YNM SERIES (UL Listed / FM Approved)

End Suction Centrifugal Fire Pumps

Operating Manual

masdaf

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masdaf

masdaf TÜV AUSTRIA CE EuP COMPLIANT

EC DECLARATION OF CONFORMITY

AT UYGUNLUK BEYANI

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

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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 olunduğunu beyan ederiz.
Aşağıda tanımlanan ürünler içüretim kontrollerine bağlı olarak **MAS DAF MAKİNA SANAYİ A.Ş.** *tarafından kontrol edilmiştir.*

Equipment / *Ürün* : END SUCTION CENTRIFUGAL FIRE PUMPS
UÇTAN EMİŞLİ SANTRİFÜJ YANGIN POMPALARI
Seri / *Model-Tip* : YNM Series – *YNM 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*
EUP 2009/ 125 /EC Electric Used Products Directive/ *Elektrik Kullanan Ekipmanlar Direktifi (EUP)*

Regulations applied acc. to harmonize standards / *Uygulanan Uyumlaştırılmış Standartlar*
TS EN ISO 12100:2010, TS EN 809+A1, TS EN 60204-1:2018.

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, 01.08.2019
Name and position of authorized person : Vahdettin YIRTMAÇ
Yetkili Kişinin Adı ve Görevi General Manager / Genel Müdür
Signature of authorized person :
Yetkili Kişinin İmzası

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1. Introduction

This manual gives the safety, installation, operation and maintenance instructions for pumps in the YNM Pumps range of horizontal, end suction, centrifugal pumps for general and industrial use. This manual applies to the following pump types:

Pump Size Code		
Size Code	**Discharge Branch Dia. mm**	**Nominal Impeller Dia. mm**
YNM 525	50	250
YNM 825	80	250
YNM 1531	150	315

2. General Information And Safety Instruction

The products supplied by **MAS DAF Makina Sanayi A.Ş.** have been designed with safety in mind. Where hazards cannot be eliminated, the risk has been minimized by the use of guards and other design features. Some hazards cannot be guarded against and the instructions below **MUST BE COMPLIED WITH** for safe operation. These instructions cannot cover all circumstances; YOU are responsible for using safe working practices at all times.

1. **MAS DAF Makina Sanayi A.Ş.** products are designed for installation in designated areas, which are to be kept clean and free of obstructions that may restrict safe access to the controls and maintenance access points. A pump nameplate is fitted to each unit and must not be removed. Loss of this plate could make identification impossible. This in turn could affect safety and cause difficulty in obtaining spare parts. Should accidental loss or damage occur, contact **MAS DAF Makina Sanayi A.Ş.** immediately.

2. Access to the equipment should be restricted to the personnel responsible for installation, operation and maintenance and they must be trained, adequately qualified and supplied with the appropriate tools for their respective tasks.

3. MAS DAF Makina Sanayi A.Ş. requires that all personnel that are responsible for installation, operation or maintenance of the equipment, have access to and study the product instruction manual BEFORE any work is done and that they will comply with all local and industry based safety instructions and regulations.

4. Ear defenders should be worn where the specified equipment noise level exceeds locally defined safe levels. Safety glasses or goggles should be worn where working with pressurized systems and hazardous substances. Other personal protection equipment must be worn where local rules apply.

5. Do NOT wear loose or frayed clothing or jewelers that could catch on the controls or become trapped in the equipment.

6. Check and confirm that the manual is the relevant copy by comparing the serial number on the identification plate with that on the manual.

7. Note any limits to the pump application specified in the contract documentation. Operation of the equipment outside these limits will increase the risk from hazards noted below and may lead to premature and hazardous pump failure.

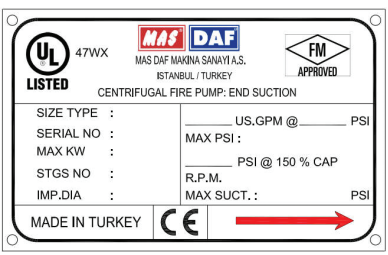
8. Clear and easy access to all controls, gauges and dials etc. MUST be maintained at all times. Hazardous or flammable materials must NOT be stored in pump rooms unless safe areas or racking and suitable containers have been provided.
9. Improper installation, operation or maintenance of this **MAS DAF Makina Sanayi A.Ş.** product could result in injury or death.
10. Within the manual, safety instructions are marked with safety symbols.

This symbol refers to general mechanical aspects of safety.

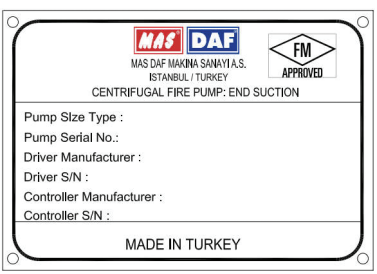
This symbol refers to electrical safety.

ATTENTION

This symbol gives warning of a hazard to the pump itself, which in turn, could cause a risk to personal safety.



Pump Label



Baseplate Label

2.1. Warranty Conditions

The entire products in our selling program are warranted by **MAS DAF MAKINA SANAYİ A.Ş.**
Warranty period is 12 months after delivery.
Life of the product is 10 Years.
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.

3. Transport Handling And Storage Instructions

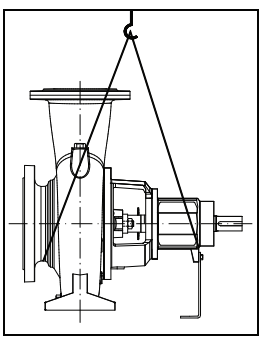
3.1. Transport

YNM pumps are dispatched fully assembled but for overseas orders the lubricating oil in the bearing housing is drained. Pumps are protected against corrosion and packed for transport by normal road, rail and sea carriers.

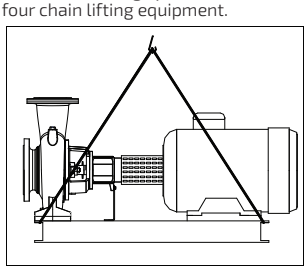
3.2. Handling

When lifting the pump unit, use lifting equipment having a safe working load rating suitable for the weight specified. Use suitable slings for lifting any pump not provided with lifting points. The use of suitable forklift truck and four chain crane sling equipment is recommended but locally approved equipment of suitable rating maybe used.

Pumps supplied on pallets may be lifted by forklift truck, to lift from the pallet the pump should be slung as shown.



Pumpset fitted with lifting eyebolts must be lifted using suitable four chain lifting equipment.



3.3. Storage

3.3.1. Temporary Storage for up to Six Weeks

If the pump unit is not to be used immediately it should be stored carefully in a horizontal position, in a sheltered, dry location. Additional rust preventative should be applied to all unpainted carbon steel or cast iron parts, and should not be removed until final installation.

3.3.2. Long Term Storage

DO NOT place fingers or hands etc. into the suction or discharge pipe outlets and do NOT touch the impeller, if rotated this may cause severe injury. To prevent ingress of any objects, retain the protection covers or packaging in place until removal is necessary for installation. If the packaging or suction and discharge covers are removed for inspection purposes, replace afterwards to protect the pump and maintain safety. Fill the bearing housing with recommended remain rust free. Remove the gland, packing rings and lantern ring, cover metallic parts with rust preventative and wrap all parts for storage with the pump. The pump shaft should be rotated by hand at least five turns every six weeks. For special protection of the coupling and electric motor, where applicable, refer to the manufacturers' instructions in the relevant appendix.

3.3.3. Exposed or Extreme Conditions Storage

For exposed storage or extreme variants in atmospheric or environmental conditions, please refer to **MAS DAF Makina Sanayi A.Ş.** for special storage instructions to suit the conditions applicable.

4. GENERAL DESCRIPTION

MAS DAF Makina Sanayi A.Ş. YNM Pumps are arrange of horizontal centrifugal pumps that comply with Pump Standard DIN2426.

4.1. Pumps

The mechanical assembly comprises a rigid shaft, supported by grease-lubricated bearings with a double shrouded type impeller mounted in a removable bearing housing assembly. This is attached to an end suction volute casing fitted with wear ring(s). The bearing housing, shaft and impeller assembly can be withdrawn from the volute for maintenance without disconnection of pipework. The discharge branch is positioned vertically opposite the main pump mounting feet, an additional mounting foot is fitted at the outer bearing position for stability. The complete assembly is of a rigid construction, being intended for mounting on suitable base plate with electric or other motor driver. A suitable coupling is required to transmit the rotational drive between pump and motor. A spacer coupling can be fitted to allow the removal of the pump rotating assembly without disconnecting pipework and removal of the motor. The shaft is sealed with a soft packed gland for fire pump applications. Nameplate details are shown on the back cover, full pump specification can be supplied on a data sheet, if requested.

4.2. Long Coupled Pumpset

These pumpset are supplied with base plate, coupling and electric motors, specified to meet the pump duty and customer requirements. Base plates are usually of the **MAS DAF Makina Sanayi A.Ş.** steel plate design but fabricated base plates may be supplied to meet additional requirements. A proprietary flexible coupling is fitted, this has been selected to meet the power transmission and other operating requirements for the pumpset.

5. Assembly and Installation

Do NOT place fingers or hands etc. into the suction or discharge pipe outlets and do NOT touch the impeller, if rotated this may cause severe injury. To prevent ingress of any objects, retain the protection covers or packaging in place until removal is necessary for installation.

5.1. Initial Inspection for Damage

During transport and storage, accidental damage to the pump may have occurred. When the pump is to be installed, or in the event of a handling accident, carefully check that no damage has been sustained by the pump before installation and commissioning.

5.2. Preparation for Mounting

Before installation, check that the pump mounting location is suitable for accepting the pump unit. Refer to this manual, for details of pump installation dimensions or to a certified General Arrangement Drawing when available.

5.3. Pump Preparation

Do NOT touch any moving or rotating parts. Guards are provided to prevent access to these parts, where they have been removed for maintenance they MUST be replaced before operating the equipment. Remove packaging but leave the flange covers in place, check that impeller rotates freely by hand by turning the shaft.

5.4. Pump Installation

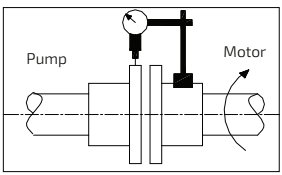
It is recommended that the pump unit is fitted to the base plate before fitting the motor and coupling.

The distance between shaft ends should be established to suit the coupling by reference to the manufacturer's instructions.

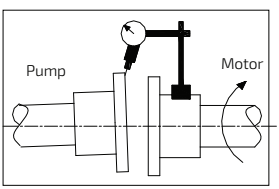
5.5. Shaft Alignment

To minimize the side load on the bearings and to achieve full coupling and bearing life. It is recommended that the shafts are aligned as accurately as possible i.e. well below the allowable misalignment of the coupling. Refer to the coupling manufacturer's instructions or proceed generally :

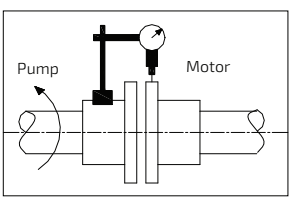
a. Lateral Alignment
Mount a dial gauge on the motor shaft or coupling with the gauge running on the machined diameter of the pump coupling. Turn the motor shaft and note the total indicator reading.



b. Angular Alignment Mount a dial gauge on the motor shaft or coupling to run on a face of the pump coupling as near the outside diameter as possible. Turn the motor shaft and note the total indicator reading.



c. Confirm Lateral Alignment
Mount the dial gauge on the pump shaft or coupling with the gauge running on the machined diameter of the motor coupling. Turn the pump shaft and note the total indicator reading.



d. Adjustment
The motor must be shimmed and repositioned to align the shafts within the coupling manufacturer's specifications.

e. Alternative Method If a dial gauge is not available, calipers or taper gauge may be used to measure the distance between the coupling flanges at four points around the circumference and a straight edge used to check the lateral alignment of the outer flange diameters.

ATTENTION

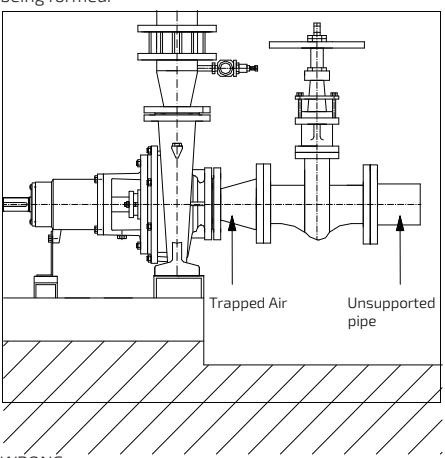
Shaft alignment must be checked again after the final positioning of the pump unit and connection to pipework as this may have disturbed the pump or motor mounting positions.

ATTENTION

If hot liquids (above 80°C) are being pumped, alignment should be checked and reset with the pump and motor at their normal operating temperature.

5.6. Suction Pipework

The run of suction pipework must be such that air can NOT become trapped where it would be sucked into the pump on starting. The bore of suction pipe is recommended to be one or two sizes larger than the pump suction branch and reducers if used must be eccentric to eliminate the possibility of an air pocket being formed.

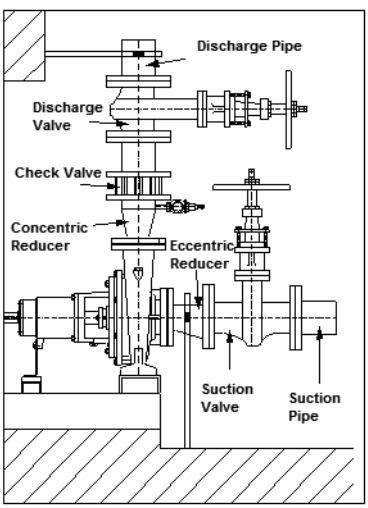


WRONG
Where pumping water at temperatures above 70°C, care must be taken to ensure that enough pressure is

available at the impeller entry to prevent vaporization. An appropriate fine strainer is recommended to prevent foreign matter from being drawn into the pump. A screen or basket strainer may also be required to hold back larger items. These should be sized to maintain the flow through them to below 0.6 m/s. The suction pipe work must be flushed clean to ensure that site debris is not drawn into the pump when it is commissioned.

5.7. Discharge Pipework

The bore of the discharge pipe should be sized to ensure a flow velocity of 2.5 to 3 m/s is not exceeded. This is usually one size larger than the discharge branch. Pipework should be as short and straight as possible to reduce friction head loss.
A non-return valve is usually fitted to prevent the pump from excessive back pressure and reverse rotation and a discharge valve is usually fitted to regulate the flow and allow for inspection and maintenance on the pump.



CORRECT
The suction and discharge pipework must be independently supported and positioned such that no excessive forces and moments are exerted on the pump flanges.

ATTENTION

Failure to support suction and delivery pipework may result in distortion of the pump casing, with the possibility of early pump failure.

5.8. Foundations

The base plate must be secured to substantial foundations with suitable foundation bolts to minimize vibrations. A space of approximately 25mm should be left between the base plate and the foundations for grouting. After the grouting has dried, the foundation bolts should be tightened and the shaft alignment checked again before commissioning and putting the pump into operation.

6. Commissioning and operation

6.1. Commissioning Checks

These checks must be done after first installation and after pump maintenance that requires removal of the rotating assembly.

⚠

Do NOT touch any moving or rotating parts. Guards are provided to prevent access to these parts, where they have been removed for maintenance they MUST be replaced before operating the equipment. If the gland packing has been removed for storage, this must be replaced as described in this manual.
Check grease in the bearing housing. If the shaft sealing is by gland packing, the packing should be relatively slack and check that the gland is free.
If the stuffing box is supplied with cooling water or the mechanical seal is supplied with clean water flush, check that the water supply is turned on.

ATTENTION

Failure to supply the stuffing box or mechanical seal with cooling or flush water may result in damage and premature failure of the pump.

ATTENTION

Check that the rotating assembly is free to rotate by hand before connecting the power supply. Also check that the piping system has been properly connected with all joints tightened and instrumentation is in position.

ATTENTION

Check that the pump is primed. Pumps should never be run dry as the pumped liquid acts as a lubricant for the close running fits surrounding the impeller and damage will be incurred.
Prime the pump using an ejector, exhauster or vacuum pump. If a foot valve is used in the suction line the pump may be primed by venting and filling the casing with liquid. Connect the electrical supply to the pump unit. Momentarily switch on motor and check direction of rotation. This should be such that the pump assembly turns clockwise when viewed on the driven end. For three phase electric motors, if direction of rotation is incorrect, disconnect the supply and change over two of three supply wires.

6.2. Starting Procedure

BEFORE YNM PUMP IS STARTED ALWAYS ENSURE THAT THE SUMP IS FILLED TO THE CORRECT LEVEL WITH LIQUID, AND THAT ANY LEVEL CONTROLS ARE FUNCTIONING CORRECTLY.

Do NOT touch any moving or rotating parts. Guards are provided to prevent access to these parts, where they have been removed for maintenance they MUST be replaced before operating the equipment. Check that the suction valve is open and that the pump is primed.

Open the discharge valve to one quarter open to prevent hydraulic lock from occurring. Switch on the motor and allow it to build up to full operating speed. Slowly open discharge valve until the pump reaches the required duty condition. Check that the motor is not overloading, unit is not vibrating or excessively noisy, bearings or gland packing are not overheating, and that the pump is developing the correct flow and head requirements. If the pump is operating at its normal speed, the pump should be shut down at once if any of the following defects are found:

a) No liquid delivered.
b) Not enough liquid delivered.
c) Not enough pressure.
d) Loss of liquid after starting.
e) Vibration.
f) Motor runs hot.
g) Excessive noise from cavitation.
h) Pump overheating.
Recommended corrective action for these faults is given in Faults and Remedial Action.

6.3. During Operation

Do NOT touch surfaces that during normal running will be sufficiently hot to cause injury. These are marked with the HOT warning symbol. Note that these surfaces will remain hot after the pump has stopped, allow sufficient time for cooling before maintenance. Be cautious and note that other parts of the pump may become hot if a fault is developing.

Do NOT operate water pumps in temperatures below freezing point, without first checking that the pumped fluid is not frozen and the pump is free to turn. Pumps in these environments should be drained down during inactivity and re-primed before starting.

In addition to local or site regulations for noise protection, **MAS DAF Makina Sanayi A.Ş.** recommend the use of Personal Ear Protection equipment in all enclosed pump rooms and particularly those containing diesel engines. Care must be taken to ensure that any audible alarm or warning signal can still be heard with ear defenders worn.

Be aware of the hazards relating to the pumped fluid, especially the danger from inhalation of noxious and toxic gases, skin and eye contact or penetration. Obtain and understand the hazardous substance (COSHH) data sheets relating to the pumped fluid and note the recommended emergency and first aid procedures.

Periodic Checks:
a. Stuffing Box:
Check that there is sufficient leakage to lubricate and cool the packing, between 30 and 120 drops per minute is required. Check also that the drain pipes are clear of obstruction.
b. Bearings:
Check the bearing temperatures do not exceed 70°C as an increase may indicate the early stages of bearing trouble.
c. Noise:
Listen for any unusual noise or an increase in normal sound level.

This may result from:
i. Loose fasteners for guards and other equipment.
ii. Worn coupling.
iii. Air trapped in the pump i.e. the pump was not fully primed.
iv. Cavitation caused by air in the liquid from leaks in the suction pipework.
v. Small solids in the liquid.

NOTICE : At certain installations or at certain operation points on the pump curve, the noise level 70dB (or the actual pump specified noise level) can be exceeded.

d. Alignment:
Alignment should be checked after the first run and after any maintenance requiring removal or disconnection of the coupling.
e. Suction Gauge Reading:
If this is higher than normal, investigate and check that valves in the suction pipework are fully open or that the suction lift may have increased.
f. Discharge Gauge Reading:
If this is lower than normal, check for a leak in the associated pipework or that a valve in the delivery line has been opened when normally it is partially closed.

6.4. Stopping Procedure

Stop the motor then fully close the discharge valve.

7. Maintenance and service

7.1. General Introduction

MAS DAF Makina Sanayi A.Ş. YNM Pumps will provide

many years of trouble free service when maintained in accordance with these instructions. In the event of failure of the pump it is recommended that **MAS DAF Makina Sanayi A.Ş.** Service Department is called to investigate and carry out repairs. The following instructions are given to cover the main elements of strip and rebuild but do NOT include instructions for work that MUST be done by a **MAS DAF Makina Sanayi A.Ş.** Service Engineer.

Period	Maintenance Required
Weekly	Carry out periodic checks as shown in the manual and take corrective action as shown in Faults and Remedial Action.
After First 200 Hours Running	Replace the grease as shown in Bearing Lubrication
Half Yearly or After 5000 Hours Running	Replace the grease as shown in Bearing Lubrication Check the alignment of pump and motor and adjust. Check and tighten all holding down bolts if found loose, for recommended bolt tightening torques. For soft packed pumps, check the gland adjustment remaining and replace packing if necessary. At the same time, check the sleeve for scoring and replace if necessary. Check the coupling for wear as per manufacturers instructions.
Each Year	Assess the performance of the pump against the duty specifications and take corrective action as shown in Faults and Remedial Action.

The following hazards may arise during maintenance work:

Check and ensure that the pump operates at below the Maximum Working Pressure specified in the manual or on the pump nameplate and before maintenance, ensure that the pump is drained down.

Wear a suitable mask or respirator when working with Packing and Gasket components that contain fibrous material, as these can be hazardous when the fibrous dust is inhaled. Be cautious, if other supplier's components have been substituted for genuine **MAS DAF Makina Sanayi A.Ş.** parts, these may then contain hazardous materials.

Be aware of the hazards relating to the pumped fluid, especially the danger from inhalation of noxious and toxic gases, skin and eye contact or penetration. Obtain and understand the hazardous substance (COSHH) data sheets relating to the pumped fluid and note the recommended emergency and first aid procedures.

BEFORE ATTEMPTING ANY MAINTENANCE ON A PUMP, PARTICULARLY IF IT HAS BEEN HANDLING ANY FORM OF HAZARDOUS LIQUID, ENSURE THAT THE UNIT IS SAFE TO WORK ON.
THE PUMP MUST BE FLUSHED THOROUGHLY WITH A SUITABLE CLEANSER TO PURGE AWAY ANY OF THE PRODUCT LEFT IN THE PUMP COMPONENTS. THIS SHOULD BE CARRIED OUT BY THE PLANT OPERATOR AND A CERTIFICATE OF CLEANLINESS OBTAINED BEFORE STARTING WORK. TO AVOID ANY RISK TO HEALTH IT IS ALSO ADVISABLE TOWEAR PROTECTIVE CLOTHING AS RECOMMENDED BY THE SITE SAFETY OFFICER, ESPECIALLY WHEN REMOVING OLD PACKING THAT MAY BE CONTAMINATED.

7.2. Preparation for Maintenance

ISOLATE the equipment before any maintenance work is done. Switch off the mains supply, remove fuses, apply lockouts where applicable and affix suitable isolation warning signs to prevent inadvertent re-connection.
In order to avoid the possibility of maintenance personnel inhaling dangerous fumes or vapours. It is recommended that maintenance work be carried out away from the pump location by removal of the bearing housing and shaft assembly to a suitable maintenance area. No special tools are required for dismantling and re-assembling, however, it is important to ensure the suitable lifting equipment is available and that the work is carried out in a clean area.

7.3. Re-packing the Stuffing Box

Where a soft packed gland is fitted, it will be necessary to replace the packing periodically when the gland can no longer be tightened to reduce leakage to the normal level, or if the gland suffers from overheating.

7.3.1. Removal and Preparation

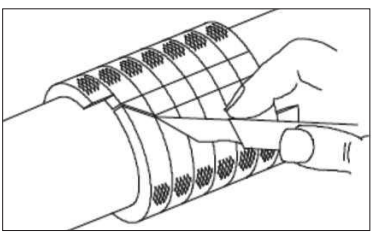
Close the suction & discharge valves and release pressure from the casing. Remove the gland , use an extractor tool to remove packing rings and remove the lantern ring without damaging the sleeve of stuffing box bore.

7.3.2. Packing Preparation

Packing Ring Dimensions (mm)

Pump	Sleeve Dia. (mm)	Box Dia (mm)	Packing Dim. (mmxmm)	Length of Packing (mm)	Number of Packing
YNM 525	40	60	10x10	157	5
YNM 825	40	60	10x10	157	5
YNM 1531	50	70	10x10	188	5

Wrap the packing strip around a dummy shaft of the required diameter, overlapping the coils as shown. Cut diagonally at 45° to produce rings with an overlapped split joint. Note that if packing is cut from flat material or with square joint lines, a good seal will not be achieved.



7.3.3. Re-packing

Insert the first ring and gently push it to the bottom of the stuffing box using a suitable tool taking care not to score the sleeve or stuffing box bore. Install the lantern ring checking that its position coincides with the lubrication connection. Insert the second ring as above but with its joint advanced by 120° from the first ring's joint position. Install the required number of further rings to complete the packing ensuring that the last ring fitted does not protrude from the stuffing box bore. Refit the gland and tighten the retaining nuts finger tight only.
Run the pump for 10 minutes at full pressure and tighten the retaining nuts by 1/6 of a turn (one flat). Repeat this at ten-minute intervals until leakage is reduced to a trickle (30 to 120 drops per minute), this being required to ensure that the gland packing is lubricated.

7.4. Bearing Lubrication

Rolling bearings are used in norm centrifugal pumps. In pumps complying with DIN 6, the bearing is provided with two 6300-2RS-C3 type ball bearings which are lubricated life long with special grease according to DIN 625 standard.

7.5. Disassembly of the Pump

Refer to Pump Cross-Section Drawings. The pump is designed to allow removal of the bearing housing, shaft and impeller assembly without disconnecting the Pipework. If the pump is fitted with a spacer coupling, the motor need not be removed.
Remove coupling and motor if necessary to allow withdrawal of the pump assembly. Remove the bolts connecting the bearing mounting bracket to the base plate. Unscrew the nuts from the volute casing studs. Remove the casing cover and the bearing housing complete with rotor using screwdrivers or similar tools as levers in the gap between the volute casing and the casing cover.

Undo the impeller nut in a counter clockwise direction and withdraw the impeller from the shaft.

For pumps fitted with a soft packed stuffing box:

Removal of the packed stuffing box depends on the pump construction:

a. For pumps with shaft sizes 25, 35 and 45 with a bolted casing cover construction only, remove stud nuts from the bearing housing first, before proceeding with instruction b. For pumps with shaft size 25 or 35 and with clamped casing cover construction, commence disassembly with instruction
b. Using screwdrivers or similar tools as levers in the recesses provided, carefully prise apart and remove the casing cover complete with stuffing box packing, lantern ring and gland, from the bearing housing.
c. Dismantle the shaft sleeve, gland , stuffing box and lantern ring.
d. Pull off thrower from shaft. Unscrew the hexagon screws and remove both bearing covers from the bearing housing.

Using a soft faced hammer or suitable drift, carefully drive the pump shaft out with its bearings in the direction of the drive end, i.e. away from the pump end, ensuring that the impeller nut thread is not damaged. Care must be taken to ensure that the pump end bearing passes centrally through the bore of the drive end bearing housing. The bearings may be cleaned and checked without removing them from the shaft. If they need to be replaced, remove them by use of a suitable puller or by applying force to the inner ring using a drift or punch, taking care to turn the shaft such that the inner ring is kept square to the shaft until the bearing is free.

Pump & Bearing Specifications

Pump Type	Bearing Type
YNM 525	2X6308 C3
YNM 825	2X6308 C3
YNM 1531	6310 + 3310 C3

If the bearings are to be re-used, ensure they are thoroughly flushed with white spirit or similar cleaning fluid, dried and protected to prevent any abrasive media from coming into contact with the races balls and rollers. Bearings should be lightly oiled and wrapped for storage.

Check the shaft for straightness by mounting between centers and measuring the run out with a dial gauge at the coupling, bearing, sleeve and impeller positions. Fit

the stuffing box sleeve and check again on this diameter.

The run-out should not exceed 0.08 mm in any of the positions measured. Wear rings may be measured and compared with the dimensions shown in the table below. If pump efficiency has reduced the wear rings may be replaced, contact **MAS DAF Makina Sanayi A.Ş.** Spares and Service Departments for fitting new wear rings.

Pump Type	Wearing Suction Side		Wearing Drive Side	
	Dia 1	Dia 2	Dia 1	Dia 2
YNM 525	100.4	115.6	118.4	136
YNM 825	135.4	145	148.4	164
YNM 1531	196.4	221	202.4	227

Notice: Dia 1 is wearing ring inside diameter and Dia 2 is wearing ring outside diameter.

7.6. Re-assembly of the pump

The pump unit may be re-assembled in the reverse manner to disassembling. To ensure correct and trouble free operation, care should be taken on re-assembly and the following precautions taken: Cleanliness is important ensure that all pump components together with the working areas, are completely free of foreign matter, dirt and dust. All gasket faces are to be properly cleaned and new gaskets fitted. Gasket and other spares kits are available from **MAS DAF Makina Sanayi A.Ş.** spare department, for details refer to Parts Lists.

It is recommended that only spare parts manufactured by and obtained from **MAS DAF Makina Sanayi A.Ş.** are used during maintenance reassembly of any YNM range pump. The company cannot be held responsible for any failure, which may cause danger to property or health, arising from the use of spare parts manufactured and supplied by others, these will also invalidate the pump warranty. When ordering spare parts it is essential to quote the pump serial number from the identification plate and the required part number(s) as shown in the parts list.

If new proprietary parts such as bearings and lip seals are to be fitted, ensure they are the correct size, grade and quality.

When fitting new bearings they should be pre-heated in an oil bath to 800C for a short period of time. This will enable the bearing to be easily slid on the shaft seating and when cool will give a positive shrink fit. Always ensure bearings abut correctly against shaft shoulder. After the shaft , pair of gaskets and the bearing covers have been fitted to the bearing housing.

Check the locking washer for wear or damage, replace if necessary.

8. Noise level and vibration

The reasons which increase the noise level are indicated below:

8.1. Expected noise values

Power of Motor PN (KW)	Sound Pressure Level (dB) *	
	Pump with Motor	
	1450 rpm/min.	2900 rpm/min.
< 0.55	63	64
0.75	63	67
1.1	65	67
1.5	66	70
2.2	68	71
3	70	74
4	71	75
5.5	72	83
7.5	73	83
11	74	84
15	75	85
18.5	76	85
22	77	85
30	80	93
37	80	93
45	80	93
55	82	95
75	83	95
90	85	95

(*) 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 (LpA). This complies with ISO 4871 and the tolerance is +3dB(A).

• Touch of coupling halves due to worn rubber sleeves (incorrectly aligned)
• 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.

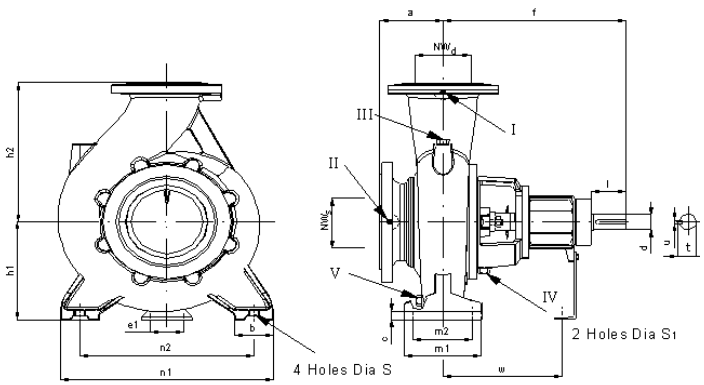
9. FAULTS AND REMEDIAL ACTION

PROBABLE CAUSES	REMEDIAL ACTION	POTENTIAL FAULT OR DEFECT							
		No liquid delivered.	Insufficient liquid delivered.	Liquid delivered at low pressure.	Loss of liquid after starting.	Excessive vibration.	Motor runs hotter than normal.	Excessive noise from pump cavitation.	Pump bearings run hotter than normal.
Pump not primed.	Fill pump and suction pipe completely with fluid.	x							
Speed too low.	Check that the motor is correctly connected and receiving the full supply voltage also confirm that the supply frequency is correct	x	x	x					
Speed too high.	Check the motor voltage.						x	x	
Air leak in suction pipework	Check each flange for suction draught, rectify as necessary.	x	x		x	x		x	
Air or gas in liquid.	It may be possible to increase the pump performance to provide adequate pumping.			x	x	x		x	
Discharge head too high (above rating).	Check that valves are fully open and for pipe friction losses. An increase in pipe diameter may reduce the discharge pressure.	x	x	x			x		
Suction lift too high.	Check for obstruction of pump inlet and for inlet pipe friction losses. Measure the static lift, if above rating, raise the liquid level or lower the pump.				x				
Not enough head for hot liquid.	Reduce the positive suction head by raising the liquid level.		x						
Inlet pipe not submerged enough.	If the pump inlet cannot be lowered, provide a baffle to smother the inlet vortex and prevent air entering with the liquid.	x	x		x	x		x	
Viscosity of liquid greater than rating	Refer to **MAS DAF Makina Sanayi A.Ş.** for guidance to increase the size or power of the motor or engine.		x	x			x		
Liquid density higher than rating.	Refer to **MAS DAF Makina Sanayi A.Ş.** for guidance to increase the size or power of the motor or engine.						x		
Insufficient net inlet head.	Increase the positive suction head by lowering the pump or raising the liquid level.	x	x		x	x		x	
Impeller blocked.	Dismantle pump and clean the impeller.	x	x			x			

PROBABLE CAUSES	REMEDIAL ACTION	POTENTIAL FAULT OR DEFECT							
		No liquid delivered.	Insufficient liquid delivered.	Liquid delivered at low pressure.	Loss of liquid after starting.	Excessive vibration.	Motor runs hotter than normal.	Excessive noise from pump cavitation.	Pump bearings run hotter than normal.
Wrong direction of rotation.	Check driver rotation with the direction arrow on the pump casing.	x							
Excessive wear ring clearance.	Replace the wear rings and/or the impeller when the clearance exceeds the maximum adjustment.								
Damaged impeller.	Replace if damaged or vanes are eroded.								
Rotor binding.	Check for shaft deflection, check and replace bearings if necessary.								
Defects in motor.	Ensure that motor is adequately ventilated. Refer to manufacturer's instructions.								
Voltage and/or frequency lower than rating.	If voltage and frequency are lower than the motor rating, arrange for provision of correct supply.								
Lubricating oil dirty or contaminated.	Dismantle the pump, clean the bearings, reassemble the pump and fill with new oil.								
Foundation not rigid.	Ensure that the foundation bolts are tight; check that foundations match **MAS DAF Makina Sanayi A.Ş.** recommendations.								
Misalignment of pump and driver.	Realign the pump and driver as specified.								
Bearings worn.	Remove the bearings, clean and inspect for damage and wear, replace as necessary.								
Rotor out of balance.	Check impeller for damage, replace as necessary.								
Shaft bent.	Check shaft run-out and replace if needed.								
Impeller too small.	Refer to **MAS DAF Makina Sanayi A.Ş.** for options to fit a larger impeller.								

10. Pump details

10.1. Pump Dimensions Table And Weights



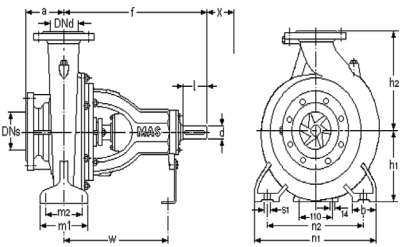
Pump Type	Flanges		Length (mm)		Height (mm)		Pump Feet (mm)			Fixing Details (mm)							Shaft Size (mm)				Weight (Kg)
	DNs	DNd	a	f	h1	h2	b	c	m1	m2	n1	n2	s(ø)	e1	s1(ø)	w	d(ø)	l	t	u	
YNM 1531	200	150	160	530	280	400	100	26	200	150	550	450	24	65	14	355	42	82	45	12	184
YNM 825	125	80	125	500	225	280	80	22,5	160	120	400	315	19	65	14	370	32	87,5	35	10	103
YNM 525	80	50	125	500	180	65	65	18	125	95	320	250	14	65	14	370	32	87,5	35	10	66

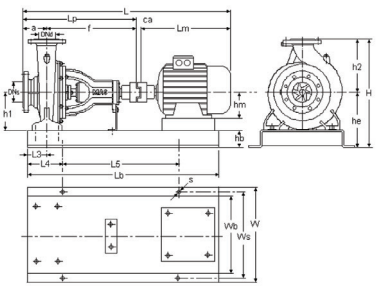
10.2. Pump connections

Suction and Delivery Flanges	Auxiliary Connections		YNM 525	YNM 825	YNM 1531
Suction and Delivery Flanges are drilled according to ANSI/ASME B16.1.with flat face	i	Pressure Gauge	Rp1/4	Rp1/4	Rp1/4
	ii	Suction Gauge	Rp1/4	Rp1/4	Rp1/4
	iii	Casing Vent	Rp3/8	Rp1/2	Rp1/2
	iv	Gland Drain	Rp1/2	Rp1/2	Rp1/2
	v	Casing Drain	Rp3/8	Rp1/2	Rp1/2
	xx	Seal Lubrication	Rp1/2	Rp1/2	Rp1/2

A threaded opening used for pipe connection complies with the requirements in the Standard for Pipe Threads, General Purpose, ANSI/ASME B1.20.1.

10.3. Pumpset dimensions





	MOTOR				PUMP		GENERAL			BASEPLATE									
	KW	IEC	Lm	Hm	Lp	Ca	L	W	H	Lb	Wb	Hb	He		L4	L5	Ws	S	Plate
			mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	No
YNM 525	22	180M	654	180	460	30	1144	490	485	1000	380	80	260	72	170	660	440	24	6,05
	30	200L	747	200	460	30	1237	540	505	1120	430	80	280	72	190	740	490	24	7,06
	37	200L	747	200	460	33	1240	540	505	1120	430	80	280	72	190	740	490	24	7,06
	45	225M	790	225	460	43	1293	610	550	1120	480	100	325	72	190	740	550	28	8,06
YNM 825	45	225M	1190	225	595	43	1428	610	605	1250	480	100	325	90	205	840	550	28	8,07
	55	250M	890	250	595	42	1527	540	610	1400	430	80	330	90	230	940	490	24	7,08
	75	280S	958	280	595	43	1596	730	660	1400	600	100	380	90	230	940	670	28	10,1
	90	280M	1010	280	595	43	1648	730	660	1600	600	100	380	90	270	1060	670	28	10,1
YNM 1531	22	180M	654	180	460	30	1144	490	485	1000	380	80	260	72	170	660	440	24	6,05
	30	200L	747	200	460	30	1237	540	505	1120	430	80	280	72	190	740	490	24	7,06
	37	200L	747	200	460	33	1240	540	505	1120	430	80	280	72	190	740	490	24	7,06
	45	225M	790	225	460	43	1293	610	550	1120	480	100	325	72	190	740	550	28	8,06

Please note that overall length must be calculated for the particular combination of pump motor and D.B.S.E. Refer to the Pump Dimension Drawing for dimensions a, f, h1 and h2 , for Motor dimensions C and MO, refer to the motor details table and for base plate dimensions B & L - 1, 2 & 3, D and H, refer to the base plate dimensions table. The estimated noise levels are for guidance only, they will vary with conditions and duty; contact **MAS DAF Makina Sanayi A.Ş.** for further details.

10.4. Standard metric nut and bolt torque recommendations

Bolt Grade	Torque (Nm) for Bolt Diameters									
	M5	M6	M8	M10	M12	M16	M20	M24	M30	M36
4.6	2.7	4.5	11	22	38	95	165	320	633	1110
8.8	6.9	11.7	28	56	95	24	476	822	1634	285
10.9	9.4	15.9	38	77	134	332	648	1120	2223	3885
12.9	11.2	19.1	46.4	92	160	397	775	1342	2566	4660

Notice: These values above are reference only. Nuts or bolts should not be under tightened or over tightened. Also, values are approximate for unplated fasteners.

Bolt and Nut Grade Combination

Bolt	4.6	8.8	10.9	12.9
Nut	4	8	12	12

Notice: Higher grades can be used for nuts than suggested.

Maintenance Record

Date	
	Replacement, maintenance and repairs
	Installed and started

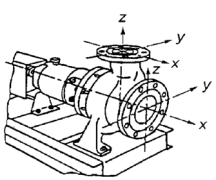
10.5. Forces and moments at the pump flanges

All of the applied loads if not reached the maximum allowable value, to provide that the following additional conditions, one of these loads may exceed the normal limit:

- Any component of a force or a moment, must be limited 1.4 times of the maximum allowable value,
- The actual force sand moments acting on each flange, should provide the following formula:

$$\left(\frac{\sum|F|_{\text{actual}}}{\sum|F|_{\text{maximum allowable}}}\right)^2+\left(\frac{\sum|M|_{\text{actual}}}{\sum|M|_{\text{maximum allowable}}}\right)^2\le 2$$

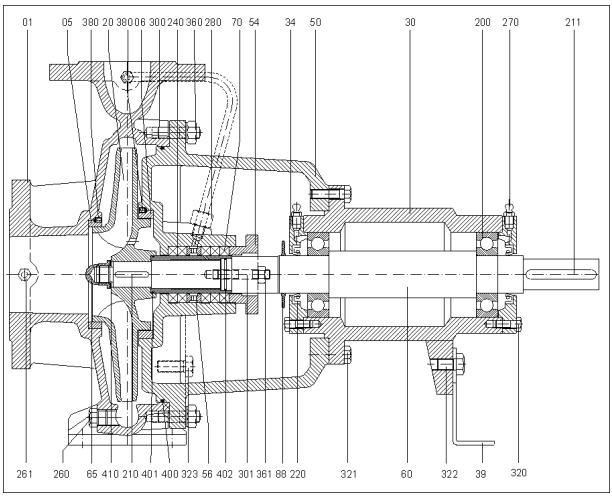
In here, $\sum|F|$ and $\sum|M|$ Mare arithmetic sum of the loads for each flange at the pump level, without regard of the algebraic signs of the actual and maximum allowable values.



Pump Type	Forces									Moments					
	Flanges DN		Suction Flange			Discharge Flange				Suction Flange			Discharge Flange		
	Suction	Discharge	N			N				Nm			Nm		
			F_y	F_z	F_x	F_y	F_z	F_x		M_y	M_z	M_x	M_y	M_z	M_x
YNM 1531	200	150	2286	1800	2233	1350	1667	1500		583	683	833	583	683	833
YNM 825	125	80	1183	1067	1317	683	833	750		417	483	583	383	433	533
YNM 525	80	50	750	683	833	450	550	500		383	433	533	333	383	467

10.6. Pump Cross Section Drawings

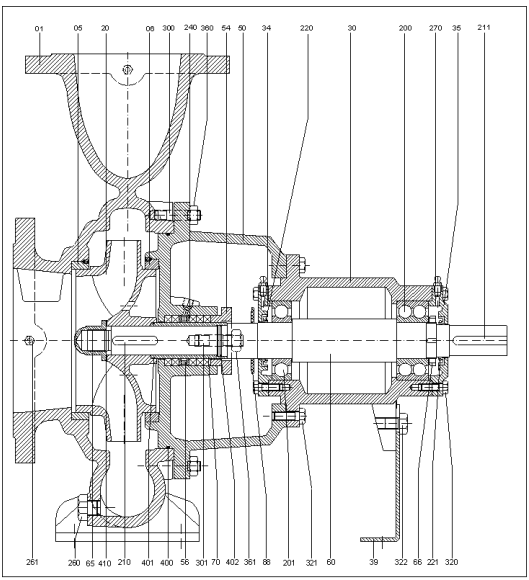
Pump section for shaft units



YNM 525 and YNM 825 Cross- Sectional Drawing

Parts Identification List- (Number as shown in cross sectional drawings)

Part No	Part Name	Part No	Part Name
01	Volute Casing	240	Stuffing Box Packing
05	Wear Ring (Outer)	260	Joint Ring
06	Wear Ring (Inner)	261	Joint Ring
20	Impeller	270	Filter Plug
30	Bearing Housing	280	Pipe Union
34	Bearing Housing Cover	300	Stud
39	Supporting Part	301	Stud for Gland
50	Casing Cover	320	Hexagonal Bolt
54	Gland	321	Hexagonal Bolt
56	Lantern Ring	322	Hexagonal Bolt
60	Pump Shaft	323	Hexagonal Bolt
65	Impeller Nut	360	Nut
70	Shaft Sleeve	361	Nut for Gland
88	Water Thrower	400	O -Ring
200	Ball Bearing	401	O -Ring
210	Impeller Key	402	O -Ring
211	Coupling Key	410	Gasket
220	Lip Seal		



YNM 1531 Cross- Sectional Drawing

Part No	Part Name	Part No	Part Name
01	Volute Casing	220	Lip Seal
05	Wear Ring (Outer)	221	Lip Seal
06	Wear Ring (Inner)	240	Stuffing Box Packing
20	Impeller	260	Joint Ring
30	Bearing Housing	261	Joint Ring
34	Bearing Housing Cover	270	Filter Plug
39	Supporting Part	280	Pipe Union
50	Casing Cover	300	Stud
54	Gland	301	Stud for Gland
56	Lantern Ring	320	Hexagonal Bolt
60	Pump Shaft	321	Hexagonal Bolt
66	Bearing Nut	322	Hexagonal Bolt
65	Impeller Nut	323	Hexagonal Bolt
70	Shaft Sleeve	360	Nut
88	Water Thrower	361	Nut for Gland
200	Ball Bearing	400	O -Ring
201	Radial Ball Bearing	401	O -Ring
210	Impeller Key	402	O -Ring
211	Coupling Key	410	Gasket

11. Spare Parts

The spare parts of YNM 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:

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.

Component name	The number of equivalent pumps in the installation						
	1 – 2	3	4	5	6 – 7	8 – 9	10 +
Shaft (Wedge included) quantity	1	1	2	2	2	3	% 30
İmpeller (quantity)	1	1	1	2	2	3	% 30
Casting wear (kit)	1	1	1	2	2	3	% 30
Ball bearing (kit)	1	1	2	2	3	4	% 50
O-Ring for casting (kit+1)	1	1	1	2	2	3	% 40
O-Ring for shaft (if exist) (kit)	1	1	2	2	3	4	% 50
Soft packing (kit)	2	2	2	3	3	4	% 50
Sealing bush(if exist)	1	1	1	2	2	3	% 30
Coupling rubber sleeves (kit)	1	2	2	3	3	4	% 50

masdaf

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