



# Operating manual

Construction site silos – M-TEC automatic mixer

# Siilos

## Easy to load, easy to use!

### Safety instructions

- Always make sure to turn the power off by unplugging all power cables before servicing and loading the silo.
- Read the instruction manual before using or servicing the silo.
- Only use spare parts and accessories provided by Fescon Oy. Fescon Oy assumes no liability for accidents caused by the use of other than approved spare parts or accessories. The machines must not be modified in any way.
- The operating instructions and regulations governing the use of the silos must be followed when transporting and assembling the silo.
- The safety of the machine must always be verified before use and any damages or shortcomings must be repaired and rectified. This applies particularly to the condition of the electrical wiring, plugs and connectors, the water hose, and the overall condition of the equipment. If any damage is observed, the machine must not be used until the damage has been repaired by a professional.
- Carelessness around the electrical cabinet and energised conductors causes a shock hazard, which could result in serious injuries, burns, or death.
- Only authorised electricians are allowed to service or repair the electrical cabinet.
- In case of fault to the electrical cabinet due to moisture or technical failure, the electrical cabinet must not be touched and power must be immediately turned off. Power must not be turned back on until an authorised electrician has tested the system and verified that it is in working order.
- The electrical cabinet must not be cleaned with compressed air or water, sand or steam jet.
- Occupational safety regulations must be observed when using the machine.

### Assembly

The transport equipment must have unobstructed access to the silo unloading site. The buyer is responsible for the conditions of the unloading and assembly site, reserving sufficient space for unloading, the durability and carrying capacity, and for any traffic arrangements required during the assembly. The construction site silo is lifted onto the assembly site by the lifting brackets located at the top of the silo. The silo is assembled on hard level ground at a two-degree angle, in a forward cant towards the pipe mixer, in a manner that eliminates the risk of the silo falling over.

If the silo is to be assembled on a public route, the buyer must see to the required official permits as well as mark the construction site equipment with appropriate warnings and signage.



The silo is assembled at a two-degree angle in the direction of the pipe mixer.

**Pay particular attention to the following:**

- The assembly site area must be at least 3 x 3 m and unobstructed.
- The assembly site must have sufficient carrying capacity and durability. The carrying capacity of the ground and possible need for foundations are verified with a structural engineer if needed.
- The silo may only be lifted by the lifting brackets located at the top of the silo. At least two hooks must always be used for lifting.
- Particular care must be observed when lifting the silos, and the risk of getting crushed must be taken into account.
- In winter conditions, make sure the silo is not assembled on frozen ground.
- Make sure that heavy rain will not erode the soil away from under the legs of the silo.
- Unauthorised persons must not have access to the risk zone during silo assembly and loading.
- The lifting equipment must have sufficient carrying capacity and its annual inspections must be performed appropriately.
- Cranes can only be used for lifting empty silos.
- The silo may be elevated and moved only if it is completely empty.
- The buyer must comply with applicable occupational safety regulations.



**Cranes may be  
used for lifting  
empty silos only.**

The silo may only be lifted by the lifting brackets located at the top of the silo.

## Commission - Electrical connections, summer

Electrical connections must always be made through the control panel supplied with the silo. Use a 16A 5pol 6h plug. The power cable must have a 5 x 2.5 mm<sup>2</sup> cross section, 16 A fuse. The machines must be connected to the power distributor through a residual-current device.

- Connect the safety device.
- Connect the power cable of the motor of the automatic mixer to the control panel.
- Connect the power cable of the silo vibrator to the control panel.
- Connect the power cable of the control panel to the mains supply.



Connect the safety device.



Connect the power cable of the motor of the automatic mixer to the control panel.



Connect the power cable of the control panel to mains electricity.

## Commission - Electrical connections, autumn/winter

- In low temperatures (under +5 °C), electrical connections must be made using the supplied power current tap 16 A (3 x 400 V), which is fixed to the silo frame. The tap enables the concurrent use of a water heater and a construction heater.
- The construction heater is not included in the delivery. The use of the heater prevents condensation water from forming mortar lumps in the valve of the silo, which would block the flow of mortar into the automatic mixer.
- The maximum power for the construction heater is 5.0 kW. The adapter required for single-phase electric power (230 V) is not included in the delivery contents

Tap

- 1 top; construction heater
- 2 left; water heating
- 3 right; control panel
- 4 bottom; mains electricity



## Commission – Water connection

To ensure the consistent quality of the mortar, the water pressure must be 3 bar and the inner diameter of the water hose 19 mm.

- Connect the supplied water hose between the water connection in the control panel and the automatic mixer.
- Connect the water supply hose to the control panel with a claw coupling (3/4").
- Turn on the water supply.
- Water must not be taken from the wash water connection when the machine is running.
- Water pressure should be kept steady in order to minimise variations in the consistency of the mortar.



Connect the supplied water hose between the water connection in the control panel and the automatic mixer.

## Control panel functions

1. Main switch
2. Start button (red / green)
3. Wash out switch "run/clean"
  - Default setting is OFF – turned off (down).
  - ON setting – turned on. Turning on the wash out switch will force-feed water into the automatic mixer and the wash tap.
4. Switch for surface level control
5. Schuko plug for a lighting fixture
  - must not be used with a construction heater
6. Connection for the mixing pipe
7. Connection for the vibrator
8. Power connection
9. Connection for the surface level control
10. Timer for the automatic mixer (behind the door)
11. Water inlet
12. Water amount adjusting valve



## Operating the silo

- Always make sure to turn the power off before servicing or loading the silo.
- The silo is loaded with dried product from big bags. The dry material is mixed with water in a continuous-flow pipe mixer. The bottom cone of the silo is equipped with a vibrator to prevent the dry material from arching inside the silo. The vibrator also helps in emptying the silo.
- The lid of the loading hatch must be kept closed. Locking must be ensured with a linchpin. The operator must ensure that water cannot enter the silo.
- Make sure that power is turned off during servicing.
- To prevent arching, the dried product should not be stored in the silo for over a month. The silo should be run out of the product every two weeks.

## Loading the silo

- Before loading the silo, make sure there are no lumps of mortar on the butterfly valve inside the silo. You can find the inspection door on the front of the silo, above the pipe mixer. If lumps have formed on top of the butterfly valve, contact Fescon Silo Maintenance Service at +358 40 322 2851.
- For deliveries arranged by Fescon Oy, the recipient must assist in the loading of the silo at the worksite by climbing on top of the silo.
- Before loading, make sure the silo is positioned at a two-degree angle, at a forward cant towards the pipe mixer, and that the base stands firmly on the ground. Before starting the loading process, inspect the condition of the lid of the loading hatch and ensure that the bag breaker and fall protection net are in working order. Any damage must be reported to Fescon Oy's Silo Maintenance Service immediately.
- The construction site silo is loaded with dried product from big bags. Loading is carried out by opening the bottom of the big bag by placing the bag carefully on top of the bag breaker 2-3 times, after which the contents of the bag will start to flow into the silo. The entire weight of the big bag should not be allowed to rest on the bag breaker and the fall protection net. Any pieces broken off from the big bags must be removed from the fall protection net, as they could cause the automatic mixer to jam.
- After loading the silo, the lid of the loading hatch must be carefully cleaned and closed. In winter, also remove any ice or snow from the top of the silo.
- The operator must ensure that water cannot enter the silo.
- Respiratory protective equipment must be used.



For deliveries arranged by Fescon Oy, the recipient must assist in the loading of the silo at the worksite by climbing on top of the silo.



After loading the silo, the lid of the loading hatch must be carefully cleaned and closed.

**The recipient at the site must assist in the loading of the silo by climbing on top of the silo.**

## Using the pipe mixer – check the rotational direction

- Never insert your hands or any tools inside the machine when it is connected to a power supply!
- First verify the correct rotational direction of the automatic mixer.
- The correct rotational direction of the motor must be verified before starting the continuous running of the machine and before opening the butterfly valve of the silo and turning on the water supply.
- Turn the main switch into the “1” position and turn on the mixer by pressing the “red / green” start button.
- Check the rotational direction of the motor from the end of the pipe mixer. The shaft must rotate in the direction of the arrow. Turn off the mixer by pressing the “red / green” button and turn the main switch to the “0” position.
- Changing the rotational direction:
  - Pull out the power plug.
  - Press the phase inverter in the plug in with a screwdriver and turn it by 180°, the phase inverter must click back into position after turning.
  - Push the power plug back in.



First verify the correct rotational direction of the automatic mixer.

## Using the pipe mixer – mixing the mortar

- Never insert your hands or any tools inside the machine when it is connected to the mains supply!
- Place a wheelbarrow or a mortar tub underneath the mortar outlet of the automatic mixer.
- Open the butterfly valve of the construction site silo and turn on the water supply.
- Turn the main switch to the “1” position and press the green start button to turn on the pipe mixer.
- The amount of water in the mortar can be adjusted with the adjustment valve on the left-hand side of the control panel. It typically takes about one tubful of mortar (90 l) to find the right setting, so be sure to not adjust the flow of water too quickly.
- Breaks must be kept as short as possible; they must be shorter than the setting time of the mass used.

The amount of water in the mortar can be adjusted with the adjustment valve on the left-hand side of the control panel.



## Finishing work

- Close and lock the butterfly valve of the silo.
- Run out all the remaining mortar in the mixer. Run the mixer until empty and collect the rest of the mortar. Do not use the partially set mass; instead, empty it in a container and dispose of it as construction waste. The mass and wash water may not be released to the ground.
- Pull the vibrator plug out of the electrical cabinet.
- Pull the power cable out of the power distributor and the electrical cabinet.
- Take the control panel to a warm, locked space for storage to prevent unauthorised people from using the machine.
- In low temperatures (under +5 °C) the control panel must be stored indoors to prevent the solenoid valve from freezing.
- In low temperatures (under +5 °C), follow the instructions below to drain the control panel from water to avoid the risk of freezing:
  - Turn off the water supply.
  - Disconnect the water supply hose from the control panel and remove the water pipe between the control panel and the automatic mixer.
  - Open the ball valve of the wash water connection at the bottom of the control panel.
  - Turn the wash out switch in the control panel to the ON position (up). This will open all the solenoid valves inside the control panel, allowing the water to flow out from inside.

## Daily cleaning

- The machine must be cleaned daily after finishing work.
- The main switch must be set to the "0" position and the power cable must be disconnected before troubleshooting or servicing. Also ensure that the machine cannot be reconnected to the mains supply during troubleshooting or servicing.
- Complete the cleaning measures instructed under the Finishing work section before starting the daily cleaning process. After that, perform the following cleaning procedures:
  - Disconnect the water supply hose from the mixing pipe.
  - Disconnect the mixing pipe from the dry material pipe. Unfasten the screws, adapter sleeves, or wedge locks.
  - Check the mixing pipe of the wet end and the mixing shaft for blockages and clean them.
  - The joint between the mixing pipe and the feed shaft must be clean, dry, and greaseless.
  - Check the bearing, feed screw, and scraper of the mixing pipe for wear and tear. If the parts are worn, contact Fescon Silo Maintenance Service.



Clean the mixing shaft and mixing pipe of the wet end.



## Weekly cleaning of the dry end

- Turn the motor to the side by unfastening the clamping screw.
- Pull the feed shaft out from the dry material pipe.
- Check the feed pipe and feed shaft of the dry end for blockages and clean them.
- Inspect the feed shaft and the mixing blade for wear and tear.



Turn the motor to the side.

## Connection and use of the water heater

- During low temperatures (under +5 °C), a separate water heater supplied with the construction site equipment can be used. The purpose of the water heater is to increase the temperature of the water mixed into the mortar, enabling the additives in the dry products to be mixed more effectively into the mortar.
- The water heater is connected through the supplied current tap. Connect the heater to the left side of the tap.
- Connect the water supply hose to the water heater. The outgoing water hose from the water heater is connected to the control panel.



Connect the water supply hose to the water heater.

**Silo maintenance  
service  
+358 40 322 2851**

## Automatic mortar amount adjuster

- The automatic mixer can be timed to run for a preset number of seconds from the control panel by using the time-limit relay.
- Adjustment instructions:
  - Disconnect the power cable from the control panel and open the panel cover.
  - Set the timer at the 1,2 position. The predefined settings apply to 90-litre tubs and building mortar. Adjust the timer as needed at the construction site.
  - Close the panel cover and reconnect the power cable.
  - Place an empty mortar tub under the automatic mixer. Turn on the machine.
- Operating instructions:
  - Use of the automatic mixer as instructed in "Using the pipe mixer – mixing the mortar"
  - When the automatic mortar amount adjuster is being used, enough mortar is mixed to fill the tub, after which the pipe mixer will be turned off automatically. Replace the tub under the automatic mixer with an empty one and press the green start button.

## Greasing

- Grease the motor nipple monthly with two doses of bearing grease from a grease gun.



## Emptying the silo



- Turn off the water supply.
- Open the valve downwards.
- Turn the main switch to the "1" position and press the green start button to turn on the pipe mixer.
- Run the machine for as long as dry mortar is discharged.
- Empty the mortar into a big bag or other container.

## Surface level control for plastering work (Note! Accessory)

- The construction site silo can be equipped with a surface level control that automatically controls the operation of the mixing pipe.
- The surface level control is installed in the mortar bin of the mortar pump. When the mortar bin is full, the surface level control system will turn off the pipe mixer and restart it once the bin has been emptied.
- Using the surface level control:
  - Connect the surface level control to the control panel (number 9 in the figure on page 4)
  - Turn the switch of the surface level control to the upward position.

## Troubleshooting

Problem	Cause	Procedure
The motor is not running	No mains voltage	▶ Check the power connection and use a voltmeter to check the fuses to make sure all the power phases work
	The mortar has set in the mixing pipe	▶ Open the mixing pipe and clean it
	The residual-current device of the motor has been triggered	▶ Press the residual-current device back on
	The control fuses are defective	▶ Replace with fine fuses
The motor is not running, no mortar is coming out	The motor rotates in the wrong direction	▶ Change the rotational direction from the plug of the power cable
No water	The residual-current device of the motor has been triggered	▶ Press the residual-current device back on
	The water filter is clogged	▶ Clean the filter
The mortar is too thick	The amount of water is too small	▶ Use the water amount adjustment valve to add water
The mortar is too thin	The amount of water is too big	▶ Decrease water supply by using the water amount adjustment valve
Consistency of the mortar is uneven	Water pressure is insufficient	▶ Check that the pressure is 3 bar. If not, make sure the water hose is not bent. The water hose must be unbranched and as short as possible. Use a pressure increasing pump if needed.
	The water filter is dirty	▶ Clean the water filter
	The material has formed into lumps in the mixing beater or pipe	▶ Clean the dirty parts

## Other considerations

- We recommend adding the inspection of the condition of the silo to the weekly operational safety walk at the site.
- The construction site silo must be run out of the dried product every two weeks to prevent arching.

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# FESCON

## Master of Materials

### A Finnish developer and manufacturer

Founded in 1984, Fescon Oy is the largest Finnish developer and manufacturer of mortar, sand and coating products and solutions for the construction sector and industry.

### High-quality mortar, sand and coating products for construction

Fescon's main products are dry mortars and concretes, plaster and repair mortars, facade coatings and paints, wall and floor plasters, Nanten concrete floor coatings, insulation plastering systems, and tiling and water-proofing products. We also rent silo and mixing equipment for masonry and plastering sites. In addition, our sand business unit offers a variety of sand and mineral products. Our sand products business unit also offers various sands that are suitable for golf and sports courts, court-yards, power plants, or sandblasting, for example.

### Reliable and efficient logistics, and professional customer service

Fescon's strengths are quality products, reliable and fast deliveries, customer service, a fast colour card service and long-term product development in cooperation with customers.

We help professionals to achieve the best possible quality of work in all phases of the construction process and offer support for choosing the right products and solutions. Our technology services also provide research services for power plants, for example.

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