

ROBIN

 **INTEHROS**



**ROBOTICS
HYDRAULICS
ELECTRONICS**



INTEHROS GROUP OF RUSSIAN MANUFACTURING AND ENGINEERING COMPANIES

We develop and produce robotics and equipment based on hydraulic drive. We provide a complete cycle from concept to serial product.

Our competencies lie at the intersection of programming, electronics, mechanics and hydraulics. For more than twenty years of experience, we have created and implemented several dozens of new products, both mechanical systems and software products among them.

Our main production site is located in Voronezh, but we also have representative offices in Moscow, Irkutsk, Vladivostok and Riga. Since 2019, we have been a part of the National Association of Robotics Market Participants (NAURR) and the Association of Railway Equipment Manufacturers (OPZHT). Besides, our company created a laboratory of hydraulic robotics at Voronezh State University, where students can undergo training in the new direction of «mechatronics and robotics». AO MGK Intehros was licensed for additional professional education as part of the training of specialists for the industry.

We make use of each of our products to solve the most complex industry problems, that's why the country's largest companies trust us – JSC Russian Railways, PJSC Gazprom, JSC Polyus Zoloto, JSC UGMC, JSC Metal Invest, PJSC GMK Norilsk Nickel and others.

22

years in the market

IRGIN

8

patents

250+

upgraded equipment
units

35+

unique projects



ROIN_RTS

R070

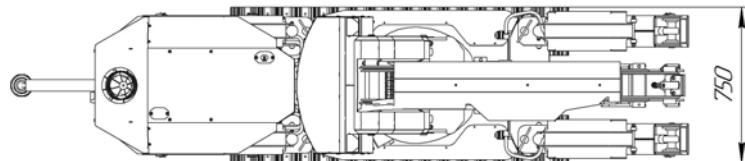
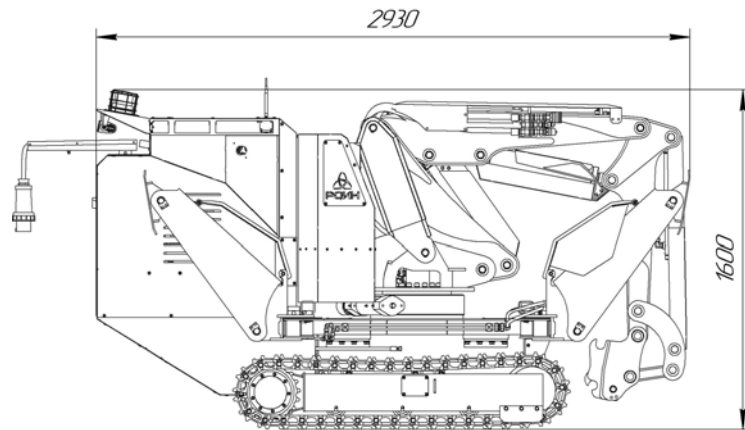
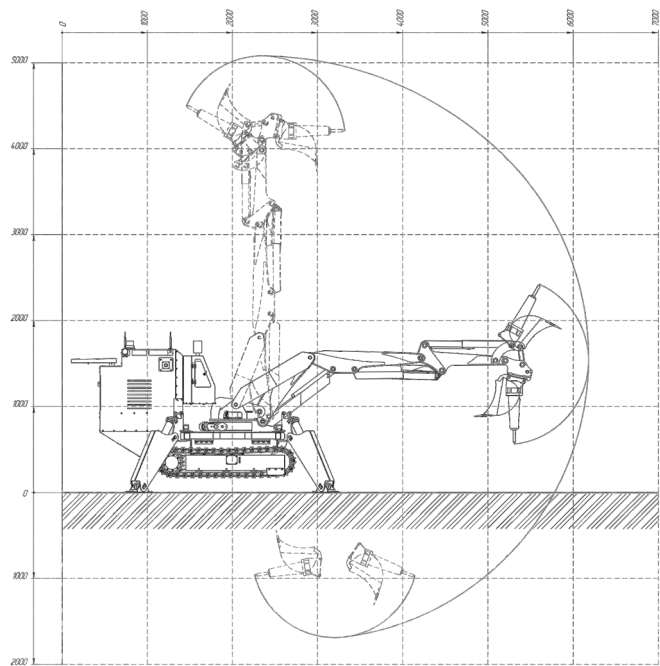
ROIN LIGHT SERIES MODEL

The R070 has the best width parameter, so it can work inside tight spaces. The outriggers can be positioned at 90°, 135° and 180° for ease of work in cramped conditions. Equipped with an electric motor, the R070 can be safely used inside buildings.

All hydraulic cylinders are protected as standard.

A choice of control range and track material is available as an option.

ROIN



Recommended attachment weight, kg	250
Maximum boom outreach, m	4,1
Maximum lifting height, m	4,32
Maximum lowering depth, m	0,86
Hydraulic pump drive	electric/diesel
Length, mm	2930
Width, mm	750(1000)
Height, mm	1600



ROIN_RTS

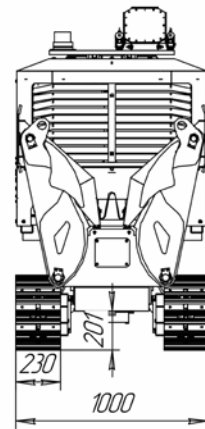
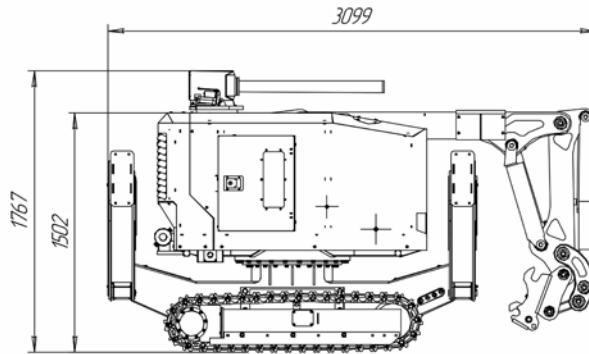
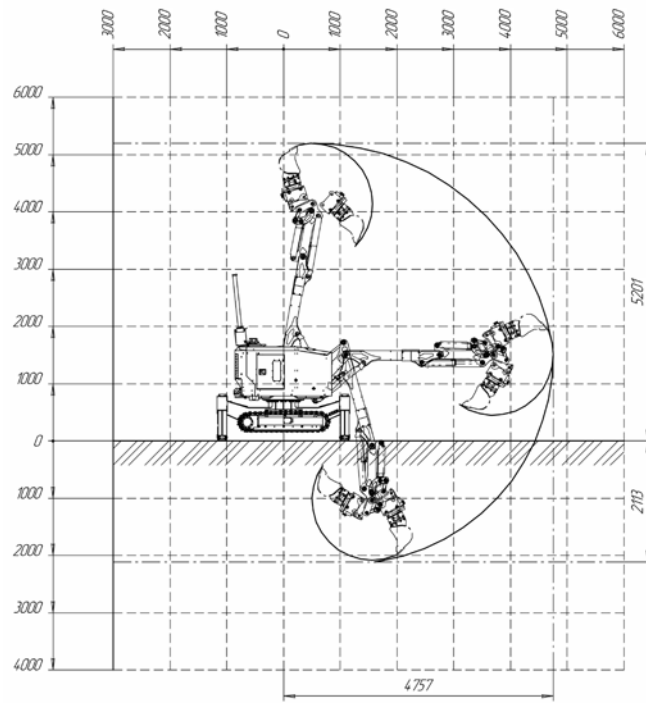
R100 ROIN LIGHT SERIES MODEL WITH HIGHER POWER

The R100 robotics tool is a next-gen robot with an enlarged working area and an upgraded hydraulic system. The robot's W x H dimensions are 1 m x 1.5 m. The boom outreach has been increased by half a metre and the enhanced power unit has resulted in a 35% increase in productivity.

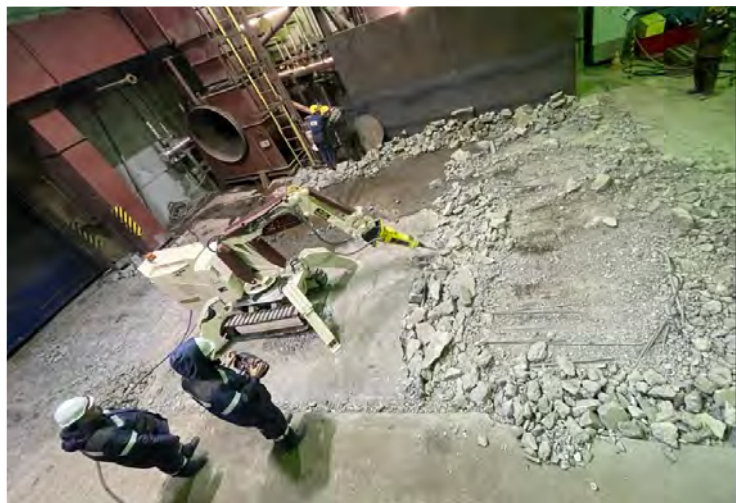
The R100 comes with a full-turn turret for expanding the working area in narrow corridors, tunnels, and converters. It uses its own chassis with rubber or steel tracks to move over any surface.

The R100 is controlled remotely by a single operator via the control panel. The operator can be up to 1.5 km away from the robot, thanks to the portable communication antennas. The robot is fitted with four Full HD video cameras for control from over 300 meters.

ROIN



Recommended attachment weight, kg	300
Maximum boom outreach, m	5,3
Maximum lifting height, m	5,8
Maximum lowering depth, m	2,1
Hydraulic pump drive	electric/diesel
Length, mm	3099
Width, mm	1000
Height, mm	1502



P070

Due to its dimensions, the R070 is used in the mining, nuclear and metallurgical industries. ROIN is actively used with a high-frequency hydraulic hammer providing fast and safe dismantling.

A separately located power unit allows the platform to be modified for transport tasks or for the removal of woody vegetation.

ROIN



P100

The R100 is available in a radiation-resistant version with full protection of electrical components when used in a radioactively contaminated site. For operating temperatures above 50 degrees Celsius, we recommend equipping the R100 with a thermal protection package.

IRCON



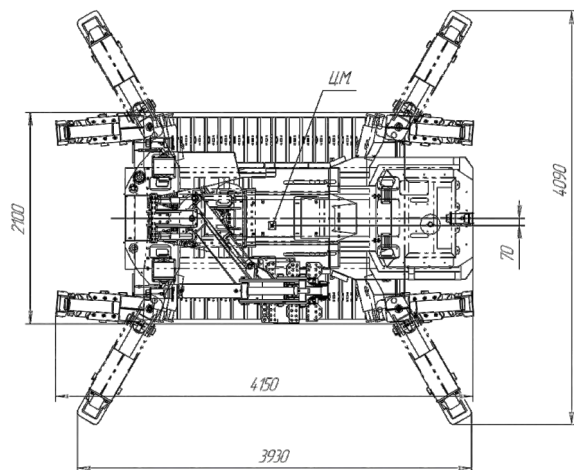
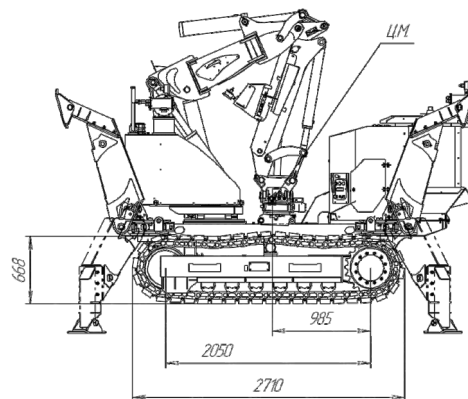
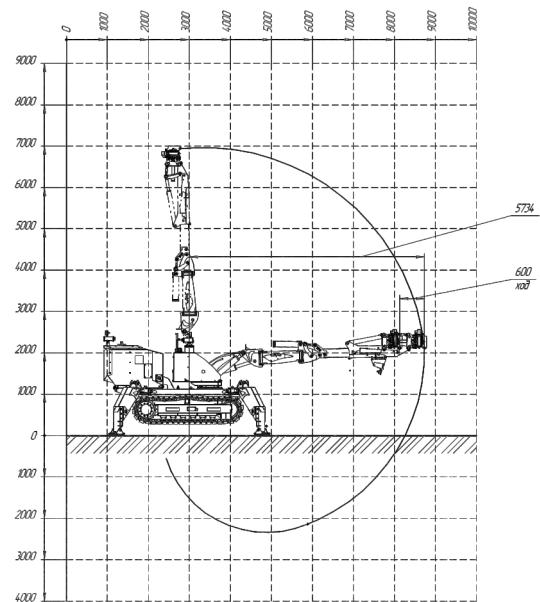
ROIN_RTS

R300 ROIN LIGHT SERIES MODEL

The mid-range ROIN_RTS R300 multipurpose robot combines high-performance manipulator with adaptability thanks to its modular design. The optional installation of additional degrees of freedom increases the flexibility of the work tool and makes it easy to use in tight spaces.

The ROIN_RTS R300 performs a variety of engineering tasks, eliminating the need for a fleet of specialized vehicles. The unit is compatible with any hydraulic attachments available for purchase from our company. The modular design provides the ability to choose the chassis, outriggers, actuator and power unit.

ROIN



Recommended attachment weight, kg	600
Maximum boom outreach, m	6,5
Maximum lifting height, m	7,0
Maximum lowering depth, m	2,2
Hydraulic pump drive	electric/diesel
Length, mm	4150
Width, mm	2100
Height, mm	2950



The flexibility and the boom outreach provide efficiency in a limited work area.

Installation on three carriers is possible: railway platform, truck and tracked chassis.

The unit is delivered in three versions: heat-resistant, radiation-resistant and Arctic version.

It supports 30+ types of attachments.

ROIN



The R300 is controlled remotely from a distance of up to 1,500 m.

The operator can use two control panels: one with video signal transmission and another with a light technological panel.

A virtual simulator is available for operator training.

IRCON



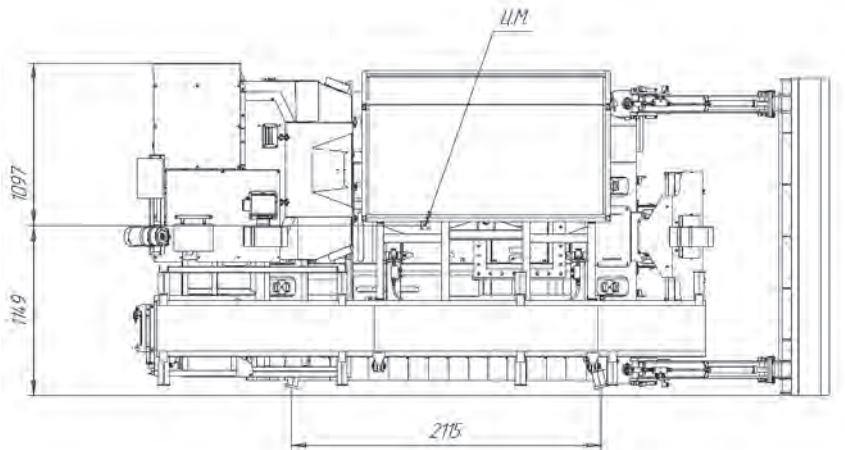
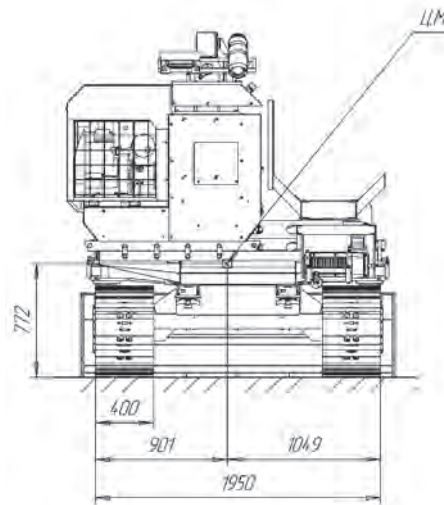
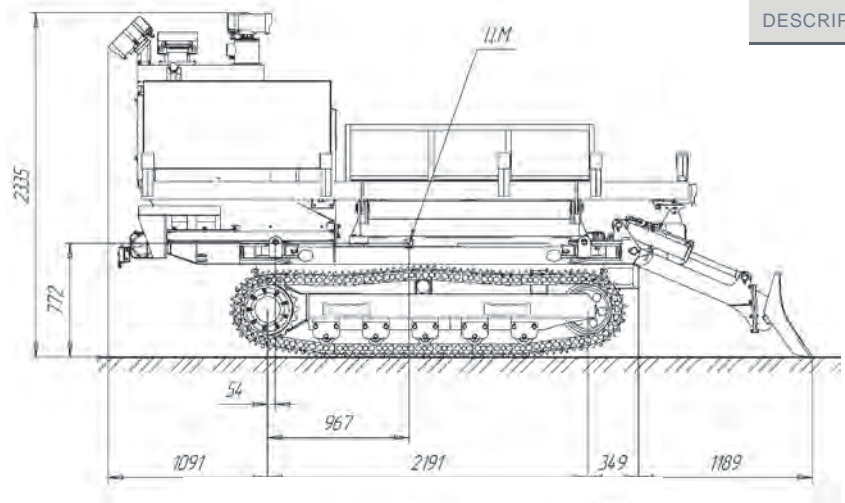
ROIN_RTP

R300gsh TRANSPORT MODIFICATION OF THE ROIN MID-SERIES

The robotic platform on the tracked chassis provides transportation and obstacle clearing tasks. The basic R300 chassis is additionally equipped with two tipper bodies, a shovel, and a hydraulic winch.

Together with the ROIN_RTS R300, it forms a robotic group that is effective in hazardous environments.

ROIN



Load capacity, tons	3,0
Hydraulic pump drive	diesel/gasoline
Length, mm	3631
Width, mm	2246
Height, mm	2335



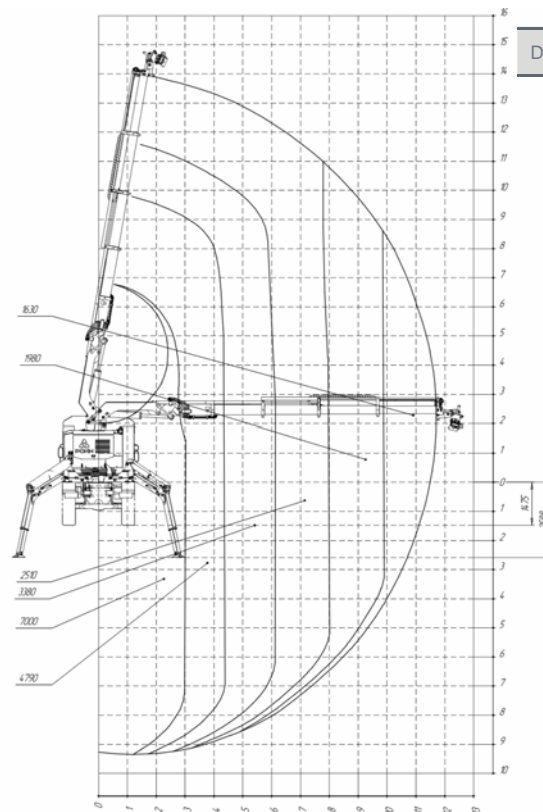
ROIN_RK

R700 REINFORCED MODEL OF THE ROIN HEAVY SERIES

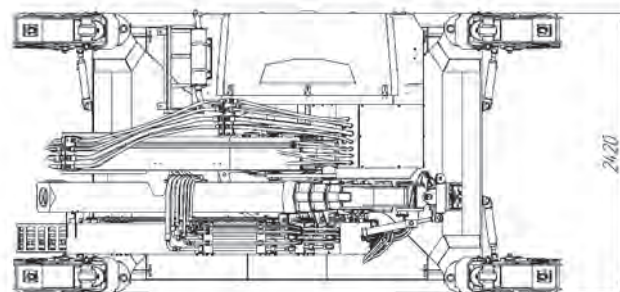
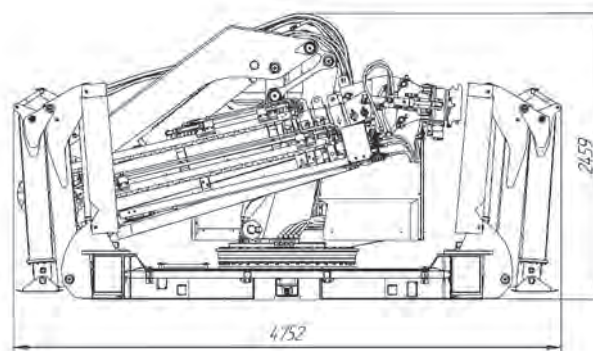
The RK ROIN R700 is designed to solve engineering tasks in infrastructure maintenance and construction. Take advantage of a new level of flexibility with three-stage supports for placement in difficult terrain, own power unit for complete autonomy, and a heavy-duty manipulator with pan/tilt unit for use with dozens of attachments.

ROIN

The R700 robotic engineering system combines the advantages of a heavy multipurpose manipulator and all-terrain truck. With a single system, it is possible to perform ground, drilling, elevated, concrete-crushing tasks, as well as bush mulching. The high capacity of the R700 system allows using it in a variety of industries.



DESCRIPTION



Recommended attachment weight, kg	600
Maximum boom outreach, m	11,7
Maximum lifting height, m	16,2
Maximum lowering depth, m	9,6
Hydraulic pump drive	diesel
Length, mm	4752
Width, mm	2420
Height, mm	2459

IRCON



The ROIN R700 does not require mandatory mounting on a carrier, but can be mounted on a customer's truck and rail platform to speed up preparation and operation.

The ROIN range features a patented pan/tilt unit with quick-release mechanism. This assembly provides compatibility with thirty types of attachments. The operator needs less than a minute to attach any type of hydraulic actuator.

ROIN



Currently, ROIN_RK R700 is actively implemented in industries with geographically distributed infrastructure by carrying out tasks on maintenance of railway tracks, construction of oil and gas pipelines, and maintenance of high-voltage power lines.

With a single R700 system you can perform ground, drilling, elevated, concrete-crushing tasks, as well as bush mulching along the right-of-way of power supply lines and many other tasks. A closed body can be installed on the carrier for easy delivery of attachments and tools. The whole system can be handled by a single operator, who can be trained at our plant with a state-issued certificate.



ROIN

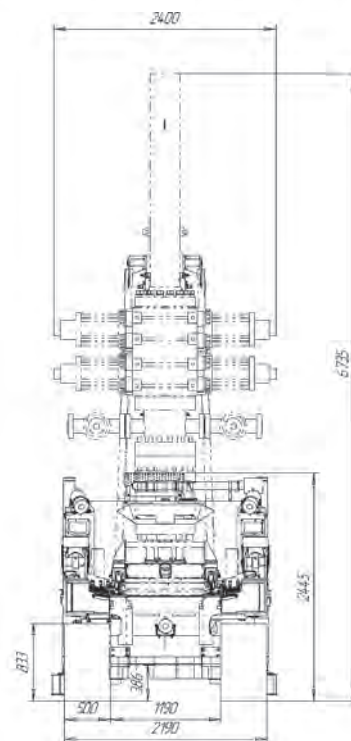
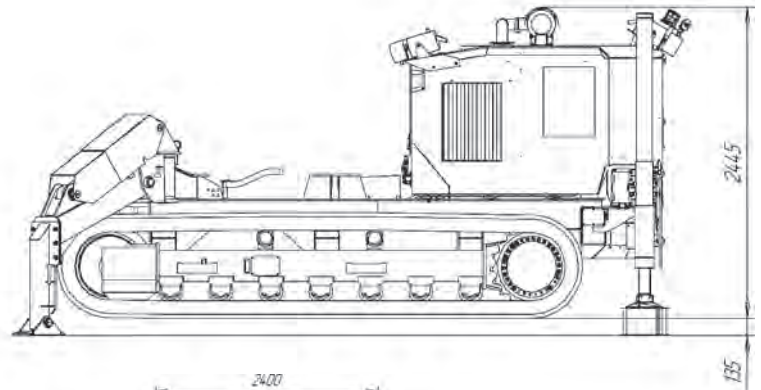
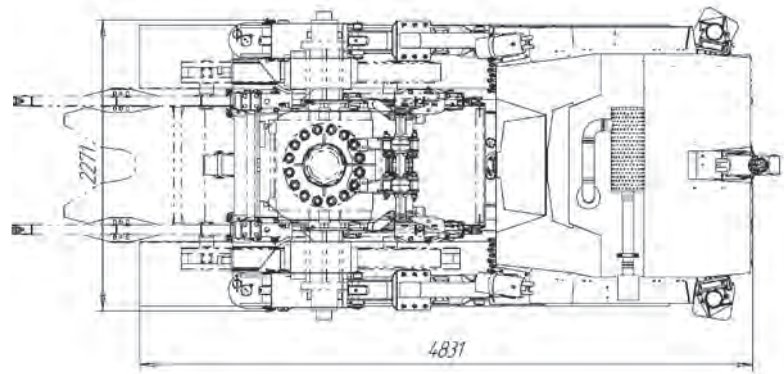
RTP-M

HEAVY SERIES MODULAR COMPLEX

ROIN RTP-M of modular type is designed to perform remote operations for liquidation of gas and oil fountains, including burning ones, as well as for extinguishing storage of petroleum products.

The system is controlled by four explosion-protected cameras and a dozen of available hydraulic lines. RTP-M is easily adaptable to the customer's tasks. The platform is designed in a heat-resistant version.

ROIN



Load capacity, tons	11,0
Hydraulic pump drive	diesel
Length, mm	4831
Width, mm	2190
Height, mm	2445

Heat-resistant materials with
operating temperatures up to

350°C

Remote control up to

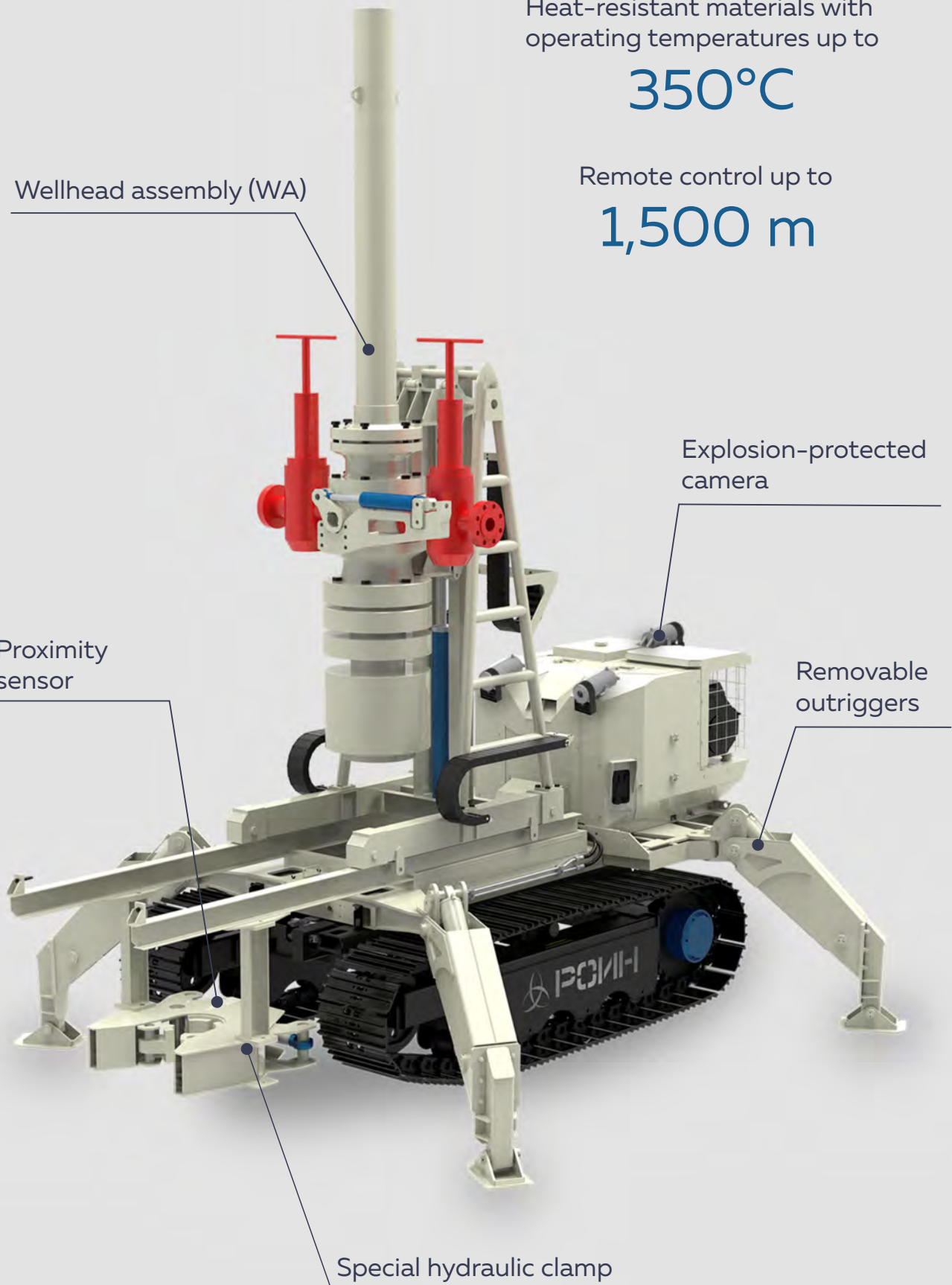
1,500 m

Wellhead assembly (WA)

Explosion-protected
camera

Proximity
sensor

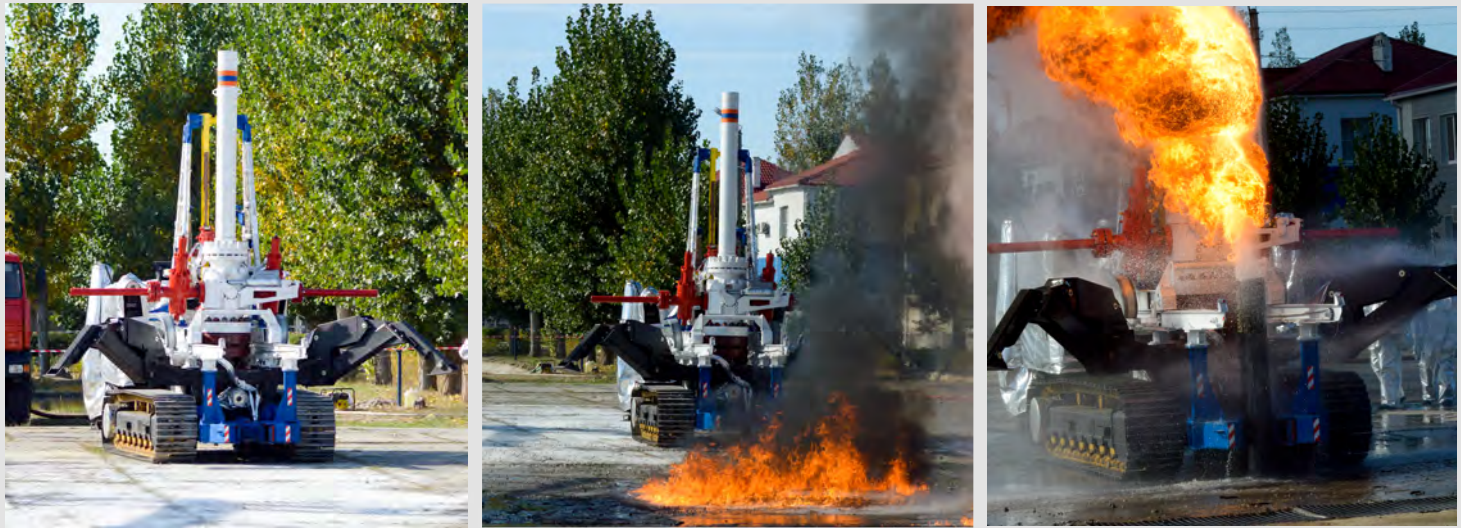
Removable
outriggers



Special hydraulic clamp

RCIN

WA module provides remote setting of the wellhead assembly (WA) on the gushing wellhead when eliminating open gas and oil gushers.



Manipulator module with the 11.7 m long telescopic manipulator is used for engineering work to dismantle emergency structures. The boom tip is equipped with a pan/tilt unit that provides operation with various attachments, as well as their quick change, rotation and tilt.

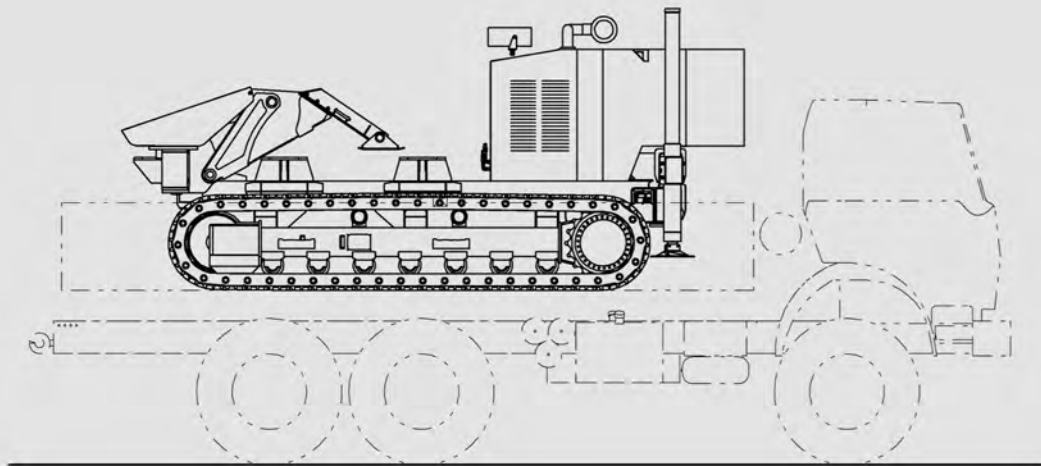


UPAT 7.5-200-300 module is designed for remote extinguishing of fires with oil products by supplying expanding gas and aerosol foam through a telescopic flexible pipeline with a maximum flow of up to 300 l/s and a jet length of at least 70 meters.

Module with shovel is used to arrange (leveling) the access road in the direction of the gushing wellhead.



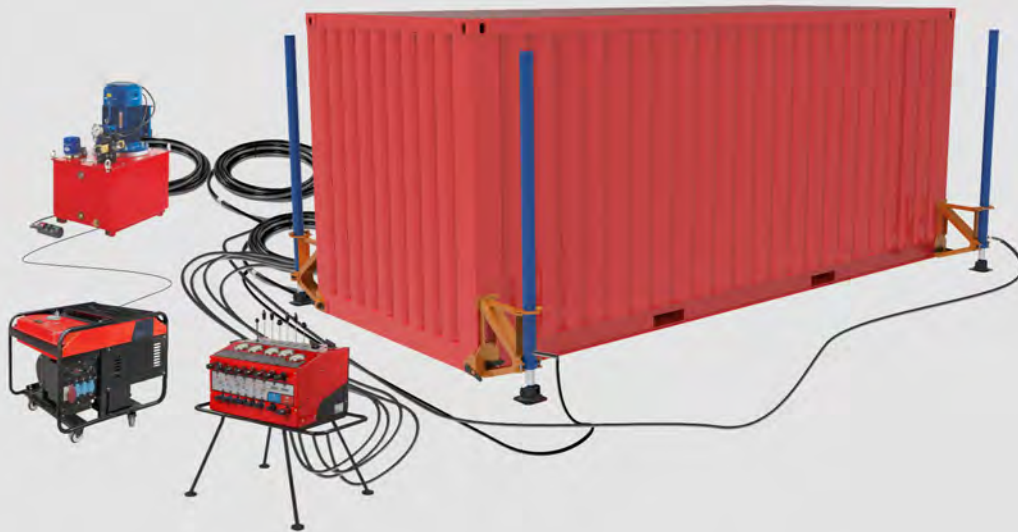
HYDRAULIC EQUIPMENT FOR CONTAINER UNLOADING/LOADING



Some types of work require the robot to be delivered to the site in off-road conditions by vehicles with all-terrain chassis. In this case, additional lifting equipment is required for unloading. To solve this problem, ROIN robotics has a special option that allows unloading and loading by two workers. The principle is based on the use of removable hydraulic telescopic supports, operating from the power unit of the robotics equipment.



UNLOADING OF LARGE-SIZED EQUIPMENT BY TWO WORKERS



We offer a loading and unloading system for small robotics and other equipment transported in containers. The system operation is based on four cylinders driven by an autonomous pump station. The weight characteristics allow carrying out works in the field by two workers.





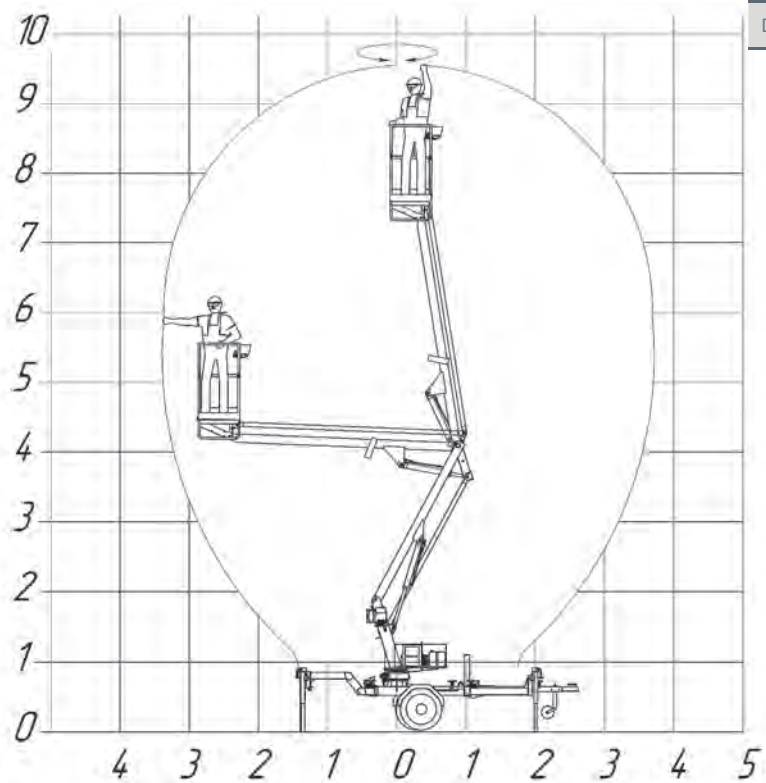
ROIN

OPN-9 LIGHT SERIES ARTICULATED BOOM ELEVATOR

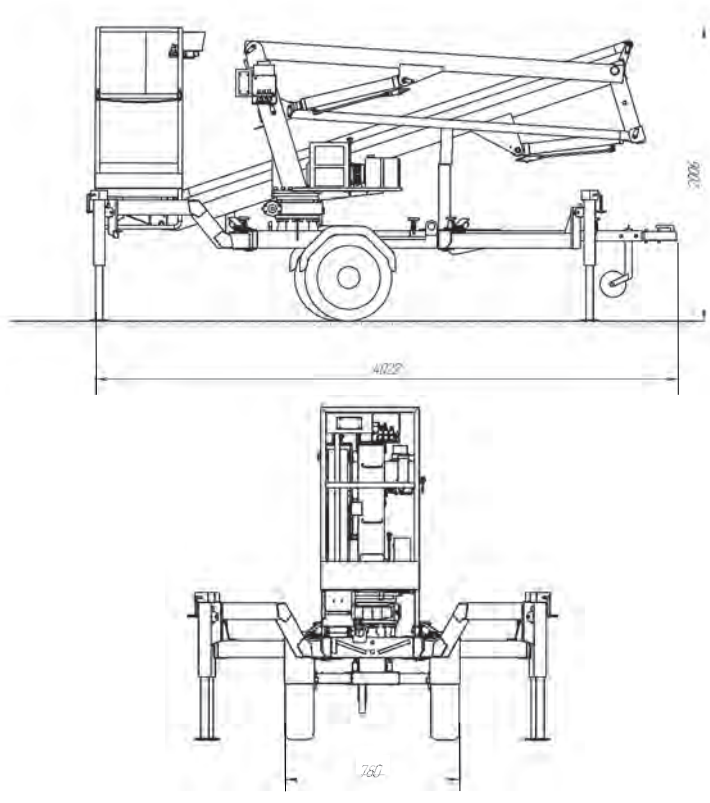
The OPN-9 is equipped with a variable wheelbase ranging from 780mm to 1,065mm. It is possible to start working after the supports have been positioned, which is monitored by four end sensors. It is possible to control the OPN-9 both from the cradle and from the ground.

The elevator is equipped with an emergency system that allows handling the ROIN even if the operator is unconscious in the cradle or in case of power loss.

ROIN

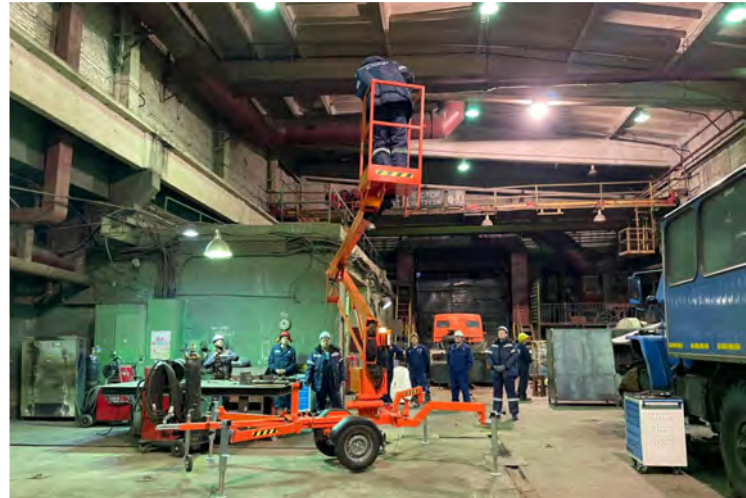


DESCRIPTION



Load capacity, kg	120
Hook lifting height, m	9,5
Column rotation, deg.	359
Cradle overhang from the central axis, m	upto 3,5
Length, mm	4022
Width, mm	780
Height, mm	2006

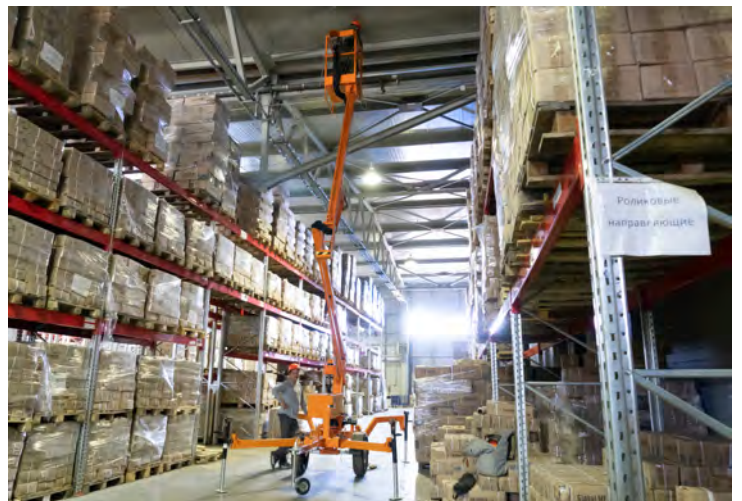
IRCON



The elevator is used to perform a wide range of tasks at any industrial, commercial or sports facility for laying communications, maintenance of electrical network of ventilation shafts, replacement of lighting appliances, installation of advertising structures, cleaning walls and storefronts.

It is possible to use the equipment in the extended temperature range from -15 to +40°C.

IRCON



The articulated boom elevator can be moved by a single operator. It is equipped with manual hydraulics to ensure operation in the event of loss of power from the mains.

ROIN elevator is most effective for use in facilities with narrow entrances of up to 800 mm and high ceilings. Thus, it is used for maintenance of subway stations, museums, business centers and industrial facilities.

ROIN

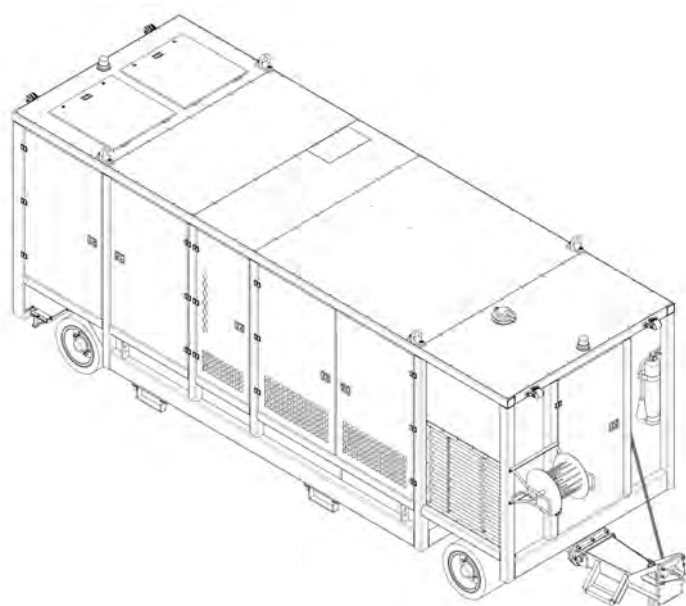
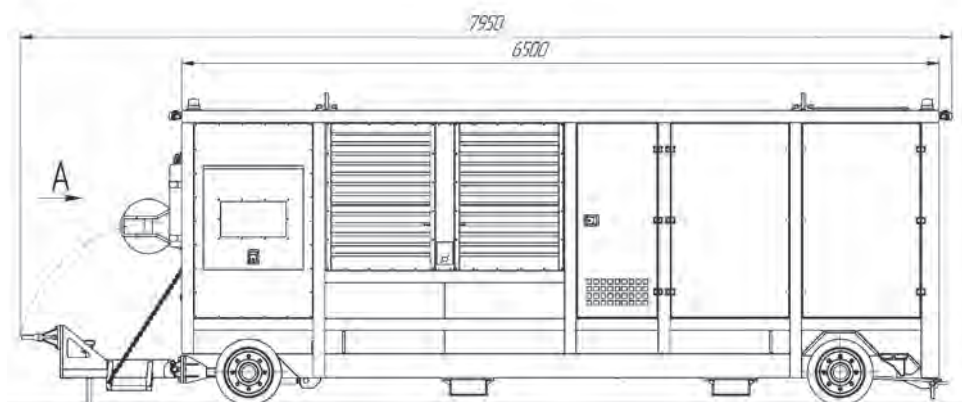
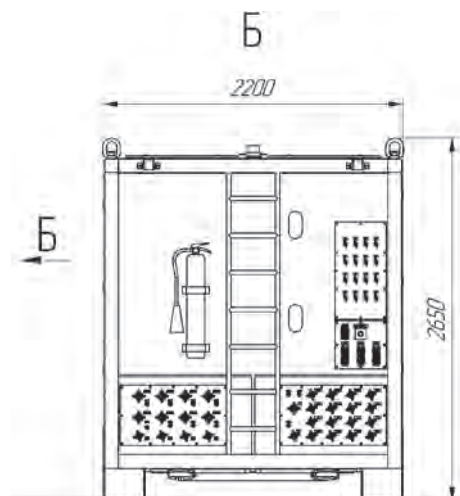


ROIN_NGS

HYDRAULIC PUMPING UNIT

The ROIN pumping unit is designed for operation as a part of the ship rail-guided transport system. The unit controls elevating boards and transport carts in automatic mode. The proprietary power unit provides energy for the working fluid volume of 3,000 l to lift cargoes up to 4,000 t.

ROIN



Number of controlled hydraulic lines, pcs.	24
Oil tank capacity, l	3300/3000
Control	portable remote control
Continuous work time without refueling, h	10
Length, mm	6500
Width, mm	2200
Height, mm	2650
Operating temperature, °C	-40 to +45



The unit has high performance qualities, as well works reliably in various climatic conditions from -40°C to $+50^{\circ}\text{C}$. It is easily transportable due to solid bandage wheels on axles with hubs and knuckles. Optional self-propelled version with hydraulic wheel motors available.

A diesel engine with an output of more than 260 kW ensures stable operation of the hydraulic system in combination with two 40-litre pneumohydraulic accumulators.

SMALL-SCALE MECHANIZATION TOOLS



Cylinders and jacks



Equipment for
screw joints



Releasers



Equipment
for rescue and
cutting tools



Pumps and
pumping units



Equipment for
railroad transport

The holding company JSC MGK INTEHROS includes the manufacturer Enerpred producing high-quality hydraulic tools of wide range of action and application, meeting the requirements of Russian and international standards.

The product range offered by Enerpred includes a full scope of hydraulic equipment and tools for all industries: jacks and cylinders, releasers, presses, tube benders, pumps and pump units, rescue equipment, special equipment and tools, railway tools, cutting tools, equipment for screw joints (wrenches, etc.) and handling equipment. There are over 1,500 items in total.



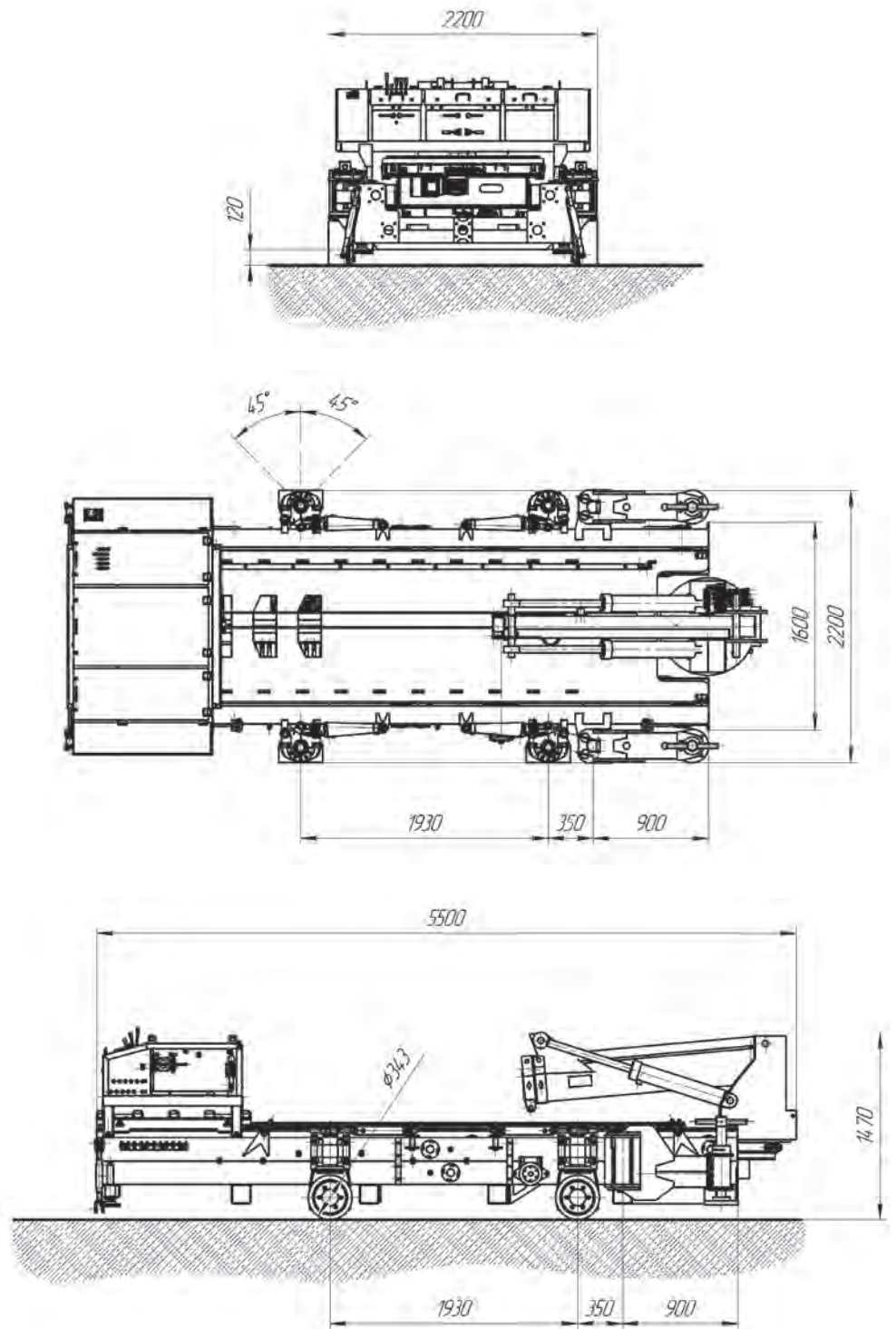
ROIN_MF

LINER MACHINE

Multipurpose wheeled handling machine with sliding chassis is designed for replacing the liner of the wet semiautogenous grinding mill and allows for performing repair work with minimum loss of time and reduction of heavy manual labor, as well as safe ways of working in the high-risk area.

Liner machine may be operated in areas with moderate climate (mainly in closed production facilities), at the ambient air temperature from 0 °C to +40 °C.

ROIN

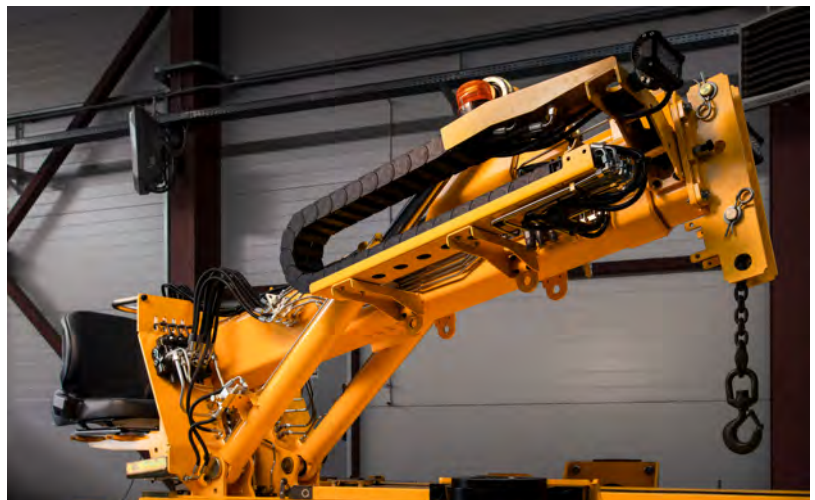
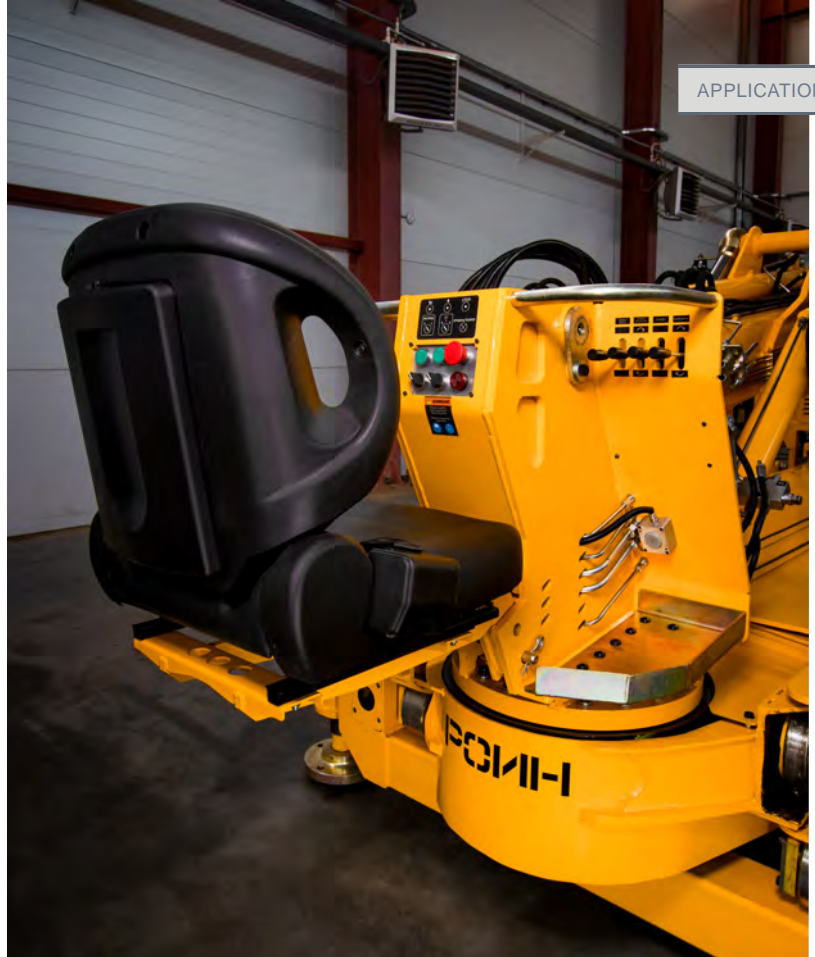


Load capacity, kg	1500
MSG column rotation, °	unlimited
Travel speed, km/h	1,3
Length, mm	5500
Width, mm	2200
Height, mm	1470
Total power consumption, kW	16
Maximum boom outreach from the MSG axis of rotation, m	3,2



The ROIN_MF removes worn liner plates from the inside of the mill drum and moves them from the mill to the outside. The ROIN delivers the new liner plates to the installation area inside the mill and installs them on the inside of the mill drum.

ROIN



The machine operates in the high-risk area and reduces the work time by five times. The liner is moved by a hook hanger or with a special hydraulic clamp.

It is recommended to employ two operators at independent control points to speed up the work.

IRCON



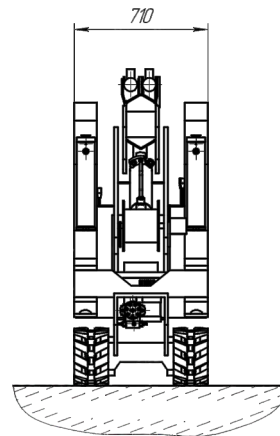
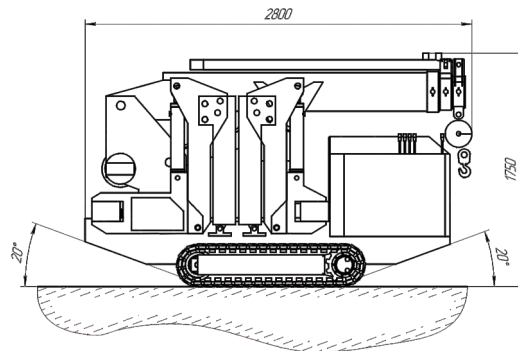
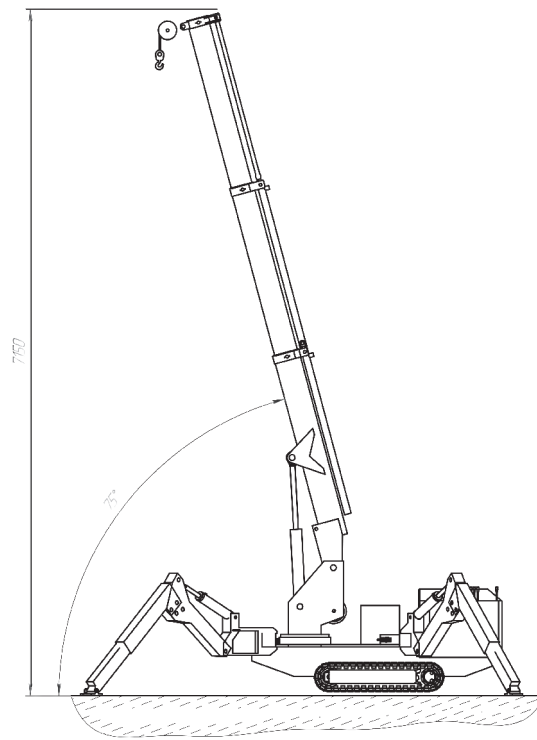
ROIN-RTS

K100 MINI CRAWLER CRANE

The ROIN mini crawler crane is compact lifting equipment that solves a large number of tasks in construction, warehouses, industrial plants, airports, railway stations, subways, museums. Mini crane can be used with a hook hanger, rig-up basket, and vacuum clamp for mounting storefronts.

In the transport mode, ROIN mini crane has a high mobility in confined spaces. In addition, compact dimensions allow easy transportation to the work site.

ROIN



Load capacity, kg	250
Hook lifting height, m	6,5
Length, mm	2800
Width, mm	710
Height, mm	1750

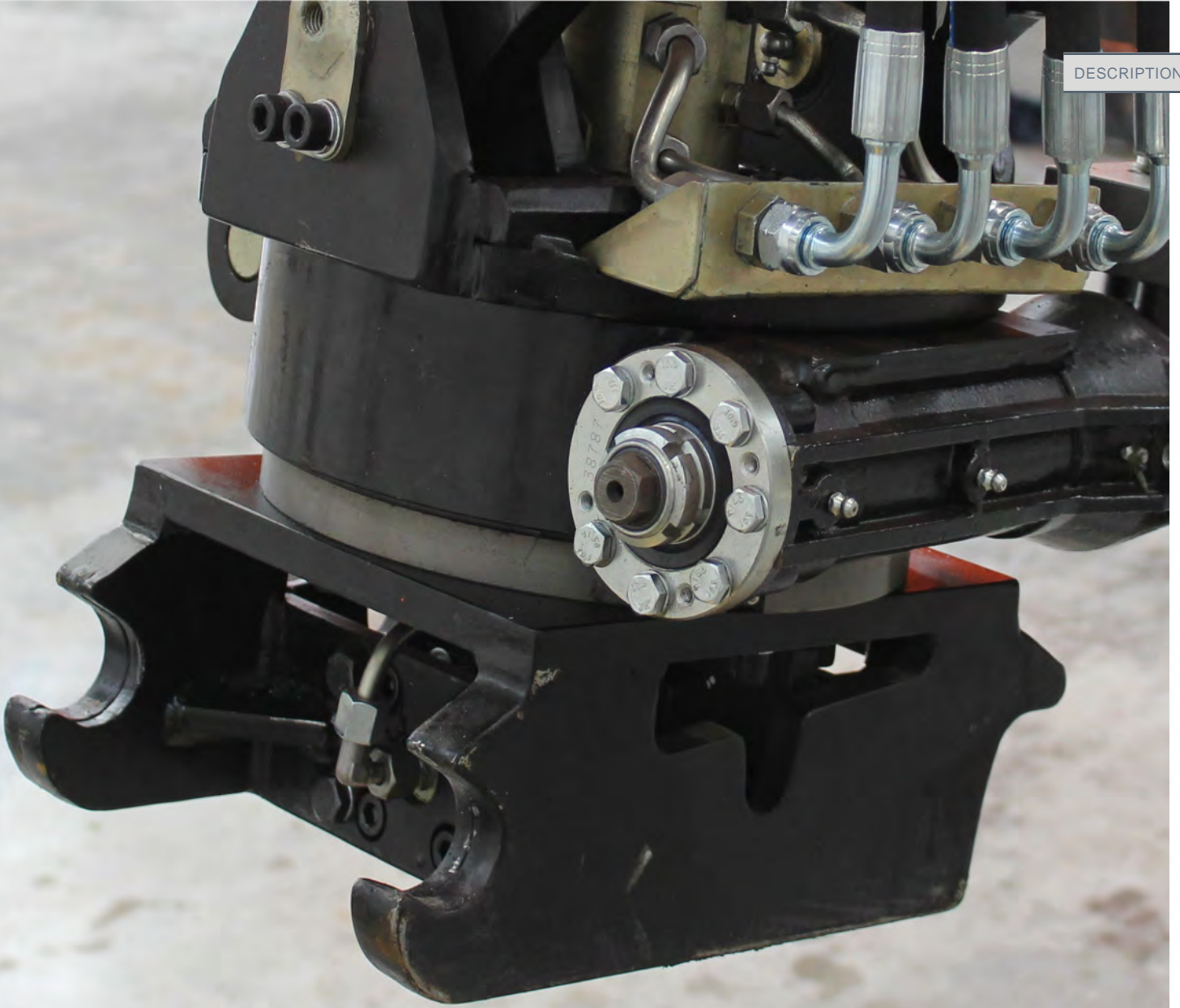


ROIN_TRM

TILTROTOR MECHANISM

A tiltrotor mechanism (TRM) is fitted between the working excavator boom and hoisting equipment. TRM use raises the earthmoving equipment's operating efficiency to a qualitatively new level. The unlimited rotation and tilt of the service equipment provide convenient handling while allowing replacement of the hoisting equipment in less than a minute at any time. ROIN TRM is the professional tool for maximum productivity.

ROIN



005



010



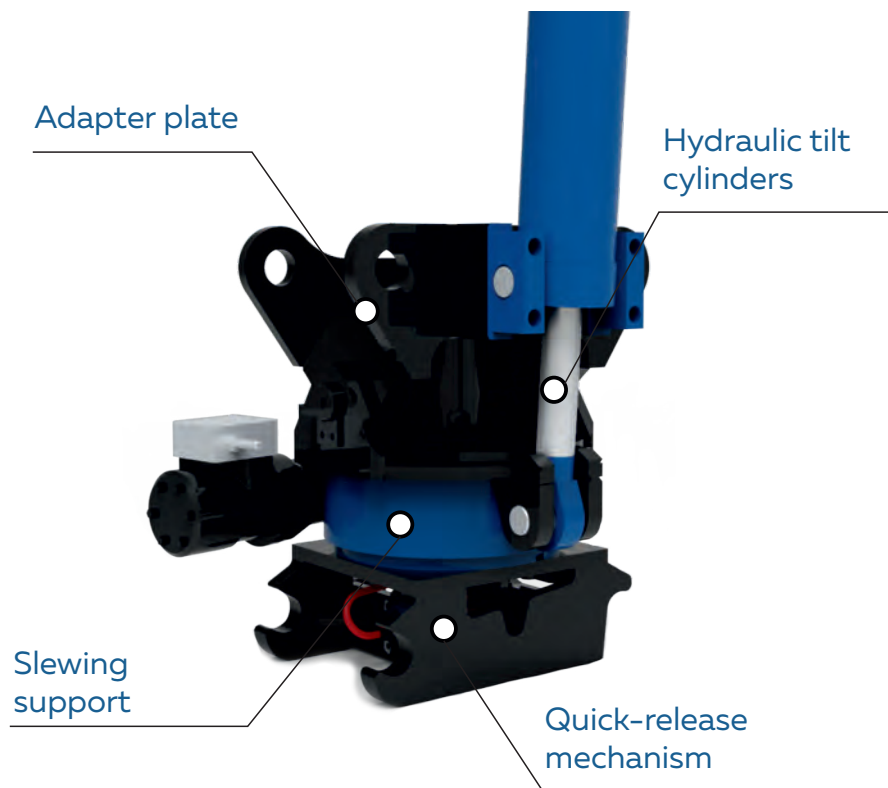
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ROIN-TRM

Created under the sponsorship of



ROIN



The TRM's robust design is made to handle a variety of loads with any type of attachment.



All connections ensure safe mounting of high-pressure hoses without loss of working fluid.

OPERABILITY

The machine's specially-designed TRM makes it versatile and able to handle high-complexity jobs in hard-to-reach places.

COST-EFFECTIVENESS

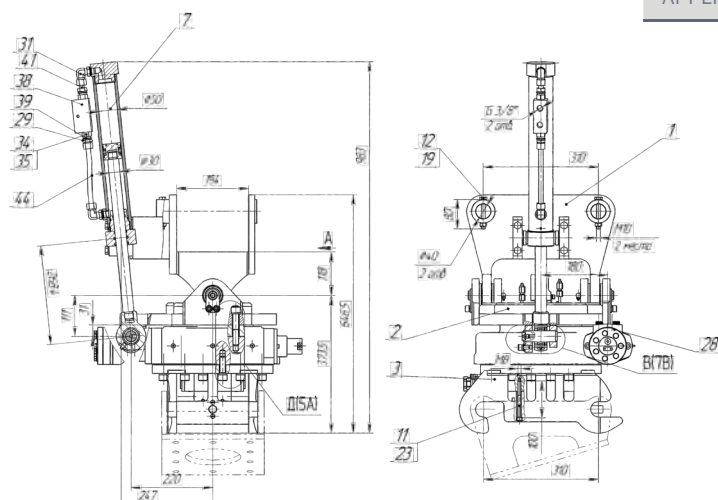
The TRM is suitable for any hoisting equipment, which eliminates the need to keep a large fleet of machines. Improved performance and greater operability increase equipment utilization and mean fewer resources are required for the same amount of work.

SAFETY

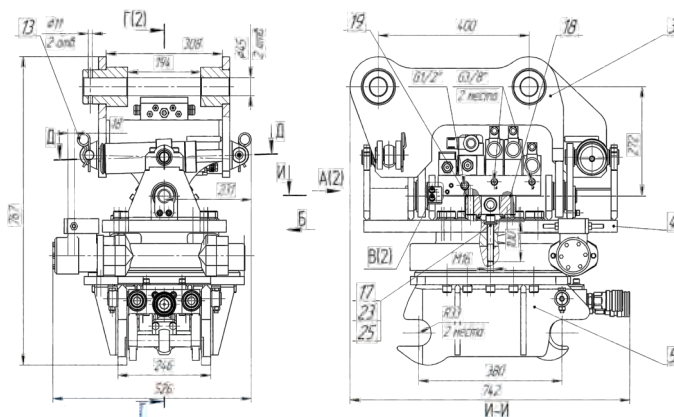
The TRM makes the excavator boom more flexible and allows using the service equipment in previously inaccessible places, eliminating the need for the operator's presence in hazardous areas. Parts are changed by reliable mounting with a hydraulic lock.

EFFICIENCY

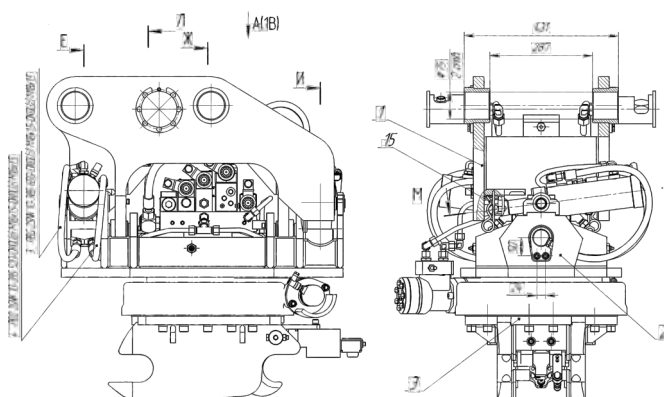
Connecting new equipment takes less than a minute and can be done without the operator leaving the cockpit, which allows to concentrate on the actual task at hand. We have built additional warehouses and increase our staff every year to provide timely service and spare parts.



Model	Dimensions (BxHxL), mm*	Tilt angle	Weight, kg*	Design oil consumption, L/min	Working oil pressure, MPa	Installation on all excavators weighing, t
TRM-005	505x515x854	2x40°	145	15-40	18-21	3-6



Model	Dimensions (BxHxL), mm*	Tilt angle	Weight, kg*	Design oil consumption, L/min	Working oil pressure, MPa	Installation on all excavators weighing, t
TRM-010	788x715x991	2x40°	340	20-40	18-21	6-14



Model	Dimensions (BxHxL), mm*	Tilt angle	Weight, kg*	Design oil consumption, L/min	Working oil pressure, MPa	Installation on all excavators weighing, t
TRM-020	720x980x850	2x40°	475	40-80	18-21	16-24

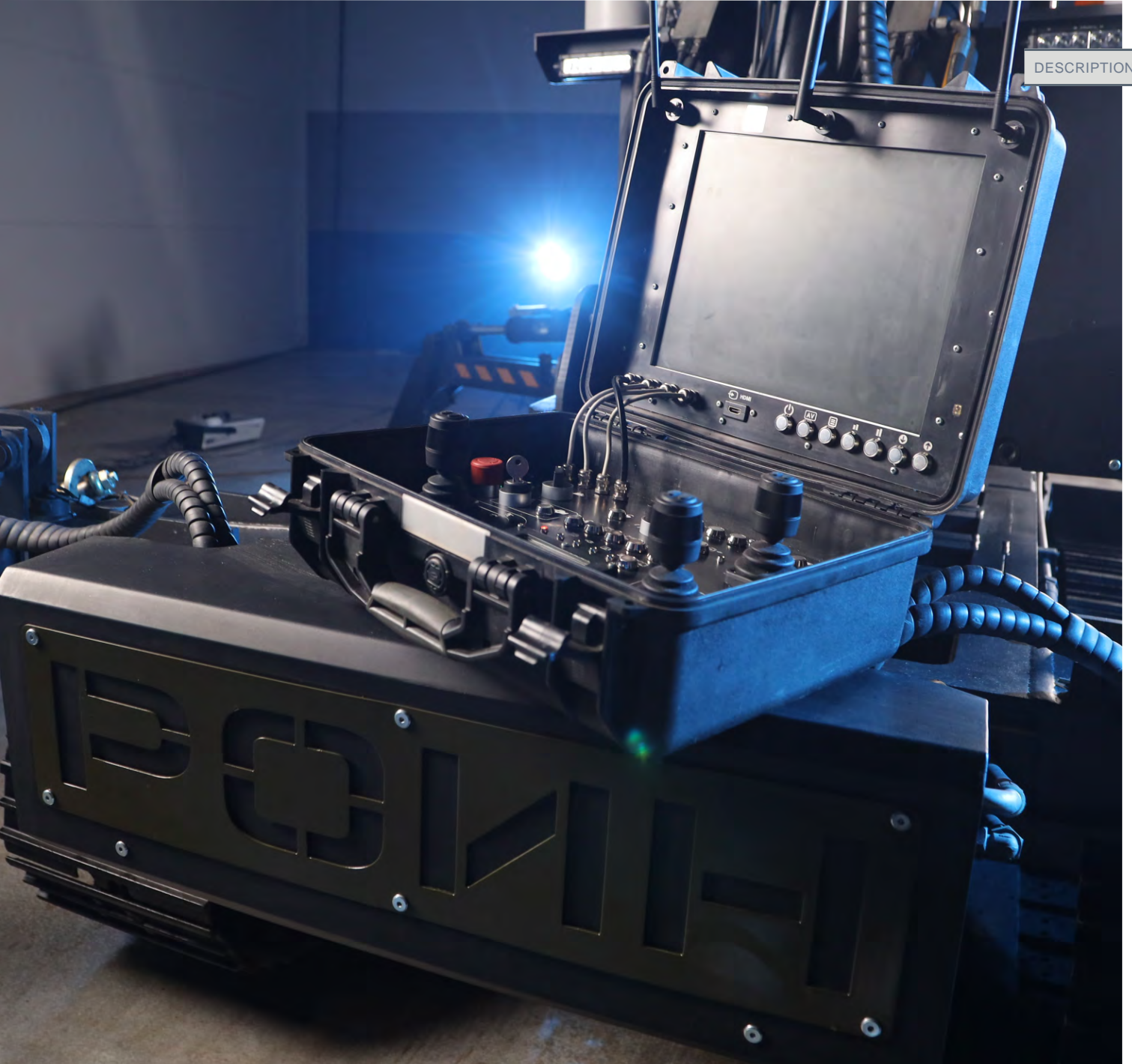


ROIN

DEVELOPMENT OF THE CONTROL PANEL

Our remote control system is ergonomic and design friendly. Professional accessories allow a fast and high-quality connection with the machinery up to 1,500 m away.

We develop turnkey control cabinets for all process lines as well.



PNEUMOHYDRAULIC ACCUMULATORS



Pneumohydraulic accumulator (PHA) is designed to generate and accumulate hydraulic energy through gas compression and maintaining working pressure in the hydraulic system. We offer pneumohydraulic accumulators with external piston diameter from 100 to 200 mm, pressure range from 9 to 32 MPa and capacity from 1.0 to 50 liters.

Gas accumulator (GA) is designed to accumulate energy through gas compression and maintaining working pressure in the hydraulic or pneumatic system. Holding manufactures gas accumulators with internal diameter from 180 to 200 mm, pressure range from 9 to 32 MPa (depending on GA model) and capacity from 6 to 50 liters.

PHA					
Charging medium	Nitrogen pressure for charging, MPa max	Working liquid pressure, MPa	Operating temperature	Design environment temperature, °C	Capacity, l
Nitrogen	1	2	from -40 to +40	-60	1 - 4
Nitrogen	8	16	from -40 to +40	-60	40 - 50
Nitrogen	18	32	from -40 to +40	-60	1 - 50

GA				
Nitrogen pressure for charging, MPa max	Working liquid pressure, MPa	Operating temperature	Design environment temperature, °C	Capacity, l
1	32	from -40 to +40	-60	6 - 50
8	16	from -40 to +40	-60	40 - 50



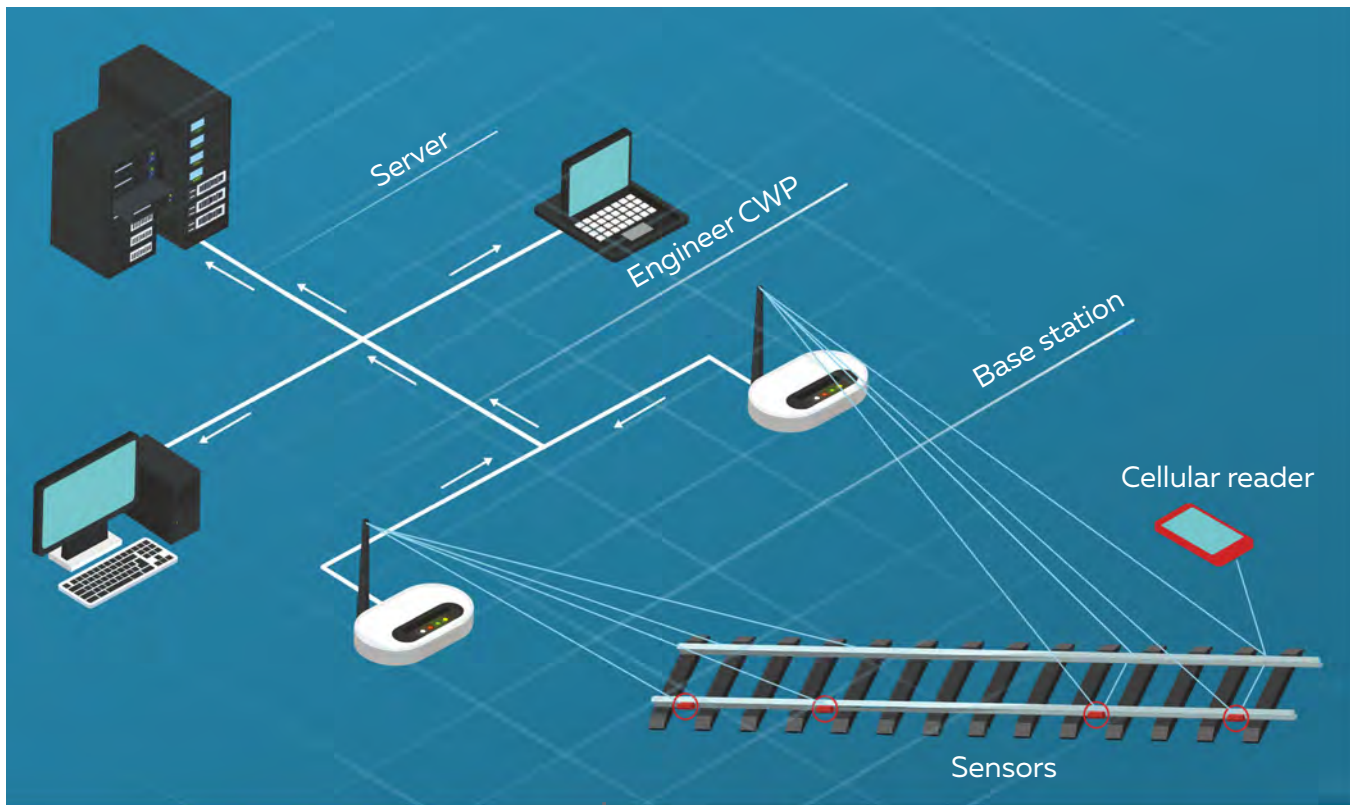
MONITORING AND CONTROL SYSTEM



Technology based on a set of multi-axis strain gauges to measure the stress-strain state of the track, including temperature measurement at the sensing point. The display system and mathematical apparatus were developed based on TU2000.



Threat codes are produced based on the TU2000 and TU2012 recommendations. The system excludes the human factor and provides real-time data on the state of infrastructure. The SKBP-2009 system developed by the company has been implemented and successfully operated at South Eastern Railway branch of JSC Russian Railways since 2009.



- Eliminating the human factor
- Real-time data retrieval
- Both remote and on-site data retrieval
- Data consistency and accuracy
- Data retrieval by different users at the same time



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