



MWM ELEKTRO

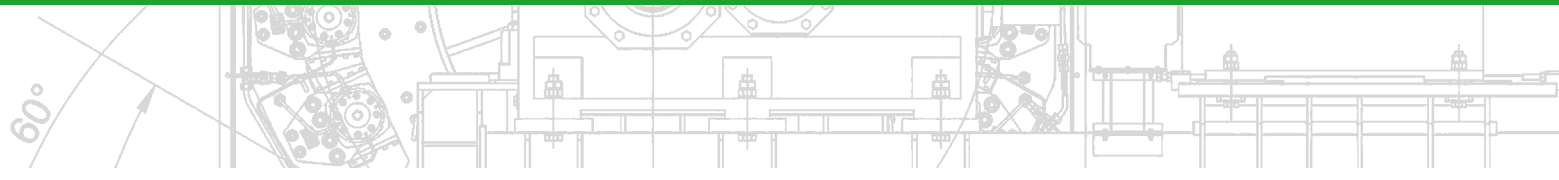
Mobile Hoisting Machine of B-1200/M/AC-2m/s type

mobile equipment of vertical transport



Mobile hoisting machine – driving unit of mining shaft hoist, having been additionally equipped, it may serve as complete mining shaft hoist.

All subassemblies that make up the machine are placed into one container, permanently mounted on a semi-trailer body approved for transport on public roads while hauled by a standard truck, with no need to get any permit or make use of special vehicles.



The B-1200M machine has been designed and manufactured so as to give it functional features as close as possible to regular stationary hoisting machine and ensure full compatibility with standard shaft signaling and communication systems.

The main construction difference as compared to typical stationary machines or those of container type is that all subassemblies that make up the mobile machine are placed into one container, permanently mounted on a semi-trailer, capable of being hauled by a standard truck.

Transport

The construction of the hoisting machine and that of the semi-trailer body, enables the whole vehicle to perform transport functions without additional permits and does not require es-

orting by a pilot car. The whole semi-trailer body has been approved for transport on public roads.



Operational conditions

Movability and relatively small dimensions of the machine allow it to be put into operation in densely built-up area, which is quite often met in the vicinity of mine shafts.



Start-up

Due to the possibility of setting up of the machine (the whole semi-trailer body) onto light foundation and anchoring of it to the foundation by means of screw lashing bars, no building permit is required to put the machine into operation.



phot. 1 Mechanical assembly

- main shaft subassembly – consists of the shaft itself (supported by two rolling bearings) and the rope winding drum (of 1,200 mm dia. – incl. the first rope layer wound on the drum), which is covered with suitable lining adapted to the applied hoisting rope diameter,
- cylindrical gear, directly set on the main shaft, along with flange mounted driving motor.



phot. 2 Driving and control system

- asynchronous AC motor – transmits the drive torque to the main shaft and rope winding drum of the machine through its gearbox,
- frequency converter – supplies the hoisting machine driving motor with electric energy (converters of that type are commonly used to power heavy-duty drives designed for industry, where they are subjected to heavy overloads while operated). Rotation direction and rotational speed of the hoisting machine driving motor is controlled in the way of frequency and voltage adjustment, executed at the converter output end,
- low voltage switchgear – enables to supply the whole machine unit with electric energy from two power supply sources,
- control, regulation and protection systems of the hoisting machine can be executed in the following modes:
 - manual control mode – executed from a control console,
 - control in remote start mode – executed from a shaft vessel (the two control modes can be executed with full-range hoisting speed regulation),
- the digital regulator of GRZ-08-A type – performs the functions of adjusting and controlling of the hoisting speed.



phot. 3 Brake system

- disc brake – comprises 2 brake discs fixed to the machine winding drum and 4 pairs of hydraulic cylinders, mounted to four supporting seats,
- electrohydraulic power-control unit of H-C MWM-8M type – enables for bi-variant emergency braking,
- UWDSO-e extra oil release device.



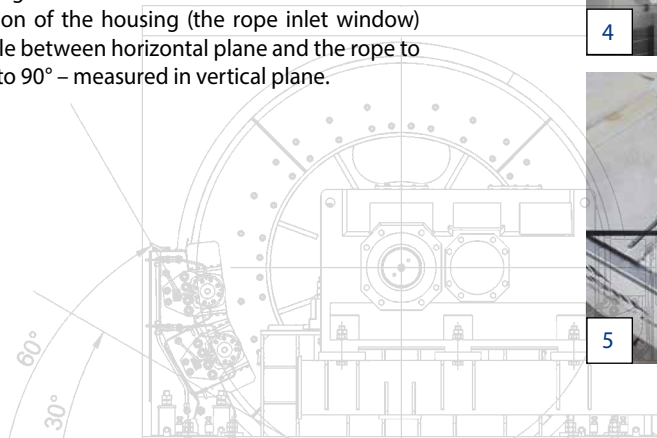
phot. 4 Hoistman workspace

- The control panel, visualization screen and terminals of the shaft signaling and communication systems are installed in separate room, to ensure work comfort.



phot. 5 Housing

- Isothermal container housing protects all the machine sub-assemblies against the effects of weather conditions either while the machine is being operated or during its transportation and storage.
- The construction of the housing (the rope inlet window) allows the angle between horizontal plane and the rope to range from 0° to 90° – measured in vertical plane.

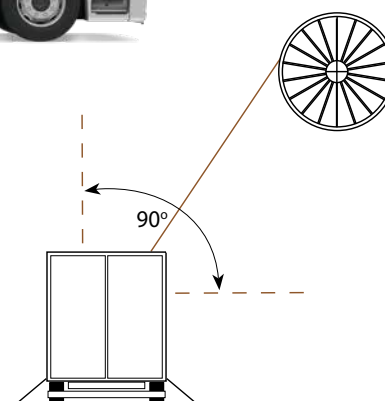
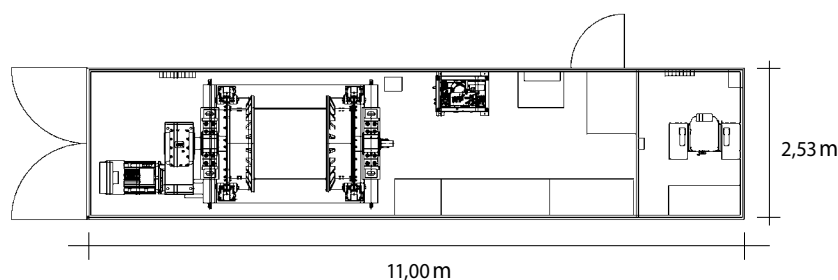


Operating range

The B-1200M machine may successfully perform the following operations:

- evacuation of people from a shaft – in case of failure of the master shaft hoist or in other forced situations,
- individual riding – conducted with the use of ECHO-S-W wireless shaft communication device,
- Shaft inspection – carried out with the use of ECHO-S-W wireless shaft communication device,
- Shaft works and inspections – in case of execution of technological works in a shaft by workers who are inside the shaft vessel and/or in case of conducting activities by means of cameras and additional sensors but without presence of workers in the shaft.





The angle between horizontal plane and the rope can range from 0° to 90° – measured in vertical plane

Purpose

The implemented technical solutions and features of the Mobile Hoisting Machine allow it to be used for:

- evacuation of the mining crew from the shaft in case of failure of the master shaft hoist – it can take over all the functions of a ladderway and/or replace the functions of the permanent emergency – inspection hoist;
- conducting of activities related to inspections and checks of the shaft itself and the shaft furniture, in case there is no other hoisting equipment in the given shaft;
- supporting technological operations carried out for the master shaft hoist, which require constant observation, eg. ropes replacement, lowering of oversized materials, repairs and rehabilitation works in a shaft, etc.;
- executing of rehabilitation works related to shaft furniture, allowing for quick transport of shaft crew and tools or auxiliary materials to the workplace in the shaft.

Advantages

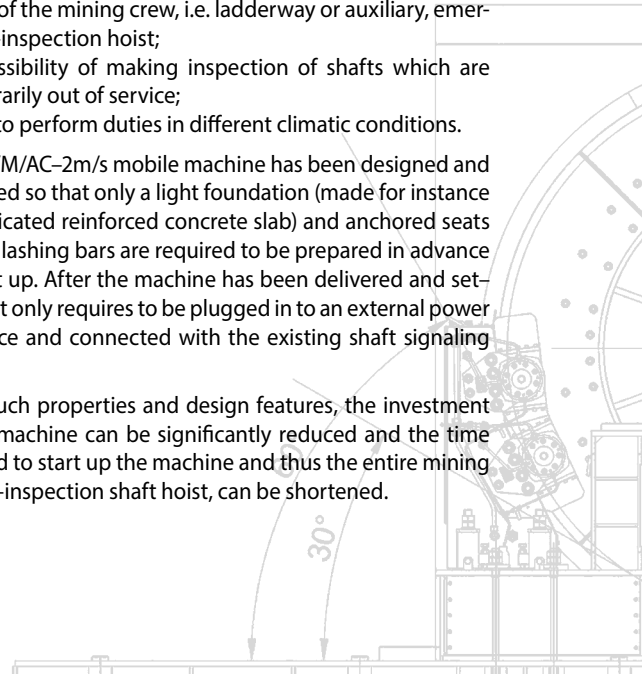
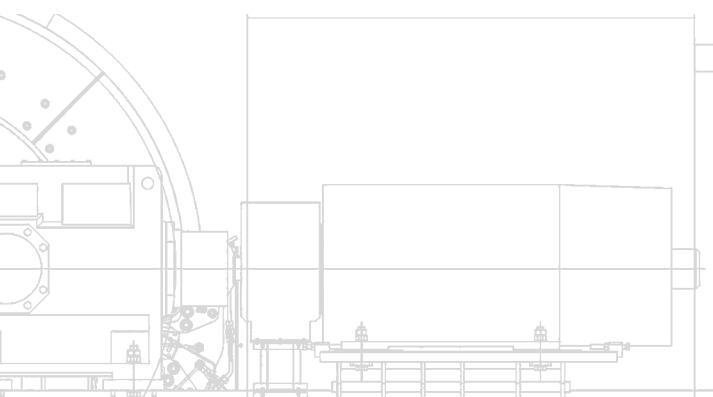
Thanks to its construction and by building it in a standard semi-trailer body, the Mobile Hoisting Machine has the features of a mobile equipment and can serve in many shafts in different locations, even distant from each other.

The advantages that come from making use of the machine, are the following:

- no need to design and install in a shaft (or in a group of shafts of the same area) an additional equipment for evacuation of the mining crew, i.e. ladderway or auxiliary, emergency–inspection hoist;
- the possibility of making inspection of shafts which are temporarily out of service;
- ability to perform duties in different climatic conditions.

The B-1200/M/AC-2m/s mobile machine has been designed and manufactured so that only a light foundation (made for instance as a prefabricated reinforced concrete slab) and anchored seats for fixing its lashing bars are required to be prepared in advance for setting it up. After the machine has been delivered and set-up in place, it only requires to be plugged in to an external power supply source and connected with the existing shaft signaling system.

Thanks to such properties and design features, the investment cost of the machine can be significantly reduced and the time span needed to start up the machine and thus the entire mining emergency–inspection shaft hoist, can be shortened.





Technical characteristics of B-1200/M/AC-2m/s Mobile Hoisting Machine

machine brand name	B-1200/M/AC-2m/s		
set-up location of the machine	on a surface – at the shaft bank level		
control modes	<ul style="list-style-type: none"> – manual control executed from the hoistman workplace – control in remote start mode – executed from a shaft vessel or mobile workplace 		
operating modes	maneuvering riding individual riding shaft inspection by a shaft crew riding in a shaft shaft works <ul style="list-style-type: none"> – inspection of a rope pulley – inspection of a shaft vessel – inspection of a hoisting rope 		
max. travelling route of a shaft vessel	up to 1,500 m		
shaft vessel travelling speed	(refers to 4 th rope layer wound onto the machine drum)	0÷2 m/s	
	for shaft inspection	1.0 / 0.5 m/s	
	for inspection of hoisting rope and rope pulley	0÷0.5 m/s; 0÷1.0 m/s	
	for rides without the hoisting speed regulator	1.0 m/s	
	for man riding	2.0 m/s	
hoisting acceleration / retardation	up to 0.4 m/s ²		
winding drum diameter	1,200 mm (measured for the first rope layer wound on the drum)		
max. static torque acting on the machine shaft	30 kNm		
supply of the hoisting machine with power	500 V _{AC} or 400 V _{AC}		
supply of the auxiliary circuits with power	500 V _{AC} or 400 V _{AC}		
type of the driving unit	asynchronous AC motor along with frequency converter		
driving motor	rated capacity	P _n = 110 kW	
	rated current	I _n = 193 A (400 V _{AC})	156 A (500 V _{AC})
	rated voltage	U _n = 400 V _{AC}	500 V _{AC}
	rotational speed	n _n = 1,485 rpm	
	rated torque acting on the shaft	M _n = 707 Nm	
	torque overload factor	k = 3.0.	
gearbox	gear ratio i = 45.5 input power – P ₁ [kW] 110 output torque – M ₂ [N m] 32093		



Headquarters

MWM Elektro Sp. z o.o.

Armii Krajowej 24
32-540 Trzebinia, Poland

tel. +48 32 625 87 00

fax +48 32 625 87 01

info@mwm.com.pl

Lubin Branch

Wójta Henryka 47
59-300 Lubin, Poland

tel. +48 76 749 09 30-31

fax +48 76 749 09 32