Design and manufacturing of mechanized equipment

MiMaks

Research and development enterprise

Sales geography of R&D "MiMaks" LLC

- equipment for repair of freight cars
- equipment for repair of passenger cars
- equipment for repair of electric trains
- equipment for locomotives repair
- equipment for repair in mining and oil producing industry
- equipment for repair of underground rolling stock

Contents:

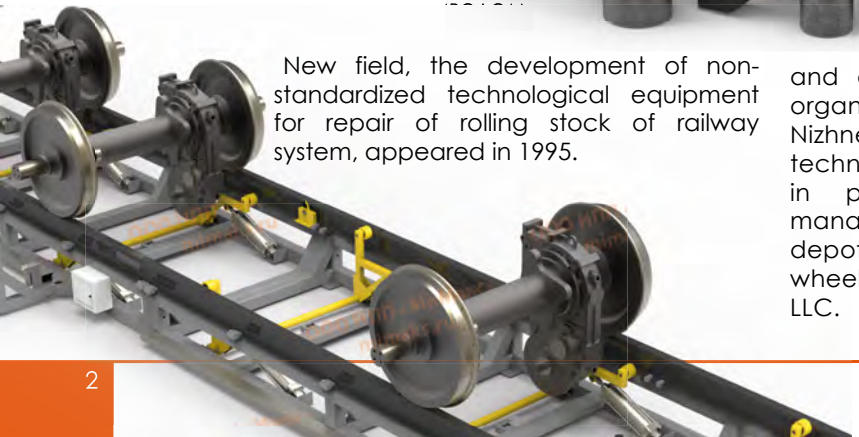
Research and development enterprise «MiMaks»

About the enterprise

Research and development enterprise "MiMaks" was founded in 1991 on the basis of one of the departments of scientific and research institute of heavy and transport machine building (VNIPTIM). The enterprise includes design bureau and plant of non-standardized technological equipment and power-operated tool.

Since the enterprise founding, the main field of work was development of tools for assembling of large threaded joints. Typical range of multiplier wrenches generating torque from 80 up to 1000 Kg*M with both manual and electric drive was developed.

New field, the development of non-standardized technological equipment for repair of rolling stock of railway system, appeared in 1995.

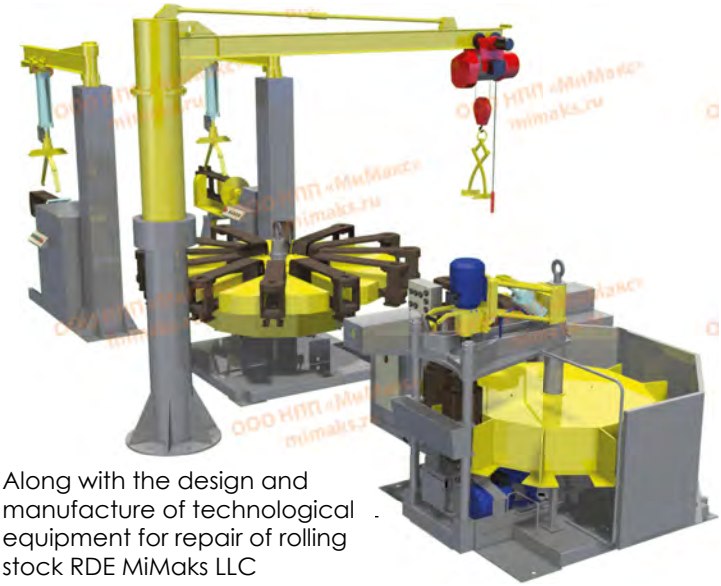


Mechanized systems for assembling and disassembling of axle box units of freight and passenger cars, electric trains, locomotives, mechanized systems of disassembly and assembly of bogies, high- and low-powered manipulators, mechanized lines for repair of wheelsets etc. were developed and implemented.

Works connected with equipping of wheel and bogie workshops of more than 50 repair enterprises of RZD OJSC, Moscow Metro SUE and other big owners of rolling stock have been performed by now.

Among other big projects performed by RDE MiMaks LLC, the following can be pointed out: comprehensive equipping with technological equipment and electric engine house Mitino of Moscow metro, organization of repair of the wheelsets at Nizhnekamskneftekhim PJSC, development of technological line of repair of the wheelsets and bogies in passenger car depot of Mineralnye Vody, management of repair of car bogies in the locomotive depot Zheleznodorozhnaya, comprehensive equipping of wheel workshop of Siberian Railway Car Repair Company LLC.

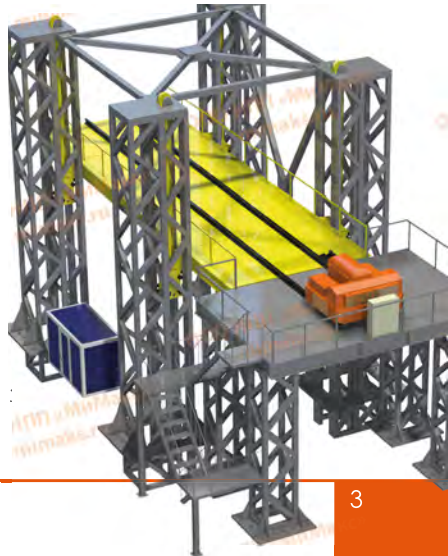
About the enterprise



Along with the design and manufacture of technological equipment for repair of rolling stock RDE MiMaks LLC cooperates with enterprises of mining and oil and gas industry. Particularly, systems for repair of hydraulic cylinders of different range, manipulators of gate valves for oil pipe lines, multiplier wrenches for tightening of threaded joints of main oil and gas pipe lines and other technological equipment were designed, manufactured and successfully put into production.

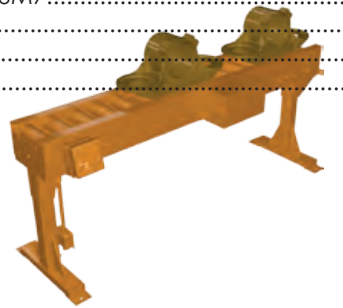
RDE "MiMaks" is a dynamically developing enterprise which has more than 25 years of cooperation experience with leading enterprises of RF. Availability of its own design bureau and productive capacities allow to perform the full cycle of creating of new equipment: development of technical proposal, design of a product, its manufacture and full implementation with further warranty and post-warranty maintenance.

The production range of the enterprise is more than 100 items and it is annually replenished with new products, each product is constantly updated and undergoes modification to comply with certain production conditions. Work in close cooperation with the customer, availability of intellectual and productive capacities allow the enterprise to solve technical tasks within the shortest time and with high quality.



Equipment for repair of railway rolling stock

Mechanized lines and equipment for transportation



Systems for transportation of units and parts of rolling stock CT

Systems of transportation are intended for transporting units or parts (in automatic or semi-automatic mode) to different technological locations according to the standard technological process.

Configuration and composition of the transportation system of units and parts of rolling stock depend on different production conditions and are determined on the basis of technical requirements provided by the customer.

Examples of transportation systems

System of bearings transportation, suggested composition:
1.Lifting devices of bearings;
2.Lowering devices of bearings;
3.Trays for bearings (single-strand and double-strand);
4.Bearings stops;
5.Devices for combination of trays with bearings;
6.Bearings stops;
7.Storage units for bearings;
8.Intermediate posts.

Approximate composition of wheelsets transportation system:
1.Turntables of wheelsets by 90 and 180 degrees (with automatic swing);
2.Devices for lifting wheelsets onto the elevated track;
3.Lowering devices for wheelsets;
4.Shutdown mechanisms of wheelsets;
5.Wheelsets pushers;
6.Elevated track (trestle);
7.Supporting mechanism of reduction gear shank;

System of transportation of bogies, approximate composition:
1.Turntable for bogies by 90 and 180 degrees;
2.Shutdown mechanisms of bogie;
3.Bogie pushers;
4.Transporter bridges;

Systems of axle boxes transportation, approximate composition:
1.Chain plate conveyors;
2.Roller conveyers;
3.Devices for swinging of axle boxes;
4.Gravity slides
5.Storage units

Example of version of bearings transportation system

System of bearings transportation to the assembly area with mechanisms of lifting, lowering, swinging, storage and delivery of bearings.

Composition of the system:

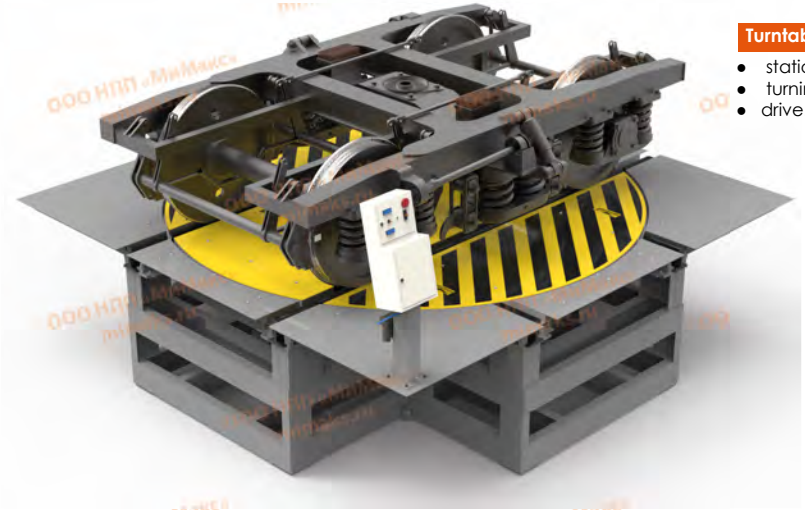
- input tray
- lifting device of bearings
- transport boats with storage units
- posts
- intermediate lifting devices for 300 mm, 2 pcs in total.
- lowering device for bearings
- output tray

Mechanized lines and equipment for transportation

Turntable for bogies MM375

Turntable is intended for turning of car bogies. It consists of the supporting frame, turning platform and turn drive. The railtrack is installed on the turning platform, and the center of rotation coincides with axial crosses of the process routes.

Rotation is provided by a bearing assembly. Wheeled transport with the load per axle of up to 50 ton is allowed to pass in a circle.



Technical specifications:	
Weight-carrying capacity, t	10
Voltage, V	380
Capacity, kW	5
Overall dimensions:	
table diameter, m	3,6
length, mm	4000
width, mm	3600
height, mm	800
weight, kg	5500

Turntable consists of:

- stationary frame;
- turning frame;
- drive.

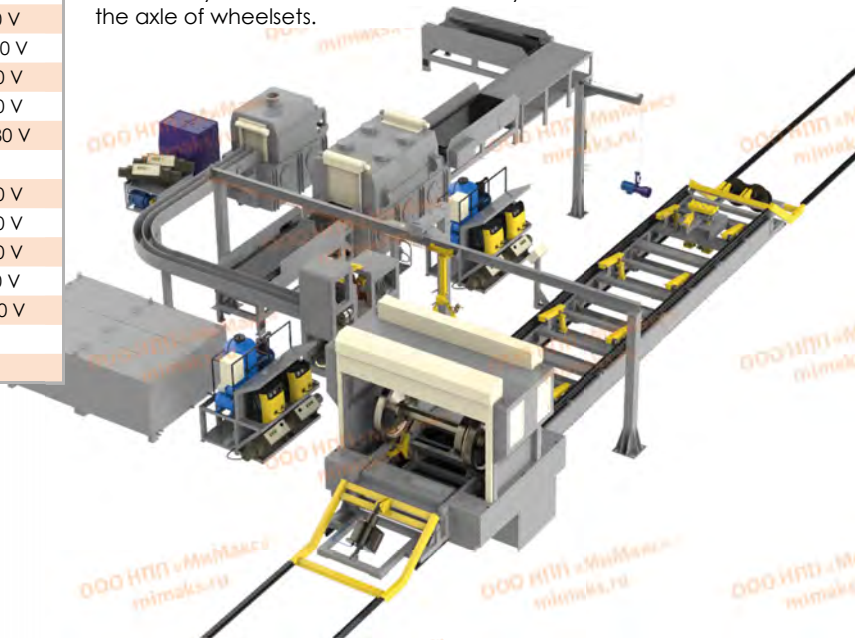
Mechanized line of axle boxes repair MM505

Technical specifications:	
Installed capacity of the disassembly area of axle boxes	
Mechanized trestle	1.0 kW, 380 V
Washing of wheelsets	90.6 kW, 380 V
Washing of axle boxes bodies	79.0 kW, 380 V
Plate conveyor (2 pcs.)	4.0 kW, 380 V
Installation of induction heating	25 kW, 380 V
Washing of bearings	22.6 kW, 380 V
Stand of disassembly of axle boxes	2.0 kW, 380 V
Stand of bearings pressing-out	0.5 kW, 380 V
Total installed capacity	224,7 kW 380 V
Installed capacity of the assembly area of axle boxes	
Mechanized trestle	1.0 kW, 380 V
Plate conveyor	2.0 kW, 380 V
Stand of disassembly of axle boxes	2.0 kW, 380 V
Installation of induction heating	25 kW, 380 V
Total installed capacity	30,0 kW 380 V
air pressure in pneumatic circuit, MPa	0,4…0,6
air consumption, m^3/h	12,0

Mechanized line is intended for performing of set of works related to the repair of axle boxes units and it consists of disassembly and assembly areas.

Disassembly area is intended for performance of disassembly, washing of axle boxes and parts of axle boxes units of the rolling stock.

Assembly area is intended for assembly of axle boxes units on the axle of wheelsets.



Electromechanical lift-and-turn device of wheelsets MM308

Device is intended for lifting wheelset to the required height and turning it by any angle.

The device can be installed on the floor level or on the elevated track, the wheelset is gripped by the wheel flanges.

Technical specifications:	
air pressure in pneumatic circuit, MPa.	0,63
total installed capacity, kW.	0,5
supply voltage, V.	220
air consumption, m3/h	6
height of lift, mm.	100…500
turning angle, degrees	90 or 180
operation mode	semi-automatic
overall dimensions, mm.	1510x1030x1054
weight, kg.	700

Device includes the following main units:

- Support assembly;
- Grippers;
- Pneumatic cylinders;
- Turning unit with geared motor;
- Protective housing;
- Body;
- Central rod;
- Control panel;
- Air-preparation unit.

Lift-and-turn device of wheelsets MM380

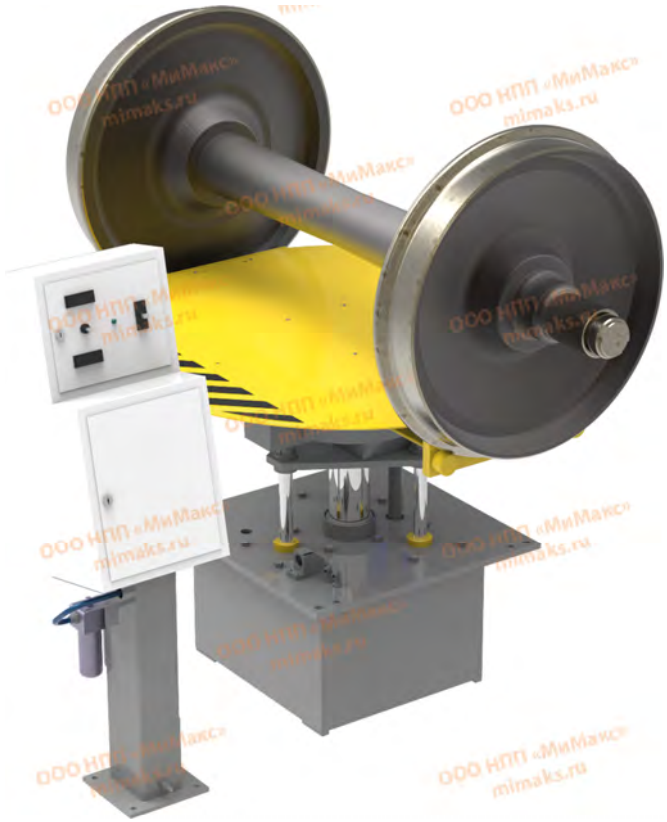
Device is intended for lifting wheelsets to the required height and turning by 90° or 180°.

The device can be installed on the floor level or on the elevated track, the wheelset is gripped by wheels flanges.

Technical specifications:	
air pressure in pneumatic circuit, MPa.	0,63
total installed capacity, kW	0,5
supply voltage, V	220
air consumption, m^3/h	6
height of lift, mm.	100…500
turning angle, degrees	90 or 180
operation mode	semi-automatic
overall dimensions, mm.	1510x1030x1054
weight, kg.	700

Device includes the following main units:

- Support assembly;
- Grippers;
- Pneumatic cylinders;
- Turning unit with the pivot actuator;
- Body;
- Central rod;
- Control panel;
- Air-preparation unit



Mechanized trestle MM256

Trestle is intended for operations connected with lifting, lowering and moving of wheelsets from one repair position to another, and also for their turning on working positions by 180

Technical specifications of the system:	
Supply voltage, V	220
Air pressure in pneumatic circuit, MPa.	0,63
Air consumption, m^3/h	0,4
Height of elevated track, mm	upon requirement
Decline (in the direction of travel)	1:400
Overall dimensions of trestle:	
length, mm	upon requirement
track width, mm	1520
height, mm	minimum 400
operation mode	automatic

Trestle includes the following main units:

- elevated rail track*;
- wheelsets lifting device;
- wheelsets lowering device;
- lift-and-turn devices of wheelsets on technological positions;
- device for wheelsets positioning and moving;(from one technological position to the other)
- air-preparation unit;
- pneumatic panel;
- trestle control panels;

** - Elevated rail track is a spatial structure with the decline in the direction of travel 1:400. Elevated rail track consists of different sections and it serves for fixing of rails and main trestle mechanisms to them.*

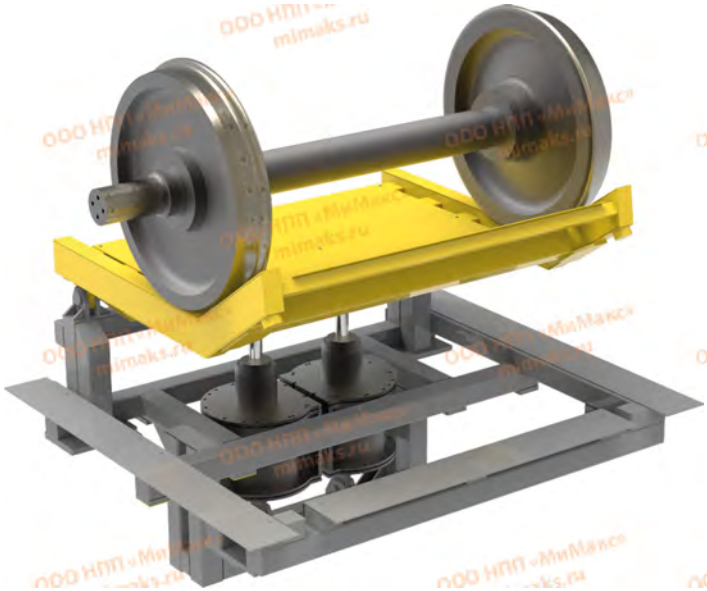
Lifting and lowering device of wheelsets MM216

Lifting device is intended for lifting of the wheelset from the main track to the elevated one. Lowering device is intended for lowering of the wheelset from the elevated track to the main one.

Technical specifications:	
Air pressure in pneumatic circuit, MPa.	0,63
Required air consumption, m^3/h	0,17
Operation mode	semi-automatic
Height of the elevated track, mm	485
Overall dimensions of trestle:	
length, mm	1300
width, mm	1920
height, mm	820
Weight, kg.	440

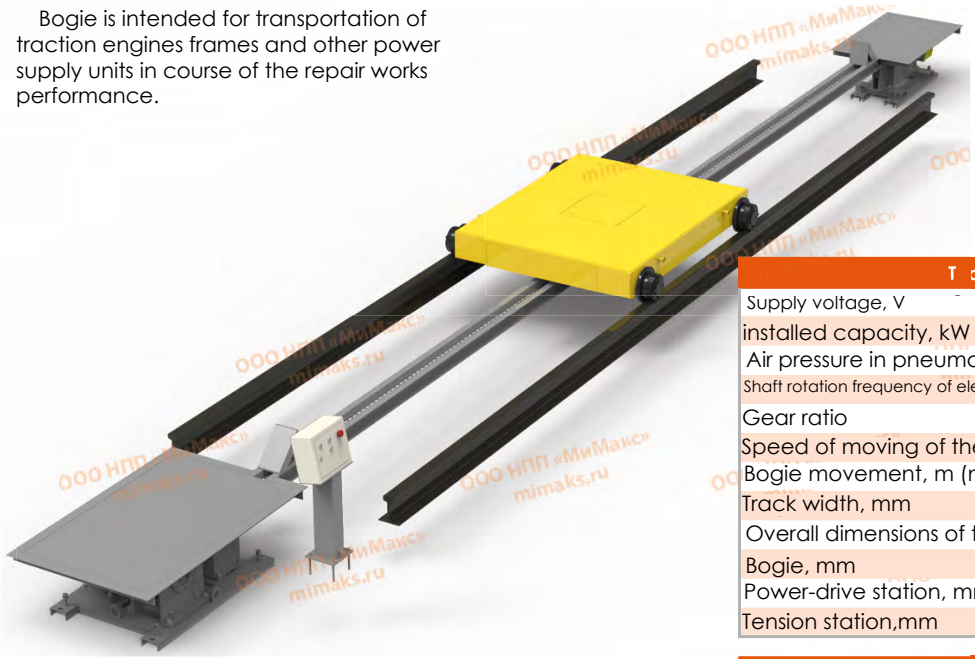
Lifting device consists of the following main parts:

- Support frame;
- Turning frame;
- Pneumatic cylinder(s);
- Pneumatic control stands



Freight bogie with cable drive MM306T

Bogie is intended for transportation of traction engines frames and other power supply units in course of the repair works performance.



Technical specifications:	
Supply voltage, V	380
installed capacity, kW	2,2
Air pressure in pneumatic circuit, MPa	0,63
Shaft rotation frequency of electric motor, min-1	930
Gear ratio	63
Speed of moving of the bogie, m/sec	0,216
Bogie movement, m (not less)	10
Track width, mm	1520
Overall dimensions of the device:	
Bogie, mm	1800x1700x300
Power-drive station, mm	1150x785x465
Tension station,mm	930x455x460

Device includes the following main units

- tension station;
- bogie;
- bogie stops;
- continuous cable with coupling device;
- control panel;
- power-drive station.

Lifting and lowering device of bearings MM100

Lifting device is intended for lifting of axle box unit bearings in order to change their transportation level.

Lowering device is intended for lowering of axle box unit bearings in order to change their transportation level.

Height and speed of lifting (lowering), number of loading places and other main parameters are determined upon agreement with the customer.

Technical specifications:	
operation mode	automatic
height of bearings reception, mm	(Upon the customer's requirement)
height of bearings delivery, mm	(Upon the customer's requirement)
drive	electric
voltage, V	380
frequency, Hz	50
capacity, kW	0,75
Overall dimensions:	
length, mm	810
width, mm	800
height, mm	(Upon the customer's requirement)
Weight, kg.	Depends on version

Lifting device consists of the following main parts:

- frame with guides for bearings;
- upper shaft with sprocket and chain tensioner;
- lower shaft with sprocket;
- chains with bearings grippers;
- trays made of channel bars;
- drive;
- control panel.

Structure and operation of lifting device

Frame of the lifting device is made of metal structure of box shape, with holes in the base for foundation bolts. Also a drive, consisting of geared motor, is installed on the frame base. The drive rotates the lower shaft with sprockets through the coupling. Upper shaft is designed to move for tensioning the chain. Chain consists of two closed chains connected with each other by several pairs of angle bars, which grip and lift bearings. Bearings are rolled along the transport tray to the lifting device and move up along the guiding vertical tray of the frame, the next bearings are rolled in the made space. In the upper position, bearings are bumped into a chipper and roll onto the upper tray.

Structure and operation of the lowering device is similar.

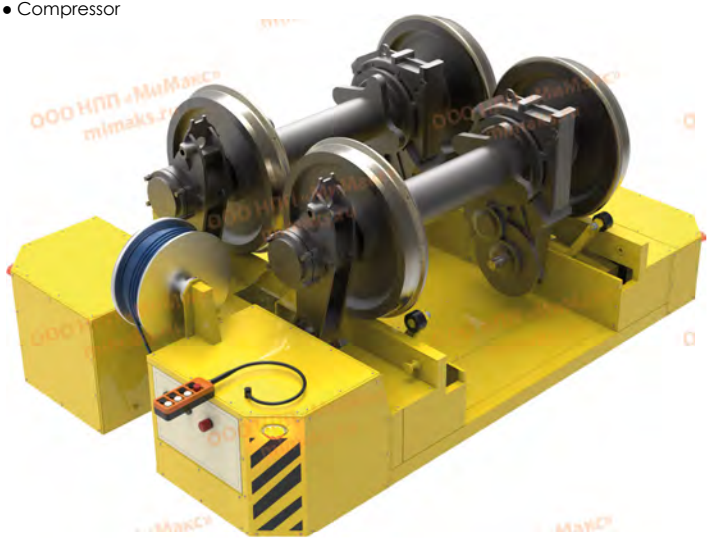
Lifting device structure provides operation in automatic mode (continuous chain rotation).

Transportation bogie of wheelsets MM306M2

Bogie is intended for transferring wheelsets between elevated tracks, located perpendicular to the bogie movement direction. The bogie is equipped with the system of automatic loading and unloading of wheelsets.

The bogie composition

- Frame.
- Guiding beams.
- Two loose wheels.
- Two driving wheels.
- Two two-sided levers.
- Pushing rollers.
- Compressor
- Cable drum
- Control cabinet
- Control panel
- Light and audible signalling.



Technical specifications:	
Track width, mm	1520
Height of receiving area of the bogie, mm	600
Distance of transportation, mm	53100
Supply voltage, V	380
Frequency, Hz	50
Installed capacity, kW	4,5
Maximum pressure of compressor, MPa	0,8
Compressor productive capacity l/min	260
Number of loaded wheelsets	1-2
Weight-carrying capacity, kg	5000
Conveying speed, m/min	24
Overall dimensions, mm	3390x2170x1210
Weight, kg.	1352

Operation procedure

In its initial position, the bogie is in front of the elevated track from which transportation of the wheelset is performed.

After loading the bogie, the bogie wheel drives are put into operation, and the bogie transports wheelsets to unloading position. At this, the light and audible signalling are switched on.

At reaching the unloading position (the bogie stops in such way that its guiding beams are set in front of the elevated track). Unloading of the wheelsets is carried out to the elevated track in an order reverse to their loading.

Cable recovered from cable drum is laid in a channel located in the floor and it does not obstruct the passage of workshop vehicles

Transportation bogie (ferry) MM306M1

Technical specifications:	
Track width, mm	1520
Height of receiving area of the bogie, mm	not less than 400
Distance of transportation, m	acc. to tech. requirements
Supply voltage, V	380
Frequency, Hz	50
Installed capacity, kW	2,24
Maximum pressure of compressor, MPa	0,63
Compressor productive capacity, l/min	210
Number of loaded wheelsets	1
Weight-carrying capacity, kg	2500
Conveying speed, m/min	24
Overall dimensions, mm	2620x1400x790
Weight, kg.	1270

Operation procedure

In its initial position the bogie is attached to the elevated track, from which transportation of the wheelset is performed.

After loading the bogie, the bogie wheel drives are put into operation, the bogie moves to the elevated track on which the transportation of the wheelset is performed (at this, the light and audible signalling are switched on) and the bogie is attached to it.

Unloading of the wheelset is performed to the elevated track after the bogie stop in order reverse to its loading

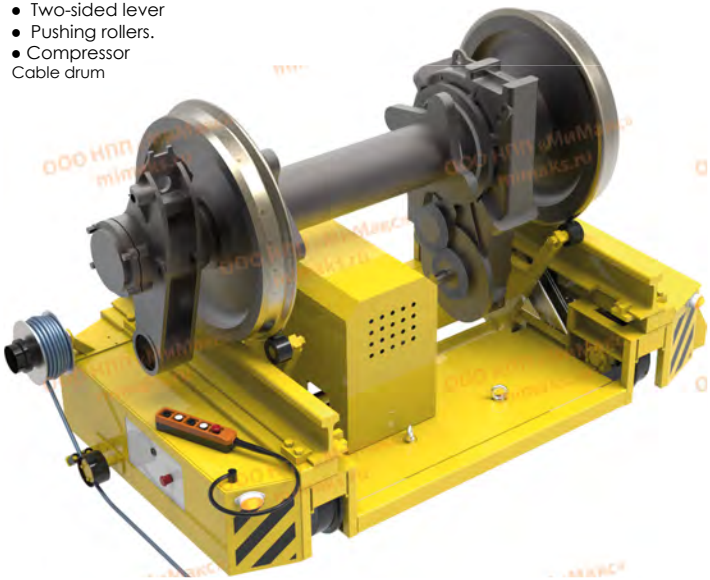
Cable recovered from cable drum is laid in a channel located in the floor and it does not obstruct the passage of workshop vehicles

Bogie is intended for wheelset transportation through the passage between sections of the elevated track. The bogie is equipped with system of automatic loading and unloading of wheelsets.

The bogie consists of:

- Frame
- Rails
- Two loose wheels
- Two driving wheels
- Two-sided lever
- Pushing rollers.
- Compressor
- Control cabinet
- Control panel
- Light and audible signalling

Cable drum



Mechanized lines and equipment for transportation

Turntable of wheelsets MM307

Turning device is intended for turning of wheelsets by 90° and 180° at the floor level (workshop rails).

Technical specifications:	
Weight-carrying capacity, kg	4
Supply voltage, V	380
Installed capacity (not more than), kW	2,5
Operating pressure of pneumatic circuit, MPa	0,63
Air consumption, (not more than) m^3/h	1,0
Track width, mm	1520
Diameter of the turning platform, mm	1900
Thickness of turning platform plate, mm	10
Turning angle, degrees	90° and 180°
Overall dimensions, mm	2200×2200×500
Weight, kg.	1050

Turning device constists of the following main parts:

- Stationary frame
- Turning frame with rails;
- Turn drive;
- Pneumatic fixing mechanism;
- Control panel (located according to design)

Operation procedure

In its initial position, the lever pins for limiting wheelset movement are hidden in holes of the turning frame body.

Wheelset is rolled on rails of the turning frame so that the wheel is set between the pin holes of the lever for limiting wheelset movement. By switching on the correspondent button, pneumatic cylinder of lever for limiting wheelset movement runs into operation. Pins of lever for limiting wheelset movement, coming from holes of the turning frame body, block the movement of the wheelset when it turns. Then turn drive is switched on and the platform turns to one or another side by ninety/ one hundred eighty degrees till the turning frame rail track aligns with the rail technological way. By switching on the correspondent button, pneumatic cylinder of lever for limiting wheelset movement is switched off, and pins return into initial position by sinking in holes of the turning platform housing.

Handling bogie for electric locomotive body ВЛ ММ376

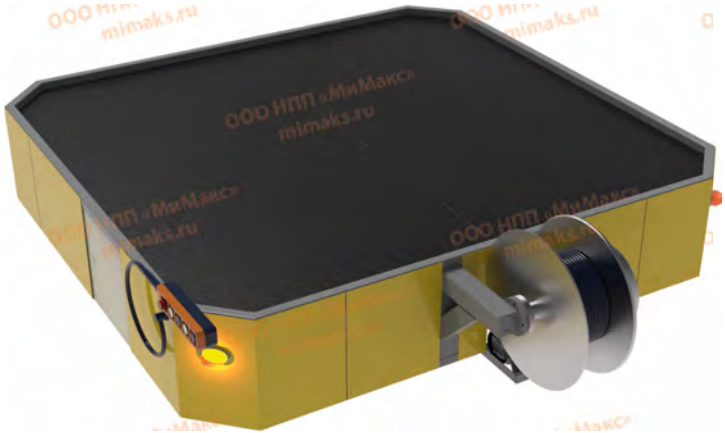
Technical specification	
Weight-carrying capacity, kg (max.)	30 000
Track width, mm	1520
Overall dimensions, mm	2320x2530x1192
Weight, kg.	2090

The bogie consists of the following main units:

- two longitudinal stops;
- two side supports;
- frame;
- two wheelsets;
- four units of wheelsets suspension;

Bogie (together with another similar bogie) is intended for moving of electric locomotive body section ВЛ-10 to technological positions.

Handling railway bogie MM306M7



Bogie is intended for transportation of different freights.

Field of application:

- for transfer of items between technological positions.
- for moving of freights and items between plant workshops.

Different accessories and mechanisms can be installed on the bogie upon the customer's request (sides, stops, support assemblies, loading and loading and unloading mechanisms etc.)

Spring or driving cable drum is used for power supply. Cable recovered from cable drum is laid in a channel located in the floor and it does not obstruct the passage of workshop vehicles

To provide safe operation the bogie has different block systems and also light and audible signalling.

The bogie consists of:

- frame,
- loading platform;
- two loose wheels,
- two driving wheels with drives,
- cable drum,
- control cabinet,
- control panel;

Technical specification:	
Track width, mm	1520
Supply voltage, V	380
Frequency, Hz	50
Installed capacity, kW	2,0
Weight-carrying capacity, kg	up to 10
Conveying speed, m/min	24
Transportation distance, m	up to150
Overall dimensions, mm	2500x2200x500
Weight, kg.	1130

Plate conveyor MM313

Plate conveyor is intended for transportation of freights. Lengths of conveyors, load-carrying capacity and other parameters are determined upon agreement with the customer.

Transportation line, consisting of several conveyors, can be equipped with specialized reloaders for change of transport flow direction.

The conveyor consists of the following main units:

- tension mechanism;
- control panels;
- frame;
- plate roller chain;
- drive mechanism;

Technical specification	
supply voltage, V	380
frequency, Hz	50
installed capacity of one section, kW	0,37
frequency of rollers rotation, min^{-1}	47,5
linear speed of movement, m/sec	0,22
overall dimensions	upon requirement

Reloader MM276

Reloader serves for change of the direction of freight flow in a transport line, consisting of several conveyors. Operation procedure, component layout and technical parameters are determined within the process of transportation line design.

Technical specification	
Supply voltage, V	380
Frequency, Hz	50
Operation mode	automatic
Air pressure in pneumatic circuit, MPa	0,63
Air consumption, m^3/h	0,4

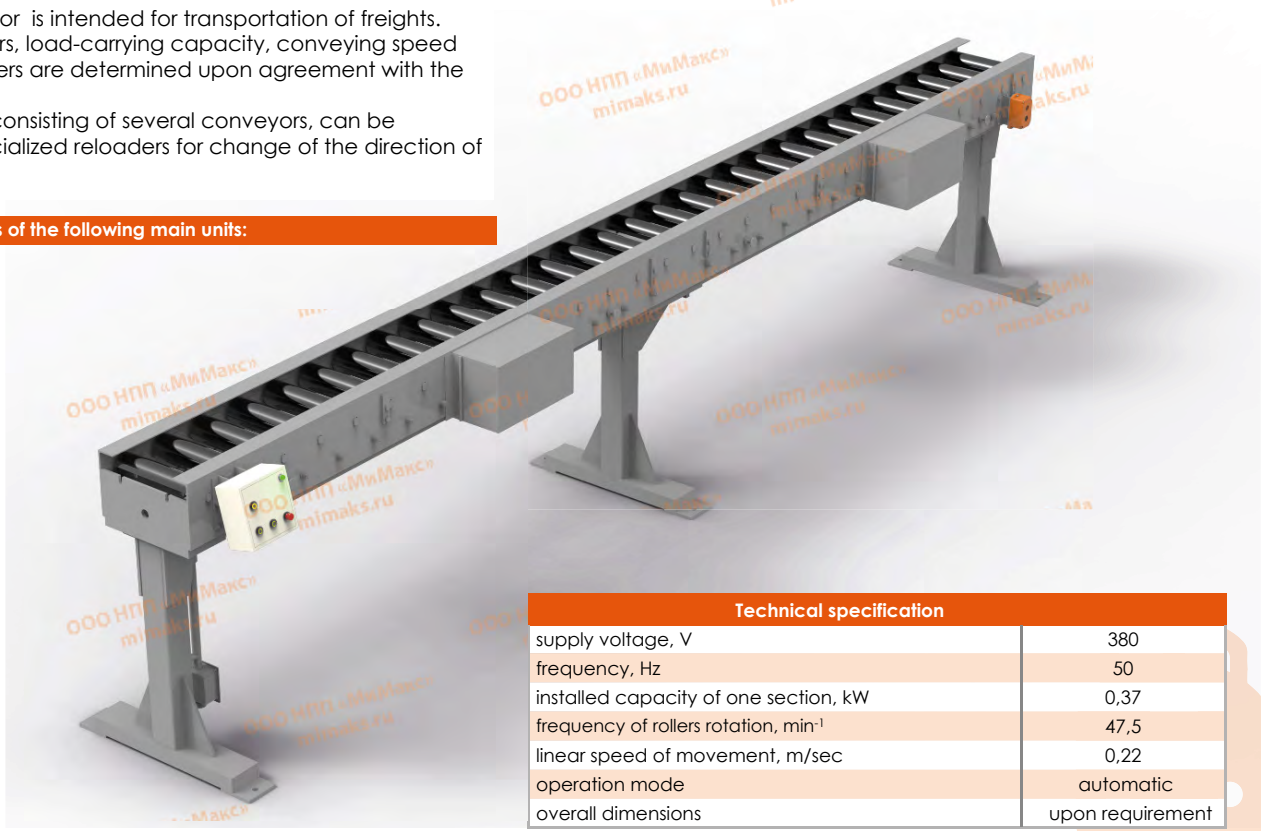
Mechanized lines and equipment for transportation

Roller conveyor MM263

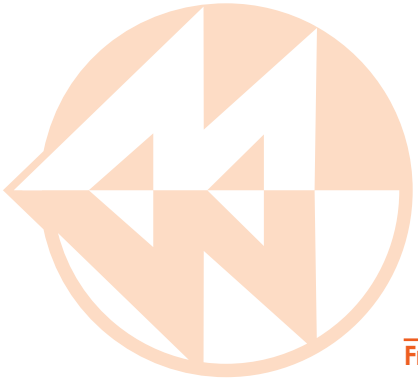
Driven roller conveyor is intended for transportation of freights. Lengths of conveyors, load-carrying capacity, conveying speed and other parameters are determined upon agreement with the customer.
Transportation line consisting of several conveyors, can be equipped with specialized reloaders for change of the direction of transport flow.

The conveyor consists of the following main units:

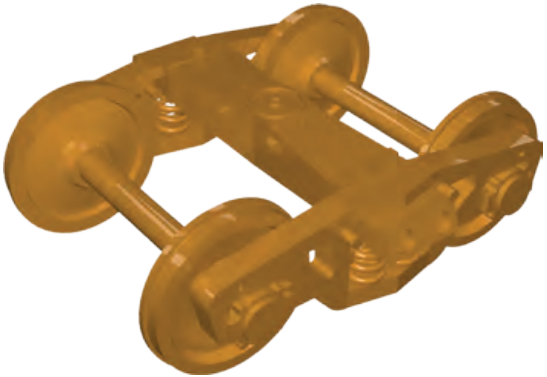
- driven rollers;
- rotary drives
- frame;
- control panels;
- supports



Technical specification	
supply voltage, V	380
frequency, Hz	50
installed capacity of one section, kW	0,37
frequency of rollers rotation, min^{-1}	47,5
linear speed of movement, m/sec	0,22
operation mode	automatic
overall dimensions	upon requirement



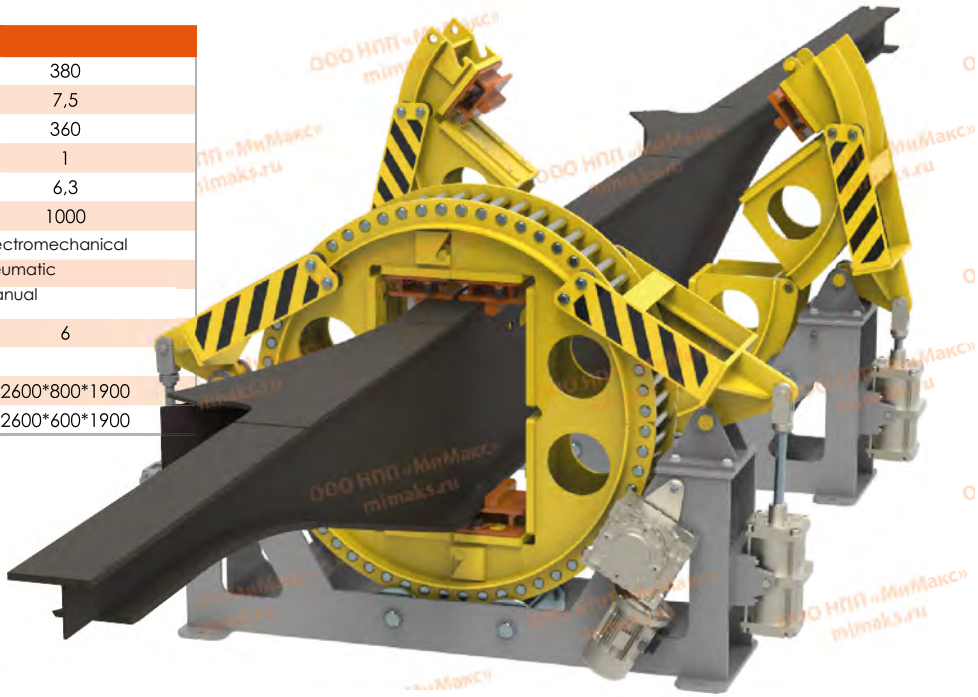
Equipment for repair of bogies



Ring manipulator MM842

Ring manipulator is intended for retention and tilting freight cars units by 360° in course of technological assembly and welding operations.

Technical specification	
Supply voltage, V	380
Main drive power, kW	7,5
Turning angle of the rotary unit, degrees	360
Rotation frequency, not less than, rpm	1
Air pressure in pneumatic circuit, Bar	6,3
Height of rotation axis (from the floor level), mm	1000
Drive of rotating mechanism	electromechanical
Opening drive of rings	pneumatic
Control mode	manual
Load-carrying capacity, min t.	6
Overall dimensions of supports, mm	
Driving	2600*800*1900
Guided	2600*600*1900



Mechanized system of disassembly

System is intended for disassembly and removal of main units and parts from bogies of electric trains and passenger cars with the purpose to send them for defects detection and repair and also for their further installation and assembly on the bogie frame. The system is delivered in one of three versions:

- ММ198У - multi-purpose system for disassembly of motor and trailer bogies.
- ММ198П - for disassembly of trailer (passenger) bogies;
- ММ198М - for disassembly of motor bogies;

For unfastening of threaded joints the system is equipped with electromechanical power wrenches of own production.

The system consists of the following main units:

- control panels of system mechanisms;
- frame;
- mechanisms for compression of springs of bolster suspension;
- dual-spindle power wrenches for anti-rattle nuts unfastening;
- mechanism of bogie centering;
- mechanism of bogie movement;
- jib cranes with electric hoists;
- two-elbow suspensions of power wrenches with power wrenches;
- rack cabinet;
- set of replacement tools and accessories.

Technical specification	
Supply voltage, V	380
Installed capacity, kW	45
Air pressure in pneumatic circuit, MPa	0,63
Air consumption, m^3/h	0,22
System overall dimensions:	
length, mm (without device for bogies movement)	6600
width, mm	5500
height, mm	2500
weight, kg	6500
productive capacity, number of bogies/shift	4

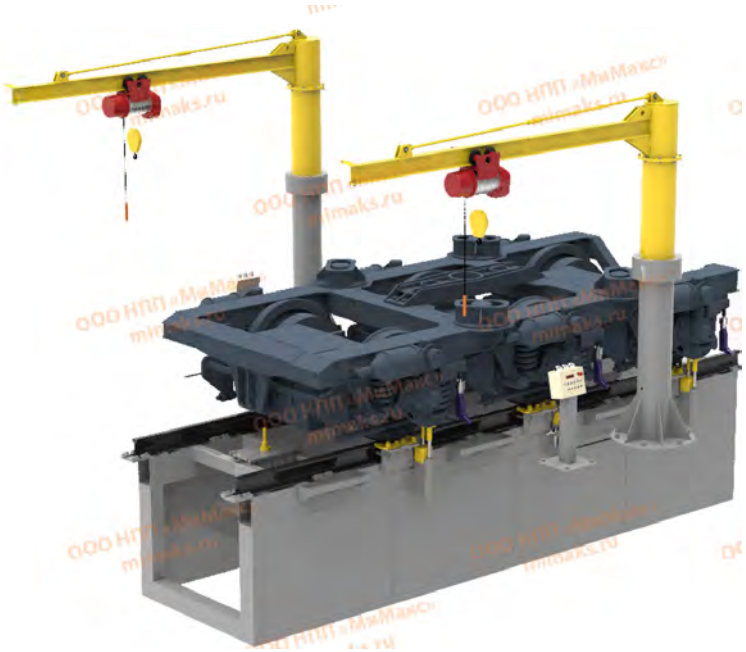
and assembly of cars bogies of electric trains MM198

The following technological operations are performed with the help of the system:

•transfer of the bogie from under the car to the area of disassembly by means of bogie traveling mechanism;
•bogie fixation by means of the centering mechanism;
•lifting of bogie for disassembly of elastic coupling, unfastening of the mounting bolts of rubber-cord casing is performed with a special power wrench MM204, suspended on a jib;
•unfastening of mounting bolts of electric motor - the angle power wrench MM360У, installed on a two-elbow centerpoint suspension, is applied;
•unfastening of anti-rattle nuts - the system is equipped with four built-in two-spindle power wrenches;
•disassembly of reduction gearbox suspension - power wrenches КМПЭ-400 installed on two-elbow centerpoint suspension and jib crane with balancing lever are applied;
•disassembly of bolster suspension - built-in mechanical jacks and centre folding bolster are applied for disassembly, unfastening of the nuts of suspension rolls is performed with power wrench КМПЭ-200;

Mechanized system for disassembly, assembly of diesel locomotives bogies MM199

Mechanized system is intended for mechanization of technological operations of disassembly and assembly of diesel locomotives bogies



Technical specification	
Supply voltage, V	380
Installed capacity, kW	12
Air pressure in pneumatic circuit, MPa.	0,4÷0,63
Air consumption, m^3/h	1
Overall dimensions without posts (below the floor level)	
Length, mm	6580
width, mm	2300
Height(depth), mm	1650
Overall dimensions with consideration of posts (above the floor level)	
Length, mm	6580
width, mm	6000
Height (depth), mm	3400
Weight, kg	5200

The system consists of the following main parts:

- Frame
- Lifting devices of electric traction motor with hydraulic drive
- Mechanisms of wheelsets locking
- Mechanisms of axle boxes locking
- Power wrench КМПЭ-200
- Control panels
- Lift-and-turn manipulators.

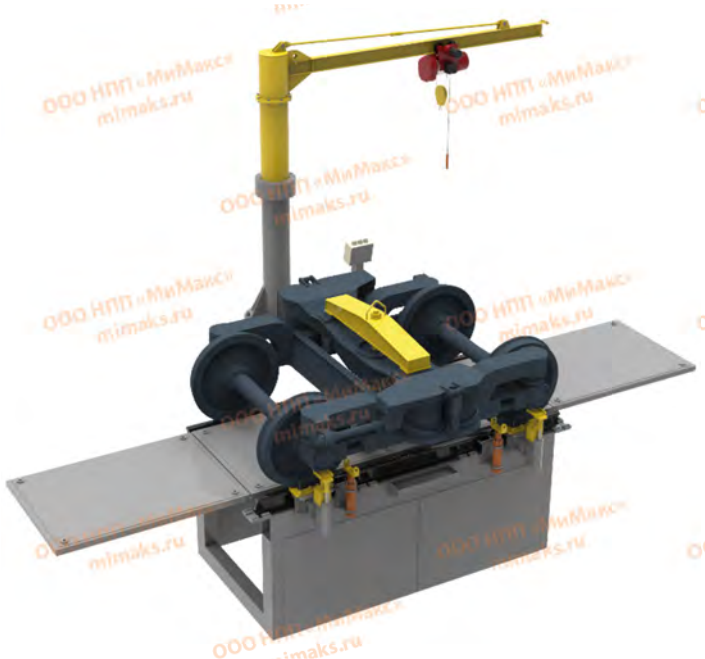
Mechanized system for assembly and disassembly of high-speed bogies of bolsterless type MM200

Mechanized system for assembly and disassembly of high-speed bogies of bolsterless type is intended for removal and setup of bogies of 68-4075, 68-4076, 68-4095, 68-4096 models.

Technical specification	
Supply voltage, V	380
Installed capacity, kW	14
Air pressure in pneumatic circuit, MPa.	0,63
Air consumption, m^3/h	40
Maximum force of compression mechanism of bolster suspension, kN	250
Rated pressure of hydraulic system, bar	200
Overall dimensions, mm	6600x5100x3400
Weight, kg	5100

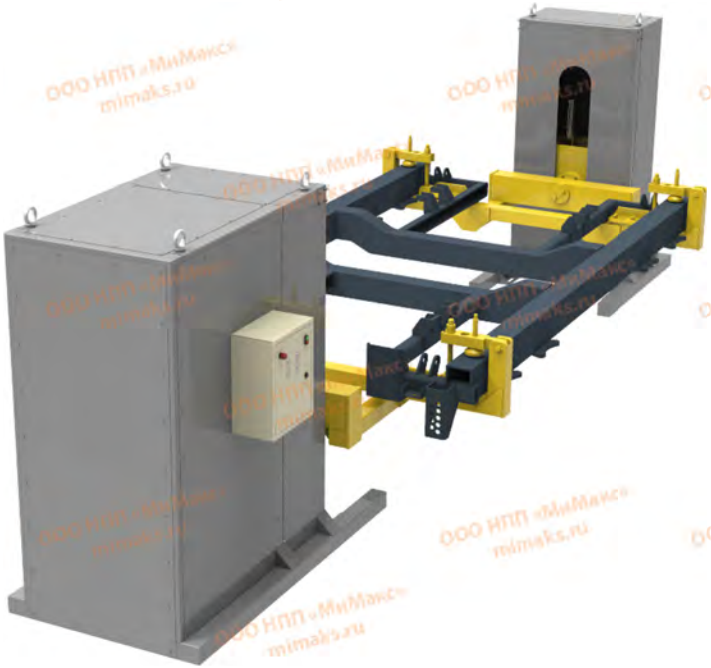
The system consists of the following main units:

- Frame
- Cantilever crane
- Compression mechanism of bolster suspension
- Loading transverse
- Mechanisms of wheelsets locking
- Axle box support mechanisms
- Mechanisms of pressing-out and pressing-in of axle box links
- Power wrench for unfastening of mounting bolts of axle box links
- Hydrostation
- Control panel



Manipulator of bogies frames MM046

Lift support base



Lift-and-turn support base

Manipulator of bogies frames is intended for turning of frames of locomotives and cars bogies by 180° along the direct axle in course of repair and geometric measurements.

It is supplied with special support assemblies for a specific type of bogie

Technical specification	
Supply voltage, V	380
power consumed, kW	4.5
weight-carrying capacity, N (kg)	70 000 (7 000)
height of rotation axis, mm:	
min.	1215
max.	1665
lift speed, m/sec. (m/min.)	0.005 (0,3)
speed of turn, s^{-1} (rpm)	0,017 (1)
weight, kg (not more than)	1980
Overall dimensions, mm:	
length	depends on bogie length
width	1800
height	1900

The manipulator consists of the following main units:

separately installed on foundations of lift and lift-and-turn support bases, on which special grippers are installed for a specific type of bogie;

The lift support base consists of the following units:
- frame;
- lift drive;
- guide screw;
- lift carriage;
- support and turn unit with frame gripping;

Lift-and-turn support base has a similar structure, but it has the turn drive installed on the lift carriage and the electrical cabinet installed on the frame.

Stand for disassembly and assembly of bolster suspension of trailer bogies MM367

Technical specification	
Type of drives	electrical
Supply voltage, V	380
Installed capacity, kW	6,0
Force of one jack (kg)	11500
Jack movement, mm	320
Speed of jack lift, mm/min	450
Overall dimensions of stand:	
length, mm	2570
width, mm	3070
height, mm	1820
Weight, kg	1820

The mechanized stand consists of the following main units:

- frame;
- clamp unit;
- two power mechanisms;
- control panel.

Stand is intended for compression of springs of bogies bolster suspension of electric trains and passenger cars, installed without wheelsets, for performance of operations connected with disassembly or assembly of bolster suspension.

Mechanized position for separation of bogies, titling and riveting of side frames of freight cars bogies MM674

Mechanized position for separation of bogies, tilting and riveting of side frames of freight cars bogies is intended to separate bogie frame, tilt its elements, rivet friction plates of side frames and frame assembly in course of repair works performance. This equipment allows to perform defects detection of side frames and center beam.

The item is mobile and it does not require specially prepared foundations.

Technical specifications	
Drive:	
withdrawal of side frames (pneumatic)	2pcs.
rotation of side frames (electromechanical)	2pcs.
locking of side frames (pneumatic)	4pcs.
stops of side frames collars (pneumatic)	4pcs.
lift of truck bolster (electromechanical)	1pc.
water clip (hydraulic)	2pcs.
Rod force of hydraulic cylinder bracket	225-250 (24-26) kN(t)
Turning angle of truck bolster (in support assembly)	±135 deg
Turning angle of support assembly (with truck bolster)	±90 deg
Turning angle of side frame withdrawal levers	±23 deg
Turning angle of side frame around horizontal axis	±360 deg
Installed capacity	7,5 kW.
Operating pressure in hydraulic system	5±0,5 MPa
Air pressure in pneumatic circuit	0,63 MPa
Air consumption	2 m^3/h
Supply voltage	380±38 V
Supply frequency	50±1 Hz
Overall dimensions, not more than	2650x5450(3700*) x1520(2400**) mm
Weight, not more than	2500 kg

** - non-operating position (folding coverings are removed).*
*** - Height with consideration of monorails.*

Stand for disassembly, assembly and testing of brake beams MM335

Technical specification	
Supply voltage, V	380
Consumed power, kW	4,5
air pressure in pneumatic circuit, MPa	0,63
air consumption, m^3/h	56
Overall dimensions of stand	
length, mm	3050
width, mm	2950
height, mm	1750
Weight, kg	1500

The stand is intended for disassembly, assembly and testing of brake beams.

Stand consists of the facility for testing of brake beams ant two power wrenches

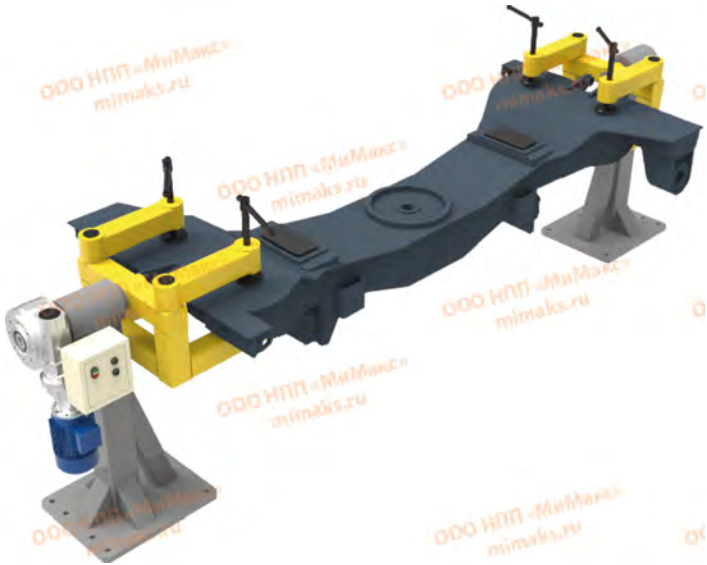
Facility for testing of brake beams includes the following units:

- frame;
- pneumatic cylinders for brake beam loading;
- lever;
- folding stops;
- control panels of power wrenches;
- control panel of pneumatics;
- pneumatic panel;

Power wrench includes the following units:

- frame;
- carriage with power wrench;
- removable handle;

Manipulator of truck bolster of bolster suspension, multipurpose MM737



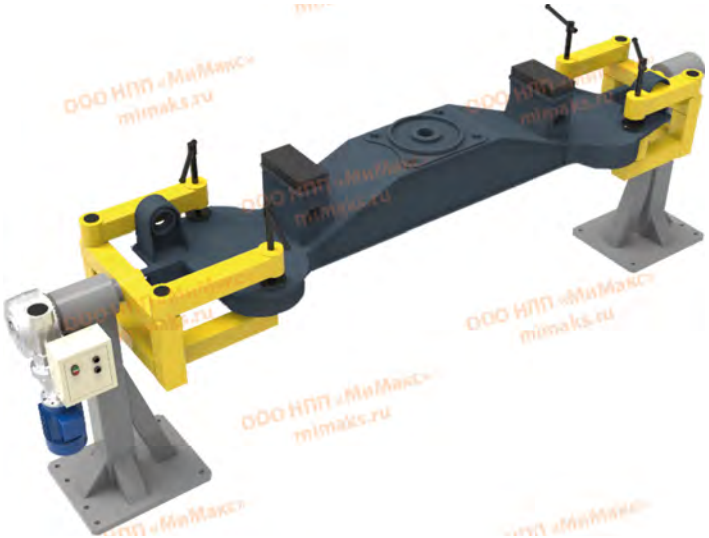
The manipulator of truck bolster of bolster suspension, multi-purpose, is intended for turning of bolster suspension of bogies КВЗ-ЦНИИ type 1, КВЗ-ЦНИИ type 2, КВЗ-ЦНИИ-М (mod. 68-875, 68-876), 68-4075, 68-4076, 68-4095, 68-4096 by 360° for the purpose of inspection and repair.

Technical specification	
Weight-carrying capacity, kg	700
Allowable moment on the rotary drive shaft, N*m	1000
Bolster turning angle, °	360
Rotation frequency of the gripper, rpm	5
Installed capacity, kW	2,2
Supply voltage, V	380
Current frequency, Hz	50
Overall dimensions, mm:	
Length	5000
Width	1200
Height	1350
Weight, kg	1100

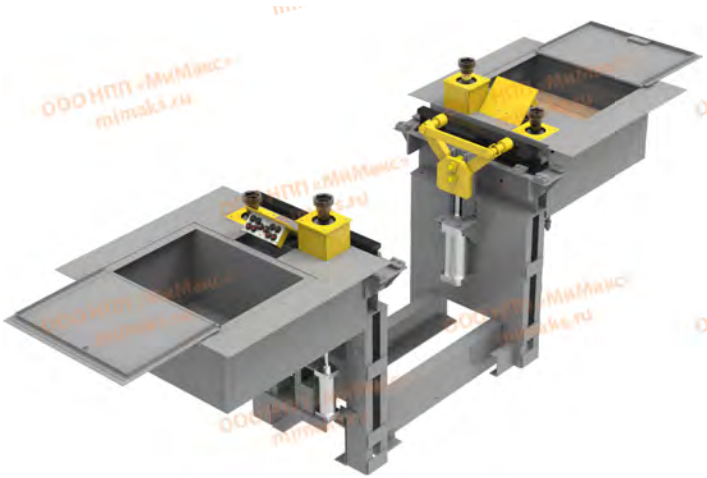
Manipulator of truck bolster of bogies bolster suspension КВЗ-ЦНИИ ММ738

The manipulator of truck bolster of bogies bolster suspension КВЗ-ЦНИИ is intended for turning of the bolster of bogies bolster suspension КВЗ-ЦНИИ by 360° for the purpose of inspection and repair.

Technical specification	
Weight-carrying capacity, kg	700
Allowable moment on the rotary drive shaft, N*m	700
Bolster turning angle, °	360
Rotation frequency of the gripper, rpm	4
Installed capacity, kW	1,5
Supply voltage, V	380
Current frequency, Hz	50
Overall dimensions, mm:	
Length	4920
Width	1010
Height	1200
Weight, kg	1100



Assembly for unfastening of anti-rattle nuts MM716



The assembly is intended for unfastening of anti-rattle nuts of passenger cars.

The assembly MM716X2 consists of two assemblies MM716 synchronized with each other and having one common device for bogie centering and it allows to unfasten all anti-rattle nuts during one installation

Technical specification	MM716	MM716X2
Supply voltage, V	380	380
Installed capacity, kW	6	12
air pressure in pneumatic circuit, MPa	0,63	0,63
air consumption, m^3/h	0,1	0,1
weight, kg (not more than)	1280	2560
Overall dimensions, mm:		
length (without device of bogies moving)	1400	3800
Width	1400	4400
Height	1620/1950	1620/1950

Assembly includes the following main units:

- Frame
- Two two-spindle power wrenches.
- Two lifting panels.
- Two pits (for comfortable work at unfastening of anti-rattle supports).
- Assembly for bogies centering.
- Heads with transient shafts.

Assembly MM716X2 consists of two assemblies MM716 synchronized with each other

Power wrench ГШ-2 with control device of fastening torque of anti-rattle nut MM808

Technical specification	
Supply voltage, V	380/220
Power consumed by electric motor, kW	4
Number of wrench turns, rpm	33
Maximum torque, kgm	132
Compressed air pressure, MPa (kgf/cm^2)	0,6 (6,0)
Overall dimensions:	
- length, mm	1100
- width, mm	500
- height, mm	1190
Item weight, kg	390
Height of wrench lifting, mm	270
Wrench size, mm	86
Track, mm	400

Power wrench ГШ-2 consists of the following parts:

- bogie
- reduction gearbox
- device of moment control
- pneumatic cylinder
- replaceable wrench
- control panel
- pneumatic panel

Power wrench is intended for unfastening and running of anti-rattle nuts in course of repair of passenger cars within car depot.

Power wrench of anti-rattle nuts MM156

Power wrench is intended for unfastening of anti-rattle nuts of passenger cars (trailing cars of electric trains). The power wrench is a five-speed reduction gearbox made on the basis of electromechanical power wrench КМПЭ-400.

The power wrench is put into gear with the anti-rattle nut due to vertical movement of suspension and stays in a stationary position during unfastening due to the stop, which is set on a body of the latest planetary stage.

To protect from overload and provide the required torque, the frequency converter is used in the item.

Technical specification	
supply voltage, V	380
frequency, Hz	50
capacity, W	1000
rotation frequency, rpm.	4
torque, kgm	400
overall dimensions	
length, mm	1030
width, mm	452
height, mm	226
weight, kg	56

Table for defects detection of small parts MM374

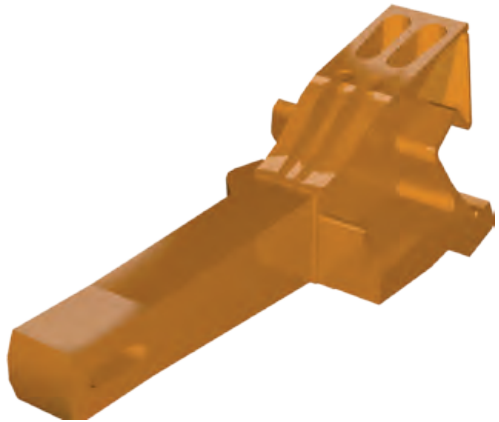
Technical specifications:	
voltage, V	220
frequency, Hz	50
Overall dimensions, mm	2550x1250x2100
weight, kg	450

The table consists of the following main units:

- frame;
- manipulator;
- reservoir for magnetic liquid collection;
- electrical cabinet;
- built-together pump for deposition and mixing of magnetic liquid;
- gun for magnetic liquid deposition (not shown for clarity).

The table is intended for defects detection of small parts using the magnetic particle method.

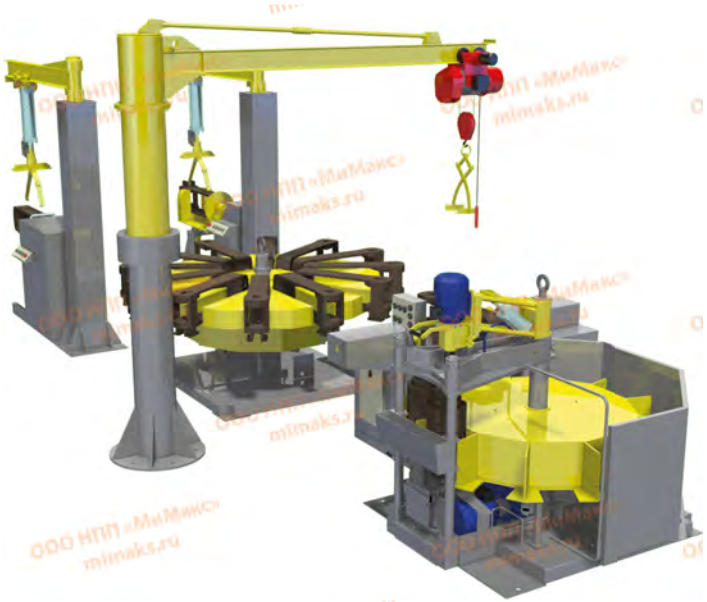
Equipment for repair of automatic coupler



Mechanized system for draft gears repair MM297

The mechanized system for draft gears repair MM297 is intended for disassembly, assembly and repair of friction-type draft gears Ш1-ТМ, Ш2-В, ПМК110.

A system configuration (manufacturing equipment layout) can be different, it depends on a design of draft gears repair area.



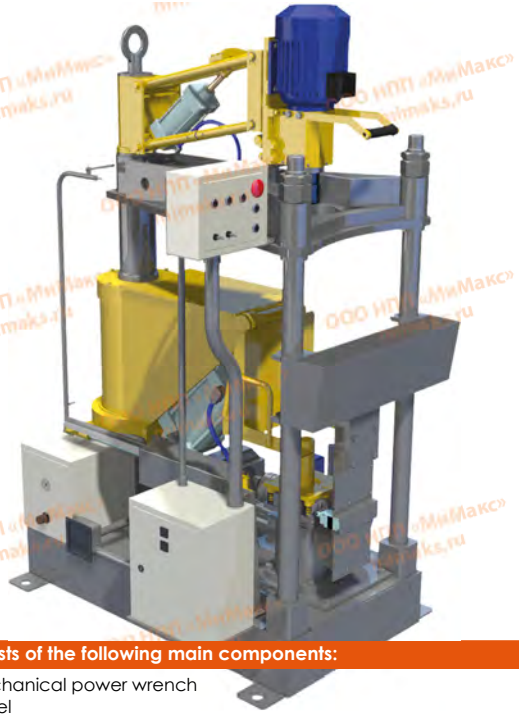
Technical specification	
supply voltage, V	380
frequency, Hz	50
total installed capacity, kW	10,3
air consumption, m^3/h	0,18
overall dimensions (approximate)	8500x3250x2400

The system consists of the following technological equipment constructively and technologically combined with each other:

- pallet carousel for yokes (12 items);
- the unit for draft gears repair (12 items);
- manipulator for non-destructive test of yoke;
- stand-manipulator for yoke welding deposition;
- manipulator for loading of yokes from the carousel to the stand–manipulator for non-destructive test of yoke;
- manipulator for loading of yokes from the carousel to the stand-manipulator for yoke welding deposition;
- jib-crane with gripper for loading and unloading of draft gears to the system and carousel.

Equipment for repair of automatic coupler

Repair unit for draft gears (one item) MM301



The unit is intended for disassembly and assembly of friction-type draft gears.

Technical specification	
General data:	
supply voltage, V	380
frequency, Hz	50
total installed capacity, kW	5,5
air consumption, m^3/h	0,12
on the screw press:	
drive power, kW	3.0
electric motor rotation frequency, min^{-1}	1430
screw movement speed at idle, mm/sec	7,5
nominal force, kgf	14400
stroke, mm	340
An automatic shutdown (electronic checker) of the press is applied upon reaching the maximum force value	
on the electromechanical power wrench:	
capacity, kW	2.2
rotation frequency, min^{-1}	15
Max. torque, kgm	250
overall dimensions:	
length, mm	1340
width, mm	1050
height, mm	1940
weight, kg	1250
operation mode	semi-automatic

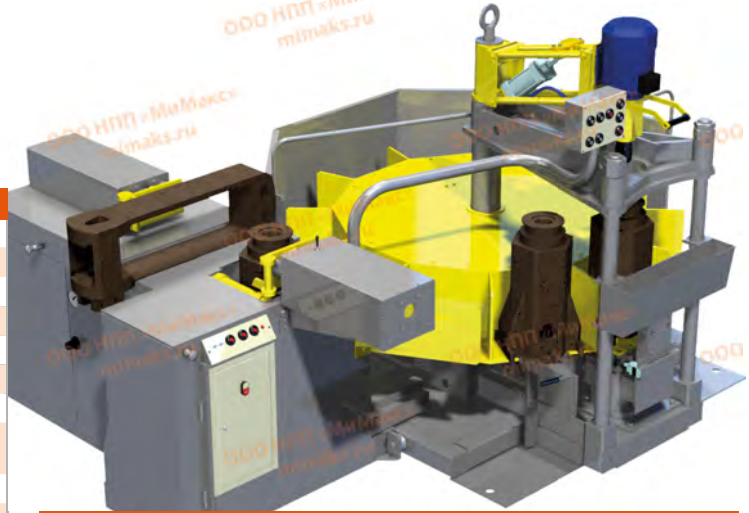
The unit consists of the following main components:

- electromechanical power wrench
- control panel
- handling equipment
- pneumatic control cabinet
- screw press
- electrical control cabinet
- frame

Repair unit for draft gears (12 items) MM210

The unit is intended for disassembly and assembly of draft gears.
It is equipped with the carousel-type accumulation conveyor for 12 units, it allows to mechanize the following operations: pushing of the draft gear from the yoke, loading the draft gear to the press, draft gear pressing, unfastening and fastening of a mounting screw nut.

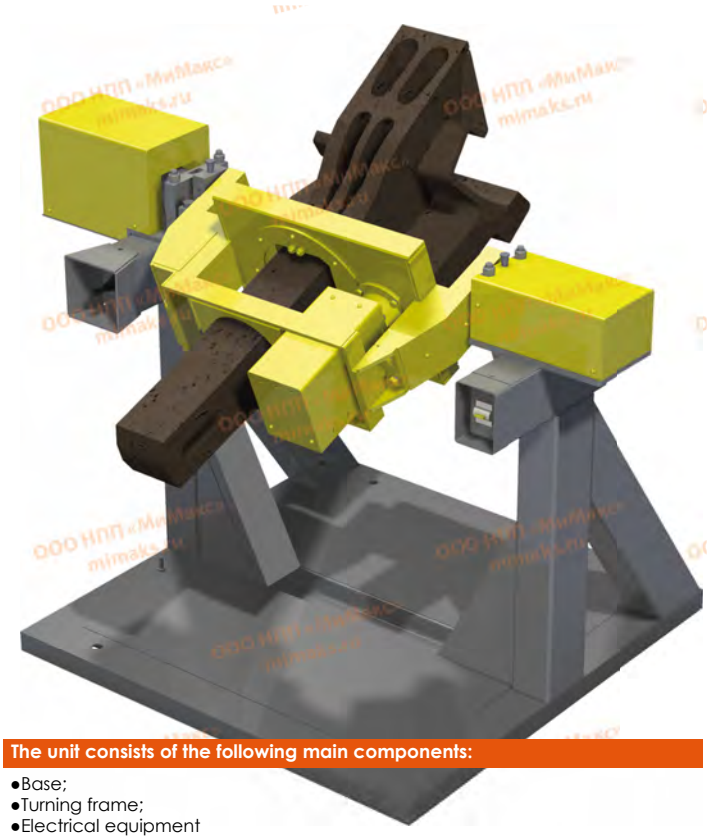
Technical specifications	
General data:	
supply voltage, V	380
total installed capacity, kW	7,0
air consumption, m^3/h	0,12
unit overall dimensions, mm	3200x2390x1750
weight, kg	2800
on the carousel-type accumulation conveyor:	
motor capacity of platform turn drive, kW	1,1
platform rotation frequency, min^{-1}	1,71
on the screw press:	
drive power, kW	4.0
screw movement speed at idle, mm/sec	5,1
nominal force, kgf	26000
stroke, mm	230±5
on the electromechanical power wrench	
capacity, kW	2.2
rotation frequency, min^{-1}	15
Max. torque, kgm	250
operation mode	semi-automatic



The unit consists of the following main components

- screw press,
- carousel-type accumulation conveyor,
- electromechanical power wrench,
- bolt setter,
- slope conveyor for bolt unscrewing,
- control panel (for accumulation conveyor, press and power wrench),
- assembly-disassembly mechanism,
- loading-unloading manipulator,
- control panel (loading-unloading manipulator and accumulation conveyor), control cabinet.

The unit for the automatic coupler repair MM182



The unit consists of the following main components:

- Base;
- Turning frame;
- Electrical equipment

The unit is intended for turning of the automatic coupler in two planes during the assembly, disassembly, welding deposition operations.

Technical specification	
Voltage, V	380
Frequency, Hz	50
Installed capacity, kW	0,92
Longitudinal rotation drive:	
capacity, kW	0,37
turning angle	not restricted
rotation frequency, rpm	1,6
Transverse rotation drive:	
capacity, kW	0,55
turning angle	not restricted
rotation frequency, rpm	4
Overall dimensions, mm	1120x1500x1100
Weight, kg	350

The equipment configuration and its components

The base is a welded metal structure which has four holes for foundation bolts in its basement. Support assemblies for rotation frame installation are located on the base columns. Also the transverse rotation drive and control manipulator are located at the left base column, and the automatic power-on machine and the power supply junction box are at the right column. A tangential-type brake is available in the transverse rotation drive to avoid an uncontrolled rotation of the automatic coupler after it stops in the desired position.

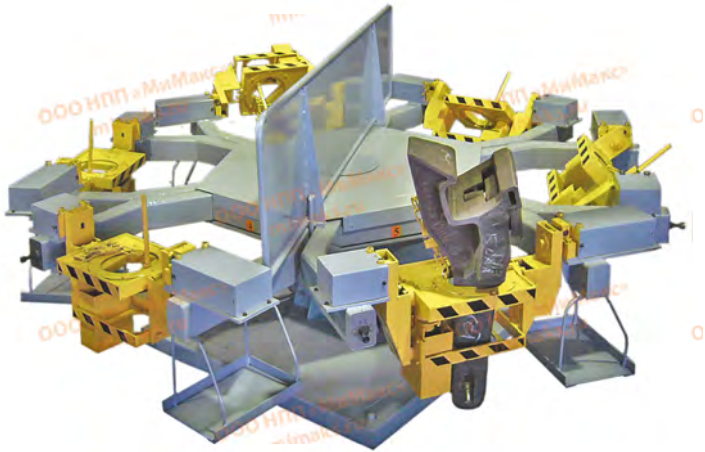
The unit for the automatic coupler repair (6 items) MM206

Technical specification	
Supply voltage, V	380
Total installed capacity, kW	6,62
Platform turn drive:	
capacity, kW	1,1
turning angle	not restricted
rotation frequency, min^{-1}	1,71
Manipulator transverse rotation drive	
capacity, kW	0,55
turning angle	not restricted
rotation frequency, min^{-1}	4
Manipulator longitudinal rotation drive:	
capacity, kW	0,37
turning angle	not restricted
rotation frequency, min^{-1}	1,4
Overall dimensions, unit	
Circumscribed-circle radius on consoles without automatic couplers, mm	3450
height, mm	1600
Weight, kg	1250

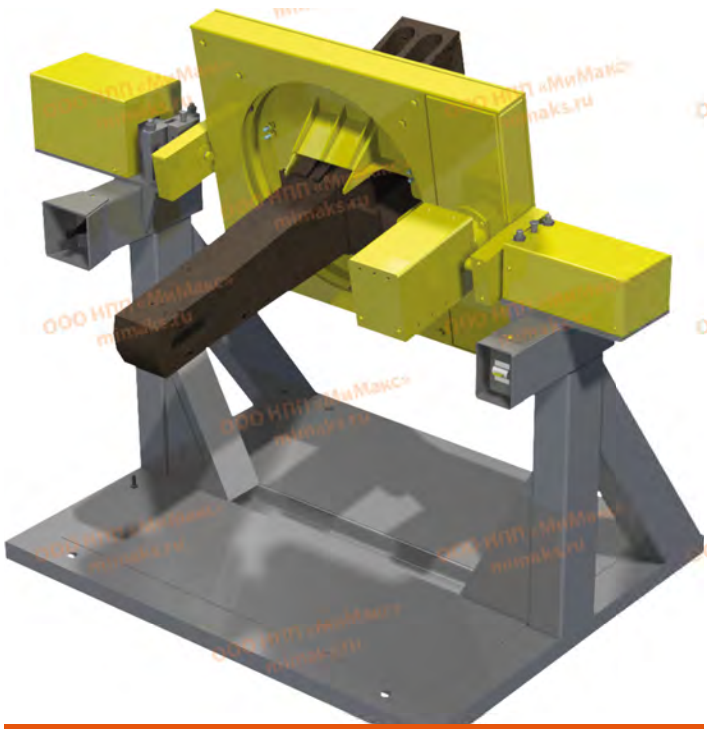
The unit consists of the following main components:

- Turning platform;
- Manipulators;
- Shield;
- Frame;
- Component bin.

The unit is intended for turning of the automatic coupler in two planes during the assembly, disassembly, and welding deposition operations.
The unit is a turning platform with 6 manipulators.
Each manipulator allows turning a fixed inside coupler in two planes (longitudinal and transverse), placing it in a most convenient repair position. The platform is divided in two areas by vertical shield. One area, consisting of three items is intended for draft gears disassembly, assembly and defects detection; and the other one, also consisting of three items, is for welding deposition. Thus, automatic couplers disassembled in the first area go to the welding area by platform turning by 180°, and the welded ones go to the first area for assembly.



Manipulator for defect detection of automatic couplers bodies MM270



Manipulator consists of the following main units:

- electrical equipment;
- manipulator;
- frame;

The manipulator is intended for defects detection of couplers bodies.

Technical specification	
Voltage, V	380
Frequency, Hz	50
Installed capacity, kW	0,95
Longitudinal rotation drive:	
capacity, kW	0,37
turning angle	not restricted
rotation frequency, rpm	1,5
Transverse rotation drive:	
capacity, kW	0,55
turning angle	not restricted
rotation frequency, rpm	3,6
Overall dimensions, mm	1120x1800x1325
Weight, kg	410

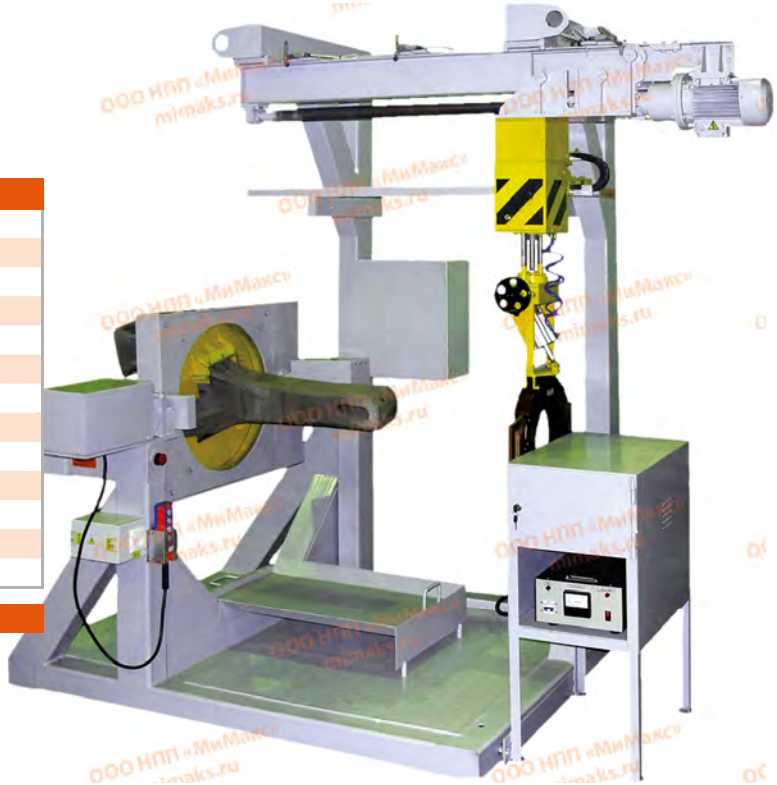
The equipment configuration and its components

The base is a welded metal structure which has four holes for foundation bolts in its basement. Support assemblies for turning frame installation are located on the base columns. Also the transverse rotation drive and control manipulator are located at the left base column, and the automatic power-on device and power supply junction box are at the right column. A tangential-type brake is available in the transverse rotation drive to avoid an uncontrolled rotation of the automatic coupler after it stops in the desired position.

Equipment system for defects detection of automatic couplers bodies MM343

The equipment system is designed for automatic couplers bodies defects detection by magnetic particle method.

The system is based on the manipulator for MM270 couplers bodies defects detection and it allows performing the defects detection in automatic mode.

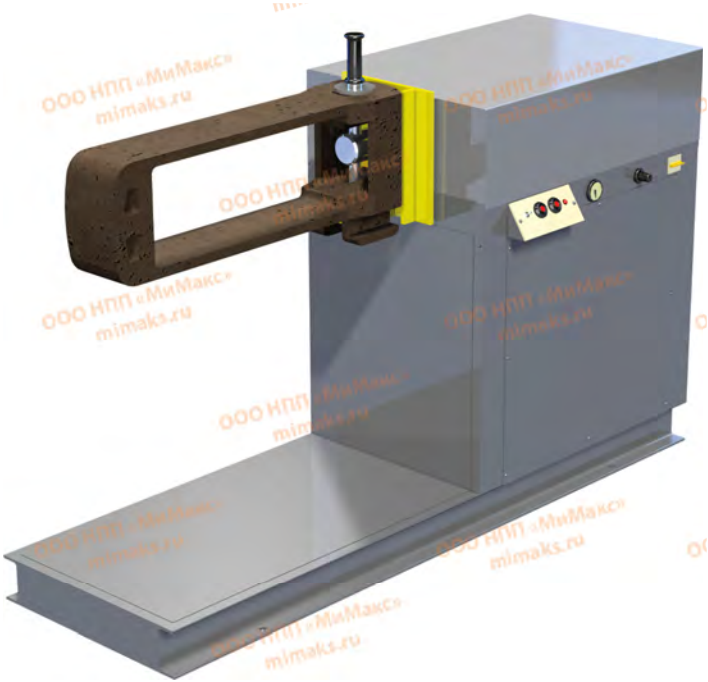


Technical specification	
supply voltage, V	380
frequency, Hz	50
total installed capacity, kW	4,5
air pressure in pneumatic circuit, MPa	0,63
compressed air consumption, m^3/h, max	0,05
operating speed of the solenoid movement, mm/sec	10-12
solenoid speed during demagnetization, mm/sec	100
Max. torque, kgm	250
overall dimensions, mm	
length	2550
width	1800
height	2500
weight, kg	1000

The unit consists of the following main components:

- manipulator transfer mechanism;
- manipulator;
- electrical cabinet;
- automatic coupler manipulator (MM270);
- frame;
- portable control panel;
- base for the block of defect detector;
- magnetic particles defects detector МД-12ПЭ;
- magnetic liquid collecting sump

Manipulator for non-destructive testing of the yoke MM290



The manipulator MM290 allows cantilevering and rotating the yoke along the longitudinal axis to place it in a desired position during the defects detection and inspection.

Technical specification	
manipulator drive type	electrical
voltage, V	380
frequency, Hz	50
total installed capacity, kW	1
air pressure in pneumatic circuit, MPa	0,63
turning angle	not restricted
rotation frequency, rpm	4
Overall dimensions:	
length, mm	1900
width, mm	600
height, mm	1150
Weight, kg	540

The manipulator consists of the following main units:

- Rotating and fixing mechanism of yoke;
- Control panel;
- Frame;
- Support assembly.

Can be equipped with a special loading device

Equipment system for yoke defects detection MM342

The equipment system is intended for the yoke defects detection by the magnetic particle method.

The system is based on the manipulator for yoke non-destructive testing MM290, and it allows to perform defects detection of the yoke in automatic mode

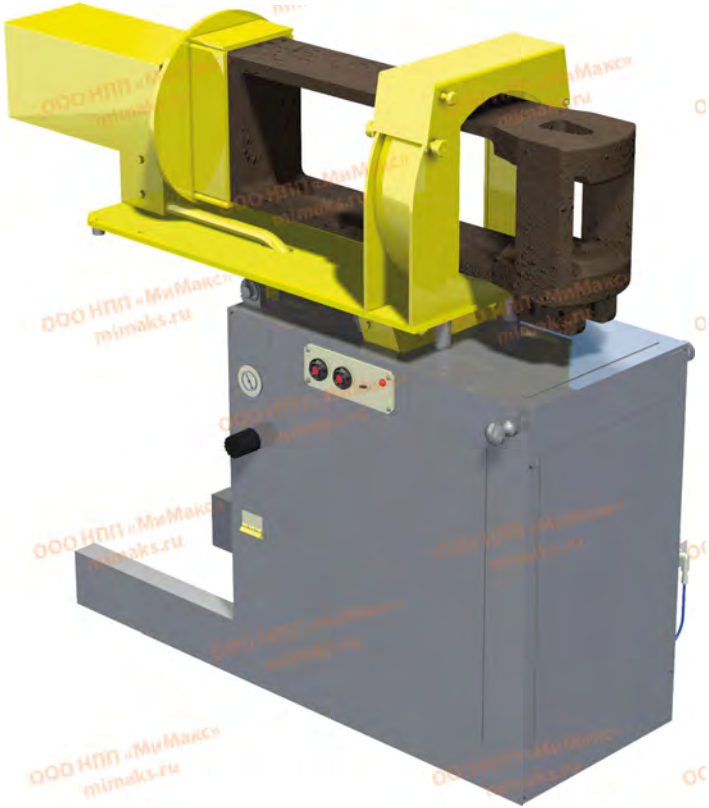
Technical specification	
supply, V	380
frequency, Hz	50
total installed capacity, kW	5,7
air pressure in pneumatic circuit, MPa	0,63
operation mode	automatic
yoke turning angle	restricted
yoke rotation frequency, rpm	4
operating speed of the solenoid movement, mm/sec	10-12
-in course of demagnetization, mm/sec	100
column conveying speed, mm/sec	55
overall dimensions, mm	2310x1170x2950
weight kg.	1360

The unit consists of the following main components:

- traversing column;
- solenoid transverse positioning mechanism;
- yoke manipulator MM290;
- magnetic particle defects detector МД-12ПС;
- frame;
- magnetic liquid collecting sump;
- control panel;
- portable control panel;
- electrical cabinet

Equipment for repair of automatic coupler

Manipulator for yoke welding deposition MM292



It is intended for the yoke inspection and welding deposition works.

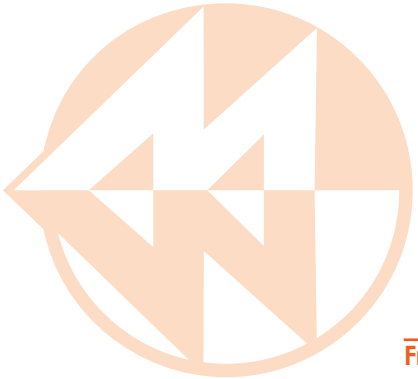
The manipulator allows to turn the yoke in the longitudinal plane and tilt it into the vertical position.

Technical specification	
manipulator drive type	pneumatic
air pressure in pneumatic circuit, MPa	0,63
required compressed air consumption, m^3/h	0,05
overall dimensions	
length, mm	1420
width, mm	440
height, mm	1300
Weight, kg	300

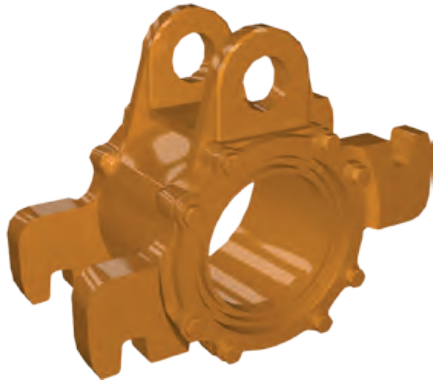
The manipulator consists of the following main units:

- rotary drive;
- support assembly with a turn drive;
- control panel;
- frame

Can be equipped with a special loading device



Equipment for repair of axle boxes



Lubricant homogenizer MM525

Homogenizer is intended for homogenization (uniform mixing) of the lubricant Л3-ЦНИИ and weighing it by 100, 150 and 200 g to a precision of ±5%.

Technical specification	
Voltage, V	380
Frequency, Hz	50
Installed capacity, kW	1,15
Compressed air pressure, MPa	0,63
Compressed air consumption, m^3/h	Max 0,02
Operation mode	manual
Produced lubricant batches, g	100, 150, 200
Dosage imprecision, %	5
Lubricant operating temperature, deg	18 - 30
Batching time for 100 g of lubricant, sec	20
Lubricant tank volume, m^3	0.311
Tank body material	Steel 08X18H10
Mixing device	Strip mixing screw
Strip mixing screw rotations, rpm	9...14
Service life of the item, years	10
Service life until general maintenance, years	5
Overall dimensions, mm	1770x830x1520
Weight, kg	640

The homogenizer consists of the following main units:

- Base
- Tank with a lid for loading
- Front lid with the lubricant batching device
- strip mixing screw shaft
- strip mixing screw drive
- control panel

System for axle boxes mounting on the wheelset (assembly at one position) MM160

The unit is intended for mounting of axle box units on the wheelsets of locomotives, electric trains, passenger cars and freight cars. It is complete with special grippers for a specific type of axle box unit.

Technical specification	
air pressure in pneumatic circuit, MPa	0,63
air consumption, m^3/h	0,2
pneumatic cylinder force, kg	440
operation mode	semi-automatic
productive capacity, number of wheelsets/shift	40
overall dimensions, mm	3500*x2200x2200
weight, kg	395
**size depends on a layout*	

The complex for mounting of axle boxes consists of the following main units:

- monorail
- carriage
- flexible pipe
- lifting and lowering mechanism of axle box
- replaceable gripper
- lift-and-turn table
- portal
- manipulators of axle boxes

Mechanized system of dismantling of locomotives axle boxes MM202

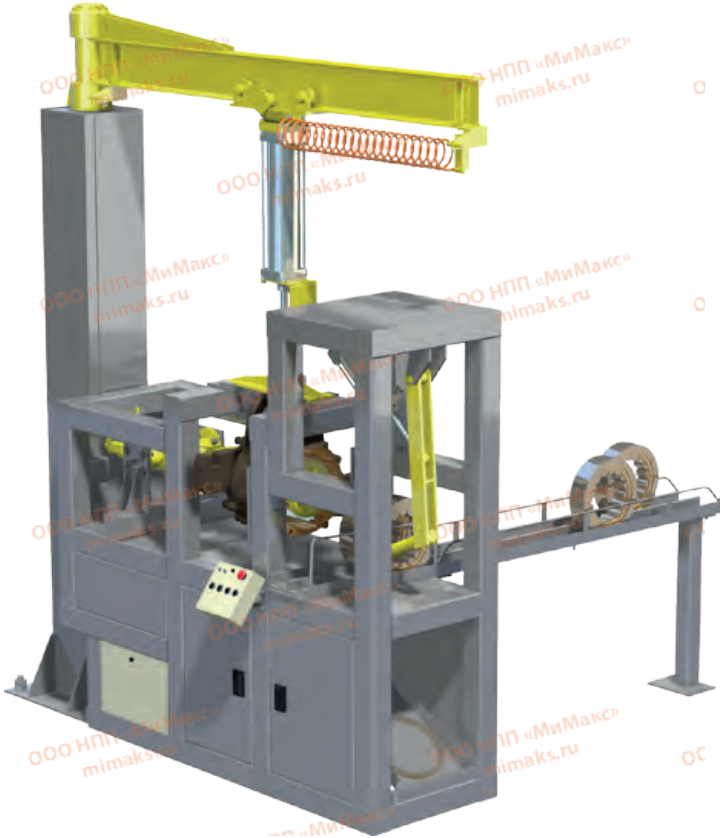
The system is intended for dismantling of axle box units from locomotives of all types, it allows to mechanize the dismantling operations of axle box links, operations of the axle nut M170 unscrewing and axle boxes removal from the wheelset axle, the bearings pressing-out and the transportation of axle boxes bodies and bearings to washing machines.

Technical specification	
voltage, V	220
power consumed, VA	100
air pressure in pneumatic circuit, MPa	0,63
air consumption, m^3/h	1,56
operation mode	semi-automatic
productive capacity, number of wheelsets/shift	6

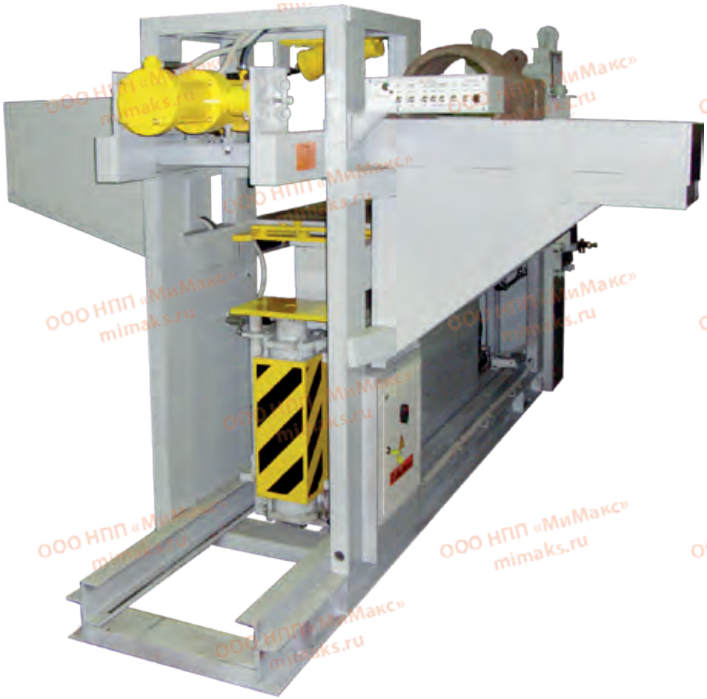
The system consists of the following main units:

- Storage tray for bearings;
- Storage conveyor for axle boxes;
- Dismantling unit for axle boxes;
- Suspended power wrench for unscrewing of the central nut of the wheelset axle.
- Lift-and-turn tables;
- Dismantling unit for links of axle boxes;

Composition and layout of the system depend on the customer's technical requirements



Mechanized system of dismantling of freight cars axle box units MM060



The system is intended for dismantling of axle box units of freight cars, it allows to perform the axle box unit dismantling from the wheelset axle, bearings pressing-out and transportation of bodies of axle boxes and bearings to washing machine in semi-automatic mode.

Technical specification	
voltage, V	220
power consumed, VA	60
air pressure in pneumatic circuit, MPa	0,63
air consumption, m^3/h	0,56
operation mode	semi-automatic
productive capacity, number of wheelsets/shift	6
overall dimensions:	
length, mm	2300
width, mm	3200
height, mm	1500
weight (without the lift-and-turn table), kg	1050

System layout option:

- Axle boxes washing machine
- Power wrench at a centerpoint suspension for unscrewing of the central nut M110 of the wheelset axis.
- Area of the preliminary disassembly
- Feeding conveyor delivering axle boxes to the washing machine
- Source tray delivering bearings to the washing machine
- Bearings washing machine
- Dismantling unit for axle boxes
- Lift-and-turn table

The system layout (direction and height of feed of axle box bodies and bearings to washing machines) depends on the customer's technical requirements.

Mechanized system of dismantling of passenger cars axle box units MM083

The system is intended for dismantling of axle box units of passenger cars, it allows to perform the axle box unit dismantling from the wheelset axle, bearings pressing-out and transportation of bodies of axle boxes and bearings to washing machine in semi-automatic mode.

Technical specification	
voltage, V	220
power consumed, VA	60
air pressure in pneumatic circuit, MPa	0,63
air consumption, m^3/h	0,56
operation mode	semi-automatic
productive capacity, number of wheelsets/shift	6
overall dimensions:	
length, mm	2300
width, mm	3600
height, mm	1500
weight, kg	1150

System layout option:

- Axle boxes washing machine
- Area of the preliminary disassembly
- Feeding conveyor delivering axle boxes to the washing machine
- Source tray delivering bearings to the washing machine
- Bearings washing machine
- Dismantling unit for axle boxes
- Lift-and-turn table

The system layout (direction and height of feed of axle box bodies and bearings to washing machines) depends on the customer's technical requirements.

Mechanized system of dismantling of electric trains axle box units MM194

The system is intended for dismantling of axle box units of electric trains ЭР2, ЭР2Т, ЭТ2, ЭД2Т, ЭД9М, ЭД9Т, ЭР9П, bearings pressing-out and transportation of axle boxes bodies and bearings to washing machines.

Technical specification	
voltage, V	220
air pressure in pneumatic circuit, MPa	0,63
productive capacity, number of wheelsets/shift	25
unit overall dimensions:	
length, mm	2300
width, mm	2165
height, mm	1925
weight, kg	1080

The system consists of the following main units:

- control panel
- dismantling unit
- axle box remover
- lift-and-turn table
- *Suspended power wrench for unscrewing of the central nut of the wheelset axle.*

Mechanized system of wheelsets assembly at the elevated track MM215

The system is intended for mounting of axle box units of railway and subway rolling stock on the wheelset axle. It allows gripping the axle box (both with and without installed bearings), turning and transferring the axle box along and across the elevated track, mounting the axle box unit, tightening of mounting bolts of locking covers and stop plates.

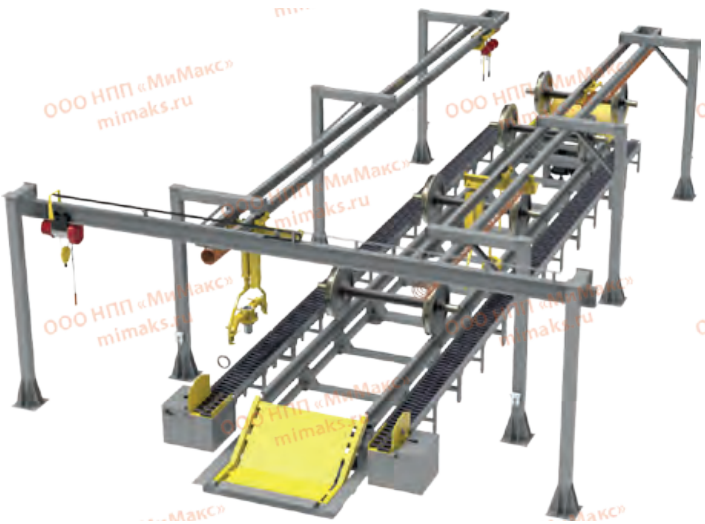
Technical specifications:	
air pressure in pneumatic circuit, MPa	0,63
operation mode	semi-automatic
total installed capacity, kW	3,5
supply voltage, V	380
air consumption, m^3/h	15,6
overall dimensions	depend on technical requirements
system weight	depend on technical requirements

The complex consists of the following main units:

- base columns (amount depends on the system length);
- suspended monorails (two at each side);
- suspended bogies with pneumatic power wrenches (2 pcs);
- mounting manipulators with grippers (2 pcs);
- air-preparation units;

Optional extra:

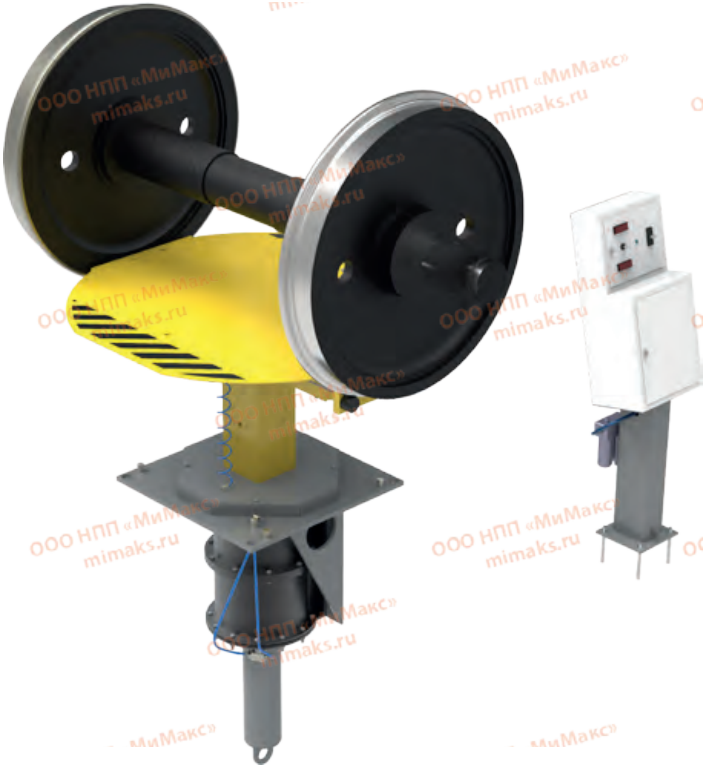
- elevated track;
- transverse monorail (fastening at its own supports) with telpher for transferring of axle boxes from one side to another;
- lifting device of wheelsets;
- lowering device of wheelsets;
- manipulators of axle boxes (1 at each side);
- roller table (1 at each side)



Pneumatic lifting devices (lowering devices) of wheelsets to the elevated track can be supplied with the system.

Equipment for repair of axle boxes

Lift-and-turn table MM309



Lift-and-turn table is intended for lifting of the wheelset to the required height, its turning and fixation. The table is intended for work as a component of different technological equipment, and for wheelsets mounting at the functional locations of repair lines.

Lift-and-turn table can be additionally equipped with the turning unit that allows to swing the wheelset in automatic mode.

The rotating column is lifted up when a compressed air is supplied to the lower cavity of the pneumatic cylinder. The crosspiece with the wheelset turns to the required position. The table is brought back to its initial (lower) position by its own weight when the pressure is released. The crosspiece fixation is performed by the compressed air supply to the pneumatic chambers of the fasteners.

Technical specification:	
voltage, V	220
air pressure in pneumatic circuit, MPa	0,63
air consumption, m^3/h	6
lift height, mm.	100..600
turning angle, deg.	90 or 180
overall dimensions, mm.	1510x1030x1054
weight, kg	710

Peeling machine for axle boxes inner surfaces MM034

Machine is intended for peeling of axle boxes inner surfaces of locomotives, electric trains, passenger and freight cars. Cleaning is performed with a wire brush by generating shuttle-type method.

Technical specification	
voltage, V	220
frequency, Hz	50
operation mode	semi-automatic
productive capacity, axle boxes/h	6
overall dimensions, mm:	
length	1150
width	670
height	150
weight, kg	84

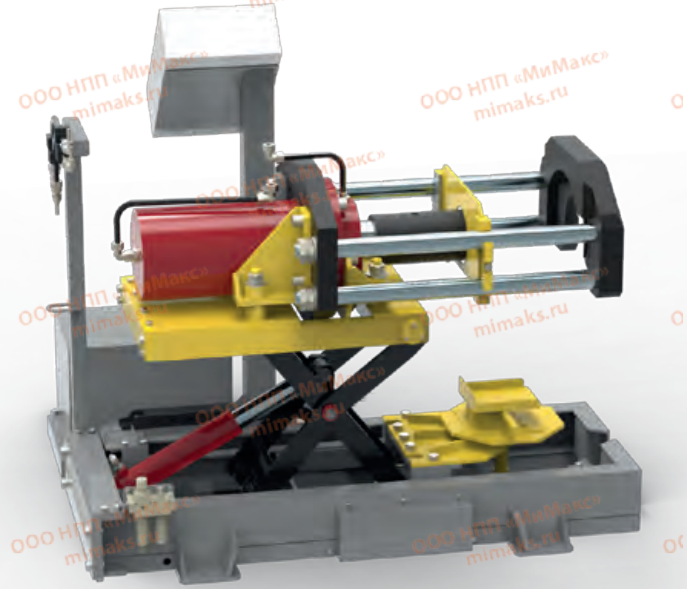
The mechanized stand consists of the following main units:

- control panel;
- framework;
- fastening device;
- main drive unit and rotary drive of the brush.

Dismantling stand for roller-type and cassette-type axle box units of freight cars MM882

The stand is intended for removal of the freight car wheelset from the axle neck by cold pressing-out of the following types of bearing units:

- axle box units with roller bearings,
- axle box units with cassette bearings,
- cassette bearings applied with adapters,
- inner races of roller bearings.



Technical specification	
Circuit characteristics, V/Hz	380/50
Pressing-out force, tf	60
Total installed capacity, kW	4
Hydraulic fluid pressure, MPa (bar)	19(190)
Air pressure in pneumatic circuit, MPa	0.63
Hydraulic cylinder stroke, mm	280
Hydraulic cylinder diameter, mm	200
Elevated track height	+0.00
Low position of the remover axle, mm	422
Overall dimensions	60
Length, mm	1450
Width, mm	710
Height, mm	1250
Item weight, kg	700
Minimum service life, years	7

The unit consists of the following main components:

- Base;
- Movable frame,
- Scissors mechanism,
- Platform,
- Remover unit,
- Delivery table,
- Pneumatic equipment,
- Hydraulic equipment,
- Electrical equipment.

Dismantling-mounting stand for roller-type and cassette-type axle box units of freight cars MM883

Technical specification	
Voltage, V	380
Frequency, Hz	50
Pressing-out force, tf	60
Total installed capacity, kW	3,0
Hydraulic fluid pressure, MPa (bar)	19(190)
Air pressure in pneumatic circuit, MPa	0,63
Hydraulic cylinder stroke, mm	280
Hydraulic cylinder diameter, mm	200
Elevated track height, mm	350
Low position of the remover axle, mm	772
Operation mode	manual
Overall dimensions	
Length, mm	1700
Width, mm	710
Height, mm	1600
Item weight, kg	690

The stand consists of the following main components:

- Frame;
- Carriages;
- Scissors mechanism;
- Platform;
- Remover unit,
- Delivery table;
- Pneumatic equipment,
- Hydraulic equipment;
- Electrical equipment;
- Set of removable devices

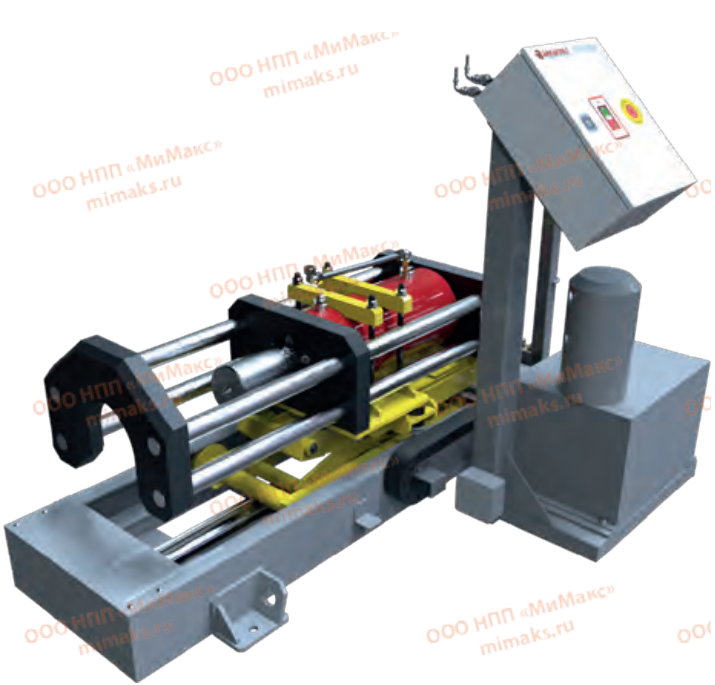
The stand is intended for the cold pressing-out/pressing-in of roller- and cassette-type axle box units from freight cars wheelsets axle neck.

The press performs the following operations:

- pressing-out of cassette-type bearings BRENCO, SKF from the wheelset РВ2Ш-957 axle neck.
- pressing-in of roller- and cassette-type axle box units (SKF-CTBU-130, ХАРП, BRENCO) to the axle necks of the wheelsets РУ-1-950 and РУ-1Ш-957.
- pressing-in of cassette-type bearings BRENCO, SKF to the wheelset РВ2Ш-957 axle necks

Stand for dismantling of bearings inner races by cold pressing-out method MM334M

The remover is intended to dismantle the roller bearing inner races with a labyrinth seal from the axle neck of the freight wagon (Ø130 mm) by cold pressing-out method.



Technical specification	
Pressing-out force, tf	60
Air pressure in pneumatic circuit, MPa	0,63
Installed capacity, kW	3,0
Pump station pressure, MPa (bar)	19 (190)
Pump station supply flow, l/min	7,54
Cylinder stroke, mm	270
Cylinder diameter, mm	200
Voltage, V	380
Current frequency, Hz	50
Technological track height, mm	0
Low position of the remover axle, mm	422
Overall dimensions (excluding the panel and hydraulic station), mm	
length	1600
width	720
height	1250
weight, kg	700

The stand consists of the following main components:

- Base;
- Movable frame,
- Scissors mechanism,
- Platform,
- Remover unit,
- Pneumatic equipment,
- Hydraulic equipment,
- Electrical equipment

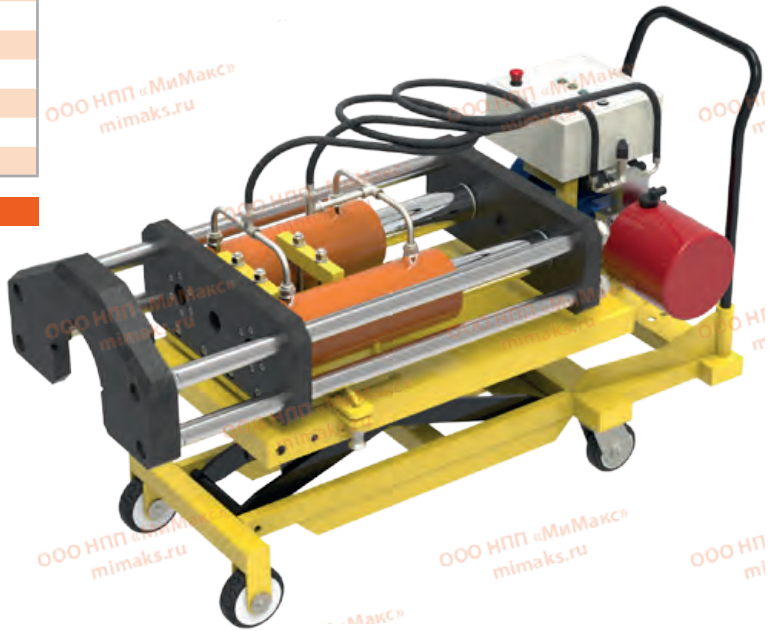
Stand for mounting-dismantling of axle box with cassette bearings from the wheelset MM809

The complex technical specification:	
Maximum pressing force, kN	650
Conveying speed, mm/sec	3,60
Maximum stroke, mm	250
Maximum pressure during dismantling, bar	210
Maximum pressure during mounting, bar	97
Frequency, Hz	50
Drive power, kW	3
Mains supply, V	380
overall dimensions: L x W x H	1717x640x1000
weight (without tooling), kg.	580

The remover consists of:

- Power mechanism;
- Lifting table;
- Hydraulic equipment;
- Electrical equipment;
- Operating tooling

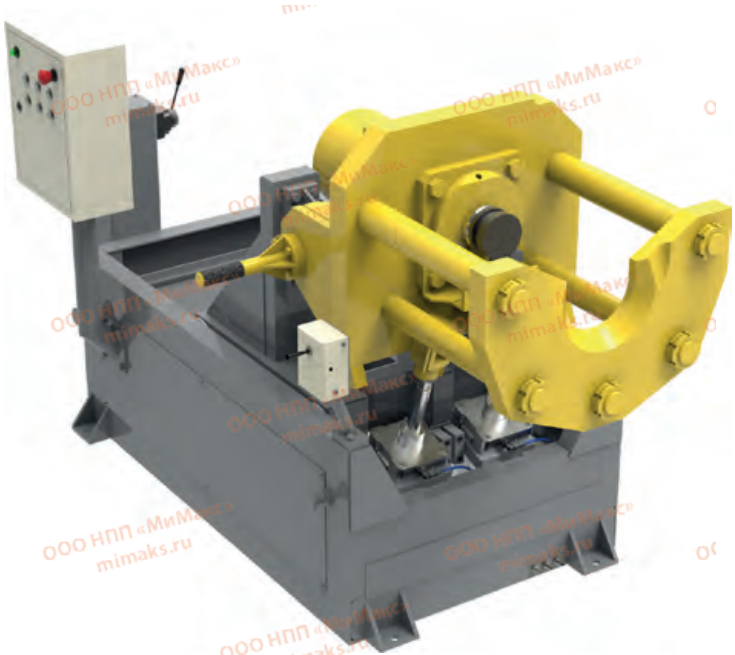
The remover for dismantling of axle boxes bodies with cassette-type bearings is intended for dismantling of axle boxes bodies and mounting/dismantling of passenger cars wheelsets cassette bearings.



Equipment for repair of axle boxes

Stand for cold pressing-out of axle box units MM344

Stand is intended for cold pressing-out of roller- and cassette-type axle box units of the freight wagons from the wheelsets axle necks.



Technical specification	
remover drive type	hydraulic, pneumatic
voltage, V	380
frequency, Hz	50
total installed capacity, kW	5,5
hydraulic fluid pressure, MPa (bar)	20
air pressure in pneumatic circuit, MPa	0,63
consupmtion by hydraulic station l/min	10
compressed air consumption, m^3/h max	0,05
hydraulic cylinder stroke, mm.	300
Maximum force generated by cylinder, tf	60
overall dimensions:	
length, mm	1987
width, mm	753
height, mm	1291
weight, kg	685

The manipulator consists of the following main components:

- Frame,
- Carriage,
- Remover unit,
- Pneumatic equipment,
- Hydraulic equipment,
- Electrical equipment

Unit for repair of bodies of electric trains axle boxes MM023

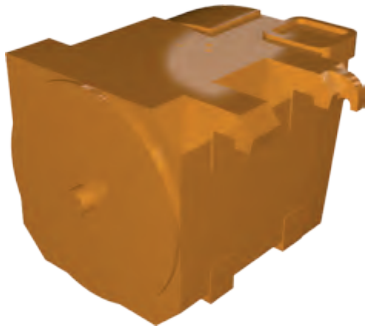
The unit is intended for turning of the axle box in two planes in course of welding deposition and peeling.

Technical specification:	
number of workstations	1
drives type	electrical
voltage, V	220
frequency, Hz	50
Longitudinal rotation drive:	
drive power, kW	0,5
turning angle	not restricted
rotation frequency, rpm	4
Transverse rotation drive:	
drive power, kW	0,5
turning angle	not restricted
rotation frequency, rpm	4
Overall dimensions, mm	1600x1120x1400

The complex consists of the following main units:

- electrical equipment;
- safety locking cover;
- manipulator;
- transverse rotation drive:
- longitudinal rotation drive:
- frame;

Equipment for repair of electric traction motors, generators and wheel and gear units



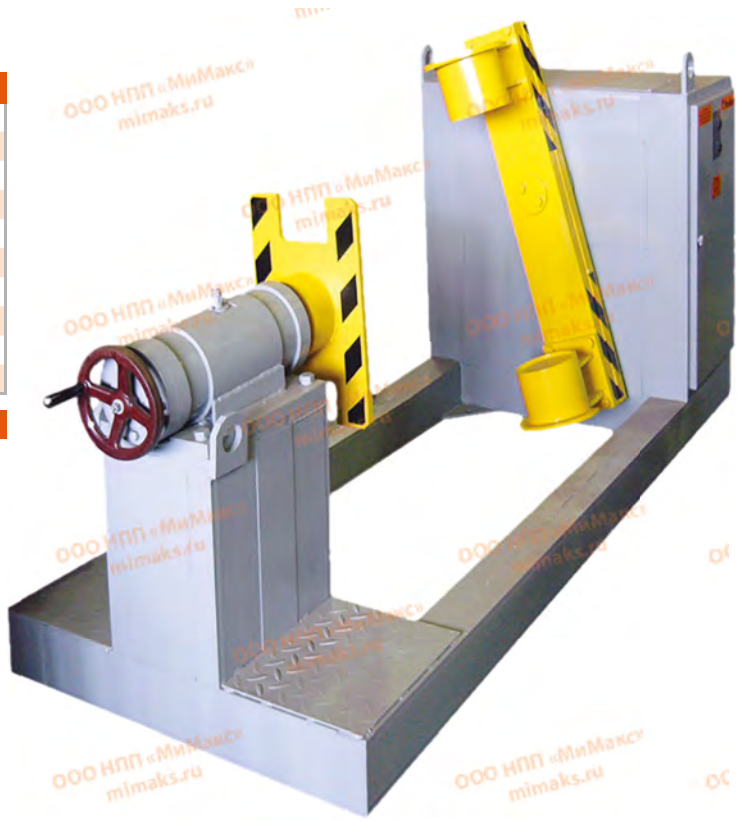
ЭД118, ЭД107 motors manipulator ММ220

The manipulator is intended for turning of ЭД118, ЭД107 electrical motors around transverse axis during repair.

Technical specification	
supply voltage, V	380
frequency, Hz	50
installed capacity, kW	1,5
rotation frequency, min^{-1}	2,53
weight-carrying capacity , kg	3000
overall dimensions:	
length, mm	2750
width, mm	1050
height, mm	1200
weight, kg	990

The manipulator consists of the following main units:

- front support;
- turn drive;
- spindle unit;
- movable sleeve with tail support;
- frame;

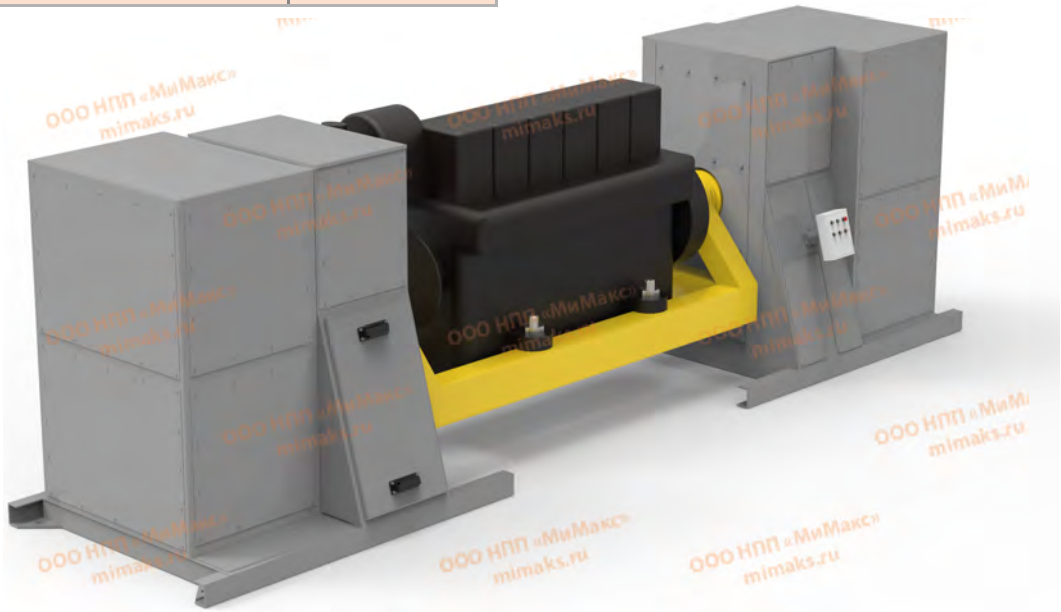


Diesel engine manipulator MM722

Technical specifications	
Angle of tilting, °	360
Unit power supply, V	380
Overall imensions:	
Length, mm	9000
Width, mm	2000
Height, mm	3000

The manipulator is intended for diesel tilting.

The manipulator consists of supports and turning platform. The support is a welded structure with a bearing assembly inside. The turning platform drive is located inside the supports. The turn drive is electromechanical. The platform is a welded frame with bearing journals located on one axle.



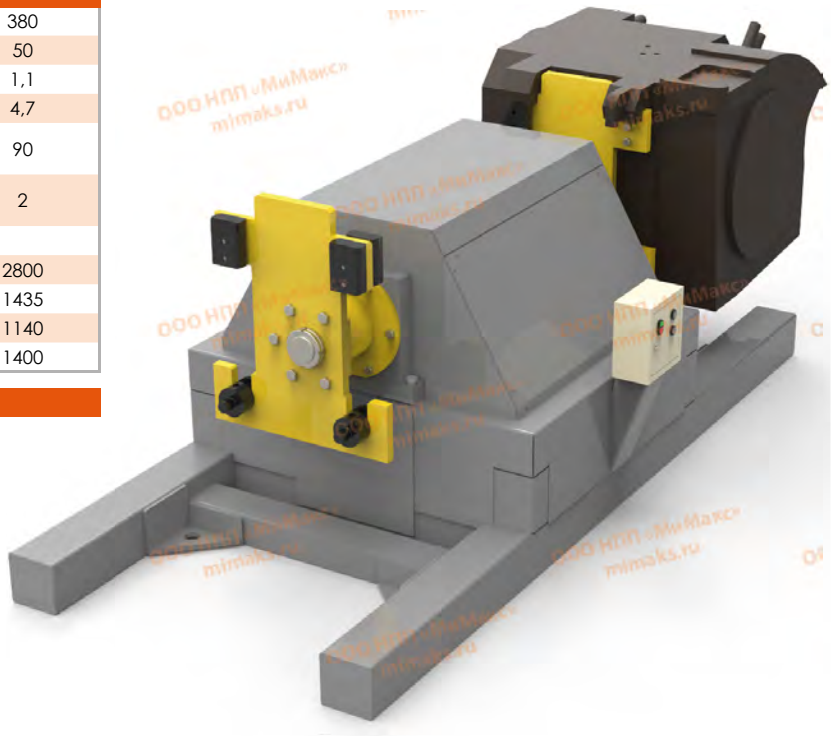
Electric traction motors manipulator MM312

The manipulator is intended for turning of electric traction motors of electric trains during their repair.

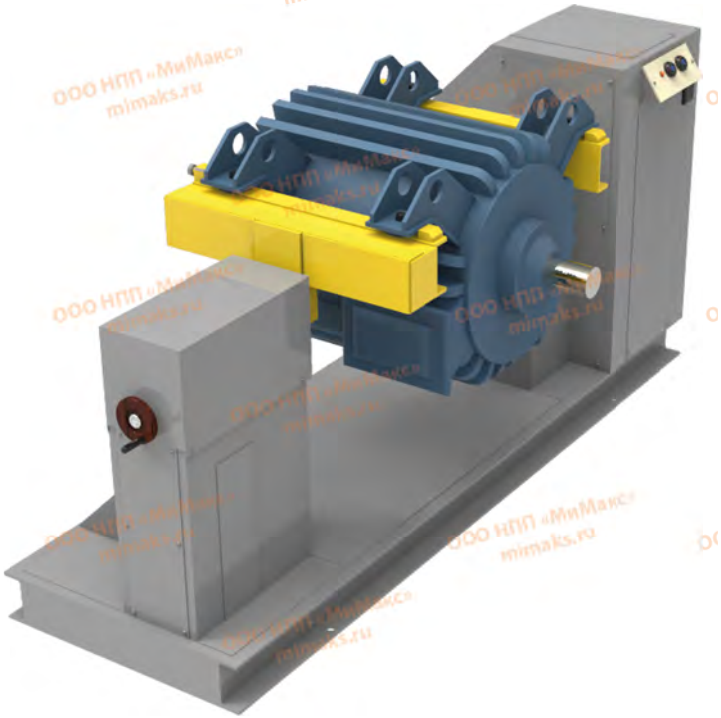
Technical specification	
supply voltage, V	380
frequency, Hz	50
installed capacity, kW	1,1
face chucks rotation frequency, rpm	4,7
face chuck turning angle, ± ° from the installation position of the turning motor support assembly, °	90
number of simultaneously installed motors, pcs	2
overall dimensions, mm	
length	2800
width	1435
height	1140
weight, kg	1400

The item consists of the following main units:

- housing
- drive shaft
- two face chucks
- dowel pins
- drive
- control cabinet
- frame



Multipurpose manipulator for generators MM317



The manipulator is intended for turning generators of ЭГВ.08 У1, 2ГВ-13У1, DCG 4435/24/2a 39, ЭГВ-32 types during their repair.

Technical specification	
supply voltage, V	380
frequency, Hz	50
total installed capacity, kW	1,1
support assembly rotation frequency, rpm	2,8
support assembly turning angle, °	not restricted
overall dimensions, mm	
length	2073
width	768
height	1000
weight, kg	467

Item comprises the following main units:

- support assemblies
- control panel
- support with holding mechanism
- support with the drive
- frame

Multipurpose manipulator for low-powered generators MM318

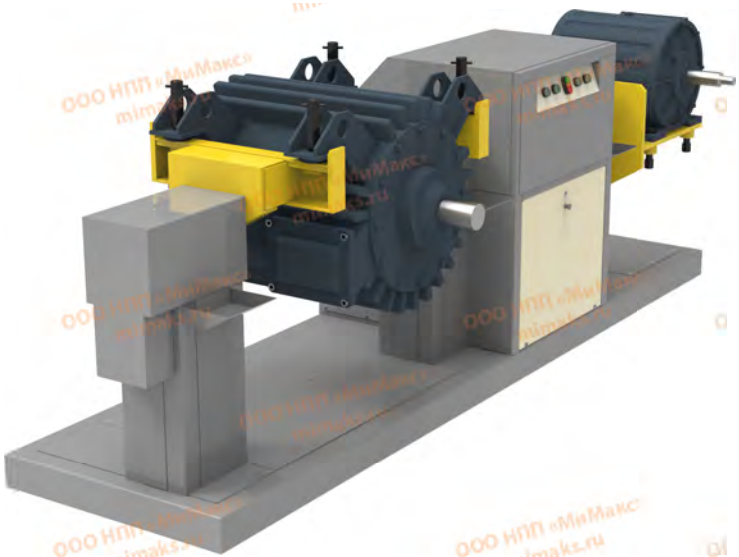
The manipulator is intended for turning the generators of the following types during their repair: 2ГВ.003.12, 2ГВ.003.12У1, ГВ003.10, 2ГВ.003.13, ЭГВ.01.У1, ЭГВ.01.1У1, ЭГВ.01.2У1, ГСВ-8Е/01, 2ГВ.008.У1, 2ГВ.008.2У1, 2ГВ.008.3У1

Technical specification	
supply voltage, V	380
frequency, Hz	50
installed capacity, kW	0,55
support assembly rotation frequency, rpm	2,8
support assembly turning angle, °	not restricted
overall dimensions, mm	
length	1200
width	810
height	1100
weight, kg	350

Item comprises the following main units:

- removable housing
- spindle unit
- worm geared motor
- support assemblies
- control panel
- frame

Multipurpose disassembly stand for generators with manipulator ММ317Г



The stand is intended for turning of generators of the following types: ЭГВ.08У1, 2ГВ-13У1, DCG 4435/24/2a 39, ЭГВ-32, 2ГВ.003.12, 2ГВ.003.12У1, 2ГВ003.10, 2ГВ.003.13, ЭГВ.01.У1, ЭГВ.01.1У1, ЭГВ.01.2У1, ГСВ-8Е/01, 2ГВ.008.У1, 2ГВ.008.2У1, 2ГВ.008.3У1 during their repair.

Technical specification	
supply voltage, V	380
frequency, Hz	50
installed capacity, kW	1,65
support assembly rotation frequency, rpm	2,8
support assembly turning angle, °	not restricted
overall dimensions, mm	
length	2855
width	740
height	1060
weight, kg	710

Item comprises the following main units:

- removable housing
- 2 spindle units
- worm geared motor
- support assemblies
- control panel
- frame

Generator stator manipulator MM836

The stand is intended for turning of generators of the following types: ЭГВ.08У1, 2ГВ-13У1, DCG 4435/24/2a 39, ЭГВ -32 and 2ГВ.003.12, 2ГВ.003.12У1, 2ГВ003.10, 2ГВ.003.13, ЭГВ.01.У1, ЭГВ.01.1У1, ЭГВ.01.2У1, ГСВ-8Е/01, 2ГВ.008.У1, 2ГВ.008.2У1, 2ГВ.008.3У1 during their repair.

Technical specification	
supply voltage, V	380
frequency, Hz	50
installed capacity, kW	1,65
support assembly rotation frequency, rpm	2,8
support assembly turning angle	not restricted
overall dimensions	
length, mm	2855
width, mm	740
height, mm	1060
weight, kg	610

The stand consists of:

- frame
- two drive spindle units
- spindle unit with fixing device, cantilever support assembly
- driven and idle support assemblies
- rotary drives
- control panel
- removable housings

Manipulator for wheel-motor module assembly ТЭМ2 ММ224

The stand is intended for turning of wheel-motor module of a diesel-locomotive shunter ТМ2 during its repair

Technical specification	
supply voltage, V	380
frequency, Hz	50
installed capacity, kW	2,2
weight-carrying capacity, kg	5700
overall dimensions:	
length, mm	2500
width, mm	1000
height, mm	1620
weight, kg	890

The manipulator consists of the following main components:

- pump station with high-pressure hoses,
- turning support,
- fixing pin,
- floors,
- hydraulic cylinder,
- bearing units,
- frame.

Machine for pinion gear shaft lapping to the crown MM183

The machine is intended for lapping of the pinion gear shaft conical surfaces and crown gear of electric trains ЭР2, ЭР2Т, ЭТ2, ЭД2Т, ЭД9М, ЭД9Т, ЭР9П.

Technical specification	
Operation modes:	
lapping	mechanical
forces generated in course of lapping:	
unit pressure, kg/cm^2	0,7
axial force, kg	10
torque, kgm	5
lapping cycles number, cycle/min	30
lapping time till 90% contact of lapped surfaces is received, min	5…10
voltage, V	380
electrical drive power, kW	1,5
air pressure, MPa	0,4…0,8
overall dimensions, mm	800x800x2344
weight, kg	480

The machine consists of the following main units:

- lifting-lowering unit,
- rotating column,
- suspension,
- spindle,
- control panel.
- frame

Machine for flange lapping to the pinion gear shaft of electric trains MM184

The machine is intended for lapping of flange conical surfaces to the pinion gear shaft of electric trains ЭР2, ЭР2Т, ЭТ2, ЭД2Т, ЭД9М, ЭД9Т, ЭР9П.

Technical specification	
Operation modes:	
lapping	mechanical
forces generated in course of lapping:	
unit pressure, kg/cm^2	0,7
axial force, kg	10
torque, kgm	5
lapping cycles number, cycle/min	30
lapping time till 90% contact of lapped surfaces is received, min	5…10
voltage, V	380
electrical drive power, kW	1,5
air pressure, MPa	0,4…0,8
overall dimensions, mm	800x800x2344
weight, kg	480

The machine consists of the following main units:

- lifting-lowering unit,
- rotating column,
- suspension,
- spindle,
- control panel
- frame

Machine for pinion lapping to the armature shaft of locomotives traction motor MM197

The machine is intended for lapping of the pinion to the armature shaft of locomotives ЭД118, ЭД-107, ТЕ006, ЭД120, ЭД133 traction motors

Technical specification	
Operation modes:	
lapping	mechanical
forces generated in course of lapping:	
unit pressure, kg/cm^2	0,7
axial force, kg	10
torque, kgm	5
lapping cycles number, cycle/min	20...30
lapping time till 90% contact of lapped surfaces is received, min	5…10
voltage, V	380
electrical drive power of lapping, kW	1,1
electrical drive power of manipulator, kW	1,5
air pressure, MPa	0,4…0,63
overall dimensions, mm	1000x2500x2500
weight, kg	700

The machine consists of the following main units:

- rotating cantilever,
- spindle unit,
- suspension,
- control panel,
- tail support,
- manipulator,
- framework

Machine for flange lapping to the traction motor shaft of electric trains MM181

The machine is intended for lapping of the armature shaft conical surfaces of electric traction motor and the electric trains ЭР2, ЭР2Т, ЭТ2, ЭД2Т, ЭД9М, ЭД9Т, ЭР9П joint flange.

Technical specification:	
Operation modes:	
lapping	mechanical
forces generated in course of lapping:	
unit pressure, kg/cm^2	0,7
axial force, kg	10
torque, kgm	5
lapping cycles number, cycle/min	20…30
lapping time till 90% contact of lapped surfaces is received, min	5…10
voltage, V	380
electrical drive power of lapping, kW	1,1
electrical drive power of manipulator, kW	1,5
air pressure, MPa	0,3
overall dimensions, mm	800x2500x2500
weight, kg	790

The machine consists of the following main units:

- turning cantilever
- spindle unit
- suspension
- control panel
- tail support
- manipulator
- framework

Disassembly and assembly position for wheel and gear units of electric trains MM234

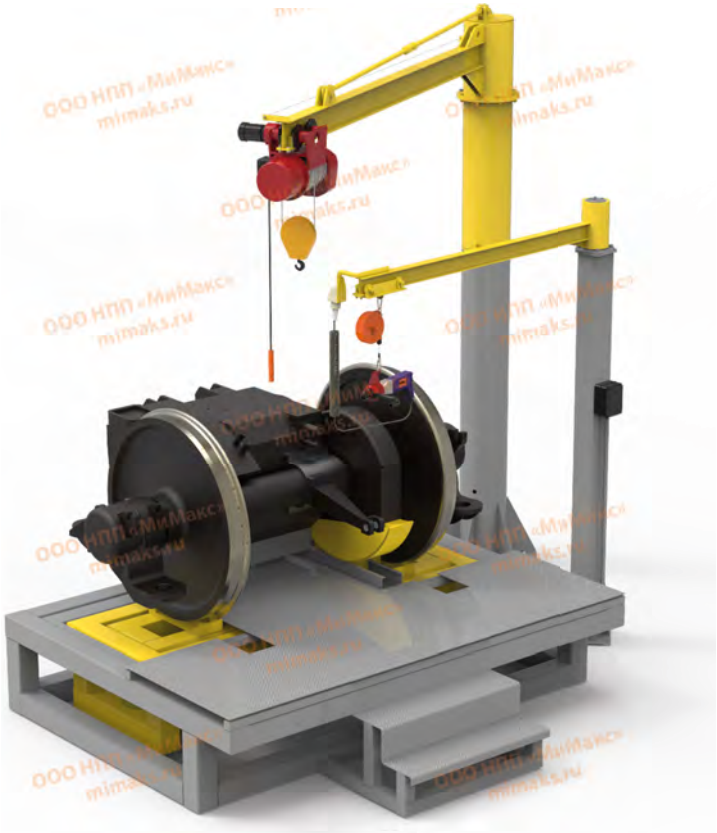
The stand is intended for disassembly and further assembly of traction gearboxes with a straight and crescent suspension during their mounting and dismantling on the wheelset.

Technical specification	
supply voltage, V	380
frequency, Hz	50
installed capacity, kW	5,5
Weight-carrying capacity of jib-crane, kg	500
Air pressure in pneumatic circuit, MPa	0,63
Compressed air consumption, m^3/h	1,5
Support force of the applied stop shoulder, kg (when 0,4 MPa)	436
Exhaust oil tank volume, l	50
overall dimensions, mm	
length	3500
width	2000
height	3500
Weight, maximum kg	1750

The position consists of the following main units:

- jib-crane
- two-leg sling
- pneumatic power wrench with heads set,
- applied stop shoulder
- exhaust oil tank
- blocks of support rollers
- pneumatic control rack
- base

Disassembly system for locomotives wheel-motor block MM721



The system is intended for disassembly of the locomotive ТЭП70 wheel-motor block: oil discharge from the reduction gearbox, housing removal, disconnecting of the drive support and wheelset from the traction motor

Technical specification	
voltage, V	380
frequency, Hz	50
total installed capacity, kW	5
air pressure in pneumatic circuit, MPa	0,63
overall dimensions:	
length, mm	4500
width, mm	4000
height, mm	3900
weight, maximum kg	2100

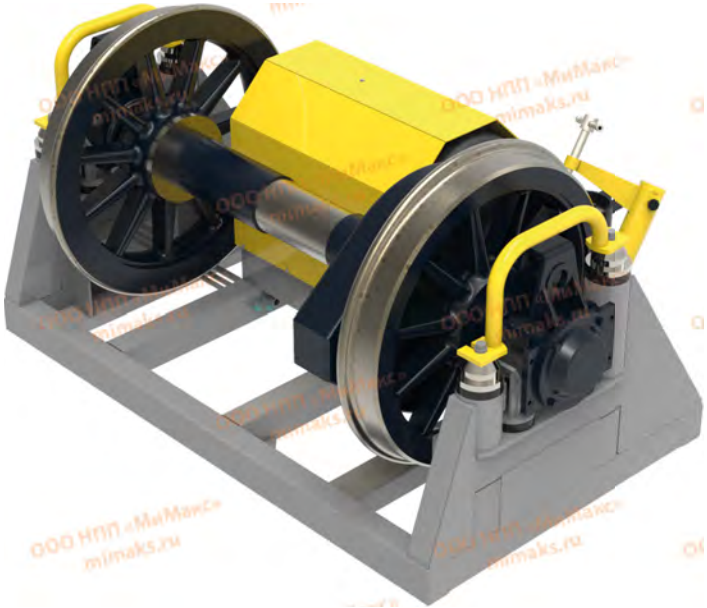
The system consists of:

- Support frame with a base for a traction motor;
- Lifting platform with support assemblies for the wheelset installed at the travelling bogie;
- Movable support assembly for removal of reduction gearbox bottom housing;
- Cantilever crane for removal of reduction gearbox top housing;
- Rotary rack for suspension of electromechanical power wrench;
- Electromechanical power wrench for unscrewing of drive support mounting bolts from the traction motor;
- Impact pneumatic power wrench;
- Vacuum oil collecting unit;
- Control panel.

Stand for vibration-based diagnostics of electric trains wheel and gear units MM231

The stand is intended for spin-up of wheel and gear units of electric trains with pedestal and driver axle boxes during the vibration-based diagnostics.

Technical specification	
Supply voltage, V	380
Frequency, Hz	50
Installed capacity, kW	5,5
Nominal rotation frequency of the wheelset, rpm (km/h)	
(when the reduction gearbox ratio i=3,17)	326,3(64,5)
(when the reduction gearbox ratio i=3,41)	303,3(60)
Maximum rotation frequency of the wheelset, rpm (km/h)	
(when the reduction gearbox ratio i=3,17)	353,6(70)
(when the reduction gearbox ratio i=3,41)	328,7(65)
Braking	by electric motor
Overall dimensions, mm	
length	320
width	1400
height	1140
Weight, maximum kg	800



The stand consists of the following main units:

- framework,
- support assemblies for driver axle boxes mounting,
- support assemblies for pedestal axle boxes mounting,
- reduction gearbox support unit,
- rotary drive of the wheel and gear unit with traversing device,
- protective arcs,
- control panel (not shown in the picture).

Stand for wheelset spin-up of electric trains motor and trailer cars MM382

The stand is intended for spin-up of both wheel and gear units of electric trains with pedestal and driver axle boxes and trailer cars wheelsets during vibration-based diagnostics.

Technical specification	
Supply voltage, V/Hz.	380/50
Installed capacity. kW	17
Air pressure in pneumatic circuit, MPa	0,63
Nominal rotation frequency of the wheelset (i=3,17/i=3,41), rpm.	326,3/303,3
Maximum rotation frequency of the wheelset (i=3,17/i=3,41), rpm	353,6/328,7
Rotation frequency of the trailer car wheelset, (min./max.) rpm	294/317,5
Braking	by electric motor
Overall dimensions including safety shield(L x W x H),mm.	4845X3403x1610
Weight, kg.	2300

The stand consists of:

- frame
- rim rotary drive of trailing wheelsets with traversing device,
- rotary drive of the wheel and gear unit with traversing device,
- support assemblies for trailer cars axle boxes,
- support assemblies for pedestal axle boxes,
- support assemblies for driver axle boxes,
- reduction gearbox support unit,
- protective arcs,
- safety washers,
- pneumatic equipment,
- control panel,
- safety shield.

Movable set of lifting jacks for wheelset jacking MM075

Jacks set is intended for jacking of electric and diesel locomotives wheelsets (ВЛ-80, ЧС-2, ТЭМ-18). Two jacks are applied for lifting (at each side of wheelset).

Technical specifications:	
Maximum lifting force, N	15000
Maximum jack stroke, mm	Depends on version
electric drive	220 V, 50 Hz
capacity, kW	1,0
Overall dimensions, mm	Depends on version
weight, kg	107-195

The unit consists of the following main components:

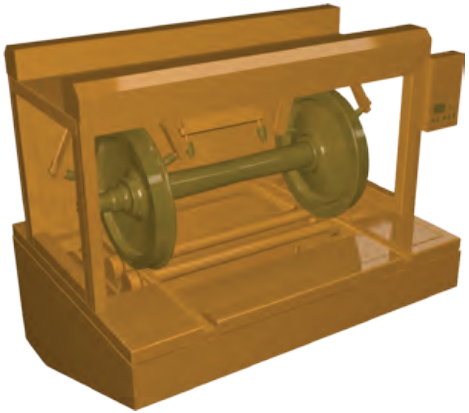
- bogie;
- body;
- angle gearbox;
- planetary gearbox;
- electric drive;
- lifting screw;
- supporting bracket;

Operation procedure:

The jack operation is performed in the following way:

- Place the jack under the spring at its attachment point to the axle box.
- Operate the remote control buttons to raise the axle box to the required height.
- Perform the same procedure on the other side of electric locomotive using another jack;
- After the required works are complete, let the axle boxes down by turning drives into the reversed direction:

Washing equipment for rolling stock



Washing system for bogies frames MM752

The washing system is intended for washing of bogies frames of electric trains in accordance with regulations for cars repair.

Equipment control system is automatic or manual and is located on the panel.

Technical specifications:	
Supply voltage, V	380
Installed capacity, kW	160
Maximum load, pcs.	1
Productive capacity, pcs./h	3
Tanks number, pcs.	1
Tank volume, m^3	3
Solution temperature, °C	60-80
Unit overall dimensions:	
length, mm	15000
width, mm	4200
height with an open curtain, mm	3200

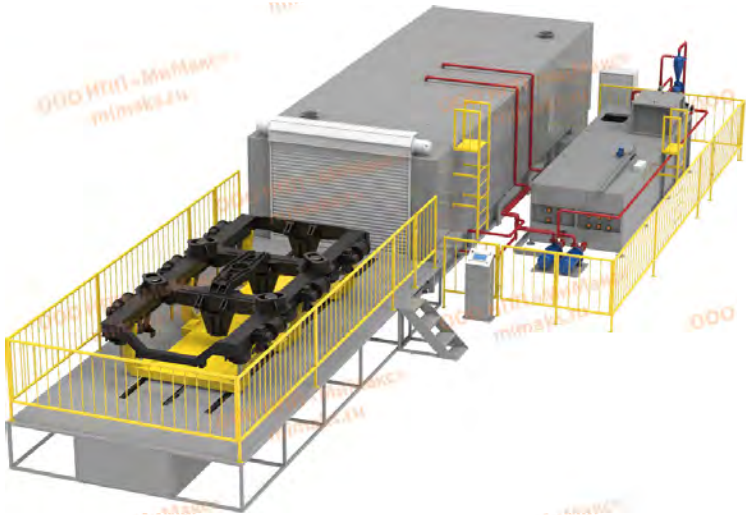
The system consists of the following main units:

- System of cleaning of the washing solution from grease and oil.
- Curtains lifting/lowering system during the transfer of the bogie frame to/out the chamber and removal of cleaned frames from the washing chamber.
- Tank level gauge.
- Automatic water refilling system.
- Tank temperature-monitoring device.
- Access doors for preventive and repair works performance.
- System maintaining the specified temperature of washing solution.
- Electromechanical chain drive for transfer bogie to bring it in and out of the washing chamber.
- The closed-cycle solution delivery system with periodic renewal.

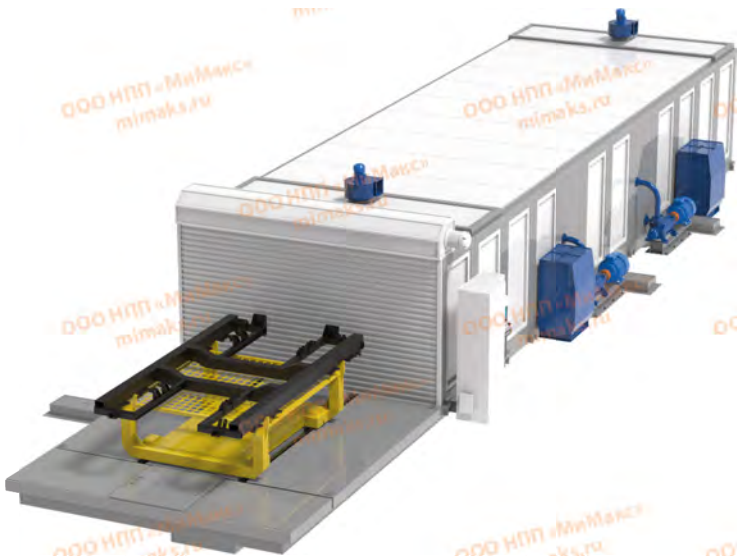
The washing system must be equipped with a thermal insulated tank for washing solution preparation including a pump, heating devices for washing solution, level and temperature gauges. The washing chamber is of a tunnel-type.

The rail track section is installed on the tray so that the transfer bogie could run on it. The electromechanical chain drive is applied for transfer bogie travelling in and out the washing chamber. The frame cleaning is jet.

The solution delivery system is of a closed-cycle type with periodical renewal. The washing machine is equipped with the system of washing solution cleaning from grease and oil.



Washing system for bogies frames with an additional washing chamber MM890



The technological system for washing of rolling stock bogies with an additional washing chamber is intended for washing of bogies frames of the rolling stock and large parts with a washing solution at a temperature 40-80˚C and pressure of 17,6 kg/cm² (1,7 6MPa).

Technical specifications	
Voltage and current frequency	380/220 V; 50Hz
Electric motors capacity (without electric heating), kW	118
Electric heating capacity, kW	132
The system overall dimensions, mm (l×w×h)	23000x8950x3900
The chamber overall dimensions, mm (l×w×h)	14520×4450×2260
Height above floor level, mm	2600
Weight, kg	33500
Maximum overall dimensions of rinsing parts, mm	4860×3400×1750
Washing section	
Solution temperature, °C	60 – 80
Pressure, MPa (kg/cm²)	1,76 (17,6)
Time of washing, min	15 – 30
Rinsing section	
Rinsing water temperature, °C	40 – 80
Pressure, MPa (kg/cm²)	0,39 (3,9)
Time of rinsing, min	5 – 10
Transportation bogie	
Conveyor type	chain
Drive power, kW	2,2
Drive tractive force, kg	2000
Weight-carrying capacity, kg	15000

The system consists of the following main units and devices:

- washing chamber
- water drain tray
- conveyor for transfer of the transportation bogie;
- washing solution treatment system;
- rinsing water treatment system;
- automatic control system;
- control cabinet.

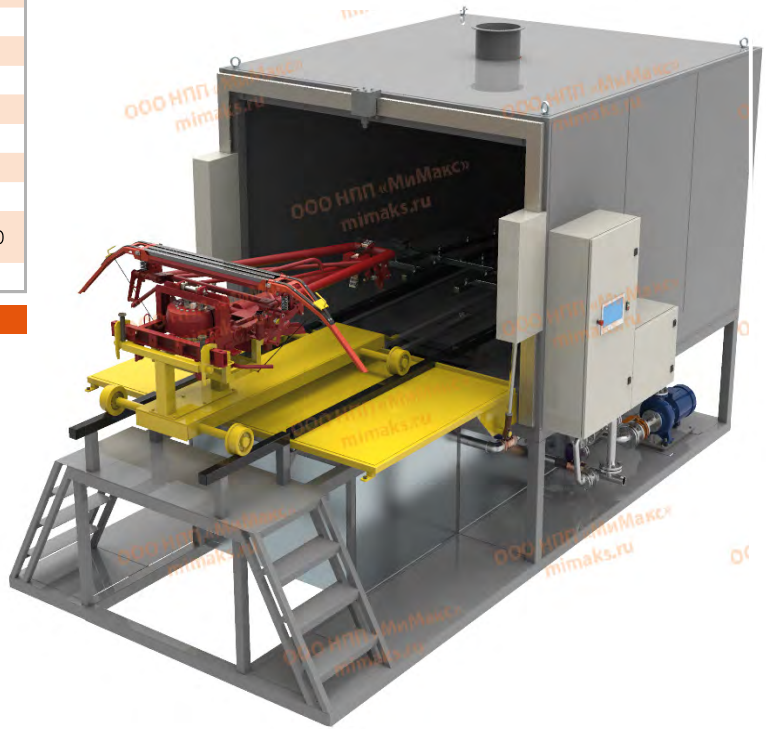
Washing machine for current collectors MM758

Technical specifications:	
supply voltage, V	380
installed capacity, kW	45
compressed air pressure, MPa	0,63
air consumption, m3/h	1
Bogie weight-carrying capacity, kg	150
Tank volume, m^3	3
Washing solution temperature, °C, max	75-90
Washing solution pressure, bar	6
Heating element type	EHT
Rinsed current collector overall dimensions, L×W×H, mm, maximum	2200x2000x600
Current collector load	by crane

The washing machine consists of the following main units:

- Framework complete with an inbuilt tank for washing solution, washing solution heating system with electric heating tubes and a rough cleaning device for washing solution.
- Washing chamber equipped with pipe system with nozzles and an automatic door.
- Chain-driven bogie for transferring the current collector to the washing chamber.
- Pump unit
- Control system
- Control panel

The machine is intended for jet rinsing of electric trains current collectors. The rinsing is performed with hot washing solution in automatic mode. The solution is heated by electric heating tubes.



Washing machine for axle boxes and reduction gearboxes bodies MM750

The washing machine is equipped with two tanks for degreasing and washing procedures. A working chamber has an extension loading platform. The parts washing process is jet. Power fluid affects the parts surface in three directions. The working chamber consists of sealed access door for parts loading and extension platform. The washing solution delivery system is of a closed-cycle type with periodic renewal.

The machine is equipped with automatic control system, which allows changing the process parameters according to the item type

Technical specifications:	
Supply voltage, V	380
Installed capacity, kW	80
Chamber effective volume, m^3	2,5
Maximum load, kg	600
Productive capacity, kg/h	1800
Tanks number, pcs	2
Tanks volume, l	750
Nozzle discharge pressure, bar	4,5
Washing solution heating, °C	80
Dimensions: of platform (minimum), mm charging door height (minimum), mm	2200x1200 1000

The washing machine consists of the following main units:

- System for cleaning of washing solution and rinsing water from grease and oil,
- Rolling platform,
- Loading table with guides,
- Parts dry system,
- Tanks level gauge,
- System of automatic water refilling.

Tanks, pipelines, connecting fittings, check valves are made of stainless steel and nonferrous alloys.

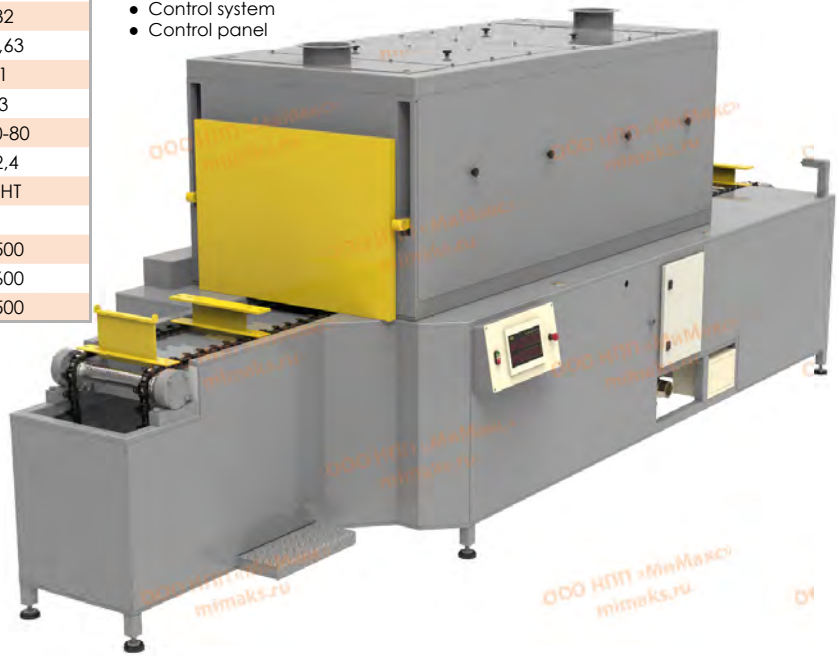
Washing machine for axle boxes MM554

The washing machine is intended for washing of the axle boxes of the rolling stock from dirt, grease, oil using the heated washing solution and further rinsing with clean water in automatic mode.

Technical specifications:	
Supply voltage, V	380
Installed capacity, kW	82
Compressed air pressure, MPa	0,63
Air consumption, m^3/h	1
Tanks total volume, maximum, m^3	3
Washing solution temperature, °C, max	70-80
Washing solution pressure minimum, bar	2,4
Heating element type	EHT
Washing machine overall dimensions:	
length (without incoming conveyor), mm maximum	3500
width, mm maximum	1600
height, mm maximum	2500

The washing machine consists of the following main units:

- Framework with inbuilt tank for washing solution, washing solution heating system with electric heating tubes and rough cleaning device for washing solution;
- Washing chamber equipped with pipelines with nozzles;
- Conveyor;
- Pump unit;
- Control system
- Control panel



Washing machine for small parts MM510

The machine is intended for jet rinsing of small parts during their repair.

Technical specifications:	
General data:	
supply voltage, V	380
installed capacity, kW	42
compressed air pressure, MPa	0,63
air consumption, m3/h (maximum)	1
turntable weight-carrying capacity, kg	200
tank volume, m^3	2,5
washing solution temperature, °C	75-85
washing solution pressure, bar (maximum)	5,0
heating element type	EHT
total capacity of electric heating tubes, kW	30
rinsed parts overall dimensions	1200x1200x1000
parts loading	by crane
Washing machine overall dimensions:	
length, mm	3550
width, mm	2200
height, mm	3000
weight, kg	3600

The machine consists of the following main units:

- Stainless steel base tank.
- Washing chamber with the door.
- Bogie.
- Main pump.
- Two washing rails with nozzles.
- Pump for discharge of disposal solution
- Bogie travel drive
- Bogie rotary drive
- Two service platforms
- Touch-screen control panel.

Washing machine for bearings MM551

Tunnel-type washing machine is intended for cleaning of bearings from dirt, grease (BUXOL), oil with heated washing solution and further rinsing with clean water and drying with compressed air in accordance with the regulations of cars repair.

The machine is equipped with an automatic control system which allows changing the process parameters in accordance with the bearings type.

The delivery of the solution is performed in the closed cycle with periodic renewal.

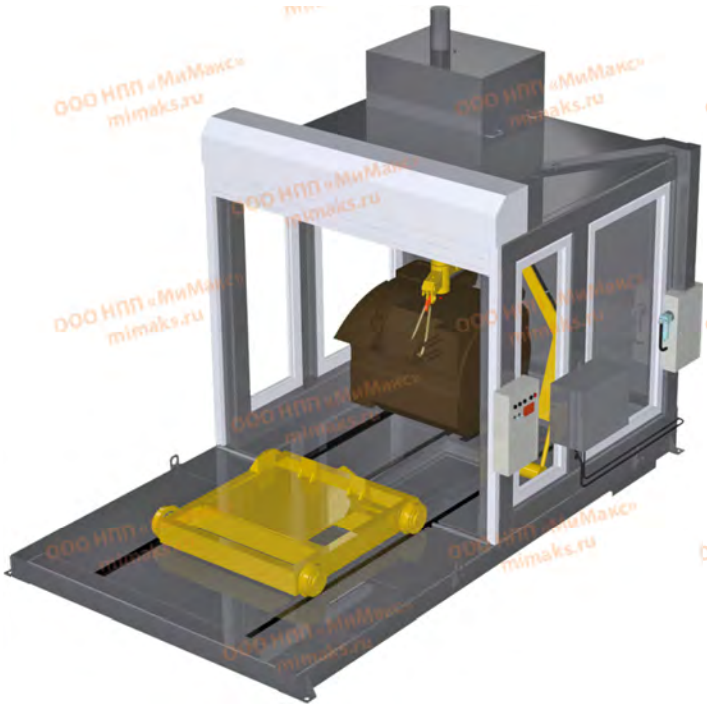
The washing machine is equipped with the system of cleaning of washing solution from dirt and oil.

Technical specifications:	
Supply voltage, V	380
Installed capacity, kW	35
Maximum load, pcs.	3
Productive capacity, pcs/h	15
Tanks number, pcs.	1
Tank volume, m^3	1-1,5
Nozzle discharge pressure, bar	4,5
time of rinsing, min. maximum	8*
Washing solution heating, °C	up to 80
Overall dimensions	6000x2720x3600
length, mm	3000
width, mm	2000
height with an open curtain, mm	2000

The washing machine consists of the following main units:

- System for cleaning of the washing solution and rinsing water from dirt, grease and oil.
- Pneumatic system for bearings charging and discharging.
- Rotary mechanism during the washing process.
- System of automatic water refilling.
- Bearing drying with compressed air inside the chamber.
- Closed-cycle solution delivery system.
- Tank, pipelines, connecting fittings and check valves

High-pressure washing machine for electric traction motors MM305



The configuration (tunnel-type or closed-end washing chamber, layout of water rotation unit components) can be changed upon customer's approval.

The washing machine is intended for rinsing and air-blast cleaning of traction motor before disassembly.

Rinsing is performed with high-pressure clean water (230 bar),with water heating up to 60°C in automatic mode.

Technical specifications:	
General data:	
Supply voltage, V	380
Installed capacity, kW	52
including the in-line heater	36
compressed air pressure, MPa	0,63
air consumption, m^3/h	110
high-pressure pump productive capacity, l/h	1000
time of rinsing, min. maximum	20
time of air-blasting, min. maximum	20
Operation mode:	
"no water heating": power consumed, kW	16
"water heating": power consumed, kW	52
Unit overall dimensions, mm	4700x3500x2700

The item consists of the following main units:

- framework
- washing chamber loading device
- tray for water collection with pump
- washing chamber
- lift-and-turn device
- control panel
- nozzles transfer device
- dirt sump tank with a pump (may be located under the washing machine)
- electric in-line heater
- water treatment system
- high-pressure pump station

High-pressure washing machine for electric traction motors of locomotives MM506

The washing machine is intended for rinsing and air-blast cleaning of traction motor before disassembly.

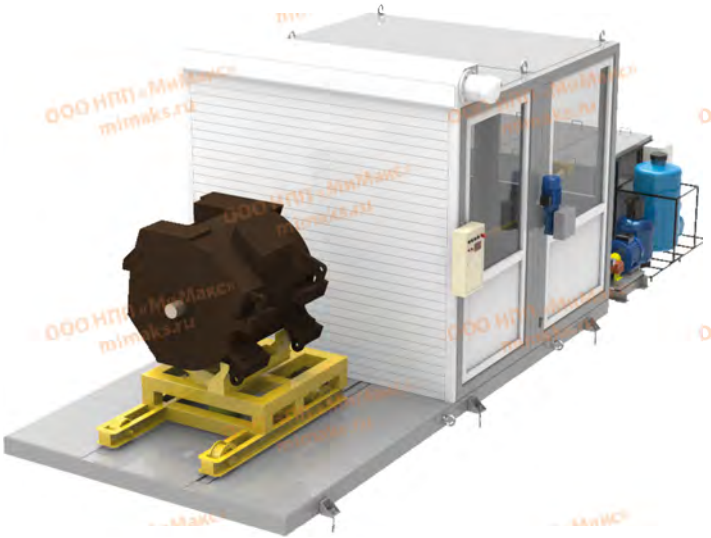
Rinsing is performed with high-pressure clean water (230 bar),with water heating up to 60°C in automatic mode.

The traction motor is delivered to the washing machine by the bogie which is a component of washing chamber loading device. The usage of high-pressure pump together with dirt blasters, moving over the target path during the washing process, greatly improves the quality of rinsing of traction motors.

Technical specifications:	
supply voltage, V	380
installed capacity, kW	16
compressed air pressure, MPa	0,63
air consumption, m^3/h	110
water pressure during the motor rinsing, bar	200
loading device weight-carrying capacity, tf	6
high-pressure pump station productive capacity, l/h	1200
time of rinsing, min maximum	20
time of air-blasting, min maximum	20
Unit overall dimensions, mm	6000x2720x3600

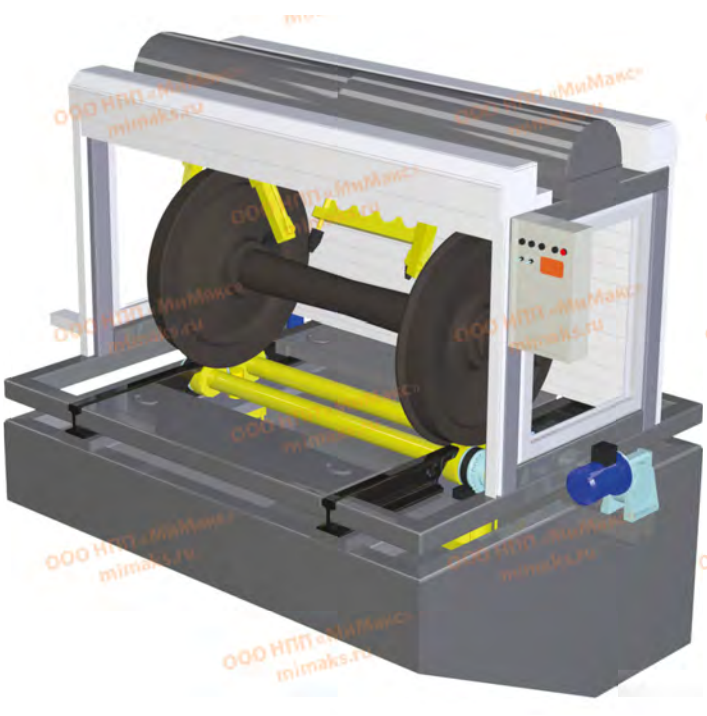
The item consists of the following main units:

- washing chamber
- water collecting tray with sludge pump
- loading and rotary device of traction motor
- transfer device for nozzles and jet
- high-pressure pump station
- intermediate water treatment tank
- Water treatment system
- Automatic control system



The configuration (tunnel-type or closed-end washing chamber, layout of water rotation unit components) can be changed upon customer's approval.

High-pressure washing machine for wheelsets MM704



The configuration (tunnel-type or closed-end washing chamber, layout of water rotation unit components) can be changed upon customer's approval.

The washing machine is intended for rinsing of the cars wheelsets of the rolling stock with high-pressure clean water (200 bars), with water heating up to 60°C in automatic mode.

Technical specifications:	
General data:	
supply voltage, V	380
installed capacity, kW	100*
including the in-line heater	72*
washing solution pressure, bar	200
compressed air pressure, MPa	0,63
compressed air consumption, m^3/h	250
high-pressure pump productive capacity, l/h	2000*
time of rinsing, min maximum	8*
Operation mode	
"no water heating": power consumed, kW	28*
"water heating": power consumed, kW	72*
The unit overall dimensions, mm	4800x2500x2500

** - Depends on version*

The item consists of the following main units:

- Water treatment system
- In-line heater
- High-pressure pump
- Washing chamber
- Running nozzles
- Roll shutters
- Dirt sump tank with pump
- Framework
- Wheelset pulling device
- Control panel
- Wheelset rotary mechanism

Washing machine for locomotives wheelsets MM514

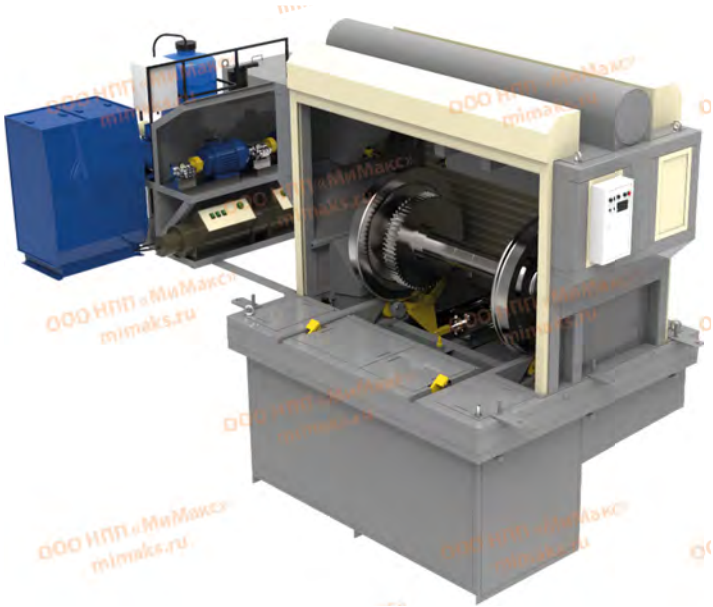
The washing machine is intended for rinsing of the wheelsets of locomotives with high-pressure clean water (200 bars) in automatic mode, with water heating up to 60°C.

Technical specifications:	
General data:	
supply voltage, V	380
installed capacity, kW	110*
including the in-line heater	72*
washing solution pressure, bar	200
compressed air pressure, MPa	0,63
compressed air consumption, m^3/h	250
high-pressure pump productive capacity, l/h	2000*
time of rinsing, min maximum	11*
Operation mode:	
"no water heating": power consumed, kW	28*
"water heating": power consumed, kW	72*
Unit overall dimensions, mm	5100x2800x2700

** - Depends on version*

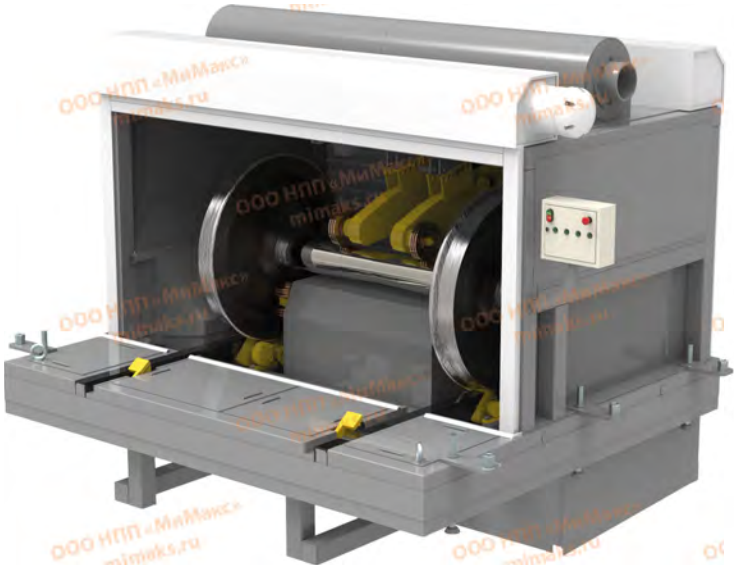
The item consists of the following main units:

- framework;
- washing chamber loading device;
- water collecting tray with pump;
- washing chamber with lifting curtain and ventilation;
- lift-and-turn device;
- control panel;
- transfer device for nozzles;
- dirt sump tank with pump;
- in-line heater;
- water treatment system
- high-pressure pump station.



The usage of high-pressure pumps together with dirt blasters moving over the target paths during the washing process greatly improves the quality of wheelsets rinsing, especially in hard-to-reach places.

Dry cleaning unit for wheelset MM504



The unit is intended for dry cleaning of the wheelset. The wheelset cleaning is carried out in closed chamber at which a flange for exhaust ventilation is located.

The cleaning procedure is performed by rotating brushes which move on the rotating wheelset along the surface to be cleaned.

The unit can be of a tunnel-type and closed-end-type, and also be completed with storage units with loading and unloading devices.

Technical specifications:	
operation mode	automatic
supply voltage, V	380
installed capacity, kW	22
time of axle cleaning, min	12...18
thickness of the removed paint coating layer, μm	200…400
Unit overall dimensions, mm:	
length	2500*
width	3100
height	1700

* basic configuration

The item comprises the following main units:

- guides (rails) with loading and unloading support assemblies;
- pushers;
- wheelset axle rotary drive;
- cleaning chamber with lifting curtains and ventilation flange;
- central carriage with rotary drives;
- side carriages with rotary drives;
- brushes;
- motion screw for central carriage;
- carriage transfer drive;
- control panel;

Dry cleaning unit for wheelset axle MM503

The unit is intended for wheelset axle cleaning to metal.

Technical specifications:	
operation mode	automatic
supply voltage, V	380
installed capacity, kW	9
time of axle cleaning, min	8...12
thickness of the removed paint coating layer, μm	200…400
unit overall dimensions, mm:	
length	1780*
width	3000
height	1680

* basic configuration

The item comprises the following main units:

- frame;
- guides with loading and unloading support assemblies;
- pushers;
- wheelset axle rotary drive;
- cleaning chamber with lifting curtains and ventilation flange;
- carriage with rotary drive;
- brushes;
- motion screw for carriage;
- carriage transfer drive;
- control panel;
- loading storage unit of axes*;
- storage unit of axes*;
- ventilation with air cleaning system*;

* not included in basic configuration

The axle cleaning is carried out in closed chamber at which a flange for exhaust ventilation is located. The cleaning procedure is performed by two rotating brushes which move over the rotating axle. The unit can be of a tunnel-type and closed-end-type, and also be completed with storage units with loading and unloading devices.

Equipment for repair of underground rolling stock

Mechanized lines and equipment for transportation

Mechanized elevated track (wheelsets storage unit) MM392

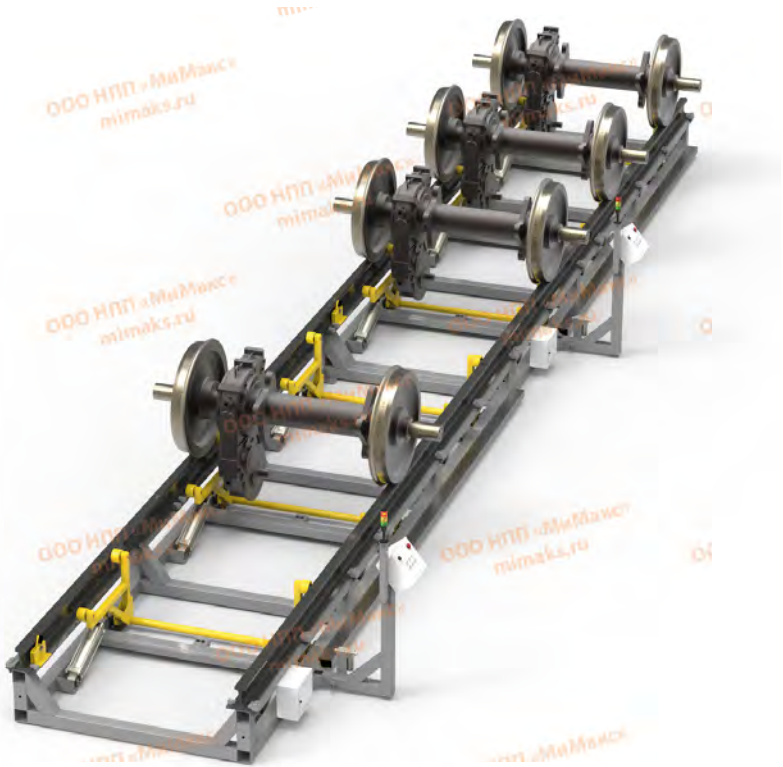
The elevated track is intended for storing and transportation of wheelsets. The elevated track consists of sections. Sections are joined together during installation and attached with collet anchor bolts as required.

The design of the elevated track allows wheelsets with parts of axle boxes and reduction gearboxes, protruding beyond the wheel circle, to be rolled. The wheelset is gripped by the wheel flanges.

Technical specifications:	
air pressure in pneumatic circuit, MPa	0,63
total installed capacity, kW	1,5
supply voltage, V	220
air consumption, m^3/h	0,84
height of rail head, mm.	600
operation mode	automatic
overall dimensions, mm.	2692x6000x1415
weight of one section, kg.	1485

The device includes the following main units:

- frame,
- rails;
- pushers;
- pushing rollers;
- receiving and pushing pneumatic cylinder;
- control panel;
- alarm lights;
- wheelset intelligent presence sensors;
- air-preparation unit;
- pneumatic cabinet



Turning device of the wheelsets with the reduction gearbox MM436

The device is intended for receiving, turning and pushing the wheelset in the required direction (in assembly with the reduction gearbox).
The device is installed between the sections of the elevated track, the wheelset is gripped by the wheel flanges.

Technical specifications:	
air pressure in pneumatic circuit, MPa	0,63
total installed capacity, kW	1,5
supply voltage, V	380
air consumption, m^3/h	0,34
height of the receiving part, mm.	on the elev.track level
turning angle, degrees	90 or 180
operation mode	semi-automatic
overall dimensions, mm.	2692x2400x1415
weight, kg.	1485

The device includes the following main units:

- fixed frame;
- turning frame;
- rails;
- turning unit with the turning pneumatic cylinder;
- lever for receiving and pushing of the wheelset;
- pushing rollers;
- twinned receiving and pushing pneumatic cylinder;
- control panel;
- air-preparation unit.

Lifting and lowering device of the wheelsets MM437

Lifting device is intended for lifting of the wheelsets from the main track to the elevated one. Lowering device is intended for lowering of the wheelset from the elevated track to the main one.

Technical specification	
Air pressure in pneumatic circuit, MPa	0,63
Required air consumption, m^3/h	0,17
Height of the elevated track, mm	485
Overall dimensions of the trestle:	
length, mm	1300
width, mm	1920
height, mm	820
Weight, kg	435

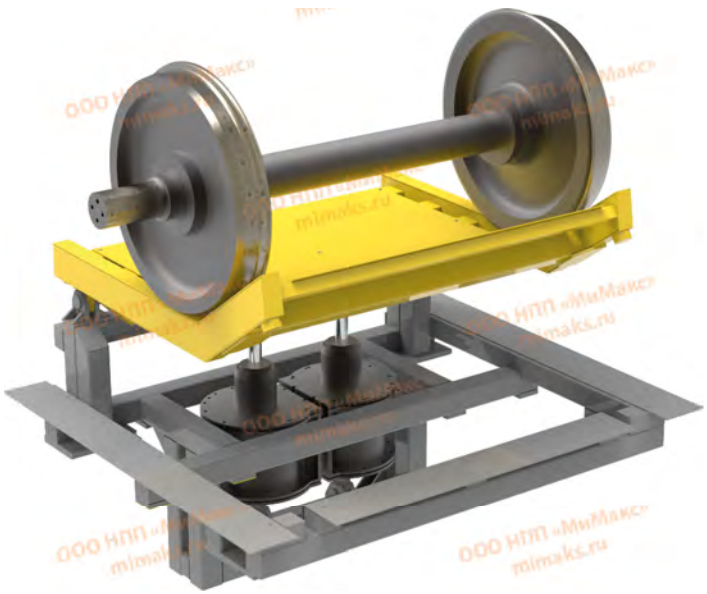
Operation procedure:

Lifting of the wheelset to the trestle of units is carried out in the following order:

- roll the wheelset on the elevator.
- lift the turning frame in top position;
- roll down the wheelset from the turning frame to the trestle;
- with the help of the buttons of the control panel lower the lifting frame into the bottom position;

Lowering of the wheelset from the elevated track is carried out in the following order:

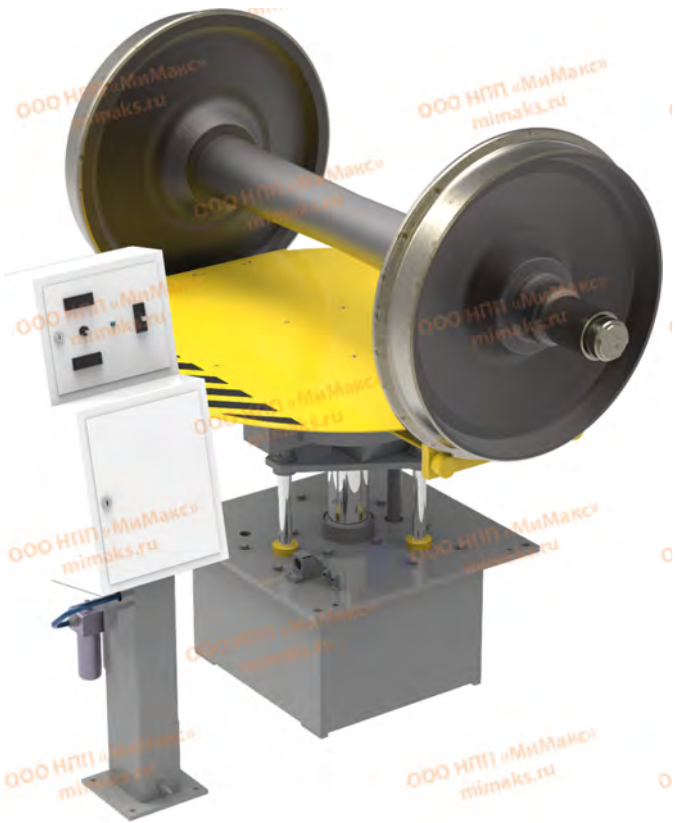
- lift the turning frame in top position;
- roll down the wheelset from the trestle to the turning frame;
- with the help of the buttons of the control panel lower the lifting frame into the bottom position;
- roll down the wheelset from the turning frame to the railroad track;



Lifting device consists of the following main parts:

- Support frame;
- Turning frame;
- Pneumatic cylinder(s);
- Pneumatic control stands (not shown in the picture)

Lift-and-turn device of the wheelsets MM380



The device is intended for lifting the wheelsets to the required height and turning by 90° or 180°.

The device can be installed on the floor level or on the elevated track, the wheelset is gripped by the wheel flanges.

Technical specifications:	
air pressure in pneumatic circuit, MPa	0,63
total installed capacity, kW	0,5
supply voltage, V	220
air consumption, m^3/h	6
height of the lift, mm.	100…500
turning angle, degrees	90 or 180
operation mode	semi-automatic
overall dimensions, mm.	1510x1030x1054
weight, kg.	700

The device includes the following main units:

- Support assembly.
- Grippers
- Pneumatic cylinders;
- Turning unit with the turning pneumatic cyllinder;
- Body;
- Central rod;
- control panel;
- air-preparation unit.

Electromechanical lift-and-turn device of the wheelsets MM308

The device is intended for lifting the wheelset to the required height and turning by any angle.

The device can be installed on the floor level or on the elevated track, the wheelset is gripped by the wheel flanges.

Technical specifications:	
air pressure in pneumatic circuit, MPa	0,63
total installed capacity, kW	0,5
supply voltage, V	220
air consumption, m^3/h	6
height of the lift, mm.	100…500
turning angle, degrees	90 or 180
operation mode	semi-automatic
overall dimensions, mm.	1510x1030x1054
weight, kg.	700

The device includes the following main units:

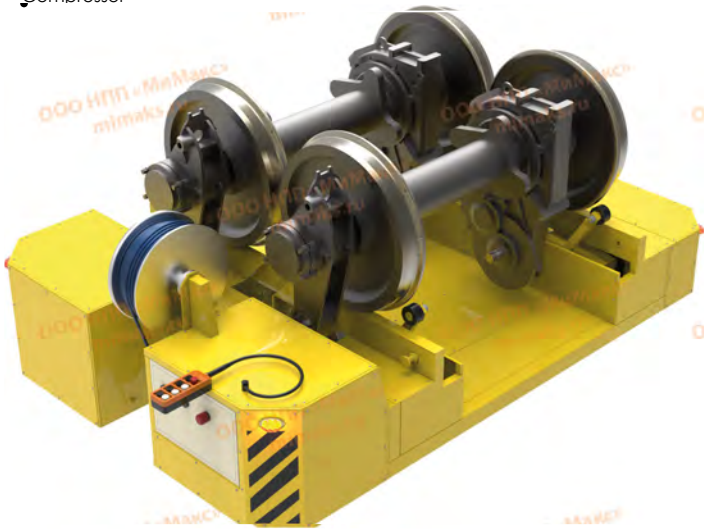
- Support assembly.
- Grippers;
- Pneumatic cylinders;
- Turning unit with the geared motor;
- Protective housing;
- Body;
- Central rod;
- Control panel;
- Air-preparation unit.

Transportation bogie of wheelsets MM306M2

The transportation bogie is intended for transferring of wheelsets between the elevated tracks located perpendicular to the direction of the transportation bogie movement. The bogie is equipped with the system of the automatic loading and unloading of wheelsets.

The bogie composition:

- Frame,
- Guiding beams.
- Two loose wheels.
- Two driving wheels.
- Two two-sided levers.
- Pushing rollers.
- Compressor
- Cable drum
- Control cabinet.
- Control panel.
- Light and audible signalling



Technical specifications:	
Track width, mm	1520
Height of receiving part of the bogie, mm	600
Distance of transportation, mm	53100
Supply voltage, V	380
Frequency, Hz	50
Installed capacity, kW	4,5
Maximum pressure of compressor, MPa	0,8
Productive capacity of compressor l/min	260
The number of the loaded wheelsets	1-2
Weight-carrying capacity, kg	5000
Travelling speed, m/min	24
Overall dimensions, mm	3390x2170x1210
Weight, kg	1352

Operation procedure

In its initial position, the bogie is in front of the elevated track from which transportation of the wheelset is performed.

After loading the bogie, bogie wheel drives are put into operation, and bogie transports wheelsets to unloading position. At this, the light and audible signalling are switched on.

At reaching the unloading position (the bogie stops in such way that its guiding beams are set in front of the elevated track). Unloading of the wheelsets is carried out to the elevated track in an order reverse to their loading.

Cable recovered from cable drum is laid in a channel located in the floor and it does not obstruct the passage of workshop vehicles

Transportation bogie (ferry) MM306M1

Technical specifications:	
Track width, mm	1520
Height of bogie receiving area, mm	min 400
Distance of transportation, m	acc. to technical requirements
Supply voltage, V	380
Frequency, Hz	50
Installed capacity, kW	2,24
Maximum pressure of compressor, MPa	0,63
Productive capacity of compressor l/min	210
Number of loaded wheelsets	1
Weight-carrying capacity, kg	2500
Conveying speed, m/min	24
Overall dimensions, mm	2620x1400x790
Weight, kg	1270

Operation procedure

In its initial position the bogie is attached to the elevated track, from which transportation of the wheelset is performed.

After loading the bogie, the bogie wheel drives are put into operation, the bogie moves to the elevated track on which the transportation of the wheelset is performed (at this, the light and audible signalling are switched on) and the bogie is attached to it.

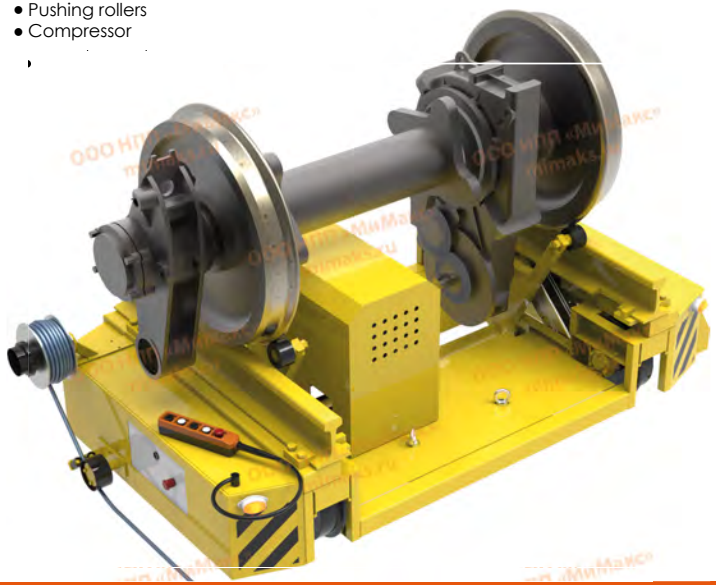
After the bogie stops, the wheelset is unloaded to the elevated track in order reverse to its loading.

Cable recovered from cable drum is laid in a channel located in the floor and it does not obstruct the passage of workshop vehicles

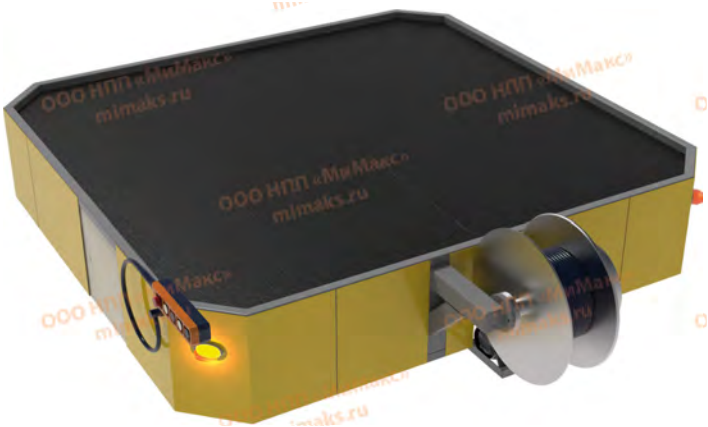
Bogie is intended for wheelset transportation through the passage between sections of the elevated track. The bogie is equipped with system of automatic loading and unloading of wheelsets.

The bogie composition:

- Frame.
- Rails.
- Two loose wheels
- Two driving wheels.
- Two-sided lever
- Pushing rollers
- Compressor
- Cable drum
- Control cabinet
- Control panel.
- Light and audible signalling



Handling rail bogie MM306M7



The bogie consists of:

- frame,
- loading platform,
- two loose wheels,
- two driving wheels with drives,
- cable drum,
- control cabinet,
- control panel;

The bogie is intended for transportation of different types of freights.

Applicable scope:

- for transferring of the items between technological positions.
- for transferring of freights and items between the plant workshops.

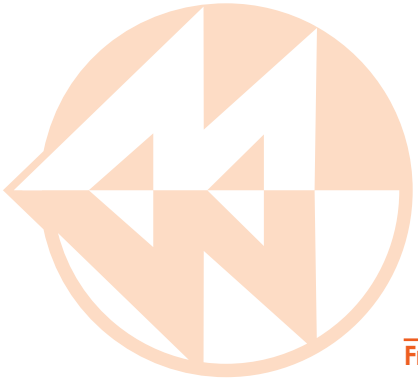
Upon the customer's request, various devices and mechanisms can be installed on the bogie (boards, stops, support assemblies, loading and unloading mechanisms, etc.)

Technical specifications:	
Track width, mm	1520
Supply voltage, V	380
Frequency, Hz	50
Installed capacity, kW	2,0
Weight-carrying capacity, tf	up to 10
Conveying speed, m/min	24
Distance of transportation, mm	53100
Overall dimensions, mm	2500x2200x500
Weight, kg	1130

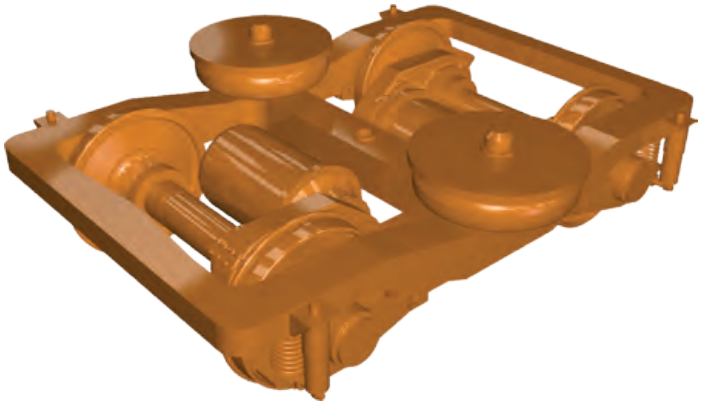
Operation procedure

A spring-actuated or driven cable drum is used for power supply. The cable recovered from the cable drum is laid in a channel located in the floor and it does not obstruct the passage of workshop vehicles.

To ensure safe operation, the bogie has various block systems and also light and audible signalling.



Equipment for repair of bogies



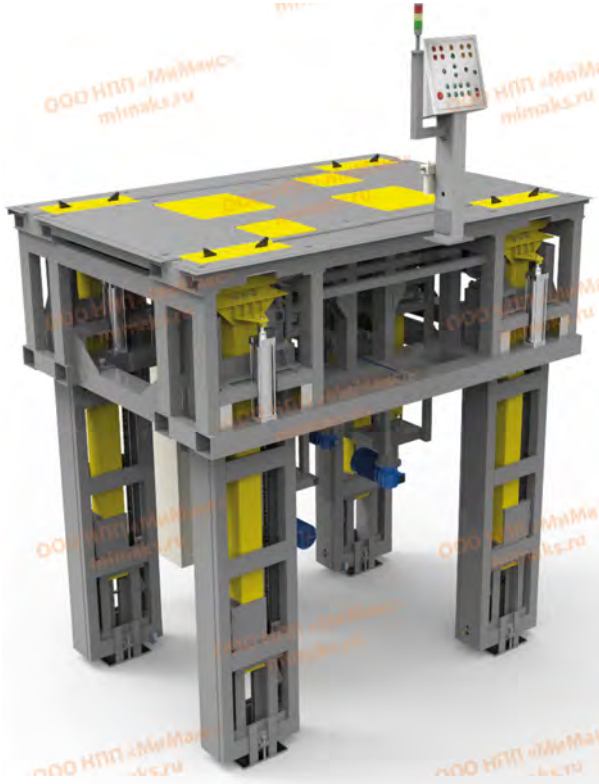
Multipurpose mechanized stand for disassembly of the motor and non-motor bogies MM641

The stand is intended for lifting of subway car bogies in course of the works on dismantling and mounting of electric traction motors, brakes and attachments of motor and non-motor bogies.

Technical specifications:	
drive type of the bogie lifting device and lifting supporters	electromechanical
supply voltage, V	380
frequency, Hz	50
total installed capacity, kW	5,5
track width, mm.	1520
lifting and lowering speed of the bogie, mm/min	600
lifting height of the bogie above the level of the rail head, mm.	1800
Stand weight-carrying capacity, t	10
air pressure, MPa	0.4-0.63
overall dimensions, mm.	3000x4500x3000
Weight, kg	4500

The stand consists of the following main components:

- Stand frame;
- Four synchronized lifting jacks;
- Two lifting platforms for reduction gearbox support;
- Two lifting platforms for electric traction motor support;
- Raised floor lifting device;
- Flooring;
- Control cabinet;
- Control panel.



Manipulator for repair of the bolster MM738M

The manipulator is intended for installation of the lift-and-turn device of the bogie bolsters of all types of subway cars operated by SUE "PM" during welding works in a convenient position.

Technical specification	
Lifting drive	
drive type	electrical
number of drives	2
supply voltage, V	380
capacity, kW	0,37
lifting run, mm	600
lifting speed, m/sec	10..15
turn drive	
drive type	electrical
supply voltage, V	380
capacity, kW	0,37
speed of turn, rpm	1
minimum level of beam axle rotation, mm	400
Overall dimensions:	
length, mm	3906
Width, mm	820
Height, mm	1483
Weight, kg	830

Composition

The manipulator consists of two lift-and-turn and lifting supports installed on the foundations, between which there is a support assembly with devices for bolster fixation

Operation procedure

1. install the key switch into the control panel;
2. turn on the manipulator;
3. install the bolster with the help of the crane along or across the support assembly in the way that the bolster can be visually equally located on the support assembly;
4. fix the bolster on the support assembly with clamps;

Installation and removal of the bolster is carried out in the bottom position of the manipulator, setting the clamps parallel to the bolster.

Manipulator of the bogie frames of the subway cars MM046M

The manipulator is intended to turn bogie frames of subway cars of 81-717/81-714 type without attachments by 360° in order to carry out repair works.

Technical specifications:	
weight-carrying capacity, kg	3500
lifting drive	
drive type	electrical
number of drives	2
supply voltage, V	380
capacity, kW	1,1
lifting run, mm	1000
lifting speed, m/min	250
turn drive	
drive type	electrical
number of drives	1
supply voltage, V	380
capacity, kW	1,1
speed of turn, rpm	1
turing angle	360°
overall dimensions, mm	5700x2800x2600
weight kg.	2180

The manipulator consists of the following main components:

The manipulator consists of the parts separately installed on the foundations - lifting support, lift-and-turn support and removable grippers. The lifting support consists of the following units:

- frame;
- lifting mechanism;
- lifting drive guard;
- lifting carriage;
- supporting and turning unit;
- terminal switches.

The lift-and-turn support has a similar design, but the turn drive is fixed on the carriage, and the control cabinet is fixed on the frame.

Equipment for repair of bogies

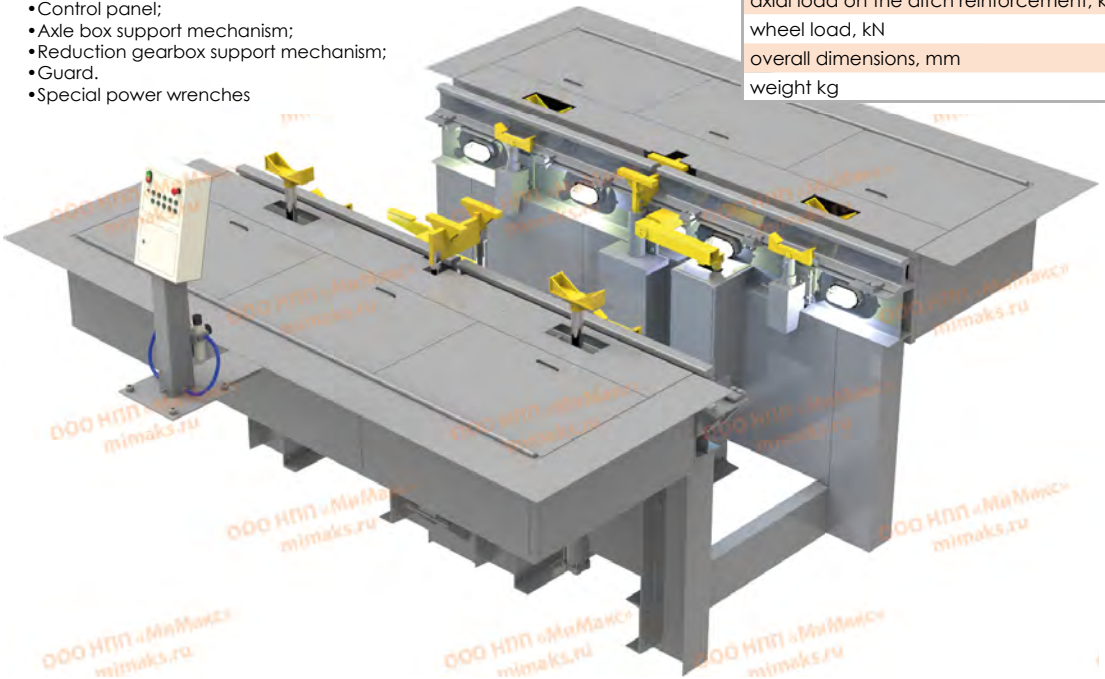
Mechanized stand for disassembly and assembly of the car bogie MM639

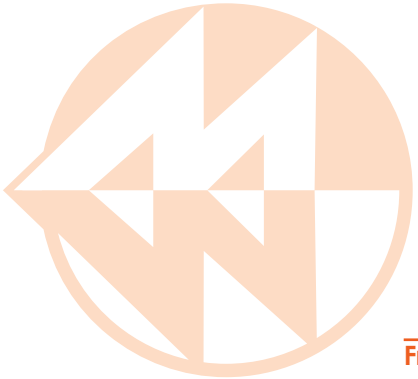
The stand is intended for disassembly and assembly of the car bogies

The stand consists of the following main components:

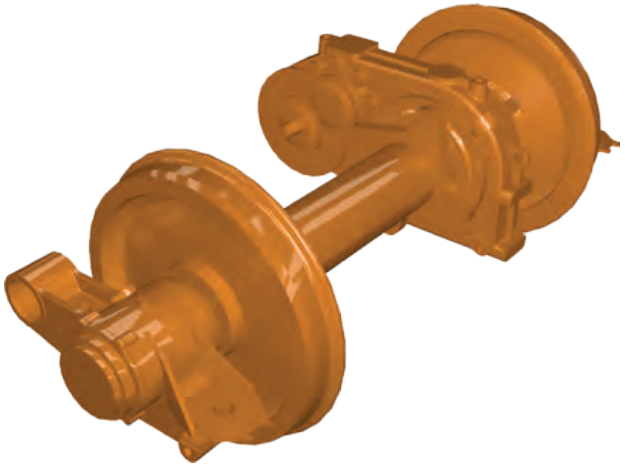
- Frame;
- The device for disassembly/assembly of the central suspension;
- Bogie fixation mechanism;
- Control panel;
- Axle box support mechanism;
- Reduction gearbox support mechanism;
- Guard.
- Special power wrenches

Technical specifications:	
supply voltage, V	380
total installed capacity, kW	34
air pressure in pneumatic circuit, MPa	0,63
axial load on the ditch reinforcement, kN	40
wheel load, kN	20
overall dimensions, mm	4800x5000x3000
weight kg	3800





Equipment for repair of wheelsets, axle boxes and wheel and gear units



Mechanized system of the wheelsets assembly on the elevated track MM434

The system is intended for mounting of axle box units of the subway network rolling stock on the axles of wheelsets. It allows to perform axle box gripping (with and without installed bearings), axle box turning and moving along and across the elevated track, axle box unit mounting, tightening of the mounting bolts of the fastening covers and locking plates.

Technical specifications:	
air pressure in pneumatic circuit, MPa	0,63
total installed capacity, kW	1
supply voltage, V	380
air consumption, m^3/h	15,6
overall dimensions	depend on technical requirements
system weight	depend on technical requirements

The stand consists of the following main units:

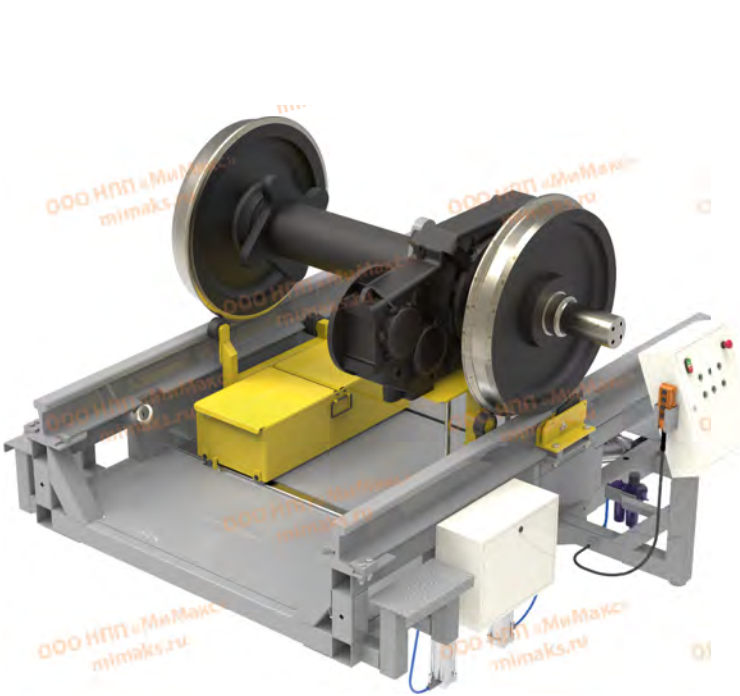
- base columns (the quantity depends on the system length);
- suspended monorails (two on each side);
- suspended bogies with pneumatic power wrenches (2 pcs);
- mounting manipulators with a gripper (2 pcs);
- air-preparation units

Optional extra:

- elevated track;
- transverse monorail (fastening on its own supports) with a telpher for transferring of axle boxes from one side to the other;
- lifting device of wheelsets;
- lowering device of wheelsets;
- manipulators of axle boxes (1 on each side);
- roller table (1 on each side)

Pneumatic lifting devices (lowering devices) of wheelsets to the elevated track can be additionally supplied with the system.

Dismantling (mounting) stand for reduction gearbox MM474



The stand is intended for dismantling (mounting) of the axial reduction gearboxes from car wheelsets 81-714/717, 81-720/740.

Technical specifications:	
air pressure in pneumatic circuit, MPa	0,63
total installed capacity, kW	1
supply voltage, V	380
track width, mm	1520
overall dimensions, mm.	2500x2745x2000
weight kg.	1350

The stand comprises the following main units:

- The elevated track with devices for catching, fixing and pushing of the wheelset;
- Mechanism of the adjustable support;
- Control panel;
- Pneumatic equipment;

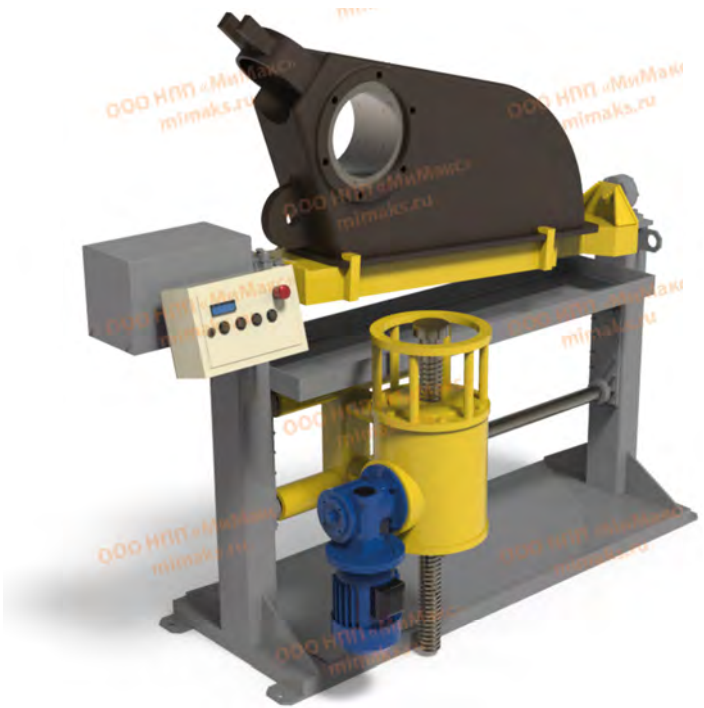
Optional extra:

- Cantilever crane;
- Gear rinsing device;
- Pneumatic power wrench;
- Vacuum oil-sump system.
- Exhaust oil collection device;

Multipurpose stand-manipulator for disassembly and assembly of the wheelset reduction gearbox body MM233U

Stand performs operations connected with reduction gearbox tilting, pressing-out and pressing-in of the shaft with the gear, the front and rear cover with the bearing outer ring in semi-automatic mode in accordance with the approved technological regulations.

Technical specifications:	
Supply voltage, V	380
Frequency, Hz	50
Installed capacity, kW	2,5
Rotation frequency, min^{-1}	5,86
Weight-carrying capacity, kg	200
Overall dimensions:	
length, mm	1822
Width, mm	900
Height, mm	1133
Weight, kg	440,1
Operation mode	semi-automatic



Wheelsets inspection and defects elimination stand MM454

The stand is intended for rolling the wheelset during inspection and elimination of defects.

Technical specifications:	
air pressure in pneumatic circuit, MPa	0,5...0,6
supply voltage, V/Hz.	380/50
installed capacity, kW	2
overall dimensions, mm.	2200x2600x400
weight, kg.	810

The stand comprises the following main units:

- Frame.
- Rolling unit.
- Pushing units.
- Control system with remote panel.
- Pneumatic grinder.

Operation procedure

- Roll up the wheelset. Under its own weight, it will come down on the block of rollers.
- Press "START" button. At the same time, the levers move away from the wheels, and the rotation of the drive rollers turns on. Wheelset control operations are carried out.
- Press "STOP" button. The drive rollers stop.
- Press button "WS PUSHING" (with the use of electronic chip). The wheelset is pushed from the "control post" to the trestle section attached to it, and the levers return to the mid-position.
- Further, the operations are carried out with the next wheelset.

The operation from the main control panel is possible only when the portable remote control is in the parking position.

Axle box dismantling stand MM439

Stand MM439 is intended for dismantling of the axle box units from the subway cars wheelsets of 81-714/717, 81-720/721, 81-740/741, 81-760/761 types and transferring them to the washing machine.

Technical specifications:	
air pressure in pneumatic circuit, MPa	0,63
air consumption, m^3/h	1,56
Overall dimensions:	
height, mm	3198
width, mm	1030
length, mm	3920

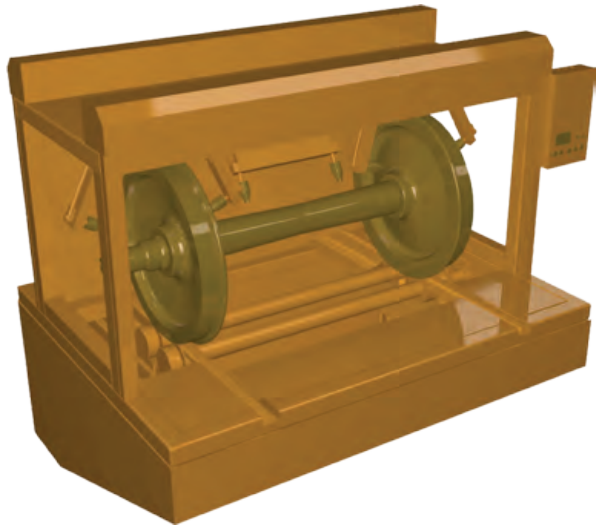
The stand consists of the following components:

- Lift-and-turn device*
- Column
- Swinging boom
- Carriage with cylinder and swivel
- Gripper for axle boxes
- Control panel

*The lift-and-turn device can be installed at floor level or built into elevated track (trestle).

Equipment for repair of underground rolling stock

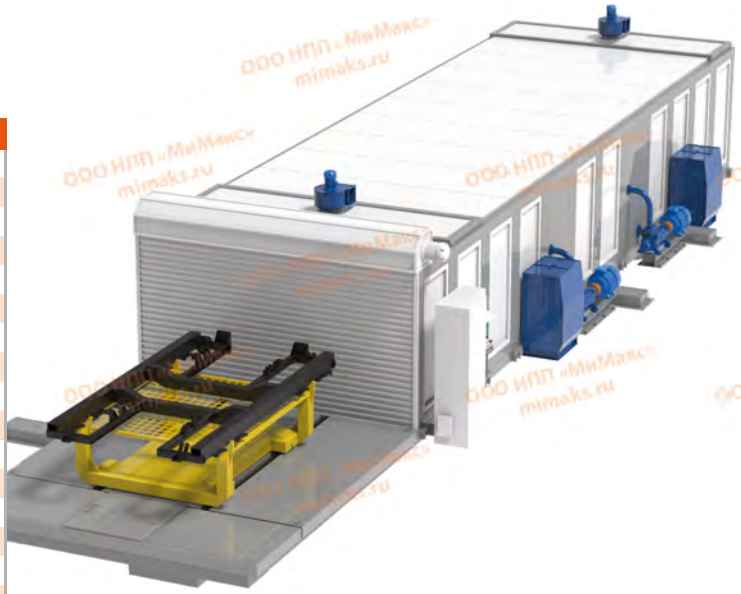
Washing equipment for rolling stock



Bogie frames washing system with additional washing chamber MM890

The technological system for washing of bogies of the rolling stock with an additional washing chamber is designed for washing of bogies frames of the rolling stock and large-sized parts with a washing solution with temperature from 40 to 80˚C and the pressure of 17,6 kg /cm^2 (1,76 MPa).

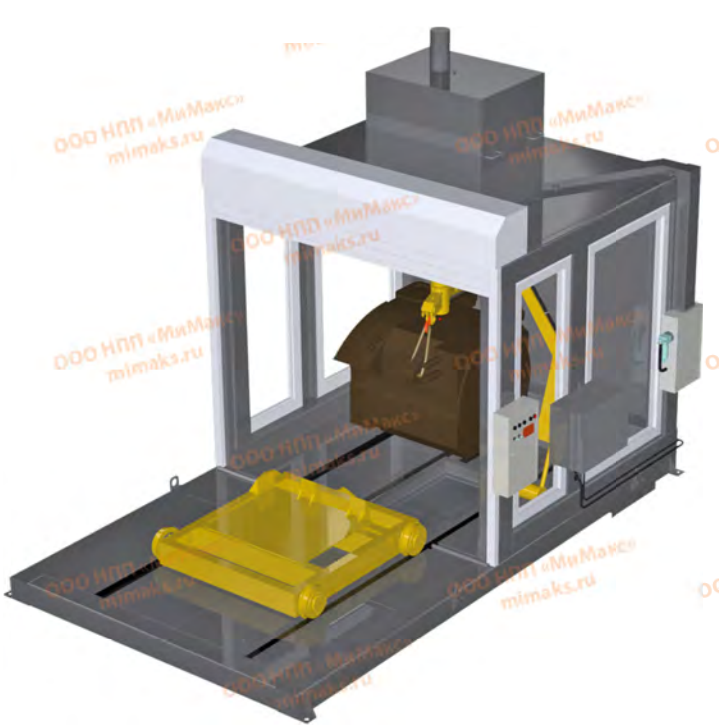
Technical specifications:	
Voltage and electric current frequency	380/220V; 50Hz
Capacity of electric motors (without electric heating), kW	118
Electrical heating capacity, kW	132
Overall dimensions of the system, mm (l×w×h)	23000x8950x3900
Overall dimensions of the chamber, mm (l×w×h)	14520×4450×2260
Height above floor level, mm	2600
Weight, kg	33500
Maximum overall dimensions of rinsing parts, mm	4860×3400×1750
Washing section	
Solution temperature, °C	60 – 80
Flow pressure, MPa (kg/cm^2)	1,76 (17,6)
Time of washing, min	15 – 30
Rinsing section	
Rinsing water temperature, °C	40 – 80
Flow pressure, MPa (kg/cm^2)	0,39 (3,9)
Time of rinsing , min	5 – 10
Transportation bogie	
Conveyor type	chain
Drive power, kW	2,2
Drive tractive force, kg	2000
Weight-carrying capacity, kg	15000



The system consists of the following main units and machinery:

- washing chamber
- water drain tray
- conveyor for transfer of the transportation bogie;
- washing solution treatment system;
- rinsing water treatment system;
- automatic control system;
- control cabinet.

High-pressure washing machine for electric traction motors MM305



Configuration (tunnel-type or closed-end washing chamber, the layout of the components of the water circulation system) can be changed upon the agreement with the customer.

Washing machine is intended for rinsing and air-blast cleaning of the electric traction motor before its disassembly.

Rinsing is carried out with high-pressure clean water (230 bar), with water heating up to 60 °C in the automatic mode.

Technical specifications:	
General data:	
supply voltage, V	380
installed capacity, kW	52
including the in-line heater	36
compressed air pressure, MPa	0,63
air consumption, m^3/h	110
high-pressure pump productive capacity, l/h	1000
time of rinsing, min. max	20
time of air-blast cleaning, min. max	20
Operation mode	
"no water heating": power consumed, kW	16
"water heating": power consumed, kW	52
Unit overall dimensions, mm	4700x3500x2700

The item consists of the following main units:

- framework
- washing chamber loading device
- water collection tray with pump
- washing chamber
- turn-and-lift device
- control panel
- nozzles moving device
- dirt sump tank with a pump (can be located under the washing machine)
- in-line electric heater
- water treatment system
- high-pressure pump station

High-pressure washing machine for wheelsets MM704

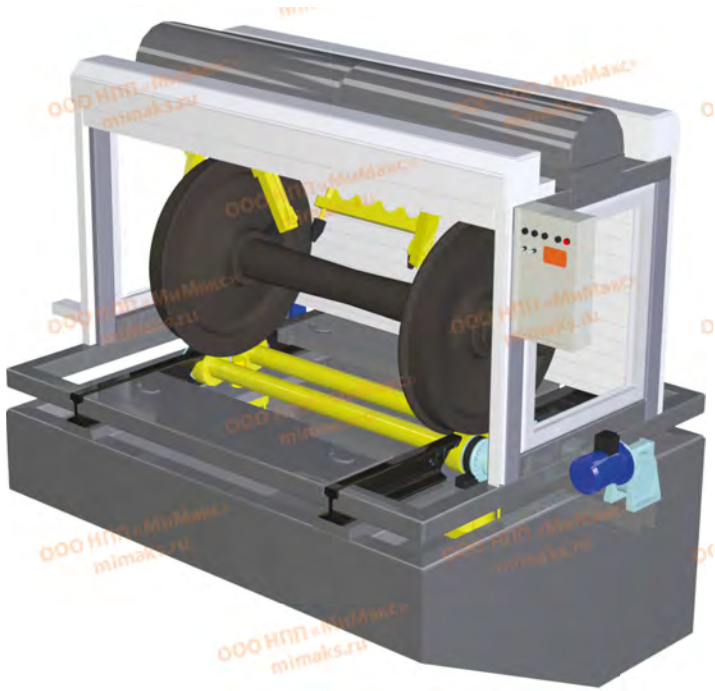
The washing machine is intended for rinsing of the wheelsets of the rolling stock cars with high-pressure clean water (200 bar), with water heating up to 60°C in the automatic mode.

Technical specifications:	
General data:	
supply voltage, V	380
installed capacity, kW	100*
including the in-line heater	72*
washing solution pressure, bar	200
compressed air pressure, MPa	0,63
compressed air consumption, m^3/h	250
high-pressure pump productive capacity, l/h	2000*
rinsing time, min. max	8*
Operation mode	
"no water heating": power consumed, kW	28*
"water heating": power consumed, kW	72*
Unit overall dimensions, mm	4800x2500x2500

** - Depends on version*

The item consists of the following main units:

- Water treatment system
- In-line heater
- High-pressure pumps
- Washing chamber
- Moving nozzles
- Roll shutters
- Dirt sump tank with a pump
- Framework
- Wheelset pushing mechanism
- Control panel
- Wheelset rotary mechanism



Configuration (tunnel-type or closed-end washing chamber, the layout of the components of the water circulation system) can be changed upon the agreement with the customer.

Washing equipment for rolling stock

Dry cleaning unit for wheelset axle MM503

The axle cleaning is carried out in closed chamber at which a flange for exhaust ventilation is located. The cleaning procedure is performed by two rotating brushes which move over the rotating axle. The system may be of a tunnel-type and closed-end-type, and also be complete with storage units with loading and unloading devices.

The unit is intended for wheelset axle cleaning to metal.

Technical specifications:	
operation mode	automatic
supply voltage, V	380
installed capacity, kW	9
time of axle cleaning, min	8...12
thickness of paint coating layer removed, μm	200…400
Unit overall dimensions, mm:	
length	1780*
width	3000
height	1680

* basic configuration

The product consists of the following main units:

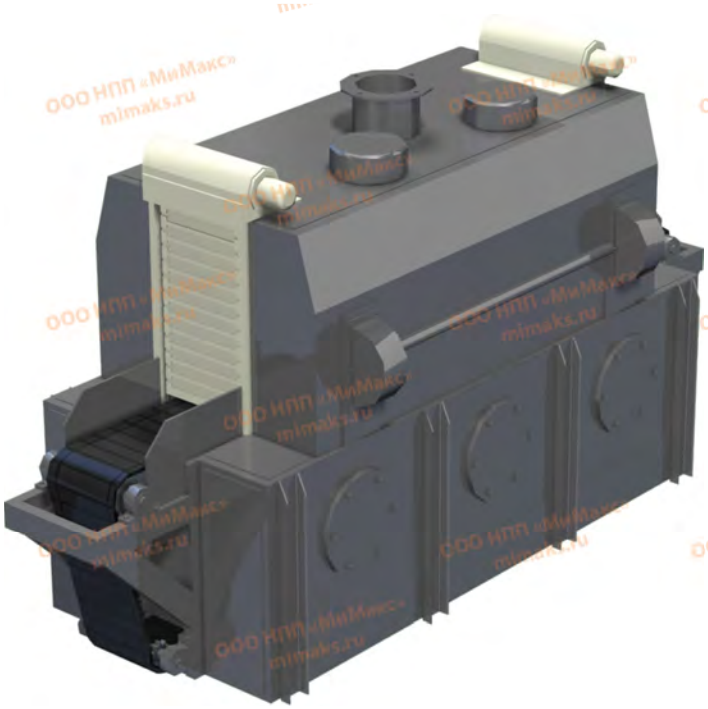
- frame;
- guides with loading and unloading support assemblies;
- pushers;
- wheelset axle rotary drive;
- cleaning chamber with lifting curtains and ventilation flange;
- carriage with rotary drive;
- brushes;
- motion screw for carriage;
- carriage transfer drive (10);
- control panel;
- loading storage unit of axes*;
- storage unit of axes*;
- ventilation with air cleaning system*;

* not included in basic configuration

Washing machine for axle box and axle box unit parts MM501

Washing machine MM501 is intended for rinsing of axle boxes and axle box unit parts with high-pressure clean water (230 bar), with water heating up to 60°C in the automatic mode.

Technical specifications:	
operation mode	automatic
supply voltage, V	380
installed capacity, kW	82
including the in-line heaters, kW	72
pumps pressure, bar	230
pumps productive capacity, l/h	2000
bogie frame rinsing time, min	7
overall dimensions (without cleaning and heating system):	
length, mm	3630
width, mm	1200
height, mm	2100



The washer consists of the following main units:

- conveyor;
- frame with the sump tank;
- washing chamber with nozzles, tray and lifting shutters;
- high-pressure pumps;
- filtration system;
- in-line heater;
- water circulation tank;
- control panel

Operation procedure :

- Bring the axle box to the receiving part of the washing machine conveyor and turn on the ventilation system.
- Further, all the operations connected with the axle box washing and its delivery to the receiving table or to the transportation conveyor are carried out in the automatic mode

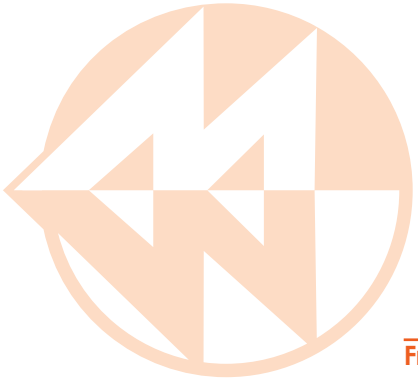
Washing machine for small parts MM510

The machine is intended for jet rinsing of small parts during their repair.

Technical specifications:	
General data:	
supply voltage, V	380
installed capacity, kW	42
compressed air pressure, MPa	0,63
air consumption, m^3/h (max)	1
turntable weight-carrying capacity, kg	200
tank volume, m^3	2,5
washing solution temperature, °C	75-85
washing solution pressure, bar (max)	5,0
heating element type	EHT
electric heating tubes total capacity, kW	30
Rinsed parts overall dimensions	1200x1200x1000
parts loading	by crane
washing machine overall dimensions:	
length, mm	3550
width, mm	2200
height, mm	3000
Weight, kg	3600

The machine consists of the following main parts:

- Stainless steel base tank.
- Washing chamber with the door.
- Bogie.
- Main pump.
- Two washing rails with nozzles.
- Pump for discharge of disposal solution
- Bogie transfer drive
- Bogie rotary drive
- Two service platforms
- Touch-screen control panel



Equipment for repair of car body

Segmented suspended two-level platform designed for simultaneous maintenance of 2 trains MM728

The segmented suspended two-level platform is designed for simultaneous maintenance of 2 trains MM728

Technical specification	
supply voltage, V	380
total installed capacity, not more, kW	200
Simultaneous maintenance, trains	2*
Unit overall dimensions, mm	180000x3600*
Level of the train car access platform from, mm	1200*
Level of the roof access platform, mm	3500*
Length of the platform sections, mm	6000
Length of section extension, mm	450*
** according to item technical requirements.*	

The platform consists of the following main units:

- The extension-type platforms for access to the train roof (450mm run),
- Train car access platforms,
- Segmented suspended fences for prevention of falling from the roof of the train car,
- Movable fences in order to prevent falling from the end part of the train.
- Stairs for entrance to the platforms of the 1200 mm level. (Lifted for passage of transport)
- Stairs for entrance to the platforms of the 1200 mm level
- Gates with electric locks and access controllers to prevent unauthorized access to the levels
- Control panel.

Handling bogie with variable geometry and lifting height MM461

Handling bogie is intended for moving 81-740/741 subway car types in conditions of electric engine house workshop to different positions for the repair at different levels.

Technical specification	
weight-carrying capacity, t	20
track width, mm	1520
transportation height from the rail head, mm	1200
operating height from the rail head, mm.	1800
overall dimensions, mm	1947x2700x1825
force of assembly and disassembly of the operation vertical stays, kg (max)	15
bogie weight, kg	1200

The bogie consists of the following main units:

- Frame;
- Flange wheels;
- Support assembly;
- Assembled vertical stays;
- Assembled vertical stays lock;
- Coupling device.

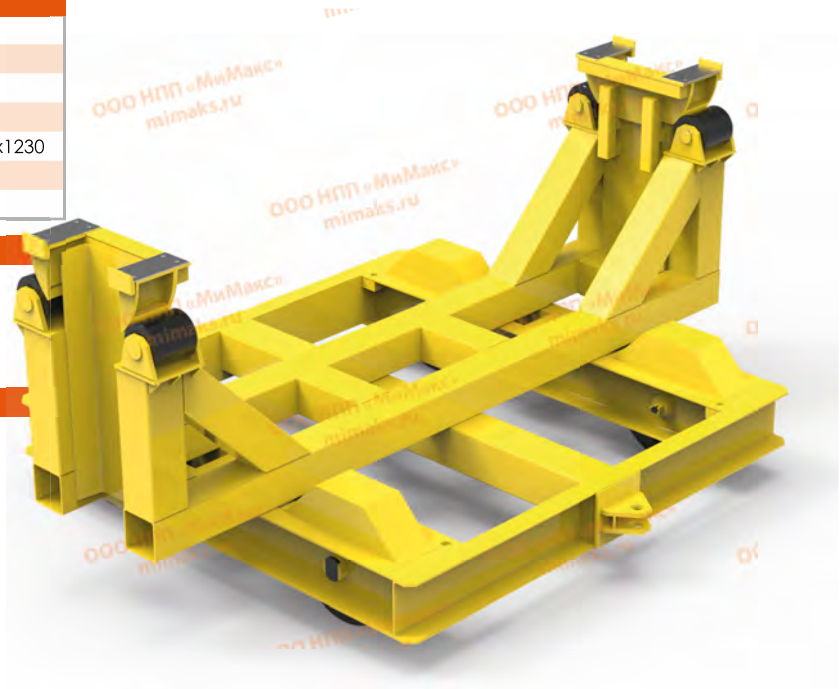
Operation procedure:

- lift the car body with workshop stationary jacks.
- roll out road trucks from under the car body·
- roll handling bogies under the car body.
- lower the car body onto the handling bogie support assembly with the help of the jacks.
- if required, install the car at the height of 1800 mm from the rail level, the assembled vertical stays must be preliminary lifted and fixed.
- the car body must be moved on the bogies to the process positions by workshop shunt vehicles

Handling bogie MM463

Handling bogie is intended for moving of subway cars of 81-714/717, 81-720/721, 81-740/741, 81-760/761 types in conditions of electric engine house workshop to different positions for the repair at different levels

Technical specification	
weight-carrying capacity, t	20
track width, mm	1520
transportation height from the rail head, mm	1200
operating height from the rail head, mm	1800
overall dimensions, mm	1947x2700x1230
turning angle of floating supports, degree ±	4
bogie weight, kg	1100



The bogie consists of the following main units:

- Frame;
- Flange wheels;
- Support assembly;
- Floating supports;
- Coupling device.

Operation procedure:

- lift the car body with workshop stationary jacks.
- roll out road trucks from under the car body.
- roll handling bogies under the car body.
- lower the car body onto floating supports of the handling bogie with the help of jacks.
- the car body must be moved on the bogies to the process positions by workshop shunt vehicles.

Process platforms ОППС

Process platforms are intended for maintenance of electric rolling stock in conditions of repair in depot.

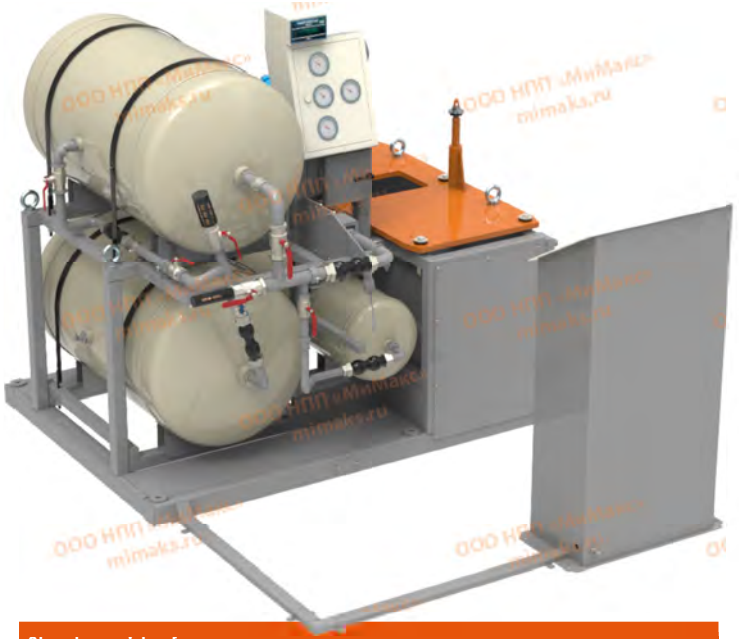
The main list of configurations of process platforms:

- Fixed platform for entering the driver's cabin.
- Fixed platform for entering the driver's cabin with a folding platform for car front part maintenance.
- Platform for car front part maintenance (rolling).
- Platform for car front part maintenance (with the folding platform).
- Movable platform for operation on the car roof. Movable platform for entering the car.

Locomotive compressor test stand MM792

The compressor run-in stand is intended for running and testing of electric compressors in accordance with the instructions for maintenance, repair and testing of pneumatic equipment of subway cars rolling stock and the instructions for testing of electric compressors after maintenance.

Technical specification	
Amount of backpressure in the system, MPa	0,8
Measuring range of compressed air, MPa	0-1,0
Measuring range of oil temperature in the case, °C	200
Measuring range of air temperature in the delivery pipeline, °C	200
Range of the anchor rotation frequency, rpm	0-1600
Power consumed, W	8
Frequency, Hz	50
Mains supply, V	380
Overall dimensions	
length, mm	2250
width, mm	1750
height, mm	1600
weight (without tooling), kg	650



Stand consists of :

- Frame;
- Receiver 300 l;
- Receiver 80 l;
- Compressor installation slab;
- Pipelines;
- Power terminals;
- Information panel;
- Control panel.

Mechanized equipment for repair of equipment of mining and oil producing industry

Manipulator of the oil pipelines valves MM315

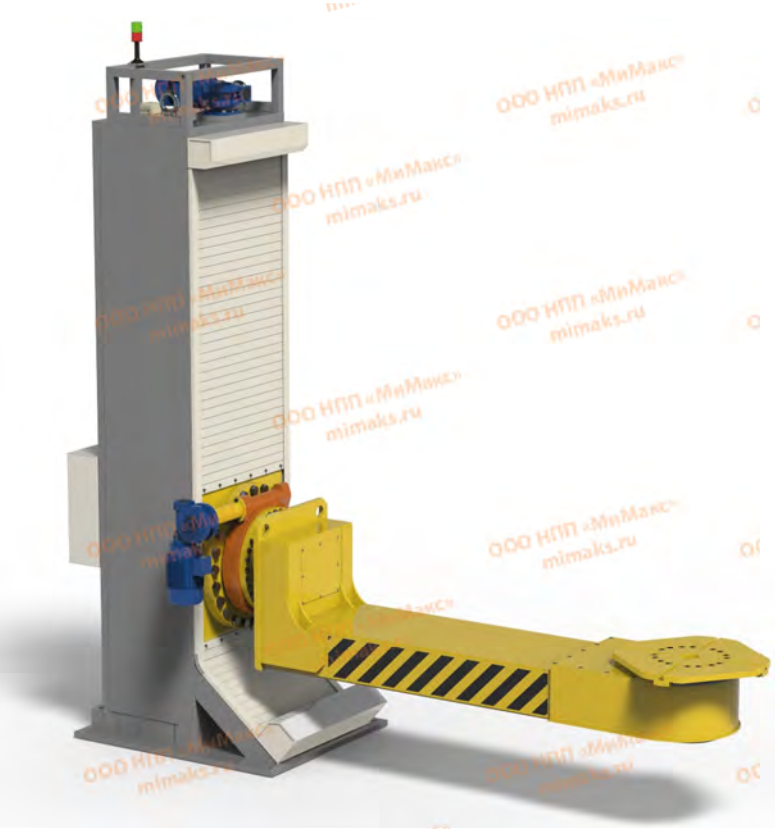
Manipulator is intended for tilting of gate valves DN700 PN8, DN800 PN8 and DN1000 PN8 from the vertical to the horizontal position and vice versa.

(All gate valves are tilted in two directions: vertical and horizontal tilt by pipe mounts)

Technical specifications	
weight-carrying capacity max, kg	19000
turning time, min.	2
drive type	hydraulic
number of cylinders	2
cylinder piston diameter, mm	125
oil (process) MPa (kgf/cm^2)	16 (160)
supply voltage of the pump system electric motor, V	380
capacity, kW	7,5
overall dimensions, mm	5824x4020x4630
weight, kg	10550

Mechanized equipment for repair of equipment of mining and oil producing industry

Welding cantilever manipulator (L-type) MM726



Manipulator is intended for locating of welded (assembled) parts, when the works are carried out in a convenient spatial position.

Technical specifications:	
Circuit characteristics, Hz	380/50
Drives type	electrical
Weight-carrying capacity, kg	2000
Total installed capacity, kW	6,7
Maximum allowable welding current, A	500
Control voltage V	24
Overall dimensions (LxWxH) mm	3980x1214,5x3830
Lifting drive	
Capacity, kW	2,2
Lifting run, mm	1800
Lift speed, mm/min	800
L-type support assembly turn drive:	
Capacity, kW	3
Speed of turn, rpm	1
Turning angle, degrees	360
Table rotary drive	
Capacity, kW	1,5
Speed of turn, rpm	2
Turning angle, degrees	360

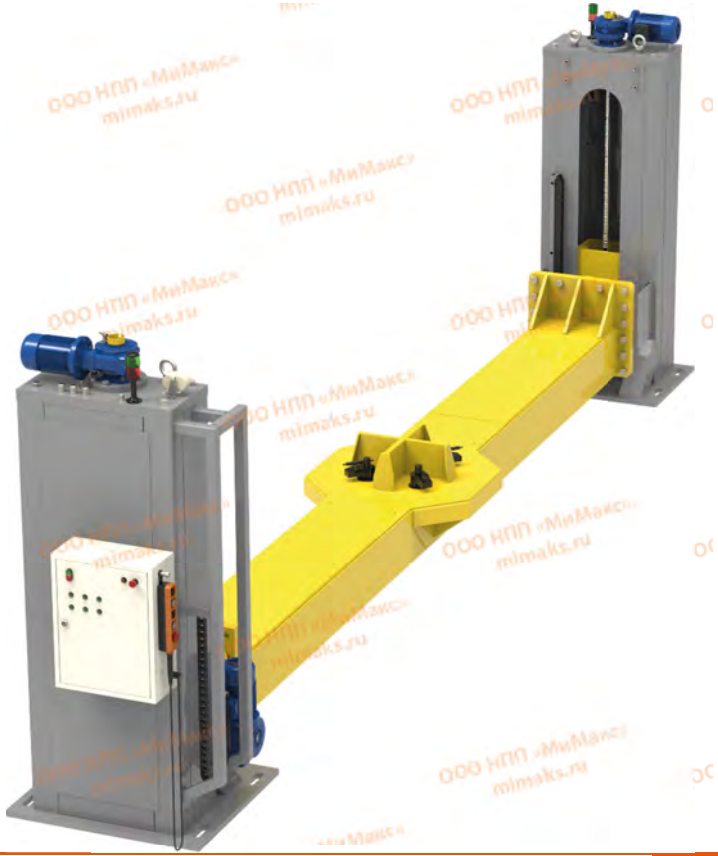
The manipulator consists of

- Lift-and-turn support
- L-type support assembly with the turntable
- Electric cabinet with remote control (not shown conditionally)
- Roller shutters

Excavator frame manipulator MM741

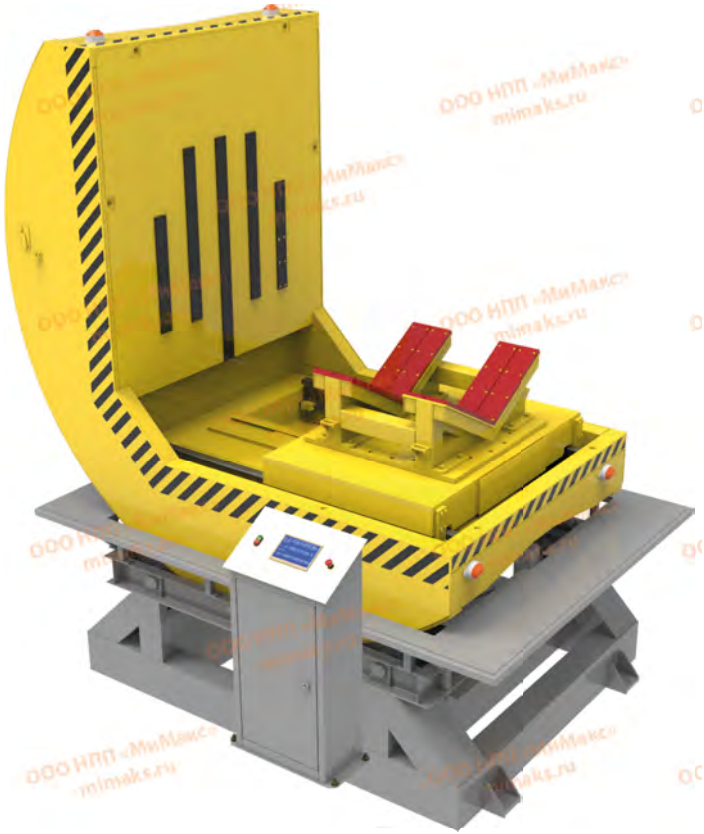
Excavator frame manipulator (without equipment for rotation) is intended to rotate excavator frames by 360° along the longitudinal axis in course of maintenance.

Technical specification	
supply voltage, V	380
power consumed, W	7,5
weight-carrying capacity, N. (kg.)	150 000 (15 000)
output shaft torque, Nm	1,5
height of rotation axis, mm	
min	750
max	1950
lift speed, (m/min).	1,3
speed of turn, (m/min)	0,95
weight, kg.	6100



Mechanized equipment for repair of equipment of mining and oil producing industry

Stator manipulator MM415



Manipulator is intended for turning of electric motors stators with a diameter of 600-2500 mm and the length of 600-2500 mm in two planes for their maintenance.

Technical specifications:	
Weight-carrying capacity, kg	20 000
Turnover angle, degrees	90
Turning angle of the table on the installation site, degrees	180
Supply voltage, V	380
Installed capacity, kW	10
Manipulator overall dimensions (excluding fences and stairs):	
length, mm	3000
width, mm	2500
height, mm	4000
Height from the floor level to loading platform, mm	500

The manipulator consists of

- Frame;
- Turning support assembly;
- Locking devices;
- Safety frames;
- Driving wheels;
- Loose wheels;
- Turning unit;
- Control cabinets;
- Cable drum;
- Control panel;
- Control plates;
- Cable fixing devices

Set of mobile jacks MM835

Equipment is intended to lift and hold the car body when necessary operations are carried out.

Design of jack includes a bogie with a hydraulic lifting mechanism for the possibility of manual movement of the jack.

The lifting mechanism is blocked in case of:

- *overload;*
- *reaching the upper or lower limit;*
- *obstruction;*
- *loss of power;*

Technical specifications:	
Supply voltage, V	380
Current frequency, Hz	50
Lifting drive type	electromechanical
Pick-up height (lower position), mm	500
Lifting height (upper position), mm	2500
Lifting platform run, mm	1800
Lift speed, not less than mm/min	300
Weight-carrying capacity of one jack, min t	10

COMPOSITION

- Mobile jack - 4 pcs.
- Control panel

Mechanized equipment for repair of equipment of mining and oil producing industry

Set of maintenance platforms for diesel and gas and diesel generators MM850

The set of platforms is intended for lifting and lowering of operators and performing necessary works for them during testing of diesel and diesel and gas generators, this equipment provides operators with access to all elements of the generator design.

The set of platforms is intended for application in enclosed spaces under normal ambient conditions.

Technical specification	
Supply voltage, V	380
Current frequency, Hz	50
Total installed capacity, kW	6,5
Minimum operating height of the working platform, mm	1650
Maximum operating height of the working platform, mm	3700
Lifting/lowering speed of the working platform mm/ min	2000
Weight-carrying capacity, tf	0,75
Run of the withdrawable element, mm	900
Allowable load on the withdrawable element, tf	0,12
Overall dimensions when folded (l*w*h), mm	4800×1200×2800
Overall dimension of the platform base (l * w), mm	4800×875
Weight, kg	2160

Each platform consists of the following main units:

- frame;
- lifting platform (with pull-out floors);
- scissors mechanism;
- extension-type ladder
- hydrostation;
- hydraulic cylinders;
- control panel;
- electric cabinet;

Car lifting and lowering device MM725

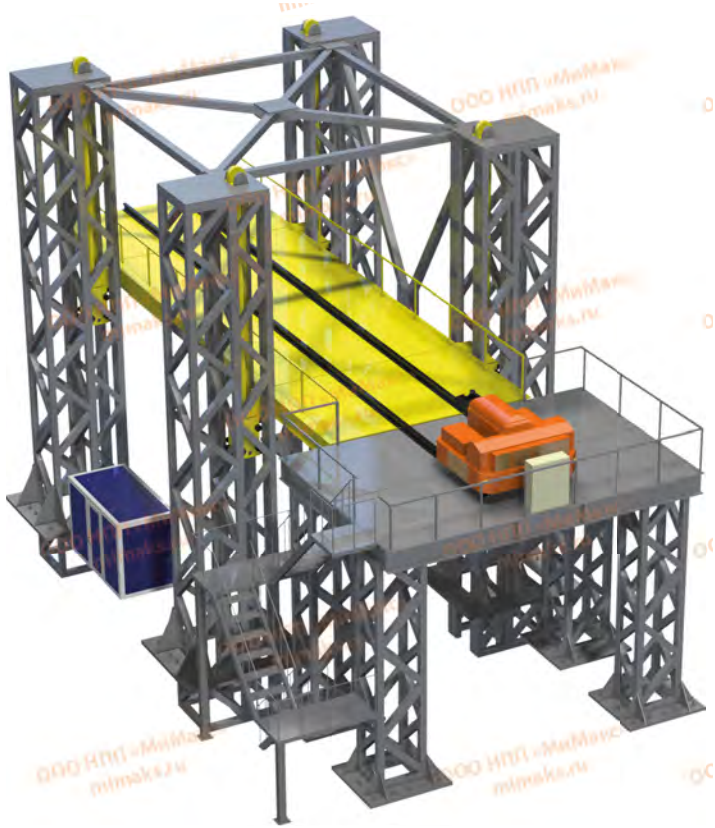
The complex of devices is intended for lifting (lowering) and delivery of cars to the swing tipping device.

The basic parameters of the system and its configuration can be changed according to the technical requirements provided by the customer.

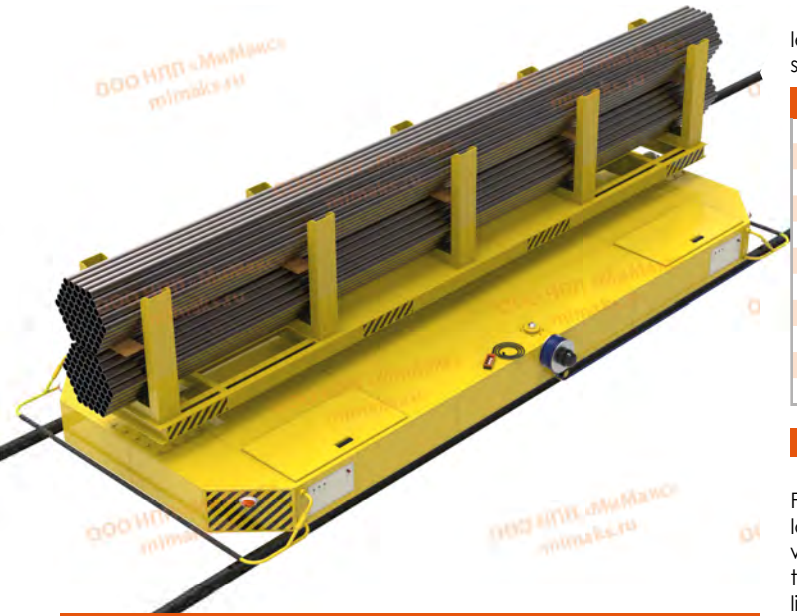
Technical specifications:	
Weight-carrying capacity, t	100
Lifting height, mm.	6000
Productivity, lifts/day	240
Operation mode	semi-automatic
supply voltage, V	380
installed capacity (not more), kW	160
overall dimensions of the system (max), mm	
length	20000
width	14000
height	15000

The unit consists of the following main components:

1.Car lifting (lowering) device consists of:
•four power hydraulic jacks connected by structural power elements.
•loading platform with a rail track
•hydraulic system with a spare station
•lifting and lowering synchronization systems
•safety system
•the devices for fixing the platform in the raised position.
2.The transportation system consists of:
•shunting trestle with the rail track and current lead
•locomotive with an automatic coupling device
•working process control systems



Rail bogie for tube banks MM306M6 (with the turning support assembly)



The bogie is designed for transportation of tube banks with the length of 6 -12,5 m. Two tube banks are transported simultaneously on the bogie

Technical specification	
Track width, mm	3500
Distance of transportation, m	34
Supply voltage, V	380
Frequency, Hz	50
Installed capacity, kW	4,5
Weight-carrying capacity, kg	20 000
Conveying speed, m/sec	0,6
Platform turning angle, deg	360
Overall dimensions, mm	10000x4000x860
capacity, kW	1
weight, kg	3100

The unit consists of the following main components:

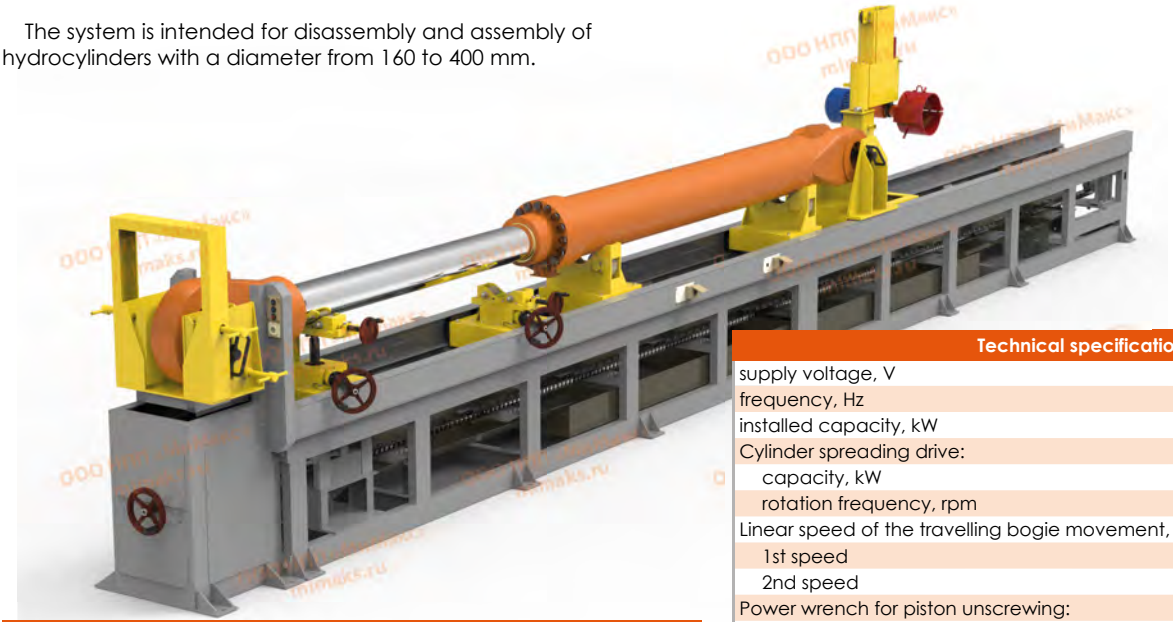
- frame
- driving bogie
- oil tanks
- cylinder support bogies
- rod support bogies
- loop eye clamping device
- power wrench for cap bolts unscrewing
- power wrench for piston unscrewing

Operation procedure:

Loading onto the bogie is carried out by an overhead traveller. For loading, the support assembly swings across the bogie. After loading, the support assembly swings to its initial position, after which the drives of the bogie wheels are turned on and the bogie transports tube banks to the unloading position. At the same time, light and audible signalling are activated, indicating that the bogie is moving. The power cable starts winding on a cable drum with a spring drive. When the unloading position is reached due to the precise positioning system of the bogie, it stops. After stopping, unloading of tube banks is performed.

Hydrocylinder repair system MM295

The system is intended for disassembly and assembly of hydrocylinders with a diameter from 160 to 400 mm.



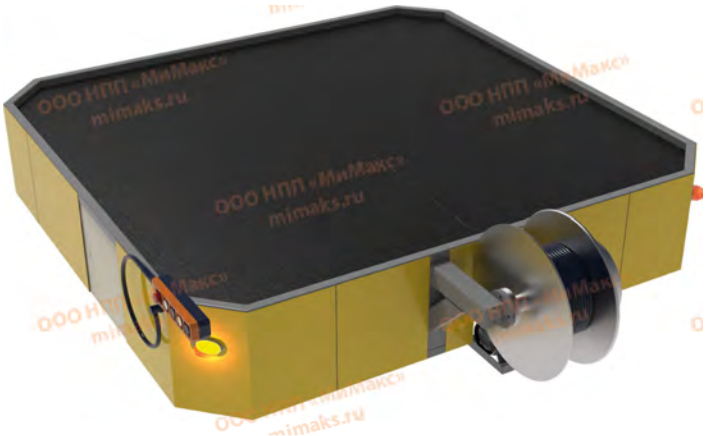
The unit consists of the following main components:

- frame
- driven bogie
- oil tanks
- cylinder support bogies
- rod support bogies
- loop eye clamping device
- power wrench for cap bolts unscrewing
- power wrench for piston unscrewing

Technical specification	
supply voltage, V	380
frequency, Hz	50
installed capacity, kW	3,5
Cylinder spreading drive:	
capacity, kW	1,5
rotation frequency, rpm	4
Linear speed of the travelling bogie movement, m/sec;	
1st speed	0,041
2nd speed	0,01
Power wrench for piston unscrewing:	
capacity, kW	1
torque, kgm	4000
Power wrench for cap bolts unscrewing:	
capacity, kW	1
torque, kgm	200
Overall dimensions, mm	10800x1000x2000
Weight, kg	3100

Mechanized equipment for repair of equipment of mining and oil producing industry

Handling rail bogie MM306M7



The bogie is intended for transportation of different types of freights.

Applicable scope:

- for transferring of items between the technological positions.
- for transferring of freights and items between the factory workshops.

Upon the customer's request, various devices and mechanisms can be installed on the bogie (boards, stops, support assemblies, loading and unloading mechanisms, etc.)

Technical specification	
Track width, mm	1520
Supply voltage, V	380
Frequency, Hz	50
Installed capacity, kW	2,0
Weight-carrying capacity, tf	up to 10
Conveying speed, m/min	24
Distance of transportation, mm	53100
Overall dimensions, mm	2500x2200x500
Weight, kg	1130

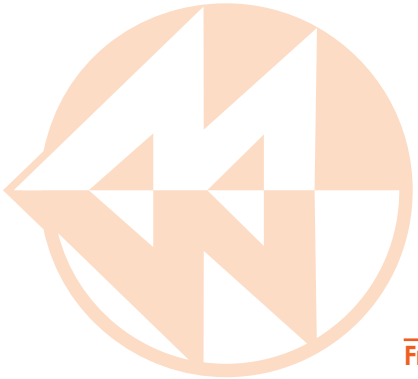
The bogie consists of:

- frame,
- loading platform,
- two loose wheels,
- two driving wheels with drives,
- cable drum,
- control cabinet,
- control panel;

Operation procedure

For power supply a spring or a drive cable drum is used. Cable recovered from cable drum is laid in a channel located in the floor and it does not obstruct the passage of workshop vehicles.

To ensure safe operation, the bogie has various block systems, as well as light and audible signalling.



Power-operated tool

Multiplier wrenches with manual drive КМП

Multiplier wrenches are intended for manual assembly and disassembly of large threaded joints, including joints with specified tightening.

The tool is a planetary reduction gearbox equipped with replaceable actuators. Mass-produced ratchet wrenches are recommended for rotating the multiplier wrenches, and torque wrenches are recommended for specified tightening.

All the models of the multiplier wrenches are equipped with the freewheel ratchet stop, have a reverse gear and the possibility of accelerated rotation.

The main set includes:

- replaceable straight stop
- torque wrench

Upon request the following can be supplied additionally:

- special replaceable stop (according to the customer's sketch)
- replaceable hexagon heads

Technical specifications:

Designation	Input block, inch	Output block, inch	Max. torque output, Nm(kgm)	Gear ratio	Accelerated rotation	Weight
КМП-80/04	1/2	3/4	800 (80)	1:4	NO	1,6
КМП-130/05	3/4	3/4	1300 (130)	1:5	NO	3,4
КМП-130/16	1/2	3/4	1300 (130)	1:16	YES	3,8
КМП-200/16	1/2	1	2000 (200)	1:16	YES	5,6
КМП-400/16	3/4	1 1/2	4000 (400)	1:16	YES	7,7
КМП-400/25	1/2	1 1/2	4000 (400)	1:25	YES	8,8
КМП-600/25	3/4	1 1/2	6000 (600)	1:25	YES	11,9
КМП-1000/64	1/2	1 1/2	10000 (1000)	1:64	YES	17,8
КМП-1600/64	3/4	2 1/2	16000 (1600)	1:64	YES	25,6

Power-operated tool

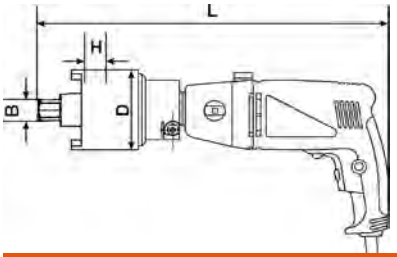
Multipurpose electromechanical power wrenches КМПЭ

Multipurpose electromechanical power wrenches are intended for a mechanized assembly and disassembly of large threaded joints without tightening torque control.

- Alternate current power supply 220V, 50Hz
- Reverse gear
- Two rotation speeds.

Technical specifications:

	Power consumed, W	Rated torque, Nm		Outlet shaft rotation frequency, rpm		Weight kg
		1 SPEED	2 SPEED	1 SPEED	2 SPEED	
КМПЭ-60	1000	600	250	18,8	44,8	4,3
КМПЭ-115	1000	1150	480	9,6	23	5,7
КМПЭ-200	1000	2000	830	4,7	11,2	7
КМПЭ-400	1000	4000	1600	2,4	5,7	10,5



Model	D, mm	L, mm	H, mm	B, mm
КМПЭ-60	85	385	20	20
КМПЭ-115	90	390	20	20
КМПЭ-200	93	420	25	25
КМПЭ-400	120	450	25	32

The main set includes an upright version of the replaceable stop

Upon request the following can be supplied additionally:

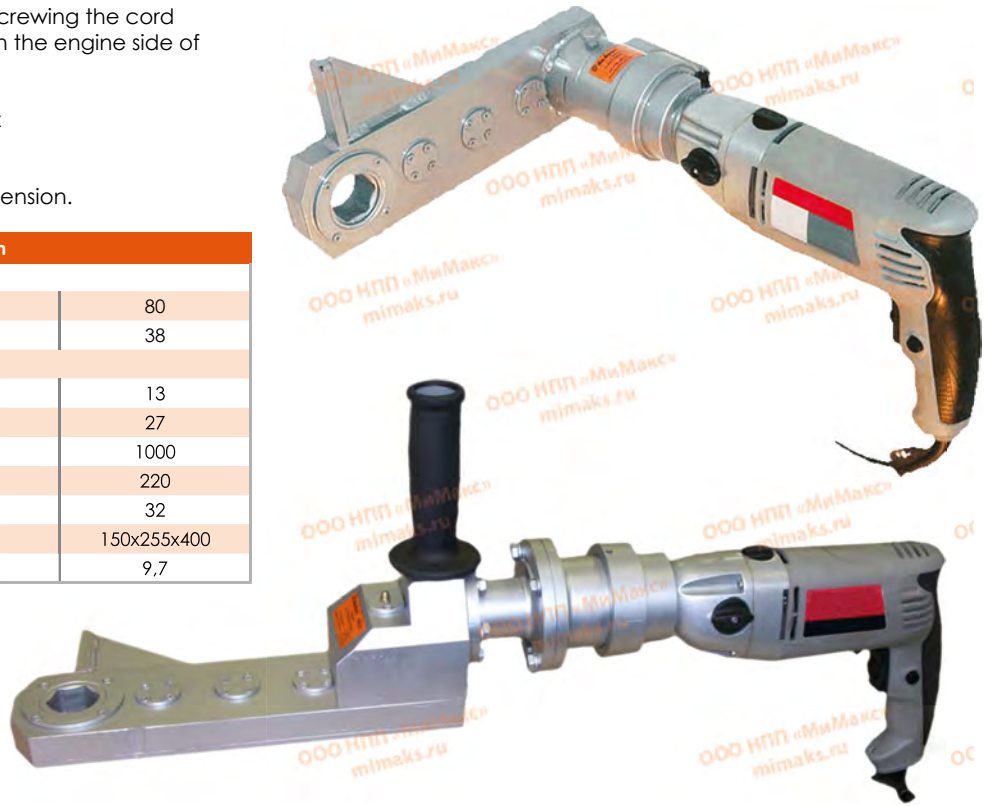
- a special replaceable stop (according to the customer's sketch)
- replaceable hexagon heads
- Bracket for mounting on a centerpoint suspension.

Power wrench for cord bolts MM204

Power wrench MM204 is intended for unscrewing the cord bolts of the rubber-cord sheath fastening on the engine side of electric trains

- Alternate current power supply 220V, 50Hz
- Reverse gear
- Two rotation speeds.
- Bracket for hanging on a centerpoint suspension.

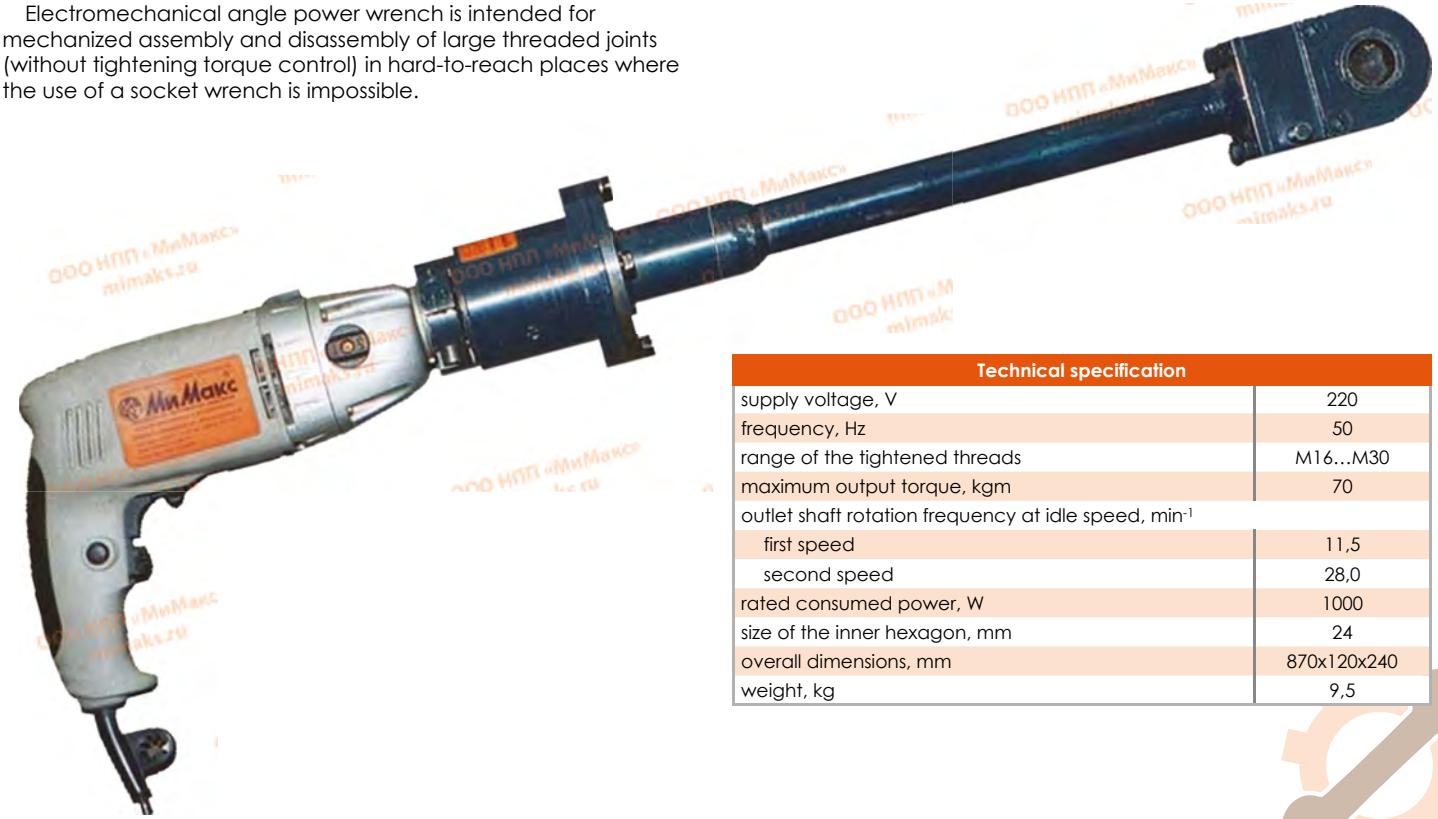
Technical specification	
rated torque, kg*m.	
first speed	80
second speed	38
outlet shaft rotation frequency, min^{-1}	
first speed	13
second speed	27
rated consumed power, W	1000
voltage, V	220
built-in head hexagon size, mm	32
overall dimensions, mm	150x255x400
weight, kg	9,7



Power-operated tool

Electromechanical angle power wrench MM102

Electromechanical angle power wrench is intended for mechanized assembly and disassembly of large threaded joints (without tightening torque control) in hard-to-reach places where the use of a socket wrench is impossible.



Technical specification	
supply voltage, V	220
frequency, Hz	50
range of the tightened threads	M16…M30
maximum output torque, kgm	70
outlet shaft rotation frequency at idle speed, min^{-1}	
first speed	11,5
second speed	28,0
rated consumed power, W	1000
size of the inner hexagon, mm	24
overall dimensions, mm	870x120x240
weight, kg	9,5

Angle power wrench КМПЭ-360У

Angle power wrench КМПЭ-360У is intended for unscrewing the locking bolts of electric train motors.

Alternate current power supply 220V, 50Hz
Reverse gear
Two rotation speeds.
Bracket for hanging on a centerpoint suspension.

Technical specification	
rated torque, Kg*m	360
outlet shaft rotation frequency, min^{-1}	
first speed	3,4
second speed	7,1
rated consumed power, W	1000
hexagon head size, mm	55
weight, kg	13,5

Power-operated tool

Suspended power wrench for unscrewing of the wheelset central axle nut MM193

Technical specifications:								
Model	Power consumed, W	Rated torque, Nm		Outlet shaft rotation frequency, rpm		Overall dimensions		weight kg
		1 speed	2 speed	1 speed	2 speed	Diameter mm	length mm	
MM193/110	1000	8000	3680	1,2	2,5	196	490	21,5
MM193/165	1000	8000	3680	1,2	2,5	220	520	26,5
MM193/170	1000	8000	3680	1,2	2,5	220	520	26,5

Power wrenches are intended for unscrewing of the central nut fixing the bearings on the wheelset axle of railway rolling stock:

- MM 193/110 - freight and passenger cars, electric trains;
- MM 193/165 - electric locomotives of ЧС2 type
- MM 193/170 - electric locomotives of ВЛ10, ВЛ80 and other types.
- Alternate current power supply 220V, 50Hz
- Reverse gear
- Two rotation speeds.
- *A bevel with a centerpoint suspension is supplied additionally*

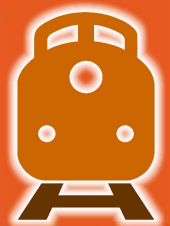
Anti-rattle nuts power wrench MM156

The power wrench is designed for unscrewing anti-rattle nuts of passenger cars (trailer cars of electric trains). The wrench is a five-stage reduction gearbox based on the electromechanical power wrench of КМПЭ-400 type.

Power wrench is put into gear with the anti-rattle nut due to the vertical movement of the suspension and during the process of unscrewing it remains stationary due to the stop which is set on the body of the last planetary stage.

A frequency converter is used in the item to protect against overload and provide the required torque.

Technical specification	
supply votage, V	380
frequency, Hz.	50
capacity, W	1000
rotation frequency, rpm	2
torque, kgm	800
overall dimensions	
length, mm	1030
width, mm	452
height, mm	226
weight, kg	56



Equipment for repair of railway rolling stock

Equipment for repair of underground rolling stock

Equipment for repair in mining and oil producing industry

Power-operated tool (for threaded joints tightening)

MiMaks

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