

MAC3



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The technical data contained in this manual cannot be considered binding, and we reserve the right to make improvements or modifications without altering this manual. Without our authorization, any total or partial reproduction of the information contained in this manual is prohibited.

You have just acquired a MAC3 Compressor.

We thank you and congratulate you on this choice, which will surely meet your expectations. However, it is essential that you carefully read this manual before beginning any work.



WE EMPHASIZE THE IMPORTANCE OF THOROUGHLY INFORMING THE MACHINE USER TO AVOID ANY RISK OF INCIDENT OR ACCIDENT. ONE COPY OF THIS MANUAL MUST REMAIN WITH THE COMPRESSOR, ALONG WITH THE DIESEL ENGINE MANUAL.

Registration:

Machines are classified by French and European authorities as road trailers and must comply with the traffic regulations.



THEREFORE, IT IS NECESSARY TO APPLY FOR A VEHICLE REGISTRATION CERTIFICATE (CART GRAY) FROM THE PREFECTURE OF YOUR DEPARTMENT.

The necessary documents for obtaining this vehicle registration certificate are provided by us.

UNBRAKED MACHINES must be towed by a vehicle with an UNLADEN WEIGHT at least equal to 2 times the maximum authorized laden weight of the towed machine.

This weight is indicated in paragraph 2, line GVWR.

BRAKED MACHINES must be towed by an appropriate vehicle.

the towable weight is usually specified on the registration certificate of the van or tractor truck. in case of doubt, consult the manufacturer of the towing vehicle.

You must verify if the b96 or be license is required based on your vehicle.

Insurance:

Your machine must be **INSURED**, to travel on the road, like a trailer. We also encourage you to **CONSIDER** insuring it against **MACHINE BREAKAGE** and **THEFT ON SITE**.

1. SAFETY

All MAC3 products are designed and manufactured with the user's safety in mind, but your best assurance against an accident remains caution. Every operator, regardless of experience, must read this manual and the accompanying documentation before operating the compressor or any equipment connected to it. The owner is responsible for providing this information to all operators and training them in the safe use of the equipment.

Please adhere to the following instructions for safe operation.

1.1 FOLLOW SAFETY INSTRUCTIONS

- Carefully read this manual before starting and using the compressor.
- Install and use this compressor only in perfect accordance with all applicable standards and regulations.
- Learn how to use and operate this equipment.
- Familiarize yourself with your equipment and its limitations.
- Before allowing a third party to use your compressor, explain its operation to them and ensure they have read the user manual.
- Do not make modifications to the compressor without written consent from the manufacturer.
- If components of the rolling part (axles, drawbar, wheel, lighting, reflector) need to be replaced, they must be replaced with identical components with the same homologation numbers.
- If the compressor is not functioning correctly, contact your MAC3 compressor distributor.

1.2 MOVEMENT – TOWING

Before any movement, ensure:

- The hood is correctly closed and locked.
- The compressor is securely locked onto its trailer in the case of the trailer option.
- The tires are in good condition, check their wear and ensure all nuts are tightly secured. Check tire pressure.
- The jack is in the correct position and raised before any movement.
- The signaling lights are in good condition and connected to a 12V power source.
- The reflectors are clean and in good condition.

CAUTION: Trucks are generally equipped with 24V systems.

- Adjust the drawbar to the correct height relative to the hitch point so that the drawbar is horizontal, firmly lock the locking levers, and secure them with pins.
- Raise the jack(s) to the maximum height and hitch the drawbar, ensuring it is correctly locked.
- Connect the signaling cable and check the lights are working properly.
- Attach chains or cables for machines without brakes to the vehicle's attachment points.
- Attach the safety breakaway cable for machines equipped with an inertia brake.
- Ensure chains, electrical cables, or other attachments do not restrict the compressor's movement.
- Check that chains, electrical cables, or other attachments are not dragging or rubbing against the road, which could render them unusable.
- Do not allow the transportation of people on the compressor.
- Ensure the space behind the compressor is clear of obstacles before maneuvering.
- For the MSP5000 model, do not tow it on the road with more than 15 liters of fuel in the tank.

IMPORTANT

Parking brake engagement: To immobilize machines equipped with a European inertia brake, the handbrake must be tightened sufficiently to compress the compensating spring to prevent unintentional braking when in reverse..



1.3 WORKING CONDITIONS

- Park or set up the MAC3 compressor on a level, firm area with sufficient bearing capacity. Do not place it on slopes exceeding 27% (15°).
- Position the MAC3 compressor so that dust from the site does not enter through the intake grilles and so that the wind tends to move exhaust gases and radiator heat away.
- Apply the handbrake if the compressor is equipped with one, or immobilize the vehicle with chocks on each side of the wheels.
- Disconnect all elements connected to the towing vehicle.
- Lower the jack and ensure the ground is firm enough to support the load and that the compressor is level.
- Do not wear loose clothing near the machine that could get caught in rotating parts or moving components.
- Depending on local regulations, the nature of the work, and working conditions, use recommended or required personal protective equipment.
- Do not operate the machine if you are under the influence of medication, drugs, alcohol, or fatigue.
- Do not use the compressor if you know its safe operation cannot be ensured.
- Perform all recommended maintenance operations daily.
- Conduct a daily check around the compressor, looking for any leaks, loose or missing parts, damaged or misaligned parts, as well as the absence of any parts or components of the compressor.
- Do not wear headphones to listen to music or the radio while using the machine.

1.4 PRESSURE HAZARDS

- Do not use equipment and accessories (hoses, fittings, etc.) on the compressor that operate at a lower operating pressure than the compressor's maximum pressure, unless using a regulator set correctly.
- Do not exceed the operating pressures indicated by the manufacturer.
- Ensure hose connections are made with appropriate devices to prevent accidental rupture.
- Do not open the oil filling cap while the compressor is running and the pressure in the separator has not returned to zero.
- Ensure there is no internal pressure before working on compressor components such as hoses, drain plugs, filters, grease fittings, etc.
- Stay out of the path of any sudden release of compressed air.
- Do not use compressed air at pressures exceeding 207 kPa (2.07 bar - 30 psi) for cleaning operations and always wear personal protective equipment and screens against projections.
- Exercise caution and vigilance when using compressed air hoses, as there is a risk of death or serious injury.

1.5 PRE-START CHECKS FOR THE MAC3 COMPRESSOR

- Ensure you check the compressor before using it. Do not operate the compressor if there is any anomaly. Repair it immediately.
- Verify that all protective covers are in place before operating the compressor. Replace any damaged or missing components.
- Ensure you and other present individuals are at a safe distance before starting the engine.
- Always keep the compressor at least one meter away from buildings and other equipment.
- DO NOT allow children or animals near the machine while the engine is running.
- DO NOT start the engine by short-circuiting the starter terminals; the machine could start in gear and operate.
- Do not bypass or disable safety devices.

1.6 KEEP THE MAC3 COMPRESSOR AND ITS ENVIRONMENT CLEAN

- Ensure the compressor is completely stopped before cleaning. Shut down the compressor at idle by closing the valves.
- Keep the compressor clean and free from any accumulation of dirt, grease, and debris to avoid the risk of fire.
- Store flammable liquids in suitable containers and cabinets, away from sources of sparks and heat.
- Immediately locate and repair any leaks.

1.7 SAFELY HANDLING FUEL AND LUBRICANTS

- Always stop the compressor before refueling or lubricating it.
- DO NOT smoke and keep all flames or sparks away from your work area. Fuel is extremely flammable and explosive under certain conditions.
- Refuel in a well-ventilated area or outdoors. In case of fuel or lubricant spills, refuel after allowing the engine to cool down.
- DO NOT mix gasoline or alcohol with diesel. This mixture can cause a fire or serious engine damage.
- Do not use unapproved containers, such as buckets, bottles, or jars. Use approved fuel storage containers and dispensers.

1.8 EXHAUST GASES AND FIRE PREVENTION

- Engine exhaust gases can be very harmful if allowed to accumulate. Ensure to use the engine in a well-ventilated area where no one or no animal is near the engine.
- Exhaust gases exiting the muffler are very hot. To prevent a fire, do not expose dry grass, mowed grass, oil, or any other combustible material to exhaust gases. Always keep the engine and muffler clean.
- To prevent a fire, be vigilant about leaks of flammable substances from hoses and ducts. Check for leaks from hoses or ducts (fuel, hydraulic fluid) following the maintenance checklist.
- To prevent a fire, do not short-circuit electrical cables and wires. Check the condition of all electrical cables and wires. Keep all electrical connections clean. Stripped wire or frayed insulation can cause dangerous electric shocks and injuries.

1.9 LIQUID LEAKAGE

- Release all pressure from air, oil, and cooling circuits before disconnecting hoses, fittings, or related components.
- Be aware of possible residual pressure when disconnecting a device from a pressurized circuit. DO NOT search for pressure leaks with your hand. Oil, fuel, or pressurized air can cause injuries.
- Liquid escaping under pressure has enough force to penetrate the skin and cause serious bodily harm.
- It is not always possible to identify a leak at a tiny hole. Use a piece of cardboard or wood to locate suspected leaks: do not use hands or body. Wear safety glasses or other eye protection when searching for leaks.
- In case of contact with leaking liquid, seek medical attention immediately. This liquid can cause gangrene or a severe allergic reaction.

1.10 BURNS, FIRE, AND EXPLOSION

- To avoid burns, be cautious of hot components, e.g., the muffler, muffler cover, radiator, hoses, engine block, bolt block, coolant, engine and compressor oil, etc., during operation and after engine shutdown.
- DO NOT remove the radiator cap while the engine is running or immediately after engine shutdown. Doing so may cause the radiator to expel boiling water. Wait until the radiator is completely cool to the touch before removing the cap. Wear safety goggles.
- Remember to close the coolant drain valve, secure the radiator cap, and tighten the hose clamp before using the engine. If these parts become detached or loose, they pose a risk of serious injury.
- The battery poses a risk of explosion. When the battery is charging, an extremely explosive mixture of hydrogen and oxygen forms.
- Avoid sparks, flames, and other ignition sources near the battery, especially during charging and when adding fuel. DO NOT light a match near the battery and fuel tank.
- DO NOT check battery charge by placing a metal object between the terminals. Use a voltmeter or hydrometer.
- DO NOT charge a battery if its temperature exceeds 45°C (113°F).
- DO NOT charge a frozen battery. There is a risk of explosion. If the battery is frozen, warm it to at least 16°C (61°F).
- Always have one or more fire extinguishers filled with the appropriate class in your country on hand when using your compressor and during maintenance work on your compressor.
- If you need to perform welding operations, remove nearby flammable items.
- Do not leave combustible materials near the compressor, such as oily rags, leaves, waste, or others.
- In forested areas, try to place the compressor in a clear area and ensure that leaves or branches do not come into contact with hot parts of the compressor.
- Ensure the wiring is in good condition, including battery terminals and other connections. Replace any cable with cracked, cut, worn sheathing, or damaged insulation, and replace any discolored or corroded connections. Ensure all connections are clean and tight.

1.11 MOVING PARTS

- Stop the compressor before checking or adjusting the alternator belt tension.
- Keep your hands and body away from rotating parts such as the cooling fan, alternator belt, fan drive pulley. Contact with rotating parts can cause serious injuries.
- DO NOT operate the compressor without its protective covers. Secure the protective covers firmly before operating the compressor.
- Close access doors, except when marking or adjusting, performing maintenance, or starting or stopping the compressor.
- Ensure all personnel have moved away from the compressor before starting it.

1.12 TOXIC AND IRRITATING SUBSTANCES

- Compressor air should not be used for breathing. It is necessary to use devices that treat compressor air to make it breathable. These devices must comply with CE standards and other local codes or regulations.
- Preferably, do not use the compressor in enclosed spaces. When you have no other options and the compressor must be used indoors, exhaust the exhaust gases outside.
- Exhaust gases should not be directed towards personnel and should not be drawn in by the compressor ventilation, which could disperse it onto personnel.
- Exhaust gases should not be sucked in by the compressor and engine air intake, which could degrade product operation.
- Antifreeze is toxic. Wear rubber gloves to prevent injury. In case of skin contact, wash immediately.
- Do not mix different types of antifreeze. The mixture can cause a chemical reaction and release harmful substances. Use original or MAC3-approved antifreeze.
- If antifreeze comes into contact with the eyes or if its vapors irritate the eyes, rinse them with clear water. See a doctor immediately, preferably an ophthalmologist.
- Consider the environment and nature protection. Before draining liquids, determine the correct way to dispose of them. Follow environmental protection regulations when disposing of oil, fuel, coolant, brake fluid, filters, and batteries.
- For draining compressor fluids, place a suitable container under the engine block, under the compressor circuit separator.
- Do not pour used liquids on the ground, into drains, or into a water source. Dispose of used liquids in accordance with regulations.

1.13 LIFTING

Before any manipulation by the lifting ring, ensure:

- There are no cracks in the welds of the brackets of the attachment points or other elements used for lifting.
- There are no deformations and corrosion on the elements used for lifting.
- The screws and bolts are tightened securely.
- The lifting hook is equipped with a safety device, and it is fully engaged.
- The lifting structure has a lifting capacity greater than the weight of the equipment to be lifted. The weight of the equipment to be lifted must include the weight of the compressor, the weight of anything stored in the compressor, mud, snow, etc. If in doubt, it is necessary to weigh the equipment before lifting.

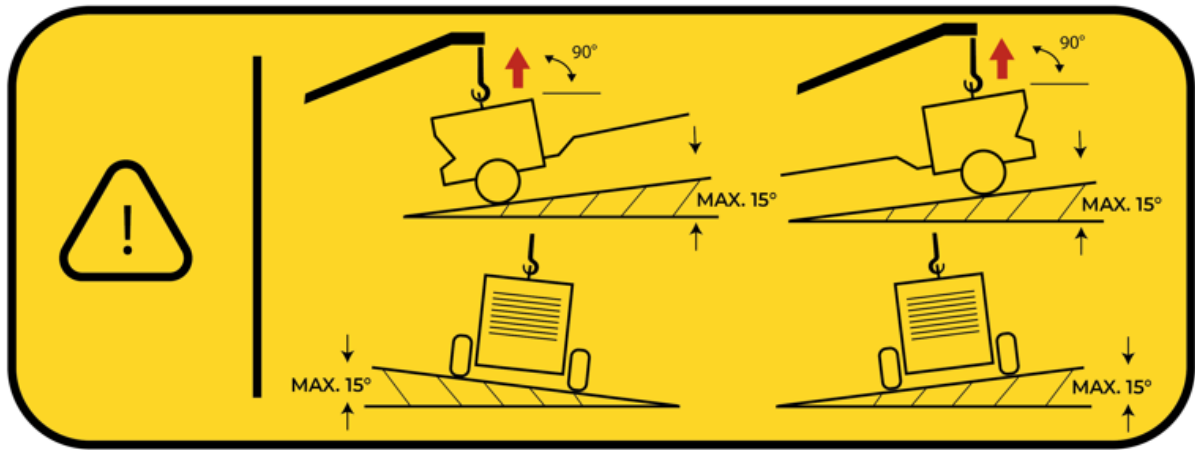
Lifting:

- Pendulum movements must be limited, and rotation must be prevented.
- Do not lift the compressor in strong winds.
- Prevent personnel access to the lifting area.
- Do not lift the compressor higher than necessary.
- There must always be someone at the lifting station during the entire compressor handling operation.

Important:

In case of helicopter lifting, you must not use the compressor ring. Use appropriate equipment according to current regulations.

It is forbidden to store the compressor at height by its lifting ring.



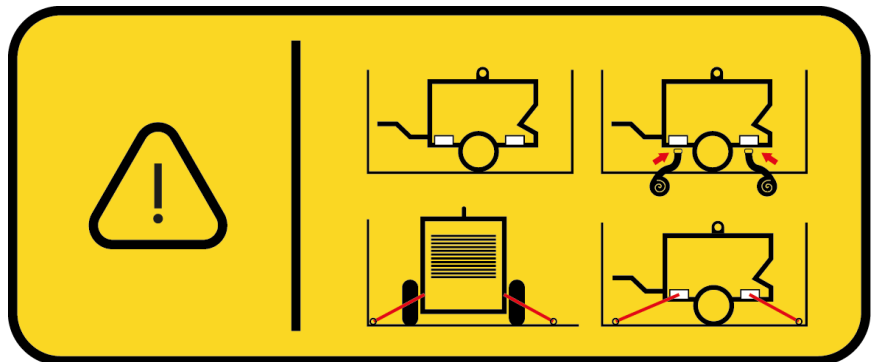
1.14 TRANSPORTATION AND SECURING

Packaging and securing depend on the mode of transportation used. Follow safety instructions and rules of good conduct to prevent accidents. Adhere to local regulations and directives regarding the transportation of goods. Secure the machine so that it cannot move, roll, or overturn. Securing is the responsibility of the driver and the carrier.

MAC3 declines all responsibility in case of damages related to transportation under inappropriate conditions.

In general:

- Use chocks or stop blocks to prevent the machine from rolling.
- Use straps to secure the machine.
 - Caution: Do not strap over the bodywork, as this could damage it.
 - You can pass the straps behind the wheels at the axle or through the rims.
 - You can use the available tie-down points identified by the following symbol: [insert symbol here].



1.15 SAFETY CHECKS AND MAINTENANCE

- When conducting inspection or maintenance on the compressor, place it on a large flat surface. DO NOT work on equipment resting SOLELY on a jack or winch. Always use suitable wedges or stands to support the compressor before intervening.
- Set the battery isolator to the "OFF" position and then disconnect the compressor's battery before performing maintenance operations. Place a "DO NOT USE!" label on the ignition key to prevent accidental starting.
- To prevent sparks from accidental short circuits, disconnect the battery's negative (-) cable first and reconnect it last.
- Stop the compressor and remove the key before performing daily and periodic maintenance, checks, and cleaning.
- Perform checks or maintenance after allowing the engine, bolt block, oil, coolant, muffler, and muffler cover to cool completely.

- Always use appropriate tools and clamping devices. Check that they are in good condition before performing any maintenance intervention. Ensure you know how to use them before using them.
- ONLY use correct crankshaft turning techniques to rotate the engine manually. DO NOT attempt to turn the engine by pulling or levering on the cooling fan and V-belt. Doing so could cause serious injury or premature fan and belt damage.
- Replace fuel and lubricant hoses with their fastening clamps according to the maintenance plan recommendations. They are made of rubber and age gradually.
- When an intervention requires two or more people, take care to work safely.
- Keep a first aid kit and a fire extinguisher within reach at all times.

1.16 MODIFICATION

- When conducting inspection or maintenance on the compressor, place it on a large flat surface. DO NOT work on equipment resting SOLELY on a jack or winch. Always use suitable wedges or stands to support the compressor before intervening.
- Set the battery isolator to the "OFF" position and then disconnect the compressor's battery before performing maintenance operations. Place a "DO NOT USE!" label on the ignition key to prevent accidental starting.

2. TECHNICAL SPECIFICATIONS

2.1 COMPRESSOR SPECIFICATIONS

Compressor	MSP 11000 7 bar (100 psi)	MSP 11000 10 bar (145 psi)	MSP 11000 12 bar (175 psi)	MSP 11000 14 bar (200 psi)	MSP 12000 7 bar (100 psi)	MSP 12000 10 bar (145 psi)
• Actual flow rate (l/min - cfm) according to ISO 1217 standard $\pm$ 5%...	10500 - 370	10500 - 370	10500 - 370	9700 - 342	12000 - 423	11000 - 388
• Maximum pressure (bar - psi).....	8 - 115	11 - 160	13 - 190	15 - 218	8 - 115	11 - 160
• Nominal service pressure (bar - psi)	7 - 100	10 - 145	12 - 175	14 - 200	7 - 100	10 - 145
• Minimum pressure in the separator (bar - psi)	5 - 72	5 - 72	5 - 72	5 - 72	5 - 72	5 - 72
• Safety valve opening pressure (bar - psi)	18 - 260	18 - 260	18 - 260	18 - 260	15 - 217	15 - 217
Compressor oil circuit						
• Separator volume (l).....	41	41	41	41	41	41
• Total oil capacity (l)	34	34	34	34	34	34
Engine						
• Maximum operating speed (rpm)	2400(0+50)	2400(0+50)	2400(0+50)	2200(0+50)	2400(0+50)	2200(0+50)
• Minimum operating speed (rpm)	1900	1900	1900	1900	1900	1900
• Approximate oil pan capacity (l)	16.5	16.5	16.5	16.5	16.5	16.5
Cooling circuit						
• Cooling liquid capacity (l)	17.5	17.5	17.5	17.5	17.5	17.5
Fuel						
• Diesel tank capacity (l)	170	170	170	170	170	170
• AD-blue tank capacity (l)	16.5	16.5	16.5	16.5	16.5	16.5
Axle version						
• Gross vehicle weight (kg – lbs.).....	2150 - 4740	2150 - 4740	2150 - 4740	2150 - 4740	2150 - 4740	2150 - 4740
• Gross vehicle weight rating (kg – lbs.).....	2200 – 4850	2200 – 4850	2200 – 4850	2200 – 4850	2200 – 4850	2200 – 4850
Palletizable version						
• Gross vehicle weight (kg – lbs.).....	1850 - 4080	1850 - 4080	1850 - 4080	1850 - 4080	1850 - 4080	1850 - 4080

Compressor

Asymmetric screw compressor with oil injection.

Engine

KUBOTA water-cooled engine, indirect injection, electric start, fuel circuit purge.
4-cylinder engine type V3800 TIE5H.

Regulation

Progressive regulation that adjusts the compressor flow rate according to consumption to maintain nominal pressure by adjusting the engine speed and closing the suction valve.

Body

Sheet metal chassis supporting the unit mounted on 4 shock absorbers, partition on which the radiator is fixed.

Rolling chassis

Articulated Alko rolling chassis.

2.2 COMPATIBLE HITCH

The fastening screws for the hitches must be tightened to 75 Nm.

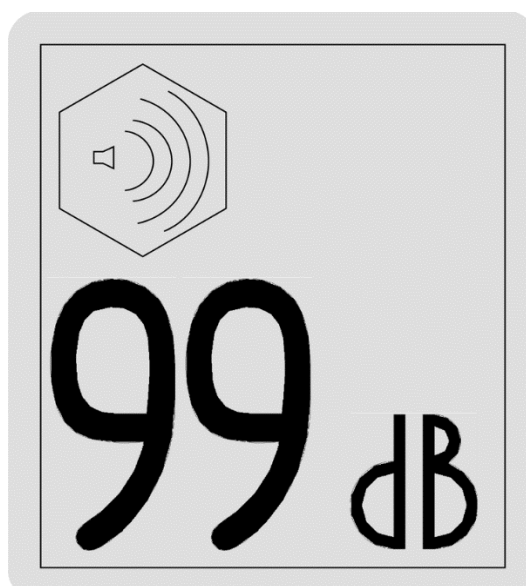
Ring list	Brand	Value D	Value S	Approval number"
AK301	ALKO	26,9	325	E1 55R-01 1594
FR F68	ALKO	31	150	E1 55R-01 0244
UK E30	ALKO	31	150	E1 55R-01 1736
UK E40	ALKO	21	150	E1 55R-01 1737
UK E50,8	ALKO	31	150	E1 55R-01 1738
NATO N76	ALKO	31	150	E1 55R-01 0243
IT I45	ALKO	21	150	E1 55R-01 0245
DIN 40	ALKO	31	150	E1 55R-01 0241
DIN 50	ALKO	31	150	E1 55R-01 0242

2.3 COMPRESSOR IDENTIFICATION

Your motor-compressor unit is assigned a serial number, which is stamped on the manufacturer's plate located inside the compressor

		MAC3 SAS 10 Allée du Canal ZAC des Landes F-42160 Saint-Cyprien www.mac3.fr		Fabriqué en France			
TYPE TYPE			SERIAL N° N° SERIE				
PRESSURE PRESSION			bar	MANUF.DATE DATE FABR.			
CAPACITY DEBIT			m³/min	ENG.SPEED VITESSE MOT.			Tr/min
NOM.POWER PUISSANCE			kW	REFERENCE			
WEIGHT POIDS			kg				

2.4 CE NOISE LEVEL LABEL



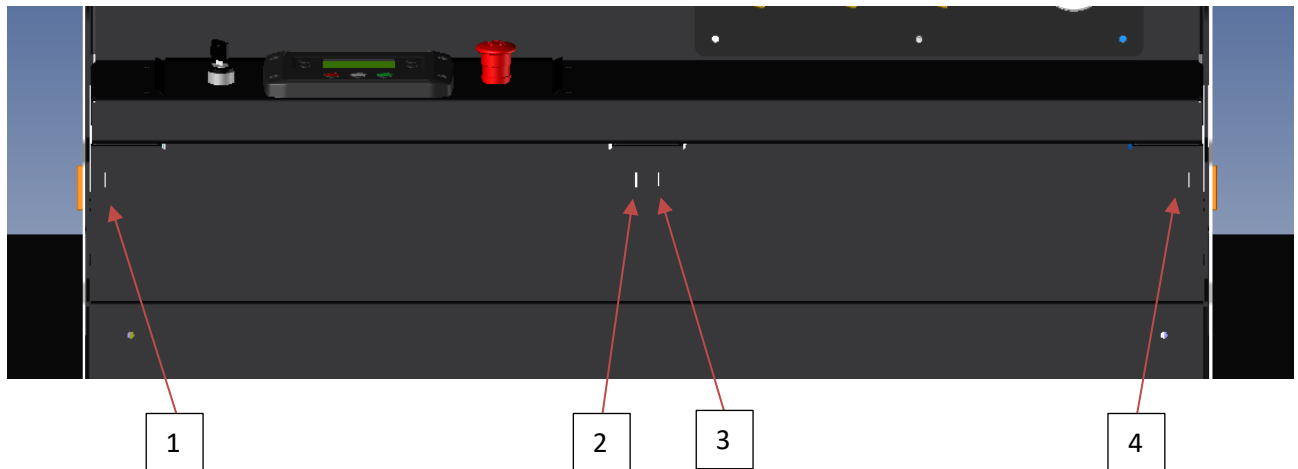
2.5 IDENTIFICATION OF MAIN COMPONENTS

The components bearing a manufacturer identification plate.

- Engine Serial Number + Brand
- Screw Block Serial Number + Brand
- Separator Serial Number + Brand
- Valve Serial Number + Brand
- Rolling Chassis Serial Number
- Road homologation number

2.6 REGISTRATION PLATE

Our compressor is designed to accommodate registration plates in the format of 520mm x 120mm. To facilitate installation, you can let the plate rest on the lower edge of the designated space. To comply with the regulations of your country regarding the display of the registration plate, several positions across the width are possible:



Indicators are provided to assist you in positioning it correctly (1, 2, 3, 4)

Centered Plate:

The center of the plate should be positioned between indicators 2 and 3.

Plate on the Left:

The plate should be positioned between indicators 1 and 2.

Plate on the Right:

The plate should be positioned between indicators 3 and 4.

Dual Plate (in cases where it is necessary to identify the towing vehicle):

The first plate should be positioned between indicators 1 and 2, and the second between indicators 3 and 4.

Example:



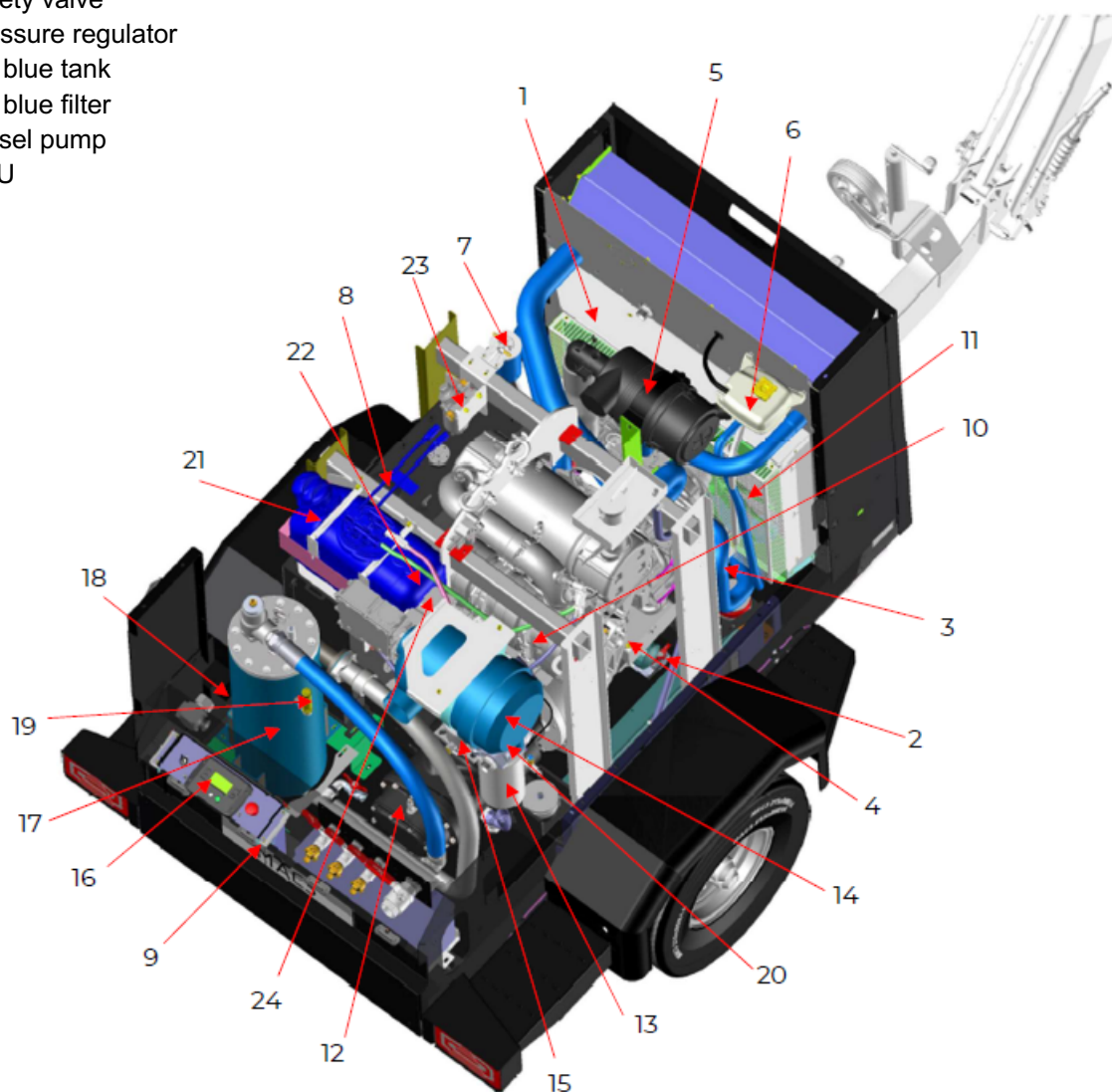
2.7 Fuel

The diesel fuel used must comply with EN 590 or ASTM D975 specifications. Do not use fuels with a sulfur content exceeding 0.0015% (15 ppm).

The AD-Blue reducing agent must comply with ISO 22241 and DIN 70070 specifications.

3. DESCRIPTION

- 1- Radiator
- 2- Engine oil filter
- 3- Engine oil filling
- 4- Oil level gauge
- 5- Engine air filter
- 6- Expansion tank
- 7- Diesel filter
- 8- Diesel water separator
- 9- Engine Control Unit (ECU)
- 10- Particle filter
- 11- Fan
- 12- Compressor
- 13- Compressor oil filter
- 14- Compressor air filter
- 15- Suction valve
- 16- Controller
- 17- Separator
- 18- Compressor oil filling
- 19- Safety valve
- 20- Pressure regulator
- 21- AD blue tank
- 22- AD blue filter
- 23- Diesel pump
- 24- ACU



3.1 COMPONENT DESCRIPTION

The machine includes a KUBOTA diesel engine, a screw block, a regulation system, a cooling system, a battery, and a controller for electronic management. Refer to the engine and battery user manual for further information. The cooling system includes a water radiator for the engine and an oil radiator for the screw block. The fan, common to both radiators, blows air through them and maintains the engine and the screw block at the correct operating temperature. The engine drives the screw block directly through a flexible coupling. The compressor has a sufficiently large fuel tank to ensure the machine operates for a full day of work.

The compressor has safety features for operating temperature and pressure.

3.2 SAFETY

- High pressure: Safety valve (19) on the separator (17).
- Abnormal compressor temperature rise: Thermal contact on the screw block (12).
- All other protections (water temperature, oil pressure, etc.) are directly managed by the electronic system.

3.3 COOLING SYSTEM

The Compressor Cooling and Lubrication System are designed to provide the necessary lubrication and maintain the compressor's correct operating temperature.

- The fan (11) removes heat produced by air compression with oil. The oil passing through the radiator (1) is cooled by the airflow produced by the fan (11).
- During operation, oil circulates from the separator (17) to the radiator (1). This circulation is caused by the pressure difference between the separator (17) (high pressure) and the low-pressure area of the screw block (12). The oil then returns from the radiator (1) to the main oil filter (13), which prevents impurities from entering the screw block (12) before being reinjected into the compression chamber and the screw block bearings.

3.4 SEPARATOR

The separator has four main functions:

- Primary oil separation.
- Final oil separation.
- Oil reserve.
- Air reserve required for regulation.

The compressed air/oil mixture from the screw block is discharged into the separator, where it is directed against a wall. This sudden change in direction reduces the air flow velocity and creates large oil droplets that fall to the bottom of the separator. The residual oil remaining in the air is separated by the separator cartridge and, by gravity, descends to the bottom of the cartridge where it is returned by pressure difference in the dip tube which returns it to the suction of the screw block. The separator complies with CE standards. A minimum pressure valve downstream of the separator ensures a minimum separator pressure as indicated in the characteristic table. This pressure is necessary for proper air/oil separation and oil circulation. A safety valve (19), located on the separator, is designed to open when the separator pressure exceeds the value indicated in the characteristic table.

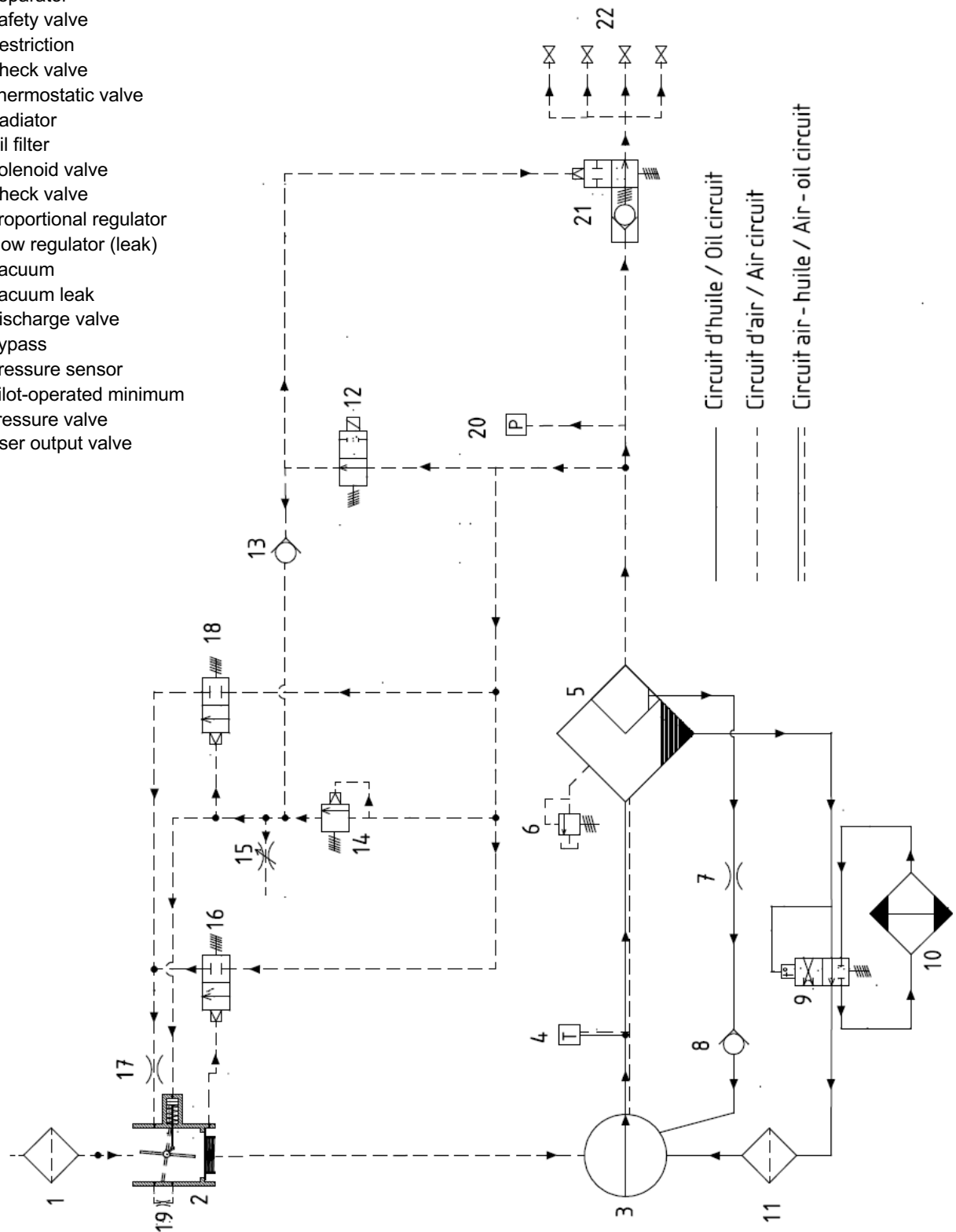
3.5 COMPRESSOR OIL

It has three main functions:

- Cooling: it controls the rise in air temperature associated with compression.
- Sealing: oil film between the screws and the body.
- Lubrication: oil film between the screws allowing direct drive of one screw by the other.

3.6 Pneumatic-Hydraulic Diagram

- 1- Air filter
- 2- Intake valve
- 3- Compressor
- 4- Temperature sensor
- 5- Separator
- 6- Safety valve
- 7- Restriction
- 8- Check valve
- 9- Thermostatic valve
- 10- Radiator
- 11- Oil filter
- 12- Solenoid valve
- 13- Check valve
- 14- Proportional regulator
- 15- Flow regulator (leak)
- 16- Vacuum
- 17- Vacuum leak
- 18- Discharge valve
- 19- Bypass
- 20- Pressure sensor
- 21- Pilot-operated minimum pressure valve
- 22- User output valve



3.7 REGULATION

Three scenarios may occur:

A. Consumption exceeds compressor flow rate.

The pressure in the separator (5) never reaches the controller's set pressure. The intake valve (2) is fully open, and the engine is at full throttle. The compressor is undersized for the application, or air is expelled directly outside to clean the pipes.

B. Consumption is less than compressor flow rate.

The pressure in the air circuit reaches the service pressure. The controller adjusts the engine speed to maintain the service pressure. The lower the consumption, the higher the pressure, and the more the controller reduces the engine speed.

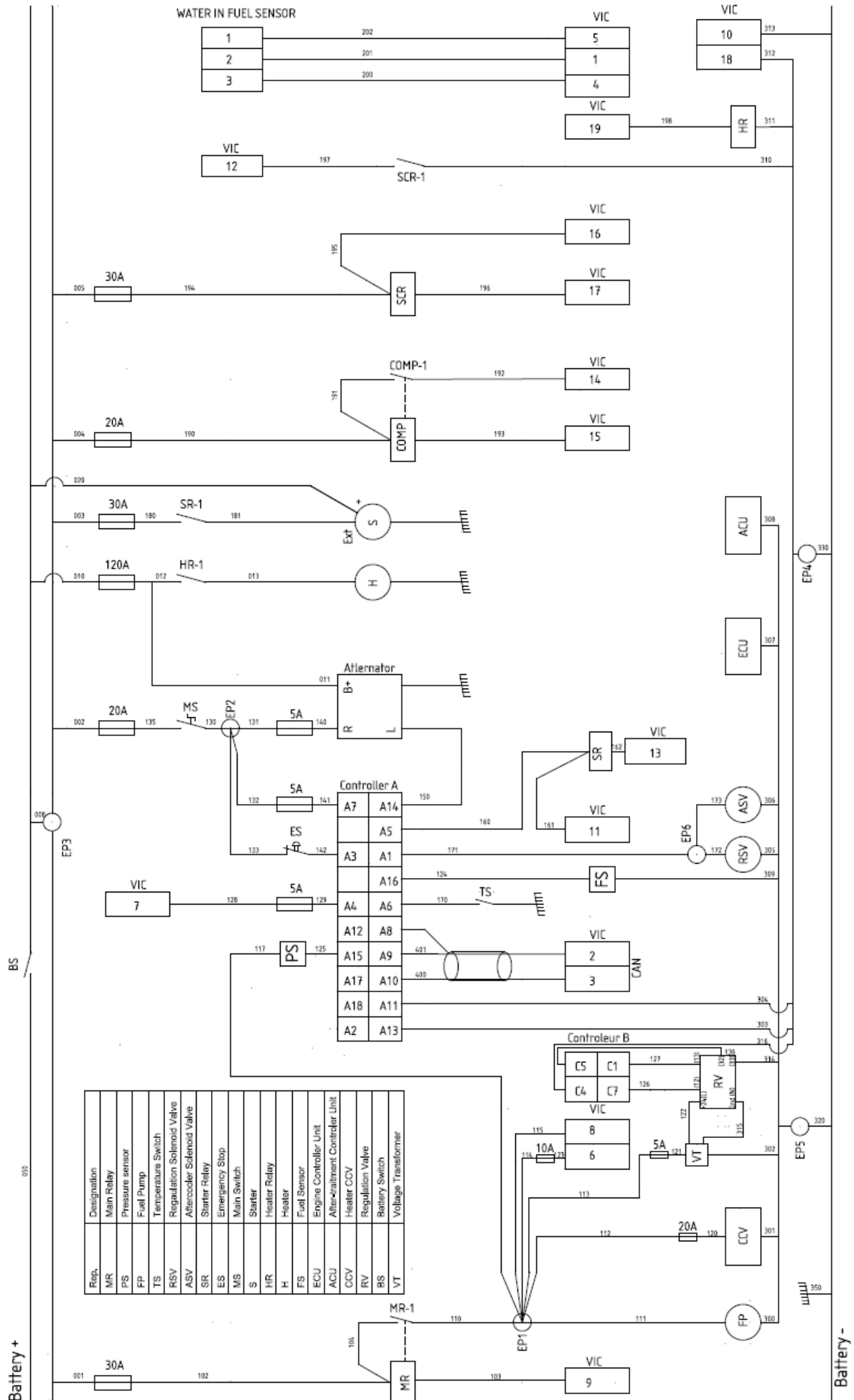
Effective regulation limits consumption and ensures long-term compressor reliability.

C. Very low or zero consumption:

The pressure in the air circuit is at its maximum. The controller has already reduced the engine speed to the maximum. The pressure regulator (14) reaches the set pressure, activates, and closes the intake valve (2).

Only a small amount of compressed air continues to circulate to ensure the proper functioning of the lubrication system. Excess compressed air escapes through the regulator leak (15).

3.8 ELECTRICAL DIAGRAM



4. USE

- In case of prolonged shutdown exceeding 6 months, consult the MAC3 agent to ensure the "long-term immobilization" treatment to avoid any incidents when restarting.

DAILY CHECKS	
To prevent any malfunction or breakdown, it's important to thoroughly check the operating conditions of the compressor. Always check before starting.	
1. If any parts had issues during previous use.	
2. By inspecting around the machine.	(1) Water or oil leaks (2) Engine oil level and contamination (3) Fuel quantity (4) Compressor oil level and contamination (5) Refrigerant quantity (6) Dust in the air filter housing (7) Damaged parts and loose bolts and nuts
3. By inserting the key into the ignition switch.	(1) Proper functioning of dashboard indicators
4. By starting the engine.	(1) Color of emitted smoke (2) Abnormal engine noise

4.1 SETUP

- Ensure the compressor is placed on a level and uniform surface.
- In highly dusty environments, install the unit in the least polluted area.
- Avoid leaving dust or fuel near the battery, wiring, exhaust muffler, and engine to prevent fire hazards. Check and clean them daily before operation.
- Work in a well-ventilated space.
- To prevent the risk of carbon monoxide poisoning, never run the engine in a building without adequate ventilation.
- Never place the air intake, discharge outlet, and exhaust outlet too close to an obstacle to avoid the risk of hot air recirculation.

4.2 PRECAUTIONS BEFORE STARTING

NOTE: For all "engine" operations, refer to the engine manual.

- Keep children away from the machine.
- Keep hands and body away from rotating parts, such as the cooling fan, pulley, or fan drive belt, as these parts can cause injury.
- Never use the compressor under the influence of alcohol or drugs or when you are tired.
- Stop working around the compressor if you wear loose clothing. Loose clothing can be caught by the compressor's moving parts or control levers and cause an accident. Also, use other safety items... helmet, safety shoes, safety glasses, hearing protection accessories, gloves, etc... Depending on circumstances and as needed.
- Do not wear a radio or headphones for music when operating the compressor.
- Check if there is a sufficient safety distance from the engine.
- Reinstall protective devices and screens, and clear the path of all tools used when starting the engine after maintenance/troubleshooting.

CHECK:

- Interior cleanliness of the unit (oil, fuel, rags, etc.).
- Cleanliness of the compressor air filter, if the environment is highly dusty, pinch the dust removal valve.
- That the pressure in the separator is zero.

IMPORTANT:

Ensure the radiator filler cap is tightened after refueling.

Separator oil level: Must be at maximum. The maximum is determined by the filling orifice and cannot be exceeded.

Cleanliness of the fuel pre-filter: should not contain water or impurities, replace if necessary. Levels should always be checked when cold so they stabilize. Use only the recommended oils in the maintenance chapter.

4.3 STARTUP

- Can only be performed after completing all the prescribed operations in the previous chapter.

IMPORTANT

In cold weather, strictly follow the instructions in the engine chapter.

Startup Steps:

- Close the air outlet valves.
- Turn the switch to turn on the controller.
- Wait for the engine at rest indication.
- Press the start button. 
- The controller will start the engine and provide a preheating phase for 30 seconds.
- It will automatically switch to automatic operating mode. 
- At the end of its priming phase, the engine will accelerate to build pressure.
- If the outlet valves have not been closed, air will be released through the valves.

NOTE:

For temperatures below 5°C, if the engine struggles to start, the controller will attempt to start the engine 3 times. If it still doesn't work, turn the key to OFF for 10 seconds. Turn the key to ON and wait 40 seconds before pressing the start button.

4.4 USE

- Check that the compressor's air outlet valve is closed and connect the supply hoses to the compressor.
- Gradually open the valves to clean the hoses and remove any water inside.
- Then close the valves to connect the equipment that needs to be used with the compressor.
- Gradually open the valve to start operation.

IMPORTANT

Never open the valves quickly to avoid "whipping" of the hoses and splashing of impurities that could cause accidents.

4.5 STOP

- Do not use the emergency stop button or double press the stop button to stop the machine. This is only necessary in emergency situations and will cause a sudden stop of the machine.
- Close the air outlet valves and press the button. 
- The compressor will decrease the pressure in the separator to avoid a sudden stop and will shut down after 30 to 60 seconds.
- Once the machine has stopped, you can turn the key switch to OFF.

NOTE:

After turning the key switch to OFF, the diesel pump and the engine ECU remain powered for another 10 seconds.

IMPORTANT:

Ensure that the pressure in the circuit has returned to 0 bars after a few seconds.

A vacuum relief valve, controlled by the pressure in the air circuit returning to the suction valve, empties the circuit into the suction hose after the compressor stops.

5. ENTRETIEN

IMPORTANT

The maintenance operations outlined in this manual are provided for normal operating conditions. Under challenging conditions such as extreme temperatures, high humidity, polluted atmosphere, high altitude, etc., some operations may need to be performed more frequently, and special precautions must be taken. Consult the engine manufacturer's manual and your local MAC3 dealer for specific instructions. Adhere to general safety regulations and accident prevention measures (see ch. 1).

Disposal of lubricants and other products:

Drained products such as oil, fuel, grease, coolant, battery electrolyte, cleaning fluid, etc., should not be allowed to penetrate the soil. They must be collected in appropriate containers and disposed of ecologically, following the regulations applicable to each product. This procedure also applies to filter cartridges and spare parts.

CAUTION!

DO NOT remove covers, caps, or other components while the compressor is running or under pressure. Stop the compressor, ensure there is no internal pressure before disassembly.

COMPRESSOR CLEANING

Always clean the compressor while avoiding electrical components.

BREAK-IN PERIOD

The break-in period requires careful monitoring. In addition to daily (or every 10 hours) operations, it involves specific intervention at 50 hours.

5.1 MAINTENANCE - First 50 hours

Follow the instructions in the "maintenance plan" document and also perform the following checks:

GROUP :

- Bleed the fuel tank and circuit
- Check the tightening of the bolts

ENGINE: (see engine manual)

- Check and clean the air filter
- Replace the fuel filter cartridge (if necessary)

COMPRESSOR:

- Check and clean the air filter
- Check the operation of the regulation (pressures)

5.2 MAINTENANCE SUMMARY TABLE

Follow the instructions in the "maintenance plan" document and also ensure these few checks:

OPERATIONS
After the first 50 hours: - Drain the engine oil - Replace the engine oil filter
Daily: - Check diesel fuel tank level - Check AdBlue tank level - Check oil level (engine and compressor) - Check radiator coolant level (engine) - Check the air filter purge valve (engine and block screw) - Check the fuel filter - Check battery (connections)
Every 100 hours or weekly (whichever comes first): - Clean the air filter (engine and block screw) - Clean radiators and check cooling circuits (engine and block screw) - Check fuel hoses and clamp rings - Drain the engine water separator (diesel circuit)
Every 100 hours: - Clean the entire group - Clean the oil separator block screw return line nozzle - Check oil filter tightening (engine and block screw) - Check battery charge - Check diesel circuit - Grease joints and axle - Check tire pressure and wheel nut tightening - Check fan belt tension (engine) - Check belt tension (block screw)
Every 500 hours or 6 months: - Oil change (engine and block screw) - Change the oil filter cartridge (engine and block screw) - Change the fuel filter - Clean fuel tank - Replace fan belt (engine) - Replace air filter (engine and block screw)
Every 1000 hours or 1 year: - Check valve clearance - Change the separator cartridge (block screw) - Check DPF-related ducts - Check exhaust gas recirculation piping - Check air intake piping (engine and block screw) - Check exhaust manifold for cracks or gas leakage and for loosening or damage
Every 1500 hours: - Check injector tip (engine) - Check exhaust gas recirculation cooler (engine) - Change the oil separator element (engine) - Check PCV valve (engine) - Injector nozzle check of DEF/Ad Blue - DEF/AdBlue hose check
Every 3000 hours: - Check turbocharger for supercharging - Change DEF/AdBlue filter - Check exhaust gas recirculation system - DEF/AdBlue injector check - DPF cleaning
Every 8000 hours: - Change DEF/AdBlue reservoir filter

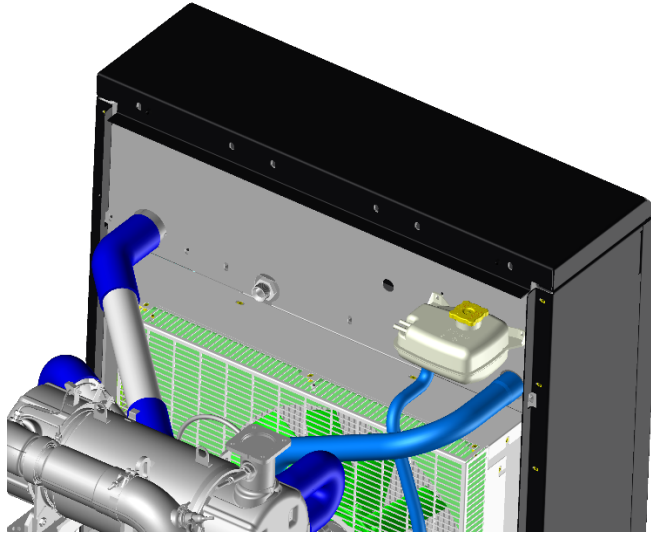
5.3 DEF/AD-BLUE

- Note :
 - It is used as a reduction agent through hydrolysis. Under the effect of heat, exhaust gases produce ammonia (NH₃). This ammonia then reduces nitrogen oxides (NO_x) into nitrogen and water for exhaust gas purification. This treatment process gives the exhaust gas a different odor compared to regular diesel.

Attention

- Do not cut off the engine's electrical supply via the main battery until the DEF/AdBlue return cycle purge process is complete, as this may damage it.
- Note :
 - When the engine is shut down, the product is returned to the reservoir once the DEF/AdBlue injector is cooled.
 - The SCR system continues to operate for several minutes after the engine is stopped to complete this purge process.
- Storage: :
 - Store DEF/Ad Blue in a tightly closed container and place it in a location protected from direct sunlight and well-ventilated.
 - Keep the container in a temperate area where the temperature does not exceed 25°C and does not drop below -5°C. If the temperature is too high, there is a risk of ammonia release.
 - Storage time may vary from 3 months to 24 months depending on the storage temperature.
- **Warning: Ammonia Emission**
 - Do not inhale the container.
 - During transfer or handling of DEF/AdBlue, work in a well-ventilated area to avoid inhaling vapors emitted by the container.
 - Do not fill the tank if the engine is running.
 - Do not fill the tank if the engine is hot.
 - Do not fill near a source of ignition, flame, cigarette, etc.

5.4 COOLING



IMPORTANT

- If the radiator cap needs to be removed, follow the precautions below and securely tighten it afterward.
- In case of a water leak, consult the local dealer.
- Ensure that muddy water or seawater does not enter the radiator.
- Do not refill the reserve tank with coolant beyond the "FULL" level mark.
- Ensure the cap is tightly closed. If the cap is loose or improperly closed, water may leak out and the engine may overheat.

5.4.1 Coolant Precautions

To prevent injuries:

- Wear protective gear such as rubber gloves when handling coolant (contains toxic substances).
- In case of ingestion of coolant, immediately induce vomiting and seek medical attention.
- If contact with skin or clothing occurs, wash with water immediately.
- Do not mix different types of coolant. Such mixing can initiate a chemical reaction generating harmful products.
- Coolant is highly flammable and explosive under certain conditions.
- Keep coolant away from flames and children.
- When draining fluids from the engine, place a collection container under the engine.
- Do not drain directly onto the ground, into a drain, or into a water supply.
- Also, comply with current environmental protection regulations for the disposal of coolant.

5.4.2 Coolant Level Check

- Remove the radiator cap and check if the coolant reaches the filler neck.
- Check the coolant level in the expansion tank. If the level is between the "FULL" and "LOW" marks, the coolant will last for a day's work.

5.4.3 Coolant Change

- To drain the coolant, always open both drain cocks and simultaneously open the radiator cap. With the radiator cap kept closed, complete drainage of the coolant is not possible.
- Remove the overflow hose from the pressure cap of the radiator to drain the expansion tank.
- The volume of coolant is indicated in the specifications table.
- Improperly closing the radiator cap or an opening between the cap and the seat will result in coolant leakage.

5.4.4 Remedies for Rapid Coolant Loss

1. Check for dust and dirt between the radiator fins and the water pipe. If present, thoroughly clean by removing it.
2. Check the tension of the fan belt. If it is loose, tighten it.

3. Check for internal blockage in the radiator hose. If scale has formed in the hose, clean it with descaling solution or its equivalent.

5.4.5 Periodic Checks

To prevent injuries:

- Periodically check the radiator hoses and hose clamps. If a radiator hose is damaged or coolant is leaking, overheating or severe burns may result.
- Every 200 hours of use or every 6 months, whichever comes first, ensure that the water pipes are securely fastened.
- If hose clamps are loose or there are water leaks, securely tighten the hose clamps.
- Replace hoses and hose clamps safely every 2 years or earlier if during inspection it is found that these hoses are swollen, hardened, or cracked.

5.4.6 Precautions for Overheating

When the coolant temperature is near or exceeds the boiling point, it is termed as **"OVERHEATING."**

While operating the machine, perform the following checks to ensure all components are functioning correctly. **If anything unusual is observed, inspect it by referring to the corresponding description in the "MAINTENANCE" and "PERIODIC MAINTENANCE" sections.**

If the warning light illuminates due to coolant temperature or if steam or coolant continuously spurts from the radiator overflow pipe, **disengage the load and idle the engine (COOLING)** for at least 5 minutes to allow it to gradually cool down. Then, stop the engine and perform the following inspections and maintenance:

1. Check if coolant is running low or if there is any coolant leakage.
2. Check for any obstructions around the cooling air inlet or outlet.
3. Check for dust or dirt between the radiator fins and tubes.
4. Check if the fan belt is loose.
5. Check if the radiator water hose is blocked.

5.4.7 Cleaning:

Radiator Fin Cleaning (External)

If there is dust between the fins and the water tube, remove it by washing with running water.

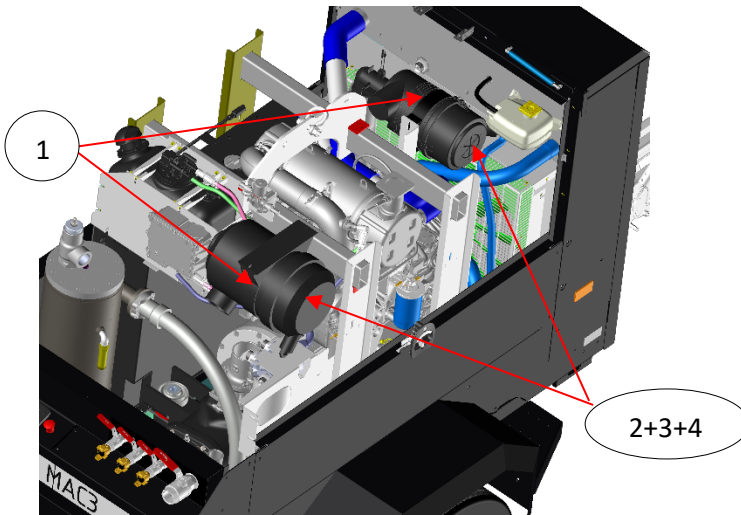
Do not clean the radiator with tools such as spatulas or screwdrivers. They could damage the fins or water tubes. They may also cause coolant leakage or reduce efficiency.- Nettoyage du radiateur (intérieur)

1. Clean the inside of the coolant circuit in the following cases:
 - According to the MAINTENANCE INTERVALS list.
 - When changing the coolant.

2. Use a radiator **cleaning product**.

This helps to remove scaling deposits by washing.

5.5 FILTRE A AIR



- (1) Air filter body
- (2) Cover
- (3) Primary element
- (4) Secondary element (if equipped)

As the elements (3 and 4) of the air filter used on this engine are of the dry type, never apply oil to them.

1. Open the drain valve once a week under normal operating conditions or daily in a dusty environment to remove large dust or dirt particles.
2. Wipe the inside of the air filter with a cloth or similar if it is dirty or wet.
3. Avoid touching the elements except during cleaning.
4. When dust adheres to the elements, blow compressed air from the inside by rotating the element. The compressed air pressure should be below 205 kPa (2.1 kgf/cm², 30 psi).
5. Replace the elements every 200 hours or after every six cleanings.

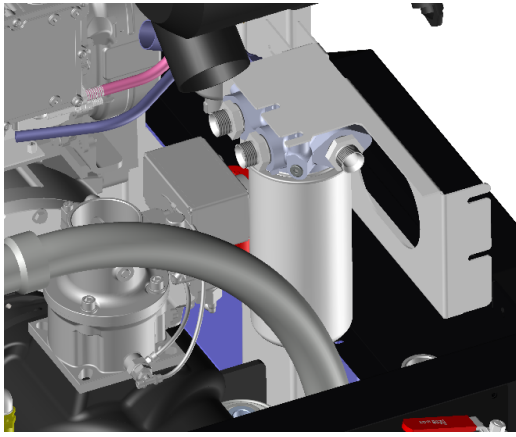
IMPORTANT:

Ensure that the cover (2) is securely closed. If the filter housing is not airtight, dirt and dust can be sucked in, prematurely wearing out the cylinder liner and piston rings and resulting in poor power output.

Do not over-maintain the air filter element. Overcare may allow dirt to penetrate into the engine, causing premature wear.

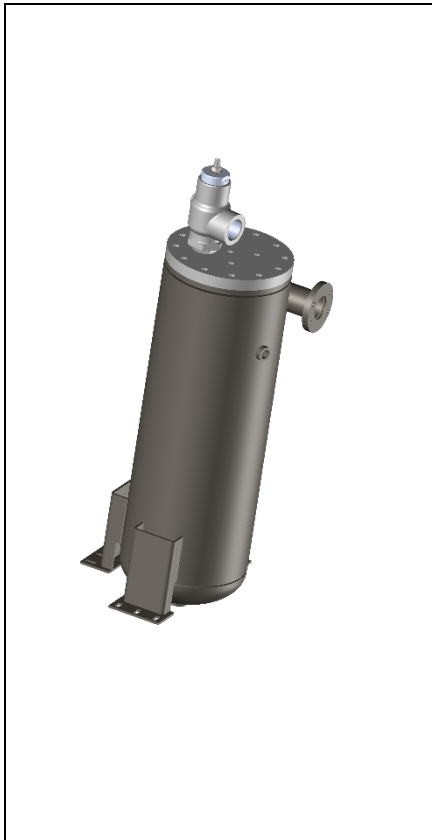
If the air filter cover is incorrectly mounted, dust or dirt will not be trapped in the cover, thereby directly attaching to the element. This causes a reduction in its lifespan.

5.6 COMPRESSOR OIL FILTER



- Unscrew the disposable cartridge.
- Replace with a new cartridge after lightly oiling the seal.

5.7 OIL SEPARATOR



To prevent injuries:

- **Ensure the engine is stopped before changing the oil separator cartridge.**
- **Allow the engine to cool sufficiently as the oil may be hot and cause burns.**
- **Ensure the air circuit is no longer under pressure.**

1. Replace the oil separator cartridge and perform draining.
2. Unscrew the 8 screws of the separator cover.
3. Remove the cover, taking care not to damage the components and the dip tube attached to the cover.
4. Apply a thin layer of oil to the seals of the new cartridge.
5. Hand-tighten the 8 screws of the cover, remembering to attach the air filter support. When the cover makes contact with the seal surface, tighten the screws with a torque wrench to avoid damaging the cartridge seals.



5.8 AL-KO CHASSIS

Maintenance Work:

- Regularly clean all components with clean water.
- During shutdown or storage, ensure adequate ventilation for hot-dip galvanized parts.
- After winter journeys, thoroughly clean the galvanized parts with clean water.
- Grease or oil the joints and bearings.

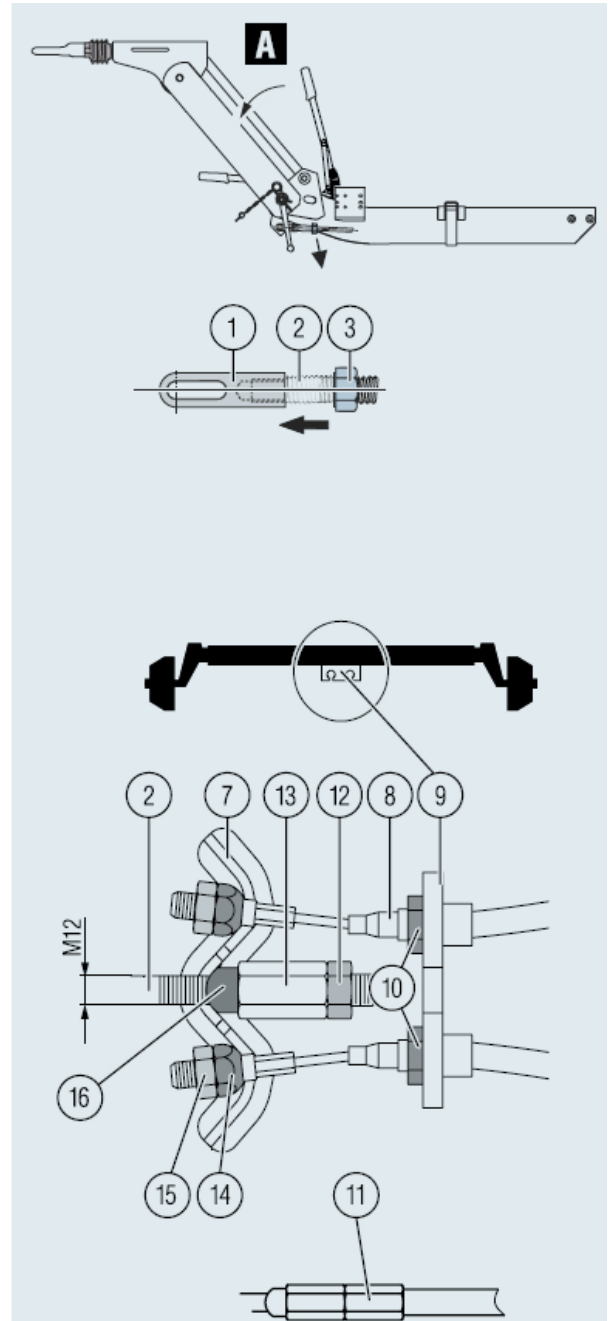
Maintenance Intervals:

Attention: All maintenance and repair work should only be carried out by trained specialized companies or AL-KO after-sales service.

New Purchase 20 to 100km • Tighten wheel nuts
6 months or after 1500 km Axle: - Check the axial play of the hub bearings, adjust if necessary - Check the braking system, adjust if necessary Braking System: - Clean the gear wheels - Application of waterproof grease - Grease the position display lever
Every 12 months or every 10000 km Axle: - Check the axial play of the hub bearings, adjust if necessary - Check the quantity and condition of the bearing grease, regrease if necessary - Check the braking system, if necessary: -Replace brake pads -Adjust the braking system Braking System: - Grease or oil the sliding and articulation sites of the inertia device. (Multifunctional grease according to DIN 515825) - Check the inertia device dampers.
IMPORTANT The maintenance interval shortens if: • Mountain trips are frequent - The trailer brake is heavily worn • Utility trailers - Early readjustment is necessary under heavy use

Mounting and Adjustment Instructions for the Braking System:

1. Mount the adjustable drawbar and the axle onto the chassis.
2. Adjust the drawbar height to the maximum position.
3. Completely loosen the brake lever (A).
4. Extend the sliding barrel of the brake control fully forward.
5. Screw the pull rod at least 15 mm (2) into the articulated head (1) of the brake control and secure it with a hexagon nut (3).
6. Pull the pull rod backward until the connecting rod is present.
 - The cable should be taut.
 - The connecting rod in the brake control should be against the drawbar tube.
7. Attach the brake cable to the wheel brake.
8. Connect the brake cable (8) to the cable stop (9) and secure it with an M16x1.5 hexagon nut (10).
9. Place the pull rod (2) in the clevis (7).
10. Thread the brake cable (8) through the clevis (7).
11. Screw in the M10 spherical nut (14). Secure it with an M10 hexagon nut (15).
12. Place the spacer (16).
13. Screw the long nut (13) onto the pull rod (2) and hand-tighten it.
14. Operate and release the brake lever vigorously three times.
15. Turn the wheel forward and tighten the long nut (13) until a braking resistance is felt. The wheel should be able to be turned by hand in the forward direction.
16. Secure the long nut (13) with a hexagon nut (12) or optionally use a rod support (10).



For adjustment, repeat steps 2, 3, 4, and 14, 15, and 16.

6. CONTRÔLER



6.1 BUTTON DESCRIPTION

ICON	DESCRIPTION
	Mode Stop / Reset This button puts the controller in Stop / Reset mode . This clears any alarm for which the trigger criteria have been met. If the engine is running, the shutdown sequence is executed.
	Mode Automatique This button puts the controller in Automatic mode . This enables automatic regulation of the engine speed based on pressure. This mode also allows the use of air outlet valves. If the engine meets all startup conditions, this button also initiates the startup sequence.
	Mode Start / Manuel This button puts the controller in Start / Manual mode . If all startup conditions are met, this button initiates the startup sequence. While the manual mode is activated, the air outlet is closed, and the separator pressure is discharged.

 	Menu and Navigation These buttons allow navigation between the various pages of the controller. Long press to access different instrumentation menus and navigate within them.
 	Engine Speed Button These buttons accelerate or decelerate the engine speed only in manual mode. Since the air outlet is closed in manual mode, these buttons will not be used for normal machine operation.

6.2 ACCESSING INSTRUMENTATION PAGES

You can access different information pages by pressing and holding the buttons:

UP  or DOWN 

The selected page will remain displayed for 5 minutes or until another page is selected.

6.3 ACCESSING THE PARAMETER EDITOR

Make sure the engine is at rest by pressing the **Mode Stop/Reset** button. 

Press and hold the **Mode Stop/Reset** button  and the **Mode Auto** button  together to enter the editor.

6.3.1 ENTERING THE PIN CODE

- The PIN code page appears.
- Press the **Mode Auto** button , the first '#' changes to '0'. Press **Up**  or **Down**  to display the correct value.
- Press and hold the **Up** button  when the first number is correct. The previous entered number now displays '#' for security.
- Repeat this step for the other numbers of the PIN code. Press and hold the Down button. 
to adjust one of the previous numbers. Press the **Mode Auto** button  to finish editing the PIN code.
- Press the **Mode Auto** button  to confirm the PIN code. The setting mode appears.
- If the PIN code is incorrect, you will only have access to date, time, and language settings. To enter a new PIN code, you must exit the editor and start over.
- To go directly to the date, time, and language settings, as well as pressure adjustment, simply press the Mode Auto button 3 times  when the PIN code prompt is displayed.

6.3.2 EDIT A PARAMETER

- Press and hold the **Up** button  or the **Down** button  to switch to the adjustment page.
- Press the **Up** button  or the **Down**  button to select the parameter to be modified on the current adjustment page.
- To edit a parameter, press the **Mode Auto** button  to enter edit mode. The parameter will blink to indicate it is being edited.
- Press the **Up**  or **Down**  button to change the parameter to the required value.
- Press the **Mode Auto** button  to confirm the value. The parameter will stop flashing to indicate that it has been accepted.

6.3.3 EXITING THE EDITOR

- Press and hold the **Mode Stop/Reset** button  to exit the editor without saving any changes.
- Press and hold the **Mode Auto** button  to exit the editor and save all changes.

6.4 CHANGING PRESSURE

Ensure that the engine is at rest by pressing the **Mode Stop/Reset** button.

Press and hold the **Mode Stop/Reset** button  and the **Mode Auto** button  together to enter the parameter editor.

It is not necessary to enter the PIN code to access the pressure adjustment settings.

Simply press the **Mode Auto** button  several times to access the editor.

Once on the date/time setting page, keep pressing the **Up**  or **Down** button  to scroll through the pages until you reach "active configuration".

Press the **Mode Auto** button once  to start blinking.

Press **Up**  or **Down**  to select the setting.

Press the **Mode Auto** button once  to confirm.

Press and hold the **Mode Auto** button  to save the setting and return to the main menu.

7. REGENERATION

7.1 REGENERATION STRATEGY

This machine is equipped with a particulate filter and must undergo regeneration cycles. Depending on the level of regeneration needed detected by the engine, certain actions will occur automatically or not.

Level	Comments
Level 0	No regeneration required. Manual regeneration is disabled.
Level 1	Automatic regeneration is in progress. Manual regeneration is possible if conditions are met.
Level 2	Automatic regeneration is still in progress but may not be sufficient. Manual regeneration is necessary and possible if conditions are met.
Level 3	Automatic regeneration is disabled. Manual regeneration is necessary and possible if conditions are met. Air outlet is closed, and air pressure is discharged.
Level 4	Automatic regeneration is disabled. Manual regeneration is disabled. Air outlet is closed, and air pressure is discharged. Regeneration is only possible using the diagnostic port.
Level 5	Automatic regeneration is disabled. Manual regeneration is disabled. Air outlet is closed, and air pressure is discharged. Regeneration is no longer possible; the particulate filter must be inspected by Kubota services.

7.2 MANUAL REGENERATION

From level 2 onwards, an information alarm appears on the controller.

Manual regeneration is required.

If not performed, the engine may progress to level 3, where the machine will be unusable until manual regeneration is completed.

Steps for manual regeneration:

- Ensure there is sufficient fuel.
- Start the machine normally.
- Switch the machine to manual mode by pressing the Start button.
- Simultaneously press the up and down buttons.
- After a few seconds, the engine speed should increase to around 2000 rpm.
- After approximately 20 minutes, the regeneration cycle will be completed, and the machine can be used normally.

IMPORTANT:

During the regeneration phase, the temperature of the particulate filter will increase significantly. Please adhere to the safety instructions in the safety chapter to avoid fire or burns.

8. OPERATING INCIDENTS

INCIDENTS	PROBABLE CAUSE	REMEDY
1. The machine won't start.	1. Out of fuel. 2. Clogged fuel filter. 3. Low battery voltage. 4. Clogged air filter. 5. Engine issues. 6. Faulty electrical safety. 7. Blown fuse in the wiring harness. 8. Faulty fuel pump.	Check the fuel level and refill if necessary. Replace the filter cartridge and pre-filter. a. Check the battery charge and recharge if necessary. b. Loose battery cables; tighten them. c. Dirty battery cables; clean them. Clean or replace the filter cartridge. Refer to your Manufacturer's Manual. Check and replace if necessary. Check continuity, and replace if necessary.
2. The machine shuts down when there is a demand for air..	1. Low fuel level. 2. Open compressor discharge temperature control. 3. Cold weather conditions.	Check the level and add fuel if necessary. a. Insufficient cooling air flow; clean the refrigerant and check ventilation. b. Low oil separator level; add oil. c. Compressor oil too dirty; change the oil. d. Clogged compressor oil filter; replace the filter cartridge. e. Faulty discharge temperature control; check for a short circuit or open circuit to the engine fuel solenoid. If not found, the temperature control may be faulty itself. Let the compressor run for 5 minutes in Manual mode.
3. The machine does not provide full discharge pressure.	1. Excessive air demand. 2. Clogged air filter. 3. Misadjusted pressure regulator. 4. Controller in manual mode.	Check for leaks or open valves on the service pressure lines. Check and replace the cartridge if necessary. Adjust it. Press the Auto mode button.
4. Faulty unloading, with excessive pressure rise leading to the opening of the pressure relief valve.	1. Overly adjusted pressure regulator. 2. Stuck intake valve. 3. Limited operation of the regulation system. 4. Clogged regulation nozzle. 5. Defective pressure regulator.	Re-adjust. Unfreeze or replace. Inspect all lines and components thereof. Ice or other substances could be causing this system malfunction restriction. Clear the clogged part of the nozzle(s). Replace if necessary. Inspect and replace if necessary.
5. Insufficient air flow.	1. Clogged air filter. 2. Clogged air/oil separator. 3. Defective pressure regulator. 4. Leakage in the control system, resulting in loss of pressure signal. 5. Controller in manual mode.	Clean or replace. Replace the separator cartridge, and perform the compressor oil and oil filter change. Adjust or repair. Check control lines. Press the Auto mode button.
6. Excessive oil consumption.	1. Blocked return line in the compressor. 2. Leakage in the lubrication system. 3. Damaged or faulty separator cartridge. 4. Overfilled oil separator.	Clean the orifice and the conduit. Check all hoses, fittings, and components. Replace it. Drain to the correct level.
7. Compressor overheating.	1. Clogged oil refrigerant central part. 2. Clogged oil refrigerant tubes (internal). 3. Low separator oil level. 4. Clogged compressor oil filter. 5. Blocked oil return line. 6. Recirculating hot air.	Clean it thoroughly. Clean them thoroughly. Refill. Replace the cartridge. Clean the orifice and conduit. Check hood lock and partition sealing.
8. Engine overheating.	1. Loose or broken fan belt. 2. Clogged radiator central part. 3. Low water level. 4. Low oil level. 5. Faulty water pump. 6. Clogged radiator. 7. Faulty engine thermostat.	Clean thoroughly. Refill. Fill. Replace. Clean thoroughly. Replace.
9- Weak braking effect / handbrake.	1. Incorrect adjustment. 2. Unbedded brake pads. 3. Damaged/clogged brake pads. 4. Significant frictional losses.	Contact after-sales service The brake strengthens after a few braking - Break-in period Contact after-sales service Oil the brake cable
10-Reverse is difficult or stuck.	1. Stiff braking system. 2. Stuck inertia braking lever in the wheel brake.	Contact customer service.

11-Overheating of the brakes in forward gear.	1. Incorrect adjustment. 2. Front brake system not engaging correctly. 3. Stuck return lever. 4. Bent linkage support. 5. Clogged wheel brake. 6. Bent traction cable or Bowden. 7. Relaxed or damaged return springs. 8. Corrosion in the brake drum.	Contact customer service. Release the handbrake and check the mobility of the transmission. Release the handbrake and check the mobility of the transmission. Contact customer service. Clean the wheel brake. Contact customer service. Contact customer service. Contact customer service.
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MAC3

10 allée du Canal – ZC des
Landes - 42160 Saint-Cyprien
France

Tél : +33 (0)4 77 02 13 08
Fax : +33 (0)4 77 02 20 28
contact@mac3.fr
www.mac3.fr