

Technical proposal

USO-20R1-12 The mixing-averaging unit

The mixing-averaging unit is designed for jet mixing of cement slurry in a container by mixing it with a belt screw, as well as recirculating it with a centrifugal pump. The unit provides the possibility of averaging and simultaneous delivery of cement slurry by centrifugal pumps to the pumping unit for subsequent injection into the well. The unit allows simultaneous delivery of the slurry from one container and preparation of the slurry in another.

Unit consists of the following components:

1 - Chassis KAMAZ 43118; 2 – Bulk storage tank; 3 – Reducer; 4 – Chain gearing; 5 – Transition platform; 6 – Ladder; 7 – Servicing platform; 8 – Loading pipeline (DN 100mm); 9 – Baskets; 10 – Stirrers; 11 – Recirculation pipeline (DN 100 mm); 12 – slurry level indicator (2 pcs.); 13 – Sampler; 14 – Discharge pop joint (DN 125 mm); 15 – Mechanical jacks; 16 – Spotlights; 17 – Hydraulics heat exchanger; 18 - Steam supply fitting pipe; 19 - Recirculation line sampling cranes; 21 – Power take-off box from the chassis transfer case; 23 – Hydraulic pumps; 24 – Hydraulic motors; 25 – Centrifugal pumps; 26 – Oil tank; 27 – Hydraulic pumps drive power take-off box.

The product is designed to work in temperate and cold climates according to GOST 15150-69, climatic version of NF at ambient temperatures from minus 50 to +40 °C, storage up to minus 69 °C. The container consists of two compartments in the lower part is made in the form of a semicircle, with a technological bias. The total Trip tank is 20 m³. The Trip tank of one compartment is 10 m³. Stirrers for mixing slurries are installed in the tank compartments. The heating system provides the possibility of additional heating from the mobile steam heater or steam line of the drilling rig.

The bulk storage tank provides level gauges for each compartment of the tank, the tank is also equipped with a ladder for lifting service personnel to the work site, technological hatches for servicing components and mechanisms in the tank, two outlet collectors for taking cementing slurry from the compartments of the tank and draining water after washing it.

The service platform is installed behind the chassis cab in front of the tank. A hydraulic mixer (ejector mixer) is installed on the site.

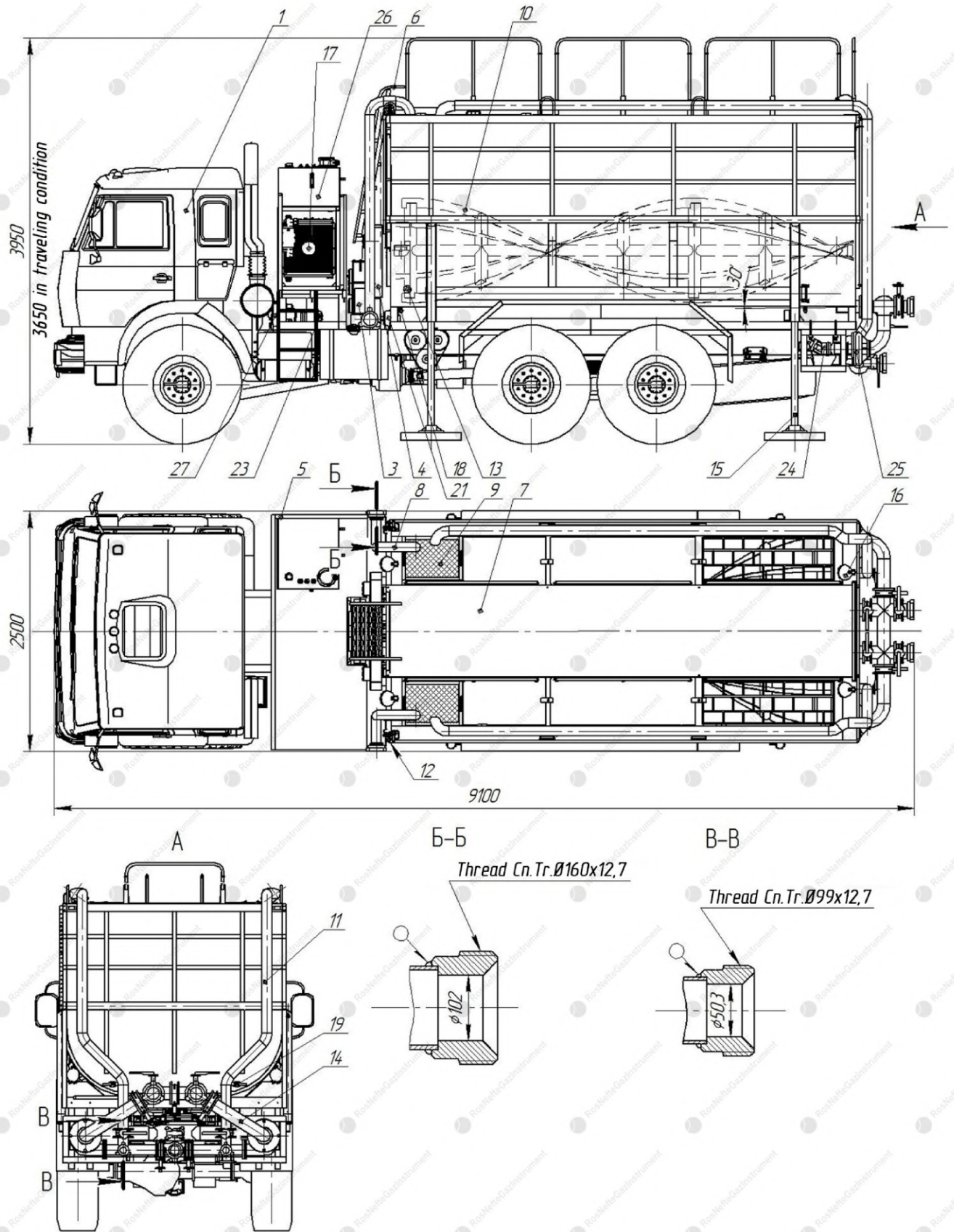
This unit is equipped with two centrifugal pumps NC-100R1 (4"X5") with a Trip tank of up to 3.5 m³/min each with a hydraulic drive (hydraulic motors).

The unit is painted with polyurethane-based paints.

All components to be painted are stripped to pure metal in accordance with the specifications before being primed.



Parameter name	USO-20R1-12
Tank volume, m ³	20 (2x10)
Accumulating slurry density up to, g/cm ³	2,2
Top performance, m ³ /min, min	3,5
Tilt angle of the tank, deg., min	0,5
Nominal diameters of pipeline flow area, mm:	
- receiving	100
- washover	50
- recirculating	100
- intaking	125
Internal coating of the tank	Epoxy primer
Mixer specifications:	
- Functional principle;	Mechanical
- Type;	two-shaft auger-drill
- Rotation rate min, rpm	20-25
Centrifugal pump rate speed, rpm	1900-2400
Unit dimension, mm, max.	
- Length	9100
- Width	2500
- Height	3650
Chassis KAMAZ 43118-3027-50 (Euro 5):	
- engine, brand	KAMAZ 740.735-400 (E-5)
- power, hp	300
- Wheel arrangement	6x6
- Gear box	154
- Cargo Trip tank, tonnes	12,7
- Spare wheel	Behind the cabin
- truck sleeper	one
- starting preheater	14TS-01
- Cabin air heater	Planar
- cabin heat insulation	Install
- Cabin	Restyling
- Cabin color	White
- fuel tanks, l	310+250
- heated fuel intake, filter, mirrors	Install
- battery compartment in thermal insulation design	Install
Centrifugal pumps:	
Brand	NC-100R1
Maximum feed at speed 2400 rpm, l/s	58
Maximum pressure at speed 2400 rpm, kg/cm ²	3,7
Maximum power consumption, kW (HP)	55 (75)



Pic. 1 USO-20R1-12 The mixing-averaging unit.



Plant manifold description.

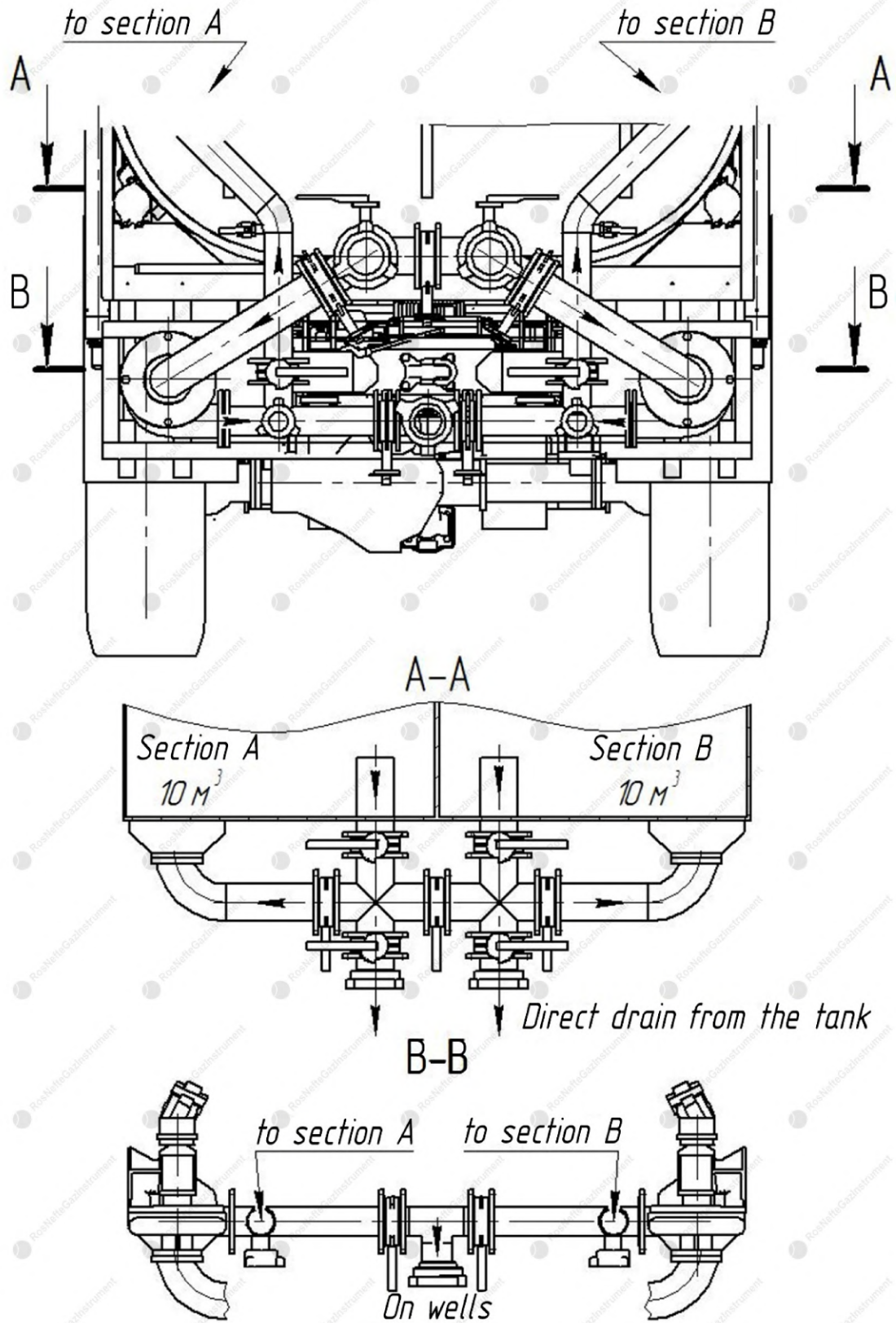
Plant manifold consist of:

- 1) Admission line DN 125 mm (Fig. 2, section A-A). Provides power to each centrifugal pump from any compartment. It is regulated by gate valve shifting. There is also a direct drain from the container through the drain tubes.
- 2) Pressure line DN 100 mm (Fig. 2, section B-B). Provides solution feeding from each centrifugal pump to a specific compartment of the tank or to the well. It is regulated by gate valve shifting. It also provides water supply to the wash ring of the tank. For emergency housing down of centrifugal pumps, entrances with QRC 2" with plugs are provided.
- 3) Loading lines DN 100 mm. Provide capacity loading from an external source. It consists of two filling line in the front part of the tank and one in the back. The rear pipeline be allowed to feed change between compartments. Equipped with QRC 4".

Description of stirrers and centrifugal pump drives.

The stirrers are driven from the car's power take-off box via a chain drive and gearbox.

Centrifugal pumps are driven by hydraulic motors. The hydraulic motors are driven by two hydraulic pumps. The hydraulic drive system of centrifugal pumps consists of two circuits. The power of the hydraulic pump is sufficient to drive one hydraulic motor. If there is no need to operate two centrifugal pumps, it is possible to turn off any pump. The delivery control of centrifugal pumps is carried out by changing the engine speed. A heat exchanger is used to cool the oil.



Pic. 2 Plant manifold.



Additional options

Name	Required equipment
Certified spark killer in the exhaust system	<input type="checkbox"/>
Preheating the starter battery	<input type="checkbox"/>
Moisture disengagement and dehumidification of air system for operation in the Far North;	<input type="checkbox"/>
Installing a truck sleeper in the cabin	<input type="checkbox"/>
Hood insulation	<input type="checkbox"/>
Company color	<input type="checkbox"/>
On-Board vehicle monitoring system (on-Board unit at-10 GLONASS, fuel level sensor FLM, diesel fuel consumption sensor SRT-8 dif. accounting - 2 pcs., IN-protection Module)	<input type="checkbox"/>
Tachograph digital Barcode-Tachorus without GLONASS, CIPF block, Russia or equivalent	<input type="checkbox"/>
Hydropneumatic mixer to the fill line quantity: _____ pcs.	<input type="checkbox"/>
Mixer hydropneumatic on the recirculation line quantity: _____ pcs.	<input type="checkbox"/>
Sampler on the recirculation line	<input type="checkbox"/>
Mixer hydropneumatic SGN-25R2	<input type="checkbox"/>