

MiniZ400

Operating and Maintenance Manual

TABLE OF CONTENTS

MANUFACTURER’S ADDRESS AND CONTACT DETAILS.....11

1. INTRODUCTION13

 1.1 GENERAL INFORMATION13

 1.2 CE MARKING15

 1.3 MACHINE ACCESSORIES15

2. INFORMATION ABOUT DOCUMENTATION.....16

 2.1 DATE OF PUBLICATION AND STATUS OF THIS MANUAL16

 2.2 COPYRIGHT AND TRADEMARK RIGHTS16

 2.3 EXPLANATION OF THE SYMBOLS AND ABBREVIATIONS USED16

 2.3.1 LIST OF ABBREVIATIONS17

 2.3.2 ILLUSTRATIVE IMAGES18

3. ENVIRONMENTAL IMPACTS.....19

 3.1 PACKAGING19

 3.2 DISPOSAL OF COMPONENTS AND BATTERIES19

4. USE OF THE SKID-STEER LOADER.....19

 4.1 CORRECT USE.....19

 4.2 CORRECT USE WHEN TOWING.....19

 4.3 IMPROPER USE20

 4.4 PLACE OF USE20

 4.5 PARKING AT TEMPERATURES BELOW -10 °C20

 4.6 USE OF WORK PLATFORMS20

 4.7 RESIDUAL RISK.....21

 4.8 STABILITY.....22

 4.9 SPECIAL RISKS RELATED TO THE USE OF THE LOADER AND ITS ATTACHMENTS.....22

5. OVERVIEW OF RISKS AND PREVENTIVE MEASURES.....22

 5.1 RISKS FOR STAFF23

6. SAFETY23

 6.1 DEFINITIONS OF TERMS23

 6.1.1 OPERATOR.....23

 6.1.2 PROFESSIONAL23

 6.1.3 DRIVER.....23

 6.2 BASIC SAFETY RULES.....24

 6.2.1 DRIVER OBLIGATIONS.....24

 6.3 BASIC SAFETY RULES FOR OPERATION24

6.3.1 INSURANCE COVERAGE ON A CONSTRUCTION SITE	24	8.4 IDENTIFICATION POINTS	41
6.3.2 ALTERATIONS AND MODIFICATIONS	24	8.5 MANUFACTURER’S LABEL	42
6.3.3 CHANGES TO THE DRIVER’S PROTECTIVE ROOF AND ROOF LOAD	26	9. COMMISSIONING.....	43
6.3.4 USE OF NON-ORIGINAL PARTS	26	9.1 CONNECTING THE BATTERY PLUG	43
6.3.5 LOADER DEFECTS AND DAMAGE, INCORRECT USE OF SAFETY DEVICES	27	9.2 CHECKS AND ACTIONS BEFORE COMMISSIONING.....	44
6.3.6 RISK TO STABILITY	27	10. OPERATION.....	45
6.3.7 MEDICAL DEVICES	27	10.1 OPTIMUM OPERATING CONDITIONS TO CONSERVE THE BATTERY CAPACITY	45
6.4 INSULATION TEST	28	10.1.1 RECOMMENDED SPEEDS	45
6.5 SAFETY INSTRUCTIONS FOR HANDLING CONSUMABLES.....	28	10.1.2 DRIVING STYLE.....	45
6.5.1 ALLOWABLE CONSUMABLES	28	10.1.3 SURFACE.....	45
6.5.2 OILS.....	28	10.2 BASIC INSTRUCTIONS FOR CORRECT USE OF THE CHARGING EQUIPMENT	46
6.5.3 HYDRAULIC FLUID	30	10.3 CHECKING THE CONDITION OF TRACKS.....	50
6.5.4 BATTERY ACID	30	10.4 ENTERING AND EXITING THE LOADER	50
6.5.5 DISPOSAL OF CONSUMABLES.....	31	10.5 SWITCHING ON THE IGNITION AND PUTTING THE LOADER INTO OPERATION	51
6.6 EMISSIONS	31	10.6 CHANGING THE FLOW RATE OF HYDRAULIC OIL	52
6.6.1 BATTERY.....	31	10.7 WORK LIGHTS	52
6.7 FIRE SAFETY	31	10.8 ROAD LIGHTS	52
6.8 SAFETY RULES WHEN WORKING.....	32	10.9 BEACON	52
6.9 SAFETY RULES FOR MAINTENANCE	32	11. LOADER CONTROL – TRAVEL	53
6.10 SECURITY RULES FOR TRAVELLING ON PUBLIC ROADS	33	12. CONTROLLING LOADER WITH A WORK ADD-ON	54
6.11 LOADING, CLAMPING WHEN LOADING.....	33	13. CONTROLLING LOADER WITH AN AUXILIARY HYDRAULIC DEVICE	55
6.12 IT IS PROHIBITED:.....	34	14. REMOTE CONTROL MINIZ 400	56
7. TECHNICAL DESCRIPTION.....	34	15. LIST OF OPTIONAL ATTACHMENTS	57
7.1 LAYOUT OF AGGREGATES	35	16. CLASSIFICATION OF ROCKS.....	58
7.2 ELECTRIC MOTOR	35	16.1. CLASS 1.....	58
7.3 HYDRAULIC SYSTEM.....	36	16.2. CLASS 2	58
7.4 BRAKE SYSTEM.....	36	16.3. CLASS 3	58
7.5 WORK DEVICE.....	36	16.4. CLASS 4	58
7.6 CLAMPING ON ATTACHMENT	36	16.5. CLASS 5.....	59
7.6.1 THE "MINIZ" QUICK CLAMP.....	36	16.6. CLASS 6	59
7.7 ELECTRICAL INSTALLATIONS.....	37	16.7. CLASS 7.....	59
7.8 TREADING PLATFORM.....	37	17. PREVENTIVE MAINTENANCE.....	60
8. VIEWS	38	17.1 INSPECTION AND MAINTENANCE SCHEDULE	60
8.1 OUTSIDE VIEW OF THE LOADER	38	17.2 CORRELATION TABLES FOR OILS AND LUBRICATING GREASES.....	62
8.2 OVERVIEW OF THE DRIVER’S PLACE	39	17.2.1 HYDRAULIC TANK.....	62
8.3 OVERVIEW OF REMOTE CONTROL	40	17.2.2 TRANSMISSION GEARS	62

17.2.3 ALL GREASE-LUBRICATED POINTS.....	62
17.3 DESCRIPTION OF MAINTENANCE ACTIVITIES	63
17.3.1 OIL CHANGE IN THE HYDRAULIC SYSTEM.....	63
17.3.2 MAINTENANCE OF HYDRAULIC CYLINDERS	63
17.3.3 CHECKING AND TENSIONING TRACKS.....	63
17.3.4 CHECKING AND TIGHTENING TRAVEL WHEELS	63
17.3.5 CHANGING OIL IN GEARBOXES.....	63
17.3.6 MAINTENANCE OF THE LOADER’S ELECTRICAL EQUIPMENT.....	64
18. TECHNICAL SPECIFICATIONS OF THE MACHINE.....	65
19. DIMENSIONAL DRAWING OF THE MACHINE	66
20. USER ACCOUNT.....	68
GARAGE SECTION.....	69
COMPANY ADMINISTRATION SECTION (Picture 15).....	70
ACCOUNT SECTION	72
NOTES.....	74

MANUFACTURER'S ADDRESS AND CONTACT DETAILS



KOVACO Electric a.s.,

U Hellady 4, 140 00 Prague 4, Czech Republic, Company ID: 089 00 213, Tax ID: CZ 089 00 213, www.kovacoelectric.com,
email: info@kovacoelectric.com

1. INTRODUCTION

1.1 GENERAL INFORMATION

The skid-steer loader described in this operating manual meets the requirements of the relevant technical standards and safety regulations.

The MiniZ 400 skid-steer loader must not be used on public roads.

Our skid-steer loaders are manufactured in accordance with the latest technical knowledge. It is thus sufficient to handle the skid-steer loader safely and to maintain its functionality.

You will find the necessary information for that in this operating manual. Read this manual carefully and follow the instructions before putting the skid-steer loader into operation. By consequently following the instructions in this manual you will ensure a long service life of the loader and its reliable operation, and you will prevent accidents and malfunctions, many of which are unnecessary.

Make sure that each worker has read and understood these instructions before starting to work with the loader.

Before using the loader, verify that the vehicle operator:

- Ⓚ is informed about the correct use of the loader and its safe operation;
- Ⓚ has read and understood the operating manual for the loader at hand;
- Ⓚ has read and understood ALL the safety labels on the loader;
- Ⓚ is actually a person that works in the operating zone;
- Ⓚ has familiarized themselves with operating the controls of the loader in a safe and empty area before starting to work with the loader.

Thank you for having read and for following the instructions in this manual. If you have any questions or suggestions for improvements, or if you find an error, contact an authorized service centre.



Danger

When working with the product, you may be exposed to chemicals such as ethylene glycol, which in some states is considered to cause birth defects or other fertility disorders. Do not swallow this chemical. Wash your hands after handling to prevent accidental ingestion.



Danger

When working with the product, you may be exposed to chemicals such as lead and its compounds, which in some states are considered to cause cancer, birth defects or other fertility disorders. Wash your hands thoroughly when handling parts that contain lead.



Danger

Stand at a safe distance. There must be no persons present in the area while the machine is turning. Pushing or squeezing may cause serious injury or death.



Danger

Risk of bruising or contusions! The machine may move unexpectedly without warning and cause injury or death. Before leaving the machine, lower the work tool to the ground, lock the controls and remove the key.



Danger

High-pressure cylinder. Do not remove any parts until overpressure has been released from the system. This will prevent serious or fatal injuries.



Danger

Improper troubleshooting and repair procedures can result in serious injury. The following troubleshooting and repair procedures should only be performed by qualified personnel who are thoroughly familiar with this equipment.



Danger of explosion!

Danger of explosion! Improper connection of connecting cables can lead to an explosion and injury or death.



Caution

Damage to the structure, the machine overturning, modifications, alterations or improper repairs may adversely affect the protective properties of this structure and invalidate its certification. Do not weld anything onto the structure or drill any holes into it. Consult the manufacturer about the possibilities for modifications to the protective structure so that the certificate is not revoked.

1.2 CE MARKING

The manufacturer uses the CE mark to demonstrate the conformity of the skid-steer loader with the standards and regulations in force at the time of sale. This fact is confirmed by the CE Declaration of Conformity. The CE mark is indicated on the manufacturer's label.

Unauthorized interference with the structure of the skid-steer loader or its attachments may cause safety risks. It also invalidates the Declaration of Conformity.

The CE Declaration of Conformity must be kept in a safe place and be made available to the competent authorities.



1.3 MACHINE ACCESSORIES

- Ⓚ Ignition switch key (two pieces)
- Ⓚ Battery charger
- Ⓚ Distilled water tank
- Ⓚ Basic shovel

2. INFORMATION ABOUT DOCUMENTATION

This operating manual describes all the measures necessary for the safe operation and proper maintenance of the skid-steer loader in all its possible versions at the time of printing. Special versions according to customer requirements are documented in a separate operating and maintenance manual. If in doubt, contact an authorized service centre.

For all technical queries, provide the identification number of the skid-steer loader with each of them. Each skid-steer loader comes with several operating manuals. These manuals must be kept in a safe place and be available at all times to the driver and the operator’s staff. The location for their storage is specified in detail in the "Views" chapter. Should the operating manual get lost, the operator must immediately obtain a replacement from the manufacturer. The operating manual is on the spare parts list and can be re-ordered as a spare part. The personnel responsible for operating and maintaining the equipment must read and understand this operating manual. The operator has to ensure that all users have received, read and understood this operating and maintenance manual.

2.1 DATE OF PUBLICATION AND STATUS OF THIS MANUAL

The date of publication of this operating manual is indicated on the title page.

KOVACO is constantly working on the further development of skid-steer loaders. This operating manual is therefore subject to change. No complaints based on the information or images provided herein will be accepted.

Contact an authorized service centre for technical support for your skid-steer loader.

2.2 COPYRIGHT AND TRADEMARK RIGHTS

This manual, including its parts, may not be reproduced, translated or provided to third parties without the express written consent of the manufacturer.

2.3 EXPLANATION OF THE SYMBOLS AND ABBREVIATIONS USED



Danger

Denotes procedures that must be strictly observed to avoid hazards to life.



Danger of explosion!

Warning of a possible explosion.



Caution

Denotes technical requirements to which particular attention needs to be paid.



Caution

Notices concerning the environment.

2.3.1 LIST OF ABBREVIATIONS

This list of abbreviations applies to all types of operating manuals. Not all the abbreviations given here may be used in this operating manual.

UNIT SYMBOL	NAME OF UNIT	EXPLANATION
°C	degree Celsius	unit of temperature
OH	operating hour	one hour of machine work
°F	degree Fahrenheit	unit of temperature
A	ampere	unit of electric current
Ah	ampere hour	electric charge storage capacity unit
dB	decibel	unit of sound intensity
cm	centimetre	unit of length (1 cm = 10 mm)
cm³	cubic centimetres	unit of volume
g	gram	unit of weight
h/d	hours daily	hours driven per day
kg	kilogram	unit of weight (1 kg = 1000 g)
kg/m³	kilograms per cubic metre	density unit (object weight to size ratio)
km/h	kilometres per hour	unit of speed
kN	kilonewton	unit of force (1 kN = 1000 N)
kW	kilowatt	power supply unit
kWh/h	kilowatt-hours per hour	energy consumption
N	newton	unit of force (1 N = 10 ⁻³ kN)
Nm	newton metre	unit of torque
L/min	litres per minute	unit of consumption
m	metre	unit of length (1 m = 100 cm)
m/s²	metres per second to the power of two	unit of acceleration
min	minute	unit of time (1 min = 60 s)
rpm	revolutions per minute	unit of revolutions per minute
mm	millimetre	unit of length (1 mm = 10 ⁻³ m)

2.3.2 ILLUSTRATIVE IMAGES

a) Illustrations of functions and procedures (Figure 1)

This document explains the (typically sequential) order in which certain functions or operations are run or performed. To show these sequences, schematic images of the skid-steer loader are used.



Caution

These schematic images do not represent the actual design of the documented loader. The sole purpose of the images used is to clarify working procedures.

b) Representation of the display operating unit (Figure 2)



Caution

The representations of operating states and values on the display operating unit are only for reference purposes and differ depending on the particular equipment of the loader at hand. Consequently, the depictions showing specific operating states and values may differ. Information not related to the descriptions is not provided.



Figure 1



Figure 2

3. ENVIRONMENTAL IMPACTS

3.1 PACKAGING

For added protection, some parts of the skid-steer loader are wrapped in packaging during transport. This packaging must be completely removed before first use.



Environmental Notices

After delivery of the skid-steer loader, the packaging material must be disposed of in an appropriate manner.

3.2 DISPOSAL OF COMPONENTS AND BATTERIES

The skid-steer loader is made of various materials. If any components or batteries need to be replaced or disposed of, they must be:

- Ⓚ properly disposed of;
- Ⓚ used elsewhere, or
- Ⓚ recycled in accordance with regional and national guidelines.



Environmental Notices

We recommend cooperating with a waste disposal company for disposal.

When disposing of batteries, be sure to follow the provisions in the battery manufacturer's handling manual.

4. USE OF THE SKID-STEER LOADER

4.1 CORRECT USE

The loader described in this operating manual is suitable for loading, sweeping and moving rocks in Classes 1 to 4 using the basic shovel, and for pulling rocks, digging narrow grooves and drilling pits in rocks in Classes 1 and 2 according to ČSN 73 3050, using specifically designated attachments. You will find the classification of rocks at the end of the manual. The loader may only be used for its designated purpose as specified and described in this operating manual.

If the loader is to be used for any purpose other than those specified in the operating manual, the approval of the manufacturer and, if applicable, of the competent authorities is required in order to mitigate the potential risks.

The maximum weight of a lifted load is stated on the rating plate and must not be exceeded.

4.2 CORRECT USE WHEN TOWING

This skid-steer loader is suitable for occasional towing of loads and is equipped with towing eyes for this purpose. The loader must not be used for occasional towing for more than 5% of its daily operating time. Consult the manufacturer when the skid-steer loader is to be used for towing more regularly.

4.3 IMPROPER USE

The operator or the driver, as opposed to the manufacturer, is liable for risks arising out of the incorrect use of the device.

The use of the machine for purposes other than specified in this operating manual is prohibited.



Danger

The loader must not be used in places where there is a risk of fire, explosion or corrosion. Loading and stacking loads on inclined surfaces or ramps is prohibited.

4.4 PLACE OF USE

The loader can be used both outdoors and indoors. Use on public roads is prohibited.

If you want to use the loader on public roads, it must meet the requirements of the national standards of the country where it is being operated.

The road must have sufficient carrying capacity (tarmac, concrete).

Driving up or down a slope is permitted provided that the prescribed indications and specifications in this operating manual are observed.

The loader can be used indoors and outdoors, from northern regions to the tropical zones (temperature range -15 to +35 °C).

4.5 PARKING AT TEMPERATURES BELOW -10 °C



Caution

Batteries may freeze!

If the loader is parked for a long time in an environment with temperatures below -5 °C, the batteries will cool down. The electrolyte may freeze and damage the batteries. In such an event, the loader will not be ready for operation.

If the ambient temperature drops below -5 °C, park the loader in such conditions only for a short time, or only for as long as absolutely necessary, or ensure that the battery is connected to the charger throughout the duration of parking.

4.6 USE OF WORK PLATFORMS



Danger

The use of work platforms is prohibited!

4.7 RESIDUAL RISK

Even with careful operation and compliance with all standards and regulations, risks when the loader is being used cannot be completely excluded.

The components of the loader and of the entire system meet current safety requirements. Even when the loader is used exclusively for its intended purpose and all instructions are followed, certain residual risks cannot be ruled out.

Such residual risks cannot be completely excluded even outside the narrow risk zone around the loader. Persons in the vicinity of the loader must be extremely vigilant so that they can react immediately in the event of a malfunction, crash, accident, etc.



Danger

All persons in the vicinity of the loader must be instructed on the risks arising from its use.

- The risks include:
- Ⓚ leakage of operating fluids as a result of cracks or ruptures of pipes and tanks;
 - Ⓚ a risk of an accident when driving over difficult terrain or surfaces such as slopes, smooth or uneven surfaces, or in poor visibility, etc.;
 - Ⓚ falling, tripping, etc. when mounting the loader, especially in wet weather or with leaking working fluids, or on icy surfaces;
 - Ⓚ a risk of fire and explosion caused by batteries and electric voltage;
 - Ⓚ human error as a result of non-compliance with safety regulations;
 - Ⓚ unattended damage or wrong and worn parts;
 - Ⓚ insufficient maintenance and inspections;
 - Ⓚ use of the wrong consumables;
 - Ⓚ not observing inspection intervals.

The manufacturer is not liable for accidents involving the loader which may occur as a result of the operator’s non-compliance with these instructions – whether intentional or as a result of negligence.



Danger

Danger of injury when the loader overturns! Maintain a sufficient distance from the machine!

If the inclination exceeds five degrees, the machine can only be operated by remote control. It is forbidden to ride on the machine.

4.8 STABILITY

Stability tests have been performed on the loader in accordance with the latest technical standards; its stability is guaranteed provided that the loader is used correctly and for the intended purpose. However, these standards only take into consideration static and dynamic centrifugal forces that may manifest themselves in the types of applications that are in accordance with the operating rules and with the intended purpose.

Consequently, loss of stability or the risk of exceeding a tolerable distribution of forces as a result of improper use or operation cannot be completely excluded. Loss of stability can be prevented or minimized in the following ways:

- Ⓚ always secure the load against slipping, e.g. by tying it;
- Ⓚ always transport precarious loads in suitable containers;
- Ⓚ always drive slowly when turning;
- Ⓚ drive with the load lowered;
- Ⓚ align the load as close to the centre of the loader as possible.
- Ⓚ try to avoid turning when driving transversely on slopes or on sloping surfaces;
- Ⓚ never drive on slopes or sloping surfaces with the load facing downhill;
- Ⓚ do not drive on the edges of ramps or on stairs.

4.9 SPECIAL RISKS RELATED TO THE USE OF THE LOADER AND ITS ATTACHMENTS

If the loader is used in another manner than the standard one, or when the vehicle operator is unsure whether the loader can be used properly and without the risk of accidents, the consent of the machine manufacturer and the attachment manufacturer must always be obtained.

5. OVERVIEW OF RISKS AND PREVENTIVE MEASURES



Caution

This table is meant as an aid in determining occupational hazards and applies to all types of drives. The table may not cover all possible hazards.

Observe the national regulations of the country in which the loader is used!

HAZARD	MEASURE(S)	CHECK NOTE	COMMENTS
Loader equipment does not comply with local regulations	Inspection	O	If in doubt, contact the competent inspectorate or the insurance company that provides the employer's liability insurance.
Deficiencies in driver skills and qualifications	Driver training (internal and external)	O	-
Use by unauthorized persons	Access with key for authorized personnel only	O	-
Loader is not in a safe condition	Repeated tests and elimination of deficiencies	O	Decree on the Protection of Safety and Health in the Operation of Technical Equipment
When recharging the traction battery	see the Decree on the Protection of Safety and Health in the Operation of Technical Equipment or the operating manual	O	Ensure proper ventilation; insulation value within permissible range
When using battery chargers	See the Decree on the Protection of Safety and Health in the Operation of Technical Equipment		

5.1 RISKS FOR STAFF

In line with the Decree on Safety and Health Protection in the Operation of Technical Equipment and applicable laws on occupational health and safety in the given country of operation, the operator has to determine and assess the operating risks and define the necessary measures to ensure the occupational health and safety of staff. The operator must therefore draw up an appropriate operating manual and provide it to the driver. An authorized person must be appointed.



Caution

The design and equipment of this loader comply with Directive 2006/42/EC on machinery and are thus marked with the CE symbol. These elements are therefore not included in the risk assessment. The attachments have their own CE markings and thus are not included either. Nevertheless, the operator must choose a type of loader and its accessories that comply with local operating regulations.

6. SAFETY

6.1 DEFINITIONS OF TERMS

6.1.1 OPERATOR

The operator is a natural person or legal entity that operates the loader, or under whose responsibility the loader is used. The operator must ensure that the skid-steer loader is used only for the designated purpose and in accordance with the safety regulations set out in this operating manual.

The operator must ensure that all users have read and understood the safety information.

The operator is responsible for the timetabling and correct execution of regular safety inspections. We recommend following national operating specifications.

6.1.2 PROFESSIONAL

A qualified professional is defined as a mechanic or person who meets the following requirements:

- Ⓚ completed professional qualification for the work, which demonstrably confirms their professional knowledge. Such proof of education is a vocational certificate or similar document.
- Ⓚ Professional practice proving that the professional has gained practical experience with loaders during a confirmed period of their professional practice. Over the period, the person has become acquainted with the full range of indications that require inspections to be carried out, for example on the basis of the results of assessments of potential risks or daily checks.

Current professional practice in the field of operating loaders and other appropriate professional qualifications are key. A qualified professional must have experience with carrying out said checks and inspections. Moreover, a qualified professional must monitor current advances in technologies pertinent to the loader and to the risks assessed.

6.1.3 DRIVER

This skid-steer loader may only be driven by a qualified person who has reached at least 18 years of age, has obtained a driver's licence, has demonstrated experience with driving and handling to the operator or their authorized representative and has received special training in driving the loader. Special knowledge of the respective skid-steer loader is also required.

The requirements for training in accordance with § 3 of the Act on Health and Safety at Work and § 9 of the Decree on Safety in the Workplace are met if the driver has been trained in accordance with the requirements. Follow the applicable regulations in your country.

6.2 BASIC SAFETY RULES

6.2.1 DRIVER OBLIGATIONS

The driver must be instructed in their duties!

Any incorrect use of this machine may cause serious physical harm or even fatal injuries!

Use by unauthorized persons is prohibited!

During working hours, the driver is responsible for the loader! The driver must not allow unauthorized persons to use the loader. When the driver leaves the loader, they are obliged to secure it against unauthorized use, e.g. by removing the key.

The driver has to:

- Ⓚ read and understand the operating manual, which must be available to the driver at all times;
- Ⓚ acquaint themselves with the safe operation of the loader;
- Ⓚ wear protective equipment (protective clothing, safety shoes, safety helmet, goggles and gloves) according to the conditions, the environment and the type of load handled;
- Ⓚ be mentally and psychologically fit to drive the loader safely.



Danger

The ability to drive the loader may be impaired by the intake of drugs, alcohol or medication that affect a person’s reactions! Persons under the influence of the above substances must not perform any operations on or with the loader.

It is forbidden to push limbs under the work tool of the machine or under the running tracks.

There is a risk of amputation of the limb.

6.3 BASIC SAFETY RULES FOR OPERATION

6.3.1 INSURANCE COVERAGE ON A CONSTRUCTION SITE

In many cases, public transport is not permitted on construction sites.



Caution

In order to ensure that the loader has insurance coverage against claims by third parties for the event of damage caused in areas with restricted public transport, the manufacturer recommends that commercial liability insurance be taken out.

6.3.2 ALTERATIONS AND MODIFICATIONS

If you use the loader for work tasks not specified in regulations or in this operating manual, and the loader must be modified or retrofitted, please note that any alteration of the design of the loader may affect its stability and performance, which may result in various accidents. Therefore, contact your service centre or the manufacturer before making any modifications.

Without the manufacturer’s consent, it is prohibited to make changes that, among other things, adversely affect the stability or load capacity of the loader or its safety functions.

Changes to the loader may only be made with the manufacturer’s prior written consent. If necessary, the consent of the competent authority must be obtained.

Changes to the brake system, steering, controls, peripheral vision and special equipment (such as attachments) are also subject to the manufacturer’s prior written consent.



Caution

When welding on the loader, the batteries and all connections to the electrical control units must be disconnected. More detailed information on these topics can be obtained from an authorized service centre.



Caution

Additional openings in the battery cover present a risk of explosion! Volatile gases may be released, which can explode and cause harm, including fatal injuries. Sealing the openings with plugs does not provide an additional barrier to gas leakage.

Do not drill any holes into the battery cover!

Otherwise the structural stability of the battery cover will be compromised, and it may then break. It can hit the driver’s position, which poses a risk of accident as a result of the uncontrolled movement of the controls while driving.

Should the manufacturer be wound up and its company is not taken over by a new owner (legal entity), the operator can make modifications to the loader.

In doing so, however, the operator must observe the following rules:

- Ⓚ production documents, test reports and assembly instructions related to the modification must be retained and be available at all times;
- Ⓚ check that the modifications have not affected the validity of the rating plate, information labels, warning labels or the operating manual and, if necessary, correct these;
- Ⓚ modifications can only be designed, approved and implemented by a design office that specializes in designing loaders in accordance with the standards and directives in force at the time of the modifications.



Caution

Never allow a ride with a passenger. Never use the work tool as a platform for another person. A failure to observe the vehicle-related instructions or warnings may result in injury or death.



Caution

Hot liquid can cause severe burns. Protect yourself with suitable protective clothing.



Caution

Improper clamping of the work tool may cause injury or death. Do not start working with the machine until you have made sure that the mechanism pins are fully inserted. Follow the work procedures specified in the operating and maintenance manual.



Caution

This machine is equipped with a communication device. Where electric detonators are used, this communication device should be switched off at a distance of 12 m (40') from the blasting point for satellite systems, and at a distance of 3 m (10') from the blasting point for mobile systems, or at a distance that complies with the applicable legal requirements. A failure to observe this provision may result in interference with explosive blasting operations, which can result in serious injury or death.

6.3.3 CHANGES TO THE DRIVER'S PROTECTIVE ROOF AND ROOF LOAD



Caution

This machine is not equipped with a FOPS or ROPS protective structure.

Dropping a load or the loader overturning with the vehicle operator's (driver's) position impacted as a result can be fatal. Potential danger to life!

6.3.4 USE OF NON-ORIGINAL PARTS

Original parts, attachments and accessories are specially designed for this loader. We would like to draw your attention specifically to the fact that non-original parts, attachments and accessories from other suppliers have not been tested and approved by KOVACO.

Before installing such components, we recommend obtaining the consent of the manufacturer and, if applicable, of the competent inspection authorities.

The manufacturer accepts no liability for damage caused by using non-original parts and accessories that have not been approved.



Caution

The installation and use of such products may have a negative effect on the design characteristics of the loader and thus also compromise passive driving safety.

6.3.5 LOADER DEFECTS AND DAMAGE, INCORRECT USE OF SAFETY DEVICES

Damage and other faults of the loader or its attachment must be reported to the operator immediately so that the fault can be rectified by the same.

Loaders and attachments that are not safe or functional must not be used until properly repaired.

Do not remove, disable or turn off safety devices or switches!

Predefined settings may only be changed with the manufacturer's consent.

Works on the electronic system (such as connecting radio, additional headlights etc.) are only permitted with the manufacturer's written consent. All interventions in the electrical system must be properly documented!

6.3.6 RISK TO STABILITY

To ensure stability, the following rules must be observed:

- Ⓚ only use tracks with the same allowable level of wear;
- Ⓚ only use tracks approved by the manufacturer;
- Ⓚ only use high-quality products.

Tracks approved by the manufacturer can be found in the spare parts list. If you want to use other tracks, you must first obtain the manufacturer's consent!

When replacing tracks, always make sure that the loader is never tilted to one side. More detailed information on these topics can be obtained from an authorized service centre.



Caution

A failure to follow these instructions and information may result in compromised stability. The loader may overturn; there is a risk of an accident.

6.3.7 MEDICAL DEVICES

Only use devices that are sufficiently protected against electromagnetic interference. Medical devices such as pacemakers or hearing aids may not function properly during the operation of the loader.

Check with your doctor or the manufacturer of your medical device to make sure that it is sufficiently protected against electromagnetic interference.



Caution

Electromagnetic interference with medical devices may occur.

6.4 INSULATION TEST

The insulation of the loader must provide sufficient insulation resistance. Consequently, as part of the tests under the FEM standard, the insulation resistance must be checked at least once a year in accordance with ČSN EN 1175, DIN 43539, VDE 0117 and VDE 0510. The results of the insulation tests must meet at least the test values given in the two tables below.

Contact an authorized service centre if you want to carry out insulation tests!



Caution

The electrical system of the loader and the traction battery must be checked separately!

Test values for the traction battery and the complete loader:

COMPONENT	RECOMMENDED TEST VOLTAGE	MEASUREMENT		RATED VOLTAGE U _{BAT}	TEST VALUES
Battery	50 V DC	Batt. + Batt. -	Battery compartment	24 V	> 1200
	100 V DC			48 V	> 2 400
	100 V DC			48 V	> 2 400
RATED VOLTAGE	TEST VOLTAGE		TEST VALUES FOR NEW LOADERS	MINIMUM VALUES DURING SERVICE LIFE	
24 V	50 V DC		At least 50 k	> 24 k	
48 V	100 V DC		At least 100 k	> 48 k	
80 V	100 V DC		At least 200 k	> 80 k	

6.5 SAFETY INSTRUCTIONS FOR HANDLING CONSUMABLES

6.5.1 ALLOWABLE CONSUMABLES

Non-compliance with the safety regulations applicable to consumables may result in injury, death or damage to the environment.

Observe the safety regulations when handling such materials.

Allowable materials necessary for operation are listed in the maintenance data table.

6.5.2 OILS



Caution

Oils are flammable!

Smoking and access with fire or an open flame is prohibited! Observe the legal regulations of the country of operation!

Make sure that oils do not come into contact with hot machine parts!



Danger

Oils are toxic! Avoid contact with and ingestion of oil.

- ⌚ When gases or vapours have been inhaled, get into the fresh air immediately!
- ⌚ If your eyes are affected, rinse with plenty of water (for at least ten minutes), then seek an ophthalmologist!
- ⌚ If swallowed, do not induce vomiting. Seek medical attention immediately!
- ⌚ Prolonged intensive contact with the skin may cause skin dryness and irritation!
- ⌚ Wear protective gloves.
- ⌚ If the substance comes into contact with the skin, wash the skin with soap and water, and then apply skin care products.
- ⌚ Change contaminated clothing and shoes immediately.



Caution

There is a risk of slipping on spilled oil, in particular in combination with water.



Caution

Spilled oil must be removed immediately using oil absorbents and disposed of in accordance with regulations.



Caution

Oil is a water pollutant.

- ⌚ Always store oils in containers that comply with the pertinent legal regulations.
- ⌚ Avoid spilling oil.
- ⌚ Spilled oil must be removed immediately with oil absorbents and disposed of in accordance with regulations.
- ⌚ Dispose of used oils in compliance with the applicable directives.

6.5.3 HYDRAULIC FLUID



Caution

These fluids are exposed to high pressures in the operation of the loader and pose a potential health hazard.

- Ⓚ Observe the legal regulations of the country of operation when handling liquids.
- Ⓚ Make sure that these liquids do not come into contact with hot parts of the machine and the environment.
- Ⓚ Avoid contact of these liquids with the skin.
- Ⓚ Do not inhale spray liquid.

Leakage of compressed fluids escaping under high pressure from the hydraulic system is extremely dangerous. In the event of such an injury, seek medical attention immediately.

To prevent injuries, use appropriate personal protective equipment (such as protective gloves, goggles, skin protection and skin care products)!



Caution

Hydraulic fluid is a water pollutant, and so the following instructions must be observed:

- Ⓚ always store hydraulic fluid in containers that comply with the national regulations of the country concerned;
- Ⓚ avoid spilling the fluid;
- Ⓚ spilled hydraulic fluid must be removed immediately using absorbents that soak up oil and disposed of in accordance with regulations;
- Ⓚ dispose of used hydraulic fluid in compliance with regulations.

6.5.4 BATTERY ACID



Caution

Battery acid contains diluted sulphuric acid. This acid is toxic and corrosive. Never touch or swallow battery acid! In the event of injury, seek medical attention immediately!

When handling battery acid, use appropriate protective equipment (rubber gloves, apron, goggles). Never wear watches or jewellery when handling battery acid!

Avoid contact of the acid with the clothing, eyes and skin. In the event of contact, rinse the affected area immediately with plenty of clean water. In the event of injury, seek medical attention immediately!

Rinse spilled battery acid immediately with plenty of water. Observe the legal regulations.



Caution

Dispose of used battery acid in accordance with the applicable regulations.

6.5.5 DISPOSAL OF CONSUMABLES



Caution

Materials that accumulate during repairs, maintenance and cleaning must be properly collected and disposed of in accordance with the national regulations of the country in which the loader is used. Such work tasks may only be carried out in designated areas. Any negative impacts on the environment must be minimized to the extent that is possible.

- Ⓚ All spilled fluids, such as hydraulic or transmission oil, must be contained immediately using an absorbent that binds oils.
- Ⓚ Neutralize spilled battery acid immediately.
- Ⓚ Always follow the national regulations governing the disposal of used oil.

6.6 EMISSIONS

6.6.1 BATTERY



Danger of explosion!

When charging, the battery releases a mixture of oxygen and hydrogen (oxygen-hydrogen mixture). This gas mixture is volatile and must not ignite.

- Ⓚ Always ensure that completely or partially enclosed workplaces are well ventilated.
- Ⓚ Keep a safe distance from open flames and flying sparks.
- Ⓚ Do not smoke.
- Ⓚ Observe the safety regulations when handling the battery.

6.7 FIRE SAFETY

The loader has several components that heat up significantly under normal operating conditions – such as the electric motor. If the electrical system is damaged or poorly maintained, it can produce electricity arcs or sparks.

The manufacturer recommends equipping the loader with a suitable fire extinguisher to be at hand during operation in accordance with the relevant national regulations.

Flammable litter (such as dry leaves or straw) must be disposed of regularly. If such waste accumulates, it will increase the risk of fire. The loader must be cleaned as needed to prevent such buildup.

Do not use the loader in places where electric arcs, sparks or hot parts may come into contact with flammable substances or explosive atmospheres.

Inspect all electrical wires and connections for damage. Keep the battery terminals clean and screwed tight. Repair or replace any damaged component.

Inspect hydraulic pipes, hoses and terminals for damage or leaks. Never use open flames or exposed skin to check for fluid leaks. Tighten or replace any leaking components. Always clean liquid stains. For cleaning the components, do not use petrol or diesel. Use commercial non-flammable solvents.

Do not use the loader in an explosive atmosphere.

Do not connect the battery improperly. It needs to be connected by a professional.

Keep batteries clean, and lubricate the pole terminals with grease.

When welding, disconnect the batteries, provide ventilation and have a fire extinguisher at the ready near the loader.

6.8 SAFETY RULES WHEN WORKING

- Ⓚ Before commencing work, the driver has to perform daily maintenance.
- Ⓚ Crushing and loading other types of rocks than those specified in the operating manual is prohibited!
- Ⓚ It is allowed to work with the machine on slopes with a transverse and longitudinal inclination of up to five degrees without restrictions.
- Ⓚ If it is necessary to work at night or in otherwise reduced visibility, the workplace must be lit by local light sources. The loader is not equipped to operate in reduced visibility!
- Ⓚ The loader must not operate on public roads. The loader must not endanger the safety of other users.
- Ⓚ Because of the possibility of overloading the loader, it is necessary to adjust the driving speed and working movements with a loaded bucket to the effective load. Overloading the machine will characteristically manifest itself when lifting the work device by lightening the load on the rear part of the machine.



Caution

The maximum load capacity of the machine (400 kg) can only be used on a paved and level surface.

6.9 SAFETY RULES FOR MAINTENANCE

- Ⓚ The personnel operating the loader have to perform maintenance and lubrication at intervals according to the operating hours worked in accordance with the operating and maintenance manual for the machine. Each maintenance and lubrication must be recorded in the machine warranty book issued by the operator in accordance with the national regulations of the country concerned.
- Ⓚ For maintenance and any repairs to the loader, always use the tools and equipment designed for the type of task at hand.
- Ⓚ Cotter pins, bolts and nuts must not be used again after disassembly, but have to be replaced with new ones.
- Ⓚ The hydraulic circuit is protected by relief valves. Only a trained person and, during the warranty period, only the warranty service may readjust the relief valves.

- Ⓚ While the boom is raised and not secured, any maintenance of the hydraulic system and any maintenance works under it are prohibited. During maintenance and repairs, it is necessary to secure the raised boom in its position with the safety strut that forms part of it.
- Ⓚ Any interventions during maintenance of the hydraulic transmission may only be carried out with the engine stopped, when there is zero pressure in pipes and hoses.
- Ⓚ After an attachment has been mounted, its operation needs to be checked without a load.
- Ⓚ It is not allowed to use any lubricants other than those specified in this maintenance manual. Mixing individual lubricants is prohibited.
- Ⓚ Contact an authorized service centre to have more complex repairs carried out by them.



Danger

When working on a slope, there is a risk of the loader tipping over.

6.10 SECURITY RULES FOR TRAVELLING ON PUBLIC ROADS

- Ⓚ Moving on public roads is prohibited.
- Ⓚ When driving, the boom must be fully lowered to the lowest position, with the bucket tilted towards the boom to the maximum extent possible, and with the cutting edge of the bucket covered with a protective cap.

6.11 LOADING, CLAMPING WHEN LOADING

For moving the loader with a crane, use a lifting device with a load capacity of at least 1.5 tons. A steel rope or a textile belt with a load capacity of at least 1.5 tons can be used for binding. The attachment points are located at the front on the boom arms and at the rear on the inside of the cross-member of the frame, and are marked with the "HOOK" symbol.

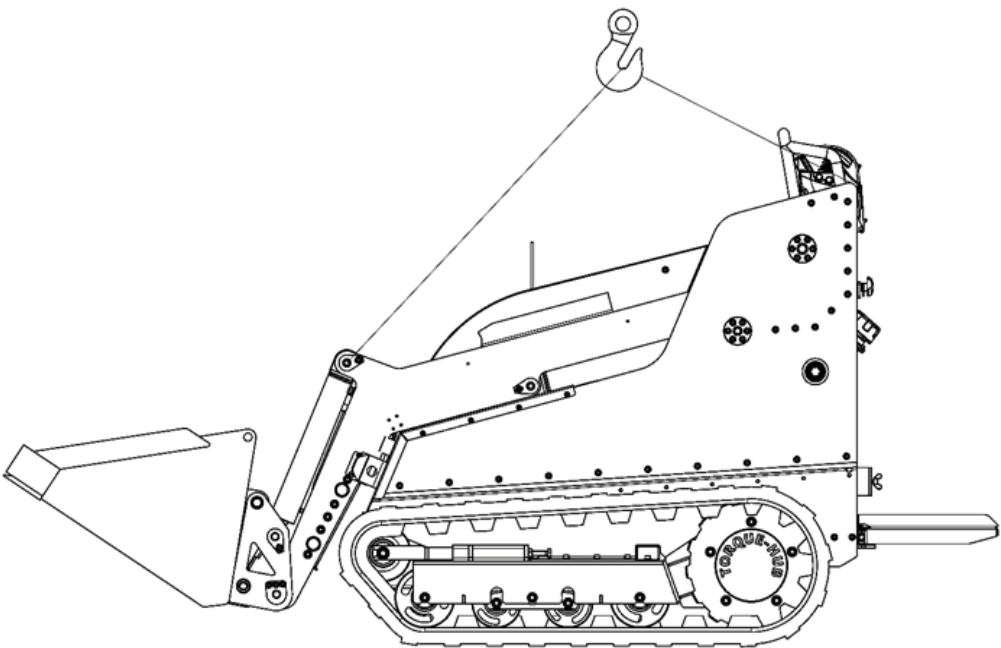


Figure 3: Loading



Caution

When loading, the boom must be locked in the lower position!

6.12 IT IS PROHIBITED:

- Ⓚ to use the loader without training and without following the operating manual;
- Ⓚ to leave the loader with the engine running or the boom raised; when parking, the boom must be lowered all the way down and the bucket be resting on the ground;
- Ⓚ to exceed the loader's carrying capacity;
- Ⓚ to let persons into the loader's work zone and to transport persons with the loader;
- Ⓚ to use the loader for any work other than specified in the operating manual;
- Ⓚ to otherwise modify attachments and use any equipment other than specified by the manufacturer for the approved version of the loader;
- Ⓚ to turn with and drive the loader with the boom raised and the bucket filled.



Danger

Before putting the machine into operation, the operating personnel must receive the respective instruction!
Untrained operating personnel may cause injury or death.
There is a risk of falling when working on high parts of the loader.

7. TECHNICAL DESCRIPTION

The MiniZ 400 universal front loader is suitable for loading, sweeping and moving rocks in Classes 1 to 4 using the basic shovel, and for pulling rocks, digging narrow grooves and drilling pits in rocks in Classes 1 and 2 according to ČSN 733050, using specifically designated attachments. An extract from the ČSN 733050 standard can be found on page 73 of this operating manual.

The loader is driven by electrical units. The transmission mechanism consists of two separate gearboxes and two crawler undercarriages.

The loader control and control of the work device is channelled into two control levers, which control all the operating functions.

The turning of the loader is facilitated by the different revolution speeds of the individual tracks. The basic shovel is toothless. In addition to the basic shovel, other attachments can be mounted on the machine as well using quick clamps.

The following sections of this operating and maintenance manual provide instructions for controlling, using and maintaining the loader. You must familiarize yourself with the content of these instructions before starting any work.

In the basic version, the loader can work in the WT climate zone according to ČSN 038900, with the range of working temperatures adjusted to -15 to + 35 °C according to ČSN ISO 7131 (Earth-moving machines – Loaders). For working in other climate zones, the loader must be modified in a manner that is subject to arrangement with the manufacturer.

7.1 LAYOUT OF AGGREGATES

The frame (1) of the loader carries the aggregates, which are concentrated in larger assembly units. The batteries (2) are stored in a section of the frame. Hydraulic tank (3) and hydraulic distributor (5). Electric motors with a gearbox (7) for travel are located in the rear part of the frame. Tilting platform to stand on (12).

The work device (9) on which the work tool (10) is mounted is attached to the rear part of the frame. The track chassis (8) is attached to the bottom part of the frame. In the front part of the frame there is an electric motor with a gear pump (4). The hydraulic oil is filtered through a filter (6). In the rear upper part of the frame there is a space for storing the remote control (11).

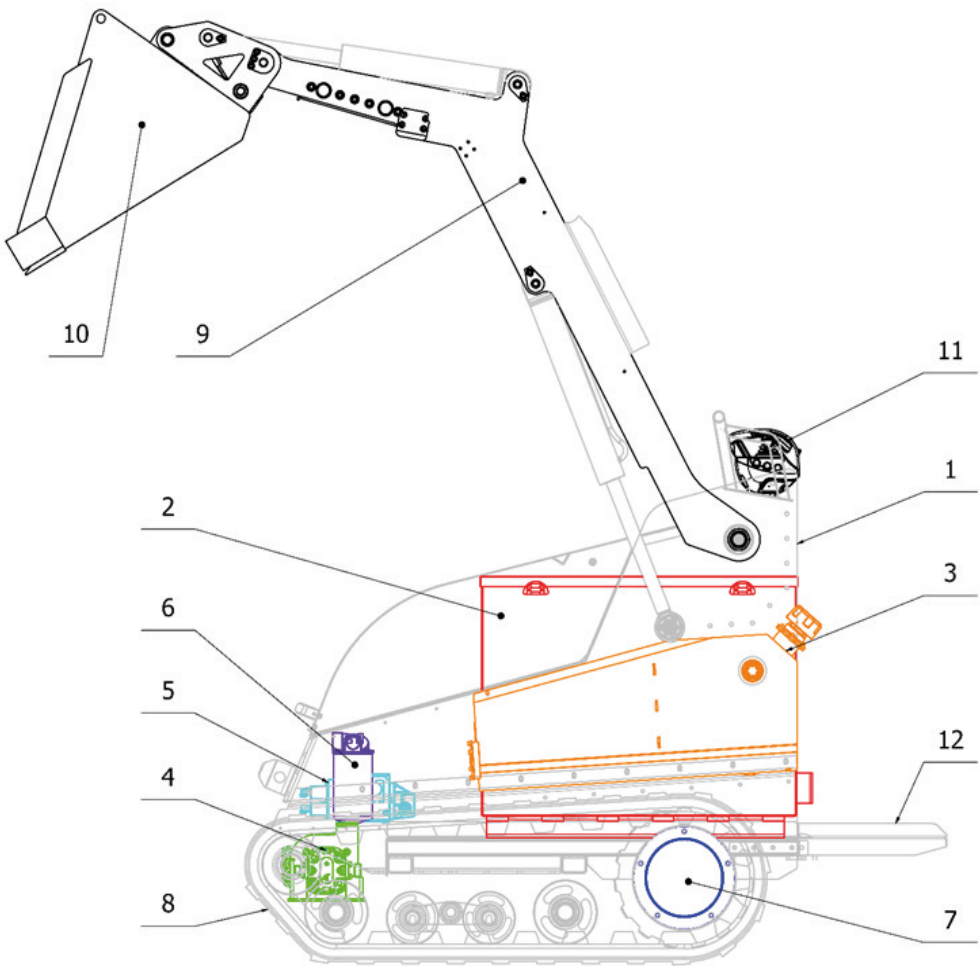


Figure 4

7.2 ELECTRIC MOTOR

The loader is driven by two three-phase electric motors with a total output of 2 x 2.7 kW.

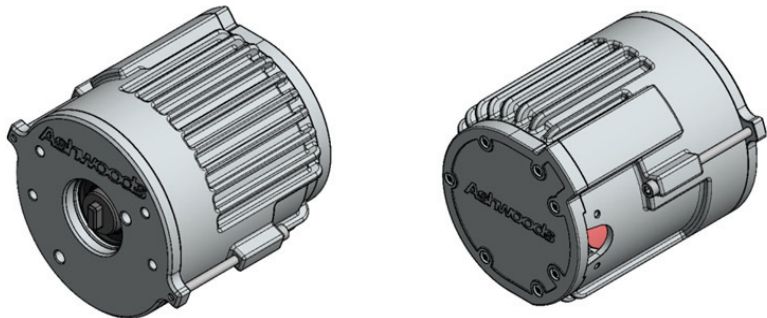


Figure 5

7.3 HYDRAULIC SYSTEM

The loader’s hydraulic system is used to control the work device. The system consists of an electric motor, hydraulic pump and distributor.

The entire hydraulic system is protected by relief valves. Pressure adjustment on the relief valves during the warranty period may only be performed by a service technician, and after the warranty period by a trained worker. For attachments, connections with quick couplings are routed via the boom to its front part.

7.4 BRAKE SYSTEM

The service and parking brakes are activated via controls (by setting these to the neutral position).

7.5 WORK DEVICE

The work device consists of a boom, clamp and hydraulic cylinders.

It is pivotally attached via pins to the rear of the frame. The basic work tool is mounted on the front part of the boom using the clamp. The boom is raised and lowered by a pair of hydraulic cylinders.

Another pair of hydraulic cylinders ensures the picking up and dumping of soil from the work tool (bucket).

7.6 CLAMPING ON ATTACHMENT

7.6.1 THE "MINIZ" QUICK CLAMP

1. Before clamping, the clamping surfaces on the attachment and on the quick clamp must be cleaned of any dirt.
2. The attachment to be clamped on must be placed with the bottom and the cutting edge on the ground so that the cutting edge faces away from the machine.
3. By flipping the lever (position 1 in Figure 6: Released quick clamp) into a vertical position, insert the quick clamp by its pins (2).
4. By handling the loader and the quick clamp, fit the clamping pins (3) of the quick coupler into the beds on the attachment.
5. Adjust the attachment by tilting the quick clamp so that the holes on the work tool are opposite the pins (2) on the quick clamp.
6. Secure the attachment by sliding the pins (2) out and into the hole on the work tool, and flip the levers (1) back to their original (horizontal) position (Figure 7: Quick clamp in secured position).

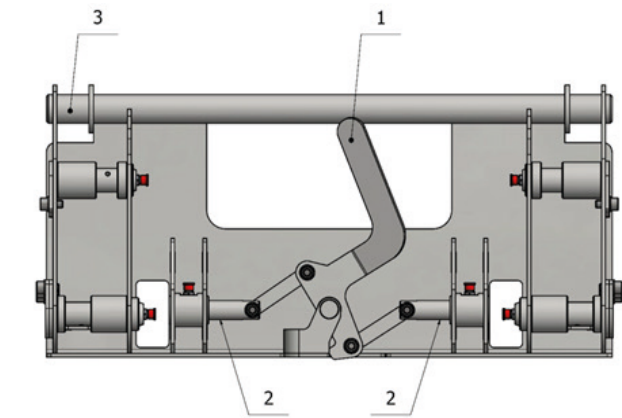


Figure 6: Released quick clamp

- 1 locking lever
- 2 retractable clamping pin
- 3 fixed clamping pins

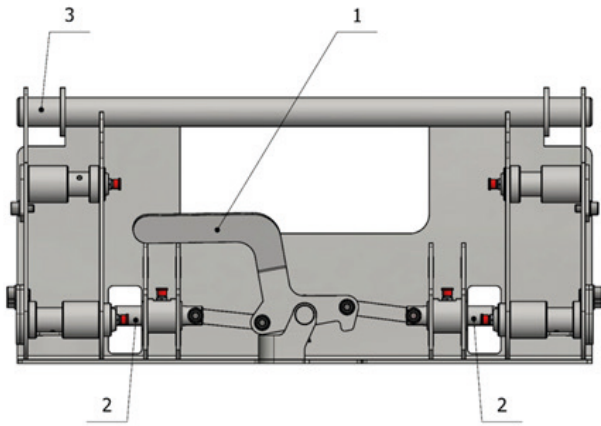


Figure 7: Quick clamp in secured position

- 1 locking lever
- 2 retractable clamping pin
- 3 fixed clamping pins



Danger

Improper clamping of the work tool may cause injury or death. When the work tool touches the ground, it may shift away from the clamp. Make sure that the work tool does not touch the ground until the clamping pins are fully inserted.



Danger

By releasing the clamping pins of the mechanism, the technician loses control over the work tool. Disconnecting the work tool when in an unstable position or when carrying a load can result in a serious or fatal injury. Place the work tool in a safe position before releasing the clamping pins.

7.7 ELECTRICAL INSTALLATIONS

The electric drive of the loader is provided with a voltage of 48 V; some appliances are in the 12 V version. The power source is batteries located in the rear part of the frame. The display operating unit, which is installed in the frame of the machine, is used to check the operating data. The machine is controlled by means of the remote control. The remote control compartment is in the rear part of the machine.

7.8 TREADING PLATFORM

The treading platform is used for occasional transport of the operating personnel of the machine when moving with the loader from its parking place to the place of work. It is forbidden to stand on the treading platform while working with the machine.



Caution

During service where the boom needs to be raised, the boom must be supported by a safety strut.

8. VIEWS

8.1 OUTSIDE VIEW OF THE LOADER

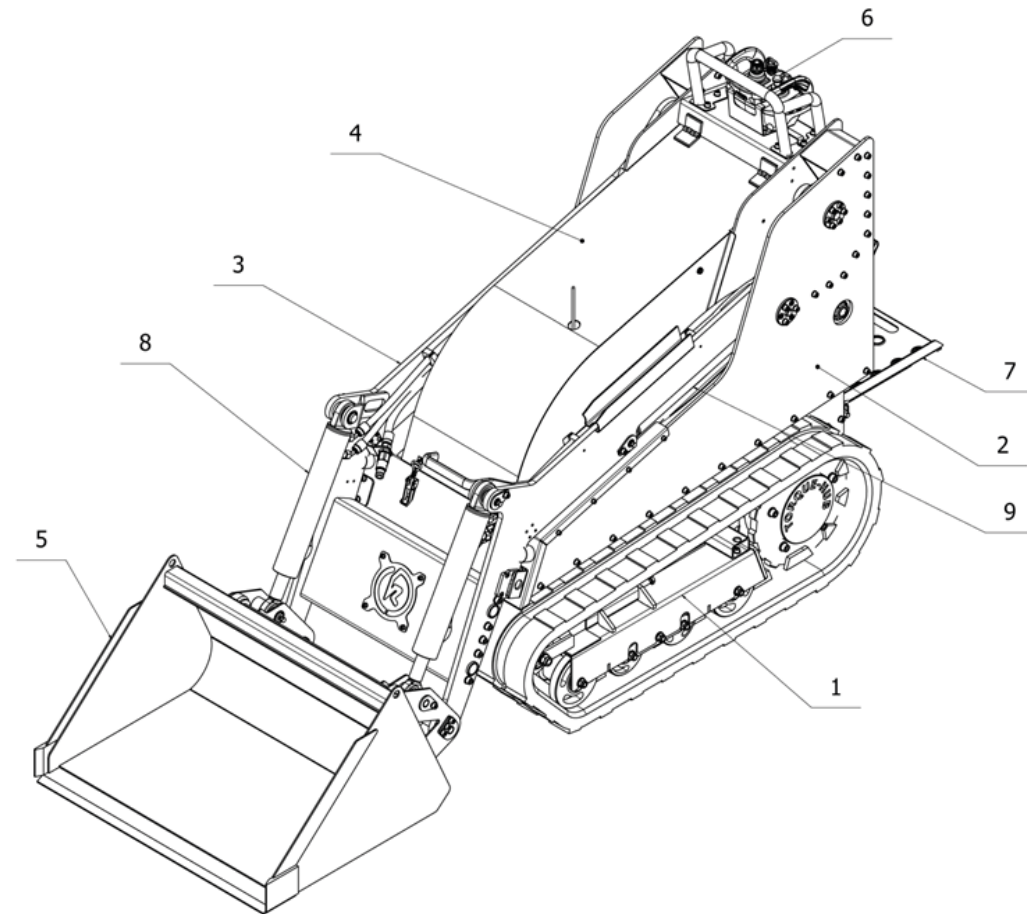


Figure 8

- ① Track chassis
- ② Frame
- ③ Boom
- ④ Bonnet
- ⑤ Basic shovel
- ⑥ Remote control
- ⑦ Platform
- ⑧ Bucket cylinder
- ⑨ Boom cylinder

8.2 OVERVIEW OF THE DRIVER'S PLACE

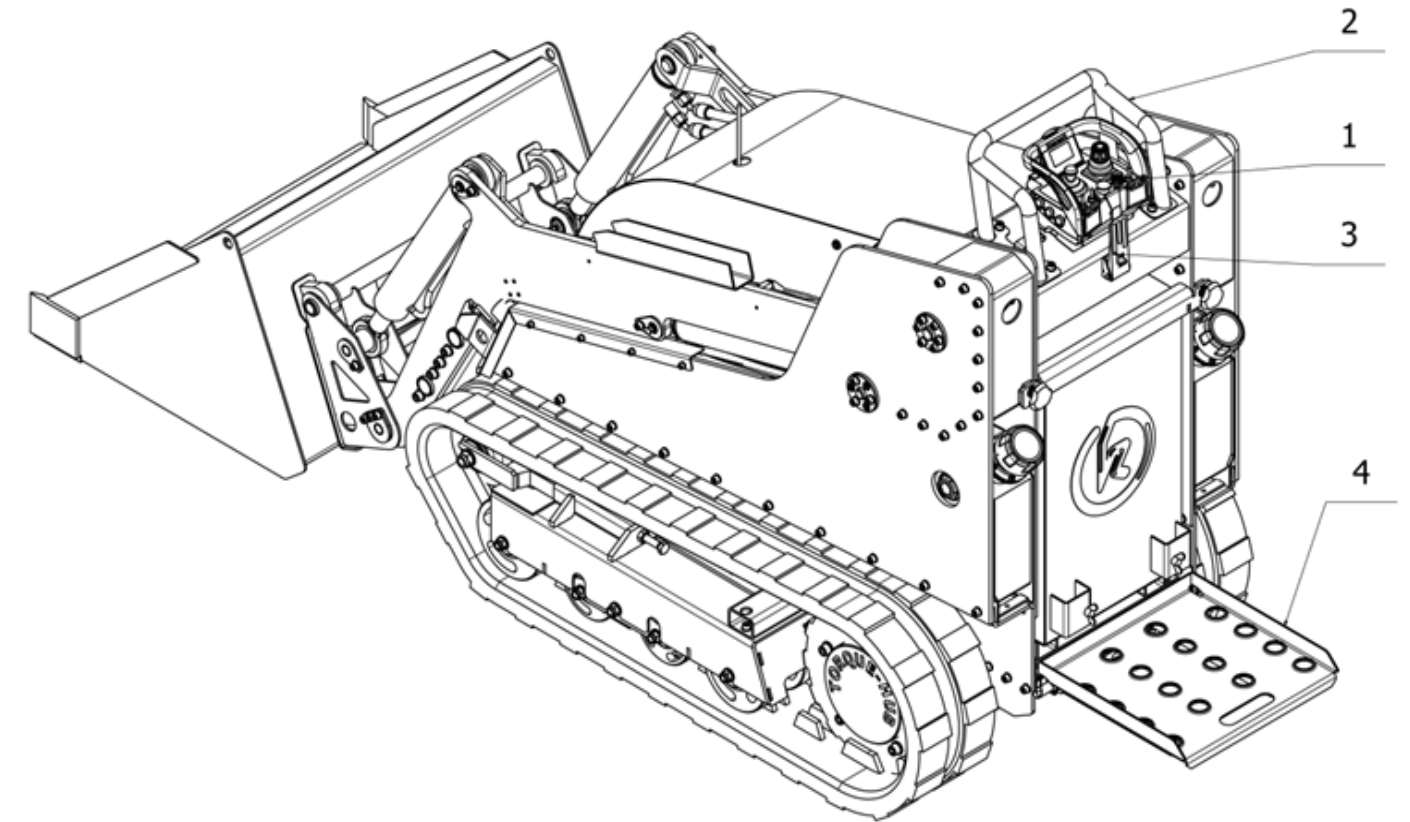


Figure 9

- ① Remote control
- ② Holding bar for operator
- ③ Remote control holder
- ④ Operator's platform

8.3 OVERVIEW OF REMOTE CONTROL



Figure 10

- ① Left control lever
- ② Label with control indications
- ③ Right control lever
- ④ Attachment button f1, f2
- ⑤ Setting button
- ⑥ Setting button
- ⑦ Setting button
- ⑧ Speed switch
- ⑨ Stop button
- ⑩ Remote control connection indicator
- ⑪ Battery status indicator
- ⑫ On/off switch
- ⑬ Battery replacement

8.4 IDENTIFICATION POINTS

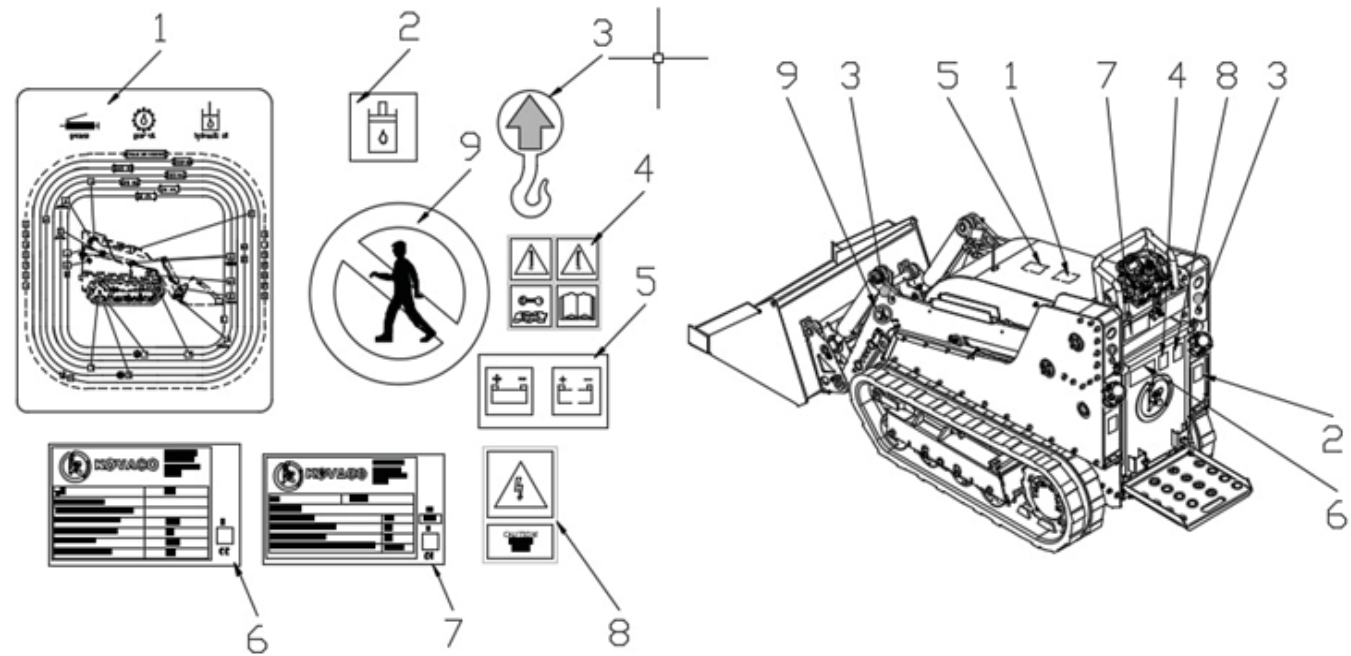


Figure 11

- ① Lubrication schedule and maintenance
- ② Hydraulic tank
- ③ Attachment point for lifting device
- ④ Caution: read the operating manual
- ⑤ Battery disconnection point
- ⑥ Battery manufacturer's label
- ⑦ Machine manufacturer's label
- ⑧ Caution, electrical equipment
- ⑨ No entry warning sign

8.5 MANUFACTURER'S LABEL

The loader is identifiable by information on the manufacturer's labels (Figures 12 and 13):

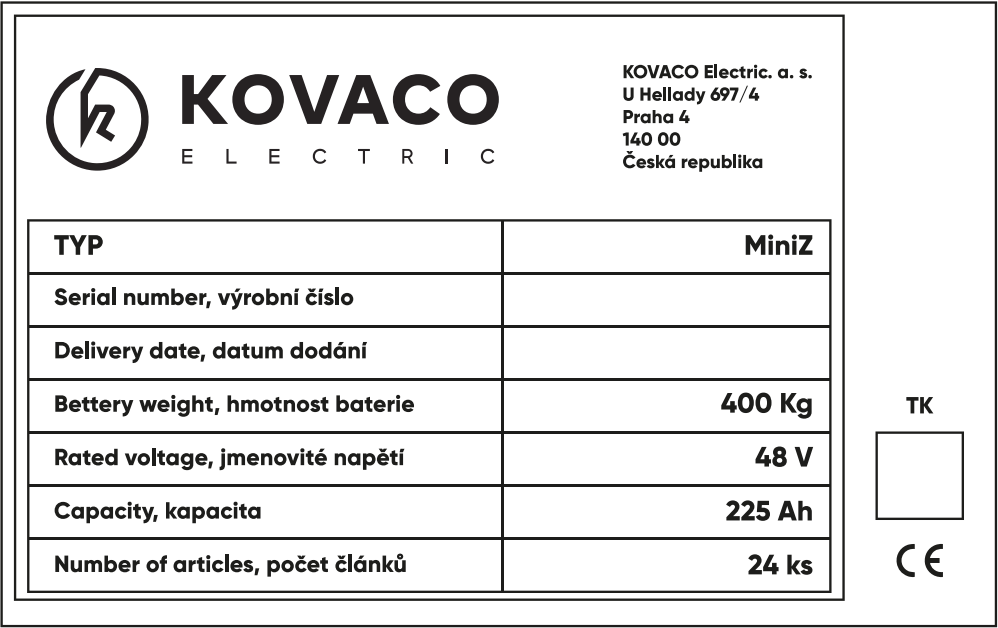


Figure 12

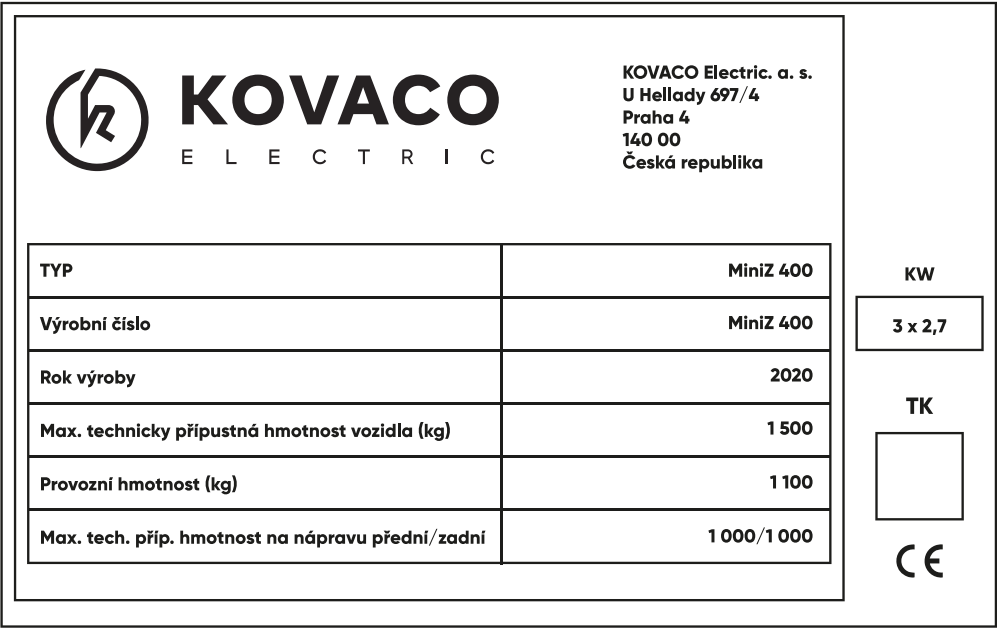


Figure 13

9. COMMISSIONING

9.1 CONNECTING THE BATTERY PLUG



Caution

Do not connect the battery plug while the ignition switch is on.

Risk of damage to components!

If you connect the battery plug while the ignition switch is on (energized), an electric arc will form. This may cause corrosion of the contacts, which will significantly shorten their life.



Danger

If cables are damaged, there is a risk of a short circuit. The battery cable must not be pinched when closing the cover.

In the event of a loader accident, make sure to disengage the battery connectors.

1. Open the top cover of the hydraulic system:

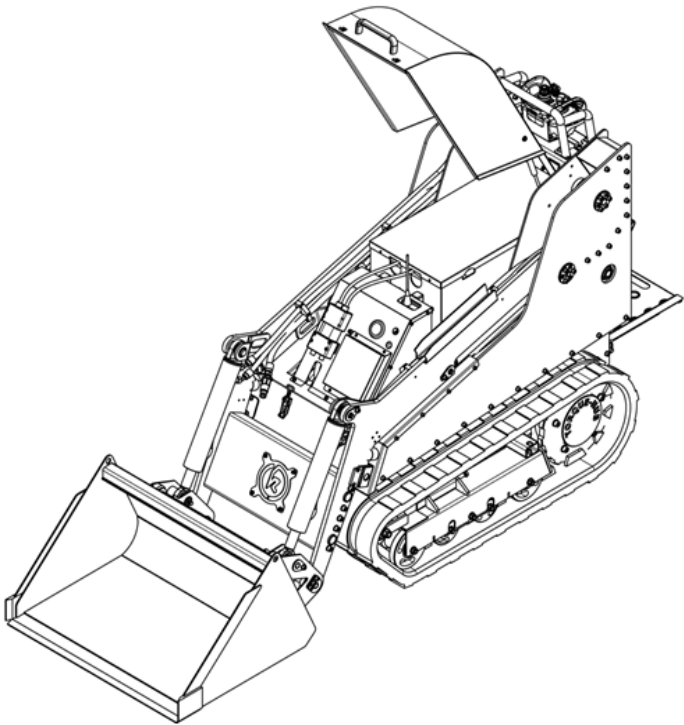


Figure 14

2. Rotate the connector to the correct position:

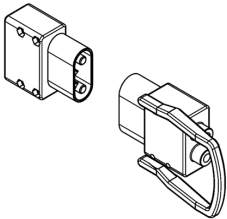


Figure 15

3. Insert the connector fully:

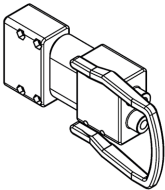


Figure 16

9.2 CHECKS AND ACTIONS BEFORE COMMISSIONING

Damage to the loader or attachment (optional equipment) can lead to unpredictable and dangerous situations. If you notice any damage or other fault in the loader or attachment (optional equipment) during the following checks, the loader must not be used until all the defects have been repaired.

- Ⓚ Do not remove, disable or turn off safety devices or switches.
- Ⓚ Do not change predefined setpoints.
- Ⓚ Do not use the loader until it has been properly repaired.

Before putting the loader into operation, make sure that its safe operation is guaranteed:

- Ⓚ The boom and bucket arms must not be visibly damaged.
- Ⓚ The locking device of the attachment must not be damaged or deformed.
- Ⓚ Any other accessories as well must not show any visible damage (such as bends, cracks or significant wear).
- Ⓚ The pins must be properly lubricated and inspected.
- Ⓚ Check the space under the loader for leaks of working fluids.
- Ⓚ The attachment (optional equipment) must be correctly fastened and must operate in accordance with the operating manual.
- Ⓚ All the information labels must be affixed in place and legible. Replace damaged or missing labels according to the indications in the chapter "Identification Points".
- Ⓚ All the warning devices (such as the warning horn) must be in perfect condition and fully functional.
- Ⓚ Check for damage and leaks in visible parts of the hydraulic system and the hydraulic oil tank.
- Ⓚ Damaged hoses must be replaced. The batteries must be located securely in the battery compartment.
- Ⓚ Check the battery plug for damage (e.g. cracks, fissures or deformation of the housing, bending or damage to contacts). If necessary, the battery plug must be replaced in an authorized service centre.
- Ⓚ The battery cover must be securely closed.
- Ⓚ The battery lock must not be damaged or deformed.
- Ⓚ The base frame of the battery, the battery compartment and the battery cover must not be damaged or deformed.
- Ⓚ Check the battery plug for damage.
- Ⓚ If necessary, the battery plug must be replaced in an authorized service centre.
- Ⓚ The service lids must be closed.
- Ⓚ The treading platform must be clean and free of icing.
- Ⓚ Depending on the type of task at hand, the loader can be equipped with an antistatic belt. The antistatic belt must not be damaged. Furthermore, it must be clean and long enough to touch the ground.
- Ⓚ Damage to the loader, or other defects in it, including the attachment (special equipment) must be reported immediately to the operator so that the fault can be rectified by the same.

10. OPERATION

10.1 OPTIMUM OPERATING CONDITIONS TO CONSERVE THE BATTERY CAPACITY

10.1.1 RECOMMENDED SPEEDS

When working with the loader with the basic shovel, we recommend setting the machine to slow speed (tortoise). For fine handling of heavy objects when loading or unloading, slow speed is also recommended. For other types of work with the loader, the settings must be made and adjusted according to the type of task at hand. As a rule, when working with the loader, the lower the speed, the more substantial the savings on battery capacity. A higher speed (hare) is recommended when travelling with the machine over longer distances.

10.1.2 DRIVING STYLE

The battery capacity is also significantly affected by the actual driving style. As far as the situation allows it, it is recommended to turn with the machine in a style around the entire radius, that is, with the track on one side of the loader not moving, or moving at low speed, and rotating on the other side of the machine. In this way, the loader turns economically. It is uneconomical to turn around the axis, which is with the tracks on each side moving in the opposite direction from the other side. This will result in a sharp drop in battery capacity.

10.1.3 SURFACE

The surface on which the loader operates also affects the battery capacity greatly. The loader has rough-terrain tracks mounted as a factory standard, specifically tracks with a sparse and high tread pattern. However, this track is not suitable for tarmac or concrete as it is soft, has great rolling resistance and it slips. Where the machine is expected to operate mostly on paved surfaces such as tarmac or concrete, it is recommended to equip the loader with tracks for paved surfaces to avoid heavy strain on the battery and severe wear of the tracks.



Caution

Risk of damage to components!

A deformed or damaged battery plug may cause overheating and subsequent damage.



Danger of explosion if hydrogen accumulates inside the loader

Hydrogen from the battery compartment may enter the loader through unsealed openings in the cabin.

Accumulated hydrogen may cause an explosion.



Danger

Distractions while working with the machine may result in loss of control over the machine. Exercise extreme caution when using any devices while working with the machine. Distractions while working with the machine may result in injury or death.



Danger

A machine fire can cause injury or death. Exposed battery cables that come into contact with a grounded connection may cause a fire. Replace cables and similar components that show signs of wear or damage. Contact the manufacturer.

10.2 BASIC INSTRUCTIONS FOR CORRECT USE OF THE CHARGING EQUIPMENT

1. Before connecting the battery to the charger, check the integrity of the contacts, connecting cables, connectors and auxiliary systems.
2. Connect the battery to the charger, observing the correct polarity.
3. The batteries may only be connected to designated chargers approved for the type concerned.
4. Observe the full charging time, i.e. until the full charge indication on the charger.
5. Charging starts automatically once the connectors are mutually engaged.
6. Disengage the connectors in the off state (when not energized) – press the STOP button.
7. Replenish the distilled water in the battery each time it is charged. In the event of water losses and leakage when replenishing, report this to service.
8. Read the instructions for using the assigned equipment carefully and thoroughly.
9. Report any damage to or malfunction of the charging equipment to your supervisor and service.

OPERATION

- Ⓚ Connect the power cord to the 230 V AC mains.
- Ⓚ Use cables to connect the battery to the charger and check that the polarity is not reversed.
- Ⓚ Check that the four LEDs light up in sequence. This confirms that the device is receiving power and that the LEDs are working properly (automatic diagnostic test).
- Ⓚ When the battery is properly connected and the charger is not in autostart mode, the DL1 LED is lit (signal battery is connected).
- Ⓚ To start the charging process, press the P1 button on the front panel.
- Ⓚ If the autostart function is on, the charger starts charging five seconds after the battery is connected (signalled by flashing DL3 and DL4 LEDs).
- Ⓚ In the event of a power failure, the charging process stops and the card switches off; after a power failure restart, the card is reset and the charging process starts from the beginning.
- Ⓚ When the battery is connected, the charging process is interrupted. After the battery is reconnected, the charger can continue with the charging process (the SW1.6 switch is off), or starts it again from the beginning (SW1.6).
- Ⓚ Please note that in order to avoid electric sparks, do not disconnect the batteries during the charging process. After connecting the battery, start the charging process with the ON/OFF button.



Figure 17

LED signal DL1 "Battery connected" (green)

LED signal DL2 "Final charging" (yellow)

LED signal DL3 "Charging complete" (green)

LED signal DL4 "Error" (red)

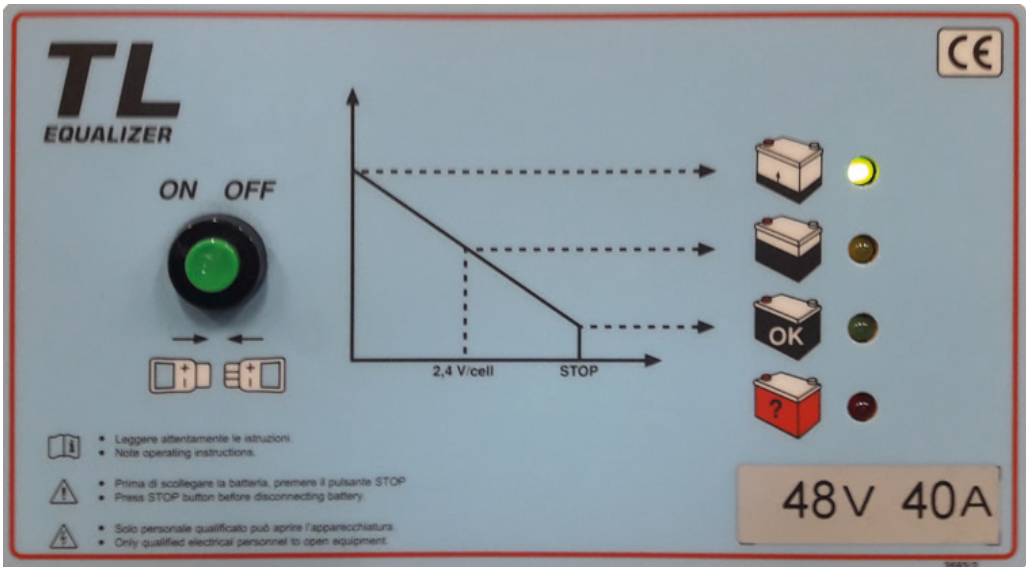


Figure 18

Battery charging progress.

LED signal "Battery connected" (green)

LED signal "Final charging" (yellow)

LED signal "Charging complete" (green)

LED signal "Error" (red)

LIST OF LED INDICATOR SIGNALS

The table below provides an overview of the signals shown by the LEDs on the control card.

	SIGNAL	LED DL1 (GREEN)	LED DL2 (YELLOW)	LED DL3 (GREEN)	LED DL4 (RED)
S1	Mains connected	OFF	OFF	OFF	OFF
S2	Battery connected	OFF	OFF	OFF	OFF
S4	Automatic start	OFF	OFF	FS	FS
C1	Initial charging	FS	OFF	OFF	OFF
C2	Final charging	FS	ON	OFF	OFF
C3	End of charging or balancing break	ON	*	ON	OFF
C5	Compensation charging	FS	ON	FS	OFF
A1	Alarm resulting from safety. timer	ON	OFF	OFF	ON
A2	Alarm resulting from interrupted operation	ON	OFF	OFF	FF

- OFF = LED OFF/switched off
- ON = LED on
- FS = slowly flashing LED (at intervals of 1 s)
- FF = fast flashing LED (at intervals of 0.5 s)
- * = LED in any state



Danger

The charger must be located in a covered area and sheltered from rain, snow and weather.

LIST OF ALARMS

Alarm A1 – charging control alarm.

The AP070 card is equipped with a single safety timer that controls the first stage of charging.

If the battery does not reach the set voltage limit (2.4 V/cell) within the expected time Ti (11 hours) from the initial charging, the alarm interrupts the charging process, which is signalled by the red DL4 LED lighting up. Check the battery and charger.

A2 – transformer disconnection alarm.

The transformer is equipped with a cutout in the primary winding with a contact that opens when the transformer temperature exceeds 150 °C. This is indicated by the red DL4 LED flashing very fast.

Check the mains voltage and whether the charger has been assigned to the battery. Follow the Wa tables (16 A x 100 AN).

DISTILLED WATER TANK

Install the container to a height of approx. 2.5 m.

After recharging the battery, top up the battery cells with distilled water. (Figure 21)

When the battery is charged, it must be replenished with distilled water. The distilled water tank is equipped with a water valve, a propeller regulating the water flow and a quick coupling for connecting the battery. The valve on the distilled water tank must only be released for as long as the flow meter indicates water flow. When the flow meter stops, close the valve to prevent overflow from the cells. When the battery cells are replenished with water, disconnect the quick coupler.



Figure 19

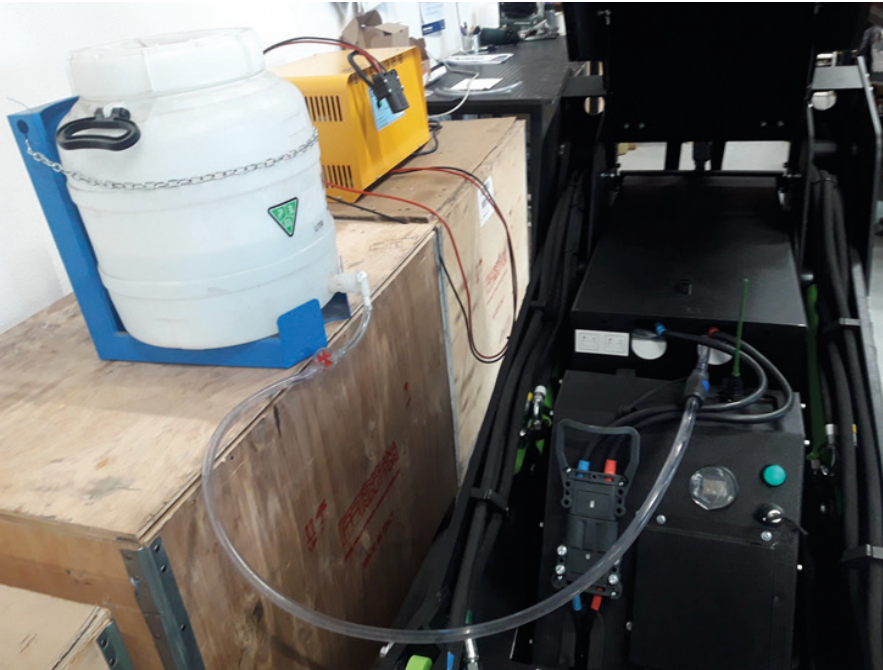


Figure 20



Caution

The charger must be located in a covered area and sheltered from rain, snow and weather.

10.3 CHECKING THE CONDITION OF TRACKS



Danger

Risk of accidents! If a track is incorrectly tensioned, there is a risk of it coming off. The braking distance extends and there is also a risk of the vehicle tipping over. Replace worn or damaged tracks immediately.

If you want to use the loader with different types of tracks from those approved by the loader manufacturer, or with tracks from another manufacturer, you must first obtain consent from the loader manufacturer.



Caution

Only track types approved by the manufacturer may be used.

Check tracks for wear and damage!

The tracks must not be damaged or worn.

10.4 ENTERING AND EXITING THE LOADER



Danger

When getting onto and off the loader, there is a risk of injury as a result of slipping, hitting parts of the loader or getting stuck!

If the surface of the footwell is very dirty or greasy because of oil, there is a risk of slipping. There is a risk of hitting your head on the machine frame when getting off the loader.

- Ⓚ Make sure that the surface of the footwell is not slippery.
- Ⓚ Do not jump onto and off the loader.
- Ⓚ Make sure you always hold on firmly to the loader.
- Ⓚ Do not wear jewellery at work.
- Ⓚ Do not wear loose work clothing.



Danger

There is a risk of injury if you jump off the loader! If your clothing or jewellery (such as watches, rings, etc.) gets caught in any part of the loader while jumping off the vehicle, you may suffer a serious injury. It is forbidden to jump off the loader!



Caution

For getting onto and off the loader, only use equipment designated for this purpose. Improper use can damage the machine components! Loader components such as the control levers, etc., are not intended as aids for getting onto and off the loader and may be damaged by improper use.

10.5 SWITCHING ON THE IGNITION AND PUTTING THE LOADER INTO OPERATION



Caution

Before switching on the ignition, all the pre-commissioning checks and actions must be carried out with no fault as a result.

If you find a fault, do not use the loader and contact an authorized service centre.

Prior to putting the loader into operation and during operation, make sure that the bonnet is properly closed and secured against opening. Otherwise there is a risk of damage to the loader and its parts and a risk of injury.



Figure 21

1. Insert the ignition key into the ignition switch and turn it to the position "I".
2. The display will show information about the operating hours and the current battery status.
3. When the remote control is turned on, the green lamp lights up.

10.6 CHANGING THE FLOW RATE OF HYDRAULIC OIL

If the loader has an attachment connected that needs a hydraulic connection, you can change the hydraulic oil flow rate within a range from 0 to 20 l. This change can be made by a combination of buttons (5), (6) and (7) as follows: press and hold button (5) and increase the flow continuously by simultaneously pressing and holding button (6). Press and hold the button (7) to reduce the flow continuously.



Figure 22

10.7 WORK LIGHTS

The loader is not equipped with work lights.

Caution

It is forbidden to operate the loader in conditions of reduced visibility!

10.8 ROAD LIGHTS

The loader is not equipped with road lights.

Caution

It is prohibited to drive the loader on public roads. The loader is not equipped for driving on public roads. Do not drive the loader on public roads so as to prevent possible collisions or impact-induced damage.

10.9 BEACON

The loader is not equipped with a light beacon.

11. LOADER CONTROL – TRAVEL

Danger

Risk of serious or fatal injuries when operating the loader!

Make sure there is no other person or living creature in the travel area.

Steer the vehicle with the left-hand control lever (1). The lever is located on the remote control (2). Move the control lever smoothly. This will avoid sudden jolts and jerky movements while accelerating or braking.



Figure 23

Driving forward – push the control lever (1) forward.

Driving backwards – push the control lever (1) backwards.

Turn forward and left – push the control lever (1) forward and left.

Turn forward and right – push the control lever (1) forward and right.

Turn backwards and left – pull the control lever (1) backwards and right.

Turn backwards and right – pull the control lever (1) backwards and left.

Fast turn forward and left – push the control lever (1) left.

Fast turn forward and right – push the control lever (1) right.

12. CONTROLLING LOADER WITH A WORK ADD-ON



Danger

Risk of serious or fatal injuries when operating the loader!

Make sure there is no other person or living creature in the travel area.



Figure 24

Lowering the boom – push the control lever (3) forward.

Raising the boom – pull the control lever (3) backwards.

Tilting the bucket shut – push the control lever (3) left.

Tilting the bucket open – push the control lever (3) right.

Lowering the boom while at the same time tilting the bucket shut – push the control lever (3) forward and left.

Lowering the boom while at the same time tilting the bucket open – push the control lever (3) forward and right.

Raising the boom while at the same time tilting the bucket open – pull the control lever (3) backwards and right.

Raising the boom while at the same time tilting the bucket shut – pull the control lever (3) backwards and left.

13. CONTROLLING LOADER WITH AN AUXILIARY HYDRAULIC DEVICE



Danger

Risk of serious or fatal injuries when operating the loader and its attachments!

Make sure there is no other person or living creature in the travel area.



Figure 25

Some attachments require a connection to a hydraulic power and flow source in order to function. The connection to the loader is through quick couplings, which are located on the arm of the boom. These are marked as F1 and F2.

Before connecting an attachment, check the technical condition and technical specifications.

Always wear protective gloves and goggles when connecting and disconnecting, as the hydraulic oil and quick couplings may be as hot as 90 °C – risk of burns.

Do not connect damaged or technically incompatible attachments as they may cause serious damage to the loader and other property, or pose a hazard to life.

Clean the quick couplings after use and put on the protective covers.

The attachment is controlled by switch (4). You can change the hydraulic flow volume by a combination of buttons (5), (6) and (7) as follows: press and hold button (5) while simultaneously pressing and holding button (6) or (7). If you need to increase the flow, hold down button (6). If you need to reduce the flow, hold down button (7) until the flow changes.



Figure 26



Caution

When working with an attachment fitted, follow the operating instructions supplied with each attachment!

14. REMOTE CONTROL MINIZ 400

To turn on the remote control:

- 1. Pull the red button (9) (main switch) up. When the green rectangular lights light up continuously, the loader controls are active and the loader can work.
- 2. Turn the ignition switch (11) to position I and press the button (11) on the side. When the green rectangular lights light up continuously, the loader controls are active and the loader can work.



Figure 27



Danger

Caution: before activating the remote control, make absolutely sure that there are no people or objects around the machine that could be injured or damaged. The minimum distance from living creatures for operating the machine when using the remote control is 5 m.

15. LIST OF OPTIONAL ATTACHMENTS

The MiniZ 400 loader can operate with the following tools and attachments:

- Ⓚ Basic shovel
- Ⓚ Bulk bucket
- Ⓚ Grate bucket
- Ⓚ Swing blade
- Ⓚ V-shaped snow-plough blade
- Ⓚ Rotary snow plough
- Ⓚ Winter sander
- Ⓚ Pallet forks
- Ⓚ Forks with holder
- Ⓚ Log forks
- Ⓚ Bale carrier
- Ⓚ Swivel undercut
- Ⓚ Sweeping device
- Ⓚ Angle broom
- Ⓚ Drilling device
- Ⓚ Combined bucket 4 in 1
- Ⓚ Mixing bucket
- Ⓚ Bucket with holder
- Ⓚ Lawn mower with width
- Ⓚ Tree shears
- Ⓚ Trencher

A complete list of attachments is available on the manufacturer’s website.

16. CLASSIFICATION OF ROCKS

Rocks are classified into seven classes according to the difficulty of separating and removing them. These classes are called mining classes (this is an excerpt from the standard; the exact wording is given in ČSN 733050).

16.1. CLASS 1

- a) cohesive with a soft consistency (topsoil, loam, loamy sand, etc.);
- b) non-cohesive, loose with a grain size up to 20 mm;
- Ⓚ with a grain size over 20 mm in up to 10% of the volume of the rock to be separated (sand, medium gravel, gravel with stone).

16.2. CLASS 2

- a) cohesive with a hard consistency (topsoil, loam, loamy sand, peat);
- b) non-cohesive, moderately compacted with a grain size up to 20 mm;
- Ⓚ with a grain size from 20 to 50 mm in more than 10% of the volume of the rock to be separated;
- Ⓚ with a grain size above 50 mm in up to 10% of the volume of the rock to be separated (sand gravel, coarse gravel, or gravel with stone);
- c) construction waste and landfill materials similar in nature to Class 2 rocks.

16.3. CLASS 3

- a) cohesive with a soft to firm consistency;
- b) non-cohesive, compacted with a grain size up to 50 mm;
- Ⓚ with a grain size from 50 to 100 mm in more than 10% of the volume of the rock to be separated;
- Ⓚ with a grain size over 100 mm in up to 10% of the volume of the rock to be separated (coarse gravel, or gravel with stone);
- c) non-cohesive, classified in Classes 2 and 3, held together by a cohesive material, as far as the grains remain in lumps after separation;
- d) weathered with very weakened structural bonds, qualifying as clay-sand soils (hydrothermally decomposed rocks, eluvial deposits);
- c) construction waste and landfill materials similar in nature to Class 3 rocks.

16.4. CLASS 4

- a) cohesive with a firm and hard consistency (clay, sandy clay, sandy loam, dust loam);
- b) non-cohesive with a grain size from 100 to 250 mm in more than 10% up to 50% of the volume of the rock to be separated, with a grain size above 250 mm in up to 10% of the volume of the rock to be separated (coarse gravel, gravel with boulders)
- c) non-cohesive, classified in Classes 2 and 3, held together by a cohesive material, as far as the grains remain in lumps after separation;
- d) solid, slightly weathered and weathered (weathered claystones, marlstones, tuffs, turiffs, slates, etc.), weathered slates, sandstones, soft limestones, etc.;
- e) solid, weathered, severely cracked. The rock is disturbed along the cracks and its disintegration spreads into neighbouring areas. The grain size corresponds to non-cohesive Class 4 rocks (highly cracked granites, gneisses and limestones);
- f) slurry and liquid in consistency (muddy alluvium, liquid sand, decomposed peat).

16.5. CLASS 5

- a) non-cohesive with a grain size from 100 to 250 mm in more than 50% of the volume of the rock to be separated, with a grain size above 250 mm up to 0.1 m³ individually in more than 10% up to 50% of the volume of the rock to be separated (coarse gravel with stone/boulders);
- b) non-cohesive, classified in Class 4, held together by a cohesive material with Class 4 properties, as far as the grains remain in lumps after separation (coarse gravel with clay-loam bonding material);
- c) solid, healthy, in layers up to 150 mm thick (conglomerate with clay bonding material, slate, travertine, sandy marlstone, etc.);
- d) solid, igneous, sedimentary, weathered and cracked with areas of divisibility of less than 150 mm (weathered granite, gneiss, andesite, sandstone, quartz);
- e) landfill materials similar in nature to Class 5 rocks;
- f) frozen soils.

16.6. CLASS 6

- a) non-cohesive with boulders from 250 mm up to 0.1 m³ individually in more than 50% of the volume of the rock to be separated, with boulders above 0.1 m³ individually in up to 50% of the volume of the rock to be separated;
- b) solid, igneous and metamorphic rocks, healthy with areas of divisibility up to 1.0 m in bench block separation. Crack distances less than 250 mm (granite, gneiss, andesite, basalt, slate, phyllite);
- c) firmly sedimented, healthy with a distance of divisible surfaces up to 1.0 m. Other crack distances of up to 250 mm – coarsely bench-shaped (coarsely fragmentary to boulder conglomerates and agglomerates with calcareous and marly bonding material, limestones, dolomite, etc.).

16.7. CLASS 7

- a) non-cohesive with a grain size over 0.1 m³ individually in more than 50% of the volume of the rock to be separated;
- b) solid, healthy, massive, or with irregular spherical, columnar detachment with individual wedges, with areas of divisibility greater than 250 mm (quartz, silica granite, gneiss, basalt, andesite, veined quartz, cherty limestones, diorites).

- Abbreviated characteristics of the mining classes according to the ways in which rocks can be separated:
- Class 1 - loose rocks that can be picked up with a shovel/with a loader;
 - Class 2 - excavatable rocks, separable with a spade/with a loader;
 - Class 3 - diggable rocks, separable with a pickaxe/with an excavator;
 - Class 4 - crumbly solid rocks, separable with a wedge/with an excavator;
 - Class 5 - solid rocks that are easily broken up and separable with a ripper/heavy excavator (over 40 tons) or with explosives;
 - Class 6 - solid rocks that are difficult to break up with a heavy ripper or with explosives;
 - Class 7 - solid rocks that are very difficult to break up, separable with explosives.

17. PREVENTIVE MAINTENANCE

Maintenance is important and is the best protection against premature wear of the unit assemblies. Perform the prescribed work tasks to prevent possible malfunctions. In regular checks and inspections, it is possible to detect wear and malfunction, and failures can be prevented by cleaning and lubricating, tightening loose connections, removing leaks, etc.

Maintenance includes the following work tasks:

cleaning and care, recharging the battery, topping up lubricating greases, changing oils, checking all units, adjusting, checking mechanical joints and their tightening, etc.

For a better overview, we have included all maintenance work tasks in tables according to the number of operating hours worked. Read the number of operating hours on the control panel located in the cabin. Keep a record of the maintenance work tasks carried out in the machine’s warranty book. Maintenance is divided according to the inspection and maintenance schedule.

The following common rules apply to all disassembly and assembly procedures:

- Ⓚ Use the most suitable tools that do not damage the nuts or bolt heads.
- Ⓚ Components that move relative to each other when assembled are not mounted dry. They need to be lubricated with a lubricant designated for the respective component in service.
- Ⓚ When assembling preserved components, the preservative grease must be removed and replaced with operating lubricant.
- Ⓚ Replace defective components only with original parts.

17.1 INSPECTION AND MAINTENANCE SCHEDULE

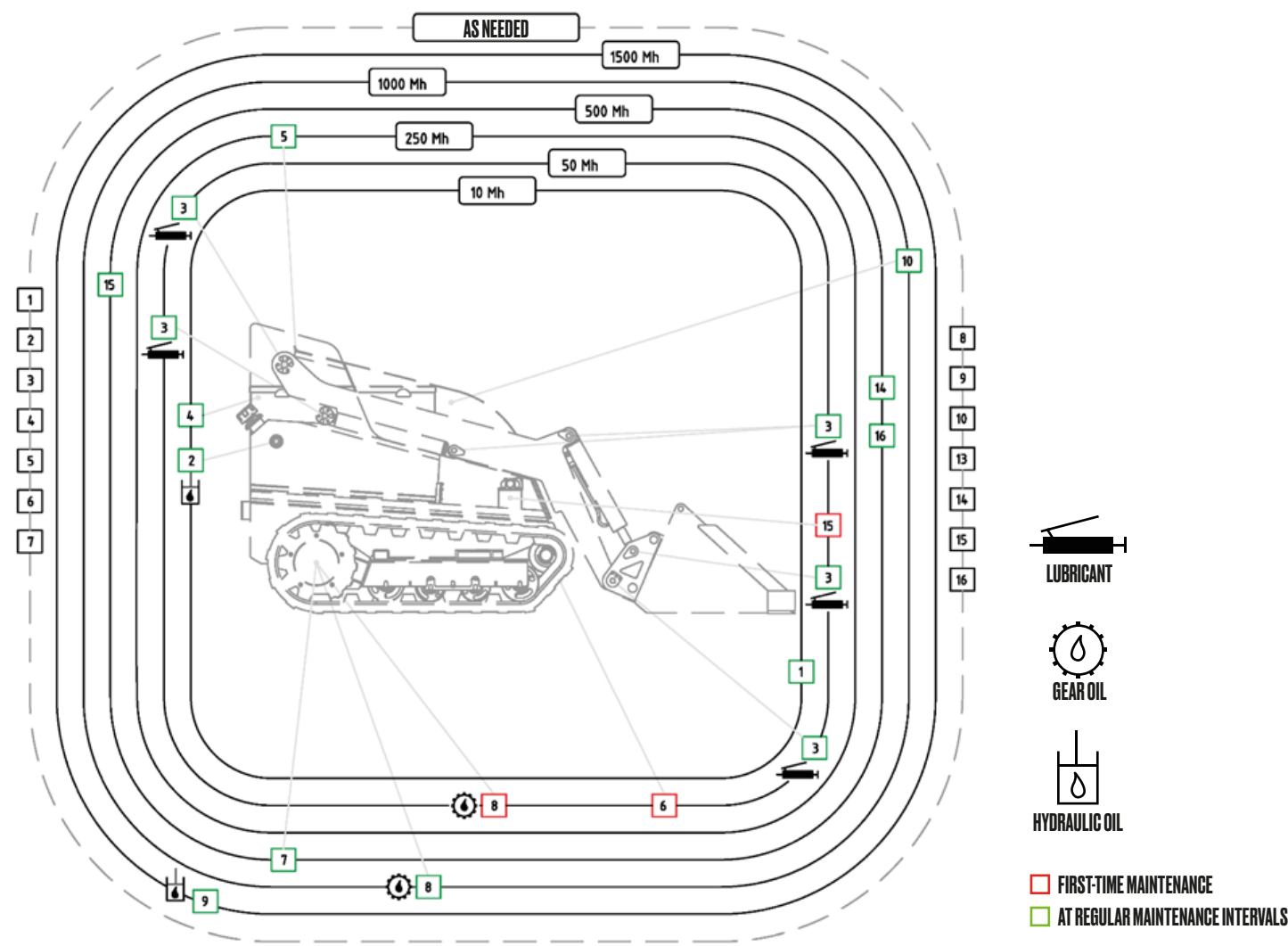


Figure 28

POSITION	INSPECTION AND MAINTENANCE WORK TASKS		FOR THE FIRST TIME AFTER OH	MAINTENANCE INTERVALS AFTER OH						AS NEEDED
				10	50	250	500	1000	1500	
1	General inspection of the machine	- Leaks - Hoses, aggregates - Work devices - Firm attachment of parts - Tracks - Instruments	10 •	•						
2	Hydraulics	Check the oil level – top up		•						
3	Work devices	Lubricate pins			•					
4	Battery	Check the electrolyte level – top up with distilled water		•						
5	Loader	Lubricate hinges, locks, etc. with an oiler				•				
6	Tracks	Inspection and maintenance of tracks	50 •		•	•				
7	Parking brake	Functionality check						•		
8	Transmission gears	Oil change	50 •				•			•
9	Hydraulics	Oil change	1500 •						•	
10	Electrical installations	Check	500 •				•			
11	Loader	Remove leaks								
12	Loader and motor	Check and tighten screw connections	500 •				•			
13	Hydraulics	Replace the hydraulic oil filter	50 •				•			
14	Work devices	Check the condition of the boom and quick clamp (welds, deformations)	500 •				•			



Caution

Explanation of the symbols used in the table:

- - "SERVICE": inspection and maintenance work tasks that are to be performed by a professional
- - Inspection and maintenance work tasks to be performed by the customer on their own

17.2 CORRELATION TABLES FOR OILS AND LUBRICATING GREASES

17.2.1 HYDRAULIC TANK

SLOVNAFT	- HV 46, HV 32, HV 68
SHELL	- TELLUS 32
MOBIL	- DTE 25, DTE 15M, SHC 525
BP	- ENERGOL HLP 32
CASTROL	- Castrol TQ
ESSO	- Esso ATF 55 type A, Esso Nuto H 46, Esso Unavis N 46
RUSSIA	- Hydraulic oil AMG-30 (-14 to +80 °C), AMG-10 (below -12 °C)
GERMANY	- Hydraulic oil WA 24 HLP 36

17.2.2 TRANSMISSION GEARS

ENI BLASIA 150

PARAMO CLP 150

17.2.3 ALL GREASE-LUBRICATED POINTS

SLOVNAFT	- Lubricating grease A 00
SHELL	- Mitilus Grease A, Retinax A
MOBIL	- Mobilgrease MP, Mobilgrease special
BP	- Energrease GP-36
CASTROL	- Imprevia GSL
RUSSIA	- Lubricating grease US-1
GERMANY	- Lubricating grease SWC 423

17.3 DESCRIPTION OF MAINTENANCE ACTIVITIES

17.3.1 OIL CHANGE IN THE HYDRAULIC SYSTEM

Drain the oil by unscrewing the plug at the bottom edge of the hydraulic tank.

When changing the oil, observe maximum cleanliness. Fill with new oil through a filter with an efficiency of 10 µm. The correct oil level is indicated by the position of the oil mark on the tank. Move the work device a little so that the oil fills the entire system. Refill the tank again with oil to half the height of the oil mark.

To extend the service life of the loader units, take a sample of the hydraulic oil in the amount of 0.5 litres every 1000 OH. Take the sample into a clean glass container when the oil is heated to approx. 50 °C. If the oil that is removed is thickened and dirty compared to new oil, it must be changed or the change intervals shortened. Use only oil specified in the machine’s operating and maintenance manual! When changing hydraulic oil, always replace the hydraulic oil filter as well.

17.3.2 MAINTENANCE OF HYDRAULIC CYLINDERS

Make sure that in operation, the bearings of the cylinder attachment lugs are sufficiently lubricated and the wiper ring on the cylinder cap wipes dirt from the piston rod over the entire stroke range. In the event of a leak, it must be replaced to prevent damage to the sleeve and subsequent oil leakage around the piston rod.

17.3.3 CHECKING AND TENSIONING TRACKS

In operation, regularly monitor the condition (wear, tensioning) of the tracks. Replace damaged tracks in good time. Proceed carefully when tensioning, and observe the prescribed tension value.

17.3.4 CHECKING AND TIGHTENING TRAVEL WHEELS

Check the tightening of the wheel nuts according to the inspection and maintenance schedule of the machine. The tightening torque is 100 Nm.

17.3.5 CHANGING OIL IN GEARBOXES

1. Turn on the machine and make a trip to warm up the oil. After a short drive, the oil temperature will rise. Once the oil is warmed up enough, it will be less viscous and much easier to drain.
2. Locate the drain plug, found on the side of the gearbox. Rotate the gearbox so that the drain plug points downwards.
3. Remove the drain plug and allow oil to drain into the prepared container. Four to five minutes should be sufficient to completely drain the used oil. Repeat the procedure for the other gearboxes as well.
4. Check that the drain plug is not damaged and screw it back on securely. Be careful not to tighten it excessively.
5. Release the filler cap found on the side of the gearbox and fill with oil using a funnel. To reach the required level, 0.4 litres of oil are needed. Tighten the cap correctly and firmly. Repeat the procedure for the other gearboxes as well.
6. Finally, dispose of the used oil properly. Use any container that can be closed tight and take the used oil to a designated place, collection point or landfill.

17.3.6 MAINTENANCE OF THE LOADER'S ELECTRICAL EQUIPMENT



Caution

For the proper functioning of the entire electrical equipment, properly charged and maintained batteries are the most important factor.

Maintain the correct electrolyte level by topping up with distilled water each time you charge.



Caution

At the end of work or a drive, and always when the loader will not be used for a longer period of time, disconnect the battery by disengaging the battery connector. The batteries must also be disconnected during repairs or when replacing parts of the electrical equipment. This will prevent a short circuit in the power line during the installation works. Battery maintenance includes cleaning the terminals, topping up with distilled water and recharging. At lower air temperatures, keep the batteries sufficiently charged, as otherwise they are not frost-resistant and may freeze.

If you do not use the battery for a longer period of time, you must recharge and carry out maintenance on it after four to six weeks. Clean the battery terminals of deposits with hot water and lubricate them lightly with grease. The service life of batteries lasts longer the more often they operate, i.e. are alternately charged and discharged.

18. TECHNICAL SPECIFICATIONS OF THE MACHINE

TRANSMISSION AND DISTRIBUTION SYSTEMS	
End gears	
TRACKS	
The machine is equipped as a factory standard with tracks 180 x 72 x 38	
STEERING	
Electronic via CANBUS data bus	
WORK DEVICE HYDRAULICS	
Pump	SAUER DANFOS
Operating pressure	18 ± 0.5 MPa
Distributor	PVG 16
Oil type	HV - 46 / HV - 32 / HV - 6
Oil filter	replaceable
DRIVING CHARACTERISTICS	
Constant forward speed	5 km/h
Traction force	14 kN
Turning radius front	1500 mm
Contour turning radius rear	800 mm
Works on slopes with reduced stability	at a maximum inclination of 5°
Parking brake effective up to a maximum inclination of	30°
Wading ability	100 mm
Climbing ability	25% (15°)
WEIGHT DATA	
Operating weight of machine	1100 kg
Total weight of machine	1500 kg
Transport weight of machine	1100 kg

ELECTRICAL INSTALLATIONS	
Electrical equipment voltage	48/12 V
Battery	24 pcs 2 V/225 A
Work lights	N/A
Heating and ventilation	N/A
OPERATING PARAMETERS	
Theoretical work cycle	10 seconds
Break-up force	8 kN
Lifting force	10 kN
Rated load capacity	400 kg
VOLUMES AND TYPES OF OPERATING FLUIDS	
Side gears	2 x 0.4 litres of oil EP ISO VG 150
Oil tank	40 litres of oil HV 32/HV 46/HV 68

19. DIMENSIONAL DRAWING OF THE MACHINE

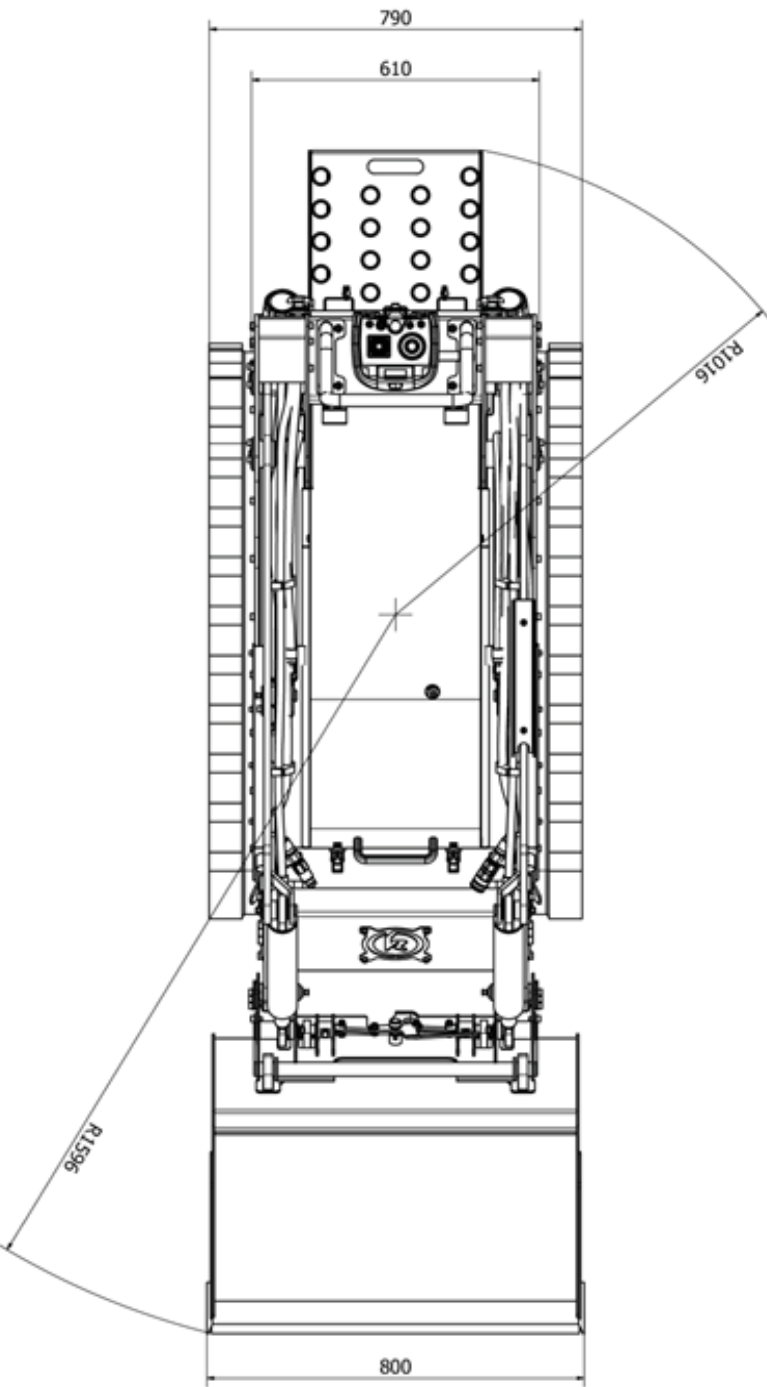
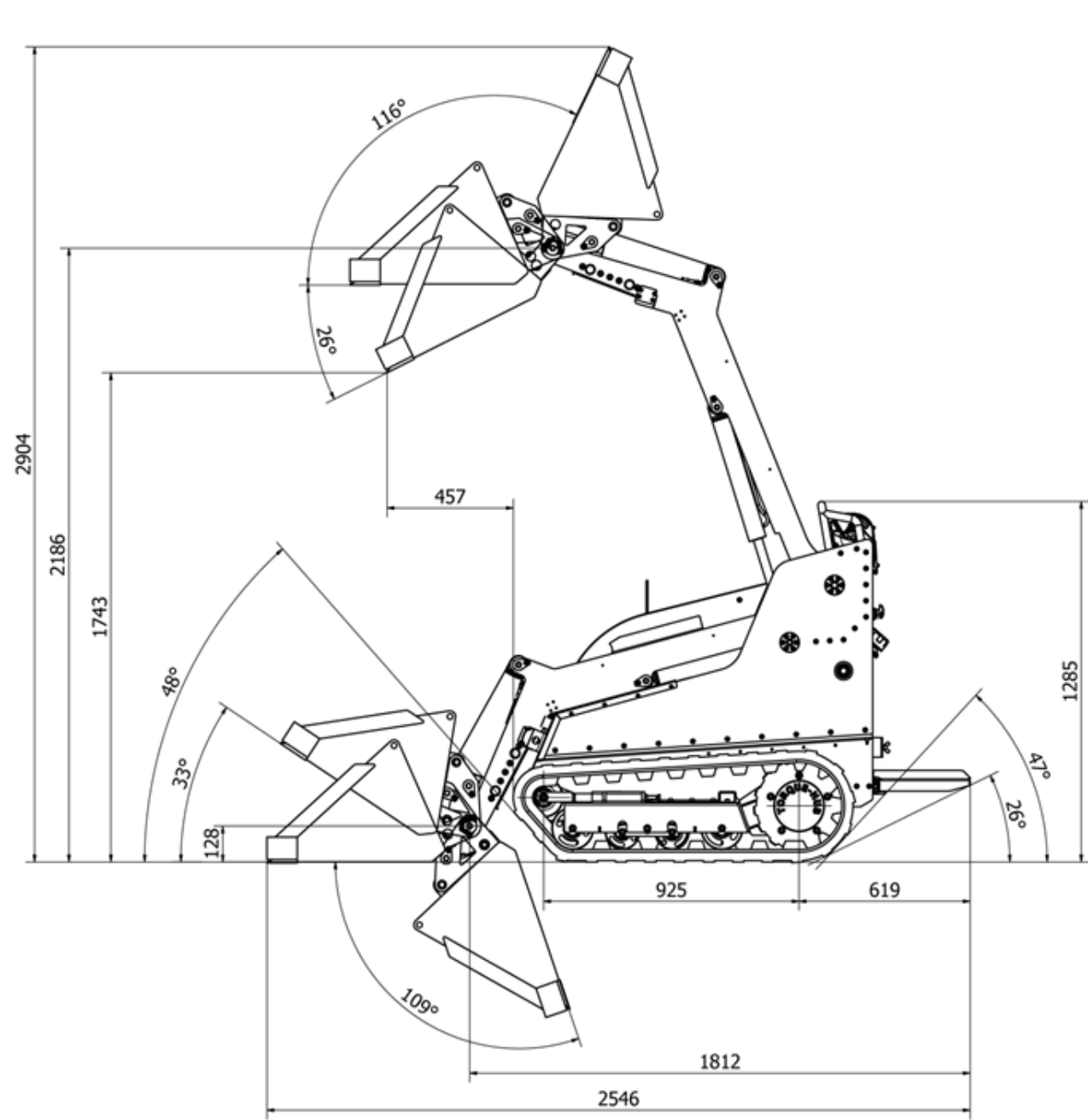


Figure 29

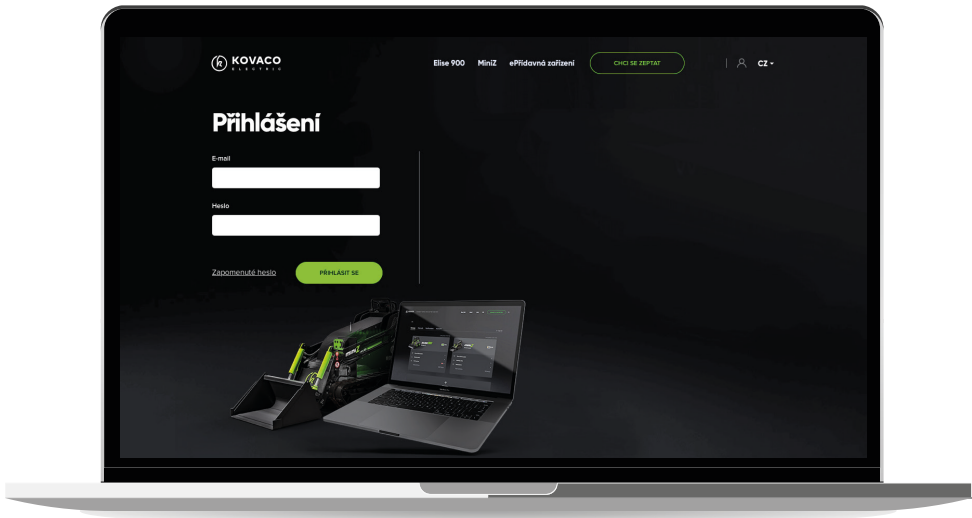
20. USER ACCOUNT

The Kovaco user account is used to manage Kovaco machines and their attachments. The account also includes administration of users and of individual authorizations to handle the machinery.

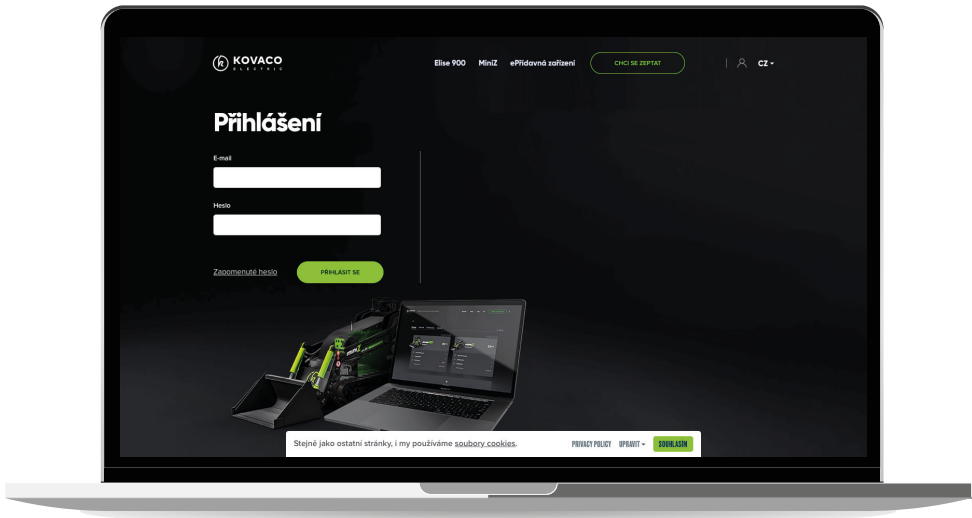
You can log in to the account via the link <https://www.kovacoelectric.com/cs/klient>

On the login page (Picture 12), enter the login details you chose when registering your machine. These are the same login details as for the Kovaco application.

If you do not know your login details, please contact your dealer. For a forgotten password, use the **Forgotten Password** option.



Picture 12 a – Kovaco user account login page



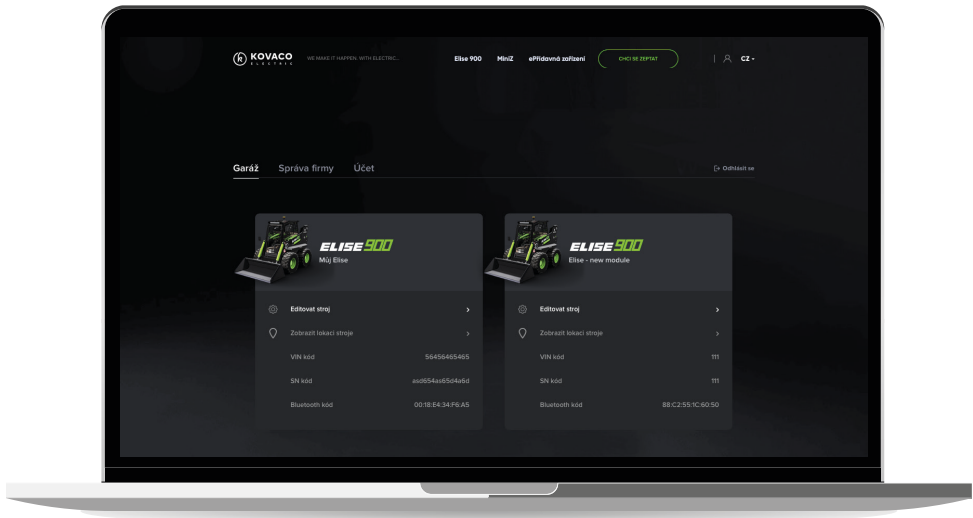
Picture 12 b – Kovaco user account login page with the Cookie bar

GARAGE SECTION

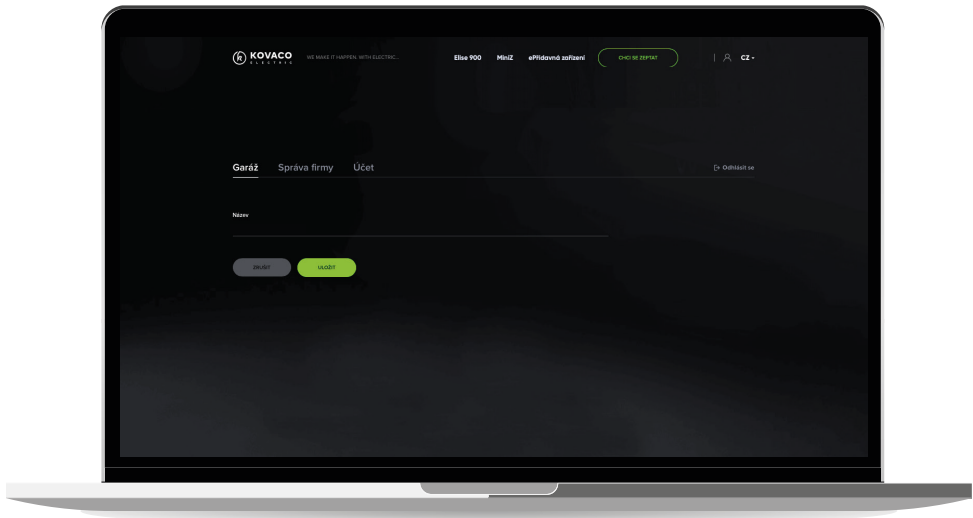
In the Garage you can see all your machines (Picture 13) and you can manage them. Click **Edit Machine** to change the name (designation) of the machine for better orientation between your machines (Picture 14).

Use the **Show Machine Location** option to find out where your machine is currently located.

For each machine, technical information is also displayed - VIN code, SN code and Bluetooth code.



Picture 13 – Garage section



Picture 14 – Editing the machine name

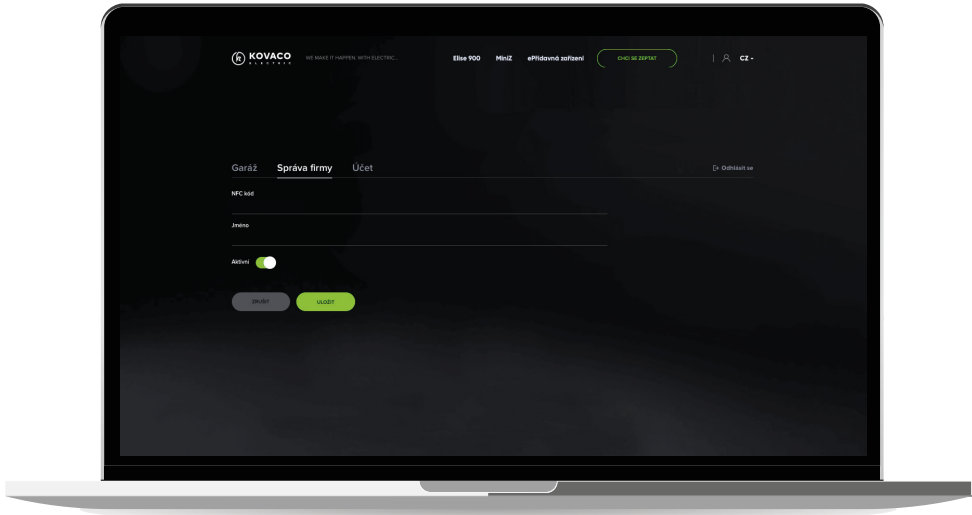
COMPANY ADMINISTRATION SECTION (Picture 15)

This section allows you to set up your company profile (Picture 16) and manage NFC chips, which are used to activate the machine in the application so that the driver can operate it. Several NFC chips may be available to operate a single machine.

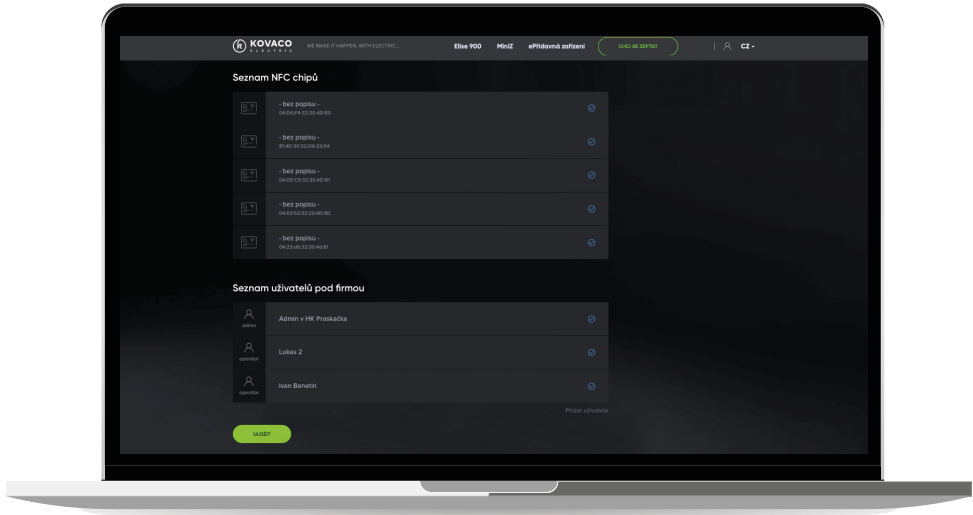
For each machine, you can see which chips are assigned to it (Picture 16), and their names can be changed for better orientation.

Further in the Company Administration section, you can also view a list of users (Picture 17) and their contact details.

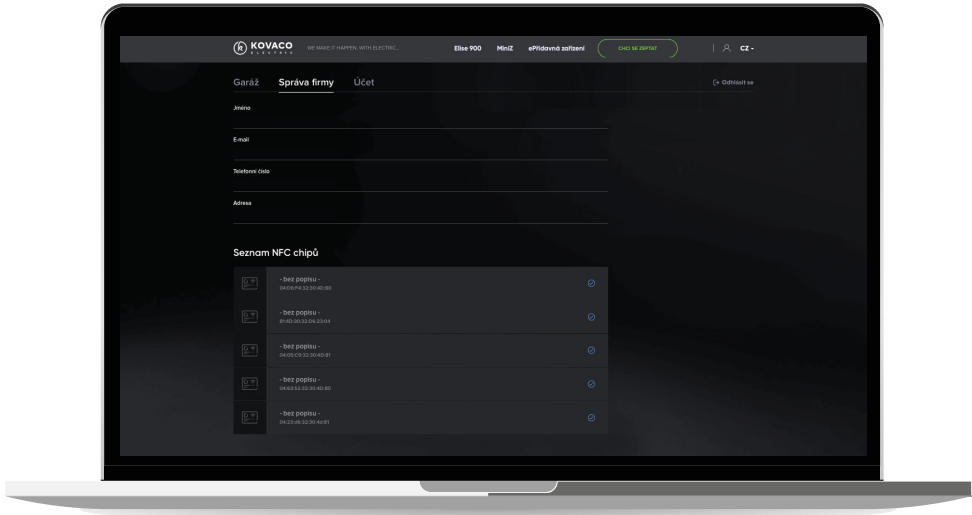
Here you assign to users machines (Picture 18) they are meant to operate and assign chips to be available to the users to operate the machines. Each user has an assigned role and has authorizations for adjusting/editing data in the user account set accordingly.



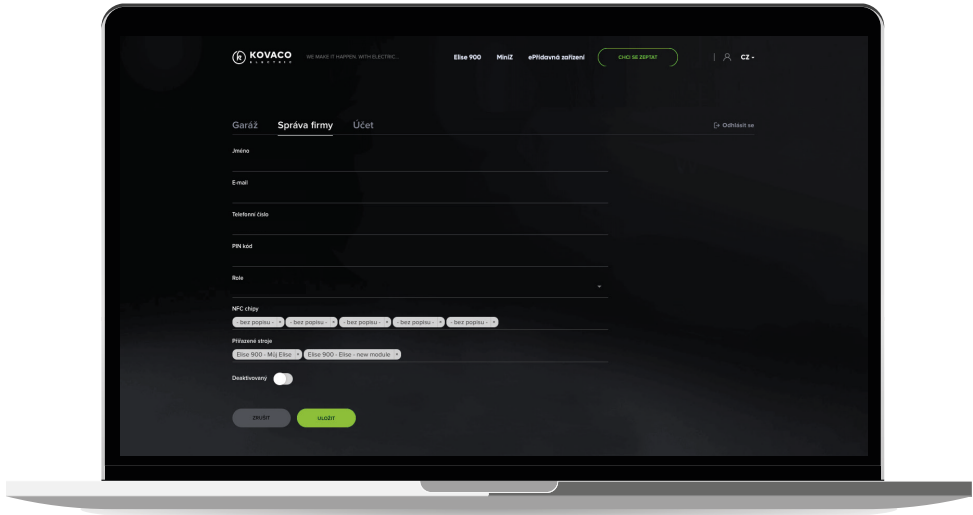
Picture 15 – Company administration



Picture 17 – List of users



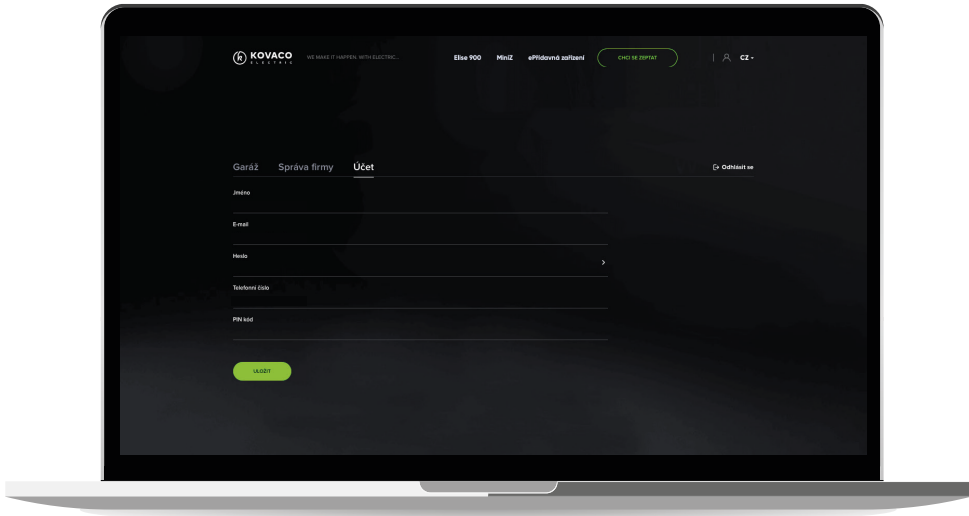
Picture 16 – Editing company administration



Picture 18 – Editing user

ACCOUNT SECTION

In the Account section, you set your user data. This section allows you to change the login details for accessing the user account.



Picture 19 - The Account section

NOTES

NOTES



KOVACO
E L E C T R I C

COPYRIGHT
KOVACO Electric a.s.

All rights reserved.