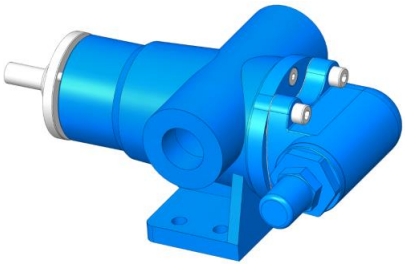
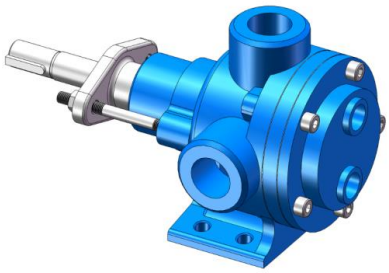
YILDIZ POMPA
YK

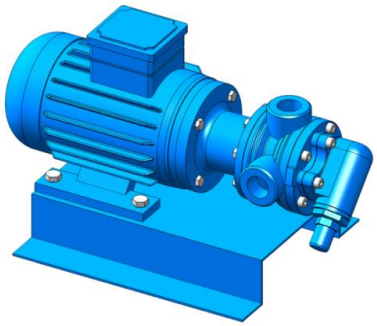
Internal Eccentric Gear Pumps



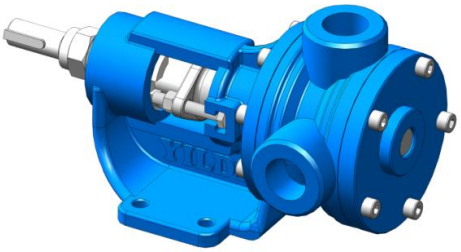
YMK 1″ with Bypass



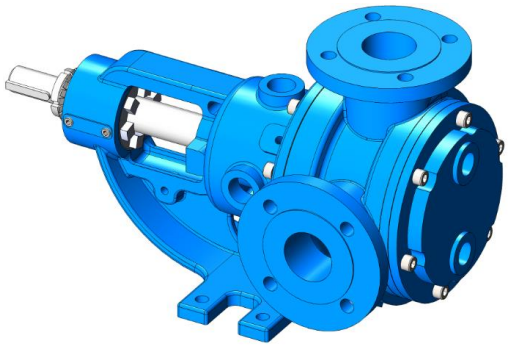
YP 1″ Jacketed



YMB 1″ with Bypass



YK 1″ Blind Cover
YK 1½″ Blind Cover

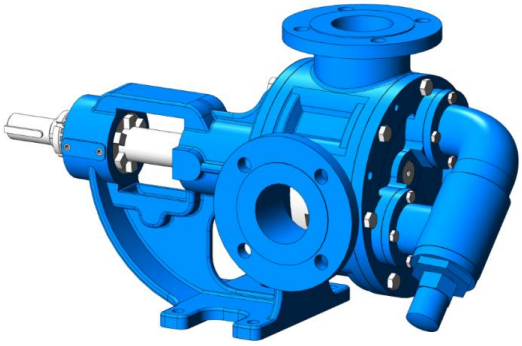


YKF 2″ Double Jacketed
Sealed with Lip Seal

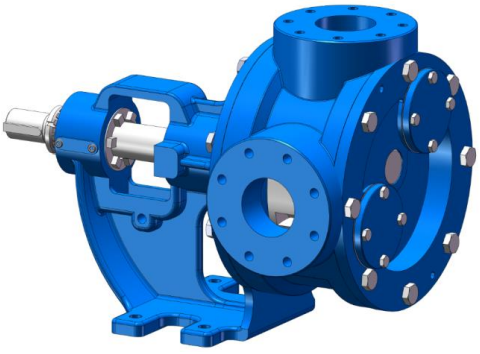
USER MANUAL for INSTALLATION, OPERATION AND MAINTENANCE

Pump Type	:	
Pump Serial No	:	
Max. Pressure	:	Bar
Capacity	:	m^3/h
Motor Power	:	kW
Pump Speed	:	rpm
Project Number	:	
Tag No.	:	

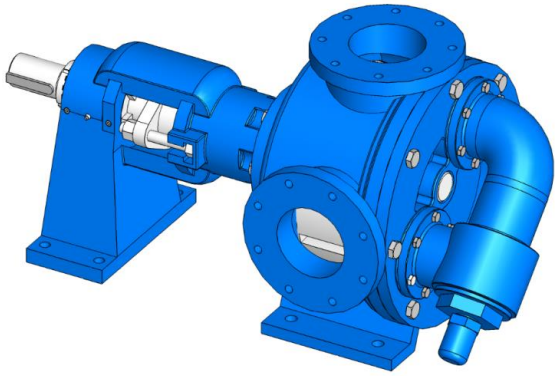
YKF 2″ Double Jacketed
and Sealed with CARTEX Mechanical Seal



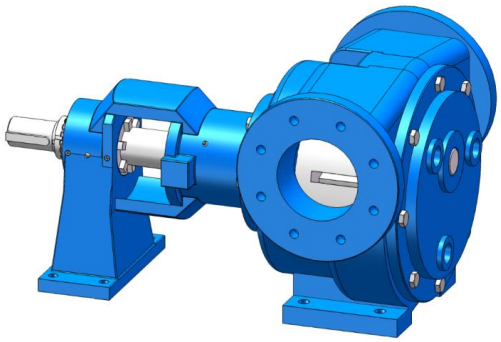
YKF 2½″ with Bypass
YKUF 2½″ with Bypass



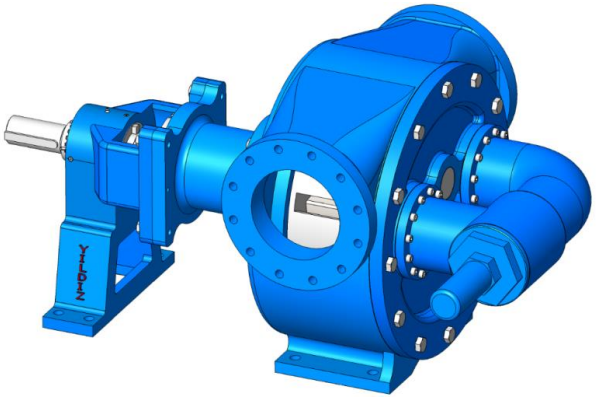
YKBF 3″ Blind Cover
YKF 4″ Blind Cover



YKF 5″ with Bypass



YKF 6″ Jacketed



YKF 8″ with Bypass

Contents

GENERAL USAGE INSTRUCTIONS

The aim of this manual is to inform user about the followings;

- Assembly and maintenance of Pump.
- Starting, operating and stopping methods.

- This handbook should be kept where qualified operators and experienced maintenance responsible can find with ease.
- Responsible should be experienced and well acknowledge of safety standards.
- To avoid improper use of pumps, instruction given in this handbook should be studied carefully and has to be applied in every step of installation and operating stages.
- User is responsible of letting controls and installation be done by qualified personal who have studied this handbook carefully.
- Pump should only be used within conditions stated in purchase order. This is due to selection of pump materials and tests been done according to operating conditions mentioned in purchase order.
- Please make sure to contact YILDIZ POMPA in case of necessity of using pump in operating conditions that varies from what has been mentioned in purchase order. Unless acting according to a received written confirmation, YILDIZ POPMA will not accept any responsibility of damages caused by using pump in operating conditions different than mentioned in purchase order.
- If delivered pump will not be installed immediately, pump should be stored in clean and dry place where ambient temperature does not varies much. In case of not taking proper precautions, very high and very low temperatures may cause major damages for the pump.
- YILDIZ POMPA will not guarantee any maintenance, repairing or changes done by end user or any unauthorized person.
- This handbook does not include information regarding safety instructions that should be done at operating place.

SAFETY INSTRUCTIONS

Definitely follow instructions below to avoid physical and/or property losses.

- Run pump **Only** according to stated operating conditions.
- Any stress, contractile and/or weight **Should Not** be transferred to pump.
- Electrical connections of motor and auxiliaries **Should** be done by qualified personal and according to local terms and conditions.
- Pump system **Should Not** be approached unless all parts has totally stopped.
- Before approaching pump system, **Always** make sure to cut off all electrical connections and be aware not to let any accidental short circuits occur.
- Any action taken towards pump system **Should Always** be done by minimum two personal.
- Personals approaching pump system **Should Always** be dressed up and/or supplied with required safety gear(s).
- **Never** approach pump while it is hot.
- **Never** touch pump and pipes with 80 ^{o}C (176 ^{o}F) temperature or higher. User should use all neccessary proper warning precautions.
- **Never** approach pump and connected pipes while being under pressure.
- After finishing all work on pump, all safety preservation taken off **Should Definitely** be placed back to its first places.
- **Never** insert any objects in any holes or empty spaces.
- **Never** walk on top of pump and/or piping system.

YK SERIES

A- OVERVIEW

A1- Description of Pumps and Working Principle

Pumps in **YK** Series are with horizontal shaft, 90^{o} or 180^{o} port position, and have and idler gear place eccentrically towards pump shaft.

Working principle can be described shortly as the following;
There is two rotating gears; Rotor gear and Idler Gear. Idler gear is placed in an eccentric position according to Rotor and has less quantity of teethes. Part extruded from cover in shape of Crescent acts as a sealing component that prevents liquids within suction and discharge areas from mixing together.

A - When pump shaft is rotated, volume within suction port increases and causes vacuum. Thus, liquid enters suction port.

B - Liquid proceeds forward, Crescent extrude divides liquid and acts as a seal by preventing liquid from reverting back to suction port. Design of Rotor and Idler gears guarantees absolute volume control and forms locked pockets.

C - Discharge port is totally filled during delivery process. Arrows shows direction of rotation and the progression of the liquid.

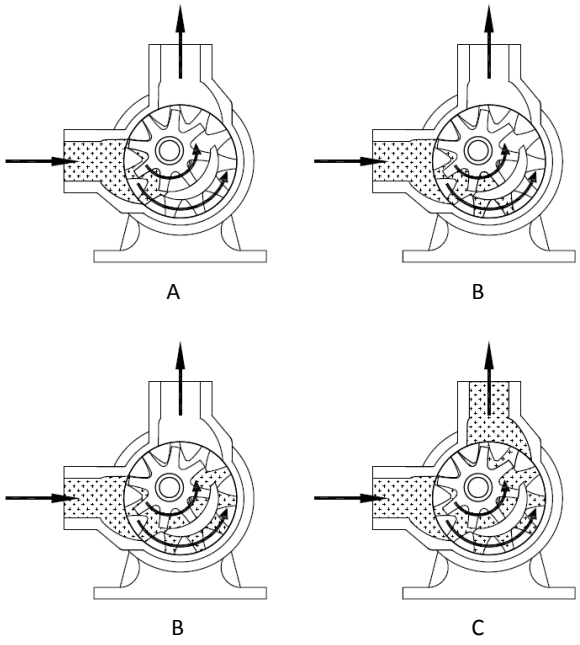


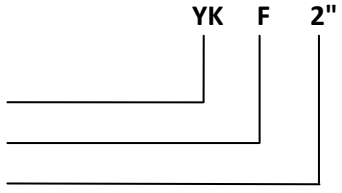
Figure 1. *Working Principle*

A2 – Aim of Use and Fields of Application

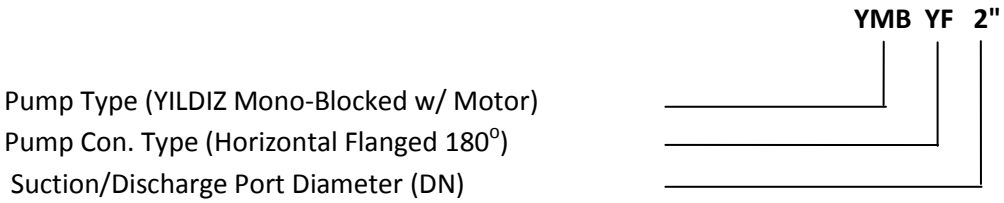
Using aim of pumps in YK Series is transferring viscose and semi-viscose liquids at operating temperatures that varies from –20 to 250 ^{o}C. Example of main applications can be summarized as;

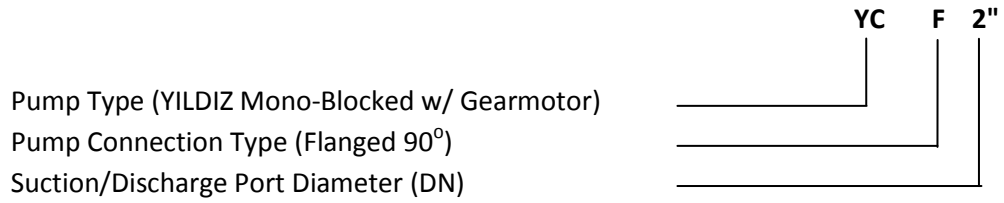
- Serving tanks of Fuel Oil, Gas Oil, Diesel and Asphalt
- Small range of circulating Hot Oil
- Food Industries
- Medicine, detergents and Chemicals Industries in general
- Paint and Dies industries
- Ship Building Sector

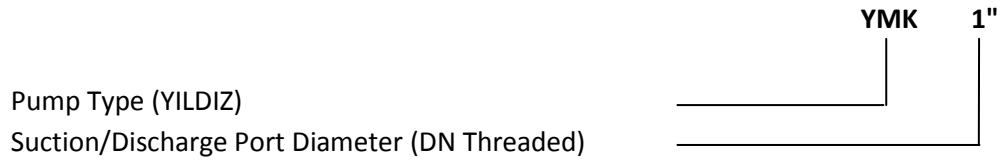
A3 – Coding System of Pumps

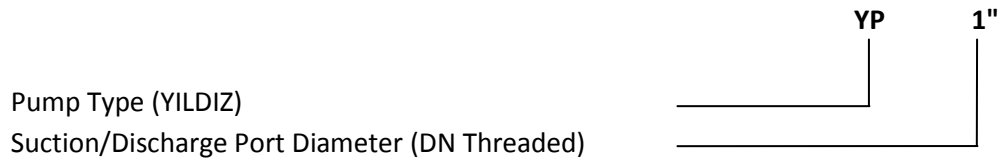


Pump Type (YILDIZ w/ Bracket)
Pump Connection Type (Flanged 90^{o})
Suction/Discharge Port Diameter (DN)









A4- Technical Specification

Speed	: up to 1500 rpm (Max.) (Max. 500 rpm for 2" pumps and bigger)
Suction/Discharge Flanges	: DN 32 ~ DN 200 mm TS ISO 7005-2 , DIN 2533/PN 16
Operating Temperature	: -20 ~ 200 °C - Soft Seal (Packing Gland) and Mechanical Seal applicable 200 ~ 400 °C – Rotatherm Seal
Ambient Temperature (Max.)	: 40 °C
Casing Pressure (Max.)	: 15 Bar
Transferrable Liquids	: See A2
Protection Class	: IP 55
Electrical Connection	: 400V – 50Hz, 3 Phase
Motor Options (on demand)	: Special Voltage, Frequency and Protection against explosions (Ex. Proof)

A5- Pump Models

Table 1.

YMK 3/8"	YMB 1"	YMBF 1½"	YCF 2"	YCF 2½"	YMBU 2½"	YMB 3"	YKF 5"
YMK 1"	YMBF 1"	YMBYF 1½"	YMB 2"	YMB 2½"	YMBUF 2½"	YMBF 3"	YKF 6"
YMK 1½"	YK 1½"	YK 2"	YMBF 2"	YMBF 2½"	YMBUYF 2½"	YMBYF 3"	YKF 8"
YMK 2"	YKF 1½"	YKF 2"	YMBYF 2"	YMBYF 2½"	YK 3"	YKBF 3"	
YP 1"	YKYF 1½"	YKYF 2"	YK 2½"	YKU 2½"	YKF 3"	YKBYF 3"	
YK 1"	YCF 1½"	YKKF 2"	YKF 2½"	YKUF 2½"	YKYF 3"	YKF 4"	
YKF 1"	YMB 1½"	YKKYF 2"	YKYF 2½"	YKUYF 2½"	YCF 3"	YKBF 4"	

B- OPENING PACKAGE, HANDLING AND STORING

B1- Opening Package

• Check package for any damage caused to product and packing material while forwarding.
• Check if all products noted in Delivery Note / Packing List has arrived in complete quantity. In case of missing a product, you are kindly requested to immediately inform YILDIZ POMPA AFTER SALES SERVICE DEPARTMENT and FREIGHT COMPANY.

B2- Handling

B2.1- General Warnings

• Put on gloves, safety shows with steel metal-tip and working helmet.
• Handling pallets or boxes can be done by forklift, crane or hoisting ropes.

B2.2- Lifting Operation

• Determine points below before lifting/handling pump system:
- Total weight and center of gravity, - Major external dimensions, - Places of lifting Points.
• Lifting capacity should be suitable with pump or pump system.
• Pump or Pump System should always be handled in horizontal position.
• Standing near or beside lifted load is strictly prohibited.
• To avoid any damage to pump or pump system, handling should be done as shown in ***Figure 2a, Figure 2b*** or ***Figure 2c.***

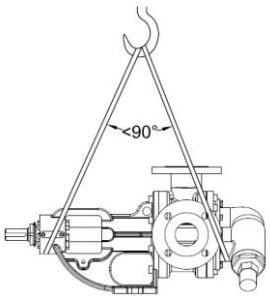


Figure 2a. *Bare Shaft Ended Pump*

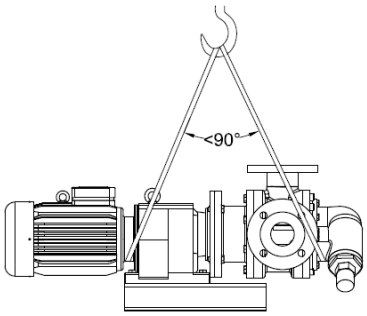


Figure 2b.*Mono-blocked Pump System on Chassis*

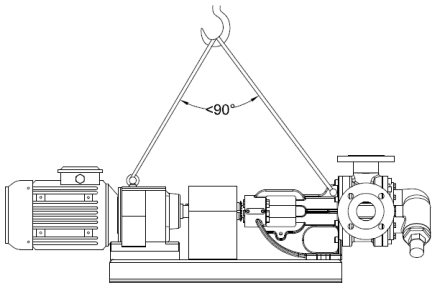


Figure 2c. *Pump System on Chassis*

B3- Forwarding

• Pump has been placed on pallet or in box according to its volume and weight.
• Freight company should deliver pump in a way which will not allow any damage and according to forwarding rules, terms and conditions.
• Delivered pump and auxiliaries should be checked for damages caused during forwarding.

B4- Storing

• If pump will not be installed immediately, pump should be stored in clean and dry place where ambient temperature does not varies much.

• To avoid moisture in pumps equipped with externally lubricated bearings, extra greasing should be done.

• All required precautions should be done to protect pump from dust dirt and foreign substances.

• Rotate pump shaft by hand (e.g. once a month) to avoid pitting on surface of bearings and pump jamming.

C- COMMISSIONING

C1- Accepting / Allowing

• Check delivered products for damages.

• Check correctness of name and type information on product label with information in PO and package label.

• In case of damage or deficiency, a written report should be presented firstly to Freight Company then to YILDIZ POMPA Company.

• While contacting YILDIZ POMPA regarding a certain delivered product, always remember to mention Serial Number printed on pump label.

D- INSTALLATION

Installation should be done according to EN 60204-1 Standards.

Installing and adjusting balance of pump should only be done by qualified personal. Otherwise, major breakdowns may occur due to wrong installation as shown in ***Figure 3***. Such breakdowns are not covered by the guarantee.

D1- Bare Shaft Ended Pump

• In case of purchasing a bare shaft ended pump, firstly, base plate/chassis should be designed in a rigid way and manufactured properly to prevent any vibration and deformation.

• In case of procuring a pump without motor/gearmotor, then a proper coupling and motor/gearmotor should be provided firstly.

Following matters should be taken in consideration will making selection of motor/gearmote:

− selecting pump speed that provides required liquid transfer capacity

− Pump pressure head

− Required power source (frequency, voltage … etc.)

− Motor Type (TEFC, Ex. Proof … etc.), Gearbox type

− Assembly way of motor/gearmotor (foot mounted, horizontal, vertical … etc.)

D2- Assembly Preparations

Before assembly system to production lines, make sure to do the followings;

• Remove covers of both ports and carefully clean all appearing sides of both suction and discharge ports.

• If pump has been temporary stored, all lubricants (grease/oil) on bearings should be totally taken off, carefully cleaned and lubricated again with the same lubricant.

(**Attention:** this does not apply on pump lubricated with lifetime greases)

D3- Assembly Location

• Pump should be work in a good ventilated environment and where there is not any risk of freezing or explosion hazards.
• Sufficient space should be lifted on sides and top of pump for convenience in required maintenance.
• Suction line connected to pump should be as short as possible.

D3.1- Base Plate / Chassis

• Making and assembling base of pump should be handled carefully. Incorrect and/or inelaborate assembly will cause pump parts to wear earlier and to pump breakdowns.
• Pump base should be heavy enough to absorb vibrations and rigid enough to prevent any torsion and damages in balance and adjusts of components. Before mounting pump to concrete base, base should have totally hardened (completed setting time). Upper surface of concrete base should be totally horizontal and straight. Minimum handling load of base should be at least 10 kg / m^2.

D3.2- Mounting Base

• Place pump system on top of concrete base. Then check horizontality of pump system by bubble level.
• Slightly turn studs in anchorage.
• Adjust coupling as shown in D4.
• Keep turning studs until linearity is accomplished.

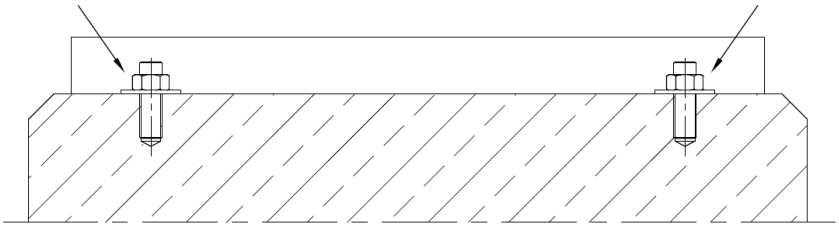


Figure 3. *Concrete Base, Chassis and Anchorage*

Base should handle 100 N/mm² Force per each m².

D4- Coupling Adjusts

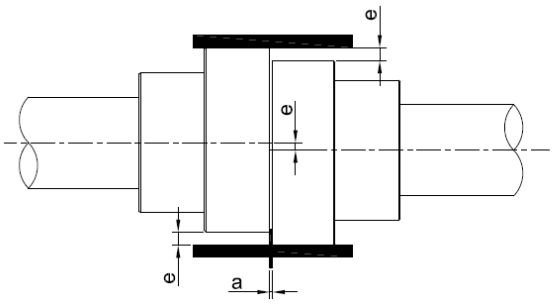


Figure 4a. *Wrong*

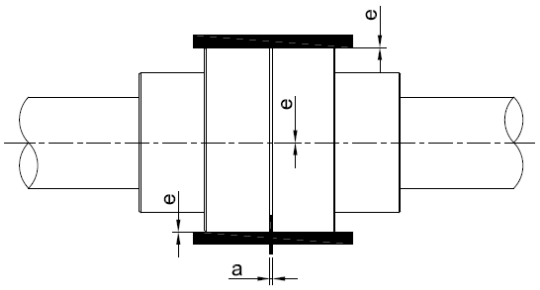


Figure 4b. *Right*

a = Space between two sides of coupling.
e = Distance between to axis
e = 0 (is always required)
a value should be within tolerances available for each type of coupling.

• Most important factor required for pump system to operate without having any breakdowns is making correct adjust to coupling. Incorrectly adjusted coupling could be the reason for various troubleshoots like vibration, noise, heating of bearing, overload and many other similar troubleshoots.

• Elastic Coupling should never be considered as an element that calibrates wrong adjustment. **Elastic coupling does not calibrate wrong adjustments and does not resolve extreme wrong adjustments.**

• **"Coupling adjustment"** is ensuring that axil of both pump and driver are on the same line. In case of ordering YILDIZ type pumps, all required coupling adjustments will be done within our factory. However, this adjustments could be corrupted easily during forwarding, handling, Installing and piping. Therefore, despite factory adjustment of coupling, **it is very important to readjust coupling after installation.**

• To adjust coupling you will need two metal pieces with straight sides no less than 10 cm (e.g. steel ruler, tolerance gauge) and a caliper. For sensitive adjusting special equipment should be used.

• In coupling adjusting, two possible failures may occur;

a) Angular failure
b) Parallel sliding failure

• To check for angular failure, measure gap distance between two coupling in vertical and horizontal positions. Distance in these for points should be equal.

• To check of parallel sliding failure, hold one of metal pieces with straight sides on one coupling parallel to axil and hold the other piece oppositely on the other coupling part. Then check for gaps. Metal piece should touch by its straight side both parts of coupling at the same time. Check in horizontal and vertical positions. ***(Figure 4)***

• Adjusting failures may occur in horizontal and/or in vertical planes. Vertical adjusting failures can be corrected by placing thin metal sheets below foots of pump or motor/gearmotor. Horizontal adjusting failures can be corrected by sliding pump or motor/gearmotor; though taking advantage of spaces in connection holes. See ***Figure 5a, 5b, 5c,*** and ***5d*** respectively for correcting coupling adjusts.

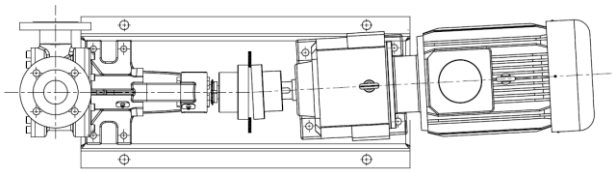


Figure 5a. *Horizontal Angular Adjust Failure*

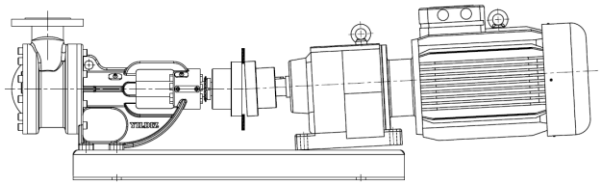


Figure 5b. *Vertical Angular Adjust Failure*

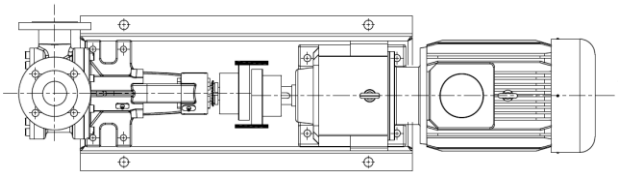


Figure 5c. *Horizontal Parallel Sliding Failure*

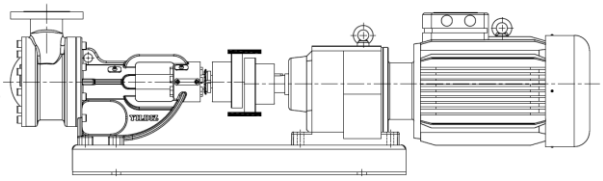


Figure 5d. *Vertical Parallel Sliding Failure*

D5- Pipe Lines

D5.1- Overview

• Never consider pump as a holder or supporting point for pipe lines.

• Pipe lines should be supported from all points near to pump (See ***Figure 6***). After making all piping assembly, check if suction and discharge pipelines are applying any tension on flanges of the pump; by loosening bolts.

• Diameter of all tubes, pipes, fittings and accessories used should be larger or at least equal to port diameter of pump. Never use any pipes or accessories with diameter smaller than port diameter of pump. In general, speed of flow should not exceed 2 m/s in suction line and 3 m/s in discharge line. High

speed causes major pressure loss which generates cavitation conditions in suction line and high friction pressure in discharge line.

• It is a must to use connecting parts that can absorb and avoid transmission of external forces caused by intense vibration and/or thermal expansions due transferring hot liquids.

• Any remaining welding spatter and/or any kind of hard particles inside pipe lines may damage the pump. Therefore, to avoid such particles from entering the pump, suction and discharge ports should be protected and closed with proper gaskets. After making assembly of pipes, all remaining particles in tubes should be removed, cleaned and reassembled after painting.

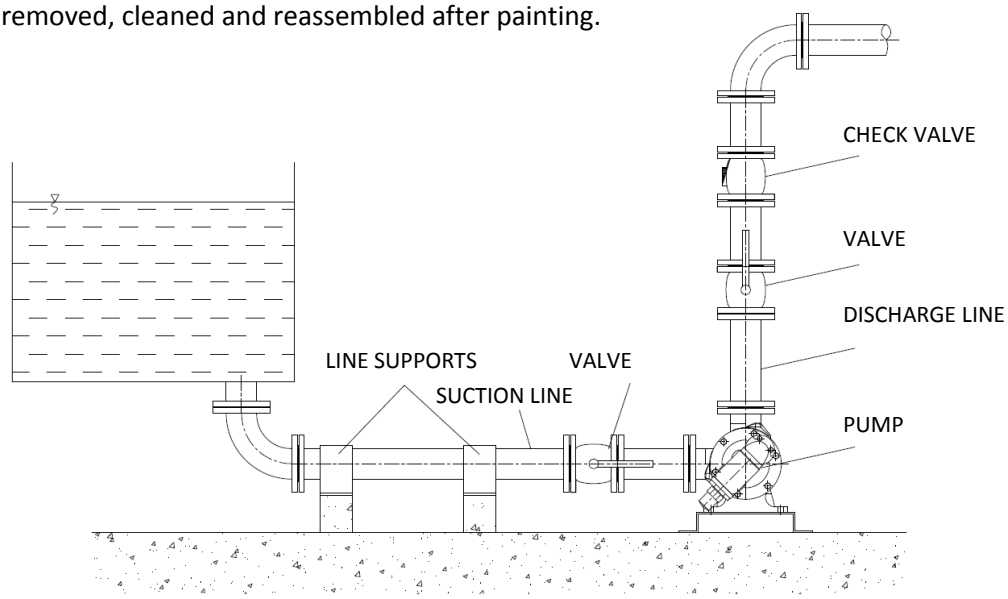


Figure 6. *Pipeline supporting points*

D5.2- Suction Line

• Suction pipes should be absolutely fitted tightly and designed in a way that will not allow any air pockets to occur.

• In order to reduce pressure losses caused by friction suction distance should be shortened along with avoiding sharp elbows and sudden changes in direction of pipelines; as much as possible.

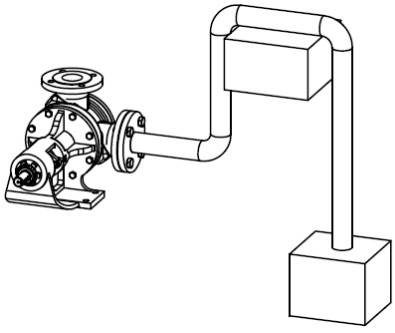


Figure 7. *Avoid this design*

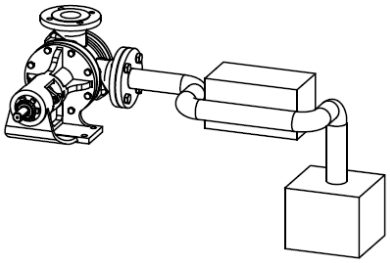


Figure 8. *If necessary, use horizontal elbows instead of vertical ones as shown.*

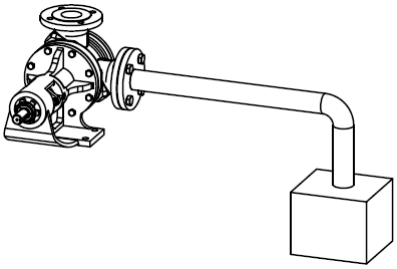


Figure 9. *Proper pipe inclination should be applied in order to avoid forming of air pockets.*

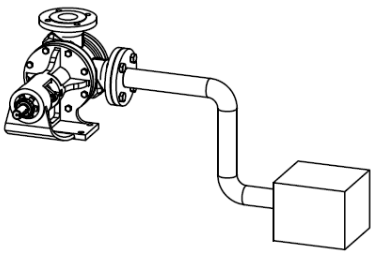


Figure 10. *This design should be preferred to bring liquid closer to the pump*

D5.3- Discharge Line

• In order to adjust capacity and pressure, a control valve should be assembled on discharge line as near as possible to the pump.
• If discharge line is quite long, then a check valve should be installed to protect the pump from fluid pulses and to avoid if from flowing back in the opposite direction.

D5.4- Pressure Relief Valve (Bypass)

D5.4.1- Function of Bypass

The main purpose of pressure relief valve (Bypass) is to protect pump and driver from any kind of damage might be caused due to high pressure, mainly happens because of blocking of discharge line. Working according principles of positive displacement, pump inner parts might face overload and even break in case of closing or blocking discharge line. Bypass can be placed on pump directly as it can be placed on pipelines. Regardless of its place, working principle of bypass will remain the same.

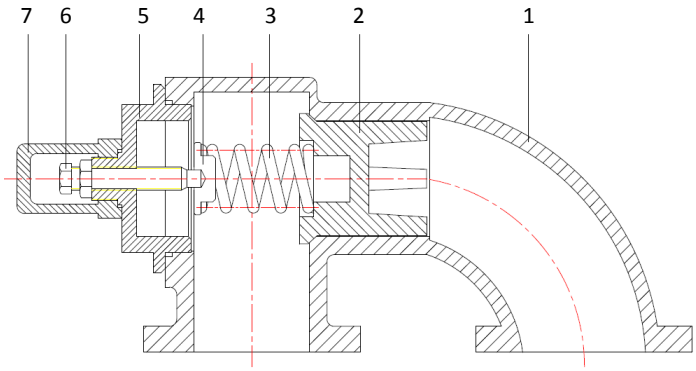


Figure 11. *Bypass*

Table 2.

1 – Bypass	5 – Bypass Head
2 – Bypass Valve	6 – Bypass Adjusting Screw
3 – Spring	7 – Screw Cover
4 – Bypass Washer	

D5.4.2- Circuit Bypass

Circuit bypass should be used in case of pump cover being jacketed and pressure relief valve is required (See ***Figure 12***). In this way, capacity and pressure will be under control and pump will be protected. Our circuit bypasses can be provided as jacketed and unjacketed.

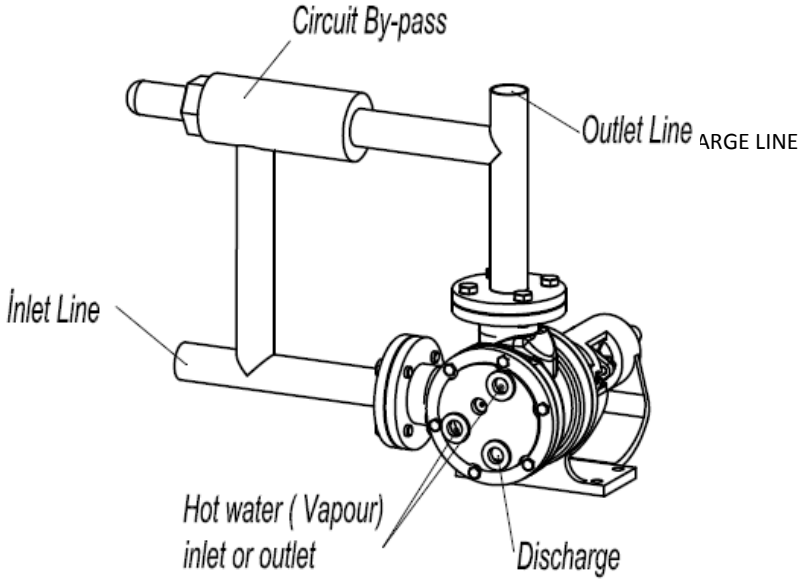


Figure 12. *Circuit Bypass*

D5.5- Electrical Connections

• **Electrical motors should be manufactured according EN 60034-1.**

• **Minimal protection class of motor casing and control systems used within pump group should be according to standards no lower than EN 60529 IP 55. However, during selection of protection class of motor and electrical connections, working and environmental conditions should be taken in consideration.**

• Electrical connections should be made by qualified electricians only. Applicable national regulations and instructions of motor manufacturer should be applied.

• All protection precautions shown under title of "Safety Instruction" should be applied. All power connections should be discontinued before starting any work.

• All energy cable routing should be done in a way that avoids contact with pipelines, motor casings and pump.

• Values of voltage, frequency and phase given on label of motor should be compared with values of available electricity grid.

• In order to protect electrical motors from overload risks, circuit breakers and/or fuses should be used. Selection of circuit breakers and fuses should according to exact electrical load current given on motor label.

• Before making electrical connections, check rotor's capability to rotate smoothly by rotating it by hand.

• Electrical connections must be made in accordance with local electrical codes and the engine ground connection must not be forgotten.

• Connection schema of the motor can be found in the motor terminal box or manual.

• Electrical connections varies according to motor power, power source and connection type. Required bridge connections in terminal box are as shown in ***Table 3*** and in ***Figure 13a, 13b,*** and ***13c.***

Table 3.

Motor Power	PN ≤ 4 kW	PN > 4 kW
Power Source	3 P1N1PE ~ 400 V	3 P1N1PE ~ 400 V
Connection Type	Y – Connection (13b)	Δ – Connection (13a)
Y / Δ - start	Not Applicable	Remove Bridges (13c)

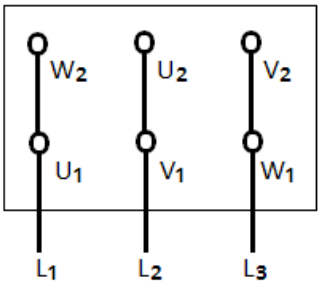


Figure 13a. *Δ - connection*

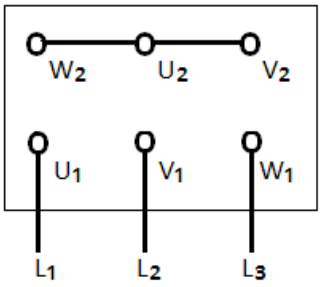


Figure 13b. *Y – connection*

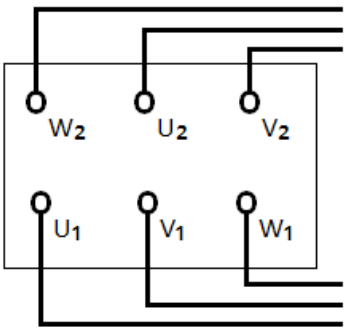


Figure 13c. *Y / Δ - connection*

D5.6- Final Checks

• After applying all processes given above, coupling adjusts should be rechecked and (if necessary) corrected according to instructions in Section D4. To be sure that pump rotor in convenient, rotor should be turned by hand several times. Then pump system should be started and after reaching regular operating heat and conditions, pump should be stopped and thin sheet metals should be placed under

motor foots. After that, a final coupling adjust should be done. **It is highly recommended to make last check of coupling adjusts while in operating temperature.**

• Pump system should never be operated without placing safety covers back to its original positions. Following this safety rule is a must.

E- Starting and Stopping

E1- Oil Check

• Pumps equipped with grease lubricated type bearings are filled with required grease to operate pump safely for at least one year before dispatching. Before starting the pump, bearing should be checked for not having any foreign particles in bearings which may happen during forwarding. In case of finding any dirt or foreign particles, bearings should totally cleaned and refilled with grease. If pump has been stored for over 6 month, then in this case too, bearings should be refilled with grease.

• Bearings lubricated with liquid oil should be refilled with up to level shown on oil indicator.

E2- Rotation Direction Check

• YILDIZ type pumps rotate clockwise when observed from coupling side. This direction is demonstrated with an arrow label placed on pump. By running for a very short period, pump rotation direction should be checked for following direction of the arrow.

• YILDIZ type pumps can be operated in revert direction. In case of having bypass, direction of bypass should be reverted as well if the pump to operate in revert direction. (See ***Figure 14***)

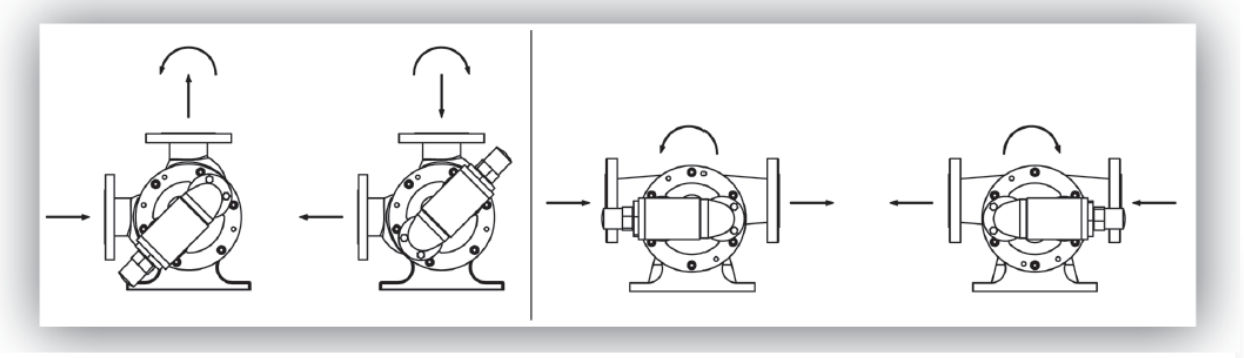


Figure 14. *CW/CCW Rotation Directions of Shaft*

E3- Starting Pump

• Open all valves on pipelines and make sure that there is no occlusion. Fill Pump with medium.

• Make sure that all safety devices are placed correctly, all moving equipment are covered conveniently and protective cover are in place before starting to avoid any physical injuries.

• To check if the rotation direction is correct, start the pump for a few seconds and look at arrow on pump cover.

• Start the pump and check speed and percentage of liquid flow. If not as required, stop the pump and refer to troubleshooting table.

• Check capacity, pressure and temperature.

• If pump is sealed with packing gland / soft seal type sealing, then allow a small amount of leaking from the seal to cool and lubricate the seal. Control the leakage with packing press.

In case of indicating any of the following problems while pump is running in nominal speed, pump should be immediately stopped and troubleshot should be fixed:

• Pump is not delivering any of the liquid.
• Pump is not supplying enough amount of the liquid.
• Motor is getting overloaded.
• Vibration is observed in the pump.
• Pump is making a lot of noise while working.
• Bearings are over heated.

E4- Stopping the Pump

• Stop the motor. Wait until all pump system has stopped totally.
• Close suction valve and all auxiliary pipelines (if any) in case of not running the pump for a long period of time. If the pump will not be used for a long time and/or if there is any liquid freezing risks, then pump should be completely emptied form unloading plugs and all required precautions should be taken to avoid freezing risks.

E5- Checks During Operating

• Check noise level, vibration and pump heat on regular basis.
• Check for not having any abnormal leakages.
• Check flow and discharge pressure on regular basis.
• Check pump seal and all other wearable parts and replace them if necessary.
• All valves on auxiliary systems should be open.
• In pumps equipped with soft seal, liquid drop leakage should be allowed from packing press side. In case of having high amount of leakage after a long working time, then slightly tighten both nuts of packing press simultaneously until having the first level of leakage as drops. If the nuts are tightened to the end, then take out all seal rings, carefully clean seal pocket and place new seal rings. Make sure that new rings are with an appropriate size and length, and connection places are at different positions.
• If pump is sealed with a mechanical seal then there will not be any need for periodic maintenance. Having a considerable amount of leakage from the seal indicates that seal faces have been damaged and needs to be replaced with new ones. Lifetime of a seal generally depends on clearness of the liquid from foreign sold particles and its abrasiveness.
• Check elastic part(s) of coupling on periodic basis. Renew all damaged parts.
• Check electrical current of motor frequently. Detecting higher consuming of Ampere values indicates jamming or frictions inside the pump.

F- Disassembling, Repairing and Reassembling

• Always remove all electrical connections before approaching the pump and take all necessary precautions to avoid running the pump accidently.
• Strictly follow all instructions given in “Safety Instructions” section.

F1- Disassembling Pump

• Close all valve on suction and discharge lines. Empty pump from liquid by opening its cover.
• Remove all protection covers on coupling and shaft.
• Detach pump by disconnecting suction and discharge flanges along with auxiliary pipelines.
• Detach pump completely by disconnecting it from motor/gearmotor and from chassis.
• Remove adjusting nut that connects ball bearing with bracket.
• Remove coupling part on pump shaft by a puller, then remove coupling key on the shaft.

• Rotor and shaft can be taken out of the pump after removing cover and adjusting nut holding ball bearing.

F2- Repairing Pump

• Check all surfaces in contact with the liquid.

• All parts damaged by wearing should be replaced with new ones to avoid losses in flow rate and pressure.

F3- Reassembling Pump

• All assembly instructions given in F1 Section should be repeated in reverse order. See attached assembly section view drawing.

• Apply proper stuffing material (i.e. graphite, silicone) on contact faces and bolts before establishing reassembling. Use lubricant oil in case mentioned materials are not available.

• Do not use removed gaskets. Use new O-Rings and gaskets with the same dimensions.

• Place bushing and bearing to bracket for assembly. Attach casing with bracket. Place back rotor and shaft from cover side. It is important to place mechanical seal or packing press at the same time. Adjust spacing between cover and rotor by tightening adjusting nuts.

• During reassembly, make sure that O-Rings have been placed correctly, not squashed or stuck.

• Place pump on base plate / chassis, mount driver, and then connect suction and discharge pipelines.

F4- Seals

F4.1- Soft Seal / Packing Gland

• Start replacing soft seal by carefully cleaning seal pocket, packing press, shaft (and bushing if any).

• Cross-cut proper seal thread in enough quantity. Then wrap seal parts on shaft (on bushing if any). Make sure to let ends meet correctly.

• Place first seal thread ring with ends at top then with the use of packing press force it inside seal pocket.

• Do the same for second ring but with ends at the bottom.

• Place packing press and slowly tighten nuts to most possible point, so that seal threads take the shape of the seal pocket. After that, loosen slightly nuts for allowable leakage.

• Rotate shaft while tightening until shaft starts to slightly brake. Stop tightening at this point.

• Leaking of few drops from seal should be allowed during pump operating. Adjust packing press by tightening/loosening nuts.

• Check if packing press is overheating after making adjusts and operating pump for about two hours. Packing press temperature, of pump transferring liquid with ambient temperature, should not exceed 80 ^{o}C

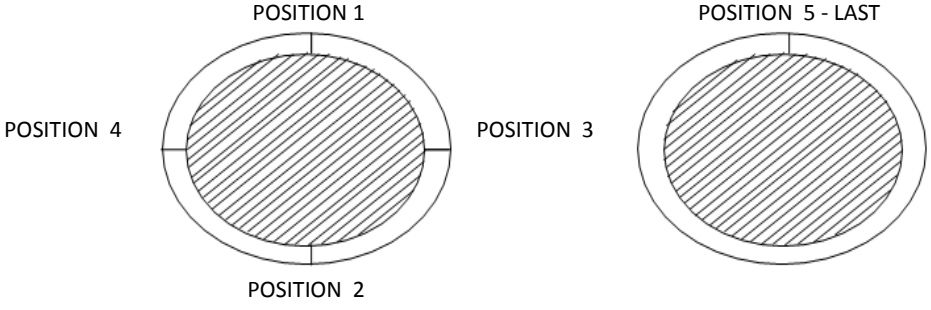


Figure 15. *Positions of Soft Seals ends around shaft*

F4.2- Rotatherm Seal

• ROTATHERM Seals has a wide using range in pumps, can provide most challenging needs among sealing technologies, and the most proper solution for operations with most difficult conditions. ROTATHERM is made of purified and expanded graphite in order to endure providing required results under supreme conditions.

• Under normal circumstances ROTATHERM Seal is durable against all chemicals between -200 to +500 ^{o}C.

• Wrapping direction of ROTATHERM Seal is one of the most important matters that should be taken in consideration while applying it. Band type ROTATHERM should be wrapped and tightened in the opposite direction of shaft rotation's direction. However, tightening should not be very hard as main tightening should be done as instructed in soft seal during installation. In this way, seal bands will take the shape of rings and fill packing pocket.

• ROTATHERM Ring type seals are manufactured in ring-shape. This type also will be tightened likewise.

F4.3- Mechanical Seal

• Properly working mechanical seal does not require any maintenance unless visible leakage is detected. At the same time, closeness of mechanical seal should be checked frequently.

• Follow instructions of mechanical seal manufacturer and **never run mechanical seal dry.**

F5- Micrometric Adjusts

• This is regarding pushing rotors which has been fixed on pump shaft. Rotor adjusts are made with two adjusting nuts. First loosen grub screws. Loosen inner adjusting nut, then tighten outer nut by rotating clockwise to decrease spaces. After that, loosen outer nut by rotating counterclockwise to increase spaces (See ***Figure 16***). After finishing all adjustments, place back grub screws.

• A locking washer and a locking nut with four canals is taking place in front of outer adjusting nut. These two parts are to remain in the same place during adjusting operation.

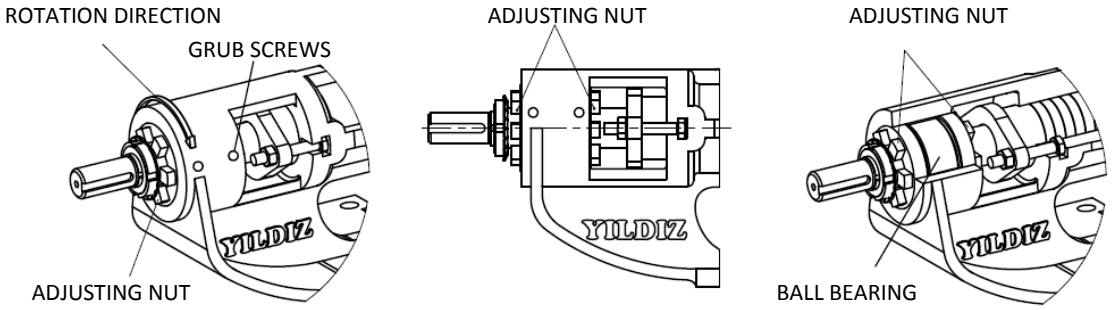


Figure 16. *Micrometric Adjusts*

F6- Flange Positions

• In our Internal Eccentric Gear Pump Series, casing can take eight different positions, which provides high convenience in pump operating location.

• Flange direction adjusted on demand.

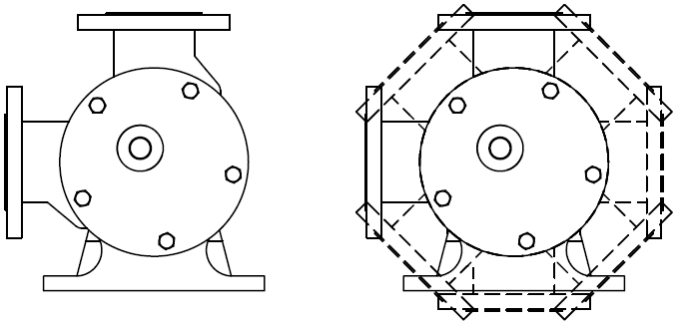
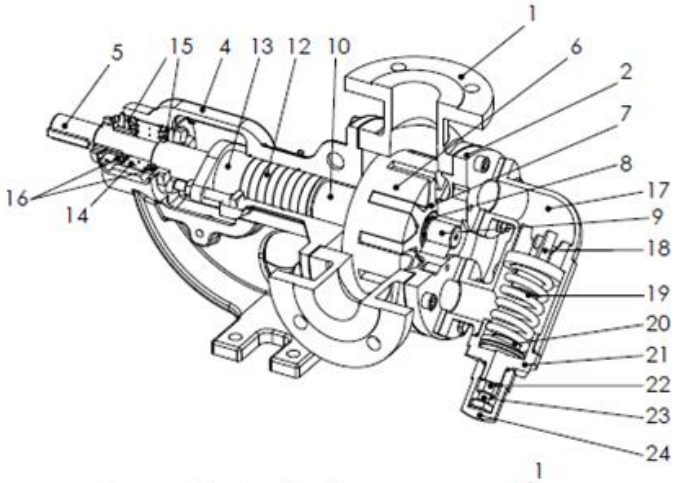
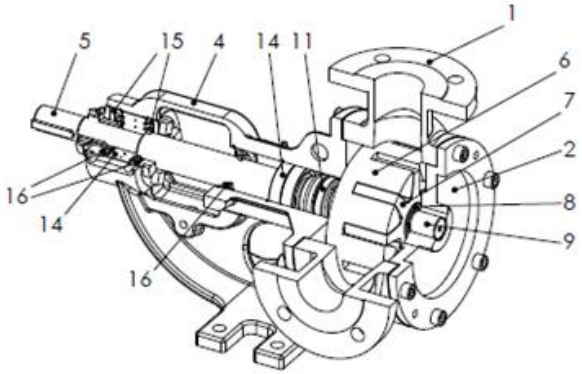


Figure 17. *Flange Positions*

G- SECTION VIEW DRAWINGS





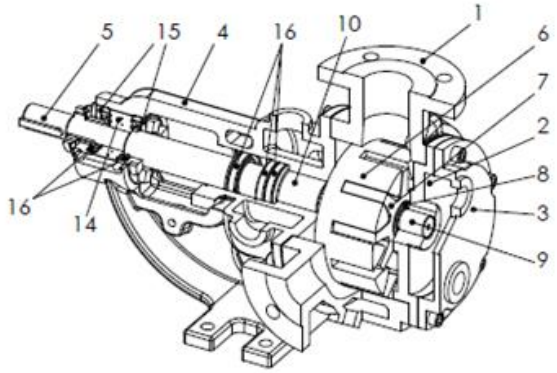


Table 4.

No	Part Name
1	CASING
2	COVER
3	HEATING JACKET
4	BRACKET
5	SHAFT
6	ROTOR GEAR
7	IDLER GEAR
8	IDLER GEAR BUSHING
9	COVER PIN
10	BRACKET BUSHING
11	MECHANICAL SEAL
12	SOFT SEAL
13	PACKING PRESS
14	BALL BEARING
15	ADJUSTING NUT
16	LIP SEAL
17	Pressure Relief Valve – BYPASS
18	VALVE
19	SPRING
20	BYPASS WASHER
21	BYPASS COVER
22	NUT
23	ADJUSTING SCREW
24	CAP

H- MALFUNCTIONS, POSSIBLE CAUSES AND FIXING METHODS

Possible causes and fixing methods of malfunctions may occur during operation of our YILDIZ type pumps.
(Table 5).

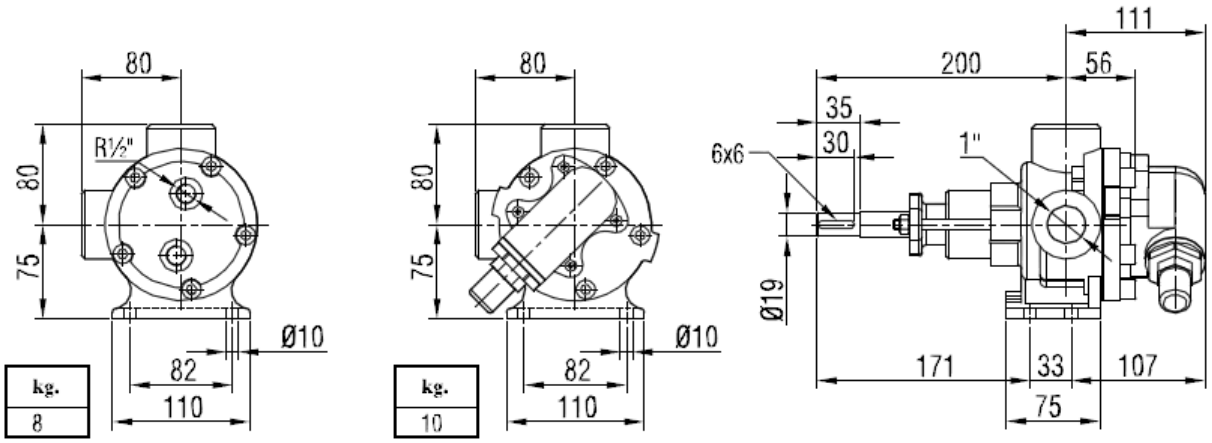
Table 5.

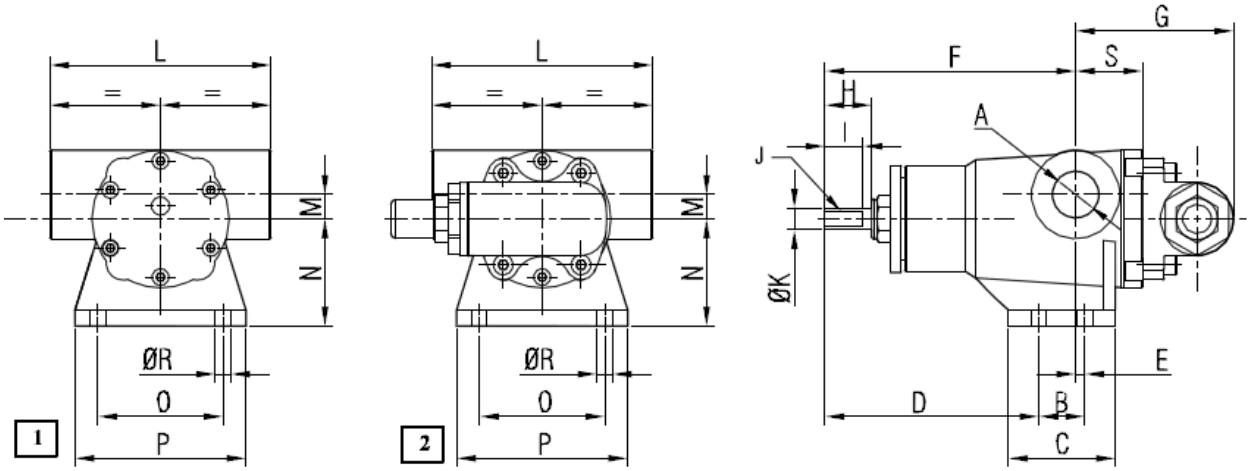
Malfunction	**Possible Causes**	**Fixing Methods**
Pump is not delivering medium while working (No Flow)	Wrong rotation direction	Reverse rotation direction
	Air pockets in suction line	Fill suction line manually and vacuum all air left by discharging
	Check valve jammed	Clean check valve
	Insufficient sealing; due to incorrect pump connecting/assembly, caused to air sucking from suction line or shaft felt	Check and seal suction line. Change pump's seal if necessary
Insufficient Capacity and/or Pressure	Check valve jammed	Clean check valve
	Air leakage	Check and seal suction line. Change pump's seal if necessary
	High NPSH – Net Positive Suction Head	Shorten and/or enlarge suction line diameter. Reduce manometric suction head
	Pump is worn	Check rotor gear spacing. Decrease gap by removing washers if necessary
	Safety valve / Relief valve (Bypass) activates early or never closes	Adjust activating pressure, Check valve mechanism
Pump make noise	Cavitation – manometric suction head is very high	Shorten and/or enlarge suction line diameter. Reduce manometric suction head. Check filters / drainers on suction line.
	Rotor / gear damage	Check gears and change if necessary
	Wrong alignment of Pump / driving shaft	Correct using washers and wedges
	Vibration noise coming from safety valve	Increase pressure on spring or change if necessary

I- PUMP DIMENSIONS

All dimensions are in mm - millimeter. Flanges are PN 16.

YP 1”

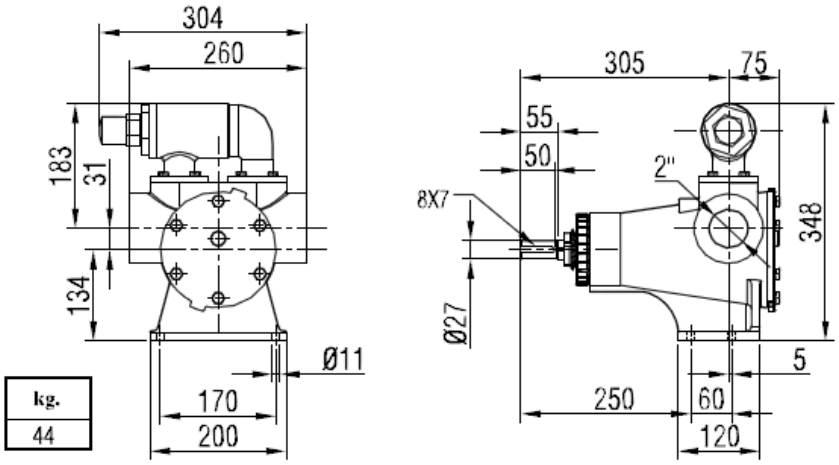




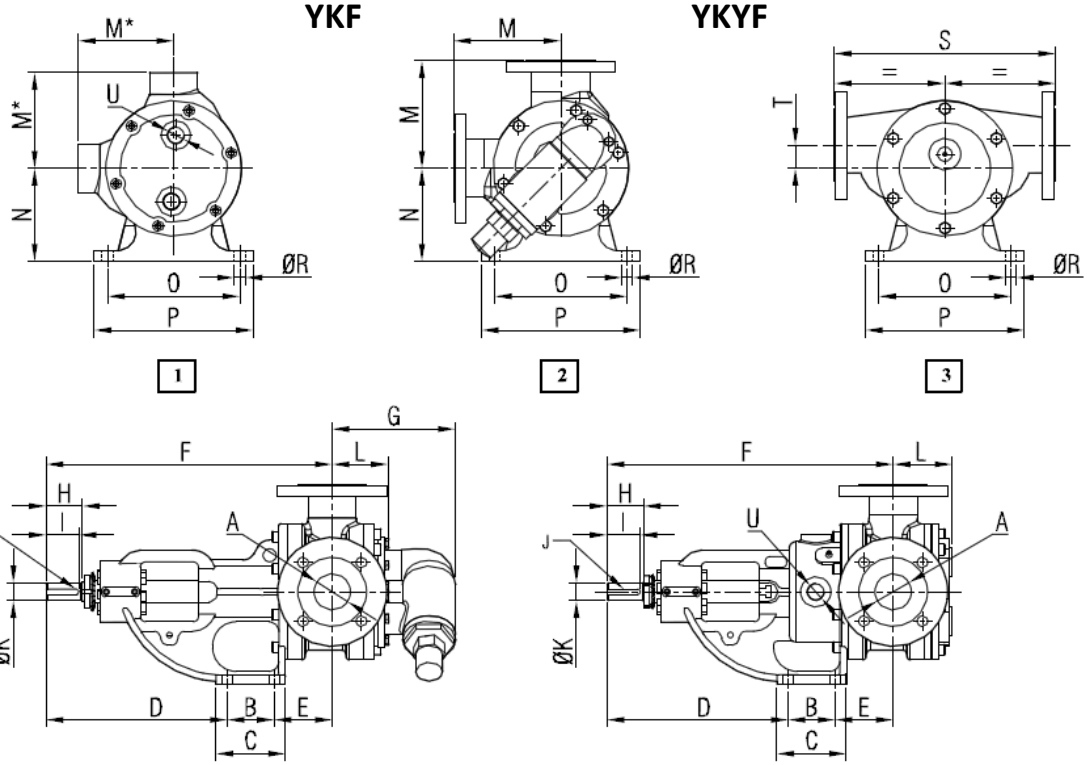
PUMP CODE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	R	S	kg
YMK 1”	DN25	30	70	140	6	164	104	30	25	-	Ø14	143	16	70	82	112	ø10	44	8
YMK 1½”	DN40	59	115	160	21	240	125	45	30	6X6	Ø20	186	17	110	100	140	ø11	66	25

Explanation	1	2
	Blind Covered Pump	Pump With Bypass

YMK 2”



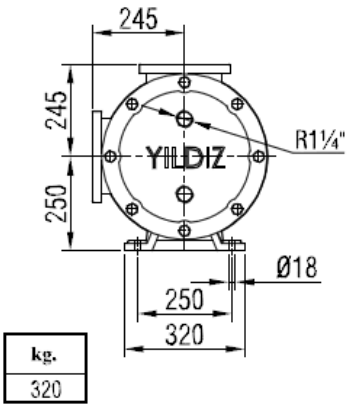
YK **YKF** **YKYF**

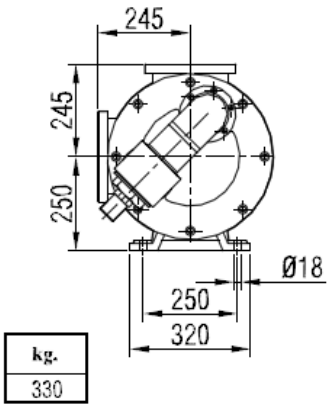


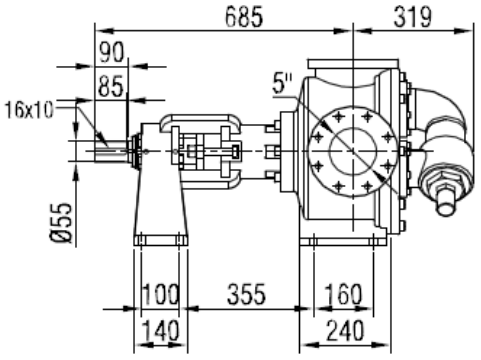
PUMP CODE	YKF 1″	YKF 1½″	YKF 2″	YKF 2½″	YKUF 2½″	YKF 3″	YKBF 3″	YKF 4″	YKBF 4″
A	DN25	DN40	DN50	DN65	DN65	DN80	DN80	DN100	DN125
B	50	58	71	100	100	100	110	110	140
C	75	95	105	134	134	134	160	160	224
D	127	165	274	272	274	274	261	261	277
E	73	97	88	93	119	119	163	163	170
F	250	321	432	467	493	493	534	534	588
G	110	116	186	201	201	201	271	271	318
H	42	50	55	60	60	60	65	65	90
I	30	45	50	50	50	50	60	60	80
J	6X6	6X6	8X7	8X7	8X7	8X7	12X8	12X8	14X9
K	Ø18	Ø20	Ø27	Ø30	Ø30	Ø 30	Ø 42	Ø 42	Ø 80
L	69	74	89	93	108	108	116	116	157
M	95	93	162	185	185	185	215	215	235
M*	78	78	140	165	165	170	-		-
N	75	90	140	180	180	180	237	237	250
O	110	137	200	180	180	180	220	220	250
P	140	175	240	220	220	220	280	280	307
R	10	12	14	14	14	14	18	18	18
S	-	184	335	377	380	385	455	-	-
T	-	16	35	30	30	30	50	-	-
U	R½″	R½″	R1″	R1″	R1″	R1″	R1″	R1″	R1¼″
kg.	13,5	21	60	90	95	95	200	200	300

Explanation	1	2	3
	Pump With Jacket	Pump With Bypass	Blind Covered Pump

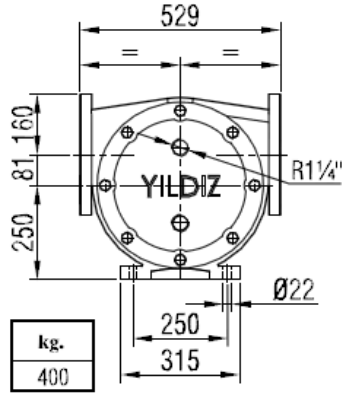
YKF 5”

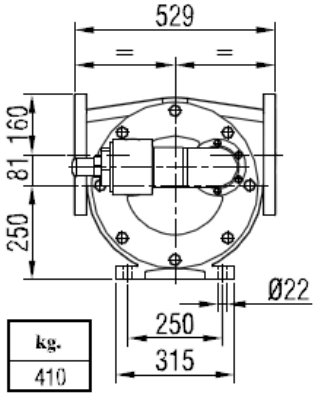


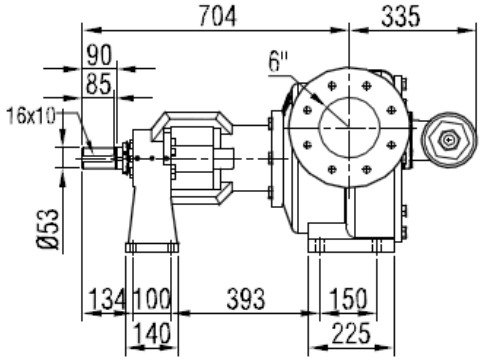




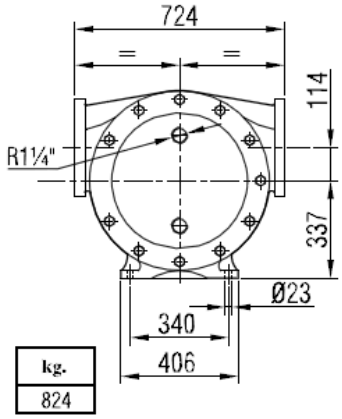
YKF 6”

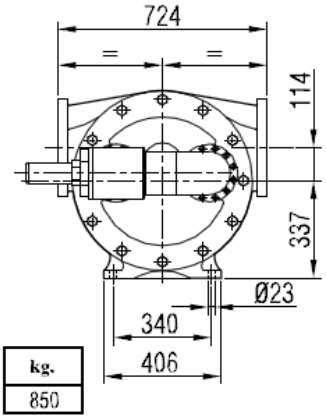


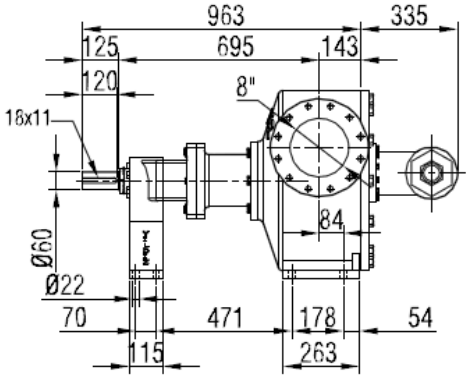




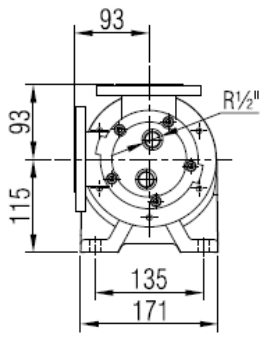
YKF 8”

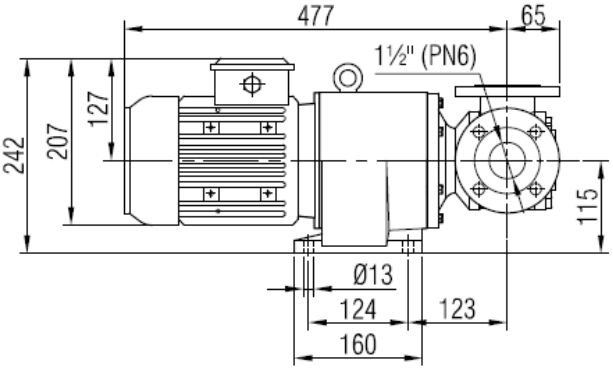






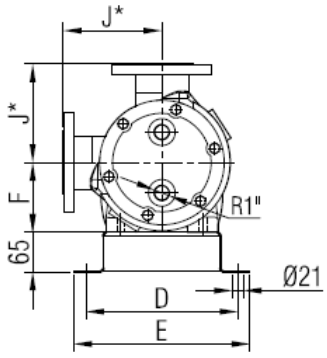
YCF 1½”



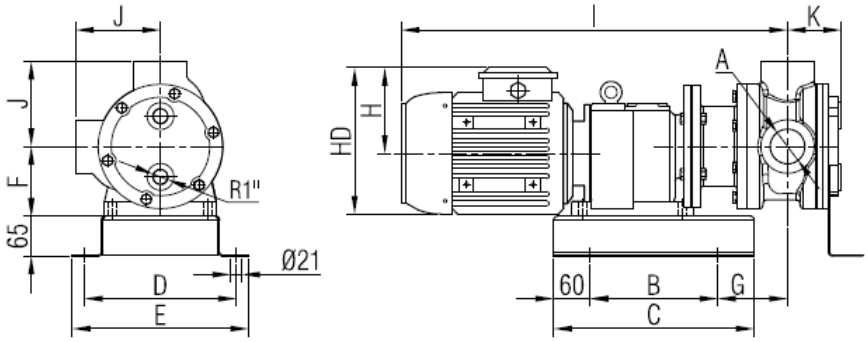


MOTOR POWER AND PUMP SPEEDS			kg
0,55 hp – 0,75 hp – 1 hp – 1,5 hp / 0,37 kW – 0,55 kW – 0,75 kW – 1,1 kW	30 / 100 d/d (rpm)	İRAM 50 / 80	9

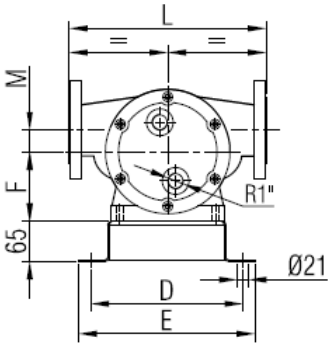
YCF



YC



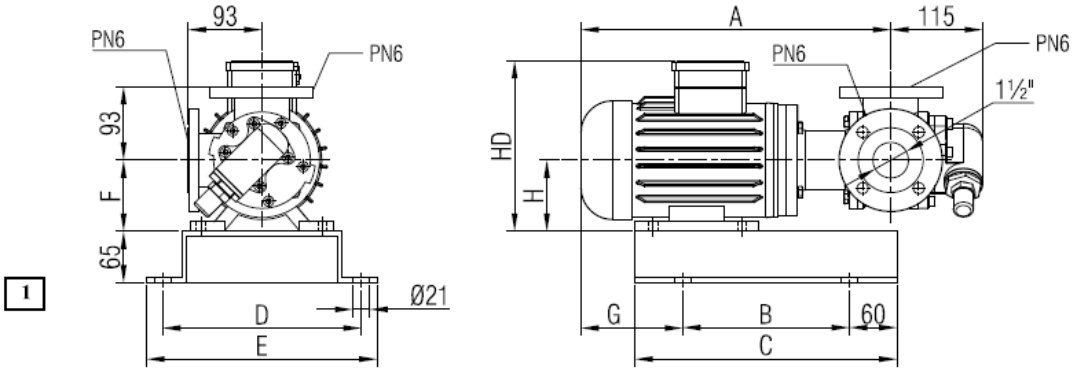
YCYF



PUMP CODE	YCF 2"	YCF 2½"	YCUF 2½"	YCF 3"
	1	2	3	4
A	DN50	DN65		DN80
J	140	165		
J*	162	185		
K	89	93	108	
L	335	337	380	385
M	35	30		

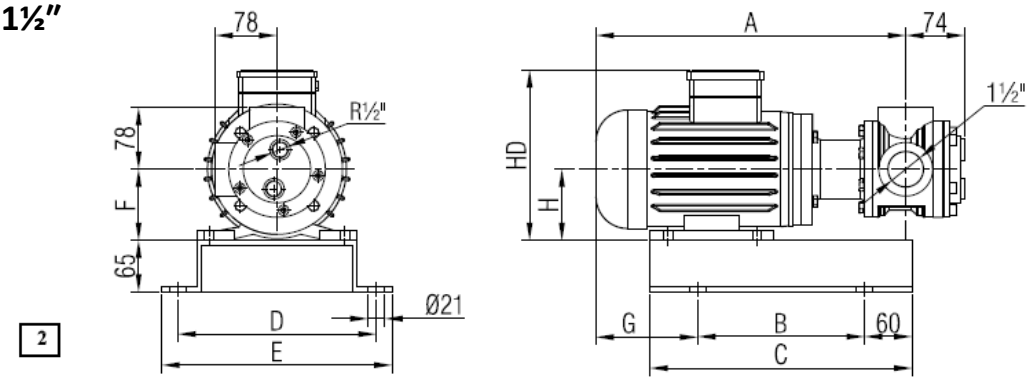
MOTOR POWER AND PUMP SPEEDS	I			HD	H	B		C		D		E		F		G			kg.		
	1	2	3/4			1	2/ 3/4	1	2/ 3/4	1	2/ 3/4	1	2/ 3/4	1	2/ 3/4	1	2	3/4	1	2	3/4
1 hp / 0,75kW																					
20 / 55 d/d İRAFM63/80	480	-	-	198	118	210	-	330	-	250	-	290	-	115	-	115	-	-	73	-	-
1,5hp / 1,1kW																					
20 / 77 d/d İRAFM63/90S	605	-	222	132	210	210	330	330	-	250	-	290	-	115	-	115	-	-	78	-	-
2 hp / 1,5kW																					
30 / 98 d/d İRAFM63/90L	630	634	-	222	132	210	230	330	350	250	310	290	350	115	140	115	83	-	80	104	-
3 - 4 hp / 2,2 -3kW																					
47 / 98 d/d İRAFM63/100L	672	676	701	241	141	210	230	330	350	250	310	290	350	115	140	115	83	107	83	113	127
5,5 hp / 4kW																					
35 / 95 d/d İRAFM73/ 112M	-	729	754	241	141	-	230	-	350	-	310	-	350	-	140	-	132	157	-	139	153
7,5 hp /5,5kW																					
70 / 95 d/d İRAFM73/132S	-	775	800	314	182	-	230	-	350	-	310	-	350	-	140	-	132	157	-	147	161

YMBF 1½”



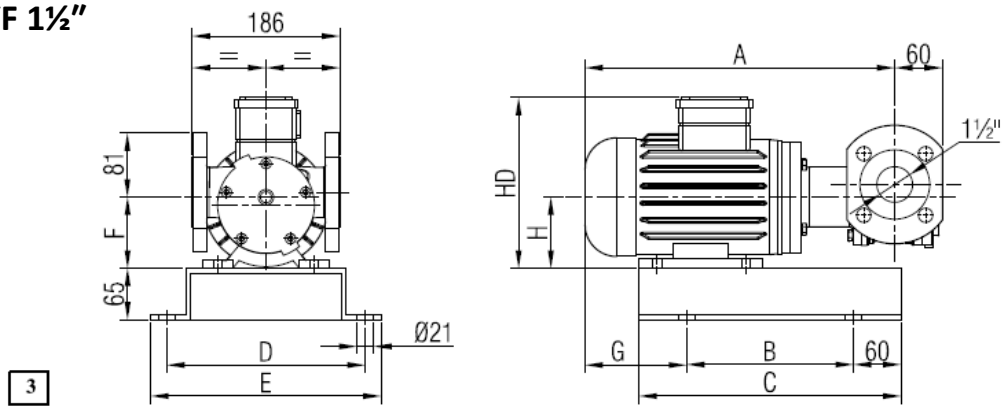
1

YMB 1½”



2

YMBYF 1½”

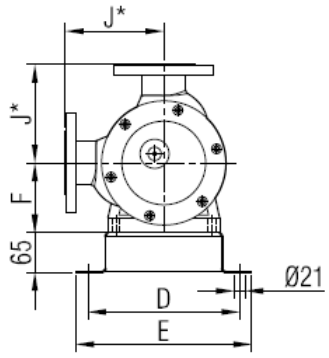


3

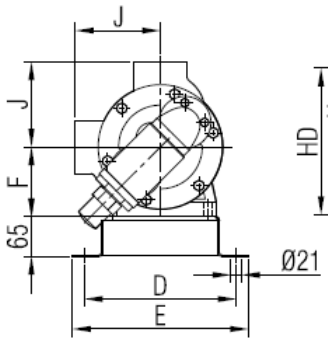
MOTOR POWER AND PUMP SPEEDS			A	HD	H	B	C	D	E	F	G	kg.
1,5 hp / 1,1 kW	1400 d/d	MOTOR 90S	390	216	90	210	330	250	290	90	128	41
1,5 hp / 1,1 kW	900 d/d	MOTOR 90L	440	216	90	210	330	250	290	90	128	44
2 hp / 1,5 kW	1400 d/d											
1,5 hp / 1,1 kW	750 d/d	MOTOR 100L	480	235	100	210	330	250	290	100	185	47
2 hp / 1,5 kW	900 d/d											
3 hp / 2,2 kW	1400 d/d											
4 hp / 3 kW	1400 d/d											
5,5 hp / 4 kW	1400 d/d	MOTOR 112M	494	258	112	230	350	290	350	112	178	56

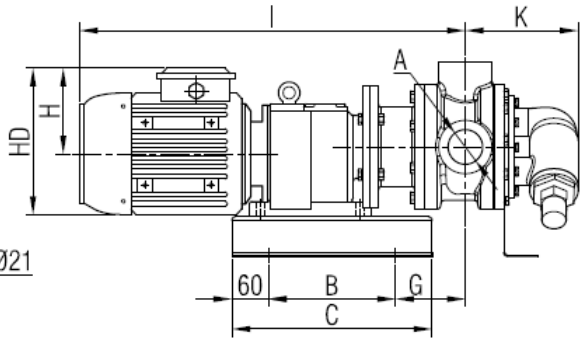
Explanation	1	2	3
	Pump With Bypass	Pump With Jacket	Blind Covered Pump

YMBF

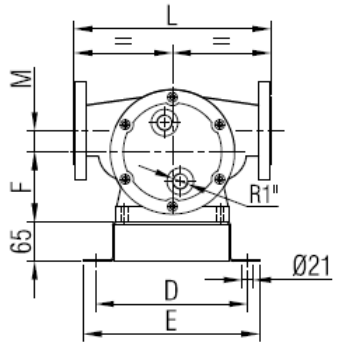


YMB





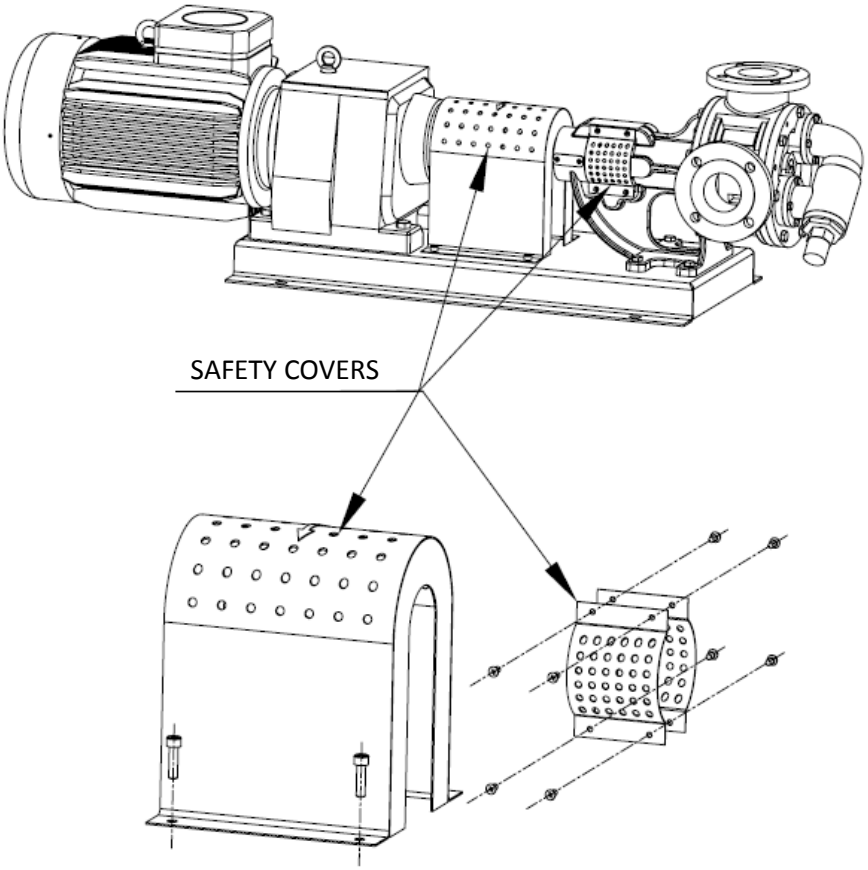
YMBYF



PUMP CODE	YMBF 2"	YMBF 2½"	YMBUF 2½"	YMBF 3"
	1	2	3	4
A	DN50	DN65		DN80
J	140	165		
J*	162	185		
K	186	201		
L	335	337	380	385
M	35	30		
N	89	93	108	

MOTOR POWER AND PUMP SPEEDS	I			HD	H	B		C		D		E		F		G			kg.		
	1	2	3/4			1	2/ 3/4	1	2/ 3/4	1	2/ 3/4	1	2/ 3/4	1	2/ 3/4	1	2	3/4	1	2	3/4
1,5 hp / 1,1kW 30 / 104 d/d İRAFM62/90S	605	-	-	222	132	210	-	330	-	250	-	290	-	115	-	115	-	-	75	-	-
2 hp / 1,5 kW 30 / 200 d/d İRAFM62/90L	630	-	-	222	132	210	-	330	-	250	-	290	-	115	-	115	-	-	77	-	-
3 - 4 hp / 2,2 -3kW 65 / 450 d/d İRAFM62/100L	672	676	701	241	141	210	230	330	350	250	310	290	350	115	140	115	83	107	82	113	127
5,5 hp / 4kW 87 / 450 d/d İRAFM62/ 112M	693	697	722	261	149	210	230	330	350	250	310	290	350	115	140	115	83	107	109	121	135
7,5 hp / 5,5kW 70 / 400 d/d İRAFM72/132S	-	775	800	314	182	-	230	-	350	-	310	-	350	-	140	-	132	157	-	142	156
10 hp /7,5 kW 120 / 400 d/d İRAFM72/ 132M	-	821	846	314	182	-	230	-	350	-	310	-	350	-	140	-	132	157	-	144	158

J- SAFETY COVERS



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NOT: