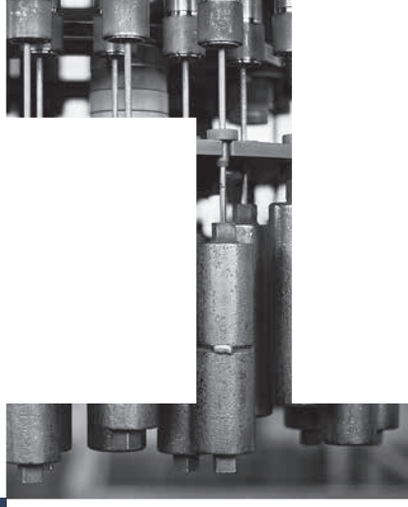
TECHNICAL CATALOG





RIMERA
IZHNEFTEMASH

Oil and gas equipment for oil lift, development and overhaul of oil and gas wells

Contents

Introduction
About company 2
About enterprise 4

Oil production equipment
Pumping units 6
Mobile pumping unit with electric drive PNShME (91-2.5-40) 9
Gear reducers 10
Subsurface sucker rod pumps 11
Sucker rods 18
Tubing couplings 19
Equipment for dual completion of several operational objects with subsurface sucker rod pumps 20
Downhole equipment 23

Equipment for well cementing
Cementing pump NC-320 30
Pump unit UNB 31
Three plunger pumps NTP 32
Pump unit UNB2-250x50K 35
Pump unit UNB2-600x70 36
Pump unit UNB-600x50 38
Pump unit UNB-125x50SO 38
Mixing units US 40
Portable cement surge and mixing unit USP-20K 42
Cementing operations measurement complex IKCS-40M 42
Unified components of pump and pump units 44

Stationary break out tongs
Automatic break out tongs, AKB-4, with pneumatic drive 47

Mud pumps and pump units
Mud pumps NB 49
Mud pumps with electric drive 52
Positive displacement NBT-375 52

Equipment for well repair and overhaul
Suspended tubing tongs KPT-2M 53
Spider ZK, ZK-56 54
Suspended sucker rod tongs KPSh-3M 55
Hydraulic bailer GZh 56
Jet pump NS-73 57
Fishing tools 59

New product lines
Control station INM-3-ChR 62
Submersible Telemetry Complex TMS-4.01 63
Modular Constructions 64

About company

The group of companies «Rimera» incorporates enterprises producing equipment and rendering services for Fuel and Energy complex.

The Group of companies «Rimera» strategy involves development of four business directions:



1 Oil production equipment

Alnas
Izhneftemash

2 Service maintenance of oil and gas production equipment and pipelines

Rimera-Service

3 Pipeline equipment

COT
MSA

4 Geophysics

Yuganskneftegazgeofizika

Developing of these business directions allowed the GC «Rimera» to form a unique integrated proposal which does not have analogues at domestic market of fuel and energy complex: beginning from «entering» into a deposit till equipping surface and underground parts of a deposit and an access to transportation pipeline.

Direction «Oil production equipment» involves leading enterprises of the branch:

- «Izhneftemash» (Izhevsk) — production of oil and gas equipment for drilling, completion and repair of oil and gas wells, as well as for oil production.

- «ALNAS» (Almetyevsk) — production of electric submersible centrifugal pumping systems for oil production.



«Izhneftemash» is comprised into the oil service company «Rimera» It is one of the leading Russian enterprises of oil engineering.
«Izhneftemash» is specializing in production of oil and gas field equipment for drilling, completion and repair of oil and gas wells, as well as for oil production. Every group of products involves a wide range of modifications, types and versions.

Having more than fifty years history and valuable unique experience of oilfield equipment production, the plant has proven itself as a reliable business partner not only in Russia, but far abroad.

Today «Izhneftemash» is an enterprise advancing steadily, providing high quality, reliability and permanent self-improvement.

Today the plant produces:

- About 80% of all break out tongs and mud pumps of low and middle power produced in Russia;
- More than 50% of sucker rod pumps and pumping units for bottomhole oil production. Sucker rod pumps are produced according to API Specification 11AX, there is the License API No.11AX-0042 providing the right to put API monogram on the equipment produced;
- 20% of pump units and 70% of mixing units for cementing of oil and gas wells during drilling and overhaul.

Production of new types of equipment intended for special operational conditions is one of priority goals of the plant development.
«Izhneftemash» applies integrated approach to the work with customers. Along with equipment production the plant supplies with spare parts, carries out overhaul of equipment (sucker rod pumps, break out tongs, gear reducers, mud pumps and cementing pumps) at main production facilities according to its technology. The plant also fulfills special orders and manufactures equipment under individual requirements of a Customer.

About enterprise





The Izhevsk Plant of Oil Engineering was founded in 1956. Since 1965 the plant has been producing oilfield equipment constantly extending and renewing its products assortment.
Long-term experience in producing of oilfield equipment, collaboration with leading industrial research and technological institutes when developing and assimilation of new equipment and application of modern technologies provide high quality of the products.
The main reserve of the enterprise is people working at the plant. Modern, dynamically developing enterprise is resulted from work of several generations of plant workers. High-skilled team of «Izhneftemash» is constantly creating a basis for successful future of the plant.

QUALITY

The quality management system acting at the plant meets the requirements of the international standards, ISO-9001 and API Q1 and is certified by the American petroleum Institute Quality Registrar. Manufactured goods meet all requirements of GOST R standards and Industrial safety rules.
Also «Izhneftemash» has a certificate of correspondence No.DSAT RU.OC015.TO0506 providing a right to fulfill maintenance and repair of transport facilities, machines and equipment.
It allows the enterprise to carry out re-equipment of transport facilities.



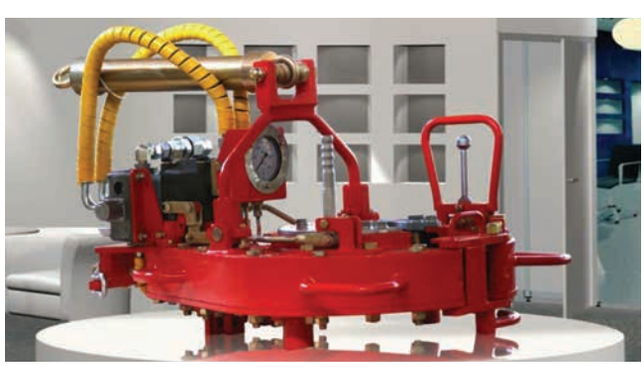
SERVICE

Integration of «Izhneftemash» into «Rimera» company in 2008 gave the plant new prospects to develop products maintenance in the largest Russian oil producing regions using the company's service network. Integration of lead enterprises of oil machine building into the Group of companies allows not only supplying with different types of oil production equipment, but also rendering full service in oil production which is developed especially for every client.
Specialized plant departments pay careful attention to the manufactured oil production equipment. They provide service maintenance of equipment, collecting of information, claims and offers concerning its operation in order to improve technical and operational features.
Catalog gives general view, denomination, functions, technical specifications and different types and versions of oilfield equipment produced at the plant.
Except this catalog, including all types of produced equipment, catalogs of assembly units and parts are available. These catalogs cover denomination, designation, configuration of assembly units and parts, their relative positions in a machine, versions of parts. Specialists, who carry out service maintenance, repair of equipment and ordering of spare parts, can receive the catalogs of assembly units by request.
By agreement with customer the plant can supply equipment of special designs.
We are ready to consider your proposals for nomenclature, versions and parameters of the products as well as for manufacture of other goods of any complexity.
Maximum satisfaction of the customer's needs is the main business principle of our company.











Oil production equipment

Beam-balanced pumping units with double-armed walking beam PNSh, PNShT



These types of pumping units are used as an individual mechanical drive for sucker rod pumps in oil production.
Pumping units PNSh 60 and PNSh 80 are developed on the base of SK-6 and SK-8 respectively. Their main units and components are interchangeable. Pumping units are equipped with double-stage gear reducers.
Pumping units PNShT (pedestal version) are equipped with double- and three-stage gear reducers and engines differed by horsepower and rotation frequency. It allows choosing design of a pumping unit ensuring the best oil production conditions with minimum power consumption.

PNSH 60-2.1-25

(SIMILAR BY TECHNICAL CHARACTERISTICS TO C-80D-119-54, C-80D-133-54, C-80D-119-64)
for mounting on a low foundation



PARAMETERS	VALUE
Maximum rod load, kN	60
Stroke length, m	2.1 / 1.8 / 1.5 / 1.2 / 0.9
Gear reducer	RP 450-28
Number of beam swings per minute	3.5-8.3
Pulley diameters, mm: - Gear reducer - Engine	 710 200; 250; 315
Brake	Drum-type
Overall dimensions, mm	8060 x 1880 x 5450
Weight, kg	8550

PNSHT 60-3-31.5

(SIMILAR BY TECHNICAL CHARACTERISTICS TO C-80D-119-54, C-80D-133-54, C-80D-119-64)
for mounting on a low foundation



PARAMETERS	VALUE	
Maximum rod load, kN	60	
Stroke length, m	3.0 / 2.5 / 2.0 / 1.6 / 1.2	
Gear reducer	RT28, three-stage, gear ratios 125, 90, 63	RP 450-28 double-stage
Pulley diameters, mm: - Gear reducer - Engine	 900 200; 250; 280	
Brake	Drum-type	
Overall dimensions, mm	7060 x 1880 x 6480	
Weight, kg	8920	

DESIGNATION	RANGE OF BEAM SWINGS PER MIN.	GEAR REDUCER	ENGINE	
			N, kW	n, rpm
PNShT 60-3-31.5-125	1.3...1.8	RT28-125	5.5	750
PNShT 60-3-31.5-125-01	1.7...2.4		7.5	1000
PNShT 60-3-31.5-125-02	2.6...3.6		11	1500
PNShT 60-3-31.5-90	1.8..2.5	RT28-90	7.5	750
PNShT 60-3-31.5-90-01	2.4...3.4		11	1000
PNShT 60-3-31.5-90-02	3.6...5.0		15	1500
PNShT 60-3-31.5-90-03	1.2...1.7		15	500
PNShT 60-3-31.5-90-04	1.2...1.7		11	500
PNShT 60-3-31.5-63	2.6..3.6	RT28-63	11	750
PNShT 60-3-31.5-63-01	3.4...4.8		15	1000
PNShT 60-3-31.5-63-02	5.1...7.2		18.5	1500
PNShT 60-3-31.5-40	4.1...5.7	RP 450-28	15	750
PNShT 60-3-31.5-40-01	5.4...7.5		18.5	1000
PNShT 60-3-31.5-40-02	8.1...11.3		22	1500

PNSH 80-3-40

(SIMILAR BY TECHNICAL CHARACTERISTICS TO C-114D-173-64, C-160D-173-74, C-228D-173-74)

for mounting on a high foundation



PARAMETERS	VALUE
Maximum rod load, kN	80
Stroke length, m	3.0 / 2.5 / 2.0 / 1.6 / 1.2
Gear reducer	RP 450, double-stage, gear ratio 37
Pulley diameters, mm: - Gear reducer - Engine	 900 200; 250; 280
Brake	Drum-type
Overall dimensions, mm	7100 x 2250 x 5385
Weight, kg	12 400

DESIGNATION	RANGE OF BEAM SWINGS PER MIN.	GEAR REDUCER	ENGINE	
			N, kW	n, rpm
PNSh 80-3-40	4.3...6.2	RP450	18.5	750
PNSh 80-3-40-01	5.8...8.1		22	1000
PNSh 80-3-40-02	8.6...12.0		30	1500
PNSh 80-3-40-03	3.0...4.2		15	500

PNSHT 80-3-40

(SIMILAR BY TECHNICAL CHARACTERISTICS TO C-114D-173-64, C-160D-173-74, C-228D-173-74)

for mounting on a low foundation



PARAMETERS	VALUE
Maximum rod load, kN	80
Stroke length, m	3.0 / 2.5 / 2.0 / 1.6 / 1.2
Gear reducer	Double- or three-stage
Pulley diameters, mm: - Gear reducer - Engine	 900 200; 250; 280
Brake	Drum-type
Overall dimensions, mm	7100 x 2300 x 6750
Weight, kg	12 600 / 13 010

DESIGNATION	RANGE OF BEAM SWINGS PER MIN.	GEAR REDUCER	ENGINE	
			N, kW	n, rpm
PNShT 80-3-40-125	1.3...1.8	RT40-125	7.5	750
PNShT 80-3-40-125-01	1.7...2.4		11	1000
PNShT 80-3-40-125-02	2.5...3.6		15	1500
PNShT 80-3-40-90	1.9...2.6	RT40-90	11	750
PNShT 80-3-40-90-01	2.5...3.5		15	1000
PNShT 80-3-40-90-02	3.7...5.2		18.5	1500
PNShT 80-3-40-90-03	1.2...1.7		15	500
PNShT 80-3-40-63	2.6...3.7	RT40-63	15	750
PNShT 80-3-40-63-01	3.5...4.9		18.5	1000
PNShT 80-3-40-63-02	5.3...7.4		22	1500
PNShT 80-3-40-37	4.3..6.0	RP 450	18.5	750
PNShT 80-3-40-37-01	5.8...8.1		22	1000
PNShT 80-3-40-37-02	8.5...12		30	1500

PNSH 80-3.5

(SIMILAR BY TECHNICAL CHARACTERISTICS TO C-114D-173-64, C-160D-173-74, C-228D-173-74)
for mounting on a high foundation

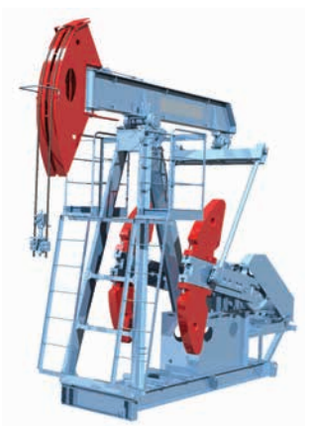


TECHNICAL CHARACTERISTICS

PARAMETERS	VALUE
Maximum rod load, kN	80
Stroke length, m	3.5 / 3.0 / 2.5 / 2.0 / 1.5
Beam swings per min	3.1; 3.9; 4.9; 6.0
Electric motor	30 kW / 750 rpm
Gear reducer	RP 450, double-stage, gear ratio 37 передаточное число 37
Pulley diameters, mm: - gear reducer - engine	 1250 200; 250; 315,380
Brake	Drum-type
Overall dimensions	7100x2250x5385
Weight, kg	12400

PNSHT 70-1.9-31.5

(SIMILAR BY TECHNICAL CHARACTERISTICS TO C-160D-143-74)



PNShT 70-1.9-31.5 Pumping Unit has an extended range of polished rod stroke length. In order to provide more safe Unit operation, it is equipped with a special safeguard 2 meters high restricting access to both pumping unit and a wellhead. Besides, gear reducer hatch cover and drain plug are protected from unauthorized opening and oil drain.

TECHNICAL CHARACTERISTICS

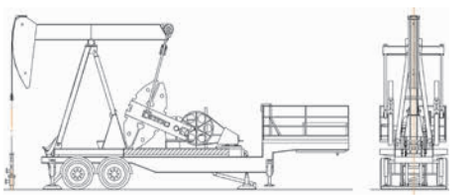
PARAMETERS	VALUE
Max load on polished rod, kN (lbf)	70 (15736)
Rated stroke length of polished rod, in. (m)	74 (1.9); 64 (1.6); 48 (1.2); 36 (0.9); 20 (0.5); 12 (0.3)
Gear reducer	RP 450-28 double-stage
- Gear reducer rated ratio	40
Pulley diameters, mm - gear reducer - engine	 900 200; 250; 280; 315
Brake	Drum-type
Transmission	Poly-V-belt-type
Overall dimensions of Unit (at horizontal position of walking beam), in. (mm):	
- width	253 $^{15}/_{16}$ (6450)
- width (without safeguard)	80 $^{3}/_{4}$ (2050)
- height	213 $^{5}/_{8}$ (5425)
Weight, kg (lbc)	22050 (10000)

Mobile pumping unit with electric drive PNShME (91-2.5-40/116-2.5-40)

Mobile Pumping Unit is intended for test short-term service of reactivated or new wells to determine their productivity and other characteristics that help to choose a size and version of a stationary pumping unit for well operation.
If required, Mobile Pumping Unit may be used for continued well operation.



Transport position



Working position

Mobile Pumping Unit produced by Izhneftemash has several advantages over foreign analogues:

- Hinge-jointed unit consisting of a walking beam, a Samson post and a frame is very easy in design, that's why Mobile Pumping Unit may be quickly transformed from transport to working position and conversely with any crane truck.
- A commercial semi-trailer and a beam-balanced pumping unit involving unified components are included in Mobile Pumping Unit. This significantly reduces cost of a unit, increases its reliability and serviceability.
- Automatic descending and lifting of base plates when transforming Mobile Pumping Unit from transport to working position and conversely with a general-purpose crane truck having load capacity 10 tons and more.

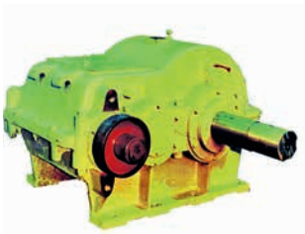
TECHNICAL CHARACTERISTICS

PARAMETERS			VALUE	
Type and versions			PNShME 91-2.5-40	PNShME 116-2.5-40
Load on wellhead rod, kN (ton), no more than			91 (9.1)	116 (11.6)
Nominal stroke of polished rod, m			2.5; 2.0; 1.8; 1.4; 1.2	
Gear reducer			Double-stage RP-450 (C2NSh-750B)	
Gear reducer rated output torque, kN·m			40	
Gear reducer rated ratio			37	
V-belt drive	V-belt type		Single 5-V belt	
	Quantity, pcs.		1	
	Pulleys diameters	Gear reducer	1250	
		Engine	200; 250; 315; 380	
Beam swings per min			3.1; 3.9; 4.9; 6.0	
Engine speed of rotation, rpm			750	
Engine rated horsepower, kW			30	
Overall dimensions (without tractor truck), mm, no more than				
- width			2500	
- length	in working position		12 500	
	in transport position		11 530	
- height	in working position		6450	
	in transport position		3960	
Unit weight, kg, no more than			13 200	
Unit weight with semi-trailer, kg, no more than			21 600	
Max. speed on highway, km/hour			60	

Gear reducers for PNSh, PNShT, OPNSh, PC Pumping units

DOUBLE-STAGE GEAR REDUCERS

RP TYPE



High-speed and low-speed stages are herringbone gear with thermally improved Novikov gearing.

PARAMETERS	RP 450-28	RP 450
Maximum gear reducer output torque, kN·m	28	40
Rated gear ratio	40	37
Lubrication volume in crankcase, dm^3	90	110
Overall dimensions, mm - length - width - height	 1450 1542 958	 1483 1930 968
Weight, kg	2105	2720

THREE-STAGE GEAR REDUCERS

RT TYPE



Equipped with herringbone gear with thermally improved Novikov gearing.

PARAMETERS	RT 28	RT 40
Maximum gear reducer output torque, kN·m	28	40
Rated gear ratio	63; 90; 125	63; 90; 125
Lubrication volume in crankcase, dm^3	110	150
Overall dimensions, mm - length - width - height	 1450 1542 958	 1520 1915 970
Weight, kg	2210	2810

Subsurface sucker rod pumps



By their design the pumps meet main requirements (except tubing thread) of API Specification 11AX. They consist of one-piece heavy wall barrel with two extensions, one plunger, traveling and standing valves and anchor.
There produced more than 1000 pump types and versions, both standard (as per API Specification 11AX) and special versions including pumps for operation in extra-heavy well conditions.

Awardee of national contest «Russian Trademark»

Awardee of contest program «100 Best Russian Products»



Certificate of Authority to use the Official API Monogram

License Number: 11AX-0042 **ORIGINAL**

The American Petroleum Institute hereby grants to

OAO "IZHNEFTEMASH"
2, Ordjonikidze Str.
Izhevsk, Udmurt Republic
Russian Federation

the right to use the Official API Monogram© on manufactured products under the conditions in the official publications of the American Petroleum Institute entitled API Spec Q1® and **API Spec 11AX** and in accordance with the provisions of the License Agreement.

In all cases where the Official API Monogram is applied, the API Monogram shall be used in conjunction with this certificate number: **11AX-0042**

The American Petroleum Institute reserves the right to revoke this authorization to use the Official API Monogram for any reason satisfactory to the Board of Directors of the American Petroleum Institute.

The scope of this license includes the following products: Pumps; Pump Parts without Tubing or Sucker Rod Threads

QMS Exclusions: No Exclusions Identified as Applicable

American Petroleum Institute

Effective Date: JUNE 23, 2014
Expiration Date: JUNE 23, 2017

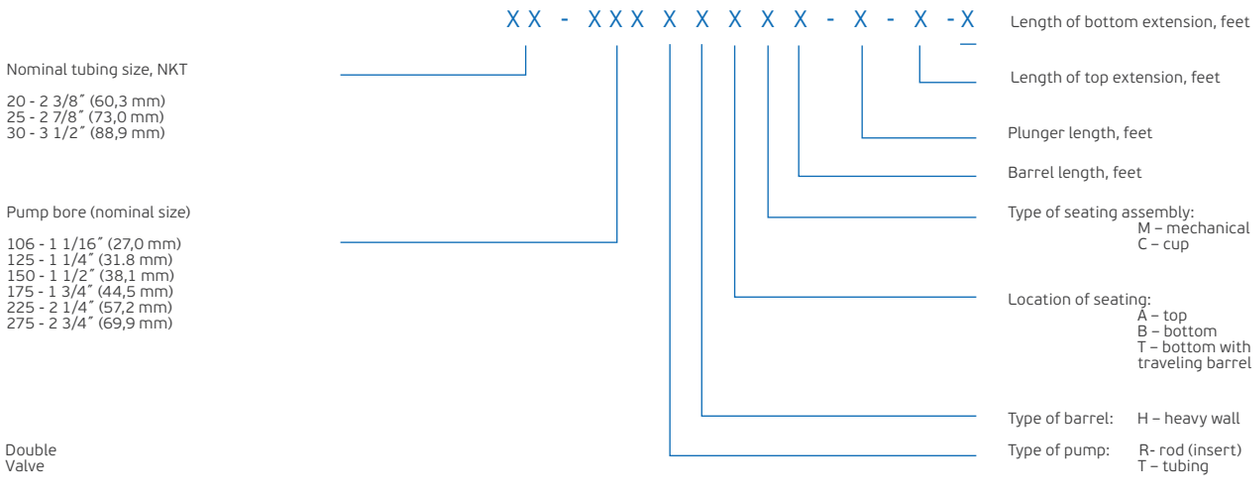
Vice President, Global Industry Services

To verify the authenticity of this license, go to www.api.org/compositelist.

TYPES OF PRODUCED PUMPS

PUMP TYPE		DESIGNATION		COMBINATION OF TUBING SIZE AND PUMP BORE
		MECHANICAL SEATING ARRANGEMENT	CUP SEATING ARRANGEMENT	
Insert pumps with standing barrel	With top anchor	RHAM	RHAC	20-106(25-106) 20-125(25-125) 25-150 25-175 30-225
	With bottom anchor	RHBM	RHBC	
Insert pumps with travelling barrel	With bottom anchor	RHTM	-	25-175
Two-stage insert pumps	With bottom anchor	RHBM	-	30-225/150
Tubing pumps		THM (THM-T, THM-C, THM-K)	THC	25-106 20-125 (25-125) 25-150 20-175 (25-175) 25-225 30-275

Full API pump designation:





All the manufactured pumps are modified for Russian downhole equipment for installing in straight NKT tubing string (with non-upset ends) as per GOST 633-80 and connecting with sucker rod string as per GOST 13877-96.
For connecting of filters or other safety devices to bottom of a pump – LP internal thread (pipeline thread) – 1:16 taper; 11.5 threads per inch. Thread diameter: 1", 1 1/4", 1 1/2", 2" (depending on pump type and diameter).

VERSIONS OF PUMP COMPONENTS:

BARREL:

- Alloy steel, nitride-plated (HN);
- Carbon steel, chrome-plated (CR);

Length of nitride-plated barrels – up to 14 feet, chrome-plated – up to 16 feet, compound barrels (for long-stroke pumps) – up to 28 feet.

PLUNGER (NIPPLE TYPE):

- Carbon steel, chromium-nickel hard alloy powder sprayed (T);
- Grooved, smooth;
- Length – up to 5 feet, compound – up to 10 feet.

VALVES:

- Standard and special designs, including double travelling and standing valves.

VALVE CAGE:

- Alloy steel;
- Stainless steel.

BALL AND SEAT:

- Stainless steel (SS);
- Cobalt alloy (ST);
- Tungsten carbide (TC1).

Plunger clearance is defined as a difference between nominal diameters of a plunger and a barrel plus sum of tolerances for plunger and barrel diameters.

PLUNGER CLEARANCE (RANGE):

- Fit-1 — 0.025 ... 0.088 mm;
- Fit-2 — 0.050 ... 0.113 mm;
- Fit-3 — 0.075 ... 0.138 mm;
- Fit-4 — 0.100 ... 0.163 mm.

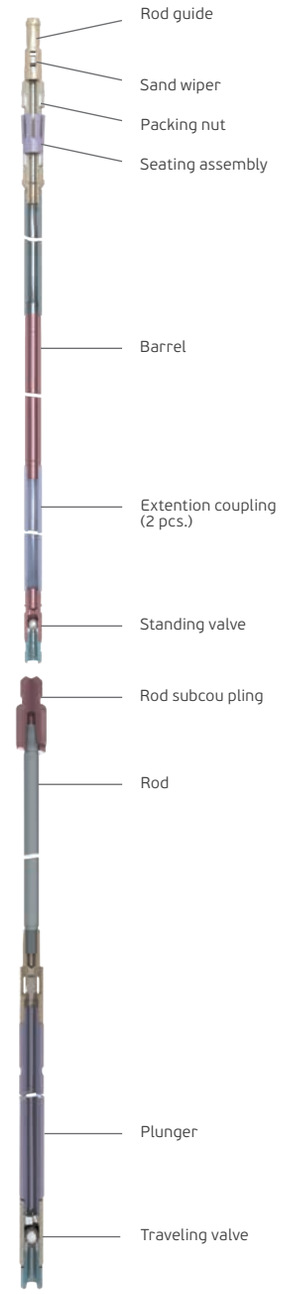
When making a request/order for pumps Customer should specify:

- Denomination, full designation of a pump including tubing diameter; diameter and type of a pump; length of a barrel, plunger and extensions (or required plunger stroke);
- Type of top seating arrangement of insert pumps: standard (according to API), in OM anchor (according to Industry standard OST) or special «taper-in-taper» type;
- Type of seating arrangement of standing valve of tubing pumps: standard (according to API), non-removalbe;
- Plunger clearance (Fit 1,2,3,...);
- Depth of pump installation (discharge);
- Material of barrel, plunger, valves, valve cages;
- Additional requirements to pump versions.

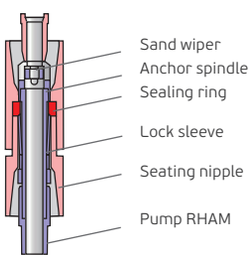
If no any requirements to material, clearance and discharge of pumps are specified, then pumps are delivered in the following type and version: barrel HN, plunger T, valves SS, alloy steel valve cages, Fit2, discharge up to 1500 m.
Seating nipples (anchors) of insert pumps, as well as filters, overflow valves, automatic tractive connections and other tools for SRP are not included in delivery set and should be ordered optionally.

Rod (Insert) pumps

Scheme of top (mechanical) anchored rod pump acc. to API



Scheme of seating arrangement



**Pump designation is given without lengths of a barrel, a plunger and extensions, which are selected for each pump type and version according to required plunger stroke.*

Rod (insert) pumps are delivered with sand wiper (sand valve). It is installed in rod guide to prevent sanding up of a pump during its idle time.
To provide better sealing of pump anchoring unit in corrosion environment, an anchor spindle of top mechanical seating arrangement as per API assembled with stainless steel packing nut is available.

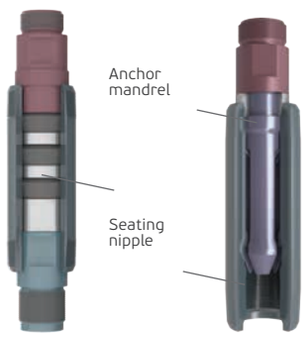
VERSIONS OF ROD PUMPS:

SEATING ARRANGEMENT	PUMP BORE, MM	TUBING SIZE, MM	PUMP DESIGNATION*	DESIGNATION OF SEATING NIPPLE (ANCHOR)
Top mechanical acc. to API	27.0	60.3	20-106 RHAM	40116-ZUS
		73.0		40116-M-ZUS
	31.8	60.3	20-125 RHAM	40116-ZUS
		73.0		40116-M-ZUS
	38.1	73.0	25-150 RHAM	40117-ZUS
	44.5		25-175 RHAM	
Top mechanical in OM support, acc. to OST 26.16.06-86	27.0	60.3	20-106 RHAM	OM-60
	31.8		20-125 RHAM	
	38.1	73.0	25-150 RHAM	OM-73
	44.5		25-175 RHAM	
Top special (taper-in-taper)	27.0	73.0	25-106 RHAM	32001-M, 32001-KM, 40116-KM-ZUS
	31.8		25-125 RHAM	
	38.1		25-150 RHAM	32002-M, 32002-KM, 40117-KM-ZUS
	44.5		25-175 RHAM	
Top cup acc. to API	27.0	60.3	20-106 RHAC	32521
		73.0	25-106 RHAC	32522
	31.8	60.3	20-125 RHAC	32521
		73.0	25-125 RHAC	32522
	38.1		25-150 RHAC	
	44.5		25-175 RHAC	
Bottom mechanical acc. to API	27.0	60.3	20-106 RHBM	32756
		73.0	25-106 RHBM	32757
	31.8	60.3	20-125 RHBM	32756
		73.0	25-125 RHBM	32757
	38.1	73.0	25-150 RHBM	
	44,5		25-175 RHBM	
	57.2	88.9	30-225 RHBM	32758
Bottom mechanical, double-stage pump	57.2/38.1	88.9	30-225/150 RHBM 12-4-2-2	32758
Bottom cup acc. to API	27.0	60.3	20-106 RHBC	32521
	31.8		20-125 RHBC	
		73.0	25-125 RHBC	32522
	38.1		25-150 RHBC	
	44.5		25-175 RHBC	
Bottom mechanical acc. to API, set in pump bottom	27.0	73.0/ 60.3	25/20-106 RHM-T	40116-MT-ZUS
	31.8		25/20-125 RHM-T	
	38.1		25/20-150 RHM-T	
	44.5		25/20-175 RHM-T	
Travelling barrel, bottom mechanical acc. to OST	44.5	73.0	25-175RHTM	OM-73

Anchor (seating nipple) of rod (insert) pumps

Top (bottom) cup seating arrangement acc. to API

Bottom mechanical seating arrangement acc. to API



SEATING ARRANGEMENT		DESIGNATION	CONNECTING THREAD, MM
Top mechanical	Acc. to API	40116-ZUS	60
		40116-M- ZUS 40117- ZUS	73
		40116-MT-ZUS	73/60
	Taper-in-taper	32001-M, 40-116-KM-ZUS	73
		32002-M, 40117-KM-ZUS	73
	Acc. to OST	OM-60	60
		OM-73	73
Top and bottom cup	Acc. to API	32521	60
		32522	73
Bottom mechanical	Acc. to API	32756	60
		32757	73
		32758	89

Rod (insert) pumps of special design:

Pump, RHM-T
(plunger is not shown)



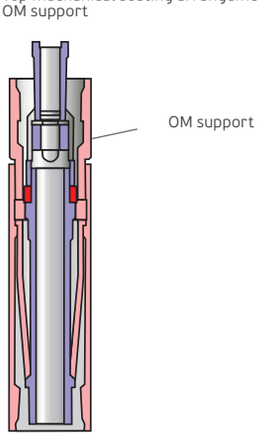
VERSIONS:

- RHAM pumps with anchor at the top end of a pump for setting in OM support according to OST 26.16.06-86;
- RHAM pumps with anchor at the top end of a pump for setting in seating nipple of «taper-in-taper» seating arrangement;
- RHM-T pumps with diameters 27, 32, 38 and 44 mm, at the bottom end of which top mechanical seating assembly acc. to API from pumps with diameter from 27 mm to 32 mm. Pumps are installed in 40116-MT-ZUS seating nipple with connecting thread of tubing 73 mm on the top and tubing 60 mm on the bottom. Such design of pumps allows to install RHAM pumps with diameters 27 mm and 32 mm and RHM-T pumps of all diameters (25/20-106 RHM-T, 25/20-125 RHM-T, 25/20-150 RHM-T, 25/20-175 RHM-T) in a well with 40116-MT-ZUS seating nipple;
- Double-stage pumps;
- On customer's request standard pumps can be equipped with doubled standing and travelling valves.

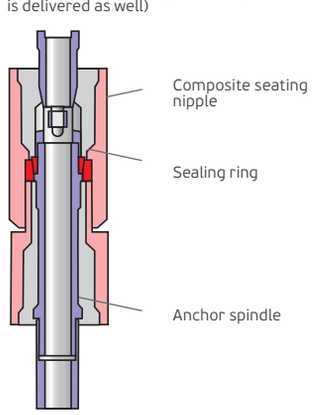
EXAMPLE OF INSERT PUMP DESIGNATION

Diameter 32 mm with bottom mechanical seating arrangement acc. to API, length of barrel – 12 feet, length of plunger – 4 feet, extensions – 2 feet each, for installation in tubing 73 mm:
25-125 RHBM 12-4-2-2

Top mechanical seating arrangement in OM support

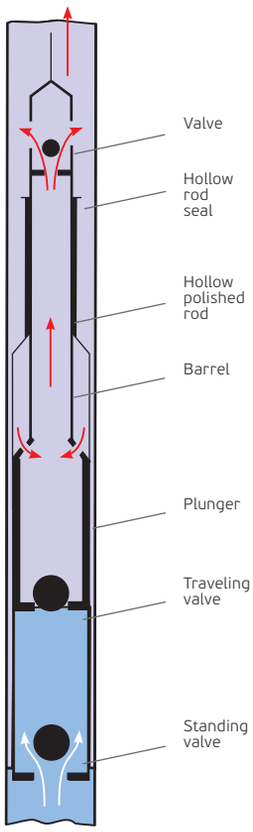


Top mechanical seating arrangement "taper-in-taper" (integral seating nipple is delivered as well)



Double-stage (differential) pump 30-225/150 RHBM 12-4-2-2

Double-stage pump operation, schematically



CONSISTS OF:

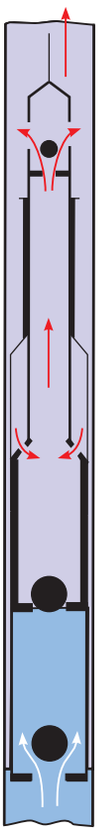
- Barrel with standing valve. There is a hollow rod guide on the top of barrel for sealing upper chamber (high-pressure stage);
- Plunger with travelling valve and hollow polished rod with additional valve on the top of a rod. Rod is connected with plunger with the help of adapter with side holes connecting internal hollow of a plunger and a rod with upper chamber which is the space between rod and barrel.

Inner hollows of a plunger with travelling valve, rod with valve and upper chamber create high pressure stage. Under-plunger space (lower chamber) is a low pressure stage.

PUMP OPERATION:

- When plunger movers upwards, both plunger valves are closed; standing valve is opened, and well fluid flows in a lower chamber (low pressure stage);
- When plunger moves downwards, upper plunger valve remains closed and standing valve is closing. Fluid flows in upper chamber through open lower plunger valve;
- With following upstroke, lower plunger valve is closed by fluid pressure, which is achieved by diminishing upper chamber space;
- When pressure in upper chamber equals to fluid column pressure in tubing string, upper plunger valve opens and fluid flows in tubing string. At the same time fluid flows through opened standing valve into lower chamber.

Thus, lower chamber is filled and released without fluid column pressure in tubing. It creates favorable conditions for pumping gassed well fluid.

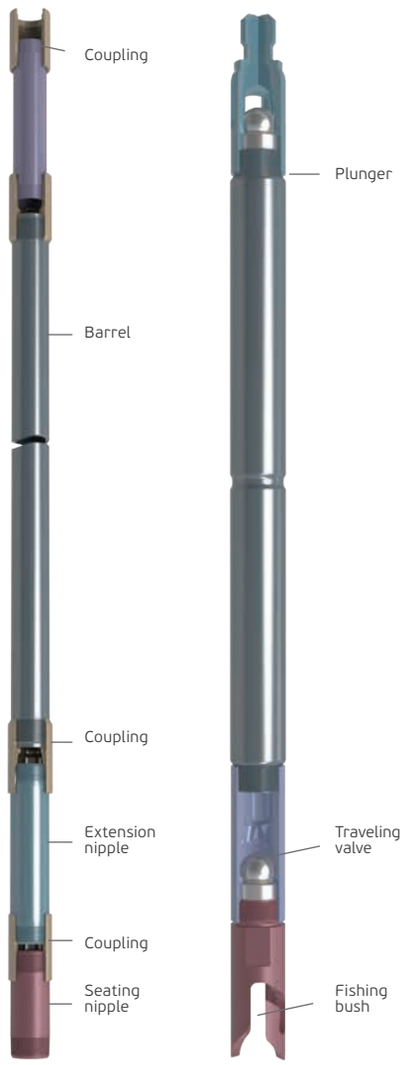


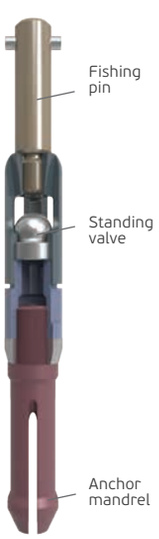
APPROXIMATE STROKE LENGTH OF ROD PUMP PLUNGER DEPENDING ON COMBINATION OF BARREL-PLUNGER-EXTENSION LENGTHS

COMBINATION OF BARREL-PLUNGER-EXTENSION LENGTHS	MAXIMUM LENGTH OF PLUNGER STROKE (FROM END TO END), M
7-4-1.5-1.5	1.4
9-4-1.5-1.5	2.0
10-4-1.5-1.5	2.3
12-4-1.5-1.5	2.9
12-4-2-2	3.2
14-4-1.5-1.5	3.5
14-4-2-2	3.8
14-5-1.5-1.5	3.2
22-4-2-2	6.2

Tubing pumps

THM tubing pump with mechanical seating arrangement acc. to API, schematically





TYPES AND VERSIONS OF TUBING PUMPS

SEATING ARRANGEMENT OF STANDING VALVE	PUMP BORE, MM	TUBING SIZE, MM	PUMP DESIGNATION
Acc. to API Spec. 11AX with bayonet fishing tool (TNM) or with cup seating arrangement (TNS)	31.8	60.3	20-125 TNM
		73.0	25-125 TNM
	44.5	60.3	20-175 TNM (TNC)
		73.0	25-175 TNM (TNC)
	57.2	73.0	25-225 TNM (TNC)
	69.9	88.9	30-275 TNM
Special (taper)	31.8	73.0	25-125 TNM-К
	44.5	73.0	25-175 TNM-К
	57.2	73.0	25-225 TNM-К
Non-removable valve (additional drain valve of SKOK type is used)	31.8	73.0	25-125 TNM-T
	44.5	73.0	25-175 TNM-T
	57.2	73.0	25-225 TNM-T
	69.9	88.9	30-275 TNM-T
Non-removable valve, long plunger (10 feet), barrel with side hole	31.8	73.0	25-125 TNM-T 11 -10-2-2
	44.5	73.0	25-175 TNM-T 11 -10-2-2
	57.2	73.0	25-225 TNM-T 11 -10-2-2
	69.9	88.9	30-275 TNM-T 11-10-2-2
Non-removable single (S) or doubled (SS) valve with built-in drain beating device	31.8	73.0	25-125 TNM-C(CC)
	38.1	73.0	25-150 TNM-C(CC)
	44.5	73.0	25-175 TNM-C(CC)
	57.2	73.0	25-225 TNM-C(CC)
	69.9	88.9	30-275 TNM-C

Designation of pumps (except TNM-T 11-10-2-2) is given without lengths of barrel, plunger and extensions which shall be selected for each size of pump, depending on required plunger stroke.

PLUNGER STROKE OF STANDART TUBING PIMPS (TNM) DEPENDING ON COMBINATION OF BARREL-PLUNGER-EXTENSION LENGTHS

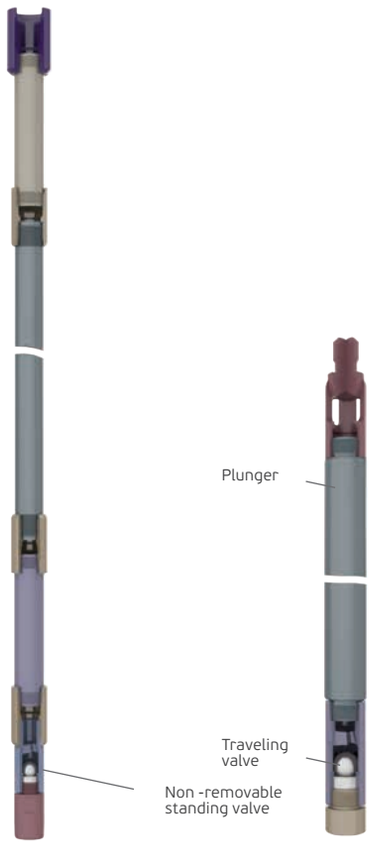
COMBINATION OF BARREL-PLUNGER-EXTENSION LENGTHS.	MAX LENGTH OF PLUNGER STROKE (FROM END TO END), M
7-4-2-2	1.5
9-4-2-2	2.1
11-4-2-2	2.7
11-4-2-3	3.0
14-4-2-2	3.6
11-10-2-2	3.0
22-4-2-2	6.0
14-5-1.5-1.5	3.2
22-4-2-2	6.2

EXAMPLE OF TUBING PUMP DESIGNATION

Diameter 44.5 mm, standard seating arrangement of standing valve (acc. to API), length of barrel – 11 feet, length of plunger – 4 feet, length of extensions – 2 feet each, for installation in tubing with diameter 73 mm: 25-175 TNM 11-4-2-2.

Tubing pumps of special design

Pump with non-removable standing valve of THN-T type



Pumps THM-T with diameters 32, 44, 57 and 70 mm with non-removable standing valve.
Standing valve is set in the bottom of pump instead of seating nipple; fishing tool is not available. Diameter of standing valve (seat and ball) for pumps with diameters 32,44,57 mm is oversized, providing more stable pump operation (free of valve sticking, occurred because of paraffin deposits). Pumps are used together with drain valve (SKOK type or other) placed above pump to drain fluid from tubing when pump is pulled out.

THE FOLLOWING VERSIONS ARE DEVELOPED ON THE BASE OF TNM-T PUMPS:

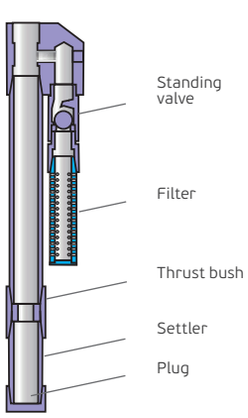
- pumps with non-removable standing valve, barrel with side drain hole and long plunger (10 feet) (TNM – T 11-10-2-2). Plunger is fitted so that side hole of barrel is constantly covered by plunger; plunger stroke is 3 m. When plunger is in its lower position (at its stop) and when it is pulled out from barrel, drain hole is opened to ensure drain of fluid from tubing both when plunger is pulled out on rods and when rods and plunger components are parted or unscrewed; direct flushing at well completion is provided as well.
- pumps with side standing valve (BVK).

The plant produces BVK valves for TNM-T tubing pumps with diameters of 32 and 44 mm. BVK valve is delivered optionally and set under barrel instead of bottom part of a pump.
In pumps equipped with BVK valves dead space is almost zero in a barrel, when a plunger is in its lower position. This allows to operate wells with insignificant pump working submergence without risk of failure of fluid feed due to pump blocking by gas.

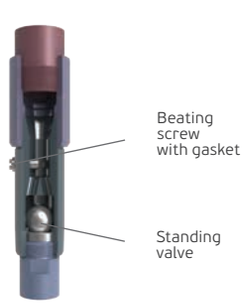
- pumps with non-removable single (TNM-C) or doubled (TNM-CC) standing valve and built-in drain beating device.

Diameter of standing valve (seat and ball) in pumps of diameters 32, 44, 57 mm is oversized. Fishing tool is not available.
Fluid is drained from tubing through a hole in beating screw which is broken with beating tool thrown into well.

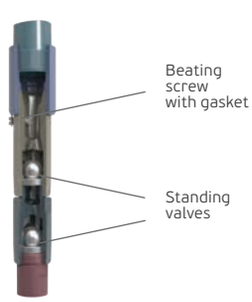
Side standing valve, model BVK



Pump THM-S



Pump THM-SS



Sucker rods



Sucker rods are intended for transmission of movement from pumping unit to sucker rod pump plunger. They are connected to form a string of sucker rods. Sucker rods are produced from précised hot rolled products made of steel containing no less than 2% of alloy elements. By mechanical properties and corrosion resistance sucker rods correspond to “D” and “D spec.” grades. Sucker rods are equipped with connecting coupling screwed on one end of a rod, packed by 40 pcs. in transportation packages unless otherwise specified in an order. Thread of sucker rods and couplings is protected with safety cups and plugs. On agreement with customer sucker rods may be equipped with armamide centralizer.

NOMENCLATURE AND CHARACTERISTICS OF SUCKER RODS

NOMINAL DIAMETER OF SUCKER RODS	LENGTH, MM		ULTIMATE TENSILE STRENGTH, N/MM²	YIELD POINT, N/MM²
	STANDARD	PONY		
ShN 19	7620, 8000, 9140	from 610 to 3660	793-965	586 min
ShN 22				
ShN 25				
ShN 19.SP			820-990	630 min
ShN 22.SP				
ShN 25.SP				

SUCKER ROD COUPLINGS

Two types of sucker rod coupling MSh (without wrench flats) are produced:

- connecting coupling, intended for connection of sucker rods with the same notional dimensions;
- bushings, intended for connection of sucker rods with different notional dimensions.

NOMENCLATURE AND CHARACTERISTICS OF COUPLINGS

NOMINAL DIMENSION OF COUPLING	DIAMETER, MM	LENGTH, MM	WEIGHT, KG
MSh 19	41.3	102	0.7
MSh 22	46.0	102	0.85
MSh 25	55.6	102	1.1
MSh 16x19	41.3	102	0.72
MSh 19x22	46	102	0.86
MSh 22x25	55.6	115	1.3
MSh 19x25	55.6	115	1.4

VERSIONS OF COUPLINGS

CLASS	MATERIAL	HEAT TREATMENT OR COATING	HARDNESS, HRC
T	steel 40, steel 45	normalization	-
S	steel 40, steel 45, steel 20ChN2N, steel 20N2M	High frequency current	43-51
SM	steel 20ChN2N, steel 20N2M	Chrome-nickel powder spraying with melting	55 min

Tubing couplings



Tubing couplings are intended for tubing adjoining as well as for connection of subsurface equipment used during oil and gas well operation which has connectors ends with tubing thread.

Tubing couplings made by «Izhneftemash» are manufactured on modern lathes and band saws with numeric control providing high productivity and accuracy of part machining.

TUBING COUPLINGS MADE BY IZHNEFTEMASH:

- With smooth (non-upset) ends:
  - Couplings for tubing with nominal diameter 60 mm, group strength: D, E,K;
  - Couplings for tubing with nominal diameter 73 mm, group strength: D, E,K, L;
  - Couplings for tubing with nominal diameter 89 mm, group strength: D, E,K, L;
- With upset ends:
  - Couplings for tubing with nominal diameter 60 mm, group strength: K;
  - Couplings for tubing with nominal diameter 73 mm, group strength: K,E.

Equipment for dual completion of several operational objects with subsurface sucker rod pumps (ORE)

The equipment is intended for simultaneous operation of two or more productive formations in one well. It is used for oil (gas) production.

MAIN CAPABILITIES OF THE EQUIPMENT:

- Pumps may be changed without packer failure and retrieval of tubing string;
- Produced oil or gas may be accounted separately;
- Field developments may be held;
- Gas may be removed from the suction of a lower pump;
- Equipment may be repaired in field conditions;
- Range of theoretical capacity (N=6, L=2.5):

- lower pump: 12.4...24.5 m^3 per day
- upper pump: 8.4...42.8 m^3 per day

- Theoretical capacities ratio (Q_{upper}/Q_{lower}): 0.34...3.46

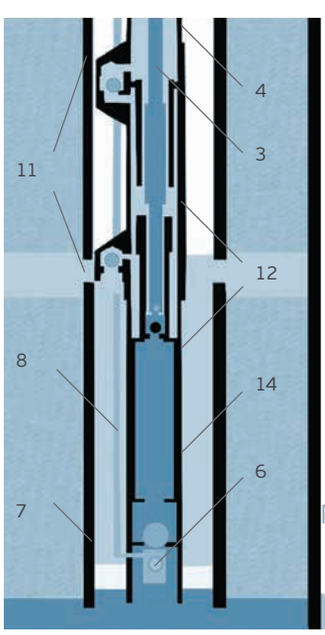
TECHNICAL CHARACTERISTICS

PARAMETERS OF EQUIPMENT	VALUE
Casing diameter (nominal), mm	146, 158
Tubing diameter (nominal), mm	73; 89
Tubing length, m, no more than	1500
Type of sucker rod string	Tubing sucker rod
Length of pumping unit stroke, m, no more than	2.5

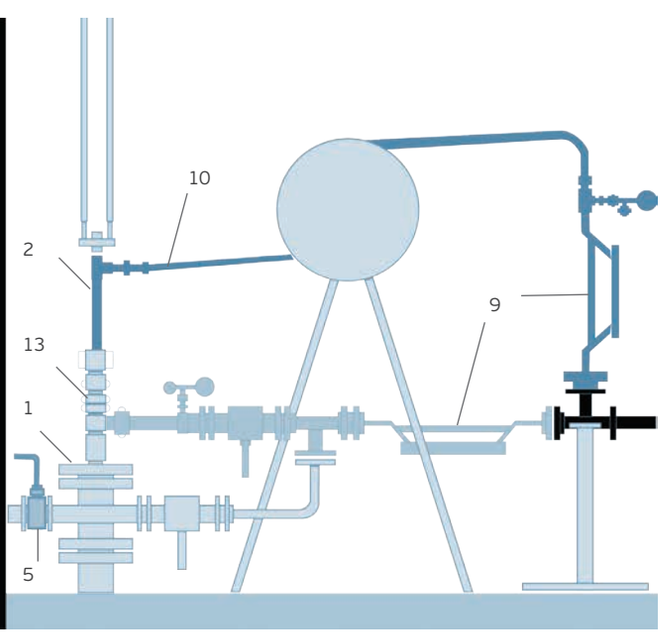
EQUIPMENT CONFIGURATION:

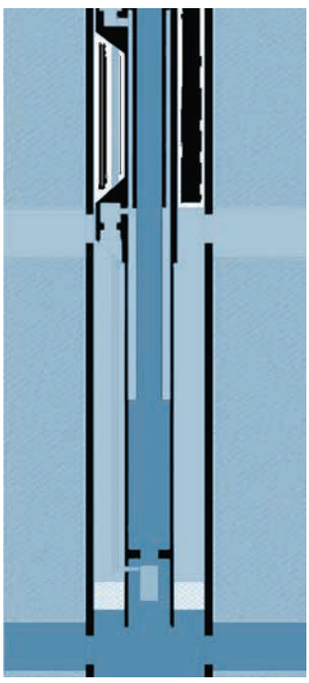
1. Modernized Christmas tree
2. Hollow polished rod
3. Hollow rod string
4. Tubing string
5. Reagent feeding equipment or heating cable line
6. Subsurface pressure gag
7. Packer
8. Logging cable
9. Flowgages
10. High-pressure hose
11. Upper sucker rod pump with by-pass valve
12. Lower sucker rod pump
13. Modernized casing-head stuffing box
14. Plunger - packer

Schematic diagram of downhole pumping equipment



Schematic diagram of above-ground equipment





THEORETICAL CAPACITY OF SUBSURFACE SUCKER ROD PUMPS DURING WELL DUAL COMPLETION, M^3 PER DAY

(Counting data: plunger's stroke – 2.5 m; number of double strokes – 6)

UPPER PUMP / LOWER PUMP	44	57
27	20.48 12.37	42.75 12.37
32	15.17 17.37	37.75 17.37
38	8.34 24.50	30.62 24.50

THEORETICAL CAPACITY RATIO OF SUBSURFACE SUCKER ROD PUMPS DURING WELL DUAL, M^3 PER DAY:

(Counting data: plunger's stroke – 2.5 m; number of double strokes – 6)

UPPER PUMP / LOWER PUMP	44	57
27	1.66	3.46
32	0.87	2.17
38	0.34	1.25

Tubing sucker rods



SUCKER RODS ARE INTENDED FOR:

- Transmission of reciprocating motion being a part of rod string from pumping unit to subsurface sucker rod pump;
- Supply of pumped out fluid from a pump to well head through the bore;
- Injection of different chemical reagents in tubing string to remove deposits of asphalt, resins and paraffin and to increase oil recovery of oil formation.

TUBING SUCKER ROD WITH A COUPLING (BTP-28.29.00.000, BTP-28.30.00.000)				
DESIGNATION	HEXTERNAL DIAMETER OF COUPLING, MM	BORE DIAMETER, MM	AREA OF ROD BODY, MM^2	WEIGHT OF 1 LM, KG
ShNT 32x4.5M	48.3	23.0	388.6	3.1
ShNT 36x5.5	52.2	25.0	526.7	4.1

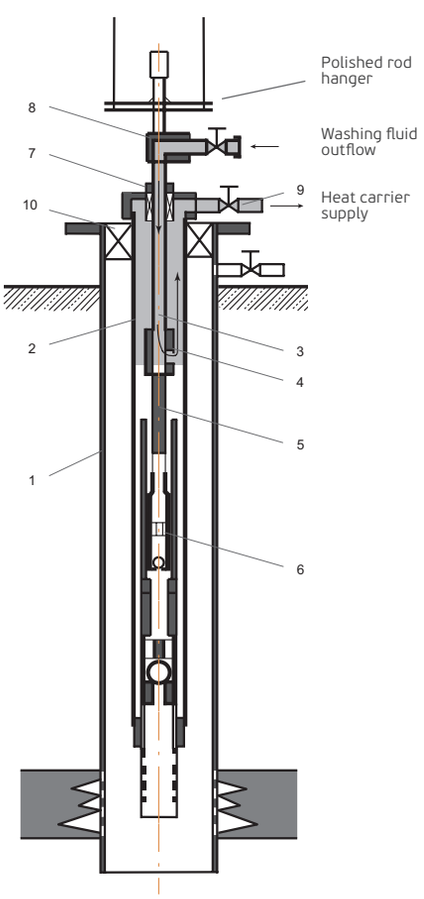
Well washing equipment

Well washing equipment is intended for washing of wells by heat method and with different chemicals (dissolver, de-emulsifier) if these wells are equipped with submersible sucker rod pumps and have deposits of asphalts, resins and paraffins in which tubing acc.to GOST 633-80 (min diameter is 73 mm) is used in a tubing string. Hollow sucker rods with couplings are used to transfer heat carrier. Complete set includes hollow rod string and wellhead equipment.

TECHNICAL CHARACTERISTICS

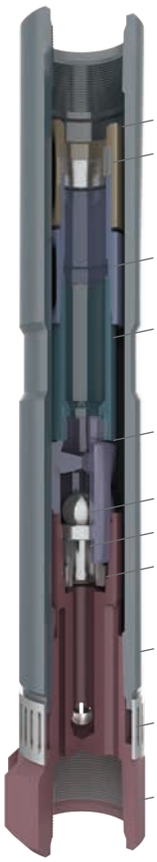
PARAMETERS	VALUE
Casing diameter, mm	146; 168
Tubing diameter (conventional), mm	73; 89
Type of rod string for well washing	Tubing rod
Heat carrier for well washing (temperature/pressure):	
- Oil	120˚C / 14 MPa
- Water	85˚C / 14 MPa
- Steam (special version)	300˚C / 10 MPa

Scheme of well equipped with well washing equipment



1. Production casing
2. Tubing string
3. Hollow rod string with polished hollow piston rod
4. Crossover sub
5. Sucker rod string
6. Pump
7. Stuffing box
8. Swivel, ball valve, quick joint connection, high pressure hose
9. Discharge in product collection system
10. Wellhead equipment

Downhole equipment
Well mixer SS-89



WELL MIXER DESIGN ALLOWS:

- To mix fluids from two formations divided by a packer during their one lift dual completion with electrical submersible pumping system (ESP) for the lower formation and with subsurface sucker rod pump of RHM-T type for the upper formation;
- To install RHM-T pump;

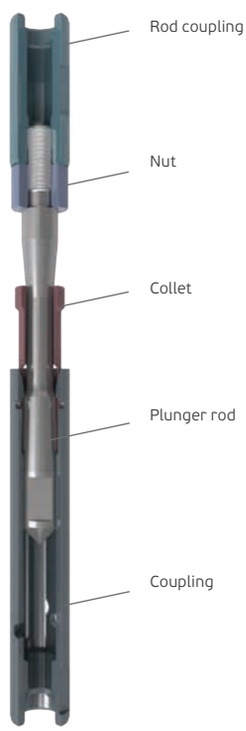
ADVANTAGES:

- Safety filter protects from mechanical impurities during SRP suction;
- Valve and seat has an increased flow area compared with analogs.

TECHNICAL CHARACTERISTICS

PARAMETERS	VALUE
Connecting thread acc. to GOST 633-80	89
Overall dimensions, mm, no more than - Diameter of circumscribing circle - Length	 123.5 700
Diameter of axial channels (for ESP), mm	17 (6 holes)
Diameter of side channels (for SRP), mm	19 (2 holes)
Dimensions of filter grooves, (for SRP), mm	3×25 (36 grooves)
Ball and seat (V11-225 valve): - material - ball diameter, mm - seat internal diameter, mm	 Stainless steel 95x18 34.925 26.57
Weight, kg, no more than	27.5
Operation conditions: - working environment - temperature of working environment, °C, no more than - discharge head, m, no more than	 Oil, gas, water 100 1500

Automatic tractive connections



This device is intended for connecting sucker rod string with a pump installed in a well.

AUTOMATIC TRACTIVE CONNECTIONS ALLOWS:

- To run insert pumps installed in seating nipple with tubing string;
- To run tubing pumps with plunger installed in barrel.

Before running of a pump, the lower part of tractive connection is screwed to plunger or plunger rod, while the upper part is fixed to bottom of sucker rod string. When running of sucker rod string, the upper part enters into the lower part, collet is locked in coupling ensuring a reliable connection between sucker rod string and pump plunger.

SIZE AND VERSIONS, TECHNICAL CHARACTERISTICS

PARAMETERS/TYPE	AS-19/60	AS – 19/73	AS-22/89
Connecting thread acc. to GOST 13877-96	Sh19	Sh19	Sh22
Tubing size, mm	60.3	73	73; 89
Connecting force, kN	75	100	100
Overall dimensions (when engaged), mm: - length - diameter	 477 42	 473 50	 473 50
Weight, kg, no more than	3.3	4.3	4.5

Safety filters

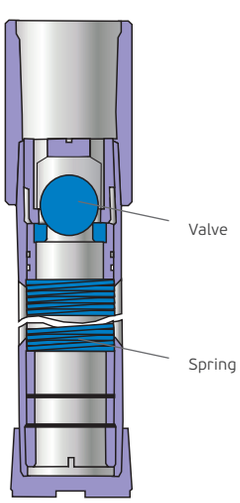


Well strainers are intended for protection of a pump from foreign particles of more than 3 mm.
Filter is a tube with welded plug and holes of diameter 3 mm. Top end of a tube ahs LP connecting thread (line pipe, tapered), which matches internal thread in the lower part of a pump, or that of RHBM seating nipple.

TECHNICAL CHARACTERISICS

PARAMETER/TYPE	FILTER 1"	FILTER 1 1/4″	FILTER 1 1/2″	FILTER 2″
Size of LP thread	1"	1 1/4"	1 1/2"	2"
External diameter, mm	34	42.5	48.3	60.3
Internal diameter, mm	24	32	40.3	50.3
Length, mm	210			
Total square of holes Ø 3, mm	720 (102 holes)	1080 (153 holes)	1440 (204 holes)	
Weight, kg, no more than	0.75	1.0	0.85	1.5

Spring well strainer FSP-73/89

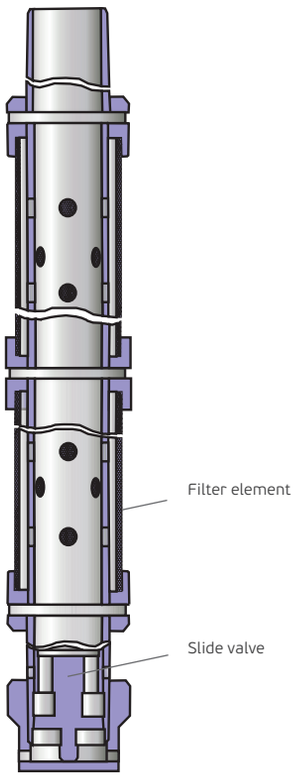


Filter element in a strainer is a spring.
FSP filter is set under sucker rod pump in NKT-73 tubing string. It is intended for preventing pumps from mechanical particles of size more than 0.2... 0.8 mm. Clearance between spring coils is adjusted to control particles size.
Filter is self-cleaning; spring filter element is cleaned out when valve (ball-seat) moves axially during sucker rod pump operation.

TECHNICAL CHARACTERISTICS

PARAMETER	VALUE
Connecting thread	Tubing NKT-73
Overall dimensions, mm, no more than: - length - diameter	 900 89
Weight, kg, no more than	15

Screen well strainer FS-60/92

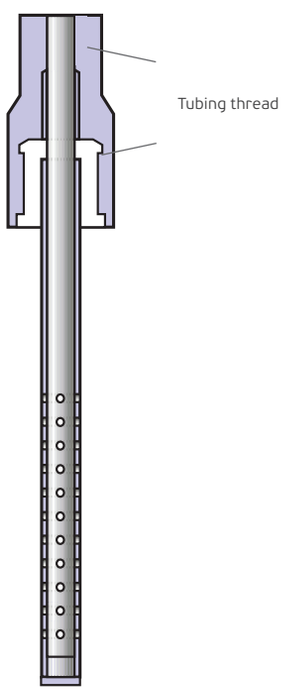


Screen well strainer (FS) is set under oilwell sucker rod pump in NKT-60 tubing string and intended for preventing pumps from mechanical particles of size more than 1 mm.
Screen with meshes of size 1x1 is used as a filter element.
Fluid flows into suction pipe through screen and holes in strainer casing.
If a strainer becomes clogged, slide valve reacts and fluid flows without cleaning into suction pipe through slide valve passages.

TECHNICAL CHARACTERISTICS

PARAMETERS	VALUE
Connecting thread	NKT-60 tubing
Overall dimensions, mm, no more than: - length - diameter	 880 92
Weight, kg, no more than	11

Sludge Trap AFNI. 631632.001

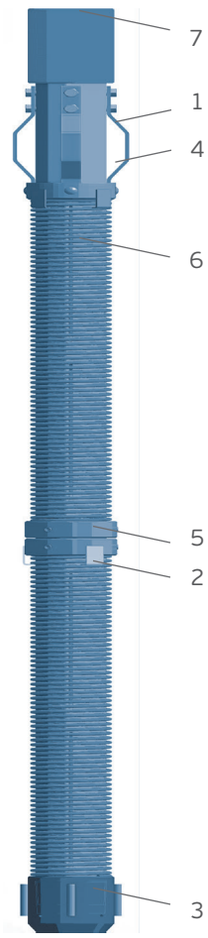


Sludge trap is installed under a pump and is intended for desludging of produced fluid from foreign impurities (sludge).

TECHNICAL CHARACTERISTICS

PARAMETERS	VALUE
Connecting thread acc. to GOST633-80	NKT-73 tubing
Filtering ports: - Diameter, mm - Quantity - Total area, mm^2	 5 44 860
Overall dimensions, mm, no more than: - diameter - length	 90 1346
Weight, kg, no more than	7

Well strainer FSP-73/105



Well strainer is intended for filtering of produced substances from foreign impurities, sand and other mechanical impurities from well.
Strainer operation is possible together with downhole pumping equipment.
Well strainer can be operated in moderate and cold macroclimatic areas.

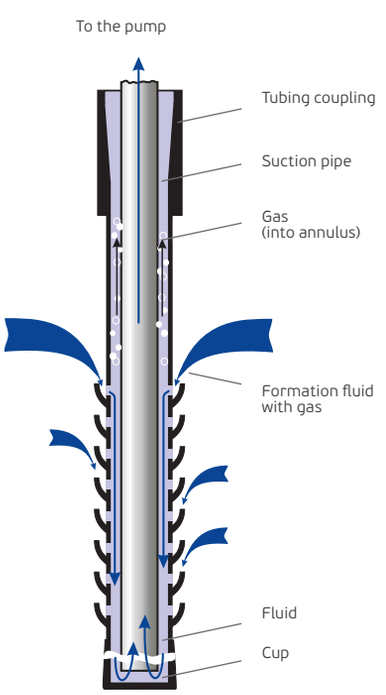
WELL STRAINER FSP-73/105 CONSISTS OF:

1 – centralizer
2 – lock pin
3 – end cup
4 – pipe
5 – adjusting o-ring
6 – filtering element
7 – coupling

TECHNICAL CHARACTERISTICS FSP-73/105

PARAMETERS	VALUE
Notional size of tubing string	NKT-73
Dimensions of slots in filter, mm	3x150 (16 slots)
Passage area, mm^2	7128
Passage area inside tubing, mm^2	3017
Overall dimensions, mm, no more than: - length - diameter	 1670 120
Weight, kg, no more than	26

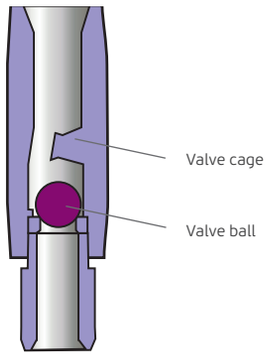
Gas Anchor



Gas anchor is intended for gas separation from oil pumped by sucker rod pumps.
As a rule, up to three gas anchors connected to each other are used. They are screwed on a tubing string under a pump and they serve as an outer suction pipe. Tubing pipe plugged with a cup is connected to a bottom anchor. Internal suction tube, entering into the bottom (plugged) tubing pipe is screwed on into pump inlet.
Internal suction pipe is not included in delivery set of a gas anchor.

PARAMETERS/TYPE	GAS ANCHOR 2 3/8" (60)	GAS ANCHOR 2 7/8" (73)	GAS ANCHOR 3 1/2" (89)
Connecting thread acc. to GOST 633-80	NKT-60	NKT-73	NKT-89
Diameter of anchor pipe, mm	60.3	73	88.9
Diameter of anchor cups, mm	79	94	109
Length of anchor, mm	1010	1020	1030
Number of holes Ø 8 mm	96	120	144
Weight, kg, no more than	8	12	16

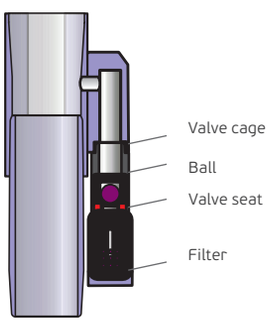
Pressure valve KO-73



Pressure valve KO-73 is intended for interval pressure testing of tubing string when running down centrifugal pump. As well as for shutting off fluid flow when pump stops. It is used during well operation without sucker rods and is installed in tubing string above a pump.

PARAMETERS	VALUE
Tubing size, mm	73
Pressure, MPa	15
Overall dimension, mm, no more than: - External diameter - Height	 73 264
Weight, kg, no more than	5.5

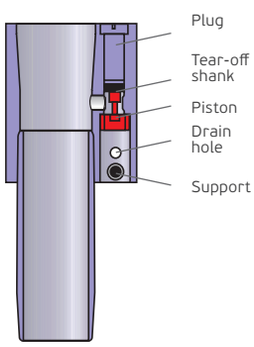
Backflush valve KP 73-15



It is intended for fluid delivery through the string downhole annulus inside tubing when carrying out process operations.
It is installed in a tubing string at the required depth.

PARAMETERS	VALUE
Tubing size, mm	73
Pressure, MPa	15
Overall dimensions, mm, no more than: - Diameter of circumscribing circle - Height	 120 405
Weight, kg, no more than	7.3

Drain valve SKOK

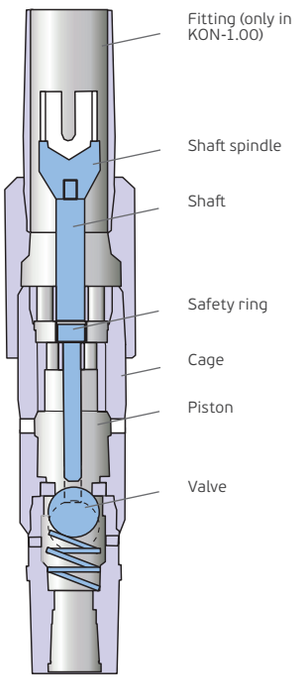


Detachable drain valve is intended for fluid drain out of tubing string.
When used in combination with tubing pump and non-removable standing valve (TNM-T), drain valve is installed on upper coupling of a pump or in tubing string above a pump.
In order to reuse a valve, it is necessary to install a new tear-off shank. Shanks are included in spare parts delivery set.
To drain fluid out of tubing string when running a pump, pressure required for valve operation is produced in string. At the same time, neck of tear-off shank breaks. After that, valve piston comes out of a barrel and let drain fluid pass through holes of valve cage into annulus.

PARAMETERS/DESIGNATION	SKOK-50-N	SKOK-70-N
Connecting thread of tubing	2 7/8" (73 mm)	3 1/2" (88.9 mm)
Diameter of drain holes, mm	10 (2 holes)	
Diameter of circumscribing circle, mm	124	143
Valve length, mm	330	
Operating pressure, MPa	from 10.0 to 20.0 by customer's request	
Weight, kg, no more than	7.2	9.2

When ordering specify valve designation and operating pressure (if not specified, valves are delivered with operating pressure 20 MPa).

Shutdown valve KON



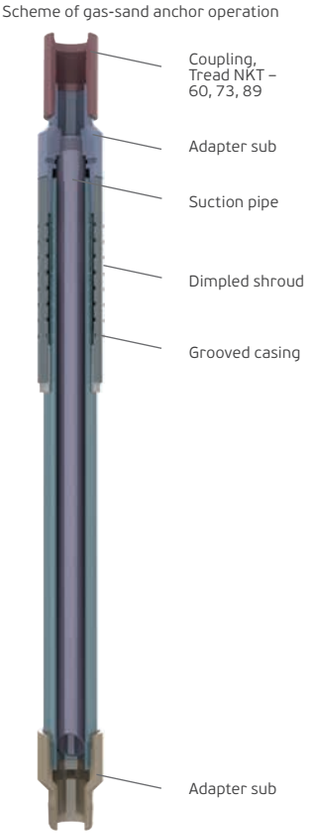
Shutdown valve is intended for well overhaul without their killing if pumps are changed without tubing pull-out. It is installed under seating nipple of insert pump.
Before first running of a pump, under the action of formation pressure and a spring a valve (seat-ball) is closed, side holes in valve cage are opened, through which fluid flows in tubing. When setting a pump in seating nipple, it pushes a shaft spindle. A spindle moves piston and a ball, a piston closes side holes, valve is opened, providing suction of fluid during pump operation. When pulling a pump, a piston stays in the same position (side holes are closed), ball affected by formation pressure and spring, closes valve, preventing fluid flow into tubing, at the same time shaft easily moves upwards. At the next running of a pump a valve is opened again with the help of a shaft.

TYPES AND VERSIONS AND TECHNICAL CHARACTERISTICS OF VALVES

VALVE VERSION	PUMP TYPE	TYPE OF SEATING NIPPLE	CONNECTING THREAD	LENGTH, MM	DIAMETER, MM	WEIGHT, KG
KON-1.00	25/20- ... RHM-T	4011 6-MT-ZUS	NKT 2 3/8" (60)	472	89	10.4
KON-2.00	20-... RHBM	32756	NKT 2 3/8" (60)	392	89	9
KON-3.00	25-... RHBM	32757	NKT 2 7/8" (73)	386	89	9

Gas-sand anchor

Scheme of gas-sand anchor operation



Intended for separation of gas and mechanical impurities included in well fluid. Gas-sand anchor is mounted in sucker rod pump suction pipe. It is recommended to install sludge collecting pipe below gas-sand anchor for collecting of mechanical impurities.

GAS-SAND ANCHOR ALLOWS:

- To prevent sand removing;
- To increase pump efficiency;
- To eliminate pump clogging and to increase its reliability;
- To increase time between repairs of well.

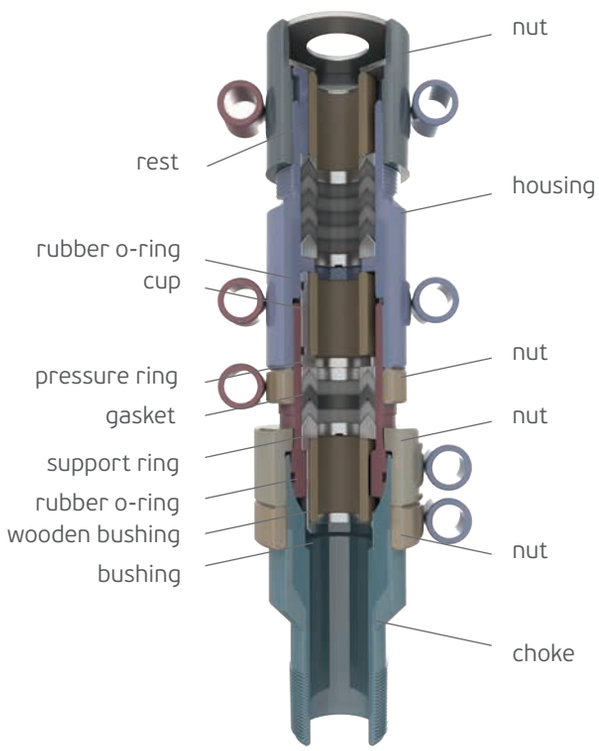
Casing Head Stuffing Box SU73-42

Stuffing box is intended for sealing of wellhead, eliminating oil leakage between polished rod and stuffing box packing.

STUFFING BOX DESIGN ALLOWS TO:

- Compensate deviation of pumping unit cementation with relation to wellhead;
- Provide gasket replacement without disassembling of polished rod.

STUFFING BOX CONSISTS OF:



TECHNICAL CHARACTERISTICS

PARAMETERS	VALUE
Connecting thread acc.to GOST 633-80	73
Polished rod diameter, mm	42.2
Max working pressure, MPa - when pumping unit is working - when pumping unit is not working	 4 14
Overall dimensions, mm, no more than: - length - width	 514 185
Weight, kg, no more than	21

EQUIPMENT FOR WELL CEMENTING

NC-320 Cementing pump for UNB Pump Units



Horizontal, two-piston, double action, with built-in worm reducer of high load capacity.

PURPOSE

Intended for pumping the fluid media (clay, cement, saline mud) during squeezing and flashing operations in oil and gas wells when performing drilling and overhaul.
The pump NC-320 is designed on the base of 9T pump; the main parts and assembly units are interchangeable.
The application of the worm-and-worm gear, the one-piece stamped plate and other components of advanced design and engineering results in reliability and long life of the NC-320 pump as compared with the 9T pump.

DELIVERY

On Customer's request, the pumps can be equipped with removers for valve seats and liners. The plant provides Customers with high-quality spare parts, as well as performs pumps overhaul using the basic production technology.

TECHNICAL CHARACTERISTICS

PARAMETERS	VALUE
Useful power, kW	108
Gear ratio of worm pair	22
Overall dimension, mm	2385 x 750 x 2390
Weight, kg, no more than	2890

PUMP PRESSURE AND VOLUMETRIC CAPACITY

NUMBER OF PISTON DOUBLE STROKES PER MIN.	DIAMETER OF CHANGEABLE CYLINDER LINERS, MM	IDEAL CAPACITY, DM^3/S (M^3/H)	MAXIMUM PRESSURE, MPA
133	90	12.3 (44.3)	8.8
	100	15.6 (56.2)	6.9
	115	21.3 (76.7)	5.1
	127	26.3 (94.7)	4.1
68	90	6.34 (22.82)	17.0
	100	7.39 (28,56)	13.6
	115	10.88 (39.17)	9.92
	127	13.37 (48.14)	8.1
30	90	2.8 (10.1)	38.6
	100	3.5 (12.6)	30.9
	115	4.8 (17.3)	22.5
	127	5.9 (21.2)	18.3

Pump units UNB



Oilfield pump units are intended for injection of working fluid during well cementation, hydraufracturing, hydraulic jet perforating, sand plug flushing, drilling, sidetracking and other flushing and squeezing operations at oil and gas fields.
A wide range of pump units (UNB types) is produced. They differ by type of high pressure pump, mounting base, water-feeding unit, any additional devices and systems.
The following high pressure pumps are used in pump units:

- Two-piston double-action pump NC-320;
- Three-plunger pump NTP with horsepower of 175, 300, 500, 800 h.p.

On customer's request all pump units may be equipped with cementing control system SKCS.
Cementing control system consists of measuring device, power supply and computer. It provides measuring, recording and control of well cementing parameters. Results (reports) are displayed in the form of tables and diagrams during the whole well cementing process.

Pump units equipped with NC-320 High pressure pump



PUMP UNIT VERSIONS:

- With tank (measuring tank with bottom valves) and water feeding unit on the truck chassis;
- With tank (measuring tank with bottom valves) without water feeding unit on the truck chassis;
- Without bunker and water feeding unit, on trailer chassis;
- With bunker and water feeding unit, skid-mounted (stationary version).

DENOMINATION	MOUNTING BASE	WATER FEEDING UNIT	MEASURING TANK, M^3	VERSIONS
Truck-mounted with water-feeding unit				
UNB-125x32U	Ural-4320	ZMZ/D144+CNS	5; 6	SM, UKU
UNB-125x32K	KamAZ-43118	ZMZ/D144+CNS	5; 6	SM, UKU
Truck-mounted without water-feeding unit				
UNB-125x32U	Ural-4320	-	5; 6	-
UNb-125x32K	KamAZ-43118	-	6	-
Trailer-mounted				
UN-125x32P	NefAZ-8332	-	-	Engine YaMZ-238+KPP, tent/container, SKCS
Skid-mounted				
UNB-125x32S	Skid	Hydraulic drive/ D144+CNS	4	Ural cub with YaMZ engine
UNB-125x32S	Skid	-	5	YaMZ engine + KPP
In container				
UN-125x32	Container	-	-	YaMZ engine + KPP
Water-feeding unit				
AN-30D	Skid	D144+CNS	-	-
AN-30B	Skid	ZMZ+CNS	-	-

NOTES:

ZMZ - ZMZ-511 engine
D144- D144 engine
CNS- CNS 38-154 pump
SM – sleeper cab
UKU – fluid level gage in measuring tank
SKCS – cementing control system

Three-plunger pumps NTP

NTP-175



NTP-175 is a three-plunger pump with the built-in reducer and changeable plungers. It is available to perform a quick replacement of plungers of other diameters.
NTP-175 Pump is used instead of NC-320 Pump on UNB-125xP Units as a power pump.

THE DESIGN OF THE PUMP BY LOCATION OF THE SHAFT END:

- right-hand – NTP-175 (P);
- left-hand - NTP-175 (L).

DESIGNATION (MODIFICATION CODE)	PLUNGER DIAMETER, MM	MAXIMUM PRESSURE, MPA /DELIVERY, L/SEC	MAXIMUM THEORETICAL PUMP CAPACITY, L/SEC /PRESSURE, MPA
NTP-175x50(L)	90	50/3.05	12.7/9.7
NTP-175x40(L)	100	40/3.77	15.7/8.0
NTP-175x32(L)	110	32/4.56	19.0/7.0
NTP-175x25(L)	125	25/5.89	24.54/5.0

PARAMETER	VALUE
Power consumption, kW (h.p.)	129 (175)
Plunger stroke, mm	160
Overall dimensions, mm	1770 x 1050 x 890
Weight, kg	2250
Max rotational speed of main shaft, min^{-1}	250

NTP-330



Three-plunger pump NTP-330 with built-in gear reducer and changeable plungers. Plungers of different diameters can be easily changed in a single pump housing. NTP-330 is used in UNB2-600x70 Pump unit with two pumps. Taper gearing of a pump drive allows locating a pump along a truck axis.

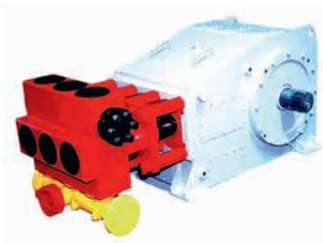
PUMP DESIGNS ACCORDING TO SHAFT AND LOCATION:

- NTP-330 (P) – from the right;
- NTP-330 (L) – from the left.

DESIGNATION (MODIFICATION SYMBOL)	PLUNGER DIAMETER, MM	MAXIMUM PRESSURE, MPA /DELIVERY, L/SEC	MAXIMUM THEORETICAL PUMP CAPACITY, L/SEC /PRESSURE, MPA
NTP-330x70(L)	90	70/2.03	18.72/14.16
NTP-330x60(L)	100	60/2.51	23.14/11.45
NTP-330x50(L)	110	50/3.04	27.99/9.47
NTP-330x40(L)	125	40/3.93	36.15/7.33
NTP-330x32(L)	140	32/4.93	45/5.84

PARAMETERS	VALUE
Power consumption, kW (h.p.)	330 (448)
Plunger stroke, mm	160
Overall dimensions, mm	2210 x 1050 x 820
Weight, kg	2550
Max rotational speed of main shaft, min^{-1}	365

NTP-300, NTP-500, NTP-800



Pumps of series NTP 300-800xP (300-800 – max power of a pump, P – max pump pressure) are horizontal three-plunger of single action. They are intended for delivery of unaggressive fluids during jet perforation, flushing of sand plugs, development of wells completed by drilling and other flushing and squeezing operations. It is possible to manufacture pumps of different efficiency and different purpose based on one pump NTP.
Attachable gear reducer is available.

MAIN ADVANTAGES

Eccentric shaft is substituted by a crankshaft on friction bearings in driving part of a pump. It results in increasing of pump efficiency due to long piston travel and reliability due to use of friction bearings instead of rolling bearings. Such design solutions also prolong a life span and decrease quantity of metal.

NTP-300

DESIGNATION (MODIFICATION SYMBOL)	PLUNGER DIAMETER, MM	MAXIMUM PRESSURE, MPA /DELIVERY, L/SEC	MAXIMUM THEORETICAL PUMP CAPACITY, L/SEC /PRESSURE, MPA
NTP-300x70	90	70/2.42	19.09/10
NTP-300x63	100	63/2.98	23.56/8,0
NTP-300x50	110	50/3.61	28.51/7
NTP-300x40	125	40/4.66	36.82/5
NTP-300x32	140	25/5.85	46.18/4

PARAMETER	VALUE
Power consumption, kW (h.p.)	204 (278)
Plunger stroke, mm	200
Overall dimensions, mm	1955 x 920 x 865
Weight, kg	2890

NTP-500

DESIGNATION (MODIFICATION SYMBOL)	PLUNGER DIAMETER, MM	MAXIMUM PRESSURE, MPA /DELIVERY, L/SEC	MAXIMUM THEORETICAL PUMP CAPACITY, L/SEC /PRESSURE, MPA
NTP-500x50	110	50/6.75	28.51/12.0
NTP-500x40	125	40/8.47	36.82/9.0
NTP-500x32	140	32/10.47	46.18/7.0

PARAMETERS	VALUE
Power consumption, kW (h.p.)	368 (500)
Plunger stroke, mm	200
Overall dimensions, mm	1935 x 920 x 856
Weight, kg	2745

NTP-800

DESIGNATION (MODIFICATION SYMBOL)	PLUNGER DIAMETER, MM	MAXIMUM PRESSURE, MPA /DELIVERY, L/SEC	MAXIMUM THEORETICAL PUMP CAPACITY, L/SEC /PRESSURE, MPA
NTP-800x80	90	80/5.41	19.09/28
NTP-800x63	100	63/6.68	23.56/23
NTP-800x50	110	50/8.08	28.51/19
NTP-800x40	125	40/10.43	36.82/15

PARAMETER	VALUE
Power consumption, kW (h.p.)	588 (800)
Plunger stroke, mm	200
Overall dimensions, mm	1935 x 920 x 856
Weight, kg	2745

Pump units with three-plunger pump NTP



PLUNGER PUMPS DIFFER FROM PISTON PUMPS BY THE FOLLOWING:

- Higher working pressure (up to 100 MPa);
- Better efficiency (feed of working fluid per unit time) due to greater number of strokes;
- Less coefficient of cyclic variation (relation between maximum instant delivery and minimum instant delivery per one working cycle).

Pump units with three-plunger pump NTP-175

TYPE (MODEL), DESIGNATION	MOUNTING BASE	MAXIMUM PRESSURE, MPA (PLUNGER DIAMETER IS 90 MM)	MAXIMUM THEORETICAL CAPACITY, L/S (PLUNGER DIAMETER IS 125 MM)	WATER-FEEDING UNIT	
				ENGINE	PUMP
UNB-125x50U	URAL 4320	50	24.5	D 144/ZMZ	CNS
UNB-125x50K	KamAZ 43118	50	24.5	D 144/ZMZ	CNS

UNB2-250x50K Mobile Two-Pump Unit

It is intended for injection of grouting mortar and different liquid media in a well during abrasive jet perforation, sand washing performed during development and workover of oil and gas wells.

ADVANTAGES:

- Comfortability – a cab is additionally heat-insulated thus providing comfortable work of an operator under low temperatures.
- Reliability – duplicate power unit and pumps unit provide reliable unit operation even if one of them is broken.
- Economical efficiency - thanks to UNB2-250x50K Unit, the number of special-purpose equipment can be reduced. Thus, significant economy may be achieved on spare parts and other charges connected with operation, maintenance, and storage of special-purpose equipment.
- Batch production – all units and components used in UNB2-250x50K Unit are batch-produced.
- Productivity – two high-pressure pumps allows reduction of time for operation, thus increasing the unit productivity as compared with batch-produced UNB-125x50K Unit.
- Safety – availability of covers, handrails and safeguards on site provides safe operation.



TECHNICAL CHARACTERISTICS:

PARAMETERS	VALUE
Mounting base: - wheel arrangement	KamAZ-63501 chassis 8x8
Power station, 2 pcs.: - engine - horsepower, kW - transmission	 YaMZ-236 165 YaMZ-238 VM
High pressure pump, 2 pcs.: - diameter of replaceable plungers, mm - Maximum horsepower, h.p. (kW) - maximum pressure, MPa (kg/cm^2) (plunger Ø 90 mm) - maximum theoretical capacity, l/s (plunger Ø 125 мм)	NTP-175, three-plunger 90,100,110,125 175 (129) 50 (500) 24.5
Measuring tank: - volume, m^3	Two-sectional 6
Water-feeding pump: - flow rate, l/s - drive	CNS 60-165 17 From power takeoff device of vehicle chassis via cardan shafts
Manifold: - diameter of discharge pipelines, mm - diameter of intake pipelines, mm - cement tank volume, m^3	 50 125/100 0.25
Overall dimension, mm, no more than: - length - width - height	 11300 2550 4000
Loaded weight, kg, no more than	26500
- on front axle/on trailing truck	11200/15300

Pump unit UNB2-600x70 (67 UNB)



UNB2-600x70 Pump Unit is intended for preparation and injection of grouting mortar and different liquid media in a well during abrasive jet perforation, sand washing, preflush and overflush operations performed during development and workover of oil and gas wells. Unit represents a set of equipment mounted on KamAZ chassis.

UNB2-600X70 PUMP UNIT CONSISTS OF:

- Transmission:
  - Hydraulic system drive transmission;
  - Three-plunger pumps NTP-330 (left and right);
- Two three-plunger pumps NTP-330;
- Double-section gauging tank 2x3m2;
  - Mix tank and cement surge tank (they are designed together in one tank and are divided by a baffle);
- Mixing system:
  - Mixing unit;
  - MISSION 4x3x13 Injection Pump;
  - Mixing tank;
- MISSION 3x2x13 Water Feeding Pump;
- Recirculation system:
  - Two MISSION 6x5x11;
  - Cement surge tank;
  - Density meter;
- Automated cement system;
- Data acquisition system;
- Heat system for hydraulic and power ends of NTP-330 high-pressure pump;
- Manifold;
- Other auxiliary equipment;
- Folding tent equipped with tent retraction mechanism.

ADVANTAGES:

- Two high-pressure pumps allow to carry out several operations simultaneously, also they reduce probability of slug appearance during grouting mortar injection.
- UNB2-600x70 Pump Unit with enhanced functionality may be used instead of two UNB-125x32 Pump Units and several mixing units with cement surge tanks. It allows to reduce costs for purchase and service of cementing equipment, decrease labor and energy costs.

SERVICE ABILITY:

- Fluid end and power end of a high-pressure pump are heated by heat system. It is not available in common pump units.
- Compact and reasonable arrangement involves hinged guard and two exits for safe and convenient maintenance of power units.
- Automatic cement (mortar) grouting preparation system is available.
- Density meter for mortar density control is represented in recirculation system.
- When operating in cold weather a unit can be covered by tent.
- Smart arrangement of UNB2-600x70 Pump Unit provides its serviceability.

TECHNICAL CHARACTERISTICS

PARAMETERS	VALUE
Mounting base	KamAZ-6560 chassis
- horsepower, kW - wheel arrangement	294 8x8
Power station, 2 pcs.	
- engine - horsepower, kW - transmission	DETROIT S60 332 ALLISON 4700 OFS
High pressure pump, 2 pcs.	NTP-330, three-plunger
- maximum horsepower, kW - maximum pressure, MPa - maximum flow rate, l/s	330 70 30
Recirculation pump, 2 pcs.	MISSION 6X5X11, centrifugal
- flow rate, l/s - maximum pressure, MPa - drive	62 0.49 Hydraulic from chassis engine
Water-feeding pump, 2 pcs.	MISSION 3x2x13/4x3x13, центробежный
- flow rate, l/s - maximum pressure, MPa - drive	20/26 1.1 Hydraulic from chassis engine
Mixing system	Ejection head
- grouting mortar density, g/cm^3 - maximum output, l/s - cement batcher drive - control system	1.0-2.4 38 hydraulic automatic or manual
Measuring tank	Two-sectional
- volume, m^3	6
Mixing surge tank	Two-sectional
- volume of mixing/surge sections, m^3 - mechanical stirrers - drive	1.6 / 2.4 Vertical blade stirrers 3 pcs. Hydraulic from chassis engine
Overall dimensions (LxWxH), mm, no more than	11 800 x 2550 x 4000
Unladen mass, kg	33 775
Loaded mass (through the 1st and the 2nd axles/back trailer), kg	34 000 (14 500 / 19 500)

Pump unit UNB-600x50 (57 UNB)



UNB-600x50 Pump unit is intended for preparation and injection of grouting mortar and different liquid media in a well at abrasive jet perforation, sand washing, preflush and overflush operations performed during development and workover of oil and gas wells.

ADVANTAGES:

- UNB-600x50 is equipped with a mixing unit which can automatically maintain density of prepared grouting mortar as well as with non-radioactive densitometer. All operations are carried out with the help of control panel set on a platform.
- Continuous process of preparation and injection of mortar in a well.

On customer's request, setting function can include writing down of cementing parameters.

TECHNICAL CHARACTERISTICS

PARAMETERS	VALUE
All-wheel mounting chassis	IVECO/KamAZ
Three-plunger pump: - maximum working pressure, MPa - maximum flow rate, l/s	OFM 600 44 35
Power unit: - model of engine - horsepower (at 2100 rpm), kW - transmission	 DDC S60 330 ALLISON OFS 4700
Mixing system: - recirculation centrifugal pump - water-feeding centrifugal pump – 2 pcs. - volume of mixing tank, m^3 - grouting mortar density, g/cm^3 - speed of mortar preparation, l/s - mixing system - density control	 MISSION 6x5x11 MISSION 4x3x13 1,6 1-2.5 38 Recirculation high-output Automatic/manual (on request)
Water tank volume, m^3	2x2
Weight, kg, no more than	22 600
Overall dimension, mm, no more than: - length - width - height	 9800 2550 3850

Pump unit UNB-125x50SO (72 UNB)



UNB-125x50SO Pump unit is intended for transportation of dry powdered materials (cement, grouting mixtures, etc.), preparation of grouting mortars, their accumulating and mixing, injection of liquid media during overhaul and other preflush and overflush operations performed during development and workover of oil and gas wells.

ADVANTAGES:

- This unit may be used instead of 2 units: cementing unit UNB-125x32 , mixing unit US-50x14.
- It may be operated in complex with other units as well as by itself.
- The unit allows to deliver up to 5 tons of cement to the well, to prepare cement mixture of required density and to inject in the well.
- It includes modernized pump with improved operating characteristics and serviceability.
- ODN pump is used for delivery of water in measuring tank, mixing tank, as well as for washing of these tanks and all the manifold.
- In cold season NTP-175 Pump and manifold are heated with exhaust gases during unit transportation to field.

TECHNICAL CHARACTERISTICS

PARAMETERS	VALUE
Mounting base - wheel arrangement - maximum horsepower, kW (h.p.)	KamAZ 63501 chassis 8x8 260
High pressure pump - plunger diameter, mm - inbuilt gear reducer gear ratio - max horsepower, h.p. (kW) - max pressure, MPa (kg/cm^2) - max theoretical capacity, dm^3/s (l/min)	NTP-175x40* 100* 5.06* 175 (129)* 40.0 (400)* 15.7 (942)*
Bunker for storage, transportation of dry mixtures - Volume, m^3, no less than - Weight of transported mixture, tons, no more than - Cement unload - Drive of worm feeder	 4 5 Worm conveyor Hydraulic
Measuring tank - Volume, m^3, no less than	 6
Mixing tank with stirrer - Volume, m^3, no less than - Stirrer - Type of stirrer - Drive of stirrer	 5.5 2 pcs. Vertical bladed hydraulic
Mixing type	Dry material is fed by worm feeder in grouting fluid
Water feeding pump - max discharge, l/s - head, m - drive	ODN 120-100-65 15 13 hydraulic
Parameters of drive hydraulic systems: Max pressure, bar Hydraulic tank capacity, l	 200 150
Manifold: Nominal diameter of manifold pipes flow area, mm - intake manifold - discharge manifold	 125 50
Unit control: - hydraulic equipment - electrical equipment	 Control panel on operator's platform Control panel in driver's cab
Overall dimension, mm, no more than, (length, width, height)	10 500 x 2550 x 4000
Loaded weight, kg, no more than	24 000
Distribution of unladen mass on a road, kg - through front axle - through back axle	 11100 12900

** Characteristics for pump with plunger diameter 100mm.*
Pump can be delivered with plungers with diameters 125, 110, 100 and 90 mm, as well as any diameter under customer's request.

Mixing units US

Mixing unit with bunker US-50x14(20)



Intended for transportation of dry powdered materials (cement, grouting mortars, sand and other bulk materials), preparation of grouting mortar blends and other sandy and liquid blends during cementing of oil and gas wells.
Material is loaded into a bunker through a charging pipe by a screw conveyer and pneumatically (loading through an upper hatch is also acceptable). To prevent grouting mortar from arc formation, a bunker is equipped with a pneumatic vibrator.
Cement is fed into a mixing device by two worm feeders.
Mixing units are equipped with slit-like nozzles of various flow areas to select required density of prepared grouting mortar.

TECHNICAL CHARACTERISTICS

PARAMETERS	VALUE			
	US-50x14U	US-50X14K	US-50X20K	US-50X20DS
Mounting base (skid)	URAL-4320	KamAZ-43118/65111	KamAZ-63501	Skid, drive D144, cab GAZ-3307
Bunker capacity, m³	14,5	14,5	20,0	20,0
Weight of transported material, ton	8	8,5/11,4	11,5	15
Additional loading at the place of cementing, ton, no more than	18	18	25	25
Mixing device, hydraulic vacuum:				
- fluid pressure, MPa (optimal/max)	1,5/2,0			
- density of prepared blend, g/cm³	1,3-2,4			
- max efficiency of grouting mortar preparation with density 1,85 g/cm³, dm³/s	27,0			
- time of achieving required density, s	40			
Overall dimensions, mm - length - width - height	 9400 2550 3700	 9000 2550 3800/3700	 10500 2550 3900	 9800 2820 3300
Weight, kg (unladen)	12 400	12 900/13 000	15000	8500





Mixing unit with a bunker and surge tank US-50-8x8



Grouting mortar is fed into mixing device of mixing unit US-50-8x8 by means of dozing screws. Prepared solution is injected into cement surge tank by means of cementing pump UNB and with the help of stirrers it becomes homogeneous in all its volume. Then homogeneous solution is injected into a well from cement surge tank. Engine of a truck is used as a drive for dozing screw mixers.
To unload truck chassis during filling a cement surge tank, unloading supports are provided in delivery set of a unit.

TECHNICAL CHARACTERISTICS

PARAMETERS	VALUE
Mounting base	KamAZ 43118
Bunker capacity, m^3	6.0
Weight of transported material, ton	8
Mixing device, hydraulic vacuum:	
- density of prepared blend, g/cm^3	1.3-2.4
- max efficiency of grouting mortar preparation with density 1,85 g/cm^3, dm^3/s	27.0
Number of dozing screws	2
Volume of cement surge tank, m^3	6.0
Number of stirrers	3
Overall dimensions, mm: - length - width - height	 8600 2550 3800
Weight, kg, (unladen)	13 000

USP 20K portable cement surge and mixing unit



USP-20K portable cement surge and mixing unit is intended for surging and homogenezation of slurry in a tank by mixing with belt conveyor, as well for its recirculation with centrifugal pumps.

ADVANTAGES:

- The unit includes two independent centrifugal pumps, and if one of them is broken, the unit operation is not interrupted.
- Vertical position of centrifugal pumps provides decreasing of total area of equipment.
- Three-axle chassis has smaller overall dimensions as compared with similar units.
- The unit is equipped with large tank with total volume 20 m3 divided into two equal parts. It allows preparation of two solutions with different parameters.
- The tank is equipped with rotating screw conveyors to make and support homogeneous density of the prepared slurry.
- Units with one-section or two-section tanks, with or without centrifugal pumps are available.

TECHNICAL CHARACTERISTICS

PARAMETERS	VALUE	
Mounting base - wheel arrangement - power, kWt, not less than	KamAZ-43118 6x6 165	KamAZ -63501 8x8 260
Tank - capacity, - slope angle of tank bottom, deg	Two-sectional / one-section 2x10/20 1.5	
Conveyors - drive	Screw-type, double-helical From chassis engine	
Recirculation pump, 2 pcs. - flow rate, l/s - maximum pressure, MPa - drive	Mission 6x5x11, centrifugal 61 0.49 Hydraulic from chassis engine	N/A
System of slurry preparation	N/A	Ejection funnel
Discharge unit support, drive type	mechanical	hydraulic
Overall dimension, mm, no more than	10500x2550x4000	11100x2550x4000
Loaded weight, kg	21100	27200
Total weight, kg	17000	22150

Cementing operations measurement complex IKCS-40M



Intended for connecting of pump units with wellhead and control of technological parameters of well cementing.

CEMENTING OPERATIONS MEASUREMENT COMPLEX IKCS-40M CONSISTS OF:

- Manifold unit
- SKC Lab.



MANIFOLD UNIT

Manifold Unit (BM) is intended for connecting pump units with wellhead during cementing of wells, hydraulic fracturing of formations and performing of other flushing and squeezing operations.

Equipment of a manifold unit is mounted on mounting frame. Pressure header and distributing header, hoisting mechanism, components of auxiliary pipeline and lodgment for cementing head transportation are installed on the frame. Since mounted on vehicle chassis, pressure header can be heated by vehicle exhaust gas.

TECHNICAL CHARACTERISTICS

PARAMETERS	VALUE				
	BM-40/70U	BM-40/70K	BM-40/70P	BM-40S	BM-40Ks
Mounting base	Ural-4320	KamAZ-43118/ KamAZ -43118 with KUNG	Trailer- mounted Nefaz-8332	Skid	Container on the skid
Pressure header					
- max working pressure, MPa	32/63			32	
- number of connecting pipes, pcs.	6				
- number of offtake pipes, pcs.	2				
Distributing connector:					
- max working pressure, MPa	2,5				-
- number of connecting pipes, pcs	10				
- number of offtake pipes, pcs.	2				
Auxiliary pipeline:					
- total pipe length, m	80	80	80		8
- number of jointed elbows, pcs.	21	21/16	21		6
Lifting mechanism, hand-driven:					
- load capacity, kg	500				-
- boom, mm	1600				
Overall dimensions, mm - length - width - height	 9300 2550 3500	 9000/10000 2550 3600/3800	 8800 2550 4000	 5000 2600 2820	 4300 2450 2600
Loaded weight, kg	13 500	14900/17000	10000	5100	3500

SKC Lab



SKC Lab is intended for control of construction and repair of different wells, recording of grouting mortar preparation parameters, parameters of injection of different non-aggressive media during cementation, abrasive jet perforation, sand washing and other preflush and overflush operations.

CEMENTING CONTROL SYSTEM CONTROLS THE FOLLOWING PARAMETERS:

- Injection pressure;
- Density of injected solutions;
- Instant rate of injected solution;
- Volume of each injected solution;
- Total volume of injected solution;
- Temperature of injected solution.

PARAMETERS	VALUE
Mounting base	Ural-4320, KamAZ-43118 chassis
Max working pressure, Mpa	70
Density of delivered medium, g/cm^3	0.8...2.4

Unified components of pumps and pump units
Safety valves

CHARACTERISTIC FEATURES OF SAFETY VALVES:

- Accurate and stable response due to self-detachable and self-cleaning lock;
- Long service life of a lock;
- Reduced hydraulic blow during valve response;
- Better safety.

KPS



Single-action valves with shear rods are intended for high-pressure oilfield equipment. The range of pressure relief cracking pressure is from 5 to 70 MPa. Nominal internal diameter is 50 mm for oil and gas equipment working under high pressure.

CODE	DESIGNATION	NOMINAL PRESSURE, MPA (KGS/CM²)
KPS-5/50	9KPS.000	5 (50)
KPS-6.3/50	9KPS.000-01	6.3 (63)
KPS-8/50	9KPS.000-02	8 (80)
KPS-10/50	9KPS.000-03	10 (100)
KPS-13/50	9KPS.000-04	13 (130)
KPS-16/50	9KPS.000-05	16 (160)
KPS-18.5/50	9KPS.000-06	18.5 (185)
KPS-20/50	9KPS.000-07	20 (200)
KPS-23/50	9KPS.000-08	23 (230)
KPS-25/50	9KPS.000-09	25 (250)
KPS-32/50	9KPS.000-10	32 (320)
KPS-40/50	9KPS.000-11	40 (400)
KPS-50/50	9KPS.000-12	50 (500)
KPS-63/50	9KPS.000-13	63 (630)
KPS-70/50	9KPS.000-14	70 (700)

KPSD



Single-action differential valves with shear rods are intended for high-pressure oilfield equipment. The range of pressure relief cracking pressure is from 16 to 105 MPa. Nominal internal diameter is 50 mm for oil and gas equipment working under high pressure.

CODE	DESIGNATION	NOMINAL PRESSURE, MPA (KGS/CM²)
KPSD-105/50	10 KPSD.000	105 (1050)
KPSD-80/50	10 KPSD.000-01	80 (800)
KPSD-65/50	10 KPSD.000-02	65 (650)
KPSD-50/50	10 KPSD.000-03	50 (500)
KPSD-40/50	10 KPSD.000-04	40 (400)
KPSD-32/50	10 KPSD.000-05	32 (320)
KPSD-25/50	10 KPSD.000-06	25 (250)
KPSD-20/50	10 KPSD.000-07	20 (200)
KPSD-16/50	10 KPSD.000-08	16 (160)
KPSD-70/50	10 KPSD.000-09	70 (700)

Quick-assembly tubing joints SBT 40/50 and SBT 70/50



Joints are used in oil field high-pressure equipment. The joints are characterized by long life and high impermeability with low torque strengthening.

TECHNICAL CHARACTERISTICS

CODE	DESIGNATION	NOMINAL INTERNAL DIAMETER, MM	PRESSURE, MPA
SBT-40/50	7SBT.000	50	40
SBT-40/50K	7SBT.000-01	50	40
SBT-70/50	7SBT.000-02	50	70
SBT-70/50K	7SBT.000-03	50	70

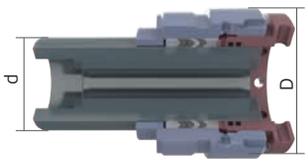
Universal valve components KPN



The valve components of standard and acid-resistant designs are used in oil field high-pressure piston and plunger pumps.
The valve components are characterized by their long life, simple design, high volumetric efficiency due to the material, thread-free cups fastening, lock configurations and improved hydrodynamics.

CHARACTERISTICS	VALVE COMPONENTS				
	KPN-40/105(K) KN.00.000-01	KPN -32/120(K) 1KN.00.000-01	KPN -70/120(K) 1KN.00.000-01A	KPN -105/116(K) 4KN2.00.000 SEATING SIZES CORRESPOND TO VALVES BY STD.7API (14)	KPN -50/132(K) 5KH2.00.000 SEATING SIZES CORRESPOND TO VALVES BY STD.7API (15)
Maximum pressure, MPa	40	32	70	105	50
Lock diameter, mm	105	120	120	116	132
Seat taper	1:5			1:6	
Weight, kg	2.98	3.458	4.58	3.6	4.2
Application in pumps	9TM, MGr, NB-125, NC-320, NPC-32	15Gr, 3NP-32-50, NTP-63, NP-50, SIN-34, SIN-46, SIN-32NM, NP-160, 2NP-60, NB-60	4R-700, N-630, 14T1,14T2,14T3, SIN-31NM, NP-200, 5NK-500, BM-700, UBM-70K, SIN-43	NP-1000, NP-1000K, NTP-800, NTP-500, NP-400K, NTP-300, TWS-900LW, TWS-1300, HT-400, RR-500, NTP-175, NTP-330	

Sealing packs



The sealing packs of variable rigidity PUNP are used in the oil field high-pressure plunger pumps for plungers of 80, 90, 100, 110, 125, 140 mm in diameters.
These new items are characterized by their corrosive resistance, high impermeability, long service life due to the cup packs manufactured from the metal-polymers, prevention of abrasive ingress on the sealing area, extrusion of the cups between the plungers and bearing sleeves.

PUNP – THE PACKS OF STANDARD DESIGN, USED FOR THE FOLLOWING PUMPS:

NP-100, NP-160, 14T2, SIN-34, SIN-32NM, NP-200, SIN-31NM, 14T1, 14T3, H-600-2

2PUNP – THE PACKS OF ACID-RESISTANT DESIGN, USED FOR THE PUMPS:

NP-100K, 14T2K, SIN-31NM, НТО-400К, 5NK-500

4PUNP – THE PACKS FOR ABRASIVE MEDIA WITH LONG SERVICE LIFE, USED FOR THE PUMPS:

NP-100, NP-160, SIN-32NM, NP-200, NTP-300, NTP-500, SIN-31HM, 14T1, NTP-800, 14T3, NP-1000

CODE	DESIGNATION	D, мм	d, мм
PUNP-80 2PUN-80 4PUNP-80	PU.000	105	80
PUNP-90 2PUN-90 4PUNP-90	PU.000-01	115	90
PUNP-100 2PUN-100 4PUNP-100	PU.000-02	125	100
PUNP-110 2PUN-110 4PUNP-110	PU.000-03	135	110
PUNP-125 2PUN-125 4PUNP-125	PU.000-04	150	125
PUNP-140 2PUN-140 4PUNP-140	PU.000-05	165	140

Stationary break out tongs

Automatic break out tongs, double speed, with pneumatic drive AKB-4



The double speed automatic break out tongs with pneumatic drive are used as a part of the drilling unit for making up and breaking out drill pipes and casings in round trip operations when drilling oil and gas wells.

ADVANTAGES:

- The torque is created without impacts, thus reducing the wear of pipes and tong retaining blocks;
- High torque allows to avoid using the wrenches;
- In order to protect the threads the makeup operations are carried out with preset torque.

New versions of tongs are equipped with electronic torque control system.

FUNCTIONS:

- Digital and graphical representation of current torque on a portable display;
- Transmission of obtained information on PC for review and analysis of histograms of parameters and types of fulfilled jobs in definite date, time, field, number of well cluster, crew, running in and out operations and creation of database.

AUTOMATIC BREAK OUT TONGS CONSISTS OF:

- Tong unit;
- String with carriage;
- Control panel;
- Double-speed gear box.

TECHNICAL CHARACTERISTICS

PARAMETERS	AKB-4(3)	AKB-4.0	AKB-4.0-04	AKB-4.0-05	AKB-4.0-05/04	AKB-4.0-03/04
Description	Based on AKB-3M2 after overhaul and upgrade (expenditure - overhaul)		Drilling pipes make-up and break-out speed is increased twice	Electronic pressure gage is available	Fast 1st gear and electronic torque meter	Fast 1st gear and hydraulic torque meter
Rotation frequency of a tube clamping device, rpm: - in 1st gear (fast) - in 2nd gear (slow)	0...39 0...2.6	0...22 0...1.5	0...39 0...1.5	0...22 0...1.5	0...39 0...1.5	0...39 0...1.5
Torque, kN·m: - in 1st gear (fast) - in 2nd gear (slow)	3.0 40	5.0 72.5	2.8 70.0	5.0 72.5	2.8 70.0	2.8 70.0
Torque control	On customer's request	Mechanical		Electronic		Pressure gage at control panel (pneumohydraulic system of torque limitation is located directly in control panel)
Control system	IVE-50 device	-		IVE-50 device		Pressure gage
Overall dimensions, mm	1730 x 1013 x 2610	1780 x 1230 x 2610				
Weight, kg, no more than	2700	3300				



To remove the quick-wear parts and restore the tongs AKB-4, as well as the ones of AKB-3M2 and AKB-3M2.E2 types having been produced earlier, the plant supply spare parts to them and perform overhaul and reconditioning on its territory under the production technology. Automatic break out tongs may be delivered in any versions. There are several programs of tongs upgrade with regard to special requirements of customer.
For example, AKB-3M2 tongs upgrade involves the following steps:

- Overhaul if required;
- Dismantling of a flywheel and installation of a two-speed gear box instead of it;
- Installation of a disk brake on a tube clamping device;
- Installation of electronic control system and break-out torque limitation system on the basis of electronic device IVE-50.

DELIVERY

The tongs are delivered in the complete set with changeable jaws (4 pcs each) and rests of 146 mm and 178 mm (2 pcs each) for pipes of 146 mm and 178 mm diameters, unless otherwise is specified in the order. On the Customer's request the tongs can be supplied with other 2 types of jaws and rests (98, 102, 105, 108, 114, 118, 120, 121, 124, 127, 133, 140, 152, 155, 159, 162, 165, 168, 172, 185, 187, 197, 198, 203, 212, 216).

DURING MAKING AN ORDER (REQUEST) FOR AUTOMATIC BREAK OUT TONGS IT IS NECESSARY TO SPECIFY THE FOLLOWING:

- Description and designation with two types of jaws and rests;
- Description, designation and quantity of spare parts.

The tongs is recommended for use by Rostekhnadzor of Russia.

Mud pumps and pump units

Mud pumps NB

Pumps of NB type – horizontal, two-cylinder, double-action, driven, with built-in gear reducer.
The pumps are intended for delivery of the fluid into the wells when carrying out exploratory and development drilling and other oilfield operations, as well as for pumping non-aggressive fluids.
The pneumatic compensator in the injection line provides the regular flow fluctuation and pump output fluid delivery.
Owing to their high reliability, easy operation and maintenance the pumps of NB type are of great demand among the customers.
The plant produces more than 30 types and versions of NB pumps, differed by capacity, position of the pulley, the gage and by coupling design.
The required operation mode for pressure and volumetric supply is freely set by removing the liners and changing the number of piston strokes.

DELIVERY

On customers' request the pumps of NB type can be optionally supplied with the pullers of valve seats and liners.
The plant provides the customers with the spare parts to the pumps and performs overhaul under the production technology.

Mud pumps NB-32, NB-50

The pumps are intended for injection of washer fluids (water, sludge) into the well when carrying out oil and gas exploratory and structure drilling.
The pumps are widely used for pumping various non-aggressive fluids at the enterprises of food, chemical and construction industries.



PARAMETERS	NB-32, NB-50
Piston stroke, mm	160
Main shaft rotation frequency (max), rpm	413 (110 double strokes)
Vacuum gage suction lift, m	3
Diameter of suction/discharge connections, mm	113/50
Overall dimensions, max, mm	1860 x 1000 x 1330
Weight, max, kg	1180

Main designs of pumps

VERSION NO.			VERSION
	NB-32	NB-50	
01			RH pulley
02			LH pulley
03			Pneumatic coupling and pulley, RH
04			Pneumatic coupling and pulley, LH
05			Friction coupling and pulley, RH
06			Friction coupling and pulley, LH
07			RH pulley, side location of pressure gage
08		-	LH pulley, side location of pressure gage
09		-	Pneumatic coupling and pulley, RH, side location of pressure gage
10		-	Pneumatic coupling and pulley, LH, side location of pressure gage
11		-	Friction coupling and pulley, RH, side location of pressure gage
12		-	Friction coupling and pulley, LH, side location of pressure gage

Pressure and volumetric capacity of pumps (at 110 piston double strokes)

PUMP DESIGNATION (TYPE)	USEFUL POWER, KW	DIAMETER OF CHANGEABLE LINERS, MM	VOLUMETRIC PUMP CAPACITY, DM^3/SEC. (M^3/H)	MAXIMUM PRESSURE, MPA
NB-32	32	80	5.2 (18.7)	6.2
		90	6.7 (24.1)	4.8
		100	8.5 (30.6)	3.8
		110	10.4 (37.4)	3.1
NB-50	50	90	6.7 (24.1)	7.5
		100	8.5 (30.6)	5.9
		110	10.4 (37.4)	4.8
		120	12.5 (45)	4.0

Mud pump NB-125IZh



APPLICATION:

- Injection of washer fluid when drilling oil and gas wells;
- Injection of fluid media during flushing and squeezing operations when carrying out wells overhaul;
- Injection of water in the reservoir bed to intensify production of oil;
- Pumping of various non-aggressive fluids.

THE PUMPS ARE EQUIPPED WITH COMPONENTS OF ADVANCED RELIABILITY:

- Rods, with chromium-nickel alloy hardening of the working section. The coating has low friction factor, enhanced corrosion resistance;
- Rubber-fluoroplastic sealing of the pistons and the rod ensures low wear of the liners and the rod and provides long and reliable pump operation.

TECHNICAL CHARACTERISTICS

PARAMETERS	VALUE
Useful power, kW	125
Piston stroke, mm	250
Main shaft rotation frequency (max), rpm	Up to 511 (100 double strokes)
Vacuum gage suction lift, m	3
Connecting nipples: - discharge - suction, mm	 external thread, tubing 60 flange D(int.)100 mm

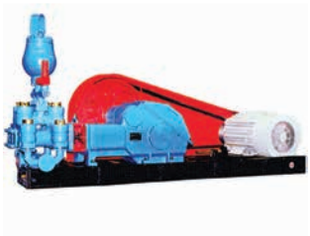
Versions of NB-125Izh

VERSION NUMBER	VERSION	OVERALL DIMENSIONS, MM	WEIGHT, KG
NB-125Izh-27	Without pulley and frame	2610 x 890 x 1960	2810
NB-125Izh-28	With pulley, without frame	2610 x 980 x 1960	3170
NB-125Izh-29	With pulley, on frame	2610 x 980 x 2010	3260
NB-125Izh-30	With pulley, discharge flanges, without frame	2610 x 980 x 1960	3190

Pressure and volumetric capacity of a pump depending on liner diameter and number of piston double strokes

DIAMETER OF CHANGEABLE LINERS, MM	PRESSURE, MPA /CAPACITY, DM^3/SEC. (M^3/H)	
	66 DOUBLE STROKES	100 DOUBLE STROKES
90	20.5/6.1 (22.0)	13.4/9.3 (33.5)
100	16.0/7.8 (28.1)	10.6/11.8 (42.5)
115	11.8/10.6 (38.2)	7.8/16.0 (57.6)
127	9.5/13.1 (47.2)	6.3/19.8 (71.3)

Mud pumps with electric drive



Mud pumps can be equipped with electric drive.
The delivery of pumps NB-32, NB-50, NB-125IZh packaged with electric drive on the single frame is provided.
In NB-125IZh Mud pump, versions 68 and 69, an electric motor is located at pump frame, thus decreasing its weight and overall dimensions (for pumps with electric motor up to 30 kW). In NB-125IZh mud pump, version 48.01, a monitoring and control cabinet with variable frequency driver is installed which allows adjustment of engine shaft rotation frequency from 300 to 1200 rpm.

THE DELIVERY SET INCLUDES:

- Mud pump with pulley (NB-32, NB-50, NB-125IZh);
- Electric motor (design, power, rotation frequency are specified by operation conditions, required pressure and volumetric capacity of the pump);
- V-belt transmission, covered with protective housing;
- Frame;
- Power electric cabinet and control panel (on customer's request);
- Monitoring and control cabinet with variable frequency driver (for NB-125IZh pump).

Positive displacement mud pump NBT-375



Intended for injection of working fluids during drilling, developing, flushing and squeezing of oil and gas wells.

TECHNICAL CHARACTERISTICS

PARAMETERS	VALUE
Pump power, kW (hp)	375 (500)
Piston stroke, mm	200
Overall dimensions, max, mm	2465 x 1334 x 1216
Weight, max, kg	4000

PRESSURE AND VOLUMETRIC CAPACITY OF A PUMP

MODIFICATION DESIGNATION	PISTON DIAMETER, MM	MAX PRESSURE, MPA/ CAPACITY, L/S	MAX THEORETICAL CAPACITY, L/S, AT 160 RPM
NBT-375x40(L)	100	40/9.4	15.04
NBT-375x32(L)	115	32/11.25	17.98
NBT-375x25(L)	127	25/13.19	21.09
NBT-375x20(L)	140	20/15.28	24.45

Equipment for well repair and overhaul

Suspended tubing tongs KPT-2M



The suspended tubing tong KPT-2M is intended for using in make-and-break operations with drill pipes and tubing during maintenance and overhaul of oil and gas wells as a port of hoisting units of AZ-37, UPT-50, A-50, CUOPER, CREMCO and other types of unit. The tong may be operated in moderated in moderate and cold microclimatic areas.

ADVANTAGES:

- Gerotor type motor M&S
- No planetary gear reducer.
- Foreign components of hydraulic system (Walvoil, Parker, Manuli).
- Enforced design, safety from external influence.
- Minimum service maintenance;
- Easy gear shift;
- Improved ergonomics.
- Increased capability (in comparison with KPT-2).

DESCRIPTION:

- The hydraulic drive of the tong is operated by the hydraulic systems of the hoisting unit.
- A set of hoses for connection to the hydraulic system is included in the tong delivery set.
- The pipe clamping device of cam type, the locking system preventing operation with the unlocked door is provided.
- The planetary reducer and the gear box ensure two speeds of the rotator.
- The tong is fastened by the compensating hanger, providing vertical travel of the tongs.
- An adjustable hydraulic valve for torque limitation and torque visual control system are available.

THE TONGS IS COMPLETED WITH THE FOLLOWING:

- Tongs completed with 73 jaws.
- Set of changeable parts is intended for operation with all tubing types and versions.
- Set of installation parts:

- high-pressure hoses;
- rope;
- clutches;
- guyline tractor;
- brake remover;
- chain sling with gauge block;
- lyrated anchor clamp.

Installation parts kit is intended for connection to hydraulic system of a unit and suspending a tongs on a mast.

- Set of spare parts, tools and accessories:

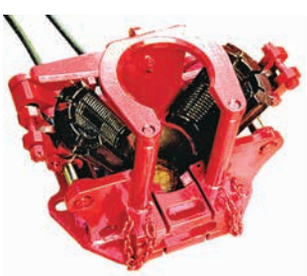
- brake;
- set of general mechanical rubber goods (rings, gaskets, sealing).

Spare tools and accessories kit is intended for installation of the goods and for change of components during operation.

TECHNICAL CHARACTERISTICS

PARAMETERS	VALUE
Nominal tubing size, mm	60, 73, 89 (48, 102, 105, 114 by order)
Rotational frequency of a rotary head, rpm: - in high gear - in low gear	 85 18
Rated torque in low gear, N·m at P = 16 MPa	 9500
Rated hydraulic fluid consumption, l/min	80
Overall dimensions, mm	1065x750x700
Weight, max, kg	310

Spiders ZK, ZK-56



A spider is intended for holding the tubing string during well repair and overhaul, as a part of units for subsurface repair operations and workover.

ADVANTAGES:

- A safety device protecting from accidental release of tubing string is provided in spider design.
- Spider is driven pneumatically from pneumatic system of hoisting unit.
- Hoses for connection to hoisting unit are delivered with a spider.
- The spider ZK-56 can be driven manually by the removable lever, included in the spider (ZK) delivery set.

PARAMETERS	ZK	ZK-56
Air pressure in pneumatic system, MPa	0,8±0,2	
Load capacity, t, min	80	56
Nominal tubing bore diameter, mm	48, 60, 73, 89, 102, 114	48, 60, 73, 89
Overall dimensions, mm	550 x 515 x 435	563 x 506 x 363
Weight, kg, max: - without slips - with slips	 175 206	 106 126

WHEN ORDERING SPECIFY THE FOLLOWING:

- Spider description (designation);
- Customer's additional (special) requirements (relating to the spider design, delivery set, etc.).

Suspended sucker rod tongs KPSh-3M



Suspended sucker rod tong KPSh-3M is intended for using in make-up and break-out operations with sucker rods during development maintenance and overhaul of oil and gas wells. Tong may be operated as a part of repair units of A-50, A-50M, AZ-37, A32/40 and other types of domestic and foreign units.
KPSh-3M Tongs operates on hydraulic system of hoisting unit.

ADVANTAGES:

- Small-sized high-torque orbital hydraulic motor (M&S, Bulgaria);
- Chain sling with height adjustment is used for suspension;
- Disk brake instead of band brake;
- Bearing units design requires minimum service maintenance;
- Without planetary gear reducer;
- Torque limitation;
- The smallest overall dimensions and weight in comparison with similar tongs of foreign and domestic production.

DESCRIPTION:

- Hydraulic drive is driven from hoisting unit hydraulic system. Set of hoses for connection to hoisting unit hydraulic system is included in delivery set;
- The tongs is mounted with the help of compensating suspension providing vertical displacement of the tongs;
- An adjustable hydraulic valve for torque limitation and torque visual control system are available.

THE TONG CONSISTS OF:

- tongs housing completed with gear reducer;
- pressure gage;
- hydraulic motor;
- hydraulic distributor;
- safety valve;
- suspension;
- balance screw;
- safety doors;
- control handle;
- holding tongs;
- jaw holder with jaws;
- disk brake.

COMPLETE SET OF THE TONGS:

- Tongs completed with jaw holder S26 and holding tongs S26;
- Changeable parts set:

- holding tongs S22.

Set of changeable parts is intended for operation with all sucker rod types and versions.

- Installation parts kit:

- rope;
- quick-release coupling with 2 tips;
- high pressure hoses;
- safety sling;
- clutches;
- chain sling with gauge block;

Installation parts kit is intended for connection to hydraulic system of a unit and suspending a tong on a mast.

- Set of spare parts, tools and accessories:

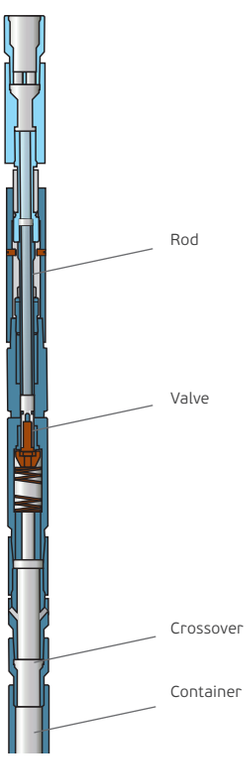
- remover of a jaw holder;
- general technical rubber goods (rings, gaskets, sealing);

Spare tools and accessories kit is intended for installation of the goods and for change of components during operation.

TECHNICAL CHARACTERISTICS

PARAMETERS	VALUE
Max torque, kN·m	1800
Rated hydraulic fluid consumption, l/min	80
Max pressure in hydraulic system, MPA	16.5
Rotation velocity, rpm	75
Overall dimensions, mm	700x380x600
Weight , max, kg	125

Hydraulic bailer GZh



Intended for cleaning of wells from sludge during well-workover operations.
Before running of a bailer, a container for gathering sludge is attached to the hydraulic bailer sub.
When running in a well, the pipe of a container bears against the dense layer of sludge. Retaining screws are being cut off, a rod of hydraulic bailer moves relative to the body, compresses the spring and opens a valve. Under well pressure, a container is filling with sludge.
As a hydraulic bailer is lifted, a valve is closed under spring action and container with sludge is pulled together with a hydraulic bailer.

TECHNICAL CHARACTERISTICS

PARAMETERS	VALUE
Connecting thread	NKT-73
Overall dimensions, mm (max): - length - diameter	 1600 95
Weight, max, kg	55

Jet pump NS-73



Jet pump is intended for development and hydrodynamic survey of wells.
The pump is installed in the string of the tubing NKT-73. Under the pump the packer is installed for sealing the hole clearance.

PUMP CONSISTS OF:

- Housing with the central and two side channels;
- A changeable insert (three designs are available);
- Injector and diffuser (installed in one or two channels).

Depending on pump operation, one of three changeable inserts is used. The inserts are replaced using the insert catcher without lifting the pump out of the well.

THE PUMP PROVIDES OPERATION IN THREE MODES:

- Reduction of the bottomhole pressure and differential pressure (the blind insert is used);
- Hydrodynamic survey of the bed (the sealing insert and geophysical instruments are used);
- Bottomhole acid treatment (the acid protection insert is used).

TECHNICAL CHARACTERISTICS

PARAMETERS	VALUE
Working fluid pressure, MPa	Up to 30
Setting depth, m	Up to 1500
Connecting thread	73 acc.to GOST 633-80
Overall dimensions, mm: - length, no more than - diameter, no more than	 575 117
Weight, max, kg	23



SEALING INSERT

The sealing insert has the central channel for the cable of the geophysical instrument. The cable is sealed with rubber rings.



BLIND INSERT

The blind insert overlaps the central channel of the pump and lets the fluid flow from the tubing to the injectors through the side channels. When the working fluid comes out of the nozzle, the underpressure zone is formed in the mixing tank, where the bed fluid enters and comes off in the hole clearance through the diffuser. The reduction of the bottomhole pressure is checked by the gage, installed on the insert.



ACID PREVENTION INSERT

The central channel of the insert is closed by the valve with the spring-loaded ball. Under the impact of the fluid pressure in the tubing the valve opens and allows the acid solution to penetrate into the bottomhole formation zone with shutting off the fluid flow in the side channels.

Fishing tools



Fishing spears and sucker rod sockets for external gripping, of collet type, non-releasing are intended for gripping and pulling out the tubing, bottom-hole pumps, downhole motors and sucker rods during elimination of downhole failures.
The fishing spears and sucker rod sockets are of great popularity among the customers through their high reliability, reached by simple construction and easy maintenance.
Assembling of fishing spears and sucker rod sockets is performed depending on the types of gripping and the fish and in accordance with the given tables.

OPERATION:

When lowering the fishing tool in the well, the bowl by its chamfer catches the fish and forwards it inside the spear (sucker rod socket); the collet with the fish is lifted up to the substitute till stop. Then it releases and allows the fish to pass inside.
The fishing string moving upward, the collet with the fish is descended over the taper surface of the body and becomes wedged. This provides the effective fish gripping.
When the fish is engaged by its coupling, the limiting liner is set, which, limits the fish motion thrusting by one end against the substitute.
When the fish is engaged under the shoulder and the coupling the collet is wedged between the taper surface and the lower edge of the shoulder or coupling of the fish.
Availability of changeable collets significantly increases capabilities of fishing spears and sucker rod sockets and allows to retrieve fishes of various diameter and configuration by the fishing too of the same class.
The fishing spears and sucker rod sockets are manufactured with the left-hand and right-hand threads; when designating the tool with the left-hand thread the letter "L" is added.

Spear-and-sucker rod socket tool

Spear-and-sucker rod socket tool is an assembly of TL1 Spear and ShL1 Sucker rod socket, used for gripping and lifting of sucker rod string together with tubing.

FISHES:

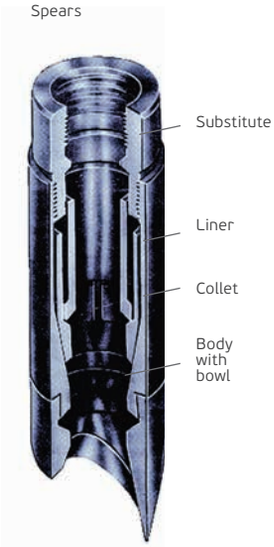
- Tubing with diameters 60, 73, 89 mm;
- Sucker rods with diameters 16,19, 22, 25 mm.

TECHNICAL CHARACTERISTICS

PARAMETERS	VALUE
Rated flow size of pipes, inside which gripping is carried out, mm	146,168
Allowable axial load, kN	500
Diameter, mm	122
Length, mm	880

Spears TL with external gripping

Spears



TECHNICAL CHARACTERISTICS

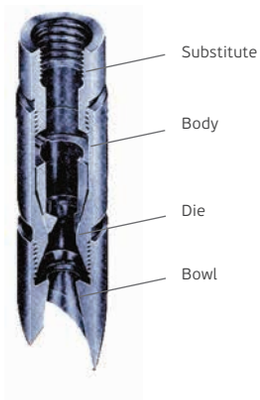
CHARACTERISTICS	TL1 (L)	TL2 (L)	TL3 (L)
Connecting thread	89 (89L) GOST 633-80	89 (89L) GOST 633-80	3-88 (3-88L) GOST 5286-75
Nominal bore of production string pipes, mm	146,168		
Allowable axial load, kN	500	400	250
Overall dimensions, mm - diameter - length	 122 630	 122 643	 120 1210
Weight, kg	22.9	17.8	40.2

SPEARS RANGE AND CONFIGURATION FISHES

SPEARS					FISHES	
TYPE	PERMANENT PARTS	REMOVABLE PARTS			DESCRIPTION	TYPE OF GRIPPING
		BOWL	BUSHING	COLLET		
TL1 (L)	Body TL1 (L) Substitute TL1 (L)	TL1.64(L)	-	TL1.48	tubing 48 mm	by the body
		TL1.64(L)		TL1.60,3	tubing 60 mm	by the body
		TL1.76(L)		TL1.68		under the coupling
		TL1.76(L)	70	TL1.73		by the coupling
		TL1.76(L)	-	TL1.73	tubing 73 mm	by the body
		TL1.98(L)		TL1.83,5		under the coupling
		TL1.98(L)		TL1.89		by the coupling
		TL1.98(L)	80	TL1.89	tubing 89 mm	by the body
		TL1.64(L)	-	TL1.49	pumps NV1B-32 NV2B-32	under the shoulder
		TL1.76(L)	-	TL1.65	pumps NV1 B-44 NV2B-44	
		TL1.98(L)	-	TL1.80	pumps NV1B-57 NV2B-57	
		TL1.98(L)	-	TL1.83.5	pump NSN-55	by the body
		TL1.98(L)	-	TL1.87	Bottom-hole motors D-85. D1-88	
TL2 (L)	Body TL2 (L) Substitute TL1 (L)	TL1.98 (L)	-	TL2.92	ECN-50 pump	by the body
				TL2.95	tubing B-89	by the body
				TL2.95B		under the coupling
TL3 (L)	Body TL3 (L) Substitute TL3 (L)	TL3	-	TL3.103	ECN-50 pump	by the body
				TL3.103B		under the flange
			103	TL3. 103		by the flange

Sucker rod sockets, ShL, with external gripping

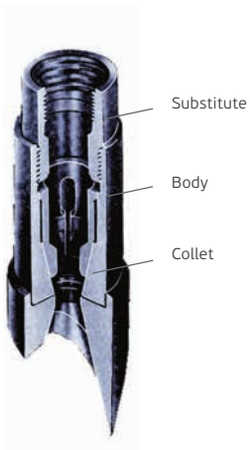
Sucker rod socket ShL1



TECHNICAL CHARACTERISTICS

PARAMETERS	SHL 1	SHL 2 (L)	SHL 3	SHL 4	SHL 5	SHL 6 (L)
Connecting thread	89	73 (73L)	SH22	SH22	SH19	SH22 (SH22L)
	GOST 633-80			GOST 13877-96		
Conditional bore of production string	146	146	89	73	60	73
Allowable axial load, kN	150	150	120	120	80	100
Overall dimensions, mm: - diameter - length	 122 575	 122 485	 68 354	 55 346	 46 310	 59 594
Weight, kg	25.2	19.0	4.3	3.7	2.2	4.8

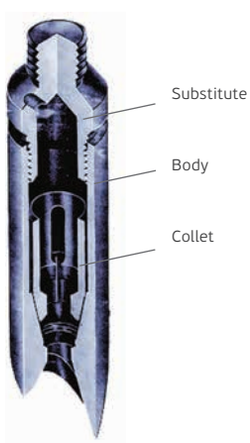
Sucker rod socket ShL2



SUCKER ROD SOCKETS RANGE AND CONFIGURATION FISHES

SUCKER ROD SOCKETS			FISHES		
MODEL	PERMANENT PARTS	CHANGEABLE PARTS COLLET	DESCRIPTION		TYPE OF GRIPPING
ShL1	Body ShL 1 Substitute ShL 1 Bowl ShL 1 Plate ShL 1 (2 pcs.)	-	Sucker rods with diameters 16, 19, 22, 25 mm		Under the shoulder
ShL 2 (L)	Body with Bowl ShL 2-1 (L) Substitute ShL 2 (L)	ShL2.16	Sucker rods with diameters	16 mm	by the body
		ShL2.19		19 mm	
		ShL2.22		22 mm	
		ShL2.25		25 mm	
		ShL2.32	Polished rod with diameter 32 mm		
ShL 3	Body ShL 3 Substitute ShL 3	ShL3.16	Sucker rods with diameters	16 mm	by the body
		ShL3.19		19 mm	
		ShL3.22		22 mm	
		ShL3.25		25 mm	
		ShL3.32	Polished rod with diameter 32 mm		
ShL 4	Body ShL 4 Substitute ShL 4	ShL4.16	Sucker rods with diameters	16 mm	by the body
		ShL4.19		19 mm	
		ShL4.22		22 mm	
		ShL4.25		25 mm	
ShL 5	Body ShL 5 Substitute ShL 5	ShL5.16	Sucker rods with diameters	16 mm	зby the body
		ShL5.19		19 mm	
		ShL5.22		22 mm	
ShL 6 (L)	Body ShL 6 (L) Substitute ShL6 (L)	ShL6.38	Sucker rod couplings with diameter	36 mm	By the coupling
		ShL6.40		40 mm	
		ShL6.43		42 mm	Under the coupling
		ShL6.46		45 mm	

Sucker rod socket ShL3-ShL6



CONTROL STATION INM-3-CHR

ESP pump control stations with frequency converters INM-3-ChR are intended for control of a pump, electric motor, and other equipment installed in the well.



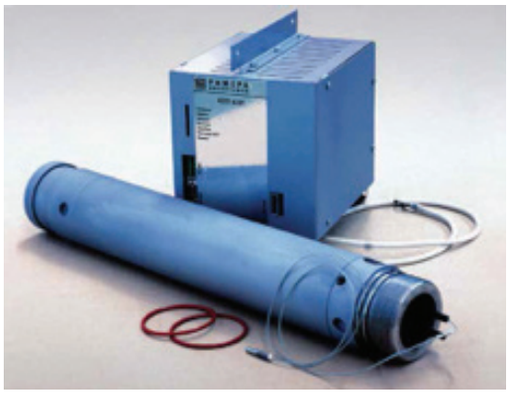
TECHNICAL CHARACTERISTICS

PARAMETERS	VALUE
Nominal voltage, V, at 50 Hz	380
Range of voltage deviation from nominal value	From -30% to 25%
Frequency of voltage output, Hz	0-200
Types of connected submersible electric motors	Asynchronous and synchronous
Method of voltage output generating	Pulse Width Modulation, 2.4-10 kHz, U/F characteristics, 5 points
Range of submersible electric motor rotational frequency, rpm	0-6000
Additional units	Thermo-manometric systems of main manufacturers, Counter SET-4TM, Mercury 6PRS modem
Interfaces, protocols	RS-232 (2 pcs.),RS-485 (2 pcs.), USB, CAN(system), GPRS, ModbusRTU, Region 2000, Telescope
Output filter	Built-in
“By-pass on network” option	Yes
Temperature range, C	From –60 to +50

ADVANTAGES:

- Easy control. It is easy to get any information or adjust the control station with the help of large graphic LCD and a keyboard on the control station controller.
- Easy maintenance. Modular configuration of the control station allows maintenance in situ.
- Support of thermo-manometric system and an electric energy counter. Control stations allow working with submersible telemetry complexes made by different manufacturers and SET-4TM and Mercury electric energy counters.
- Easy data reading. Connection to telemetry control systems Region 2000 and Telescope is provided. Connection can be made via GPRS. Information about previous station operation can be read manually with the help of usual USB Flash.
- Easy upgrade. Control stations can be upgraded, and functional parameters can be extended by reprogramming of the control station controller in situ without controller dismantling.
- Compliance with Unified Technical Requirements of NK ROSNEFT.

SUBMERSIBLE TELEMETRY COMPLEX TMS-4.01



Submersible Telemetry Complex TMS-4.01 allows measuring of extended range of well parameters. It is intended for equipping of hardware-software complex implementing Intelligent Well conception.

MS-4.01 COMPLEX CONSISTS OF:

- Submersible telemetry controller (INM-KPT-4.01);
- Submersible telemetry unit (INM-BPT-4.01).

ADVANTAGES:

- High speed of telemetric data acquisition – main data update mode is 10 seconds;
- Possibility of simultaneous work of the measuring device and exchange with BPT-4;
- Possibility of BPT-4 application almost with all types and versions of submersible units with the help of junctions (due to small diameter 81 mm);
- Possibility to complete the standard configuration of KPT-4 with additional channels of contact and analog inputs/outputs, clocks, and memory for autonomous work;
- General interface for data exchange of KPT-4 with KSU, imitating exchange of SU made by different manufacturers;
- Installation and fixation of KPT-4 in SU similar to surface units made by different manufacturers (Electon).

TECHNICAL CHARACTERISTICS:

PARAMETERS	VALUE
INM-BPT-4.01 UNIT	
Measuring of fluid pressure on pump suction	0.1-40 (60) MPa, ±1%
Measuring of oil pressure in submersible electric motor	0.1-40 (60) MPa, ±1%
Measuring of stator winding temperature in submersible electric motor	10-200°C, ±2°C
Measuring of fluid temperature on pump suction	0-150 °C, ±2°C
Measuring of submersible unit vibrations in X/Y/Z plane	0-5 g, ±5%
Measuring period, s	10
Isolation of submersible unit, kB	Up to 5
Power supply and data transmission	Center tap of submersible electric motor, (50-170V, 900 Hz)
Overall dimensions, mm	534 x 81 x 81
INM-KPT-4.01 UNIT	
Measuring of isolation resistance of the system "TMPN – submersible cable – submersible electric motor"	30-999 kOm ±5%, 1000-9999 kOm ±10%
Communication interfaces	RS-232, RS-485 (Modbus RTU)
Controller power supply	from 110 to 275 V, 50 Hz
Power consumption, Wt	Not more than 150
Number of analog inputs	4 (4-20 mA, ±0,5%) (optionally)
Number of analog outputs	4 (0-10 V, ±0,5%) (optionally)
Number of contact inputs	4 (optionally)
Number of contact outputs	2 (up to 50 mA) (optionally)

MODULAR CONSTRUCTIONS

TECHNOLOGICAL MODULAR CONSTRUCTIONS:

- Fire pump stations
- Modular water pumping stations
- Chemical metering units



HOUSEHOLD MODULAR CONSTRUCTIONS:

- Accommodation buildings for shift personnel
- Offices and amenity buildings
- Special purpose buildings (canteens, medical offices)
- Different purpose mobile housing units on chassis
- Modular buildings of different purpose

Various types of manufactured equipment can be delivered with regard to customer specific technical requirements.



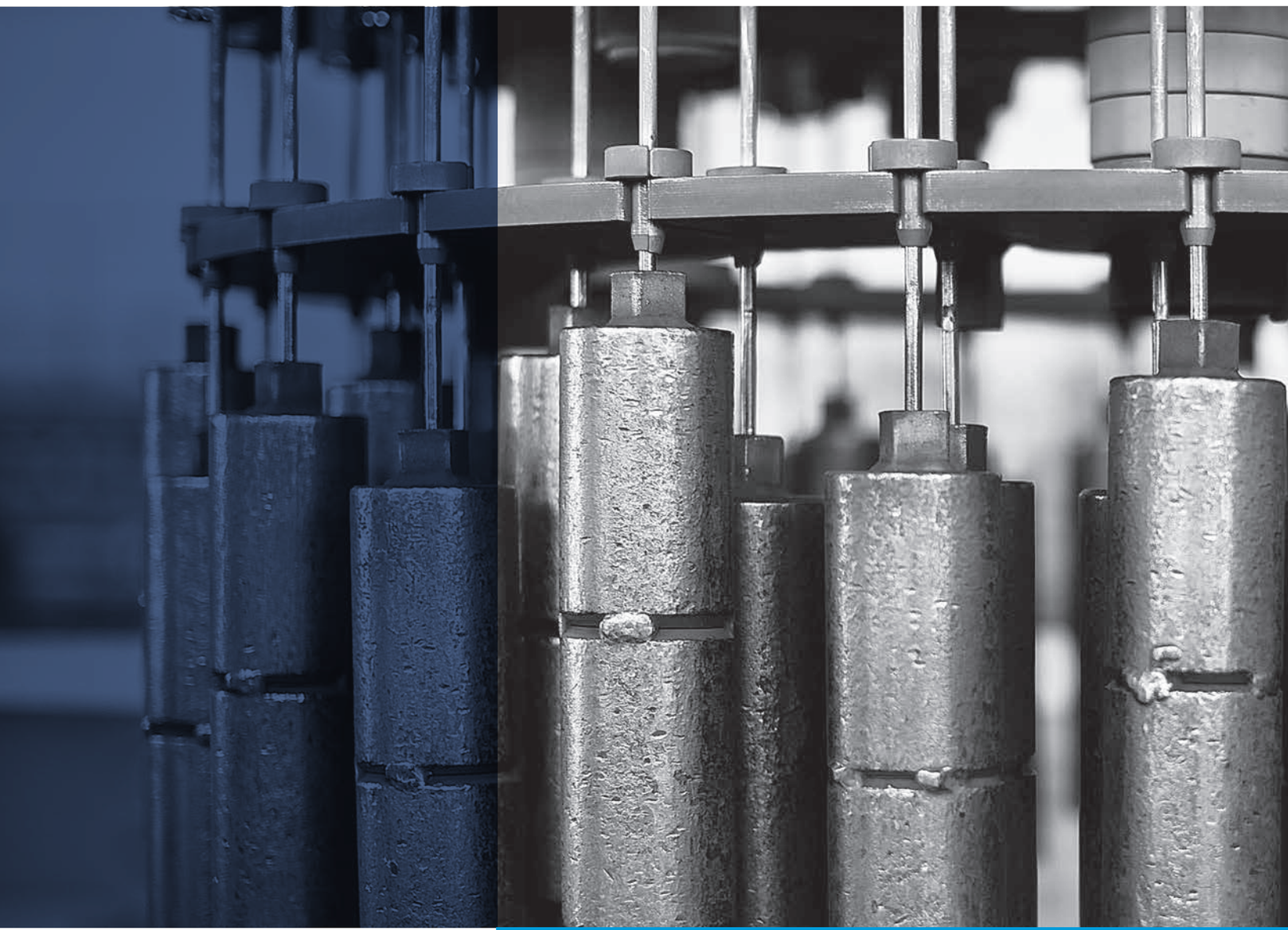
RIMERA
IZHNEFTEMASH

«RIMERA».
EXPANDING POSSIBILITIES
CATALOG

Moscow 2016

EXPANDING POSSIBILITIES

RIMERA
IZHNEFTEMASH



«Izhevsk Plant of Oil Engineering»
(«Izhneftemash»), JSC

2, Ordjonikidze str, Izhevsk,
Udmurt Republic, Russia, 426063
Tel.: +7 (3412) 68-91-91
Fax: +7 (3412) 68-92-12
izhneftemash@rimera.com
www.rimera.com