

Ideen aus der Praxis!

MEIER-BRAKENBERG

Frequency controlled high-pressure pump

Operating manual



MBH STF
MBH STH
MBH Flex

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1. Introduction

Dear Customer, please read this manual carefully prior to first use and act accordingly. Keep the manual in a safe place and pass it on to any future user. It is very important to read the safety instructions prior to commissioning!

Warranty: 12 months when maintained properly and used as intended! Parts subject to wear and tear are excluded.

Liability: Each user shall be responsible for maintaining and using the high-pressure cleaner in a responsible manner.

The manual shall be directly accessible to the user to ensure proper operation and in particular to ensure the compliance with the safety instructions (see paragraph 3). The high-pressure cleaner is constructed with approved components and in compliance with the "Richtlinien für Flüssigkeitsstrahler" (Directive for the Use of Liquid Blasters) and the "Gesetz über technische Arbeitsmittel" (Machine Safety Code).

2. Use

High-pressure cleaners of type MBH must only be used for cleaning the interior of pigsties and chicken houses. Use only water as cleaning agent. Use warm water (up to 40 °C) to enhance cleaning effect. Use exclusively accessories and spare parts approved by MEIER-BRAKENBERG. When using and/or exchanging jets and dirt blasters make sure to select the correct nozzle size!

3. Safety instructions

Safety features protect the user and functions must neither be deactivated nor bypassed. The high-pressure cleaner must only be operated by persons fully acquainted with the device functions. Please observe the following safety-related instructions before commissioning and during operation.

- The working place and the device position must be free of dirt and grease during operation to ensure operational safety for the user (or users).
- Use approved and non-aggressive additives only.
- Ensure that the reaction between cleaning or spraying liquid and the item to be cleaned is not dangerous. When working in enclosed spaces be aware of any possibly occurring gases or vapours.
- **Switch off the device during maintenance or repair work. In doing so turn over the main switch to position „0“ and secure against reactivation!**
- **After switching off the frequency converter and disconnecting from the power supply, make sure to wait for a sufficient period of time before working on the electrical unit. Determine voltage-free status with a suitable measuring instrument.**
Due to charged capacitors, frequency converters carry residual voltage after shutdown which needs to dissipate.
- Do not spray-wash the device.
- Handle the high-pressure hose tube in a proper manner to avoid bending, damage, passing over or destruction.
- Replace defect high-pressure hoses with original hoses. Hoses must comply with „The Directive for Use of Liquid Blasters“. Therefore it is not permitted to use hydraulic hoses.
- The spray gun trigger must not be locked in ON-position.

- Secure spray gun by using the security lock during work breaks. The security lock of the spray gun prohibits unintended activation of the device.
- Do not direct the water jet at people or live animals.
- **It is strictly forbidden to lock the spray gun! If the pump is activated while the spray gun is locked, the spray hose including lance and gun might cause serious physical injury or damages to property!**
- **Under no circumstances may the high-pressure spray gun be used without lance!**
- The circulation valve must not be altered with respect to its maximum limit.
- It is not permitted to use the device in explosive environments. Observe the safety instructions when using in dangerous areas (e.g. gas pumps).
- Do not use when other peoples are in reach of the device unless they are wearing protective clothing. Do not direct the water jet at yourself or other people to clean clothing or shoes.
- The water jet emitted by the high-pressure nozzle causes reaction force at the spray gun. Secure safe standing position and hold spray gun and steel pipe with both hands.
- A qualified person (customer support) must check the high-pressure cleaner every 12 months to ensure continuous safe operation.
- Repairwork must be done by qualified persons only. Apart from that the following operating regulations apply:
 "Richtlinien für Flüssigkeitsstrahler" (Directive for Use of Liquid Blasters) available at:
 Carl Heymanns Verlag,
 Gereonstraße 18-32
 50670 Köln

Note:

In addition to the always present reaction force, a torque effect at the wrist joints occurs during spraying operation.

4. Commissioning (Note: see also point 9 of manual!)

4.1 Components of the high-pressure cleaner

1. Base structure: Aluminium rectangular pipe 60/40/3
2. Drive motor, high-pressure pump
3. Circulation control / manometer
4. Spraying device
5. Electrical connection

4.2 Oil level check

Check oil level at high-pressure pump. The oil level must reach the middle of the oil level indicator. Refill if necessary.

Oil to be used: SAE 10 W 60 (art.-no.: WB011-01)

4.3 Power supply

Observe the following regulations and provisions:

VDE0100 part 530: Low voltage electrical installations – Selecting and set-up of electrical equipment, switch and control units

VDE 0160 / EN 50178: Equipment of power plant with electronic devices

VDS 2067 Directive for the prevention of damages: Electrical installations in agriculture

Electrical connection must be carried out by an electrician.

Ensure that the voltage stated on the specification plate complies with the voltage of power supply. Unsuitable extension cables might be dangerous. When working outside only use with wires approved and correspondingly marked for outside use.

4.4 Water supply

- See specification plate for connection values. Proper operation cannot be guaranteed if the domestic water supply does not meet the requirements with respect to the amount of water needed by the cleaner.
Water shortage destroys the pumps!
- The water pressure of the supply line must be between 3 bar and 10 bar.
- Follow the instructions of your water supplier.
- The water filter is mounted between the water connection and the floater container. Check and if necessary clean the water filter regularly.
- Water connection must be established by using a pressure and suction resistant fibre reinforced water hose.
- Connect hose to water connection of inlet flow tank and water tap of domestic water supply.

4.5 Starting the pump

- Connect hoses and electrical installation (see also manual: Frequency pump unit, commissioning page 8).
- Open water supply tap.
- Press high-pressure gun and wait until water emerges in a steady stream free of air. Close gun.

Starting stationary unit (mobile devices MBH3000Flex see point 5.4)

Switching on unit:

- Switch on main switch.
- Confirm green button “Betriebsbereit” (Ready for operation).
- Green LED illuminates.
- Device is now ready for operation.
- The motor starts when opening the high-pressure gun “ON” and stops with overtravel time “OFF” during breaks.
- Pressure must build up immediately!
- If pressure does not build up, switch off pump and check whether:
 - Nozzle „washed out“
 - Supply filter blocked (insufficient water supply)

Switching off unit:

- Press red button “Betriebsbereit” (Ready for operation).
- Green LED turns off.
- Switch off main switch.

5. Mode of operation

5.1 General notes

A hose supplies the electric motor-driven high-pressure pump with water directly from the flow tank, increases the working pressure and leads the water through the high-pressure hose to the spray gun or nozzle spraying device. A special nozzle generates a fan-shaped spray jet for best possible cleaning effect.

During breaks, the pressure circulation valve (bypass valve) leads the water delivered by the high-pressure pump in circulation back to the suction side of the high-pressure pump.

Once the water tap is open and the main switch is on, activation of the spray gun switches device "ON" automatically and during breaks it switches "OFF" automatically.

Always switch off main switch during longer breaks!

5.2 Control stationary single pump unit

Control and signal units in control cabinet:

- Indicator lamp „Netzspannung “ (supply voltage) - illuminates with connected supply voltage.
- Indicator lamp „FU Betriebsbereit“ (frequency converter ready for operation) - illuminates when the frequency converter of the pump unit does not identify any errors and is ready for operation.
- Illuminated push-button „FU-Störung Reset“ (frequency converter fault reset)- illuminates when frequency converter identifies an error; reset the error by pressing the button. In the event that the error reoccurs shortly afterwards: contact Meier-Brakenberg Service; identified errors are indicated on the frequency converter display (see manual frequency converter).
- Indicator lamp „Störung Lüfter Pumpenmotor“ (fault ventilator pump motor) - illuminates if the motor protection switch of the ventilator motor is activated.
- Potentiometer „Solldruck“ (set pressure): Adjustment requested set pressure; the digital display unit next to the potentiometer indicates the set pressure.

Option flow tank:

- Indicator lamp „Vorlaufbehälter Wassermangel“ (flow tank water shortage)- illuminates when lower floater switch identifies water shortage - in case of insufficient water supply.
- Indicator lamp „Vorlaufbehälter Füllvorgang“ (flow tank filling process) - illuminates when tank is filled with water through an open magnetic valve.
- Indicator lamp „Vorlaufbehälter Wasser-Übertemperatur“ (flow tank excess temperature) (optional equipment for tank) - illuminates when the temperature of the water filled in the tank through the supply line is too high.
In this event, interrupt the filling process by closing the magnetic valve!

5.3 Control stationary twin pump unit

Control and signal units in control cabinet:

- Indicator lamp „Netzspannung “ (supply voltage) - illuminates with connected supply voltage.
- Indicator lamp „FU 1 Betriebsbereit“ (frequency converter ready for operation) - illuminates when the frequency converter of pump unit 1 does not identify any errors and is ready for operation.
- Indicator lamp „FU 2 Betriebsbereit“ (frequency converter ready for operation) - illuminates when the frequency converter of pump unit 2 does not identify any errors and is ready for operation.
- Illuminated push-button „FU 1 Störung Reset“ (frequency converter 1 fault reset)- illuminates when frequency converter 1 identifies an error; reset the error by pressing the button. In the event that the error reoccurs shortly afterwards: contact Meier-Brakenberg Service; identified errors are indicated on the frequency converter display (see manual frequency converter).
- Illuminated push-button „FU 2 Störung Reset“ (frequency converter 2 fault reset)- illuminates when frequency converter 2 identifies an error; reset the error by pressing the button. In the event that the error reoccurs shortly afterwards: contact Meier-Brakenberg Service; identified errors are indicated on the frequency converter display (see manual frequency converter).
- Indicator lamp „Störung Lüfter Motor 1“ (fault ventilator motor 1) - illuminates when the motor protection switch of the ventilator motor is activated.
- Indicator lamp „Störung Lüfter Motor 2“ (fault ventilator motor 2) - illuminates when the motor protection switch of the ventilator motor is activated.
- Potentiometer „Solldruck“ (set pressure): Adjustment requested set pressure; the digital display unit next to the potentiometer indicates the set pressure.

Option flow tank:

- Indicator lamp „Vorlaufbehälter Wassermangel“ (flow tank water shortage)- illuminates when lower floater switch identifies water shortage - in case of insufficient water supply.
- Indicator lamp „Vorlaufbehälter Füllvorgang“ (flow tank filling process) - illuminates when tank is filled with water through an open magnetic valve.
- Indicator lamp „Vorlaufbehälter Wasser-Übertemperatur“ (flow tank excess temperature) (optional equipment for tank) - illuminates when the temperature of the water filled in the tank through the supply line is too high.
In this event, interrupt the filling process by closing the magnetic valve!

5.4 Control mobile MBH2000Flex / MBH3000Flex

- Switch on main switch.
- LED „PWR“ illuminates.
- Device completes a self-test .
- LED „RDY“ illuminates, device is ready for operation.
- Using the high-pressure gun activates the high-pressure cleaner and the „RUN“ LED illuminates.

- In case of device fault the LED „FLT“ illuminates.
- Switch off main switch to reset error, wait for approx. 5 seconds and switch on main switch again
- Adjust working pressure at integrated potentiometer.
Do not reduce the motor speed to such an extent that the cooling capacity is no longer sufficient (< 15 litres).

6. Shut-down

- Switch off main switch.
- Close water tap.
- Release remaining pressure by activating the spray gun.
- Lock high-pressure spray gun!

7. Maintenance

7.1 Before each use

- Check power supply line. The cable must not be damaged (risk of electric shock). Damaged power supply cables must be immediately replaced by an authorised electrician.
- Check high-pressure hose. The hose must not be damaged (risk of bursting). Damaged high-pressure hoses must be replaced immediately.
- Check filter and ensure that filter insert is clean. Clean if filter insert is dirty and place back in position (see also point 7.4 of manual).
- **Measures when there is a risk of frost:** Store the pump unit and extra equipment protected from frost!

7.2 Oil level high-pressure pump (check regularly)

- Check oil level in crankcase before starting to operate the cleaner.
- Check at oil dipstick.
- Check at oil gauge glass.
- First oil change after approx. 50 hours of operation, subsequently every 300 hours of operation or every 6 months.

- Oil change:**
- Unscrew oil drain plug.
 - Discharge oil into collection container.
 - Screw in oil drain plug.
 - Slowly fill with new oil until it reaches the middle of the oil level indicator.
 - **Oil to be used: SAE 10 W 60 (Art.-no.: WB011-01).**

7.3 Filter

The standard black water filter (article: HE032; 1“ AG) is at the water supply side of the pump.

Exception: MBHSTF4200

A 500 litres flow tank is installed to ensure a consistent water supply. This tank is equipped with an additional large water filter inside the water supply line (article: E030; 1" IG). The large filter is equipped with a 50 mic. filter insert which is capable of filtering out even fine sand particles.

Filters must be checked regularly (at least 1x daily) and must be cleaned, if necessary. To clean, unscrew filter casing and rinse filter.

CAUTION:

- **Dirty filters lead to water shortages and therefore cause damage to the pump!**
- **Fine sand and other contaminations lead to pump defects. Remaining circulating sand has blast cleaning effects.**
For this reason the pump unit must not be used without filter or filter insert!
- **Increased Fe-content may cause conglutination of pump components. If so, rinse with clean water.**
Water with minor lime or iron contents does not affect the pump wear.

8. Accessories

8.1 Hose reel

The hose reel is optional equipment and supplied on request. It is made of stainless steel and includes the following components:

- Hose reel
- Crank handle
- Brackets
- Hose brake
- Swivel joint

Hose brake:

Adjust modulation or lock hose brake entirely with the pin at the right hand side of the device. We recommend securing the hose reel during cleaning operation to avoid unwinding of the hose caused by vibration.

8.2 Hose reel trolley

The hose reel trolley is optional equipment and supplied on request. It is made of aluminium and equipped with pneumatic tyres. The trolley is suitable for installation of hose reels type HST30, 70 and 100. The HST30 must be mounted crossways to travel direction, type HST70 and 100 lengthways to travel direction.

8.3 Special lances

Special lances are optional equipment and supplied on request. The KEW fast coupling systems allows the exchange of lances at the gun.

Use the dirt blaster lance for heavy soiling. It generates a particularly aggressive cleaning jet due to spot blasting rotation. Only clean those surfaces with the dirt blaster which are resistant to the powerful jet.

A pressure control lance for the adjustment of pressure can be used in connection with frequency controlled pumps of the MBHSTF series, on request.

☎ **Do you need more information? We would be pleased to help you. Call us!**

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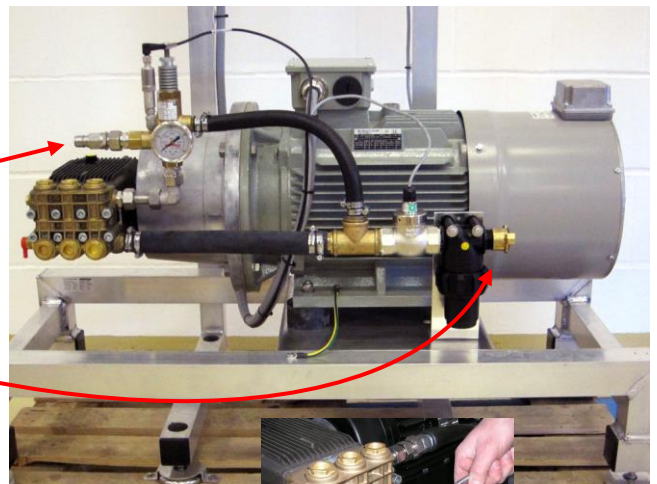
9. Stationary frequency pump unit Commissioning

9.1 Connection requirements

Water supply: min. 40 mm line diameter (1½")
at approx. 3 bar pressure.

9.2 Connection fittings

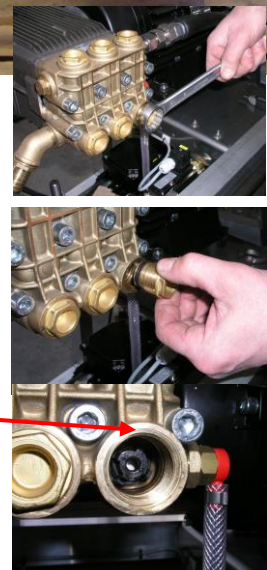
- High-pressure connection to stainless steel pipe.
- Pressure connection of water supply.



9.3 Venting the pump

- Connect hoses.
- Fill flow tank.
- Loosen and remove suction hose from the pumps so that air can escape from the suction hose.
- Loosen and remove a valve at the pump.

- Water is pressed from the tank to the pump. As soon as the pump is filled with water, insert the valve in straight position and screw in afterwards.



9.4 Electrical connection

- Electric supply must be connected by electricians only.
- Operating voltage of device 400V/3 Ph./50Hz/N/PE. Technical data are stated on the specification plate.
- Residual-current-operated protective devices (RCD) must be type B (all-current sensitive, short-time delayed deactivation).

10. Frequency pump unit Maintenance manual

Spare parts and parts subject to wear must be replaced by original Meier-Brakenberg components or components approved by Meier-Brakenberg!

10.1 Before each use

- Check high-pressure hose for damages (risk of bursting). Replace damaged hoses immediately.
- Check oil level at gauge glass in crankcase of high-pressure pump.
- Check at oil dipstick.

Measures when there is a danger of frost: Store the pump unit incl. accessories in a place protected from frost!

10.2 High-pressure pump

Oil level high-pressure pump (check regularly)

- Check oil level at gauge glass in crankcase of high-pressure pump.
- Check at oil dipstick.

Service interval oil change

First pump oil change after approx. 50 hours of operation, afterwards every 300 hours of operation or every 6 months alternatively.

Operational hours are displayed on the control unit of the operating hour counter.

Oil change:

- Switch main switch to position „AUS“ (off).
- Place container with at least 2 l capacity underneath the oil drain plug.
- Loosen oil drain screw (HE006E10) and empty the oil from the pump.
- Retighten oil drain screw after oil discharge.
- Afterwards fill with new oil through the oil filler neck / control plug.
- Use motor oil: **SAE 10 W 60 (article no.: WB011-01)**.
- Restart of pump after service shutdown: Press ON and OFF button simultaneously (min. 5 sec.); LED stops flashing; afterwards set control back to operational readiness by pressing “EIN” (ON).

10.3 Service interval electric motor

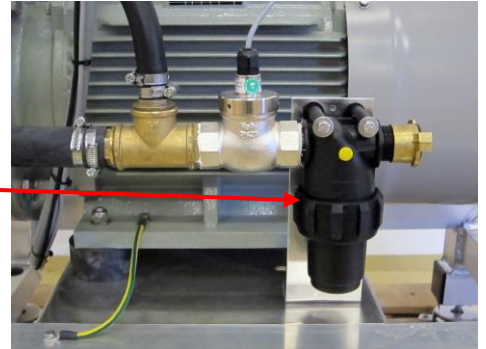
Cooling fins of the electric motor of the pump unit must not be blocked by dirt in order to ensure smooth operation. Cooling fins must be uncovered to allow air circulation and cooling. Clean every 6 months.

Cleaning with compressed air is possible.

Covered cooling fins result in overheating which may cause damages to the motor.

10.4 Service interval filter

The frequency pump is equipped with water filters to protect the high-pressure pumps from soiling caused by utility water. Check all filters at least once monthly and clean if necessary.



- The main filter with black case is located at the water inlet of the high-pressure pump.
- Loosen the cap nut and remove filter case with insert for cleaning. Rinse filter insert with clean water.
- Afterwards place the filter insert back in filter case and tighten with cap nut.
- Optional equipment MBHSTF4200:
500 l flow tank to ensure consistent water supply. The tank is fitted with an additional large water filter inside the water supply line (article: E030; 1" IG). The large filter is equipped with a 60 mic. insert filtering out even fine sand particles.

Due to the transparent filter case, the filter insert can be easily checked. If there is visible dirt, remove and clean.

Caution: Multiple pump systems must not be used without filter since contaminated water may cause damages to the high-pressure pumps!

10.5 Troubleshooting

Error	Cause	Troubleshooting
Pressure exceeds 150 bar	- Frequency controller	Get in touch with manufacturer immediately
Pressure too low	- Too many users	Reduce number of users
Lance „sputters“ during cleaning	- Insufficient amount of water in supply line	- Check if water supply is sufficient - Check if filter is blocked

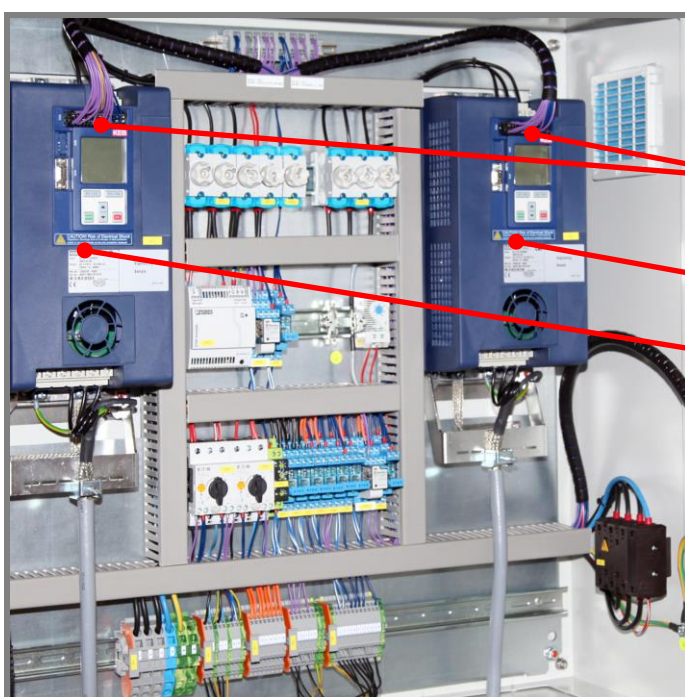
11. Emergency operation frequency twin pump

In system constellations where two pump units share one pressure line, each pump unit is equipped with an individual drive motor.

- Control of individual drive motor by separate frequency converter.
- Frequency converter 6T1 is the „master unit“; frequency converter 7T1 is the “slave unit”.
- Should the converter or motor be defect, the device can be operated in emergency mode with reduced performance.

Set up emergency mode:

- All measures must be carried out by a qualified electrician.
 - Ensure beforehand that the main switch of the device is switched off and secured against restart.
 - Afterwards ensure and determine voltage free status of the device.
1. Defect slave-drive (right hand side frequency converter 7T1 or right hand side motor 7M1):
 - Remove plug from control terminal strip X2A (converter 7T1), unit continues operation with master-drive unit (6T1 / 6M1).
 2. Defect master-drive (left hand side frequency converter 6T1 or left hand side motor 6M1):
 - Remove plug from control terminal strip X2A (converter 6T1).
 - Remove plug from control terminal strip X2A (converter 7T1).
 - Insert plug of converter 6T1 into converter 7T1 . The unit continues operation with slave-drive unit (7T1 / 7M1).



Terminal strip X2A

Frequency converter slave 7T1

Frequency converter master 6T1