



MANTSINEN GROUP

DEEPSTABILIZATION- MACHINE

SS50 Machine 8910

OPERATINGMANUAL

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PLEASE PAY SPECIAL ATTENTION TO THESE ITEMS:

**DANGER!**

- Failure to comply with the instructions provided herein may lead to an accident resulting in serious injury or death.

**WARNING!**

- Failure to comply with the instructions provided herein may lead to serious material damage.

NOTE!

- Useful information.

TABLE OF CONTENTS

1	GENERAL	5
1.1	Main components of the machine	6
2	MACHINE SPECIFICATIONS	7
2.1	Environmental operating conditions	7
2.2	Materials and substances related to the machine's normal operation	8
3	FUNCTIONS OF THE MACHINE	10
3.1	Duties of the operator	10
3.2	Duties of the maintenance personnel	10
3.3	Machine access and work locations	11
3.4	Power transmission elements and moving parts	12
3.5	Operating controls	12
3.6	Protection	12
4	OPERATION	13
4.1	Instructions for using the base machine	13
4.2	Assembling the machine	13
4.3	Ground on which the machine is used	13
4.4	General	14
4.5	Starting	15
4.6	Driving on crawler tracks (long distances)	15
4.7	Lifting the mast	15
4.8	Lowering the mast down	15
4.9	Filling the binder tank	16
4.10	Driving the machine on to the transport carriage	16
4.11	Driving the machine off the transport carriage	16
4.12	Driving the machine	16
4.13	Driving on crawler tracks	16
4.14	Interruption of work due to storm wind	17
5	MAINTENANCE	18
5.1	Maintenance of the base machine	18
5.2	The effect of the changes made by Mantsinen on checks and maintenance	18
5.3	Maintenance intervals	19
5.4	Tools and spare parts	20
5.5	General cleaning	21
5.6	Cleaning before maintenance and repair work	21
6	SAFETY AND ACCIDENT PREVENTION	22
6.1	Checks that must be carried out on the machine	22
6.2	Manufacturer's instructions for the inspector	23
6.3	Official regulations	23
6.4	Commissioning	23
6.5	Training	24
6.6	Persons authorised to operate and maintain the machine	24
6.7	Work clothes and personal safety equipment	24
6.8	Cleanliness and good order	24
6.9	Information to be provided to those working with the machine	25
6.10	Items to be checked	25
6.11	Comments on adjustments, maintenance and repairs	25
6.12	Preventing risks during the use of the machine	26



6.13	Before starting work	26
6.14	Starting.....	28
6.15	During use.....	29
6.16	Parking the machine	32
6.17	Prohibited uses	33
6.18	Uses that require extra care.....	33
6.19	Preventing crushing accidents	34
6.20	Preventing burns, explosions and electric accidents.....	34
6.21	Hazards during maintenance	35
6.22	Only authorised persons are allowed to maintain the machine	36
6.23	Provision of information on repairs and maintenance	36
6.24	Lubricants, chemicals and hot or toxic substances	37
6.25	Lifting and supporting objects during maintenance	37
6.26	Working high up	38
6.27	Hydraulic system.....	38
6.28	Electrical system	38
7	IQAN -INSTRUCTIONS	40
8	STORING AND DISCARDING	48
8.1	Storing the machine	48
8.2	Storing the machine in the event of a storm.....	48
8.3	Discarding	48



1 GENERAL

NOTE!

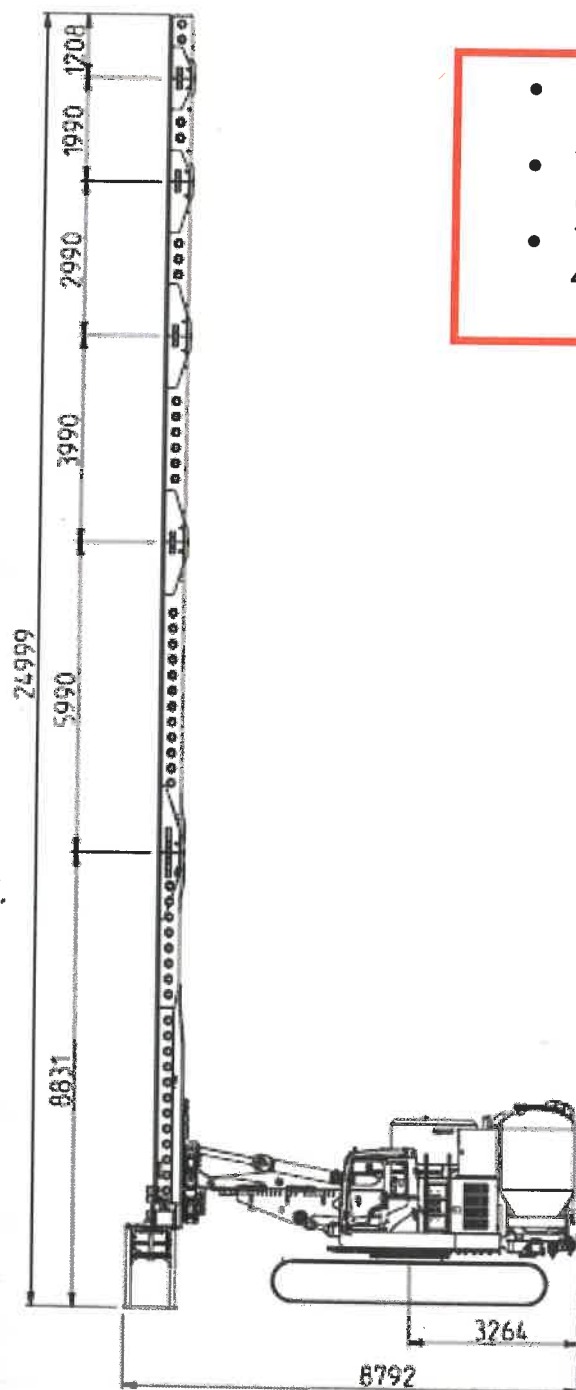
The following documents are also part of this manual

1. Operator's manual and maintenance instructions for the base machine
2. The machine's specification and other machine-specific documentation.
3. Machine-specific instructions regarding accessories, such as load control equipment, centralised lubrication, crawler tracks, etc.

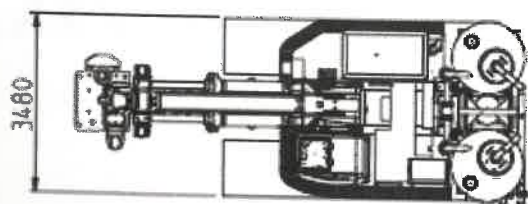
This manual includes the instructions for operating and maintaining the deep stabilization machine.

In this manual, deepstabilization machine is also referred to as the "machine". An excavator that has been converted into a deepstabilizationmachine is called a "base machine".

1.1 Main components of the machine



- Total mass of the machine, tanks empty is 33000 kg.
- Volume of the tanks 5.6 m³, capacity of binder 4700....7000 kg.
- Total mass of the machine, tanks full, 40000 kg.



2 MACHINE SPECIFICATIONS

An excavator's upper carriage is used as the main component for the machine.

The crawler tracks of the machine are specially designed for stabilization use.

The materials handling machine can be driven to work sites on its crawler tracks. However, the machine is not designed to be driven on public roads.

Use and capacity

- The machine is designed for the stabilization only. Other kind of use is prohibited.
- Passengers are not allowed in the cabin or platforms during operation. The machine must not be used to lift passengers.
- For more information, refer to the machine-specific documentation and the instructions supplied with the base machine.

2.1 Environmental operating conditions

- | | |
|------------------------------|--|
| • Working environment: | Stabilizationworksites. |
| • Ambient temperature: | -20°C ... +40°C |
| • Ambient relative humidity: | Normal outdoor relative humidity. |
| • Ambient pressure: | Normal air pressure. |
| • Corrosive conditions: | Painted machines withstand normal rain and washing with weak solvent/water.
Monitor the condition of the protective paint. Repair any damage caused to the painted surface and keep the machine clean to prevent corrosion.
In sea ports and in marine environments, where the conditions are harsher, it is recommended that the paintwork is checked and the machine washed more often to prevent corrosion. |
| • Lighting conditions: | Machine can be used on non-luminous enviroment with extra caution. The machine is equipped with work lamps to improve safety.. |
| • Ambient radiation: | The machine is designed to be used in conditions where there is normal background radiation. The machine does not emit harmful radiation to the environment. |



WARNING!

Special measures when the machine is used in operating environments with low or high temperature.

- The ambient temperature is measured with a mercury thermometer. The wind chill factor is not taken into account.
- The properties of oils used in the machine at low temperatures (hydraulic oil, transmission oil, motor oil, etc.) must correspond to the operating conditions, in accordance with the data given by the oil manufacturer, e.g. with regard to the pour point.
- In extremely cold conditions the hydraulic circuit of the driving engines requires additional heating, since the driving engines are located far from the upper carriage. Without additional heating the hydraulic oil may become too cold.
- The machine can be used normally when the operating temperature is above
 - -20°C.
- If the operating temperature is below -25°C, do not turn off the machine's engine, but keep it running (not idling).
- However, if the engine is turned off, keep the hydraulic oil and engine warm with an external heater designed for the purpose.
- If the engine is turned off in very cold conditions, for example, for the night, and there is no external heater, there is a risk that the entire machine will cool down so much that it cannot be reheated, even if the engine does start.

2.2 Materials and substances related to the machine's operation

- | | |
|--|--|
| • Materials that can be used as binder: | Cement, lime and gypsum |
| • Fuel: | Dieseloil. |
| • Other lubricants: | Motor oil, petroleum jelly, etc. |
| • Cleaning agents: | Water, mild solvents. |
| • The main materials used in the manufacture of the machine: | Steel, iron, other metals, glass and various rubbers and plastics. |
| • Emissions | <ul style="list-style-type: none">• Diesel exhaust gases, when the engine is running.• Diesel residues that remain in used fuel filters.• Waste oil and oil filters as a result of oil changes.• Small amounts of grease, oil and petroleum jelly that are removed during washing.• Binder feed into ground, Binderdust. |

**WARNING QUICKLIME!**

- Quicklime is highly reactive, and can cause damage in skin- and liningtouch. Inhaling of matter should be avoided. Use respirator and safety goggles. Bare skin must be covered with protective clothing. Keep outsiders away from workingarea.
- Quicklime drained on to ground must be covered with soil.
- In populous areas the worksite must be compound, to keep outsiders away from the worksite. If quicklime is used it must be noted with a warningsign.

3 FUNCTIONS OF THE MACHINE

- The machine can move and turn around on its own crawler tracks. The travel speed is low, approximately walking speed. The machine's upper carriage can be rotated 360° in relation to the lower carriage.
- Lifting the mast vertical from transport position
- Leaning the mast.
- Lifting up and layingdown the boom
- Extending of the boom
- Rod rotating and up- downmovement
- Feeding the binder

3.1 Duties of the operator

The machine is operated by one person, who must be trained and familiar with the functions of the machine. The duties of the operator are divided into the following main categories:

1. Stabilization process.
2. Driving the machine to move the machine.
3. Controlling the daily condition of the machine and, together with the supervisor, ensuring that the use of the machine causes no direct or indirect danger to people or damage to property.
4. Driving the machine to the transport carriage.

3.2 Duties of the maintenance personnel

The maintenance personnel are responsible for maintaining and repairing the machine to ensure its appropriate and safe use. For maintenance instructions, refer to the base machine's manual and the Maintenance section in this manual.

Maintenance includes the following items:

- Changing the oil and oil filters
- Manual lubrication
- Checking the tightness of bolt connections, as well as performing other checks
- Washing the machine
- Various repairs
- Responsibility for the safe and appropriate working condition of the machine at all times.

**DANGER!**

Standing on the maintenance platforms, the steps or anywhere else on the machine or standing in the immediate vicinity of the machine when the machine is in use is prohibited!

- It is strictly prohibited to stand on the maintenance platforms, the steps, on top of the machine or its crawler tracks when the machine is being used.
- It is strictly prohibited to use the machine if there is anyone on the maintenance platforms, the steps, the crawler tracks, on top of the machine or in the machine's immediate vicinity.

3.3 Machine access and work locations

The following components are used to access the machine:

- The cab steps and the platform outside the cab door.
- The machine's maintenance platforms and their steps.
- The special textured walkways on top of the upper carriage.
- The crawler tracks' upper surface.

The machine can be driven along the following routes and in the following areas:

- Stabilizationworksites
- On private roads and vehicle paths

**DANGER!**

- The ground on which the machine is to be used must be able to bear the total weight of the machine and its load.
- The ground on which the machine is to be used must be able to bear the total surface pressure caused by the machine and its load.
- The safety distance from the machine to people is 45m from the rotating centerin of the machine.
- It is forbidden to use the machine near electric power lines. The safety distance to electric power lines is 30m from the reach of the boom (33m). Total of 63 meters.
- It is forbidden to use the machine during a thunderstorm.

Work locations:

- The machine operator works in the cab. The cab door must be kept closed during work to prevent the operator from falling out of the cab.
- The machine's maintenance personnel work on parts that need to be maintained. The machine is equipped with maintenance platforms and steps to provide safe access to the parts to be maintained. Some of these parts may be located high and out of reach of the maintenance platforms. Separate scaffolding or ladders will be required to access such parts.

Accessing work locations:

- The operator must enter and leave the cab via tracks and platforms.
- The maintenance personnel must access parts to be maintained via maintenance platforms and their steps. The crawler track covers and the specially textured walkways on top of the machine's upper carriage can also be used for this purpose. Climbing on the railings of the maintenance platforms and steps or on surfaces that are not specially textured is forbidden.

3.4 Power transmission elements and moving parts

- The boom and mast system is controlled using pilot-controlled hydraulics.
- Both crawler tracks have hydraulic motor drives.
- The upper carriage's swing motor is a stepless control hydraulic motor.
- Rod rotating and up- downmovement are performed by hydraulic motors.
- Binderfeeding is performed by hydraulicmotor
- Compressor is equipped with hydraulicmotor.

3.5 Operating controls

- The boom and mast system, rotating of the uppercarriage and rod controls are performed with three joysticks. A placard in the cab indicates the movements controlled by the joysticks.
- The crawler tracks allow the machine to be driven forwards, backwards and turned. These operations are carried out either with two pedals. A placard in the cab indicates the directions of movement.
- For information on the other operating controls, refer to the base machine's manual or separate specifications.

3.6 Protection

- The supplier has installed the necessary heat and sound insulation material around the base machine's engine.
- The enclosed cab protects the operator from falling as well as from noise and the elements.

4 OPERATION

4.1 Instructions for using the base machine

For more detailed instructions on the use of the base machine and accessories, refer to the base machine and accessory manuals. Most operating, maintenance and other instructions relating to the machine have been given in these manuals.

NOTE!

- These instructions apply mainly to the components manufactured by Mantsinen.
- Should the instructions relating to the base machine be inconsistent with these instructions, follow the instructions of the base machine unless the inconsistency concerns a change made because of the components manufactured by Mantsinen.

4.2 Assembling the machine

The machine can be transported in a one piece (basemast attached) in working order.

NOTE!

- Follow the safety instructions relating to the assembly, commissioning, use and maintenance of the machine.

4.3 Ground on which the machine is used

Special requirements for the ground on which the machine is used:

- Bearing strength (see machine-specific surface pressures in the specification document)
- Ability to support the gross load (see the combined gross load of the machine and load in the specification document)
- The maximum inclination of the ground during lifting is 5°.
- Icy, snowy or in other ways slippery surfaces must be gritted before driving the machine onto the surface, or the skidding of the machine on an inclined surface must be prevented by some other means..
- The crawler tracks will damage the asphalt.

The materials handling machine must be on a level surface during operation to ensure work safety. Unless otherwise mentioned in the machine-specific instructions, the maximum inclination of the ground during lifting is 5° (five degrees).



DANGER!

If the machine is used on a surface with an inclination greater than 5°, it may tip over. If the machine tips over, it is dangerous to the operator and to anyone near the machine.

Make sure that the surface on which the machine is to be used has sufficient load-bearing capacity.

- The ground on which the machine is to be used must be able to support at least the total mass of the machine and the maximum load. For the total mass, see the machine specification document.
- Ensure the bearing strenght of the ground.
- If the surface is slippery (icy or snowy), grit it or ensure by some other means that the machine will not skid on the surface.

4.4 General

- The operator must enter and leave the cab via tracks and platforms. Do not enter or leave from the moving machine.
- Adjust the working position using the seat adjustments.
- Using the machine is allowed only from the operators seat.
- Only one person allowed to be in cabin during the use.
- Check the powerlines and keep the safety distances required.
- Clean the windows if needed.
- Adjust the mirrors.
- Keep the door and windows closed during the use.
- Confirm that no persons are in working area.
- Never start the machine or start working with the machine if you are not certain of its safety.

WARNING!

Allways keep the safety distances required.



- Safety distance to people is 43 meters with all mast extensions.
- Safety distance to powerlines is 63 meters.
- It is forbidden to use the machine during a thunderstorm..

DANGER!

People are not allowed on the maintenance platforms or the steps when the machine is being used.



- The operator may not see the maintenance platforms or their access steps from the cab. If the operator is in the cab during maintenance work, make sure that he/she is aware of the maintenance work before allowing anyone on to the platforms.
- The machine must be stopped if anyone attempts to climb onto the maintenance platforms.
- Anyone on the steps or the platforms is in danger of falling several metres.

4.5 Starting

- 1 In cold weather conditions use the webasto heater before starting the engine.
- 2 Adjust all hydraulic controls into HOLD-position.
- 3 Adjust hydraulic lock into LOCKED-position.
- 4 Start the engine.
- 5 Warm up the engine and hydraulic oil before starting work.
- 6 For more information, refer to the base machine's manual.

4.6 Driving on crawler tracks (long distances)

- Keep the mast in horizontal position when driving the machine
- For more information, refer to the base machine's manual
- When driving the machine long distances, drive so that the crawlers rotate forwards, with the crawler motors located at the back of the machine. In this way, the crawler plates function as designed.

4.7 Lifting the mast

- Before lifting the mast up ensure that
 - Machine is on flat and solid surface
 - Wind speed is under 20 m/s
 - If the machine is on a inclined surface, position the machine so that the surface is inclined to forward direction
 - The inclination to the machine side is dangerous during the uplifting
 - The inclination of the ground is under 5 degrees
 - There is no obstacles (powerlines, trees etc.) in way
 - There is no people inside safety area
 - Boom extension is in short position
- Lift the mast with slow and steady movement
- Observe also hydraulic hoses during lift
- Uplifted mast is imposed to vertical position
- Land the foot of the mast to the ground

4.8 Lowering the mast down

- Before lowering the mast down ensure that
 - Machine is on flat and solid surface
 - If the machine is on a inclined surface, position the machine so that the surface is inclined to forward direction
 - The inclination to the machine side is dangerous during lowering the mast
 - The inclination of the ground is under 5 degrees
 - There is no obstacles (powerlines, trees etc.) in way
 - There is no people inside safety area
 - Boom extension is in short position
- Lower the mast with slow and steady movement
- Observe the path of the mast during the lowering
- Observe also hydraulic hoses during the lowering

4.9 Filling the binder tank

- Use safety goggles, respirator and protective clothing during the filling.
- Fill up the binder tanks
- Observe the scale, do not overfill

4.10 Driving the machine on to the transport carriage

- It is recommended to use front loadable carriage for machine transportation
- Remove all extensions from the mast
- Check that carriage is on a flat and solid surface
- Use driving ramps when loading, maximum angle 15 degrees
- Switch off the AEC-switch to prevent sudden moves
- Turn the speed switch to LOW- position
- Attach transportbrackets into liftcylinders
- Switch the hydraulic lock to LOCKED- position
- Kun moottori pysäytetään, käännön seisontajarru kytkeytyy automaattisesti päälle, joka estää ylävaunun kääntymisen
- Attach the lower carriage to transportcarriage
- Attach the uppercarriage to transportcarriage
- Kiilaa kone teloista lavettiin
- Attach the mast to transportbracket
- Turn the mirrors to transport position
- Check the transport dimensions
- Also read and follow Volvo manual instructions

4.11 Driving the machine off the transport carriage

- Check that carriage is on a flat and solid surface
- Remove attachments
- Maximum angle of driving ramps 15 degrees
- Switch off the AEC-switch to prevent sudden moves
- Turn the speed switch to LOW- position
- Also read and follow Volvo manual instructions

4.12 Driving the machine

Driving the machine on a public road is not permitted.

4.13 Driving on crawler tracks

- When driving the machine long distances, drive so that the crawlers rotate forwards.
- The machine can be driven a short distance irrespective of the direction in which the crawler tracks rotate.
- When turning the machine, make use of the difference in speed of the crawler tracks. Do not stop a crawler track completely, and do not drive one crawler track in the opposite direction.
- Turn the machine using a maximum turning radius. Sharp turns wear out the crawler plates more quickly.

4.14 Interruption of the work due to storm wind

- Interrupt the work when the windspeed exceeds 20 m / s.
- Estimate the safety of the work as a whole, interrupt the work,
 - If the windspeed is under 20 m/s but causes intensive fading to mast
 - The features of the ground, such as gradient, together with wind can cause conditions to stop working
- If the storm interrupts the work, lower the mast down into transportation bracket.

5 MAINTENANCE

5.1 Maintenance of base machine

Follow the maintenance instructions given in the base machine's manual, which is supplied by the importer of the base machine. The instructions relating to the maintenance of a Mantsinen machine differ from the instructions in the base machine's manual only with regards to the changes made by Mantsinen.



DANGER!

Inform the operator of all maintenance work.

- The operator may not be able to see any maintenance platforms or their access steps. If the operator is in the cab during maintenance work, make sure that he/she is aware of that maintenance work is being carried out.
- Place a sign with the words "Maintenance, DO NOT START!" in a prominent position in the cab before commencing any maintenance work.
- The machine must not be used during maintenance work.

5.2 The effect of the changes made by Mantsinen on checks and maintenance

Changes made to Volvo base machine:

1	Changes made to the cabin	<p>The most significant changes in cabin:</p> <ul style="list-style-type: none"> • Added joystick for stabilization • Added IQAN user interface • Added PC • Added scaledisplay • Added inverter • Added console • Changed Volvo-joystick functions and added functions • Added Webasto console
2	Crawler tracks	Track specially manufactured for stabilization
3	Hydraulic components added to the machine	<ul style="list-style-type: none"> • Hoses and pipings changed • Hydraulicvalves added
4	Electric components added to the machine	<ul style="list-style-type: none"> • Added logic controlsystem for stabilizationprocess • Added automatic greasingsystem for feedingscrew • Added emergency stop switches • Added worklights • Added sensors • Bindertank filling switches added into back of the machine
5	Stabilization mast and booms	Excavator booms replaced by booms and mast made for stabilization

6	Bindertanks and feedingscrew	<ul style="list-style-type: none">• Added tanks and feedingscrew• Scalesensors under bindertank attachmentpoints
7	Counterweight	Counterweight removed, added accessoryframe for bindertanks and compressed air system.
8	Compressed air system	Added compressedair system, which includes, <ul style="list-style-type: none">• compressor• compressed airtank• bindertanks
9	Platforms and steps	Platforms and steps changed

5.3 Maintenance intervals

Daily maintenance/ check or every 8 h :

- Check the condition of electrical-wirings, -sensors and –components
- Check the condition of hydraulic and pneumatic hoses/ pipings
- Check cylinders for leaks
- Check and tighten loosen screw joints
- Check the function of automatic greasing device
- Check visually condition and function of the booms and the mast
- Check the function of emergency stop switches, and safety devices.
- Check the function of worklights
- Check the machine visually from all sides each day before starting work
- Follow the instructions given in the base machine's manual

Weekly maintenance/ check or every 40 h:

- Lubricate all targets equiped with greasenipples
- Clean airfilters
- Check the oil level of rod rotating gear and rod driving gear
- Check the calibration of tiltingsensori
- Follow the instructions given in the base machine's manual

Monthly maintenance/ check or every 160 h:

- Wash the machine if needed for the check.
- Check the structures of the booms and the mast (fatigue fractures and screwjoints). All fractures must be repaired or replaced with new part before using the machine.
- Check the condition of pins.
- Check the boom and cylinder attachment points from the base machine (fatigue fractures and screwjoints).
- Check the condition of compressed air tanks
- Check the condition of hydraulic and pneumatic hoses/ pipings.
- Check the condition of electrical-wirings, -sensors and –components.
- Check and if needed clean the batteryspace
- Check cylinders and valves for leaks

- Follow the instructions given in the base machine's manual

Yearly maintenance/ check or every 1000 h:

- Check that the condition of cabin is safe.
- Check the area of swinging centre (fatigue fractures and screwjoints).
- Check the platforms.
- Check the condition of trackframes and hydraulicmotors (fatigue fractures and screwjoints).
- Check the existence of manuals and markings.
- Follow the instructions given in the base machine's manual

Other inspections:

- Pressurevessel inspections must be done by regulations of authority.

5.4 Tools and spare parts

Use appropriate quality tools that are in good working order during the maintenance and repair work. Defective or inappropriate tools may damage the machine's components and may even cause personal injury.

Approved spare parts for the machine are supplied by Mantsinen Group Ltd Oy and the base machine's dealer.

5.5 General cleaning

Regularly clean the machine's frame structures, body extension, boom and arm system and the cab elevator's structures with water and a mild solvent.



WARNING!

- Unshielded electric equipment must be protected from water.

NOTE!

- Keep the machine clean, as dirt accelerates corrosion and makes it difficult to detect damage.
- A clean machine is good PR for its owner.

Keep the machine's steps, maintenance platforms and other walkways free from ice, snow and any objects that may cause the operator or maintenance personnel to fall.

5.6 Cleaning before maintenance and repair work

- Clean dirt and oil from connectors, wires, hoses and pipes before starting maintenance work. Use a mild solvent and a soft cloth for cleaning.
- Do not clean the machine with petrol or other flammable substances.
- Before starting to wash the machine, protect all sensitive components from water, solvent or steam and cover all openings through which cleaning liquid might enter and come in contact with sensitive components such as unshielded safety devices, electric motors, control cabinets and the battery compartment.
- After washing, remove all covers that are not part of the machine and check all fuel and oil hoses and pipes for abrasions, loose connectors and leaks. Repair any defects immediately.
- Clean the machine and keep the working environment free from dust, oil and flammable materials. Protect the machine's flammable components before carrying out any work that requires high temperatures.
- Do not wash a new or newly painted machine for at least two months.

6 SAFETY AND ACCIDENT PREVENTION

Operators and maintenance personnel must observe the following safety instructions to ensure the safe use and maintenance of the machine. The machine is safe when it is properly used and maintained and all the required precautionary measures are taken. Failure to observe these instructions during the use or maintenance of the machine may lead to serious injury or death. To use the machine correctly, the instructions provided in this manual and in the base machine's manual must be followed. In addition, the checks and maintenance work, described in the maintenance instructions, must be carried out at the specified intervals.

NOTE!

Operators and other persons responsible for the machine must familiarise themselves thoroughly with the machine's operating, maintenance and safety instructions. All these instructions must be understood and observed.

- Follow the safety instructions carefully to be able to use and maintain the machine safely and to prevent injury to people and/or damage to the machine.
- Henkilöiden tai muun kuorman kuin sideaineen kuljettaminen säiliössä ei kuulu koneen käyttötarkoitukseen ja on siksi kiellettyä. Ainoastaan ohjaaja saa olla liikkuvan koneen kyydissä.
- The manufacturer and the dealer of the machine are not responsible for any damage caused by the machine. The machine operator bears total responsibility for any damage caused by the machine.
- The appropriate use of the machine is specified in section 2 Machine specifications. Using the machine for purposes other than those specified in section 2 is forbidden.
- In addition to these safety instructions, the workplace and local safety regulations and statutory rules must be obeyed.
- If the machine is to be used for special purposes, separate special instructions must be observed and the machine must be equipped with the appropriate safety devices designed for the use in question.

6.1 Checks that must be carried out on the machine

The following checks must be carried out on the machine:

- checks specified in the base machine's manual,
- checks specified in the Mantsinen manuals, and
- checks in accordance with valid official regulations.
 - Note. Bindertank is a pressure vessel.

INFO!

- If the machine is subject to more than one inspection requirement, it is worthwhile having all the inspections carried out at the same time, usually once a year
- Even if no national inspection requirement applies to the machine, the inspections specified in the instructions supplied by the manufacturer of the base machine and Mantsinen Group Ltd Oy are the minimum inspections that must be carried out.

6.2 Manufacturer's instructions for the inspector

The operator of the machine is responsible for the machine's safety. Even if no national inspection requirement applies to the machine, proper maintenance and the annual condition inspection required by the base machine's manufacturer and Mantsinen Group Ltd Oy must be carried out. A record of the annual inspection must be kept. The name of the inspector and the items inspected must be indicated in the record. Any defects or faults detected must be recorded and repaired as required.

6.3 Official regulations

In every country the local legislation regarding inspections must be observed.

NOTE!

- Make sure that the inspector is qualified for the job.
- The Finnish legislation, for example, sets certain competence requirements for the inspector.
- The Finnish legislation also requires that the inspection records must be kept on file for a certain period.

6.4 Commissioning

- Read the machine's operating, maintenance and safety instructions before starting to use or maintain the machine.
- If the machine includes special equipment, make sure that the instructions for using this equipment have also been provided. These instructions must be read, understood and observed.
- Test and, if necessary, adjust all the machine's functions before commissioning to ensure that they work in accordance with the instructions.

WARNING!



- After the machine has been assembled or after any alterations have been made to the machine and before accepting the machine for use, check that the machine functions correctly by operating all controls in all operating directions and by testing all the safety equipment.

- Check all the oils, liquids, lubricants, etc..
- The machine is equipped with an audible signal to warn people when the machine is moving, check that the signal functions when the machine is driven.
- Check that the fire extinguishers are in their correct places, are ready to be used and that they have been inspected.
- Check that all the required shields, covers and railings are securely attached.
- Check that the ground on which the machine is to be used satisfies the requirements for durability, surface pressure endurance and level as specified in this manual.
- Follow the instructions given by the owner of the machine as to the commissioning of the machine.
- Take into account the official regulations relating to e.g. machine inspections (see section 6.1).

6.5 Training

- An experienced operator/member of the maintenance personnel must train new operators/members of the maintenance personnel to operate/maintain the machine. The training must include familiarisation with the technical documentation relating to the machine as well as practical instruction. All operators and members of the maintenance personnel must study and understand the technical documentation supplied with the machine.
- The duration of the training period is up to the instructor. However, new operators/members of the maintenance personnel must learn to use/maintain the machine safely during the training period.
- Do not allow untrained or insufficiently trained persons to operate or maintain the machine without the supervision of an experienced operator/member of the maintenance personnel.

6.6 Persons authorised to operate and maintain the machine

- Only trained persons who have been authorised by the employer and familiarised with the machine are allowed to operate/maintain the machine.
- Check that the operator/member of the maintenance personnel is old enough to operate/maintain the machine.
- Check that the operator/member of the maintenance personnel is able and fit enough to carry out his/her allotted tasks.
- It is strictly forbidden to operate/maintain the machine under the influence of alcohol or drugs.

6.7 Work clothes and personal safety equipment

- The machine operator, maintenance personnel and anyone working near the machine must use appropriate, safe work clothes.
- Those working outside the machine must use hearing protectors.
- In cold weather wear warm clothes to prevent frostbite.
- Do not use loose clothes, such as unbuttoned shirts, or hanging accessories such as scarves or ties when working near the machine. If such items become entangled in the machine or a part of the machine, the result can be serious injury or death.
- Some work may require the use of personal safety equipment, such as a helmet, safety shoes, goggles, protective gloves or a safety harness.
- Use work shoes with effective anti-slip soles and working gloves that provide a good grip. When working on top of the machine, a slip may lead to a fall from a considerable height.

6.8 Cleanliness and good order

- Keep the cab, steps, maintenance platforms and railings free from dirt, ice and other materials and objects that may cause personnel to slip or fall.
- The operator must keep the windows, mirrors and, when working in the dark, the lamps clean for good visibility.
- Keep the machine clean because dirt makes it difficult to detect any damage and accelerates corrosion.

6.9 Information to be provided to those working with the machine

- The operators and the maintenance personnel must know the locations of fire extinguishers and must be able to use them.
- The operators and the maintenance personnel must know the people responsible for the use, maintenance and repairs of the machine as well as for equipment installation and other work carried out on the machine.
- The supervisor must specify the duties of the operators, maintenance personnel, loading assistants and others working with the machine and must make sure that they all understand their responsibilities.
- The machine operator, maintenance personnel and everyone working near the machine must be familiar with the work safety regulations when working on the machine.
- The supervisor must advise the operators not to carry out potentially dangerous tasks nor to follow any instructions from an unauthorised person.
- The supervisor is responsible for ensuring that all necessary maintenance, installation and repair work is carried out. The supervisor must name a person to be responsible for each maintenance, installation or repair task and must make sure that the tasks are carried out at the correct intervals and in accordance with these instructions.
- The operator must contact his/her supervisor if he/she notes that a new safety device is required.
- The supervisor must be immediately informed of any faults detected and any repairs and maintenance work required. All faults must be repaired immediately.
- Before starting any maintenance work, place a prominent sign with the words "DO NOT START" on the ignition lock and remove the ignition key from the lock.

6.10 Items to be checked

- Check that there is no direct or indirect danger to people, animals or property when the machine is used.
- When driving the machine, check that the ground can withstand the machine's weight for the whole route.
- Site supervisors must check that the operating, maintenance and safety instructions are observed and that work is being carried out safely.
- Check the tightness and condition of bolts whenever the machine is being maintained.
- Regularly check the machine structures for fatigue fractures and other damage.

6.11 Comments on adjustments, maintenance and repairs

- The machine is initially set up during assembly and/or commissioning. Subsequent adjustments must be carried out at regular intervals, often enough to ensure safe working conditions.
- Follow the maintenance instructions provided in this manual in section 5 **Virhe. Viitteen lähdettä ei löytynyt.** and in the base machine's manual.
- If any adjustment or maintenance work is to be carried out high up, use appropriate safety equipment.
- If no special instructions are provided for a specific maintenance or repair task, proceed as follows:
 - Park the machine on a firm, horizontal surface.
 - Set all controls to their neutral position.

- Turn off the engine.
- Leave the ignition key in the ON position only if you need to have the electrical system on.
- Depressurise the control, steering and power hydraulic systems before starting any repair or maintenance work on hydraulics. If no special instructions are provided, proceed as follows:
 - Turn off the engine.
 - Leave the electrical system on.
 - Make sure that the pilot control lever is switched on.
 - Move the hydraulics control levers in the different control directions several times.
 - Switch off the power.
- Do not remove, change, replace or add any machine components or settings that may affect the machine's safety without written permission from the manufacturer and without proper instructions. This also applies to the installation and adjustment of safety devices and all welding and modification work on the machine's bearing elements and blocks.
- Do not install any accessories or parts in the base machine without written permission from the base machine's manufacturer.
- Do not install any accessories or parts in the materials handling machine without written permission from Mantsinen Group Ltd Oy.
- Do not install any such accessories or parts in the materials handling machine that would change the machine's functions from its intended use. For the intended use of the materials handling machine, refer to section.

6.12 Preventing risks during the use of the machine

6.13 Before starting work

- Familiarise yourself with the regulations and practices applied in your workplace and make sure that you know who is responsible for what.
- Familiarise yourself with the work site before starting work. Pay attention to any special obstructions and hazards that may affect work on the site..
- Before use of the machine:
 - check that the ground is smooth, horizontal and firm and check its bearing capacity
 - powerlines
 - buildings
 - underground electric-, gas- and fluidpipes
 - trees
- Find out about the traffic on the site, the hand signals and the safety signs used. Check whether new signs are required to control traffic.

Before entering the cab

- Check the machine visually from all sides for any loose bolts, fractures, worn parts, leaks and signs of vandalism before starting the machine. Check that the machine is in safe working condition.
- Check that all the machine doors and hatches are safely closed and that all warning signs and labels are in place and readable. Check that the hearing protectors are in place and in working order.



- Check that no one is under or on top of the machine, in the engine compartment or in the machine's immediate vicinity before starting work. Note all safety distances.

Climbing to the cab

- Avoid carrying tools, spare parts or other equipment with you when climbing into or leaving the cab. Ask a colleague to hand you or to take equipment from you when you are in the cab.
- Never use the pilot control lever or the controls as handles and never hang anything from them.

In the cab

- Adjust the seat, mirrors and controls. Check that all controls are easy to reach.
- If necessary, clean all windows and mirrors for good visibility.
- Secure the doors, windows and hatches so that they cannot open or move accidentally during work.
- Fasten the seat belt if there is one.
- Never start the machine or start working with the machine if you are not certain of its safety.

6.14 Starting

Before starting

After you have carried out the procedures given in section 6.13:

- Check that the warning lights and gauges function properly.
- Note that the engine should only be started outdoors or in a building with efficient ventilation.
- Set all controls to their neutral positions. Keep the pilot control switched off.
- Before starting the machine, sound the horn.
- Start the engine.
- Follow the appropriate workplace regulations.
- For more information, see the base machine's manual.

After starting

- Engage the pilot control lever and check that the gauges, warning lights, safety devices and controls function properly.
- Check that the machine's attachments function properly.
- Use the machine with special care until the hydraulic system has reached its working temperature. If the hydraulic system's temperature is low, the machine's functions are slow and unstable.
- Check that the safety equipment functions properly.
- Drive the machine to the work site and check that the controls, driving and braking functions, lamps and hazard lights function properly.
- For more information, see the base machine's manual.

Starting after maintenance and repairs

- Check the tightness of all bolts that were loosened during maintenance.
- Check that all hydraulic hoses and electrical cables have been connected correctly.
- Check that all parts that were disconnected or removed during maintenance have been re-installed correctly.
- Start the machine as instructed above.
- Test all the steering and control movements, and verify their proper operation before starting work with the machine.



WARNING!

There may be air in the hydraulic system after maintenance.

- Some air may get into the hydraulic system during maintenance.
- Any air trapped in the hydraulic system during maintenance may make the machine function incorrectly.
- Remove the air from the hydraulic system before starting to work with the machine by moving all cylinders several times through their complete ranges of movement. Care must be taken when removing air from the system.

6.15 During use

- Do not carry passengers in the cab or elsewhere on the machine.
- Operate the machine from the driver's seat, with the seat belt fastened. Remain seated whenever the machine is moving.
- Do not leave the machine when the engine is running.
- When driving the machine, keep the upper carriage parallel to the lower carriage. Take into account the height of the machine and of the boom system when passing under bridges, electric power lines etc.
- Always disengage the pilot control lever, if you carry out other movements except those related to controlling the machine; for example, when taking off your coat or turning backwards in your seat.



DANGER!

Cardiac pacemakers may not work properly in the cab.

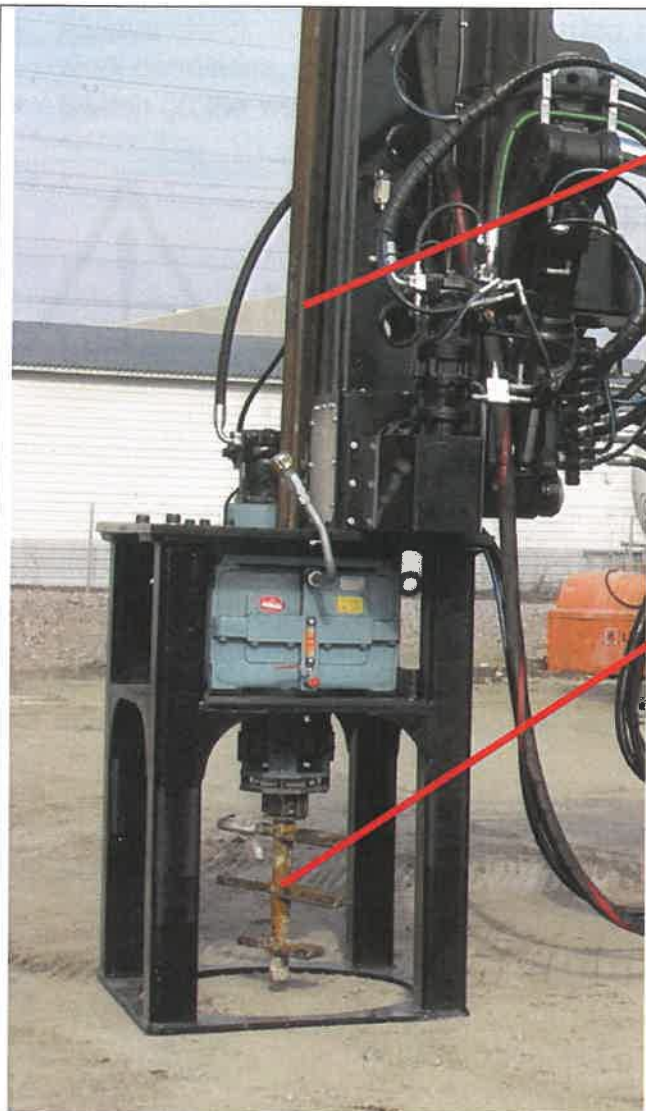
- Do not enter the cab if you are using a cardiac pacemaker. The equipment in the cab may cause the pacemaker to malfunction.



DANGER!

Long hair and clothes may become entangled in machine components.

- Long hair or clothes may become entangled in the machine's moving components. This can cause serious injury or death.
- If you have long hair, tie it up or protect it so that it cannot become entangled in the machine or its moving components.

**Warning!**

Long hair, clothes and limbs may become entangled in rotating rod. Keep out of reach of rotating rod.

Warning!

Long hair, clothes and limbs may become entangled in rotating rod. Keep out of reach of rotating rod.

**DANGER!****Do not overturn the machine.**

- Use the machine only on a flat horizontal surface.
- Do not make any steering movements that may overturn the machine.

- Make sure that when the machine is used or moved it causes no hazard to anyone.

**DANGER!****Do not let the mast hit the cabin.**

- Perform the mast uplifting and lowering with slow and steady movement, observe the path of mast to prevent hitting the cabin.







- Always check that work can be carried out safely whenever there is a change in the work conditions, such as the terrain, visibility or weather.
- Switch on the work lamps if it is dark or if the conditions demand lighting.

**DANGER!****Maintain safety distances.**

- The safety distance from the machine to people is 43m.
- The safety distance from the machine to electric power lines is 30m from the reach of the boom 33m, total safetydistance 63 meters
- Do not move the machine on to or to the vicinity of soft ground or other surfaces that may sink or yield under the machine's weight.
- Extra care must be taken if there are oil, chemical or gas tanks or pipelines near the machine.
- Using the machine in a thunderstorm is prohibited.
- If you are not sure about the safety distances, check them with your supervisor or the person responsible for safety distances.

- Anyone on the maintenance platforms or near the machine is in danger of falling or becoming crushed when the machine is moved or operated.
- No one is allowed on the personal access or maintenance platforms, the steps or in the immediate vicinity of the machine when it is in operation.

DANGER!

People standing on the machine are in danger of falling or being crushed.

Anyone standing in the immediate vicinity of the machine is in danger of being crushed.

Passengers are not allowed in the cab elevator nor on the outside of the machine when the machine is in operation.

Maintain safety distances.

- Anyone on top of the machine / on the maintenance platforms is in danger of:
 1. falling from a considerable height
 2. becoming crushed
- Anyone near the machine is in danger of:
 1. getting run over by the machine
 2. getting hit by flying dirt and binder
 3. becoming crushed between a crawler track

6.16 Parking the machine

- The machine may be parked only on a horizontal surface that can withstand its weight.
- Lower the mast down to transport bracket.
- Set the machine controls to the neutral position.

Turning off the engine

- Turn off the engine in accordance with the instructions given in the base machine's manual.
- Let the engine idle long enough before turning it off.
- Switch off the pilot control before leaving the driver's seat.
- Switch off the logic controlsystem.

Leaving the cab

- The pilot control must always be switched off before leaving the driver's seat.

- Close and lock the cab windows and take all other necessary measures to protect the machine from vandalism. Do not leave anything valuable in the cab. Take all the keys with you and lock the door behind you. The keys must be kept in a safe place where no unauthorised persons can gain access to them.
- Use the steps to climb down from the cab. Do not jump down.

In an emergency

- Use the emergency switch if necessary, for example if there is a direct danger.
- Use the cab window as an emergency exit if necessary.

6.17 Prohibited uses

- The machine must not be used to lift people. No passengers are allowed in or outside the cab (for example, on the cab steps).
- No one is allowed on top of the machine, on the maintenance platforms or the maintenance steps when the machine is being used.
- The operator must not use the machine if there are people within the safety distance. The safety distance to people is 43 meters.
- It is prohibited to use the machine near live overhead electric power lines. The safety working distance from electric lines is 30m from the reach of the mast.
- The machine must not be used if it is defective.
- It is strictly prohibited to use the machine under the influence of alcohol, drugs or medication.
- It is prohibited to use the machine in a thunderstorm.
- Do not change the machine's settings, install or adjust any safety devices or carry out any welding work on the machine's bearing elements or blocks without written permission from the manufacturer and without proper instructions.

6.18 Uses that require extra care

- The operator must take extra care if there are gas or fuel tanks or pipelines within the machine's operating range.
- Note that the steering movements of travel functions are opposite if the upper carriage has been rotated by 180°.

**DANGER!****No one is allowed near the towing cable!**

- When handling cables, wear safety gloves and appropriate work clothes to protect yourself from being injured by cable strands.
- If the machine is being towed with a cable or if the machine tows another machine, keep well away from the taut towing cable.
- If a towing cable breaks, it can separate at a very high speed. A broken cable may cause serious injury if it hits someone

**DANGER!****Risk of falling!****Take extra care when working on top of the machine or on the maintenance platforms.**

- Henkilötasoilta ja koneen päältä on korkealta putoamisen vaara.
- Noudata aina suurta varovaisuutta kun liikut koneen päällä tai huoltotasoilla.
- Kun työskentelet korkealla, käytä tarvittaessa turvavaljaita.

**WARNING!****Removing a protective shield or a cover may expose you to danger.**

- Dangerous components that can cause injury by crushing, cutting or electrocuting have been protected with shields, covers or hatches. The covers also decrease the noise level.
- Keep the shields, covers and hatches in place. They should be removed only for maintenance or repair purposes. Replace the hatches and covers as soon as the maintenance or repair work has been completed.
- It is prohibited to use the machine with the covers removed or the hatches open.
- Extra care must be taken if a hatch has been opened to carry out maintenance or repair work.

6.19 Preventing crushes accidents

- Always use gloves when handling the load or machine components.
- The hoisting device must not be moved or positioned by hand.
- Do not put your limbs between the shanks or cylinders, in apertures or in other places where they could be crushed or cut if the machine moves accidentally.
- Never use your hands or fingers to inspect the alignment of locking pin holes. Use the appropriate tools.
- Make sure that the doors and hatches of the engine and battery compartments are locked in the open position before starting work in the engine or battery compartment.
- Beware of any fans and other devices that start automatically. Never put your limbs between them.
- Do not place any loose parts near the radiator fan or other rotating components. They may shoot out if the fan starts suddenly.
- Never go under a raised or supported machine component or near the side to which it would fall or tilt, unless the component has been securely supported in the raised position.
- Do not work under a raised hoisting device or the cab elevator unless it has been securely supported.
- Fasten all hoses and cables to the machine structures with cable ties to prevent people from tripping over them.

6.20 Preventing burns, explosions and electric accidents

Preventing burns:

- Do not touch machine parts that contain hot liquids. For example, coolant is extremely hot and pressurised after it has completed a cooling cycle, and may cause burns.
- Do not open the radiator cap until the system has cooled sufficiently. Open the cap slowly to safely release any pressure.
- Do not touch hot oil and beware of splashing oil. Do not touch parts that contain hot oil. Hydraulic and motor oils that have reached or are close to the working temperature are hot and may be pressurised.
- Always use goggles and gloves when working on the batteries. Open fire, sparks and smoking are not allowed near the batteries. Do not breathe in the fumes emitted by the batteries.

Prevent the risk of accidents:

- Always use the proper starting method. For starting instructions, refer to the base machine's manual.
- The ether that is used for cold starting is highly flammable. Do not use or store ether near an open fire or in a hot place and do not smoke when using ether. Follow the instructions given by the ether manufacturer and provided in the base machine's manual. Do not pre-heat the engine if you are using ether.
- Turn off the engine before refuelling.
- Smoking and starting open fires are absolutely prohibited in the refuelling area, in the rooms where batteries are stored or recharged and near flammable materials.
- Do not keep flammable materials, other than those needed, in the machine.
- The machine's fire extinguishers must always be in their correct places and must be inspected in accordance with the safety regulations. Make sure that you know their locations and how to use them.
- Familiarise yourself with the fire-fighting regulations of the work site and find out how to give a fire alarm if necessary.
- Check that all fasteners, protective covers and thermal insulators are in place. These elements prevent vibration, wear and unintentional heat loss.
- Check the electrical system regularly. Immediately repair all malfunctions, such as loose connectors, worn conductors and blown fuses and remove the causes of the malfunction.
- Check all oil and fuel pipes and hoses for leaks and defects. Replace any defective parts immediately. Oil and fuel leaks pose a serious fire and explosion risk.
- Do not use petrol or other flammable substances to clean the machine.
- Use cable ties to fasten the hoses and cables securely to the machine structures to prevent abrasion and people tripping over them.
- Remove all dirt and flammable materials from the machine and its surroundings before starting work such as welding, flame cutting or sanding. Make sure that the ventilation is sufficient and protect any flammable materials and unshielded flammable components from the heat and sparks.
- Maintain a sufficient safety distance from electric power lines.

NOTE!**If the machine touches a live electric power line, proceed as follows:**

- Do not leave the cab. The cab's metal case protects you.
 - If possible, drive the machine away from the power line and move it sufficiently far from the hazardous area. If this is not possible:
 - Warn everyone near the machine of the danger. No one must touch the machine or come too close to it.
- Ask a work colleague to switch off the power of the power line that the machine is in contact with.
- Do not leave the cab until you are absolutely certain that the power has been switched off.

6.21 Hazards during maintenance

- Unauthorised persons are not allowed near the machine when maintenance or repair work is being carried out. Close off the maintenance area if required for safety reasons.
- Maintenance work should be carried out only when the machine is standing on a firm, horizontal surface.

- Always turn off the engine before starting maintenance or repair work unless it is necessary to leave the engine running in order to be able to carry out a check, maintain the machine or make an adjustment.
- Follow the maintenance and safety instructions given in the base machine's manual.
- When the maintenance or repair work has been completed, check that all bolts and connectors that were loosened during the maintenance or repair work have been properly re-tightened.
- Reinstall all safety devices that were removed during the maintenance or repair work and check that they function properly.
- Observe the maintenance intervals specified in this document, in the base machine's manual and in your workplace.
- Use only appropriate tools that are in good working condition. Inappropriate or defective tools may damage the machine or cause injury.
- Use appropriate work clothes and the required personal safety equipment.

**DANGER!**

The rotating engine fan may cut or crush a limb between the blades and may eject objects left in the fan at high speed.

- Never put your limbs between the fan blades, even when the fan is not working.
- Never leave any tools or other loose objects in or near the fan.
- Keep the fan housing in place at all times. Remove the housing only for maintenance and repair purposes.
- Extra care must be taken when working near the fan

6.22 Only authorised persons are allowed to maintain the machine

- Follow the instructions given in this document, the base machine's manual and in your workplace. In addition, obey all official regulations concerning the persons authorised to carry out maintenance and repair work.
- The operator is allowed only to carry out daily and weekly maintenance work that does not require any special training or qualifications. Only trained persons with the required qualifications are allowed to carry out special maintenance work.
- Only specially trained, experienced and authorised mechanics are allowed to maintain and repair the machine's power transmission, brakes, hydraulic system, electrical system and control system.
- Do not carry out any maintenance or repair work for which you are not trained and authorised.
- Do not carry out any maintenance or repair work that you are not able to do. You must always know what you are doing.

6.23 Provision of information on repairs and maintenance

If the operator notices that the maintenance personnel have omitted to do certain repairs or maintenance tasks, he/she must inform his/her supervisor or the person responsible for maintenance.

Before starting maintenance or repair work:

- Place a sign with the words "DO NOT START" on the ignition lock.
- Remove the key from the ignition lock.

- If necessary, inform the operator and the person responsible for work that the maintenance work is being carried out.

After completion of the maintenance work:

- Remove the sign with the words "DO NOT START" from the ignition lock.
- Insert the key into the ignition lock or return it to the operator.
- If necessary, inform the operator and the person responsible for the work that the maintenance work has been completed.
- Record the maintenance work done in accordance with the practice followed in your workplace.

6.24 Lubricants, chemicals and hot or toxic substances

- Follow the instructions regarding the handling of lubricants, greases and other chemicals.
- Make sure that the recovery and disposal of used liquids, oils and spare parts is carried out in accordance with safety and environmental regulations.
- Handle hot oils and other hot liquids with care.
- Only use the machine outdoors or in a building with efficient ventilation. Check before starting the engine that the ventilation is sufficient. Observe workplace and local regulations and instructions.

6.25 Lifting and supporting objects during maintenance

- Do not lift heavy objects by hand. Use proper hoisting equipment that has sufficient load-bearing capacity. Fasten the parts to be lifted securely to the hoisting device before lifting.
- Do not stand nor let anyone else stand under a load that has been lifted with a hoisting device.
- Never work under the machine or any of its parts if it is only supported with the hoisting device. Secure the machine or the part to be maintained with an external support. Do not use supports that maintain their position by friction and in which one metal surface is against another metal surface.
- If you have to work under or near a raised boom or cab elevator, use a secure external support to prop it up. Do not use supports that maintain their position by friction and in which one metal surface is against another metal surface.
- Lifting the machine or its parts with a hoisting device may cause the machine or its parts to tilt or fall over. Care must be taken when lifting the machine or its parts.

6.26 Working high up

- Some parts that require maintenance are located high up.
- Always use secure scaffolding or maintenance platforms when carrying out maintenance work high up.
- Do not climb on the machine. Use the machine's own access steps or maintenance platforms or external ladders or platforms.
- Use safety ropes and a safety harness when working high up.
- Check that all steps, handles, walkways, gratings and maintenance platforms are clean from ice, oil and any obstacles that may cause someone to slip or fall.

6.27 Hydraulicsystem

- Regularly check all pipes, hoses and connectors for leaks or damage. Repair all faults immediately.
- Never look for leaks with your bare hands. Use appropriate working gloves or a suitable tool. Oil discharging through a small hole at high pressure can penetrate the skin.
- Do not remove any pipes, hoses or connectors before you have lowered the working devices to the rest position. Turn off the engine, leave the key in the ON position and depressurise the hydraulic system in accordance with the instructions given in the base machine's manual.
- Before starting work, make sure that there is no pressure in the hydraulic circuits on which you are going to work. Make sure that you are familiar with the machine's hydraulic system and equipment.
- Mark and check all connections and hoses to prevent confusion.
- All the connectors, hoses, pipes and other components to be installed must fulfil the requirements relating to the materials handling machine and the requirements of the base machine's manufacturer with regard to their size, type and quality.
- Replace all hydraulic hoses at regular intervals even if there are no visible defects.

6.28 Electricalsystem

- Check the machine's electrical equipment at regular intervals. Repair any faults immediately.
- Change all blown fuses and bulbs and replace worn connectors immediately.
- Always use fuses that are the base machine's original spare parts and have the same ratings.
- Disconnect the battery cables before starting work on the electrical system and before starting welding. Always disconnect the negative (–) cable first and reconnect it last. However, note any instructions given in the base machine's manual before disconnecting the battery cables.
- Only use insulated tools when carrying out electrical work.
- If there is a power supply failure, stop the engine immediately and repair the fault before continuing to work with the machine.
- If you need to work on an energised machine part, you must have another person ready to switch the main power off or to switch off the battery circuit in the event of a problem.



- Check beforehand that there is no charge in the parts to be disconnected, connect the parts in question to the ground and switch them on. Isolate any powered equipment adjacent to the parts to be worked on.

When working on structures or their parts that use medium or high voltage:

- Switch off the power supply to the equipment.
- Earth the equipment supply cable.
- Discharge the capacitors and other similar equipment by using a grounding rod.
- Only an authorised electrician, or a person under the supervision of an authorised electrician, is allowed to maintain or repair the electrical system. The work must be carried out in accordance with valid regulations.

7 IQAN - INSTRUCTIONS

Iqan system converts the control commands from stabilizationlogic to machines hydraulic-control commands. All the changes to machines parameters are done to stabilizationlogic.

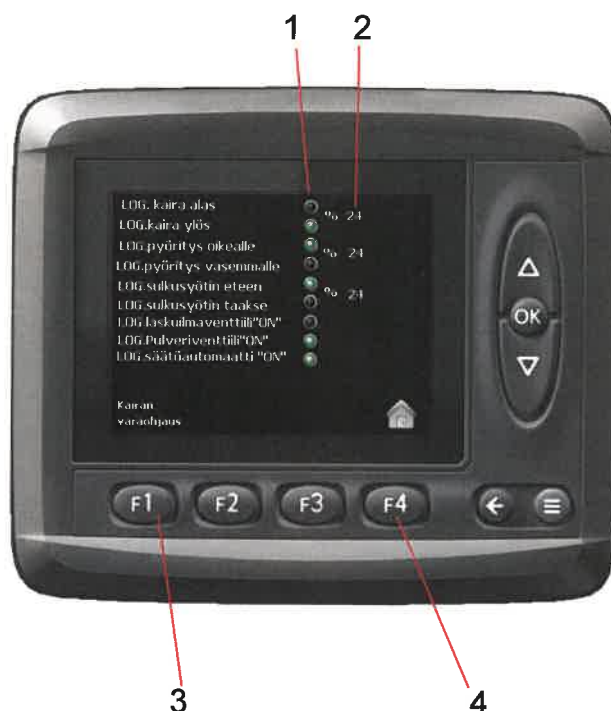
Basic display



1. Stabilization hydraulic pilotpressure signal light:
 - Red lock = pilotpressure switched off, stabilization functions prevented.
 - Green lock = pilotpressure switched on.
 Stabilization pilotpressure can be switched on / off press F1 (7).
2. Basemachine pilotpressure signal light:
 - Red lock = pilotpressure switched off, all movements prevented.
 - Green lock = pilotpressure switched on.
 Base machine pilotpressure can be switched on / off by safegate.
3. Tank pressure of compressed air system
4. Compressor temperature
5. Arrowbutton up / down
6. OK button
7. Stabilization pilotpressure on/ off button
8. Compressor running signal light
9. Moving to infopage
- 10.ESC button
- 11.MENU button

INFO page

For info page press button F4 in basic display



The page shows the control requests from the stabilizationlogic

Alternatecontrol of the rod



For alternatecontrol press F1, enter the note by pressing F2,OK. Arrowbutton steers the rod up and down. The velocity of rod is limited. Press OK button to end using alternate control.

NOTE. When alternate control is set on, the joystickcontrol is set off.

For basic display press F4

Diagnostic

For diagnostic display, press MENU button

Display



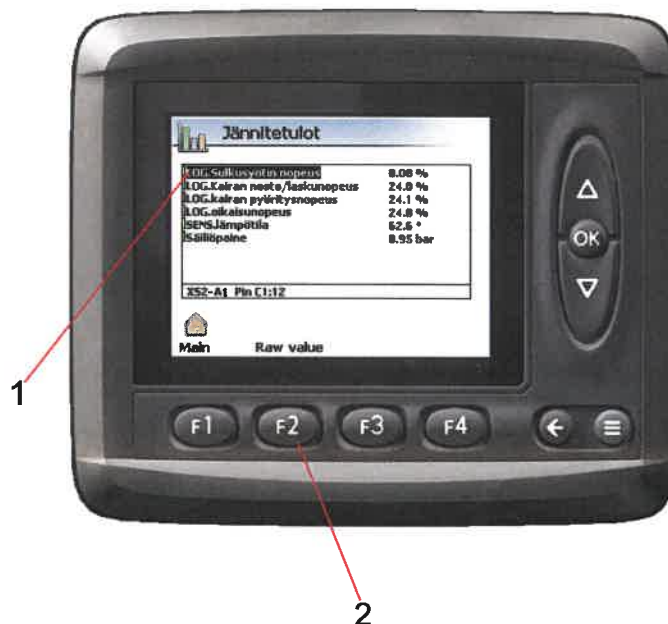
1. Adjustmentmenu
2. Measuringmenu
3. Display setting, date and clock settings, language settings
4. Logfiles and modul info
- 5.

Measuringmenu



1. Press F2 in main display for measuring menu. Choose measuring group with arrow buttons and press OK.

Measuringview



Measuring view shows all objects of the measuring group.

Preferences



For preferences press F3 in main display.

Press F1 for display settings.

Press F2 for date and clock settings.

Press F3 for language settings.

Infopage

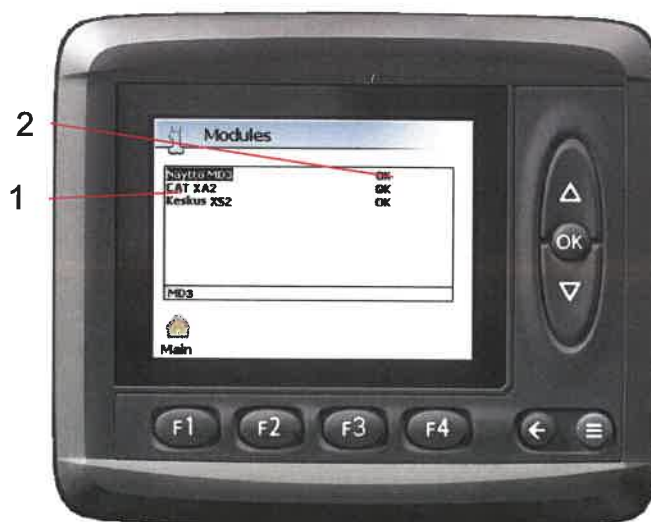


For infopage press F4 in maindisplay.

Press F1 for modules info

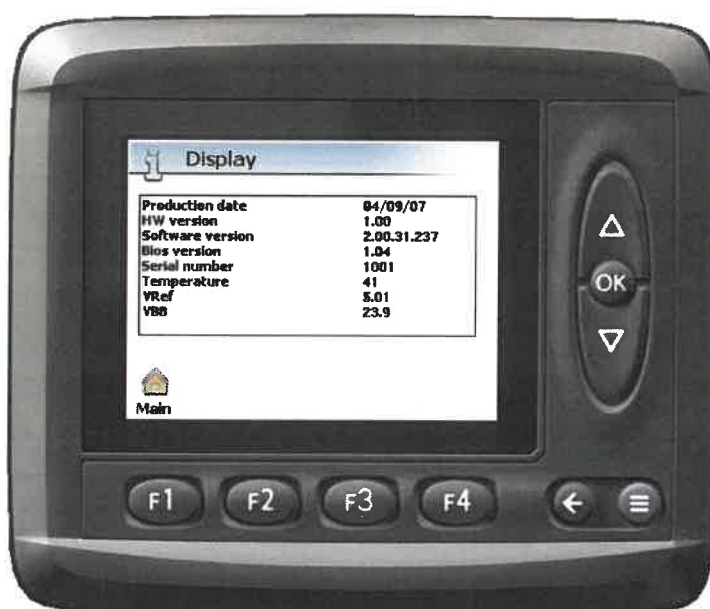
Press F2 for logfiles.

Modules



Modules infopage shows the modules of the system (1), and their state (2).

Choose the module and press OK for details.



Infos: Module production date
Hardware version
Software version
Bios version
Module serialnumber
Module internal temperature
Referensvoltage (+5V)

Logfiles

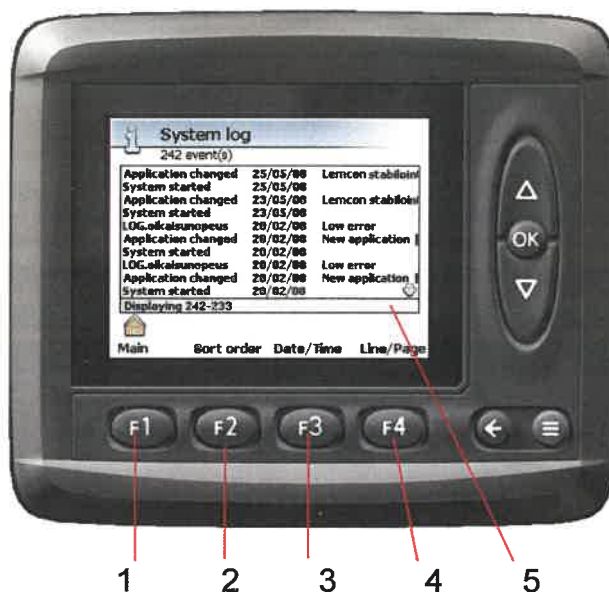


1. The name of logfile

2. Number of saved data in logfile

There is a system log in every software version. The system log saves information about the software and error reports.

Choose the wanted logfile and press OK to open.



8 STORING AND DISCARDING

8.1 Storing the machine

The machine can be stored outdoors or in a large hall.

- Select the place of storage so that the machine does not obstruct traffic and is not exposed to vandalism.
- Lower the mast so that the end of mast is resting securely on the ground and upperpart is in transport bracket
- Switch off the pilot control.
- Turn off the engine and turn the ignition key to the "OFF" position.
- If the machine has a separate main switch in addition to the ignition lock, turn it to the "OFF" position.
- Before you leave the machine parked for storage, remove the ignition keys, lock the cab door and engine covers, etc., and ensure that the machine has no oil or petrol leaks, etc.
- The machine's specification document may contain exceptions to these instructions. For example, the machine may be specially equipped against vandalism.
- Also follow the instructions in the base machine's manual relating to storage.

8.2 Storing the machine in the event of a storm

See section 4.14

8.3 Discarding

When the machine is discarded, deliver the components for recycling:

- Dismantle the machine. If needed, flame-cut large steel parts into smaller pieces. Deliver steel parts to a scrap collector.
- Oils, liquids and greases shall be taken to a hazardous waste plant.
- Oily parts, electronic and electric parts, and other similar parts shall be taken to a hazardous waste plant.