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MTC

Installation and Operating Instructions

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Please leave these instructions with the pump for future reference



SAFETY WARNING

Shock Hazard

A faulty motor or wiring can cause electrical shock that could be fatal, whether touched directly or conducted through standing water. For this reason, proper grounding of the motor frame to the power supply's grounding terminal is required for safe installation and operation.

In all installations, the above-ground metal plumbing should be connected to the power supply ground as described in Article 250-80 of the National Electrical Code.

Electrical Work

All electrical work should be performed by a qualified electrician in accordance with the latest edition of the National Electrical Code, local codes and regulations.

WARNING

The safe operation of this pump requires that it be grounded in accordance with the National Electrical Code and local governing codes or regulations. Connect the ground wire to the grounding screw in the terminal box and then to the **acceptable** grounding point.

Pre-Installation Checklist

1. Confirm You Have The Right Pump

- Read the nameplate to ensure it is the one you ordered
 - Compare the pump's nameplate data or its performance curve (for head, GPM, etc.) with the application in which you plan to install it.
- Will it do what you expect it to do?*

2. Check the Condition of The Pump

The shipping carton your pump came in is specially designed around your pump during production to prevent damage. As a precaution, it should remain in the carton until you are ready to install it. At that point, look at the pump and examine it for any damage that may have occurred during shipping. Examine any other parts of the shipment as well (electrical control boxes, etc) for any visible damage. If you find any, contact the transportation company in writing and ask to have it inspected.

3. Electrical Requirements

Verification of the electrical supply should be made to be certain the voltage, phase and frequency match that of the pump motor. The proper operating voltage and other electrical information can be found on the motor nameplate. These motors are designed to run on $\pm 10\%$ of the nameplate-rated voltage. For dual-voltage motors, the motor should be internally connected to operate on the voltage closest to the 10% rating, i.e., a 208 voltage motor wired per the 208 volt connection diagram. The wiring connection diagram can be found on the plates attached to the motor.

If voltage variations are larger than $\pm 10\%$, do not operate the pump.

4. Glance Through This Guide

Even if you are very familiar with the installation of this pump, a quick glance through the remaining sections of this guide may help you avoid a potential problem.

5. Application

The Grundfos pumps, type MTC, are multistage centrifugal pumps designed for pumping liquids for machine tools, condensate transfer, liquid transfer in industrial washing machines and similar applications.

WARNING

The pump must not be used for the transfer of inflammable liquids such as diesel oil, petrol or similar liquids. The pump is designed for pumping liquids with a density and viscosity corresponding to those of water. The pumped liquid must not contain fibers. When pumping liquids with a density or viscosity higher than that of water, the motor size should be taken into consideration.

6. Type Designation

The standard range of pumps encompasses complete impeller in chamber combinations. Other lengths, against duty combinations, can be supplied by fitting empty intermediate chambers instead of standard chambers with impellers.

The pump key on the pump nameplate indicates the number of chambers and impellers fitted to the pump.

6.1 Pump Key

Example	MTC	4 -	50 / 3	A	-W	-A	-XXXX
Pump Range							
Nominal Flow Rate in m ³ /h							
Number of Stages x 10							
Number of Impellers							
Code for Pump Version							
Code for Pipework Connection							
Code for Materials							
Code for Shaft Seal and Rubber Pump Parts							
TDKV = "Sealless" for MTC 2/4							
BUUV = For grinding applications MTC 2/4							
AUUV = Seal for MTC 8/12/16							

7. Technical Data

	MTC 2,4	MTC 8, 12, 16
Minimum liquid temperature (°C/°F)	- 10/+14	
Maximum liquid temperature (°C/°F)	+90/+194	
Maximum ambient temperature (°C/°F)	+55/+131	+40/+104
Maximum operating pressure (bar/psi)	8/116	12/174
Enclosure class	IP54 (TEFC)	

Installation Procedures

Installation

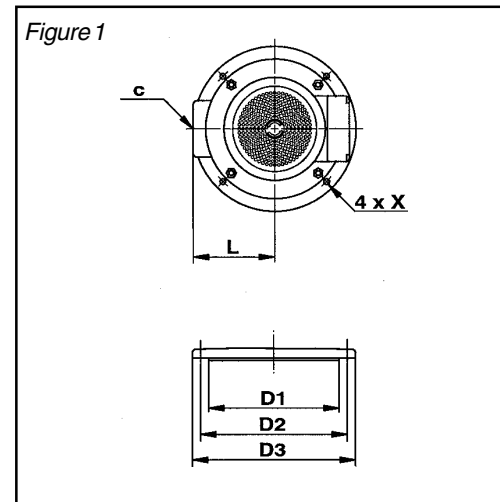
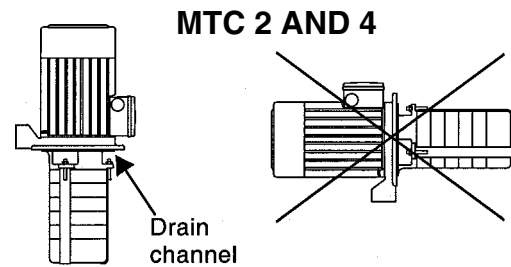
WARNING

The pump must be installed so that persons cannot accidentally come into contact with the hot surface of the motor.

Pump Location

The pump is designed for tank mounting in vertical position. The pump is positioned in a hole cut into the cover of the tank (upper side) and is secured to the tank by four hexagon head screws through the holes in the mounting flange. It is recommended to fit a sealing gasket between the pump flange and tank.

NOTE: The pumps can only be mounted in vertical position. The MTC 2 and 4 must have access to the tank from the drain channel in the motor stool.



Pump mounting flange dimensions:

MTC	D1 (mm/in)	D2 (mm/in)	D3 (mm/in)	L (mm/in)	C	X (mm/in)
2, 4	140/5.51	160/6.30	180/7.09	121/4.76	3/4" NPT	7/0.28
8, 12, 16	180/7.09	210/8.27	200/7.87	100/3.94	1 1/4" NPT	9/0.35

Suction Conditions

The bottom of the pump strainer must be at least 25 mm above the bottom of the tank.

The pumps are designed to provide full performance down to a level of A mm above the bottom of the strainer.

At a liquid level between A and B mm above the bottom of the strainer, the built-in priming screw will protect the pump against dry running.

Pump Type	A (mm/in)	B (mm/in)
MTC 2, 4	37/1.1	22/0.9
MTC 8, 12, 16	40/1.6	25/1.0

Figure 2

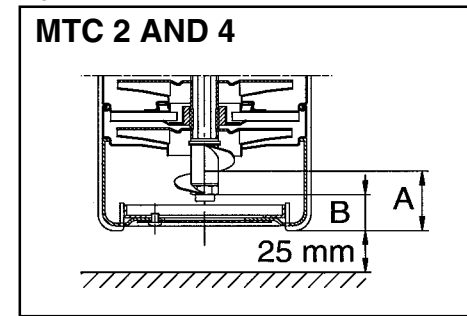
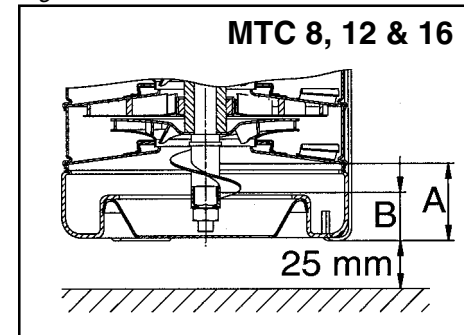


Figure 3



Electrical Connection

The electrical connection should be carried out in accordance with local regulations.

WARNING

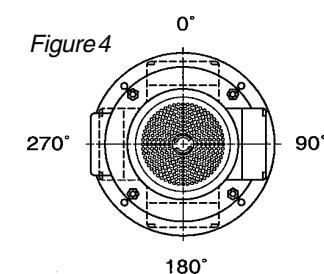
Never make any connections in the pump terminal box unless the electricity supply has been switched off.

If the pump is not connected to an electric installation, it must be connected to an external mains switch.

The operating voltage and frequency are marked on the pump nameplate. Please make sure that the motor is suitable for the electricity supply on which it will be used.

The motor must be connected to a motor starter.

The terminal box, for motors up to and including 1.1 kW, can be turned to four positions, in 90° steps, see Figure 4. Proceed as follows:



1. Removed the four bolts securing the motor to the motor stool.
2. Turn the motor to the required position.
3. Replace and tighten the four bolts.

Operating The Pump

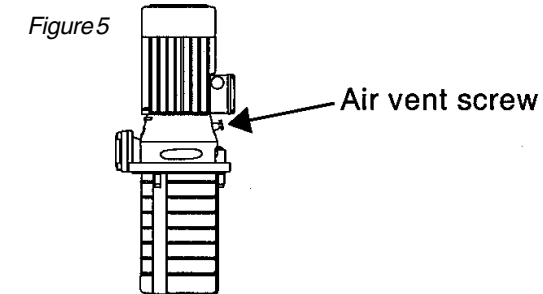
The electric motor should be connected to the supply as shown in the diagram inside the terminal box cover.

All other motors, from 1.5 kW and up, cannot be turned.

Start-up

WARNING – MTC 8, 12 and 16

Pay attention to the direction of the vent hole and take care to ensure that the escaping water does not cause injury to persons or damage to the motor or other components. See Figure 5.



Before starting the pump, make sure:

- that all pipe connections are tight.
- that the pump body is partly filled with liquid (partly submerged).
- that the strainer is not blocked by impurities.

Start the pump as follows:

1. Close the isolating valve on the discharge side of the pump.
2. See the correct direction of rotation of the pump on the motor fan cover. When seen from the top, the pump should rotate counter-clockwise.
3. Start the pump and check the direction of rotation.
4. **MTC 2 and 4:**
Open the discharge isolating valve a little.
MTC 8, 12 and 16:
Loosen the air vent screw in the motor stool.
5. **MTC 2 and 4:**
Completely open the discharge isolating valve.
MTC 8, 12 and 16:
When a steady stream of liquid runs out of the vent hole, tighten the air vent screw and completely open the isolating valve.

The pump has now been vented and is ready for operation.

Operating The Pump

Operation and Maintenance

Note: The pump is not allowed to run against a closed discharge valve for more than approximately five minutes as this will cause an increase in temperature/formation of steam in the pump which may cause damage to the pump.

Lubrication and Maintenance

Pumps installed in accordance with these instructions require very little maintenance.

When a mechanical shaft seal is fitted, it is self-adjusting and has wear-resistant seal rings which are lubricated and cooled by the pumped liquid.

The pump bearings are also lubricated by the pumped liquid. The motor ball bearings are grease packed and sealed for life. No further lubrication is necessary.

Pumps from 4 kW and up have angular contact bearings.

Filter

Chip trays, filters, etc. should be cleaned at regular intervals to ensure a correct flow of liquid.

Periodic Checks

At regular intervals, depending on the conditions and time of operation, the following checks should be made:

- Check the quantity of liquid and operating pressure.
- Check that there are no leaks.
- Check that the motor is not overheating.
- Check the tripping of the motor starter.
- Check that all controls are operating satisfactorily.

If the above checks do not reveal any abnormal operating details, no further checks are necessary.

Should any faults be found, check the symptoms with the Fault Finding Chart, page 4.

Service

WARNING

If a pump has been used for pumping liquids which are injurious to human health or poisonous, it will be classified as contaminated. Do not turn the pump upside down during service. Residual liquids from the chambers may damage the motor.

A contaminated pump must not be sent to Grundfos for service until Grundfos has received all necessary details about the pumped liquid, etc. Otherwise, Grundfos can refuse to accept the pump for servicing.

Possible costs of returning the pump are to be paid by the customer.

Sound Pressure Level

Motor (kW)	L _{pA} [dB(A)]	
	50 HZ	60 HZ
0.25	<70	<70
0.37	<70	<70
0.55	<70	<70
0.75	<70	<70
1.1	<70	<70
1.5	<70	71
2.2	<70	71
3.0	<70	71
4.0	73	71
5.5	73	78
7.5	73	78

Troubleshooting

Fault Finding Chart

WARNING

Before starting work on the pump, make sure that the electricity supply has been switched off and that it cannot be accidentally switched on.

<i>If The Pump...</i>	<i>It May Be Caused By...</i>	<i>Correct It By...</i>
Does Not Run	a) Supply failure	Connect the electricity supply
	b) Fuses are blown	Replace fuses
	c) Motor starter overload has tripped out	Reactivate the motor protection
	d) Main contacts in motor starter are not making contact or the coil is faulty	Replace contacts or magnetic coil
	e) Control circuit is defective	Repair the control circuit
	f) Motor is defective	Replace the motor
Motor starter overload trips out immediately when supply is switched on	a) One fuse/automatic circuit breaker is blown	Cut in the fuse
	b) Contacts in motor starter overload are faulty	Replace motor starter contacts
	c) Cable connection is loose or faulty	Fasten or replace the cable connection
	d) Motor winding is defective	Replace the motor
	e) Pump mechanically blocked	Remove the mechanical blocking of the pump
	f) Overload setting is too low	Set the motor starter correctly
Motor starter overload trips out occasionally	a) Overload setting is too low	Set the motor starter correctly
	b) Low voltage at peak times	Check the electricity supply
Motor starter has not tripped out but the pump does not run	a) Check 1 a), b), d) and e)	
Pump runs but gives no liquid or pump capacity is not constant	a) Pump strainer partly blocked by impurities	Clean the strainer
	b) Liquid level in tank too low	Increase the liquid level
	c) Pump rotates in the wrong direction	Change the direction of rotation of the motor

Disposal

Disposal of this product must be carried out according to the following guidelines:

1. Use the local public or private waste collection service.
2. In case such waste collection service does not exist or cannot handle the materials used in the product, please deliver the product or any hazardous materials from it to your nearest Grundfos company or service workshop.