

Submersible Grinder Pumps Wilo-Drain MTS 40/MTS 40E

US Installation and operating instructions

Fig.1: Simplex and Duplex Package Fiberglass Basin

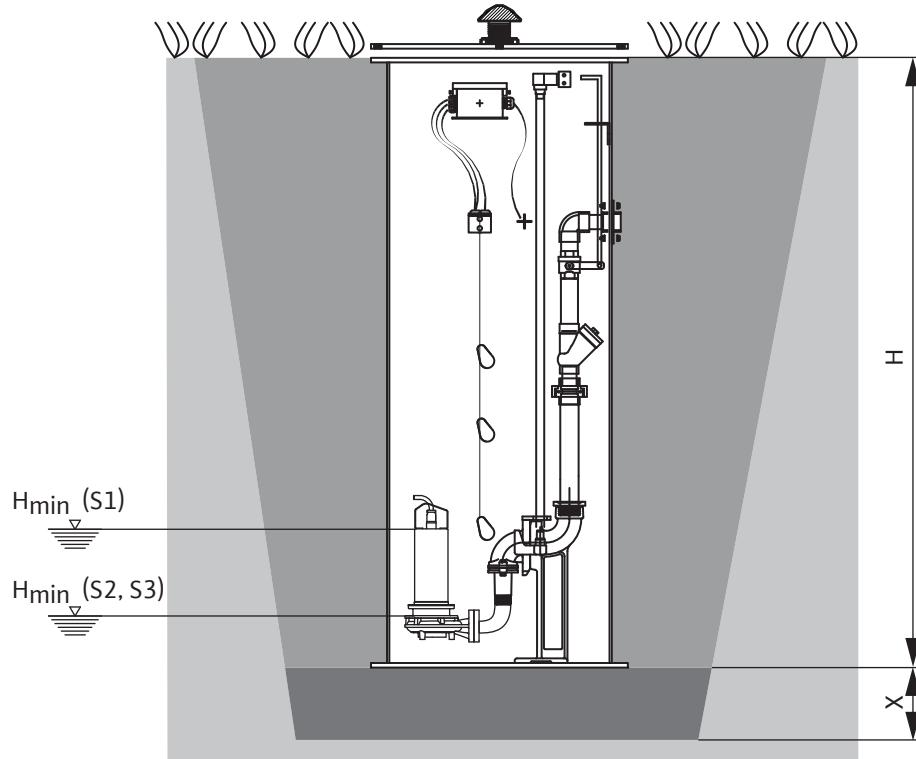


Fig.2: DN 40 (1½") Dual Guide Suspension Device

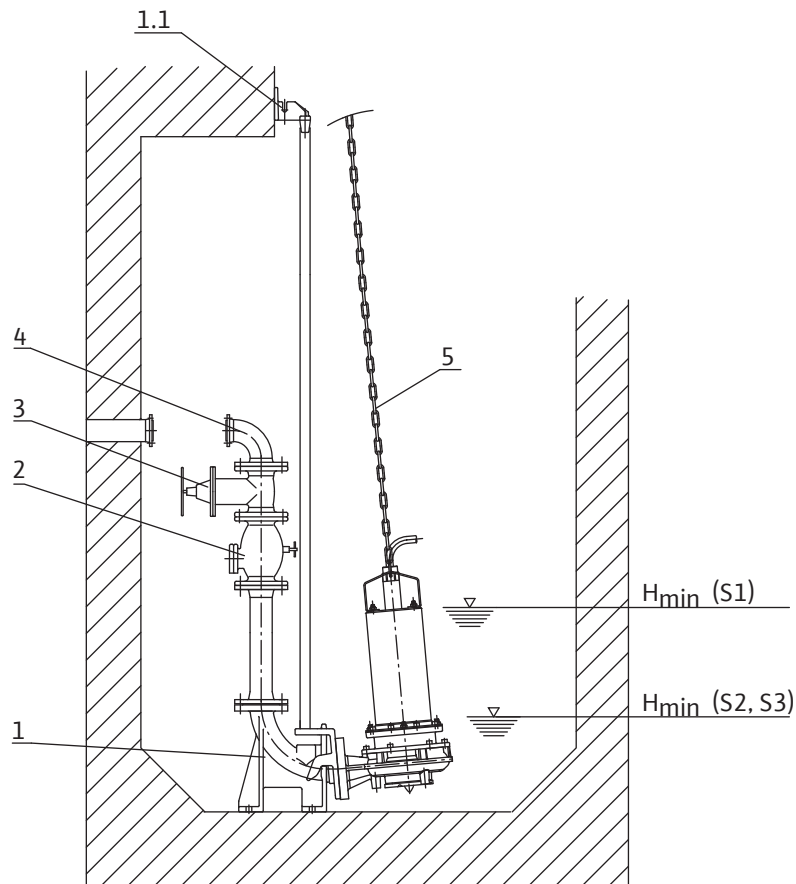


Fig.3: Portable Base

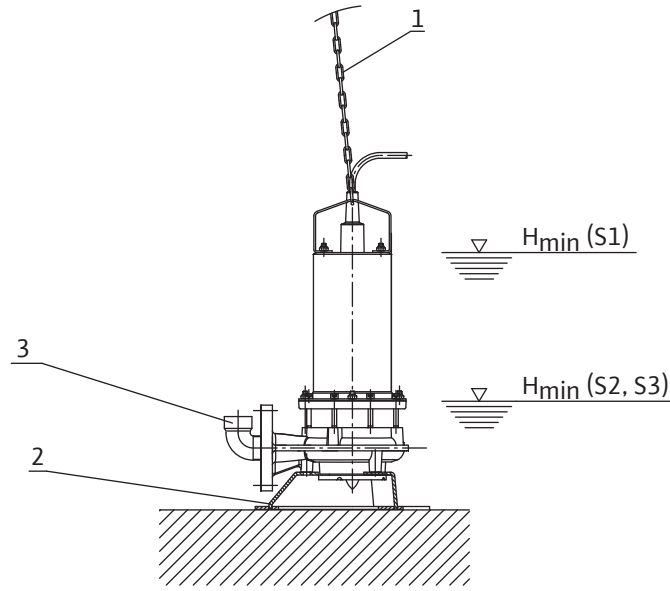
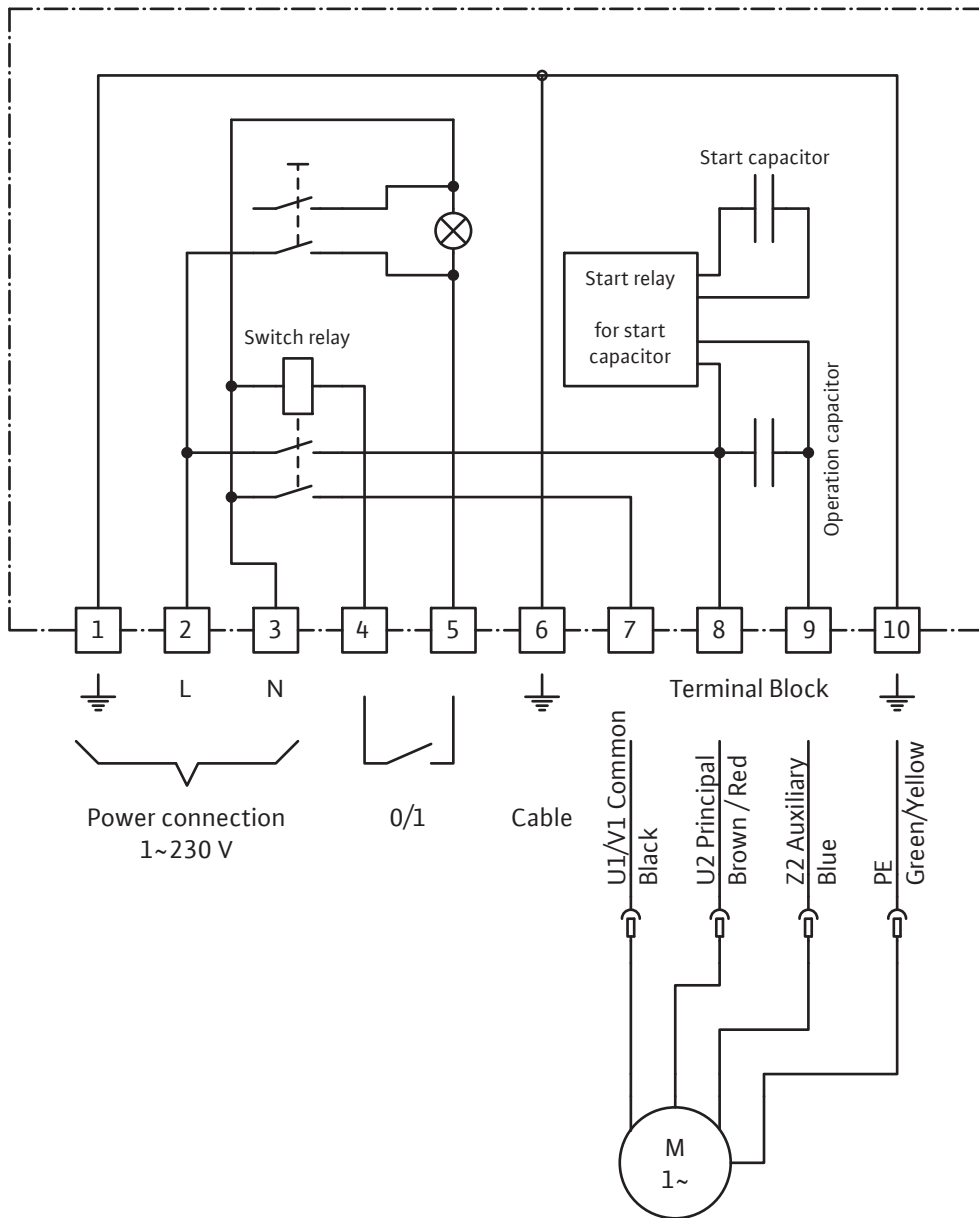


Fig.4: Single Phase Wiring Diagram – 2.0 hp





1 General

1.1 About this document

The language of the original operating instructions is German. All other languages of these instructions are translations of the original operating instructions. These installation and operating instructions are an integral part of the product. They must be kept readily available at the place where the product is installed. Strict adherence to these instructions is a precondition for the proper use and correct operation of the product. The installation and operating instructions correspond to the relevant version of the product and the underlying safety regulations and standards valid at the time of going to print.

1.2 Note on conformity

This product was developed and manufactured in accordance with the applicable EU product directives with which products in the EU area market are obligated to comply. This product therefore complies with the relevant, general safety and health requirements of the European Union, as well as the published European standards and internationally recognised German standards. Since this product was not intended to be sold and used in the European Economic Area, it does not have a CE label. It is therefore not permitted to sell it in the European Economic Area.

2 Safety

These operating instructions contain basic information which must be adhered to during installation, operation and maintenance. For this reason, these operating instructions must, without fail be read by the service technician and the responsible specialist/operator before installation and commissioning.

It is not only the general safety instructions listed under the main point "safety" that must be adhered to but also the special safety instructions with danger symbols included under the following main points.

2.1 Indication of instructions in the operating instructions

Symbols:



General danger symbol



Danger due to electrical voltage



NOTE:

Signal words:

DANGER!

Acutely dangerous situation. Non-observance results in death or the most serious of injuries.

WARNING!

The user can suffer (serious) injuries. 'Warning' implies that (serious) injury to persons is probable if this information is disregarded.

CAUTION!

There is a risk of damaging the pump/unit. 'Caution' implies that damage to the product is likely if this information is disregarded.

NOTE:

Useful information on handling the product. It draws attention to possible problems.

Information that appears directly on the product, such as

- direction of rotation arrow,
- identifiers for connections,
- name plate,
- and warning sticker,

must be strictly complied with and kept in legible condition.

2.2 Personnel qualifications

The installation, operating and maintenance personnel must have the appropriate qualifications for this work. Area of responsibility, terms of reference and monitoring of the personnel are to be ensured by the operator. If the personnel are not in possession of the necessary knowledge, they are to be trained and instructed. This can be accomplished if necessary by the manufacturer of the product at the request of the operator.

2.3 Danger in the event of non-observance of the safety instructions

Non-observance of the safety instructions can result in risk of injury to persons and damage to the environment and the product/unit. Non-observance of the safety instructions results in the loss of any claims to damages. In detail, non-observance can, for example, result in the following risks:

- danger to persons from electrical, mechanical and bacteriological influences,
- damage to the environment due to leakage of hazardous materials,
- property damage,
- failure of important product/unit functions,
- failure of required maintenance and repair procedures,

2.4 Safety consciousness on the job

The safety instructions included in these installation and operating instructions, the existing national regulations for accident prevention together with any inter-

nal working, operating and safety regulations of the operator are to be complied with.

2.5 Safety instructions for the operator

This equipment is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

- If hot or cold components on the product/the unit lead to hazards, local measures must be taken to guard them against touching.
- Guards protecting against touching moving components (such as the coupling) must not be removed while the product is in operation.
- Leakages (e.g. from a shaft seal) of hazardous fluids (e.g. explosive, toxic or hot) must be led away so that no danger to persons or to the environment arises. National statutory provisions are to be complied with.
- Danger from electrical current must be eliminated. Local directives or general directives [e.g. NEC, IEC, VDE etc.] and local energy supply companies must be adhered to.

2.6 Safety instructions for installation and maintenance work

The operator must ensure that all installation and maintenance work is carried out by authorized and qualified personnel, who are sufficiently informed from their own detailed study of the operating instructions.

Work to the product/unit must only be carried out when at a standstill. It is mandatory that the procedure described in the installation and operating instructions for shutting down the product/unit be complied with. Immediately on conclusion of the work, all safety and protective devices must be put back in position and/or recommissioned.

2.7 Unauthorized modification and manufacture of spare parts

Unauthorized modification and manufacture of spare parts will impair the safety of the product/personnel and will make void the manufacturer's declarations regarding safety.

Modifications to the product are only permissible after consultation with the manufacturer. Original spare parts and accessories authorized by the manufacturer ensure safety. The use of other parts will absolve us of liability for consequential events.

2.8 Improper use

The operating safety of the supplied product is only guaranteed for conventional use in accordance with Section 4 of the operating instructions. The limit values must on no account fall under or exceed those specified in the catalog/data sheet.

3 Transport and interim storage

The system and individual components are delivered on a pallet.

Immediately after receiving the product:

- Check the product for damage in transit,
- In the event of damage in transit, take the necessary steps with the forwarding agent within the respective time limits.



CAUTION! Risk of damage to property!
Incorrect transport and interim storage can cause damage to the product.

- Transport the product only on the pallet and use only approved handling equipment.
- During transport, ensure that the product/unit remains stable and does not suffer mechanical damage.
Prior to installation, store the product on the pallet so that it remains dry and is protected from the sun.

4 Intended use



WARNING! Health hazard!
The materials are not designed for the potable water supply.
The pump may not be used for pumping potable water.

The submersible pump is suitable for pumping drainage and sewage from sumps and tanks. Its main use is for the pressure drainage of sewage water for domestic purposes (as per EN 12056 while observing country-specific prefaces and regulations).



CAUTION! Danger of damage to the pump!
the pump is not suitable for fluids with hard components such as sand, stones and metal.

5 Product information

5.1 Type key

Example: MTS 40/95 1-230-60-2

MT	Macerator pump (Macerator Technology)
S	Stainless steel motor
40	Nominal diameter diameter in mm (1½ in.)
95	Maximum delivery head in ft (at Q = 0 gpm)
1	Type of motor: 1 = single phase motor, 1~ 3 = three phase motor, 3~
230	Rated voltage in V
60	Rated frequency in Hz
2	Number of poles

Example: MTS 40 E 95.80/20 3-460-60-2 FM	
MT	Macerator pump (Macerator Technology)
S	Stainless steel motor
40	Nominal diameter diameter in mm (1½ in.)
E	
95	Maximum delivery head in ft (at Q = 0 gpm)
80	Max. volume flow in gal/min (at P ₂ = P ₂ max)
20	Value/10 = performance P ₂ in HP
3	Three phase motor (3~)
460	Rated voltage in V
60	Rated frequency in Hz
2	Number of poles
FM	FM approval (explosion protection)

5.2 Technical data

Unit

Discharge diameter:	DN 40 (1½ in / 40 mm)
Max. volume flow	See name plate
Max. delivery head	See name plate
Max. immersion depth	33 ft (10 m)
Perm. fluid temperature:	+37 °F (+3 °C) to +104 °F (+40 °C)

Operating modes

Motor immersed	S1 (max. operating hours/year: MTS 40/... = 200 h; MTS 40E... = 2000 h)
Motor non-immersed	S2-8 min (max. operating time: 8 minutes) S3-25% (2.5 min operation / 7.5 min pause)

Motor

Power connection	See name plate
Voltage tolerance	±10 %
Frequency	60 Hz
Protection class	IP 68
Insulation class	F
Speed	Max. 3480 rpm
Power consumption P ₁	See name plate
Rated motor power P ₂	See name plate
Nominal current	See name plate
Starting mode	Direct
Cable length	25 ft (8 m)
Type of cable	H07RN-F (MTS 40/...) NSSHÖU (MTS 40E...)
Cable size 1~230 V	4G1
Cable size 3~230 V	6G1 (MTS 40/95; MTS 40/120) 7G1.5 (MTS 40E95...; MTS 40E120...) 7G2.5 (MTS 40/143; MTS 40/165; MTS 40E143...; MTS 40E165...)
Cable size 3~460 V	6G1 (MTS 40/95; MTS 40/120) 7G1.5 (MTS 40/143; MTS 40/165; MTS 40E...)
Thermal winding contact (NC contact), Max. contact load	U _{max} =250 V AC, I _{max} =1 A, U _{max} =30 V DC, I _{max} =30 mA DC
Explosion protection according to FM	MTS 40E...FM

Sealing

Seal on the fluid side	Mechanical seal
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5.2 Technical data

Sealing: on the motor side	Rotary shaft seal (MTS 40/...) Mechanical seal (MTS 40E...)
Separation chamber oil type	Marcol 82 (medical white oil)
Oil filling quantities	0.63 cups (150 ml) (MTS 40/...) 0.97 cups (230 ml) (MTS 40E...)

5.3 Scope of delivery

- Pump with 25 ft (8 m) connecting cable and free cable end
- Installation and operating instructions

5.4 Accessories

- Switchgear for 1 or 2 pump operation
- External monitoring devices / tripping unit
- Level control device (level sensor / float switch)
- Accessories for portable wet well installation
- Accessories for stationary wet well installation
Accessories must be ordered separately!

6 Description and function

6.1 Description of the pump

The submersible pump must be flooded with fluid to ensure sufficient cooling. It is driven by a corrosion-resistant water pressure-tight encapsulated three phase or single phase motor.

The pump housing and single-channel impeller are made out of cast iron. The fluid is sucked in on the underside through the macerator openings and exits on the side through the pressure ports into the piping.

The macerator cuts up cuttable admixtures so that they can be transported through the single-channel impeller and the DN 40 pressure pipe. The blades, cutters and counter-cutters are of hard metal. Non-cuttable admixtures, such as stones or metal pieces, destroy the macerator and should therefore be kept away from the pump. An oil barrier chamber is installed between the hydraulics and the motor. It is filled with medical white oil and is to lubricate/cool the seal. Furthermore, fluid entering the system is taken up by the seal on the fluid side. The pump chamber is sealed using a mechanical seal on the fluid side and a radial shaft seal or with a mechanical seal on the motor side (depending on type, see point 5.2).



CAUTION! Danger of leakage!
If the mechanical seal is damaged, small amounts of oil may escape into the pumped fluid.

The pumps can be installed as a stationary wet well installation using a DN 40 foot elbow or as a portable wet well installation using a pump base. Pumps installed as a stationary wet well installation are connected to the discharge pipeline using the foot elbow, portable wet well pump installations are connected to the discharge pipeline using a pipe elbow with DN 40 flange connection.

The motors are equipped with a thermal winding contact which automatically switches the motor off upon overheating. Monitoring is self-switching on single phase motors. That means, once the motor has cooled off it switches back on automatically. On three phase motors, the thermal winding contact must be connected to a switchgear and evaluated.

Furthermore, the MTS 40E... pumps are equipped with leakage detection (DI) for the motor compartment. It switches the pump off as soon as water enters the motor housing. The leakage detection must be connected to a switchgear and evaluated.

7 Installation and electrical connection

Installation and electrical connection must be carried out in accordance with local regulations and only by qualified personnel!



WARNING! Danger of personal injury!
The existing directives for accident prevention must be adhered to.



WARNING! Danger of electric shock!
Danger from electrical current must be eliminated. Local directives or general directives [e.g. NEC, IEC, VDE etc.] and local energy supply companies must be adhered to.

7.1 Installation

The pump is intended for stationary wet well installation and portable wet well installation.



CAUTION! Danger of damage to the pump!
Only suspend the pump on the intended handle using a chain. Never by the cable!

- The pump installation site must be free of frost.
- The sump must be cleared of coarse material such as rubble before installation and starting the pump.
- Install the pipes so that they are stress-free. Fix the pipes so that the pump does not carry the weight of the pipes.
- To protect against any backflow from the public drainage system, install the pressure pipe as a loop. It must be above the established backflow level (usually street level).

- In the case of a stationary installation, install a non-return valve and a stop valve with full passage cross-section in the pressure pipe. These valves are to be installed above each pump for multiple pumps installations.

**NOTE:**

The valves should not be connected directly to the pressure port or the pipe elbow. A device to vent the pump must be provided. Otherwise the air cushion cannot open the non-return valve.

- “Original-Wilo-accessories” are recommended to guarantee perfect functioning of the pump/system.

7.1.1 Sump installation (Fig 1.)**WARNING! Risk of injury!**

People may fall into the open sump and suffer serious injury.

- **Once the fiberglass sump is installed, always close it with a WILO sump cover that is suitable for the application.**
- **Have a WILO sump cover available when the installation work starts.**

**CAUTION! Risk of damage!**

Incorrect installation can result in damage to the product.

- **Please ensure that installation work is only carried out by qualified personnel!**
- **Install and check the pump station according to the relevant standards, e.g. DIN EN 1610 (Laying and checking sewage pipes and drains)!**
- **Observe national and regional regulations!**
- **Observe the installation and operating instructions for accessories!**

**NOTE:**

If outdoor temperatures are persistently cold (below 32 °F (0 °C)), there is a risk of frost in the sump due to insufficient water exchange, particularly if the sump is not being used or is only being used occasionally.

- In this case, appropriate insulation measures must be taken on-site in the area above the pump cover.
- If you do not want to operate the sump at all, we recommend you empty the sump and the pipe fully.

Sump installation**Choose a suitable location**

- Take into account the necessary pit depth $H + X$:
H: Height of fiberglass sump
X: Sand bed layer, $X_{min} = 8$ in (200 mm)
- Take into account the position of the inflow connection, pressure outlet and ventilation connection.
- Take into account the depth of the inlet connection and a % fall for the inlet pipe.

Excavate the pit

- Excavate pit with a depth $(H + X)$,
 $X_{min} = 8$ in (200 mm).

At the floor level, the pit should have a diameter which is 6.5 ft (2 m) larger than that of the sump. Observe the applicable regulations for excavation work/civil engineering/construction work (slope angle, pit lining). If required due to the groundwater level, the pit must be protected using a groundwater drawdown.

- Make sand bed layer (X; non-cohesive, grain size 0–1½ in (0–32 mm), no sharp-edged parts, minimum thickness $X_{min} = 8$ in (200 mm)) and compact and level until a pit depth of (H) is reached.

Insert the fiberglass sump

- Prepare the inflow pipe, ventilation pipe and pressure outlet pipe on site.
- Insert the fiberglass sump in the pit.
- Align the inlet and pressure outlet connection to the pipes prepared on site.
- Check the alignment and position of the fiberglass sump including sump cover in relation to the surrounding ground level and adjust if necessary.
- Connect inflow pipe and pressure outlet pipe.

Connect the pipes.

- Connect the inlet pipe to the pit, maintaining a fall in the direction of the fiberglass sump.
- Connect the pressure pipe to the pressure outlet and make it frost-proof.
- Install and lay all pipes so that there is no tension.
- Test that it is leakproof, according to the relevant regulations.

Backfill the pit.

- Backfill the pit in layers (max. layer depth 12 in (300 mm)) all round with non-cohesive beds of equal depth (sand/grit without sharp-edged parts, grain size 0–1½ in (0–32 mm)) and seal properly (97% simple Proctor compaction). Make sure that the fiberglass sump is vertical and avoid deformation!

During backfilling, ensure that the sump is kept in position and that it does not swell. If necessary, fill the sump with water before backfilling and compaction in order to ensure this.

- If the surrounding ground is made up of cohesive material, the top layer of the filling can be backfilled with an approx. 1½ ft (0.5 m) thick layer of this material and compacted to improve the sump's adaptation to the surroundings.

Install the pump

See point 7.1.2.

Remove coarse contaminants from the fiberglass sump.

**NOTE:**

When using this pump, the stud bolts of the pump (pump feet) must be removed from beneath the pump housing!



CAUTION! Risk of damage!
Any stud bolts (pump feet) which are not removed could cause damage to the sump and disrupt operation.
Elements in the fluid may collect on the stud bolts (pump feet) and block access to the suction area and to the pump macerator.
The suction area and macerator of the pump must be kept free of deposits.

Installing the level control

Follow the installation and operating instructions for the level control.
 Insert the level control from the top into the opening of the beam.

- To adjust the switching level:
 - Switch-on level "ON" = top edge of motor housing
 - Switch-off level "OFF" = Bottom edge of pump motor



NOTE:
 Check which operating mode is permitted for immersed operation. In S2 or S3 operation, the specified operating and idle times must be adhered to when configuring the level control!

- Make sure the float switch can move freely; the float switch must not hit the sump wall or the pump!
- When using a level sensor, adjust the suspended cable length to the switching levels accordingly. The level sensor must not be on the floor!

Allow an adequate cable length for the pump and level control system so that they can be lifted out of the sump.

Final work

- Remove coarse dirt from fiberglass sump and pipes.

Fitting the sump cover

Only use suitable Wilo sump covers, because only these are designed for the fiberglass sump and ensure optimal safety!



WARNING! Risk of injury!
People may fall into the open sump and suffer serious injury. Always keep the sump closed and ensure that the cover is fixed firmly in position.

- Fit the cover and fasten to sump.
- Make sure the sump cover is properly secured

7.1.2 Stationary wet well installation

- Stationary wet well installation (Fig. 2).
 - 1: **Foot elbow** with pump holder, profile joint, installation and floor fixation accessories and pipe retainer (item no. 1.1) for double pipe feed. The guide pipes (2x ¾" (26.9 mm) as per DIN 2440) must be provided by the customer.
 - 2: **Non-return valve** with non-constricted passage, cleaning opening, vent and mounting accessories
 - 3: **Gate valve** with mounting accessories
 - 4: **Pipe elbow** with mounting accessories

5: Chain

See catalog for detailed information.

- The fixed pipe connections on the pressure side must be provided by the customer.
- Using the floor fixation accessories, mount the foot elbow on the bottom of the sump and align it.
- Connect the pressure pipe with the necessary valves (accessories) on the foot elbow.
- Fix the pump holder, profile joint on the pressure port of the pump.
- Plug ¾" guide pipe (to be provided by the customer) on to the foot elbow.
- Suspend the pump in the guide pipe and lower carefully on the chain. The pump reaches the correct operating position automatically and seals the pressure connection on the foot elbow through its dead weight.
- Fix the chain on the guide pipe bracket with shackle (provide on site).

7.1.3 Portable wet well installation



CAUTION! Danger of damage to the pump!
The pump must be secured against moving or falling over.

- Portable wet well installation (Fig. 3).
 - 1: **Chain**
 - 2: **Pedestal** with fixation material
 - 3: **DN 40 (1½") pipe elbow** with mounting accessories
 See catalog for detailed information.

7.2 Electrical connection



WARNING! Danger of electric shock!
Electrical connection must be carried out by an electrician authorized by the local electricity supply companies (EVU), and in accordance with the applicable local regulations [e.g. VDE regulations].

- The current type and voltage of the Power connection must correspond to those stated on the name plate.
- Ground the pump according to the regulations.
- Use a residual current circuit-breaker (RCD) ≤ 30 mA.
- Use an isolating device to disconnect from the mains.
- Fuse protection: 16 A, slow-blow or automatic fuse with C characteristic.
- The pump switchbox should be provided as an accessory or be provided by the customer and must have a motor protection switch which is to be set to the nominal motor current according to the name plate plus 20 %.
- As a rule all switchboxes should be installed away from potentially explosive areas.
 Allocate the connecting cable wires as follows:

Pump with three phase motor

For the three-phase current connection, connect the wires at the bare cable end as follows:

- 6-wire connecting cable MTS 40/...:

Wire no.	Terminal
1	U
2	V
3	W
green/yellow	PE (⊕)
4	T1 (thermal winding contact)
5	T2 (thermal winding contact)

- 7-wire connecting cable MTS 40/...:

Wire no.	Terminal
1	U
2	V
3	W
green/yellow	PE (⊕)
4	T1 (thermal winding contact)
5	T2 (thermal winding contact)
6	not allocated

- 7-wire connecting cable MTS 40E...:

Wire no.	Terminal
1	U
2	V
3	W
green/yellow	PE (⊕)
4	T1 (thermal winding contact/DI)/⊕
5	T2 (thermal winding contact)
6	Motor compartment sealing chamber control (DI)

Wire up the free end of the cable in the switchbox (see the installation and operating instructions of the switchbox).

Connecting the temperature (thermal winding contact) and sealing chamber control (DI)

- 5 VDC, 2 mA
- max. 30 VDC, max. 30 mA).

The monitoring devices must switch off the unit. It must only be possible to restart the unit when the "unlock key" has been actuated by hand.



CAUTION! Incorrect connection of the monitoring devices can destroy the unit.

- **The monitoring device connections (thermal winding contact and DI) are on one side of the earthing (PE). A galvanically isolated or unearthed control voltage should be used.**
- **Reliable function of the protective devices mentioned depends on the design and is only guaranteed when a corresponding switchgear is used.**

Pump with single phase motor

- 4-wire connecting cable MTS 40/95:

Wire colour	Terminal
black	U1/V1
brown/red	U2
blue	Z2
green/yellow	PE (⊕)

- The free cable end is to be wired in a separate switchbox with a starting and operating capacitor. Observe Fig. 4 and the following parts list for this:
- Operating capacitor:
Capacity: 30 µF, ±5 %; 50/60 Hz
Service life: 400 V ~, class B, 10000 h;
450 V ~, class C, 3000 h
Climate class: 25/85/21 (-13/185 °F) (-25/85 °C)
Safety class: P0
- Starting capacitor:
Capacity: 30 µF, ±5 %; 50/60 Hz
Service life: 400 V ~, class B, 10000 h;
450 V ~, class C, 3000 h
Climate class: 25/85/21 (-13/185 °F) (-25/85 °C)
Safety class: P0
- Switching relay
2 pin, normally open contact
30 A / 250 V
25 A / 440 V
Coil control voltage: dependent on the control voltage
- Switching relay
300/480 Vac., 50/60 Hz
-13/158 °F (-25/70 °C)
Motor: 220/240 V
Start-up time: 1 sec.
Recommissioning cycle: 6 sec.
- Start relay function description:
When starting the pump (voltage is applied) the starting capacitor is switched parallel to the operating capacitor for approx. 1 second. After this time has elapsed, the starting capacitor is isolated from the operating capacitor.

8 Commissioning



WARNING! Risk of injury!

Danger due to rotating blade! Electrically isolate the pump first!



CAUTION! Danger of damage to the pump!

Before commissioning, clear the sump and the inlet pipes of all solid materials such as rubble.

8.1 Rotation direction monitoring for three phase motors

Check that the pump is rotating in the correct direction before submersion. It is shown by the direction of rotation arrow on the pump housing.

- To do this, suspend the pump safely in a hoist.
- Switch the pump on briefly. The pump recoils in the opposite direction (arrow on the housing) to the motor's direction of rotation.

- If the direction of rotation is incorrect, swap two mains connection conductors.

8.2 Setting the level control device

Setting the level control device: See the installation and operating instructions for the level control device.



CAUTION! Danger of damage to the pump!
Dry running will destroy the mechanical seal. The pump must not run dry and suck in air.

8.2.1 "On" switching point

The "On" switching point should be adapted to the desired maximum level, it must, however, be below the inlet line in the sump.

8.2.2 "Off" switching point

The "Off" switching point (H_{\min} , Fig. 1, 2, 3) of the level control device depends on the type of pump and the operating mode.

Operating mode S2 and S3

H_{\min} : 8.3 in (210 mm)

Operating mode S1

Pump type	H_{\min}	
	Inch	mm
MTS 40/95 (1~230 V)	18.3	464
MTS 40/95	19.1	484
MTS 40/120		
MTS 40/143	20.6	524
MTS 40/165		
MTS 40E95...	19.6	499
MTS 40E120...		
MTS 40E143...	20.6	524
MTS 40E165...		

8.3 Operating conditions in a potentially explosive environment



See supplementary operating instructions for FM products.

8.4 Operation with frequency converter

The unit is not approved for operation on a frequency converter.

9 Maintenance

Maintenance and repairs may only be carried out by qualified experts!



DANGER! Danger of suffocation
Sumps for submersible sewage pumps can contain sewage with substances which are toxic and/or harmful to health.

- For safety reasons, maintenance work in the pump sump must be carried out with another person present.
- Prior to beginning work, the pump sump is to be ventilated sufficiently.



WARNING! Risk of infection!

All maintenance must be carried out wearing suitable protective clothing (protective gloves) in order to prevent the risk of infection.



WARNING! Danger of electric shock!

Any danger from electrical current should be ruled out.

- The pump should be electrically isolated and secured against unauthorized switch-on during any maintenance or repair work.
- Any damage to the connecting cable should always be rectified by a qualified electrician only.

It is recommended to have the pump serviced and checked by WILO Customer Service every six months. Carry out maintenance as per EN12056 Part 4.

9.1 Checking and cleaning the pump

The pump service life depends on the operating conditions and therefore differs. The pump should be checked at regular intervals. If you notice an increase in operating noise, vibrations in the pipe system or diminishing output, check the impeller with integrated macerator for solid material clogging and wear.

9.1.1 Cleaning

- Remove coarse contamination from the intake channels of the macerator.
- Then rinse out the intake channels of the macerator. Rinse out the pump housing via the pressure port until no more contamination comes out of the intake channels of the macerator.
- Check the cutting gap of the macerator:
 - visually check the cutting edges for damage such as grooves, chunking, etc.
 - check the cutting gap using a feeler gauge (0.1 mm).
 - If the blade is damaged, or if the cutting gap is enlarged due to wear (>0.1 mm), please consult a specialist technician or the nearest WILO after-sales service point or representative.
- Restart the pump.

9.2 Frost protection:

- The pump must be protected against frost if it is not possible to guarantee that the fluid will not freeze in the pump.

10 Faults, causes and remedies

Faults	Causes	Remedies
Pump does not start	Interruption to the main supply, short-circuit Insulation error in the motor winding	Check mains voltage. Have the cable and motor checked by a consultant.
	Fuses, capacitor defect.	Replace fuses, capacitor.
	Cable interruption.	Check cable resistance. If necessary, change the cable. Only use original WILO special cable!
	Level switch does not switch.	Check the level switch.
Motor protection switch has triggered.	Motor protection switch set incorrectly.	Set to nominal current.
	Macerator / impeller blocked by a foreign body.	<ul style="list-style-type: none"> • Disconnect the system from the power supply and secure it against being switched on again. • Close the check valve behind the pump. • Lift the pump out of the sump. • Remove foreign bodies from the pump.
Pump is not pumping.	Air in the spiral housing.	Vent the non-return valve.
	Level control device set incorrectly.	Ensure that the impeller is flooded during priming.
Pump pumping too little, turbulent running.	Incorrect direction of rotation	Swap 2 phases of the mains connection.
	Impeller worn.	Change impeller.
	Impeller, macerator or pump housing blocked with sludge.	Clean the pump, see 6th line

If the operating fault cannot be remedied, please consult a specialist technician or the nearest WILO after-sales service point or representative.

11 Spare parts

Spare parts may be ordered via a local specialist retailer and/or WILOCustomer service.

In order to avoid queries and incorrect orders, all data on the name plate should be submitted for each order.

12 Disposal

Proper disposal and recycling of this product prevents damage to the environment and risks to personal health.

1. Use public or private disposal organisations when disposing of all or part of the product.
2. For more information on proper disposal, please contact your local council or waste disposal office or the supplier from whom you obtained the product.

Technical information subject to change without prior notice!

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