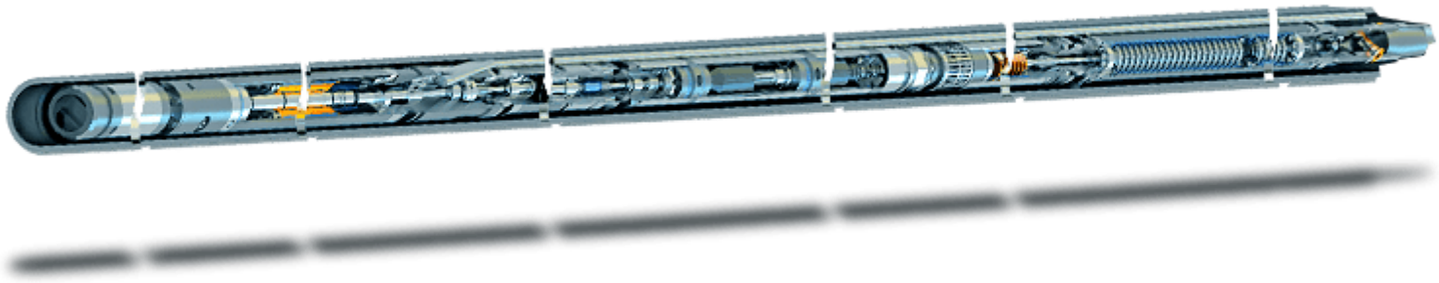
الإمتياز

ALEMTIAZ

ELECTRICAL SUBMERSIBLE PUMP SYSTEM



ABOUT

Alemtiaz represents World-Class company with the track-record and services as listed down below:

NEFTESERVICE

NEFTESERVICE is a manufacturer of complete sets of electric centrifugal pumps for oil production, and oil submersible cables. The company provides rental and maintenance services for submersible and surface equipment for oil production.

THE PLANT INCLUDES:

- Metal workshop
- Mechanical assembly workshop with rubber products manufacturing site
- Submersible equipment production and repair workshop
- Cable cutting and repair workshop with metallurgical area
- Cable manufacturing workshop

LOCALIZATION OF ESP AND OSC COMPONENTS WITHIN THE ENTERPRISE IS 90%

Available testing rigs provide multi-stage quality control of the manufactured equipment and cables.

Average operating time of the manufactured ESPs exceeds 740 days.

25+	**1200+**	**100+**
Years experience	**employees** Company's total Personnel	**Thousand m2** technological Company's production area

PRODUCTION RATE

- Over 500 ESPs per month
- Over 600 km of cable and wire products

AND ALSO PROVIDE SERVICES:

- Servicing 10,000+ wells
- Equipment rental for 5,000+ wells

Nefteservice Trading House (Moscow) sells both the company's products and the products of other company's partners: ESP components and complete ESPs, all types of oil submersible, geophysical, mine and power cables.

Company's products are delivered to large vertically integrated oil companies in Russia and Kazakhstan, to buyers in Latin and North America and the Middle East.

NEFTESERVICE

Nefteservice LLC has implemented more than 50 rental contracts in the Russian Federation with such customers as Rosneft, Russneft, NNK and others.

When implementing rental projects, the following standards are met:
- running time. Surplus of at least 100 days per year
- turnout - 2 - 4 weeks
- simultaneously serviced wells stock - up to 10,000 wells
- introduction of new sets of ESPs - at least 100
- simultaneous operation of five service bases and the main site

Nefteservice LLC has implemented more than 70 service projects in the Russian Federation with Rosneft, Russneft, NNK and others.

During the implementation, the following parameters have been achieved:
- 2,500 repairs of subsurface units per month
- on average, the Company implements about 5 - 8 service projects simultaneously per year

Nefteservice LLC repairs equipment of all Manufacturers, which is used in the Russian Federation, including permanent-magnet motors.
The Company has testing rigs for all ESP elements, cable lines and surface equipment.

SERVICE

The company provides a full scope of services for servicing the stock of wells fitted with ESPs, from the selection of units for wells to the maintenance and overhaul of all ESP assemblies, and also provides rental and leasing of Nefteservice equipment.
The services use an integrated approach to customers, which allows oil companies to operate the wells as efficiently as possible and reduce the oil production costs.

WE OFFER:

- Rental of Nefteservice units
- Equipment service
- Integrated solution for Customer's tasks, no matter how difficult or complex it is

ESP SERVICING:

- Selection and assembly of equipment suitable for well operation conditions
- New equipment incoming inspection
- Wells commissioning and operation monitoring
- ESP submersible equipment components and surface components installation and dismantling
- Well stock operation analysis
- Surface equipment preventive maintenance
- Supervised operation of innovative equipment
- Quick maintenance of ESP and surface electrical equipment during operation, ESP assemblies and surface electrical equipment testing
- Investigation of the ESP and surface electrical equipment failures
- Submersible and surface electrical equipment current repair and overhaul
- Equipment delivery and removal
- Providing ESPs for temporary possession and use, rental/leasing
- Personnel training
- Tubing integrated maintenance and repair

To improve oil production at fields that have entered the late stage of development, improve the marginal wells performance, as well as to engage the higher and lower oil-saturated formations in the development and recover the idle wells, there are **272 series pumps electrically driven centrifugal pumps (ESPs) available. These pumps are recommended for the following applications:**

- Repair wells with patches that reduce the internal flow area
- Exploration slim wells
- Wells with excess curvature of the wellbore
- Horizontal sections
- In side tracks
- In bypass systems for research and monitoring of multi zone production wells and in dual systems both for separate production and for improving the wells turnaround interval (ESPs sequential operation)

Nefteservice produces 272 series pumps units that are fitted with a pump with casing diameter of 69 mm. Max transverse dimension, including the cable, is 81 mm when fitted with an additional module or 86.9 mm without this module.

272 SERIES PUMPS ESP FOR SLIM WELLS AND SIDE TRACKS
ELECTRICAL SUBMERSIBLE PUMPS

PURPOSE

Submersible electric centrifugal pumps (ESPs) and their individual units have been designed to operate as part of a unit for pumping formation fluid from oil wells.

Separate designs of the electrically driven submersible centrifugal pumps can be supplied as booster pumps, or pumps for pumping liquid into the below-packer space to raise or maintain the formation fluid pressure in the FPM systems. Supplies are possible as part of dual-side units for operation with sidetracking systems with an internal diameter of 3,5" **Pumps supply options:**

- by series: 272, 319, 362, 406, 449, 512, 535, 677
- by appointment: conventional, booster or for HPS;
- by productivity from 94 bpd to 15700 bpd;
- by head: up to 3800 m;
- length of the sections (m): 2; 3; 3.5; 4; 4.5; 5; 5.5; 6;
- according to the design of the stage - single-bearing, single-bearing with an extended hub or double-bearing, open type;
- by type of as ESP motor bly: floaters, semicompression, compression;
- by the temperature of the formation fluid: ordinary 110°C (230°F), heat-resistant 135°C (275°F), or extra-heat-resistant temperature versions 170°C (338°F); • in terms of wear resistance (material of steps): can be completed with steps (working bodies) made of cast iron, type I Ni-resist, type IV Ni-resist, powder pseudo-alloys, high-alloy powder alloy, stainless steels and other alternative materials at the request of the customer; • in terms of corrosion resistance: conventional or corrosion-resistant (K) execution;
- by the type of splined shaft design - straight-sided or involute connection;

(thread pitch may vary from the customer's request);

- by the type of connection: body-flange or flange-flange

Manufactured pumps are unified to the maximum possible extent.

Therefore, they are easily serviced at any ESP service **centers**.

ESP MOTORS

PURPOSE

Almaz-Nefteservice produces several types of submersible electric motors (ESP motor): asynchronous submersible three-phase oilfilled motors - ESP induction motor and ESP high voltage motor series, parametric three-phase oil-filled submersible motors - ESP parametric induction motor series, permanent-magnet oil-filled motors with permanent magnets in the rotor - PMM series. Motors can be supplied as a driving unit of the oil production units, for fluid injection into the below-packer space to raise (maintain) the formation fluid pressure (HPS systems), or part of dual-side units.

MOTORS SUPPLY OPTIONS

- by series: 319, 400, 406, 460, 512.
- Thermal resistance - basic, heat-resistant (T) or extra heat-resistant (TT) versions - Corrosion resistance - basic or corrosion-resistant (K) design. Corrosion-resistant design is available in full stainless steel or Monel coated

- Heat-resistant leads

All motors have connecting dimensions unified with national manufacturers. Motors are characterized with high maintainability, including maintenance at any ESP service base. Upon request, we can adapt the manufactured products to different manufacturers.

- Operating shaft rotation - right (clockwise) or left (counterclockwise)
- Shaft spline type - flat or involute connection
- Connection with protector - six-, eight- and ten-point pin version (thread pitch may vary depending on the customer's request)

- Rated power (depending on the design type: ESP induction motor, ESP high voltage motor, ESP parametric induction motor, PMM):

· Size 319 - up to 180 kW;
· Size 400 - up to 210 kW;·
· Size 406 - up to 210 kW;·
· Size 460 - up to 360 kW;
· Size 512 - up to 500 kW.

THE FOLLOWING DESIGN AND PROCESS SOLUTIONS ARE APPLIED IN ALMAZ GROUP MOTORS:

- Radial bearings with anti-rotation device in the stator

- Stator sheets are made with a closed groove and guide elements from rotation relative to each other

- Position of the keyway is marked on the stator housing - an indicator of no rotation of the stator sheets in the housing

- A fluoroplastic tube is used for groove insulation

- Vacuum impregnation with Elplast-220 compound or BC-346/Arnish

- Rotor packs are load-tested before installation in the motor

DOWNHOLE MONITORING SYSTEM

PURPOSE

DMS have been designed to measure and transmit to the control station' controller the current operating parameters of the electric centrifugal pump unit (ESP) in oil wells or horizontal pumping systems (HPS), i.e. the following data (depending on the equipment):

- Formation fluid, motor oil, motor windings temperature
- formation fluid pressure in the ESP suspension area
- vibration acceleration in radial and axial directions
- system insulation resistance: transformer - cable - motor stator winding
- other options (customer-specific)

- Downhole monitoring system consists of a downhole sensor (DHS) and surface unit (SU) - The following downhole monitoring system designs can be delivered to the customer:
- Submersible unit series - 319, 400, 406 (mounted to 460 and 512 motors through connection assembly), size 460
- DHS for dual-side units (a distinctive feature of the dual-side DMS is the configuration with a shaft for transmitting rotation from the motor to bottom protector). - Max measured formation fluid pressure: from 3670 up to 8820 psi.
- Measured temperatures:
· motor oil temperature and formation fluid temperature measurement, with min allowable error of 1.5%, with a resolution of 0.1 °C
· Motor oil temperature, formation fluid temperature and motor winding temperature measurement (the code has the “T” symbol).
- Operating temperature: DHS max 125°C (257°F), 150°C (302°F) or 170 °C (338°F).
- Corrosion resistance: DHS basic or corrosion-resistant (the code has the “K” symbol) versions
- Design - basic, for dual-side units, for conventional dual-side units that can be connected to geological survey equipment - Formation fluid pressure measurement accuracy: basic (DMS-1) and high-precision (DMS-2).

High-precision DMS di ers from the conventional DMS in that it uses more accurate pressure sensors, minimizes the parameter drift over time and has more adjustments and tests..

- If requested by the customer, we can manufacture DMS that supports the new universal TRANSFER exchange protocol.DHS has connecting dimensions unified with national manufacturers.

TMSs are characterized with high maintainability, including maintenance at any ESP service base

PROTECTORS

PURPOSE

Protector has been designed to protect the internal cavity of the electric motor from formation fluid ingress, to compensate for oil volume changes, to transmit the torque from the electric motor shaft to input module's shaft.
Some versions of the protectors can also transmit torque to the ESP shaft (double-side installation).
Protectors can be both conventional (PA) and modular (MPA).
These may differ in the number of bags, labyrinths, bearings, end seals.
These can be for general purpose and higher reliability (up to 4 diaphragms and three end seals).

Protectors supply options:

- by series: 319, 338, 362, 406, 449
- Thermal resistance - basic, heat-resistant (T) or extra heat-resistant (TT) versions
- Corrosion resistance - conventional or corrosion-resistant (K) design. Corrosion-resistant design is available in full stainless steel or Monel coated
- Design - conventional or for double-side installations (mounted from below the motor)
- Operating shaft rotation - right (clockwise) or left (counterclockwise)
- Shaft spline type - flat or involute connection
- Shaft transmitted power - T9 ... T14 yield strength group
- Shaft material - stainless steel or K-monel alloy
- ESP motor connection - with six-, eight- and ten-point pins (thread pitch may vary depending on the customer's request) • Input module (pump) connection - with six-, eight- and ten-point pins

(thread pitch may vary depending on the customer's request)

- Valve design
- Diaphragm design: - With diaphragms; - Without diaphragm
- Bags design: - With bags; - Without bags
- Upon the customer's request, input module can be built into the protector head

All manufactured protectors have connecting dimensions unified with national manufacturers.
Protectors are characterized with high maintainability, including maintenance at any ESP service base.
Upon request, we can adapt the manufactured products to foreign products.

INTAKES

PURPOSE

Intakes have been designed for use with pumps in wells with high gas content and can be installed upstream the pump inlet. Depending on the function type of the inlet handler, they can provide simultaneous separation of the gas-liquid mixture into two fractions or separation and (or) dispersion of the gas-liquid mixture.
If requested by the customer, the gas separators can be upgraded and used for mounting the motor casing.

Intakes supply options:

- by series: 272, 319, 362, 406, 449
- Purpose different configurations: gas separating stage; vortex gas separating stage; dispersing stage; gas separating and dispersing stages; double pump module with gas separating and dispersing stages • Capacity, depending on size: 272 - up to 629 bls/day; 319 - up to 1000 bls/day; 362 - up to 1572 bls/day; 406 - up to 5030 bls/day; 449 - up to 7863 bls/day • Design - supported or unsupported (support in protector)
- Formation fluid temperature: basic 110°C (230°F), heat-resistant 135°C (275°F) or extra heat-resistant 170°C (338°F) • Wear resistance - basic (solids up to 200 ppm), wear-resistant (solids up to 500 ppm), extra wear-resistant (up to 1000 ppm)
- Corrosion resistance - basic or corrosion-resistant (K) design. Corrosion-resistant design is available in full stainless steel or Monel coated

- Operating shaft rotation - right (clockwise) or left (counterclockwise)
- Shaft spline type - flat or involute connection
- Shaft transmitted power - T9 ... T14 yield strength group
- Shaft material - stainless steel or Monel alloy
- Connection - six-, eight- and ten-point version (thread pitch may vary depending on the customer's request)
- Connection type - body-flange or flange-flange

All manufactured intakes have connecting dimensions unified with national manufacturers.

Intakes are characterized with high maintainability, including maintenance at any ESP servicecenter.
Upon request, we can adapt the manufactured products to foreign products.

VALVES

DRAIN VALVE

This has been designed to remove fluid from the tubing string during well workover. There are versions with heavy-duty knock nozzle.

CHECK VALVE

This has been designed to pass the working fluid (drilling fluid, water, formation fluid) in one direction. It shuts the channel when pressure drops from the working fluid supply side during process operations, automatically prevents fluid backflow and retains fluid in the tubing string after the pump stops. Other valve types can also be supplied upon request.

CHECK VALVE SPRING-LOADED

This is used with a pump for pumping fluid into the below-packer space.
The valve shuts the flow channel after the pump stops, and prevents the fluid backflow.

SLUDGE CATCHERS

PURPOSE

These have been designed to protect the check valve and pump from contaminants that may be inside the tubing and deposited during installation and operation.

Two or more sludge catchers can be installed upon customer's request.

THERE ARE TWO OPTIONS FOR THE SLUDGE CATCHER OPERATION:

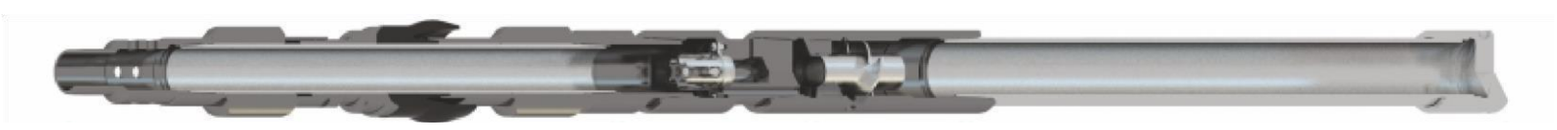
– Installation directly above the check valve supported on the upper end of the special-purpose branch pipe.
At the same time, the bottom end of the tubing, which is screwed into the valve sleeve, acts as a limiter for the sludge catcher

– Installation anywhere in the tubing string with support on the upper end below the tubing.
– In this case, KS bleed valve must be screwed into the sleeve above the tubing, which ensures the fluid drainage from the tubing string sections above the sludge catcher.

MECHANICAL IMPURITIES SEPARATOR

PURPOSE

This has been designed to separate mechanical impurities (sand, sludge) from formation fluid at the pump inlet.



DOWNHOLE MIXER

PURPOSE

This has been designed for mixing fluid from two formations separated by packer, with their simultaneous/separate operation by one lift using ESP for the lower formation and RHM-T pump for the upper formation, as well as for the RHM-T pump installation.

DOWNHOLE CABLE WITH PROPYLENE BLOCK COPOLYMER PTFE INSULATION FOR ESP INSTALLATIONS

ESP cable, flat, PFTE

Heat resistance: 230 (250)°C(446°F)
AWG# 2; 3; 4; 5; 6; 7; 8; 9
Design features: Minimum weight and size
Stay flexible at minus 60°C(minus 76°F)
Permissible voltage 5000 V

Cables, cable lines and extensions for them designed to provide power supply to submersible motors, AC voltage, 30 to 200 Hz, AWG# 2; 3; 4; 5; 6; 7; 8; 9, rated voltage 5000V, operated in certain downhole conditions.

DOWNHOLE CABLE FOR SUBMERSIBLE PUMPS INSTALLATIONS

ESP cable, flat, BC

Heat resistance: 120°C(248°F)
AWG# 2; 3; 4; 5; 6; 7; 8; 9

DOWNHOLE CABLE FOR SUBMERSIBLE PUMPS INSTALLATIONS

ESP cable, flat, BC

Heat resistance: 140°C(284°F)
AWG# 2; 3; 4; 5; 6; 7

Cable with copper core, the first layer of insulation is PMF-S-352 polyimide-fluoroplastic film with 50% overlap, the second layer of insulation is made of a composition of a propylene block copolymer with ethylene, bedding is made of non-woven material, armored with galvanized steel tape, flat.
Short-term (up to 36 hours) overheating up to 160°C (320°F) is permissible.
Permissible voltage 4500V.

04 MOTOR LEAD EXTENSION - MLE

MLE WITH RADIAL - FACE SEAL, SMALL-SIZED

This is used as part of a cable line for three-phase electric current supply to submersible electric for motor size: 319

05 MOTOR LEAD EXTENSION - MLE

MLE WITH RADIAL - FACE SEAL

This is used as part of a cable line for three-phase electric current supply to submersible electric for motor size: 272

CABLE PRODUCTS

PPI-U WIRE Technical Specifications

Wires have been designed for winding of stators in submersible oil-filled electric motors.

Operating temperature: up to 230 °C (446°F).
Min ambient temperature is minus 60°C (minus 76°F).

Wire estimated weight

HEAT-RESISTANT WINDING WIRES WITH POLYIMIDE-FLUOROPLASTIC FILM INSULATION

PVTFI WIRE

Technical Specifications

Wires have been designed for manufacture of winding leads of submersible electric motors that operate with rated voltage of up to 4.5 kV AC and frequency range from 35 to 200 Hz (nominal frequency is 50 Hz). Wires do not lose their operating properties when exposed to temperatures from minus 45 (minus 49°F) °C to plus 230°C (446°F).

Wires can also be used for other applications (for example, a “null” wire for TMS, etc.)

Nominal cross-section of the current-conducting conductors and external diameter

THIN-WALL FLUOROPLASTIC TUBES

Technical Specifications

Tube has been designed for use in DC electrical machines (including electric motors that drive submersible units operated in oil wells and formation pressure maintenance systems), as well as in electrical and radio engineering products operating in aggressive environments and in the temperature range from minus 60 (minus 76°F) to plus 200 °C (392°F).

There are two tube types available:

TP - grooved tube with wall thickness up to 0.27 mm.
TI - insulating tube with wall thickness of 0.34 mm or greater.

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