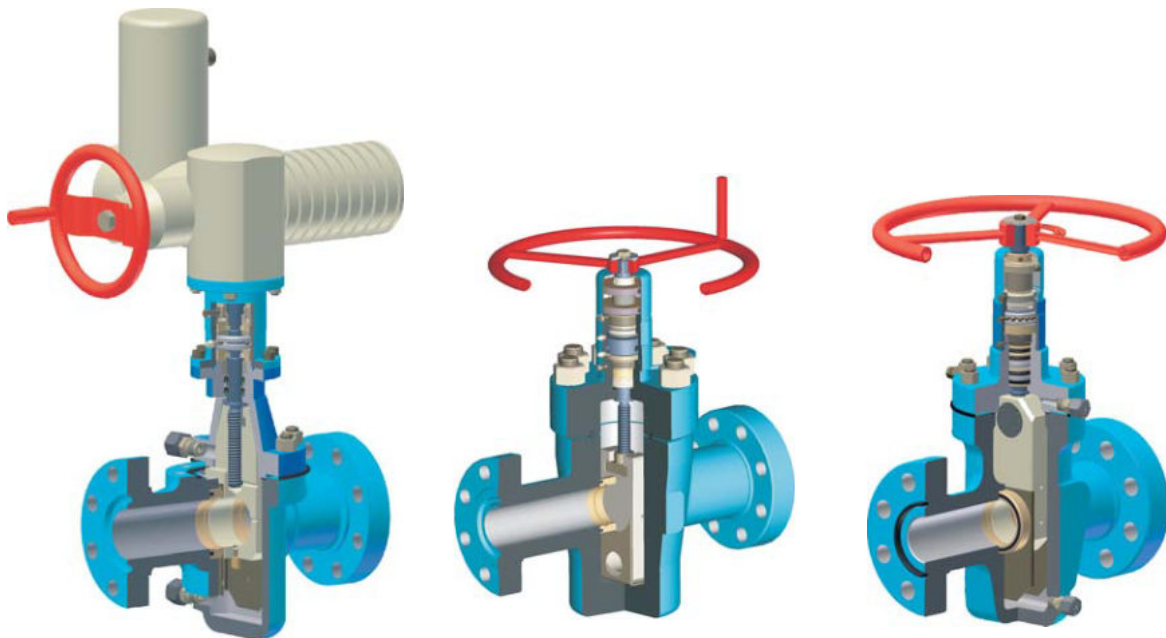
mm	50	80	100	150	180
inches	2	3	4	6	7 1/16

Climatic version acc. to GOST.

Connection design: flange.

### Basic advantages:

- closure mechanism parts of hardened stainless steel
- gate valve equipped with pressure and drain valves for grease injection (visual control of filling) or condensate bleeding
- fusible ring in stem packing for automatic back seating in case of fire
- full leakproofness of closure mechanism is ensured by constant tightening of seats
- gate position indicator "open-closed"
- full-bore adjustment mechanism
- built-in gear box is available
- equipping with electric or hydraulic actuators on request
- stem leakage elimination by adding plastic into seal is available
- backup soft seal gate-to-seat is available
- seat-body seal of metal-to-metal type is available
- equipped with hand grease gun and pressure relief device
- full or partial inside surface coating with corrosion resistant alloy



## PIPELINE WEDGE GATE VALVES



Designed for operating fluid flow shutdown in pipelines.

### Available versions:

- according to API standards with API monogram
- according to Russian standards

### Working pressure

MPa	2,5	4,0	10	16	20	25
psi	150	300	600	900	-	1500

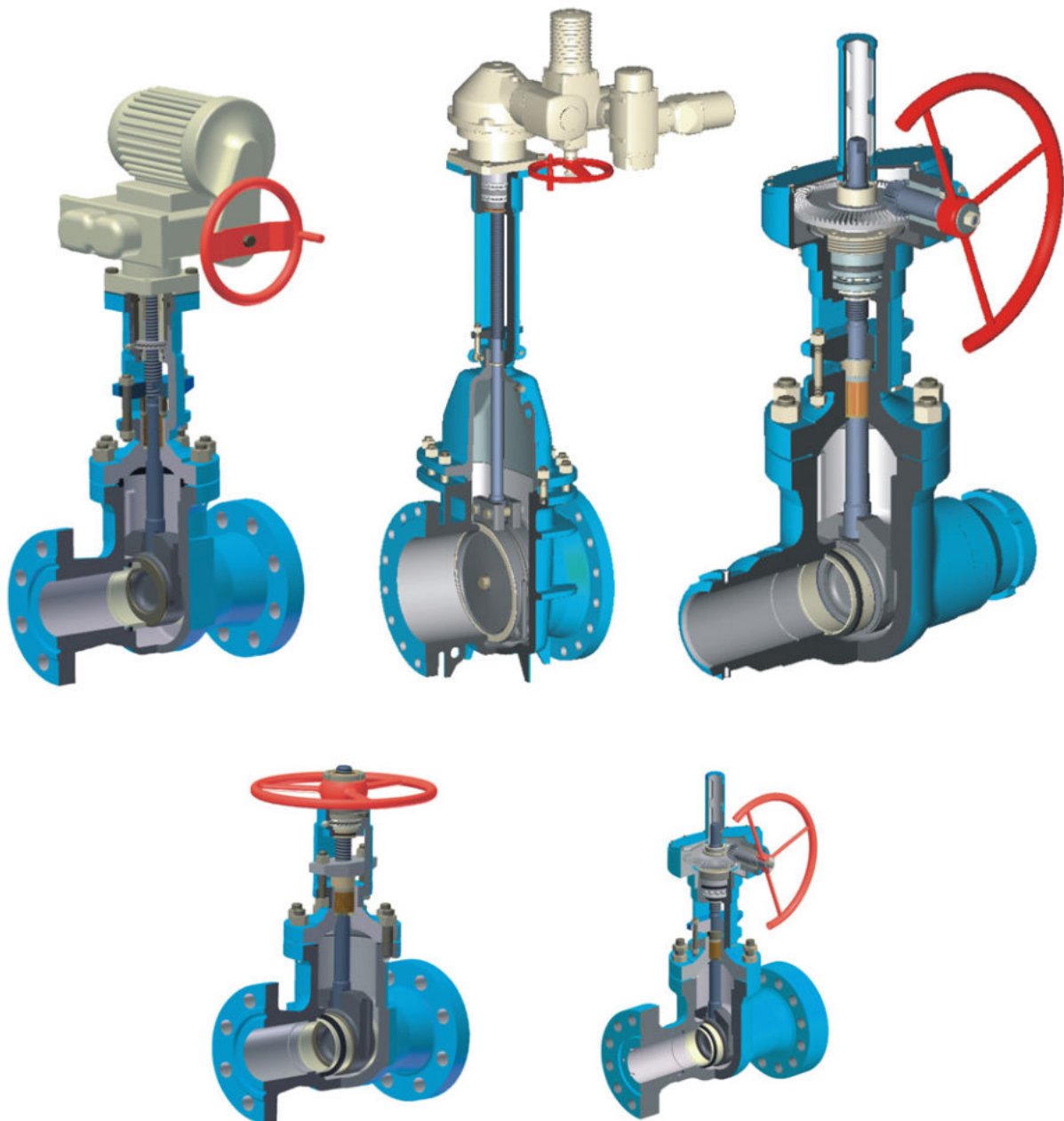
### Nominal bore

mm	50	80	100	150	200	250	300	350	400	500	600
inches	2	3	4	6	8	10	12	14	16	20	24

Connection design: flange, welded.

### Basic advantages:

- closure mechanism parts of hardened stainless steel
- wedge gate position indicator "open-closed"
- gear-box is available
- completed with electric actuators on request



## BALL VALVES

Designed for shutdown of natural gas, oil, and oil product pipelines, pipeline cleaning up.

### Basic advantages:

- reliable and simple design
- convenient for installation and operation due to lightweight and small dimensions
- completing with pneumatic, gas-hydraulic, hydraulic or electrical actuator is available
- convenient replacement of out-of-order valve, availability of visual inspection and periodic maintenance due to possibility of dismantling without cutting the valve out of pipeline
- subsurface versions of valves are available

### Available versions:

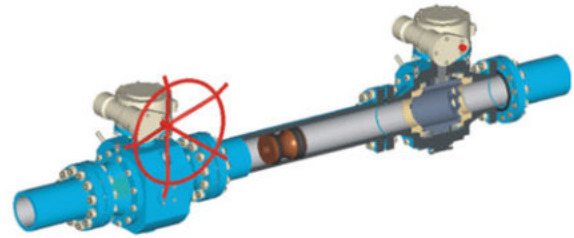
#### Working pressure

MPa	6,3	8	10	16	21
psi	400	-	600	900	1500

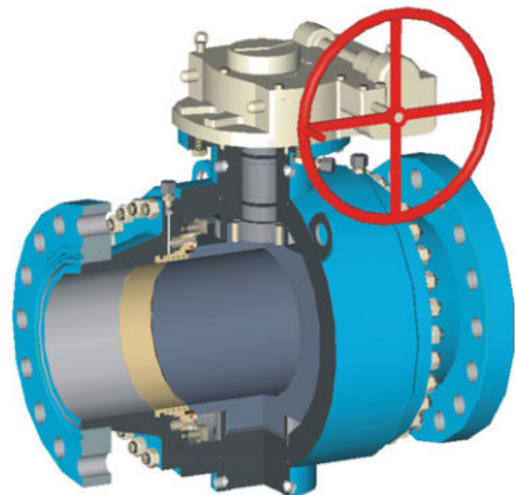
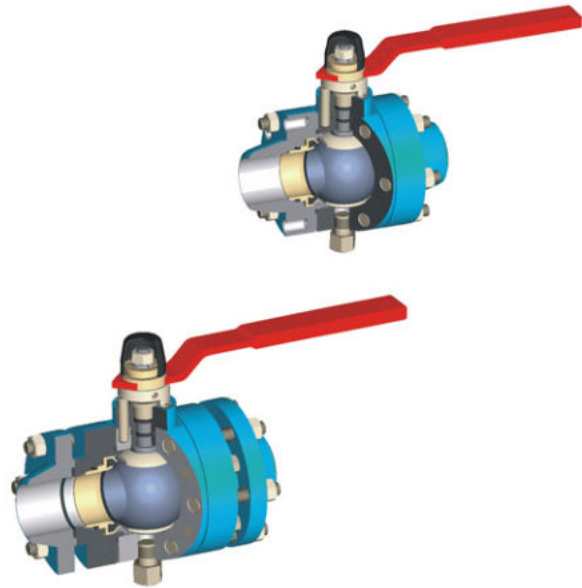
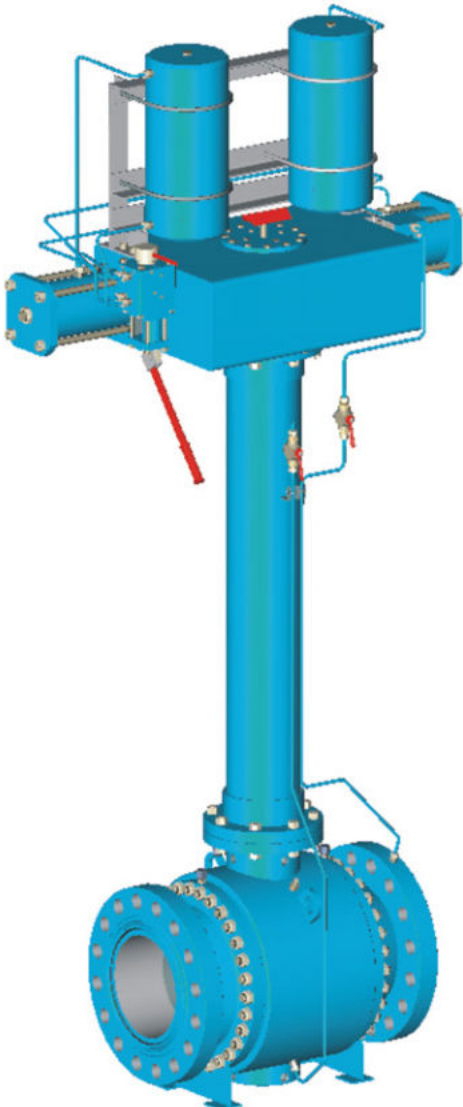
#### Nominal bore

mm	10	15	20	25	32	50	80	100	150	300
inches	3/8	1/2	3/4	1	1 1/4	2	3	4	6	12

Connection design: welding neck.



PIG LAUNCHER-RECEIVER





## SHUT-OFF VALVES

Designed for installation on pipelines as shutoff devices.

### Available versions:

#### Working pressure

MPa	10	16	20	25
psi	600	900	–	1500

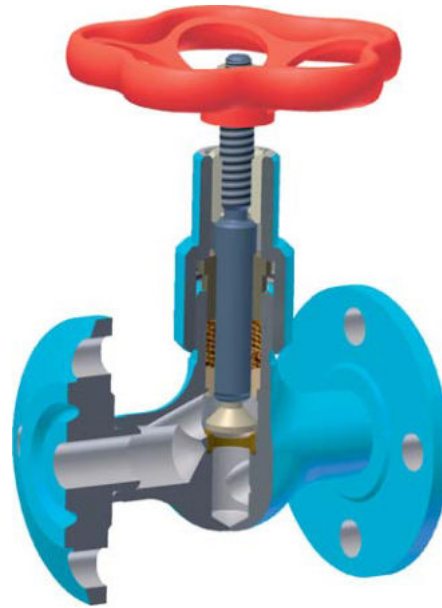
#### Nominal bore

mm	15	20	25	32
inches	1/2	3/4	1	1 1/4

Connection design: coupling, flange, welding neck.

### Basic advantages:

- any installation position
- sealing surfaces made of stainless steels
- body parts available manufactured from stainless steel



## CHECK VALVES

Designed for blocking of the fluid back flow in pipelines.

### Available versions:

#### Working pressure

MPa	10	16	20	25
psi	600	900	–	1500

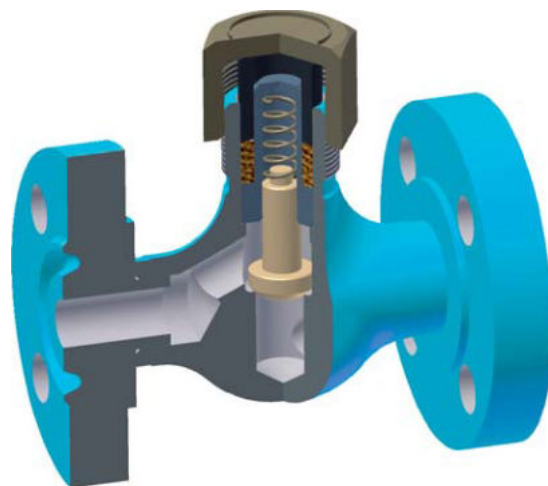
#### Nominal bore

mm	15	20	25	32
inches	1/2	3/4	1	1 1/4

Connection design: coupling, flange, welding neck  
Installation position: on horizontal pipelines with cap upward.

### Basic advantages:

- stainless steel sealing surfaces as well as resilient sealing surfaces are available
- body parts available manufactured from stainless steel





## SWING CHECK VALVES

Designed for blocking of fluid back flow in pipelines.

### Available versions:

Working pressure

MPa	0,6	1,0	1,6	2,5	4,0	6,3	10	16	20	25	35	50	70
psi	–	–	–	150	–	400	600	900	–	1500	–	–	–

Nominal bore

mm	32	40	50	80	100	150	200	250	300	400	500	600
inches	1 1/4	1 1/2	2	3	4	6	8	10	12	16	20	24

Connection design: flange, welding neck.  
Installation position: on horizontal, vertical, and inclined pipeline sections, with flow direction from down to up, according to the arrow on the body

### Basic advantage:

- sealing surfaces are made of stainless steel
- body parts available manufactured from stainless steels or alloys

