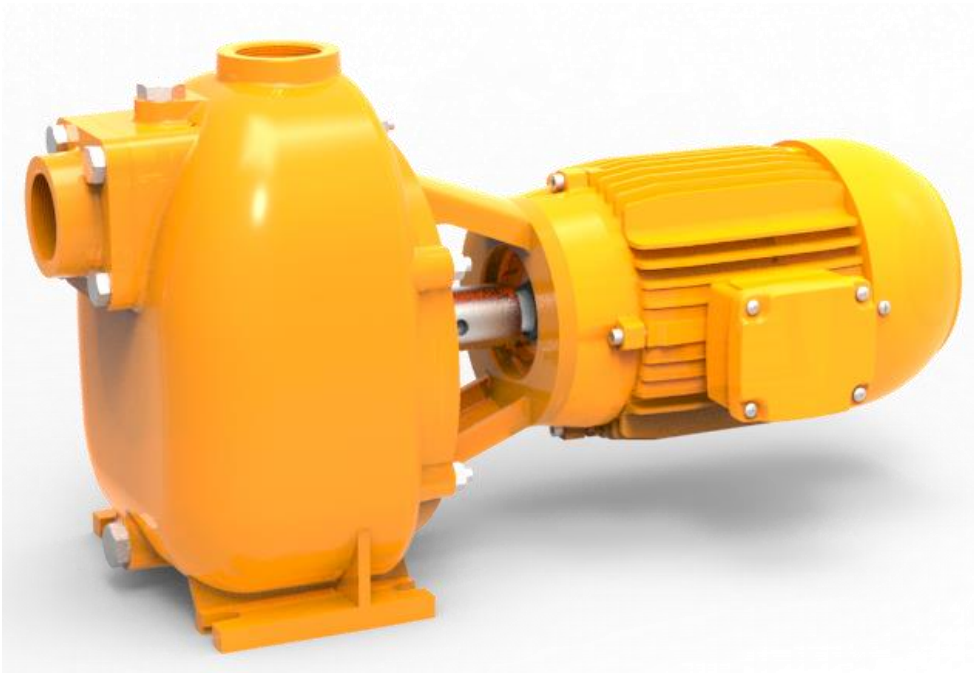


Self Priming, Single Stage Waste Water Pumps

UKM M 50 SERIES



OPERATING MANUAL





EC DECLARATION OF CONFORMITY

AT UYGUNLUK BEYANI

Manufacturer / İmalatçı : MAS DAF MAKİNA SANAYİ A.Ş.

Address / Adres : Aydınli Mah. Birlik OSB. 1.No'lu Cadde No:17 Tuzla - İSTANBUL / TÜRKİYE

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Teknik Dosyayı Derleyen Yetkili Kişi ve Adresi Tuzla - İSTANBUL / TÜRKİYE

The undersigned Company certifies under its sole responsibility that the item of equipment specified below satisfies the requirements of the mainly Machinery Directive 2006/42/EC which is apply to it.

The item of equipment identified below has been subject to internal manufacturing checks with monitoring of the final assessment by MAS DAF MAKİNA SANAYİ A.Ş.

Aşağıda tanımlanmış olan ürünler için Makine Emniyeti yönetmeliği 2006 / 42 / AT' nin uygulanabilen gerekliliklerinin yerine getirildiğini ve sorumluluğun alınmış olduğunu beyan ederiz.

Aşağıda tanımlanan ürünler içüretim kontrollerine bağı olarak MAS DAF MAKİNA SANAYİ A.Ş. tarafından kontrol edilmiştir.

Equipment / Ürün : Self Priming, Single Stage Waste Water Pumps
Kendinden Emişli, Tek Kademeli Atıksu Pompaları
Seri / Model-Tip : UKM M 50 Series – UKM M 50 Serisi

For pumps supplied with drivers/ Elektrikli Pompa Üniteleri

Related Directives / Yönetmelikler

2006/42/EC Machinery Directive / 2006/42/AT Makine Emniyeti Yönetmeliği

2014/35/EU Low Voltage Directive / 2014/35/AB Alçak Gerilim Yönetmeliği

2014/30/EU Electromagnetic Compatibility Directive / 2014/30/AB Elektromanyetik Uyumluluk Yönetmeliği

Regulations applied acc. to harmonize standards / Uygulanan Uyumlaştırılmış Standartlar

TS EN ISO 12100:2010, TS EN 809+A1, TS EN 60204-1:2011.

We hereby declare that this equipment is intended to be incorporated into, or assembled with other machinery to constitute relevant machinery to comply with essential health and safety requirements of Directive The machinery covered by this declaration must not be put into service until the relevant machinery into which it is to be incorporated has been declared in conformity with provisions of the directive.

Ekipman, uygun bir makina oluşturmak amacıyla diğer ekipmanlar ile birleştirilirken ya da monte edilirken gerekli sağlık ve güvenlik yönetmeliklerine uyulması gerekmektedir.

Bu bildiri kapsamında yönetmelikte belirtilen bütün hükümler yerine getirilmeden makinanın devreye alınmaması gerekmektedir.

Place and date of issue / Yer ve Tarih

: İstanbul, 02.06.2014

Name and position of authorized person

: Vahdettin YIRTMAÇ

Yetkili Kişinin Adı ve Görevi

General Manager / Genel Müdür

Signature of authorized person

:

Yetkili Kişinin İmzası

TABLE OF CONTENTS

Page No

| | |
|--|----|
| Introduction | 1 |
| 1.Important Safety Precautions | 1 |
| 2.General | 1 |
| 3.Safe Operating Conditions | 2 |
| 4.Technical Information | 2 |
| 5.Transport and Storage | 3 |
| 6.Assembly/Installation | 3 |
| 6.1. Installation | 3 |
| 6.2. Type of Connection | 4 |
| 6.3. Foundation | 4 |
| 6.4. Piping | 4 |
| 6.5. Motor Connection for Applications with Electric Motor | 5 |
| 7.Commissioning, Start up and Operating | 6 |
| 7.1. Preparations Before Start up | 6 |
| 7.2. Checking The Direction of Rotation | 6 |
| 7.3. Start up Procedure | 6 |
| 8.Maintenance | 6 |
| 8.1.The Checks During the Operation | 6 |
| 8.2. Disassembly and Reassembly of Pump | 6 |
| 8.3. Drive | 6 |
| 8.4.Auxiliary Components | 6 |
| 8.5. Service | 6 |
| 8.6. Spare Parts | 7 |
| 9.Noise Level and Vibration | 7 |
| 10. Possible Failures, Causes, Solutions | 8 |
| 11. UKM M 50 Pump Dimensions Table | 9 |
| 12. Tightening Torques | 9 |
| 13. UKM M 50 Sectional Drawing and Part List | 10 |
| 14. Figure List | 11 |
| 15. Table List | 11 |

1. IMPORTANT SAFETY PRECAUTIONS

In order to minimize the accidents during the mounting and putting into service of the pump, the following rules have to be applied:

1. Do not work without taking safety measures relevant to equipment. Cable, mask and safety band must be used when necessary.
2. Be sure there is adequate amount of oxygen and there is no toxic gaseous around.
3. Before using welding or any electrical equipment make sure that there is no risk of explosion.
4. Check the cleanliness of the area to take care of your help. (Dust, smoke, etc.)
5. Do keep in mind that there is a risk of having accidents related to electricity.
6. Do not lift the pump before you check the transport equipment.
7. Use helmet, eye glasses and protective shoes for your safety
8. Place a protective barrier around the pump within the necessary safety area.
9. Dust, liquids and gaseous that may cause overheating, short circuit, corrosion and fire must be kept away from the pump unit.
10. By checking the noise level of the pump unit, necessary measures to avoid noisy operation of the pump that can have harmful effects on the personnel and environment.
11. Be careful about the direction of transport and storage.
12. Cover appropriately the moving parts to avoid possible injury of the personnel.
13. All the electrical and electronic applications must be performed by authorized person conforming EN60204-1 and /or domestic instructions.
14. Protect the electrical equipment and motor against overloading.
15. If flammable and explosive liquids are pumped, ground connection of electricity should be carried out properly.
16. Do not expose the pump unit to sudden temperature variations
17. All personnel who work with the waste water system need to be vaccinated in case of contagious diseases.
18. If the pump contains hazardous liquids, one must use protective helmet against the risk of splatter. One also must accumulate the liquid in a proper container against any risk of leakage.

All Other Health and Safety Rules, Laws and Regulations Must Be Applied

2. GENERAL

2.1. Definition of Pump and Usage Areas

UKM M 50 series pumps are self-priming, single stage waste water pumps.
They are used as,

- Sewage Sludge Transfer Pump
- Bilge Pump
- Ballast Pump
- General Service Pump
- Emergency Fire Pump
- Cooling Water Pump

CAUTION

This pump is designed for handling mild industrial corrosives, mud or slurries containing large entrained solids. Do not attempt to pump volatile, corrosive, or flammable materials which may damage the pump or endanger personnel as a result of pump failure.

Technical specifications of UKM M 50 type pumps

| | |
|-------------------|---------------------------|
| Capacity | :5 – 45 m ³ /h |
| Total Head | :10 – 40 mWC |
| Max. Suction Lift | :7 mWC |
| Max. Liquid Temp | :50 °C |
| Motor Speed | :2800 – 3600 rpm |
| Pipe Connections | :2" Suction - Discharge |

INTRODUCTION



- This manual contains instructions for the installation, operation and maintenance of the UKM M 50 type self-priming, single stage waste water pumps of **MAS DAF MAKINA SANAYI A.Ş.**
- Please read carefully this manual and apply all the instructions to operate pumps without problems. Pumps shall be used for their intended duties. In this manual, there are information on operating conditions, installation, starting-up, settings and main controls of pumps.
- These operating and maintenance instructions contain **MAS DAF MAKINA SANAYI A.Ş.**'s suggestions. The special operating and maintenance information of the plumbing that a pump is fitted to is not considered in these instructions. This information must be given by the plumbing constructors only.
- **Please refer to instructions of plumbing constructors.**
- Please pay attention to the warnings in this manual and ensure that it is read before the installation-start up process. **MAS DAF MAKINA SANAYI A.Ş.** is not responsible for the accidents resulting from negligence.
- If you cannot find an answer to your questions in this manual, it is suggested that you contact **MAS DAF MAKINA SANAYI A.Ş.** Please inform us about the rated value and especially the serial number of the pump when you get in contact for help.
- The safety instructions in this manual cover the current national accident protection regulations. Beside all of these, an operation, work and safety measure imposed by the costumer has to be applied.

The Signs Used in This Operation Manual



Read the instructions carefully in this operating manual and keep it for your future reference.



Warning sign against the electrical risks



Sign for the operator's safety.

Figure 1: Pump Label



3.1. Training of Personnel

Installation, operation and maintenance personnel must have necessary knowledge in order to accomplish the given job. The responsibility, adequacies and controlling duties of such personnel must be determined by the customer. It has to be certain that these personnel comprehend totally the content of the operating manual.

If the personnel do not have enough knowledge, required training must be given by the customer. If training support is needed by the customer, it will be provided by the manufacturer/seller.



Untrained personnel and unwillingness to comply with safety instructions may be risky for both machine and environment. **MAS DAF MAKINA SANAYI A.Ş.** is not responsible for this kind of damages.

3.2. Hazardous Conditions That May Occur When One does not Comply with the Safety Instructions

Incompliance with safety regulations may put the personnel, the environment and the machine in danger and thus may cause damages. Incompliance with safety regulations may give rise to situations listed below.

- Important operational functions of the factory may stop.**
- Maintenance may get difficult.**
- One may get injured by electrical, mechanical or chemical hazards.**

3.3. Safety Measures for Operator

Dangerous, hot or cold components in the pump area must be covered so that one cannot touch them.

Moving components of the pump must be covered so that one cannot touch them. Those covers must not be dismantled while the pump is running. Dangers that results from electrical connections must be removed. To get more information about this subject, you can refer to domestic electrical instructions.

3.4. Safety Measures for Maintenance and Installation

The customer must assure that all maintenance, check and installment tasks are performed by qualified personnel. Repair work must only be performed while the machine is not running.

The pump and its auxiliary system must be cleaned thoroughly if it contains hazardous liquids. At the end of the repair work, all safety and protective equipment must be re-installed.

3.5. Spare Parts Replacement

Replacement of spare parts and all modifications must be done after contacting with the manufacturer. Spare parts and accessories certified by the manufacturer are important for the safe operation of the system.

Notice: **MAS DAF MAKINA SANAYI A.Ş.** is not responsible from the usage of improper spare parts.

4. TECHNICAL INFORMATION

4.1. Design

Since they are self-priming, the UKM M 50 type pumps are easy to operate. After submerging the suction pipe in water, depending on the suction head they operate approximately in 1 minute.

4.1.1. Impeller

The impellers are designed such open impeller which allow the passage of 18 mm (0,75") diameter solid particles.

2.2. Performance Information

Actual performance of the pump can be obtained from the order page and/or from the test report. This information is given on the pump label.

The performance curves given in the catalog are valid for water whose density and viscosity are $\rho=1 \text{ kg/dm}^3$ and $\nu=1 \text{ cst.}$ respectively. For those liquids whose densities and viscosities are different from those of water, please consult with **MAS DAF MAKINA SANAYI A.Ş.** since the performance curves vary with density and viscosity



Do not operate the pump with a motor that has a different power except for the given catalog and label values.

The pump is not to be operated at off-design point given in the order and supplied from the firm.

It is necessary to ensure that the instructions are obeyed for the safe running of the pump.

2.3. Warranty Conditions

The entire products in our selling program are warranted by **MAS DAF MAKINA SANAYI A.Ş.**

The warranty conditions will only be valid when all the instructions about installation and start-up operations of the pump unit are taken into account.

2.4. Test

All Pumps are dispatched for sale when all the performance and pressure tests are completed. Proper assurance of material and fault-free operation of pumps whose performance tests are made is under the warranty of **MAS DAF MAKINA SANAYI A.Ş.**

2.5. Pressure Limit



Pressure at the discharge flange must not exceed 10 Bar. A special order is necessary for applications with higher pressures.

3. SAFE OPERATING CONDITIONS

This manual contains main safety instructions for the installation, operation and maintenance. It must be read by the personnel who are responsible for installation and operation. This manual should always be kept near the installation location. It is important to comply with safety precautions stated in page 1 along with the general safety instructions as well as preventive measures repeated in other sections of this manual.

4.1.2. Bearing and Lubrication

UKM M 50 series use bearings of the driver.

4.1.3. Seals

In UKM M 50 type pumps, silicon carbide (SiC) surface mechanical seal are used. Seal region is filled with liquid oil.

4.2. Construction of Pump Group

4.2.1. Drive

TEFC (Totally Enclosed Fan Cooled) 3 phase, squirrel caged, IM 1001B3 type electrical motor which complies with DIN EN 60034 IEC is used to drive the pump in proper speed and power.

Specifications of electrical motor;

| | |
|------------------|--|
| Isolation class | : F |
| Protection class | : IP 54-IP 55 |
| Frequency | : 50 Hz |
| Running type | : S1 |
| Start up type | : Up to 4 kW, 3x380 V (Y) More than 4 kW, 3x380V (Δ)+(Y/ Δ) |

4.2.2. Shaft Coupling

In UKM M 50 type pumps, a clamped type rigid coupling is used.

4.2.3. Base Plate

It is manufactured from steel plate or U profile steel in accordance with DIN 24259 in direct coupling applications. In the case of belting drive, U profile is preferred.

5. TRANSPORT AND STORAGE

Suction, discharge and all auxiliary fittings must be closed during transport and storage. Dead-end covers must be removed while the pump unit is being installed.

5.1. Transport

Pump and pump group must be carried safely to the installation location by lifting equipments.

CAUTION

Current general lifting safety instructions must be applied. Please use a suspension system shown in figure while you are carrying and lifting the pump unit. The suspension rings may be broken because of the excessive load and may result in a damage of the pump. Prefer fabric cable for suspension.

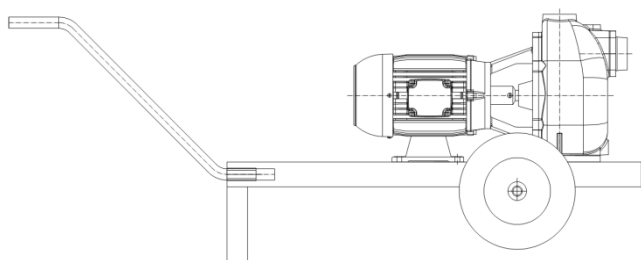


Figure 2-a: Transport of Pump Group (With hand truck)

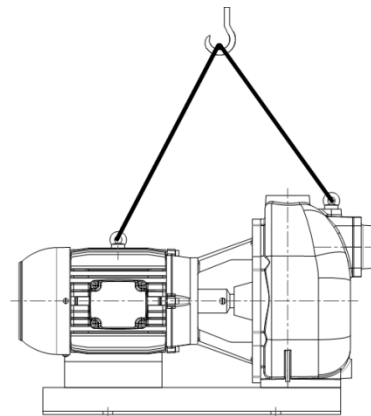


Figure 2-b: Transport of Pump Group



Incorrect lifting may damage the pump unit and cause injuries.

Damages caused in transport

Check the pump when it is delivered to you. Please let us know of there is any damage.

5.2. Storage



Please keep the unit clean and dry area during storage.

If the pump is out of use for a long time, please consider the instructions below.

- 1.If there is water inside the pump, drain it.
- 2.Clean the pump casing and impeller by jetting clean water for a short time.
- 3.Empty water inside the pump casing, suction line and discharge line.
- 4.Add small amount of antifreeze inside the pump casing if it is not possible to empty it completely. Rotate the pump shaft by hand to mix the antifreeze.
- 5.Add liquid lubricator into the bearing and seal gap up until the level indicator.
- 6.Close the suction and discharge exits with gasket.
- 7.Spray an anti-corrosive into the pump casing.
- 8.Rotate the pump shaft by hand once in every month, in order to protect it from freezing and to lubricate the bearings.

6. ASSEMBLY / INSTALLATION

6.1. Installation

In our standard production, the pump and the motor have been installed in a common base plate.

6.1.1. Location of Installation

Pump will be installed in a location where the control and the maintenance of the pump are easily made. The pump room should be suitable for operation of lifting systems such as freight elevator, forklift, etc.

6.1.2. Location of Installation- Local Ambient Temperature

When the local ambient room temperature exceeds +40°C in a pumping system, suitable ventilation should be provided in order to remove the heat dissipated to the environment and supply fresh air.

6.2. Type of Connection

Type of connection depends on the design type and the size of the pump and the motor, as well as the local installation conditions. Foot-mounted horizontal pump-motor units have been installed in a common base plate.

6.3. Foundation

6.3.1. General

In applications where a trailer is not used, the pump must be properly fixed to solidified concrete base plate with studs.

Base plate of the pump must be grouted. The foundation shall be of concrete or steel framework.

Note: The foundation shall distribute the weight of the pumping group evenly.

6.3.2. Main Properties of the Steel Framework Bases

Foundations with steel framework shall be designed in such a way that the base plate is bolted or welded contacting to all area.



If base plate is supported from only four points, pump group will stay in the middle causing increasing the noise level.

6.3.3. Foundation Properties

The foundation shall be horizontal, flat and clean and shall support all the weight.

Note: Reinforced concrete bases are constructed from standard concrete with at least B 25 resistance class.

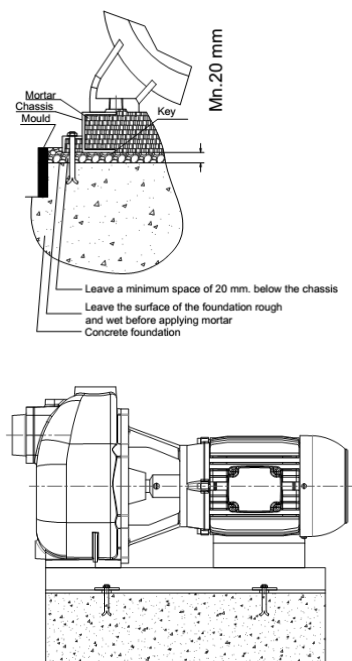


Figure 3: Typical Concrete Foundations

6.3.4. Fixing (Securing) Of Pump Group

After the alignment of the pump group on the foundation has been made, the mutual securing bolt screws should be used alternately to fix the pump group. As possible in all areas of the base plate should be filled with aqueous soil mixture.

Note: Be sure the entire surface of the base plate is in contact with the foundation and have no gaps during molding and fixing with soil mixture. Inside of the chassis should be filled with concrete to complete.

6.4. Piping

6.4.1. Suction and Discharge Piping

Pump performance is adversely affected by increase suction lift, discharge elevation and friction losses. See the performance curve and operating range to be sure your overall application allows pump to operate within the safe operation range.

6.4.1.1. Material

Either pipe or hose may be used for suction and discharge lines. However, the materials must be compatible with liquid being pumped. If hose is used in suction line, it must be the rigid-wall, reinforced type to prevent collapse under suction.

6.4.1.2. Line Configuration

Keep suction and discharge lines as straight as possible to minimize friction losses. Make minimum use of elbows and fittings, which substantially increase friction losses. If elbows are necessary, use the long radius type to minimize friction losses.

6.4.1.3. Connections of Pump

Before tightening a connection flange, align it exactly with the pump port. Never pull a pipe line into place by tightening the flange bolts and/or connections.

Lines near the pump must be independently supported to avoid strain on the pump which could cause excessive vibration, decrease bearing life and increase shaft and seal wear. If hose-type lines are used, they should have adequate support to secure them when filled with liquid and under pressure.

6.4.1.4. Gauges

Most pumps are drilled and tapped for installing discharge pressure and vacuum suction gauges. If these gauges are desired for pumps that are not tapped, drill and tape the suction and discharge lines not less than 18" (457.2 mm) from the suction and discharge ports and install the lines. Installation closer to the pump may result in erratic reading.

6.4.2. Suction Lines

To avoid air pockets which could affect pump priming, the suction line must be as short and direct as possible. When operation pumped, if the line slopes down to the pump at any point along the suction run, air involves a suction lift, the line must always slope upward to the pump from the source of the liquid being pumped. Air pockets will be created.

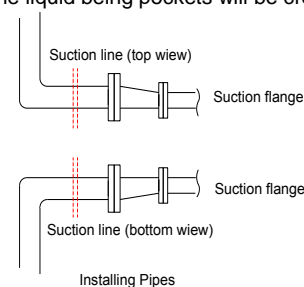


Figure 4: Installing Pipes

6.4.2.1. Fittings

Suction lines should be the same size as the pump inlet. If reducers are used in suction lines, they should be the eccentric type and should be installed with the flat part of the reducers uppermost to avoid creating air pockets. Valves are not normally used in suction lines but if a valve is used, install it with the horizontal to avoid air pocket.

6.4.2.2. Strainer

If a strainer is furnished with the pump, be certain to use it; any spherical solids which pass through a strainer furnished with the pump will also pass through the pump itself.

If a strainer is not furnished with the pump, but is installed by pump user, make certain that the total area of the openings in the strainer is at least three or four times the cross section of the suction line and that openings will not permit passage of solids larger than the solids handling capability of the pump.

6.4.2.3. Sealing

Since even a slight leak will affect priming, head and capacity, especially when operating with a high suction lift, all connection in the suction line should be sealed with pipe dope to ensure an airtight seal. Follow the sealant manufacturer's recommendations when selecting and applying the pipe dope. The pipe dope should be compatible with the liquid being pumped.

6.4.2.4. Suction Lines in Sumps

If a single suction line is installed in a sump, it should be positioned away from the wall of the sump at a distance equal to 1.5 times the diameter of the suction line.

If there is a liquid flow from an open pipe into sump, the flow should be kept away from the suction inlet because the inflow will carry air down into the sump and air entering the suction line will reduce pump efficiency.

It is necessary to position inflow close to the suction inlet, install a baffle between the inflow and the suction lines; it must be the rigid-wall, reinforced type to prevent collapse under suction.

Using piping connections in the suction lines is not recommended.

Suction inlet at a distance 1.5 times the diameter of the suction pipe. The baffle will allow entrained air to escape from the liquid before it is drawn into the suction inlet.

If two suction lines are installed in a single sump, the flow path may interact, reducing the efficiency of one or both pumps. To avoid this, position the suction inlet so that they are separated by a distance equal to at least 3 times the diameter of the suction pipe.

6.4.2.5. Suction Lines in Positioning

The depth of the submergence of the suction line is critical to efficient pump operation. Figure 7 shows recommended minimum submergence vs. velocity.

Note: The pipe submergence required may be reduced by installing a standard pipe increaser fitting at the end of the suction line. The larger opening size will reduce the inlet velocity. Calculate the required submergence using the following formula based on the increased opening size (area or diameter).

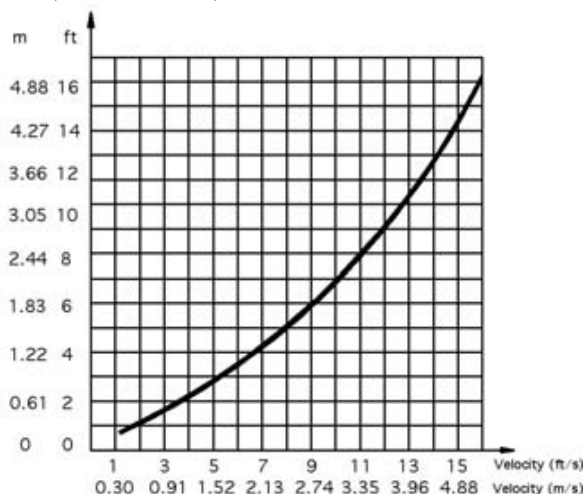


Figure 5: Recommended Minimum Suction Line Submergence vs. Velocity

$$VELOCITY (ft/s) = \frac{QUANx(GPM)x0.321}{AREA}$$

$$VELOCITY (m/s) = \frac{FLOW(m^3/s)}{AREA (m^2)}$$

6.4.3. Discharge Lines

6.4.3.1. Siphoning

Do not terminate the discharge line at a level lower than of the liquid being pumped unless a siphon breaker is used in the line. Otherwise, a siphoning suction causing damage to the pump could result.

6.4.3.2. Valves

If a throttling is desired in the discharge line, use a valve as large as the largest pipe to minimize friction losses. Never install a throttling valve and system check valve be installed in the discharge line to protect the pump from excessive shock pressure and reverse rotation when it is stopped.



If the application involves a high discharge head, gradually close the discharge throttling valve before stopping the pump.

6.5. Motor Connection for Applications with Electric Motor

In electric motor coupled UKM M 50 type pumps, motor must be connected by an electrical technician according to the connection (switch) diagram. Local electricity policies have to be applied.



- Electrical connections have to be made by authorized electricians.
- In dismantling the pump, make sure the electricity is cut off before taking the motor cover out.
- Use the appropriate electrical connection to the motor.

In environments where there is a risk of explosion, prescribed protective law and regulations shall be applied by competent authorities.

6.5.1. Motor Connection Diagram

- Motors requiring high moments at start up shall not be connected star-delta
- Frequency controlled motors, require high moment at start up and have to be cooled properly at low speeds. Provide the necessary cooling for the motors.

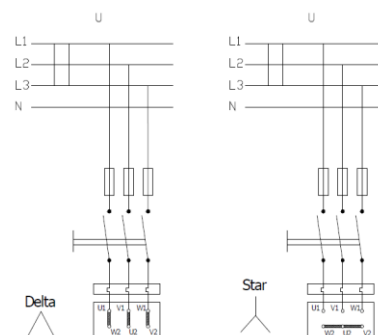


Figure 6: Electric Connection Diagram

| Electrical circuit | Motor | |
|--------------------|-----------|-------|
| U (Volt) | 230/400 V | 400 V |
| 3 x 230 V | Delta | |
| 3 x 400 V | Star | Delta |

6.5.2. Motor Protection

- Three phased-motor shall be connected to power supply.
- Wait the motor to cool down when thermic protected motor breaks in circuit due to the overheating. Make sure the motor does not start automatically until it cools completely
- In order to protect the motor from overcharging and short circuit use a thermic or thermic-magnetic relay. Adjust this relay to the nominal current of the motor.



Electrical equipments, terminals and the components of the control systems may carry electric current even though they are not operating. They may cause deadly and serious injuries or irreparable material damages.

7. COMMISSIONING, START UP AND OPERATING

7.1. Preparations Before Start Up

Lubrication of Motor Bearing

The lubrication must be performed as it is recommended by the motor manufacturer.



Do not start your pump dry (WITHOUT WATER).

7.2. Checking The Direction of Rotation



- The direction of rotation is in the clockwise sense when looked from the motor side (right). The direction of rotation must always be checked before each operation.
- One should always check the labels which show the direction of rotation and the direction of fluid flow.

7.3. Starting the Pump

7.3.1. Priming



**Never operate this pump unless there is liquid in the pump casing.
The pump will not prime when dry.**

Extend operation of dry pump will destroy the seal assembly.

Add liquid to the pump casing when:

1. The pump is being put into service for the first time.
2. The pump has not been used for a considerable length of time.
3. The liquid in the pump casing has evaporated.

Once the pump casing has been filled the pump will prime and reprime as necessary.



After filling the pump casing, reinstall and tighten the fill plug. Do not attempt to operate the pump unless all connecting piping is securely installed. Otherwise, liquid in the pump forced out under pressure could cause injury to the personnel.



**Stop the motor if the pump gets too hot. Wait until it gets cold.
Then start the system up again carefully.**

8. MAINTENANCE



Maintenance operations must be done by authorized personnel with protective clothing only. The personnel must also beware of high temperatures and harmful and/or caustic liquids. Make sure that the personnel read carefully the manual.

- The instructions in Safety Precautions must be executed during maintenance and repair
- Continuous monitoring and maintenance will increase the engine's and pump's lives.

The instructions below should be applied.

8.1. The Checks During the Operation

- Pump must never be operated without water.
- Pump must not be operated for a long time with the discharge valve closed (zero capacity).



Do not operate the pump against a closed discharge valve for along time. If operated against a closed discharge valve, pump components will deteriorate and the liquid could come to boil, build pressure and cause the pump casing to rupture or explode.

- Bearing temperature must never exceed 80°C if the ambient temperature is 30°C.
- Precautions must be taken against flare up when the component temperatures are over 60°C. "Hot Surface" warnings must be placed over necessary areas.
- Water leakage from the mechanical sealing indicates the fact that the sealing is worn out and therefore need to be replaced.
- All the auxiliary systems must be in use while the pump is operating.
- If the system consists of a substitute pump, keep it ready by operating it once a week. Check also the auxiliary systems of the substitute pump.

8.2. Disassembly and Reassembly of Pump

This pump requires little service due to its rugged, minimum-maintenance design. However, if it becomes necessary to inspect or replace the wearing parts, follow these instructions.

Many functions may be performed by draining the pump and removing the back cover assembly. If major repair is required, the piping and/or power source must be disconnected. The following instructions assume complete disassembly is required.

Before attempting to service the pump, disconnect or lock out the power source and take precautions to ensure that it will remain inoperative. Close all valves in the suction and discharge lines.

For power source disassembly and repair, consult the literature supplied with the power source or contact your local power source representative.



If you wish to keep spare parts in store, depending on the number of same type of pumps, for two operation years, the quantities which are listed in the table below are recommended.

Before attempting to disassemble or service the pump:

1. Familiarize yourself with this manual.
2. Disconnect or lock out the power source to ensure that the pump will remain inoperative.
3. Allow the pump to cool if overheated.
4. Check the temperature before opening any cover, plates or plugs.
5. Close the suction and discharge valves.
6. Vent the pump slowly and cautiously.
7. Drain the pump.



| Component Name | The Number of Equivalent Pumps in the Installation | | | | | | |
|-----------------------------|--|---|---|---|-----|-----|-----|
| | 1-2 | 3 | 4 | 5 | 6-7 | 8-9 | 10+ |
| Shaft (key included) kit | 1 | 1 | 2 | 2 | 2 | 3 | %30 |
| Impeller (kit) | 1 | 1 | 1 | 2 | 2 | 3 | %30 |
| Wearing Plate | 2 | 3 | 4 | 5 | 5 | 6 | %60 |
| O-Ring for Casing (kit + 1) | 1 | 1 | 1 | 2 | 2 | 3 | %40 |
| Sealing Bushes (kit) | 1 | 1 | 1 | 2 | 2 | 3 | %30 |

Table 1: Spare Part List

9. NOISE LEVEL AND VIBRATION

The reasons which increase the noise level are indicated below:

- Noise level increases due to the fact that the pump is not founded properly (Vibration)
- If the installation does not have compensator noise and vibration increases.
- Wearing in ball bearing also increases noise level.



Check if there is any noise increasing elements in your installation.

9.1. Expected Noise Values

Measurement conditions:

- The distance between the measure point and the pump : 1m
- Operation : Without Cavitation
- Motor : IEC Standard Motor
- Tolerance : ±3 dB

8.3. Drive

Apply to the operating instructions of the motor manufacturer.

8.4. Auxiliary Components

Check regularly the fittings and the gaskets, replace the worn out pieces.

8.5. Service

Our Customer Service Department offers after-sale service. Manager should employ authorized and trained personnel for mounting/dismounting procedures. Before these procedures, one must make sure that pump interior is clean and empty.

This criterion is also valid for the pumps which are sent to our factory or to our service points.



Maintain the safety of the personnel and the environment in every field procedure.

8.6. Spare Parts

The spare parts of UKM M 50 type pumps are guaranteed for **10 YEARS** by **MAS DAF MAKINA SANAYI A.Ş.**

In your spare parts requests, please indicate the below listed values that are indicated on your pump's label.

- Pump type and size:**
- Motor power and speed:**
- Pump serial number:**
- Capacity and head:**

| Power of Motor PN [kW] | Sound Pressure Level (dB) * | |
|------------------------|-----------------------------|-----------------------|
| | 2 Poles | 4 Poles |
| | 2900 rpm/min 50 Hz | 1450 rpm/min 50 Hz |
| 0,37 | 50 | 44 |
| 0,55 | 50 | 46 |
| 1,1 | 54 | 46 |
| 1,5 | 61 | 46 |
| 2,2 | 61 | 50 |
| 3 | 62 | 50 |
| 4 | 63 | 52 |
| 5,5 | 66 | 54 |

Table 2: Sound Pressure Level

(*) Without protective sound hood, measured at a distance of 1 m directly above the driven pump, in a free space above a sound reflecting surface.

The above values are maximum values. The surface noise pressure level at dB(A) unit is shown as (L_{pA}). This complies with TS EN ISO 20361.

10. POSSIBLE FAILURES, CAUSES, SOLUTIONS

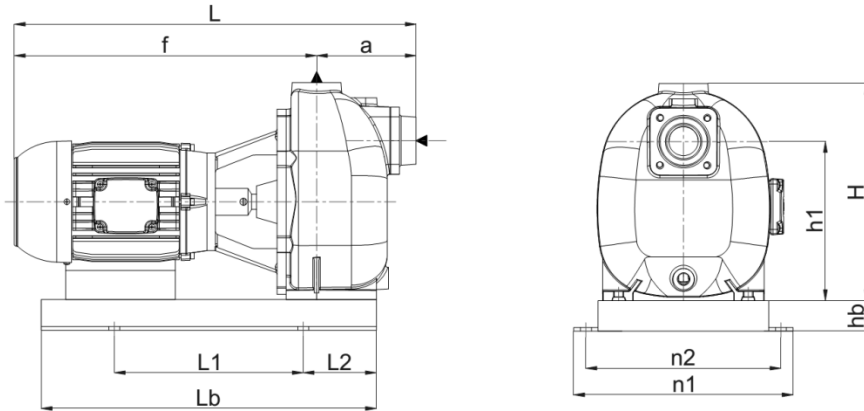
Possible failures and solution strategies are listed in the table below. Please apply to the Customers' Service Department of our company when a generic solution is not found to your problem.



While the failures are repaired the pump must always be dry and un-pressurized.

| POSSIBLE FAILURE | CAUSES | SOLUTIONS |
|--|---|--|
| Pump fails to prime. | <ul style="list-style-type: none"> • Not enough liquid in casing. • Flap valve contaminated or damaged. • Air leak in suction hose collapsed. • Leaking or worn seal or pump gasket. • Suction lift or discharge head too high. • Strainer clogged. | <ul style="list-style-type: none"> • Add liquid to casing. • Clean or replace check valve. • Correct leak. • Replace suction hose. • Check pump vacuum. Replace leaking or worn seal or gasket. • Check piping installation and install by-pass line if needed. • Check strainer and clean if necessary. |
| Pump stops or fails to deliver rated flow or pressure. | <ul style="list-style-type: none"> • Air leak in suction line. • Lining of suction hose collapsed. • Leaking or worn seal or pump gasket. • Strainer clogged. • Suction intake not submerged at proper level or sump too small. • Impeller or other wearing parts worn or damaged. • Impeller clogged. • Pump speed too slow. • Discharge head too high. • Suction lift too high. | <ul style="list-style-type: none"> • Correct leak. • Replace suction hose. • Check pump vacuum. Replace leaking or worn seal or gasket. • Check strainer and clean if necessary. • Check installation and correct submergence as needed. • Replace worn or damaged parts. Check that impeller is properly centered and rotates. • Free impeller of debris. • Check driver output. • Measure lift with vacuum gauge. Reduce lift and/or friction losses in suction line. |
| Pump requires too much power. | <ul style="list-style-type: none"> • Pump speed too high. • Discharge head too low. • Liquid solution too thick. | <ul style="list-style-type: none"> • Check driver output; check that sheaves or motor rpm are correctly sized. • Adjust discharge valve. • Dilute is possible. |
| Pump clogs frequently. | <ul style="list-style-type: none"> • Liquid solution too thick. • Discharge flow too slow. • Suction check valve or foot valve clogged or binding. | <ul style="list-style-type: none"> • Dilute is possible. • Open discharge valve fully to increase flow rate and power source at maximum governed speed. • Clean valve. |
| Excessive noise. | <ul style="list-style-type: none"> • Cavitations in pump. • Pumping entrained air. • Pump or drive not securely mounted. • Impeller clogged or damaged. | <ul style="list-style-type: none"> • Reduce suction lift and/or friction losses in suction line. Record vacuum and pressure gauge readings and consult local representative or factory. • Locate and eliminate source of air bubble. • Secure mounting hardware. • Clean out debris; replace damaged parts. |

Table 3 - Possible Failures, Causes, Solutions

11. UKM M 50 PUMP DIMENSIONS TABLE

Figure 7: UKM M 50 Pump Dimensions Figure

| Pump Type | DNs | DNd | Motor Power (kW) | a | f | L | L1 | L2 | Lb | h1 | H | hb | n1 | n2 |
|-----------|-------|-------|------------------|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|
| UKM M 50 | DN 50 | DN 50 | 1.5 | 163 | 434 | 597 | 310 | 120 | 550 | 260 | 355 | 50 | 360 | 320 |
| | | | 2.2 | | 464 | 627 | | | | | | | | |
| | | | 3 | | 496 | 659 | | | | | | | | |
| | | | 4 | | 507 | 670 | | | | | | | | |
| | | | 5.5 | | | | | | | | | | | |

Table 4: UKM M 50 Pump Dimensions Table
12. TIGHTENING TORQUES

| THREAD DIAMETER | TIGHTENING TORQUE MAX (Nm) | |
|-----------------|----------------------------|------|
| | Property Classes | |
| | 8.8 | 10.9 |
| M4 | 3.0 | 4.4 |
| M5 | 5.9 | 8.7 |
| M6 | 10 | 15 |
| M8 | 25 | 36 |
| M10 | 49 | 72 |
| M12 | 85 | 125 |
| M14 | 135 | 200 |
| M16 | 210 | 310 |
| M18 | 300 | 430 |
| M20 | 425 | 610 |
| M22 | 580 | 820 |
| M24 | 730 | 1050 |
| M27 | 1100 | 1550 |
| M30 | 1450 | 2100 |
| M33 | 1970 | 2770 |
| M36 | 2530 | 3560 |

Table 5: Tightening Torques Table

13. UKM M 50 SECTIONAL DRAWING AND PART LIST

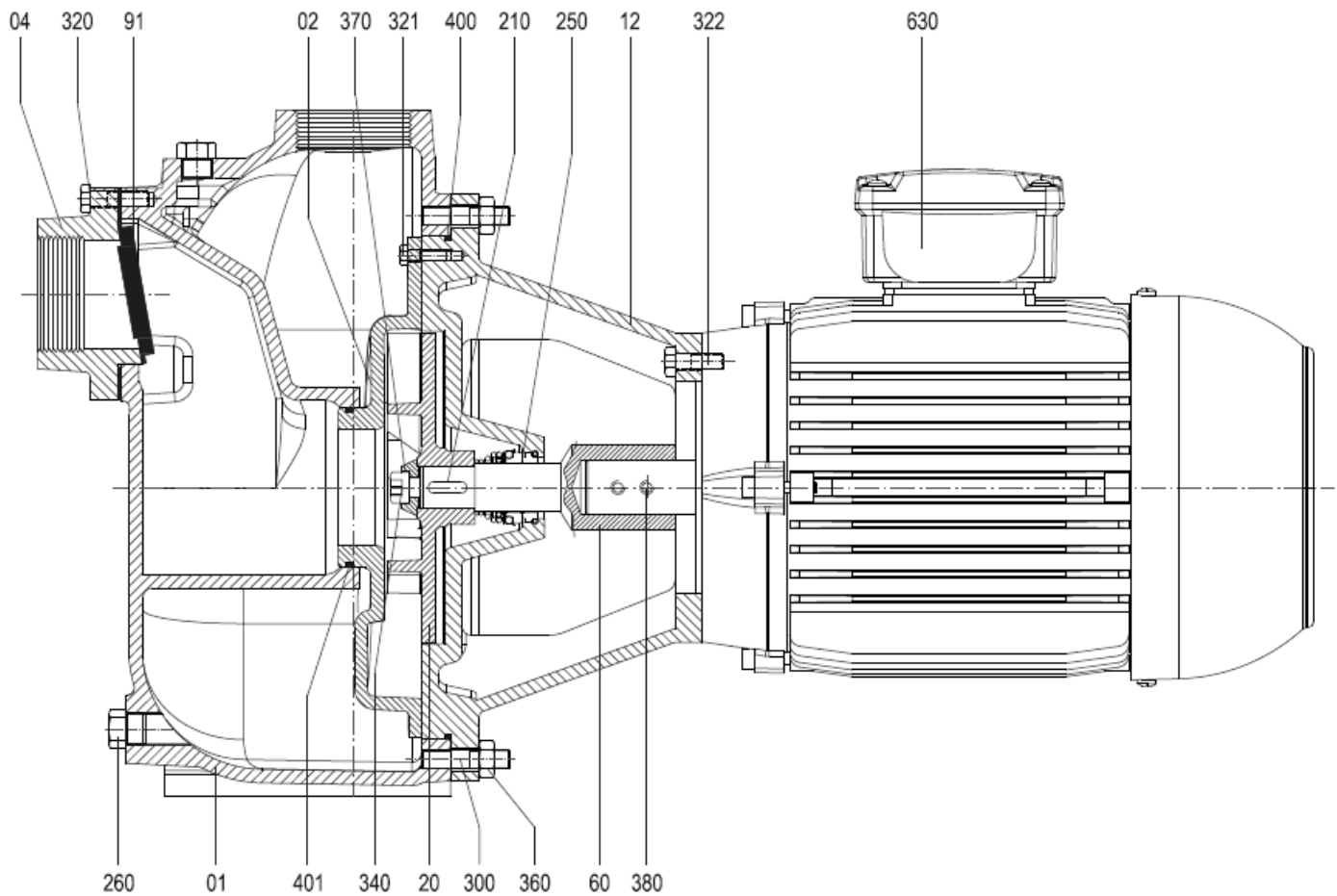


Figure 8: UKM M 50 Sectional Drawing

| Part No | Part Name | Part No | Part Name |
|---------|-------------------|---------|-------------------------------|
| 01 | Pump Casing | 320 | Hex Bolt |
| 02 | Volute Casing | 321 | Hex Bolt |
| 04 | Flap Valve Casing | 322 | Hex Bolt |
| 12 | Adaptor | 340 | Imbus Bolt |
| 20 | Impeller | 360 | Casing Nut |
| 60 | Shaft | 370 | Washer for Impeller Cap Screw |
| 91 | Suction Flap | 380 | Setscrew |
| 210 | Key for Impeller | 400 | O-Ring |
| 250 | Mechanical Seal | 401 | O-Ring |
| 260 | Plug | 630 | Electrical Motor |
| 300 | Casing Stud | | |

Table 6: UKM M 50 Sectional Part List

14. FIGURE LIST**Page No**

| | | |
|-------------------|---|----|
| Figure 1 | Pump Label | 2 |
| Figure 2-a | Transport of Pump Group (With hand truck) | 3 |
| Figure 2-b | Transport of Pump Group | 3 |
| Figure 3 | Typical Concrete Foundations | 4 |
| Figure 4 | Installing Pipes | 4 |
| Figure 5 | Recommended Minimum Suction Line Submergence vs. Velocity | 5 |
| Figure 6 | Electric Connection Diagram | 5 |
| Figure 7 | UKM M 50 Pump Dimensions Figure | 9 |
| Figure 8 | UKM M 50 Sectional Drawing | 10 |

15. TABLE LIST**Page No**

| | | |
|----------------|--------------------------------------|----|
| Table 1 | Spare Part List | 7 |
| Table 2 | Sound Pressure Level | 7 |
| Table 3 | Possible Failures, Causes, Solutions | 8 |
| Table 4 | UKM M 50 Pump Dimensions Table | 9 |
| Table 5 | Tightening Torques Table | 9 |
| Table 6 | UKM M 50 Sectional Part List | 10 |



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