SLD series

INSTRUCTIONS FOR INSTALLATION, USE & MAINTENANCE

WARNING! READ THE INSTRUCTIONS MANUAL BEFORE OPERATE

MARKIDIS D. & SON O.P.
BLOCK 39 A, INDUSTRIAL AREA, SINDOS, P.C. 570 22
Tel: (+302310) 79 78 33, Fax: (+302310) 79 79 65
e-mail: contact@emikam.gr, web: www.emikam.com

INDEX

1. MARKING

1.1 Technical characteristics label

A label as the one shown below is placed on each pump.

Picture 1: Technical characteristics label

1.2 Installation

Stamp and signature for both constructor and installer are filled below.

FOR THE MANUFACTURER INSTALLER

Date: Date:

Information included in each label (**identification with serial number**) has to be familiar in order for the reference on them to be easy when they get asked. This can happen in case of spare parts ordering from the construction company where identification of the pump is necessary through label data.

In case of a pumping unit (type **PSWP2xxC**) the electromotor and the electric panel carry their own marking labels which can be, depending on the case, anti - explosive type according to the customer's and application's demands.

2. OPERATION GUARANTEE

MARKIDIS P. & Co G.P

BLOCK 39 A, INDUSTRIAL AREA, SINDOS, P.C. 57022
Tel: (+302310) 79 78 33, Fax: (+302310) 79 79 65
e-mail: contact@emikam.gr, web: www.emikam.gr

With the present document, manufacturer guarantees the good operation of the machine which is reported below:

TYPE	
SERIAL NUMBER	
PURCHASE DATE	
SUPPLIER : (stamp & signature)	

The present guarantee is valid for 12 months since the purchase date.

The manufacturer guarantees the good operation of the machine.

The present guarantee does not stand as long as:

- The machine was used for a different purpose from the one for which it was designed.
- The installation was not implemented with the proper way.
- The use did not match with its technical characteristics.
- Damages were made because of wrong use.

Apply to the constructive company for any doubt or question. Even after the end of the guarantee, we are willing to help you and give you the proper information. Never trust the maintenance or repair of your machine to people inexperienced and mainly do not try yourselves if you don't have the proper education.

The company also provides technical support (customer service) and has full range of spare parts of the present product.

3. THE COMPANY

3.1 Historical development and products

EMHKAM PUMPS was established on 1977. It is one of the top companies on liquid fuel pump production and on products for fuel truck equipment to Greece and one of the best worldwide.

The company manufactures different kinds of pumps such as **sliding vane pumps**, **bevel gear** and **vacuum pumps**, **pump stations** as well as **bottom valves**, **hose reels**, **filters**, **volumetric bars** and **rotary clips** for fuel **trucks**.

EMHKAM Company also undertakes responsibly **constructions** and **reconstructions** of pumps of senior manufacture.

EMHKAM manufactures and provides the biggest product variety on liquid fuel and viscously material transport. The specific range is constructed of perfect material quality and it is used on:

a) Tanks for gasoline, petrol, crude oil, oil, tar, lubricant waste and chemical products transport.

b) Stations for storage and filtration of liquid fuel, crude oil, tar, lubricant, waste and chemical products.

c) Industries of oil, paper, soap, chocolate and chemicals production.

d) Shipyards – Shipping companies, ships for liquid fuel, crude oil, waste carriage.

4. LABELS WHICH ARE USED


This is a safety alert symbol. When you see this symbol on the product or on the manual, look for one of the following signal words and be alert to the potential for personal injury, death or major property damage.


This symbol follows message relative to information that are reported in the present or in the accompanying handbook and should be taken under consideration.


This symbol follows indication.

Meeting the symbols above we become more careful for possible accidents or important points regarding the operation and should carefully read the message that follows.

Undetachment and uninsurance of the electric power before maintenance can cause electric shock, fire of even death.

If pumping hazardous or toxic fluids, system must be flushed prior to performing service.

Operation without guards in place can cause serious personal injury, major property damage, or death.

Disconnecting fluid or pressure containment components during pump operation can cause serious personal injury, death or major property damage.

Failure to relief system pressure prior to performing pump service or maintenance can cause personal injury or property damage.

Failure to disconnect and lockout electrical power or engine drive before attempting maintenance can cause severe personal injury or death.

High temperature in the pump can cause ignition in gases and dust.

In the dangerous areas are prohibited the smoking and the naked flame.

It should is used at proper equipment for explosive atmosphere.

The contact with hot surfaces can cause seriously burn.

Grease oil and lubricants can pollute the environment.

Not knowledge of instructions manual can cause severe personal injury or death.

5. INTRODUCTION TO THE MANUAL

We strongly recommend you to read carefully this manual before you try to install, operate and maintain the pump.

We prepared it in order for you to reach maximum performance through operation. This manual refers to the installation, use and maintenance of the **«EMHKAM» sliding vane pumps** and aims on helping for the best processing of all the above. It also includes guarantee document with terms and conditions which validate it.

«EMHKAM» Company does not have any responsibility for damages becoming from improper use or disobeying of the instructions included on the specific manual.

ATTENTION! This manual is an integral part of the **EMHKAM sliding vane pumps** and should accompany it in every transfer of resale. It should be kept in a safe place and the staff has to be aware of it. The staff is also responsible for the good condition and safekeeping of the manual. In case of damage of loss you must ask for a new copy from the supplier.

Keep the manual in an ideal place close to the pump and popularize it to whom .it may concern.

Never neglect to review this manual, independently from your previous experience. Few moments of study will save you time, money and most important from difficult situations.

Service shall be performed by qualified technicians **ONLY**. Service shall conform to all applicable local and national regulations and safety standards.

6. SAFETY MEASURES

6.1 Specifications

The Sliding Vane pump was manufactured and assembled according to the regulations of Directive **2006/42/EC** for machine safety and **94/9/EC** for equipment used in explosive atmosphere.

Sliding vane pumps are non electrical equipment intended for use in explosive atmosphere.

6.2 Safety data

ATTENTION! Disobeying of the following can cause personal injury, death or major property damage.

- EMHKAM pumps **MUST** only be installed in systems which have been designed by qualified engineering personnel. The system MUST conform to all applicable local and national regulations and safety standards.
- Pump installing, operation and maintenance shall be performed by qualified technicians **ONLY**. Service shall conform to all applicable local and national regulations and safety measures.
- Never proceed on changes relative to the pump in any way.
- Use only original spare parts of the manufacturing company.
- **Never operate the pump without liquid** except of instances mentioned on the specific manual.

At certain installations and operation points on the pump curve the noise level 70 dB, or for the actual pump specified noise level, can be exceeded.

7. INTENDED USE

7.1 Application field

EMHKAM sliding vane pumps are used for the transport of the following:

a) Transport into fuel tracks of liquid fuel as gasoline, heating and moving petrol, shipyards, liquid fuel storage and filtering installations.

b) Transport of mild chemical products in chemical industries.

c) Lubricant transport into fuel trucks and lubricant storage installations.

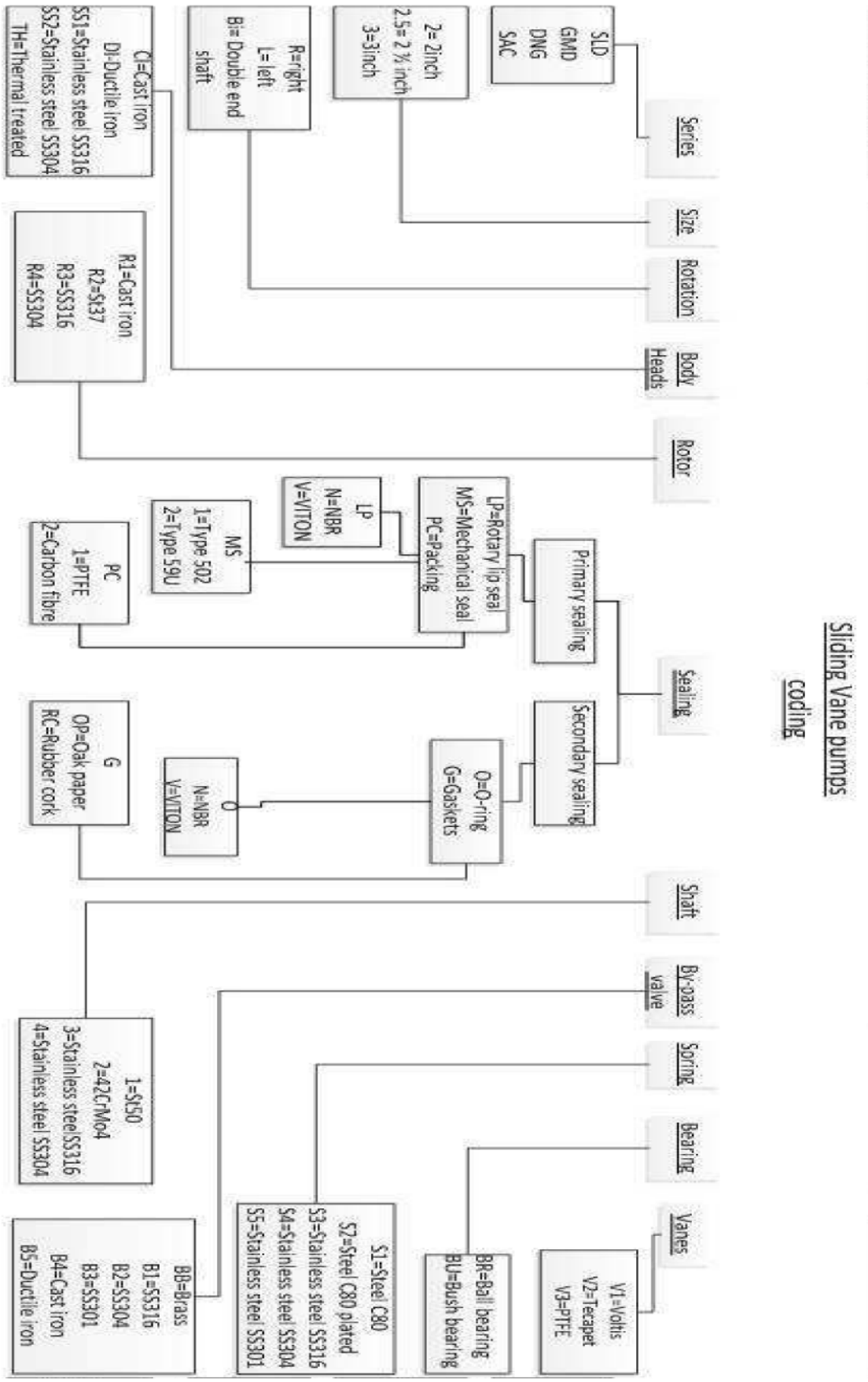
ATTENTION! Use only proper liquid in order to avoid damage or even corrosion of the gaskets and possible leak.

ATTENTION! Pumps are the kind of equipment where surface temperature depends on the liquid temperature used. Overheating of the product can cause impropriate operation and surface temperatures of the pump.

Operator of the pump should secure the safe temperature limits and never allow the temperature to exceed.

When EMHKAM Company installs its products on to the fuel truck, it can also install the logo including company data on an obvious point of the truck, optionally. By this, EMHKAM Company claims that equips the fuel truck with certified equipment and is available for any information and technical support.

8. TECHNICAL DATA



9. PERFORMANCE

Pump model	Minimum Pump Speed			Maximum Pump Speed			maximum differential pressure	maximum working pressure	Maximum operating temperature
	Speed	Flow	Viscosity	Speed	Flow	Viscosity			
	Rpm	lpm (gpm)	cSt (ssu)	Rpm	lpm (gpm)	cSt (ssu)	bar (psi)	bar (psi)	°C (°F)
SLD2	200	86	4250(20000)	780	480	6 (46)	8 (116)	10 (145)	125 (257)
SLD2.5	200	136	4250(20000)	780	760	6 (46)	8 (116)	10 (145)	125 (257)
SLD3	150	196	4250(20000)	640	1090	6 (46)	8 (116)	10 (145)	125(257)

Table 1: Maximum specifications chart

Pump Model	SLD2			SLD2.5			SLD3		
Pump speed	640	520	420	640	520	420	640	520	420
lpm	390	330	260	640	520	420	1090	900	710
gpm	103	87	69	169	137	111	288	238	188
Hp	2.2	1.6	1.0	4.6	2.4	1.5	10.8	7.9	6.8

Table 1: Performance data

10. INSTALLATION

EMHKAM truck pumps must only be installed in systems designed by qualified engineering personnel. System design must conform to all applicable regulations and codes and provide warning of all system hazards.

Undetaching or uninsuring of the electric power before maintenance can cause electric shock, fire of even death. (Only in case pump is rotated through electromotor or is part of a pump station).

ATTENTION! Installation has to be done after make sure you have unplugged and secured the electrical power supply in case of electromotive pump.

ATTENTION! Electrical power supply has to be equal to the one mentioned on the technical data label.

ATTENTION! While electrical installing follow all the security rules. Ground the electrical circuit in any case.

EMHKAM sliding vane pumps are able to move from the drive shaft (p.t.o. – power take off) to liquid fuel transport trucks, from electromotor to fixed mainly installations, from hydraulic motors or as parts of an EMHKAM pump station.

For more information concerning installation and operation of the EMHKAM pump stations, refer to the respective use operations.

10.1 FLUSHING THE PUMP

Make sure you clean the pump with plenty of water before first use. It contains anti-rusting liquid.

ATTENTION! When installing on liquid fuel trucks be careful because remains from the protecting material of the weldings may enter the interior of the piping and as a result the pump will intake them and will be destroyed.

10.2 Piping installation

Inlet circuit of the pump has to be free material other than those which are meant for the pump. Such an existence may cause serious damage to the pump.

Before connection beware of the following:

- Place the pump as closer to the supply as you can to avoid many frictions.
- Install a strainer in the inlet line to protect the pump from foreign matter. Filter has to be placed very close to the pump and has to cover surface equal to the pump inlet for four times.

Consult technical data of the manufacturer for each pump concerning its maintenance.

It is possible to adapt an especial filter on the EMHKAM bevel geared pumps on the pump inlet (dimensions details in chapter 16).

- No air should enter the circuit.
- Piping parts have to be designed for the proper pressure developing in the pump.
- Piping has to be align among them.
- For high temperature liquid transport, possible piping expansion has to be taken under consideration, especially for long piping.

10.3 Pump station installation

All the above apply also in a pump station install as well as connection to the plug of the electrical panel for power supply.

ATTENTION! When connecting the pump to the electric power, make sure for grounding existence and compatibility of connector – socket.

10.4 Pump mounting

a) In case of installing on a liquid fuel truck, the pump can be bolted to the truck frame or on a construction fitted on the truck.

b) Base of the pump has to be steady and fastened on when its about permanent installations in order to avoid vibrations.

c) Pumping station (pump – electromotor – electric panel) is supported on a wheeled buggy from the manufacturer.

ATTENTION! Secure the pump station from movement while operating (brakes on the wheels).

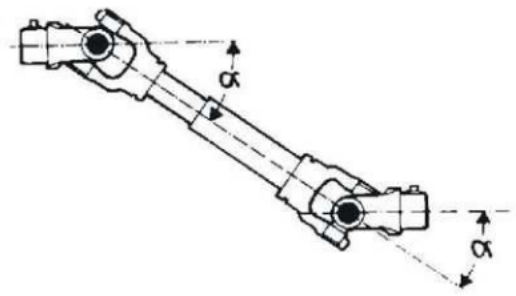
Pump can operate with secure in every place its situated.

10.5 Pump rotation layout

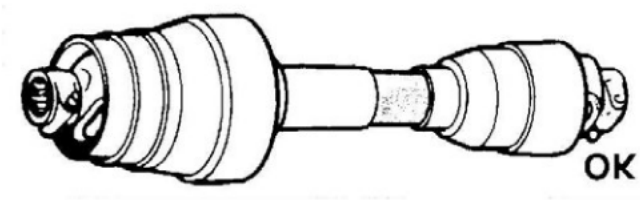
a) When pump is driven by a power take-off through axle and two kardan systems with their edges adapted on the axles with friction joints, the following should apply:

- The maximum angle between the jackshaft and the pump shaft is 15 degrees.
- The pump shaft and power take-off shaft must be parallel in all respects.
- The shaft length has to be regulated correctly.
- The safe guards to be in place.
- Kardan joints to be well fixed.

It is very important to install a proper drive line to avoid excessive



Picture 2: Drive shaft



Picture 3: Safeguards install

b) When pump is moved via electromotor, hydraulic motor or in to pump station you use:

- A discal joint of two pieces, one of each is adapted on the pump shaft and the motor with a pin.
- A tubed joint of one piece which is adapted to both shafts in a mutual pin groove.

Connection of the pumps through belts is not recommended because they reduce performance and reliability.

For the discal joint alignment you should check the parallelism of the two shafts (motor – pump).

Use a surface measuring device to ensure that the p.t.o. and pump shaft are parallel to each other. Turn fully a stable point over the two parts of the joint. Alternatively use an angular level measuring device.

Alignment of the tubed joint becomes automatically and requires lubrication at least every three months (refer to maintenance section).

10.6 Pump station joint

In case of a pump station (type **PS**) the joint is aligned from construction. Only if you disconnect the pump or the electromotor from their base you will need to align the joint as it was mentioned above.

10.7 Pump rotation

Clockwised rotating pumps rotate as with a clock while counterclockwised pumps rotate in reverse (as the operator looks from the exit to the pump). Double end shaft pumps can rotate in both directions

Confirm correct pump rotation by checking the pump rotation arrow.

To change rotation, the pump must be disassembled then reassembled with the shaft on the opposite side of the pump (see the maintenance section for instructions).

11. OPERATION

Operation without guards in place can cause serious personal injury, major property damage, or death.

Disconnecting fluid or pressure containment components during pump operation can cause serious personal injury, death or major property damage.

Failure to relief system pressure prior to performing pump service or maintenance can cause personal injury or property damage.

11.1 Pre – start check list:

Before operation perform the following checks:

1. Check the alignment of the pipes to the pump.
2. Check the alignment of the joint or parallelism of the p.t.o. – pump shafts. Check also angle between the jackshaft and the pump shaft to be 15 degrees.
3. Ensure that inlet and outlet of the pump are free of valves or other parts.
4. In a pump station, check security against moving.

5. Check safeguards install to the connecting shaft of p.t.o. – pump.
6. In a pump station check safeguard install to the joint.
7. Check motor connection and make sure that pump rotation is the one declared on the arrow on it.

11.2 Operation in reverse

For starting follow the procedure below:

1. Operate the driving setout to the pump (power take off or electromotor)
2. Check for leaks.
3. Inspect piping, fittings and associated system equipment for leaks, noise, vibration and overheating.
4. Check the pressure setting of the bypass valve by closing the exit of the pump. To increase the pressure setting, loosen the locknut and turn the adjusting screw inward of clockwise. Retighten the locknut. To decrease the pressure setting, loosen the locknut and turn the adjusting screw outward or counterclockwise. Retighten the locknut.

ATTENTION! DO NOT operate the pump against a closed outlet for a long period.

If adjustments need to be made, refer to the ''bypass valve setting'' section of this manual.

ATTENTION! Wrong adjustment of the bypass valve can cause serious injury, damage or death.

11.3 Reverse rotation

Pump must not operate for more than 1 minute in reverse and only with the existence of the bypass valve for protection against overheating.

ATTENTION! Never operate the pump having the outlet (

Reversed operation is allowed only for maintenance.

11.4 Flushing the pump

If flushing fluid has to be left in the pump for an extended time, it must be a lubricating, non –corrosive fluid. If a corrosive, non – lubricating fluid is used, it must be flushed from the pump immediately.

1. To clean the pump, leave the outlet open and the inlet closed.
2. Run cleaning fluid and operate for 1 minute.
3. To remove fluid follow step 1.

After flushing the pump some residual fluid will remain in the pump and piping.

Properly dispose of all waste fluids in accordance with the appropriate codes and regulations and don't infect the environment.

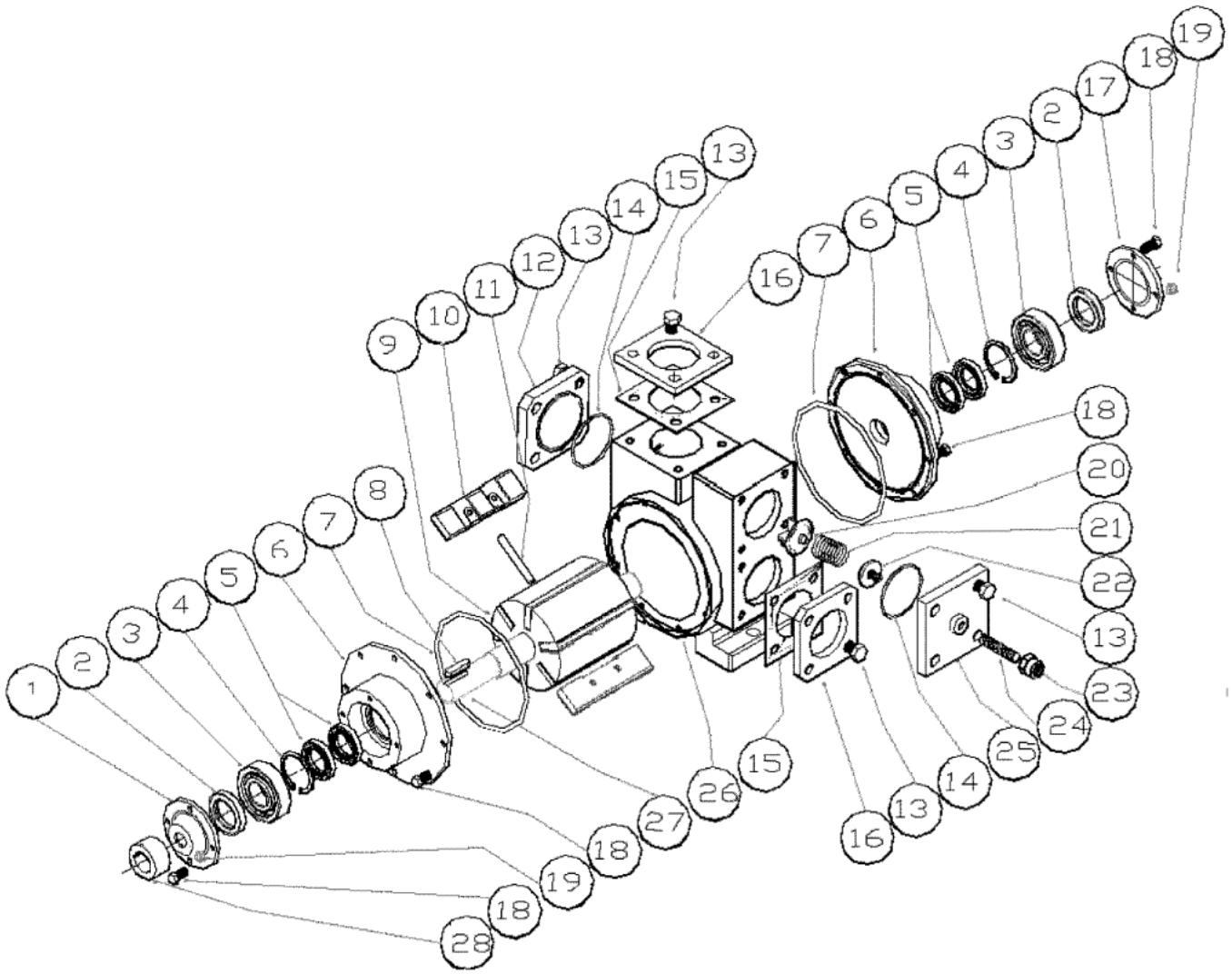
11.5 Relief valve

The bypass valve is designed to protect the pump from excessive pressure. Bypass valve is set from construction lower than the maximum operation pressure.

To regulate the relief valve follow the next steps:

1. Bypass valve carries for its regulation a M6 Allen screw and a M 22 locknut.
2. To increase the pressure setting we loosen the locknut.
3. Then we turn the adjusting screw clockwise until the desiring point.
4. We retighten the locknut to secure the screw.
5. We follow the same procedure in case we want to decrease the pressure setting but by turning the screw counterclockwise.

12. PART LIST



Picture 4: Spare parts of SLD pump

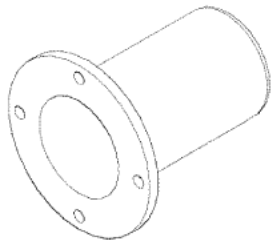
No	DESCRIPTION	PIECES	CODE
1	Bearing cover(open)	1	1001
2	Rotary lip seal 30×45×7	2	2002
3	Ball bearing 6206	2	1003
4	Retaining ring B52 (DIN 471)	2	1004
5	Rotary lip seal 52×30×7	4	1005
6	Head	2	1007
7	O-ring 151×145×3	2	1008
8	Shaft key 8×7×40	1	2009
9	Rotor	1	2010
10	Vanes	6	2011
11	Push rod Φ8	3	2012
12[4]	Two-way outlet cover	1	1030
13	Hex screw M8×30	12	2024
14	O-ring 70×64×3	2	1029

No	DESCRIPTION	PIECES	CODE
15	Gasket	2	2017
16[2,3]	Flange weld	2	2016
17[1]	Bearing cover(open)	1	1001
18	Hex screw M8×30	12	2024
19	Greaser ⅛	2	2027
20	Valve	2	2017
21	Spring	1	1019
22	Spring guide	1	1020
23	Valve nut M22	1	2023
24	Allen screw M12×60	1	2021
25	Valve cover	1	2022
26	Pump body	1	2013
27	Shaft	1	1031
28	Coupling	1	1028

[6]For GMD3 model there is no two-way outlet ability therefore part nr 12 must be removed along with the corresponding o-ring and hex screw

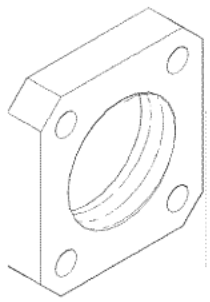
No	DESCRIPTION	PIECES	CODE
29[1]	Shaft cover	1	1501

[1]For double end shaft model replace nr17part with shaft cover part nr29



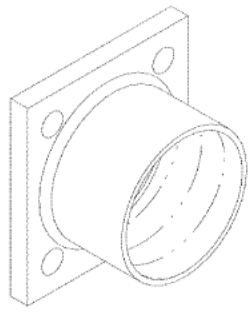
No	DESCRIPTION	PIECES	CODE
30[2]	Flange NPT	2	2016

[2]For NPT flange connection replace nr16 part with NPT flange part nr30



No	DESCRIPTION	PIECES	CODE
31[3]	Flange BSPP	2	2016

[3]For BSPP flange connection replace nr16 part with BSPP flange part nr31



13. MAINTENANCE - CLEANING

Undetachment and uninsurance of the electric power before maintenance can cause electric shock, fire of even death.

If pumping hazardous or toxic fluids, system must be flushed prior to performing service.

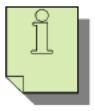
Failure to disconnect and lockout electrical power or engine drive before attempting maintenance can cause severe personal injury or death.

Operation without guards in place can cause serious personal injury, major property damage, or death.

Disconnecting fluid or pressure containment components during pump operation can cause serious personal injury, death or major property damage.

Failure to relief system pressure prior to performing pump service or maintenance can cause personal injury or property damage.

Maintenance shall be performed by qualified technicians only, following the appropriate procedures and warnings as presented in this manual.



For pump maintenance use the service cards attached to the end of the manual.

13.1 Bearing lubrication

ATTENTION! To avoid possible entanglement in moving parts do not lubricate pump bearings, hydraulic adapter coupling of any other parts while the pump is running.

Lubricate the ball bearings every three months at a minimum.

Grease specifications:	**Calcium**		**Lithium**	
CHARACTERISTIC	**NLGI-3**	**NLGI-2**	**NLGI-3**	**NLGI-00**
DISCERNMENT	220-250	265-295	220-250	355-430
DROP POINT °C MIN	95	95	180	160
SOAP LEVEL	13%	13%	13%	
WORKING TEMPERATURE	-10 °C to +95 °C	-10 °C to +95 °C	-25 °C to +120 °C	-25 °C to +120 °C
COLOR	Yellow	Green	Yellow	Green

Table 3: Grease specifications

Daily check of the pump bearings for excessive noise.

Daily check of the gaskets for possible leaks.

Apply grease to the greasers (19) which stand over the bearing covers (1) of (17) of the pump.

Do not overgrease pump bearings. Excessive grease can cause seal failure.

13.2 Pipe fitting lubrication

At least every three months.

CLEANING

13.3 Cleaning after use

1. To clean the pump, leave the outlet open and the inlet closed.
2. Run cleaning fluid and operate for 1 minute.
3. To remove fluid follow step 1.

After flushing the pump some residual fluid will remain in the pump and piping.

Properly dispose of all waste fluids in accordance with the appropriate codes and regulations and don't infect the environment.

13.4 Cleaning of the relief valve (bypass)

1. First of all remove the screws (13).
2. Remove the cover (25).
3. Remove the valve with the cover.
4. Follow the reverse procedure for the replacement.
5.

ATTENTION! Wrong installation of the spring can cause serious injure of even death.

13.5 Strainers

Strainers must be cleaned regularly to avoid pump starvation. Strainer cleaning becomes according to the instructions of the manufacturer and the conditions of use.

For each filter consult the technical characteristics of the manufacturer about maintenance.

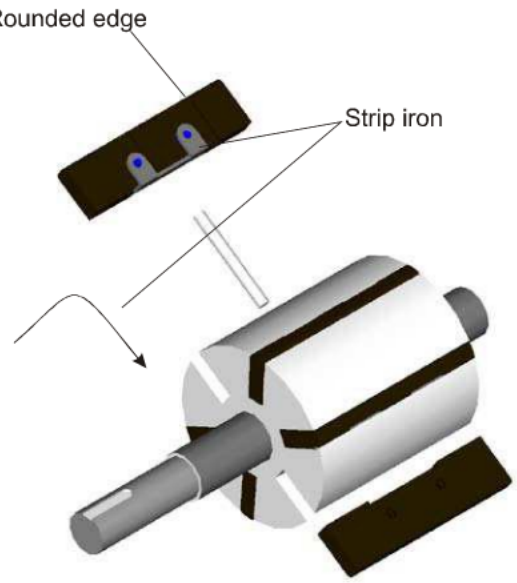
The numbers of the parts mentioned relatively, become by the spare parts drawing.

SERVICE PACKS

13.6 Replacement of the Vanes – Push rods

To perform service pack 1, follow the procedure below:

1. Remove screws (18) placed on cover (6).
2. Remove the cover (6).
3. Remove the rotor (9).
4. Remove the vanes (10).
5. Remove the push rods from the rotor (11).
6. Replacement.
7. Follow the reversed procedure for assembly.
8. While replacing the vanes, the vane should be placed with the strip iron towards the direction of rotation.



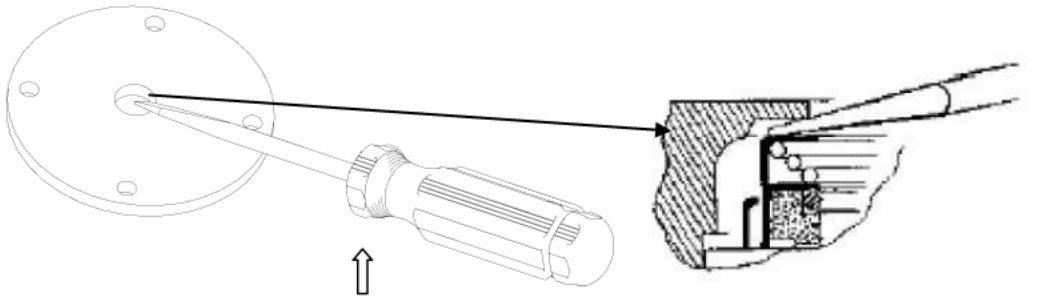
Picture 5: Vane placement

13.7 Replacement of the vanes – push rods – seals

To perform service pack 2 follow the procedure below:

Use the same procedure for replacement of the vanes – push rods until step 3.

1. Remove the screws (18) and the covers (1) and (17),
2. To replace the rotary lip seals (5) put a screw to the setting place of the cover gaskets (6) (from the rotor side) and push.



Picture 6: Cover remove

3. To remove the rotary lip seals, you have to remove first the similar bearing (bearing 3) through an extractor. Before the bearing you have to remove the retaining ring (4).
4. To replace the rotary lip seal (2) put a screw to the setting place of the cover rotary lip seal (1) (from the external side) and push.

Rotary lip seals have to be replaced every 5000 h of pump operation.

The numbers of the parts mentioned relatively, become by the spare parts drawing.

13.8 Replacement of the vanes – push rods – seals – bearings

To perform service pack 3, follow the procedure below:

1. Same procedure for the vane – push rod – gasket replacement and:
2. For the bearing (3) removal you have to remove it with an extractor before you remove the rotary lip seals (5). But first you have to remove the retaining ring (4).

Bearing have to be replaced every 5000 h of pump operation.

ATTENTION! Before each service of maintenance work on the pump and when a part sealed with 0-ring is removed, **always** replace the o-ring.

If body has internal corrugations the pump should return to the manufacturer for repair.

14. TRANSPORT / STORAGE

Pumps do not need special transport conditions. They have to be protected from strokes

About storage, they must not be stored in a wet environment because there is danger of corrosion.

If the pump is stored for a long time and stays for a long time out of operation, anti-corrosive fluid intake to the pump interior is recommended.

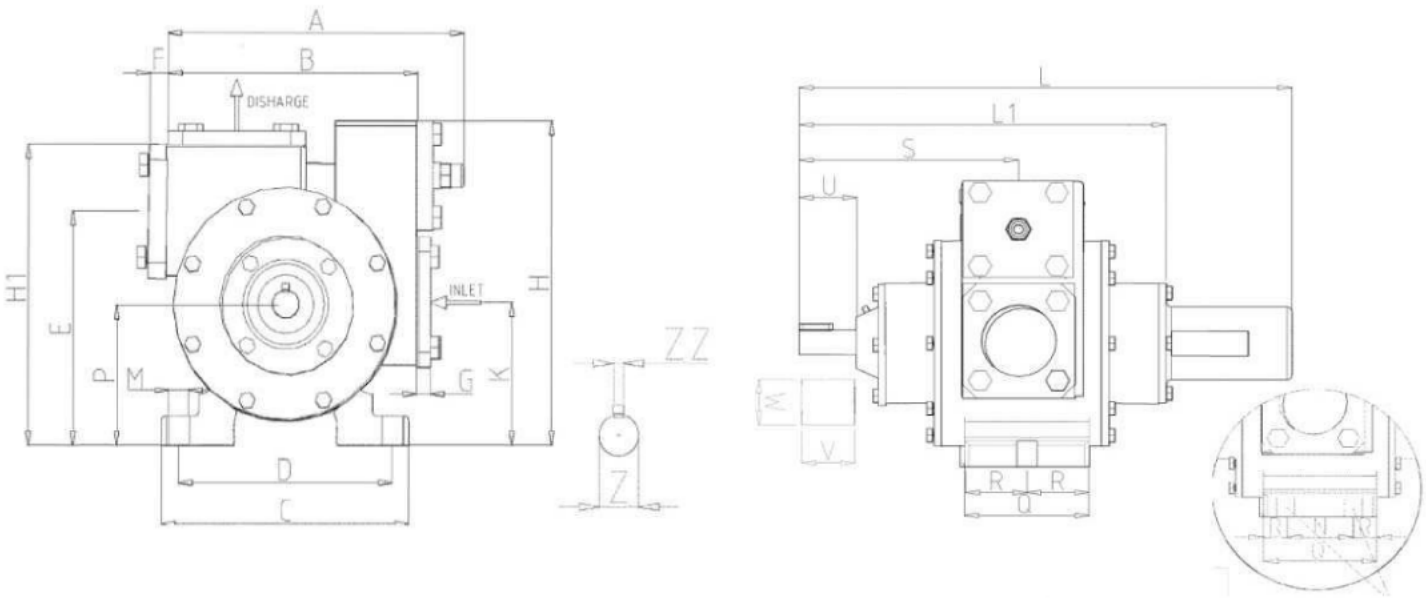
When the pump is withdrawn, it is recommended to attend to a company that deals with material recycling. The specific company will disassemble the pump and divert it to a proper dimension for recycling or storing.

RECYCLING

15. TROUBLESHOOTING

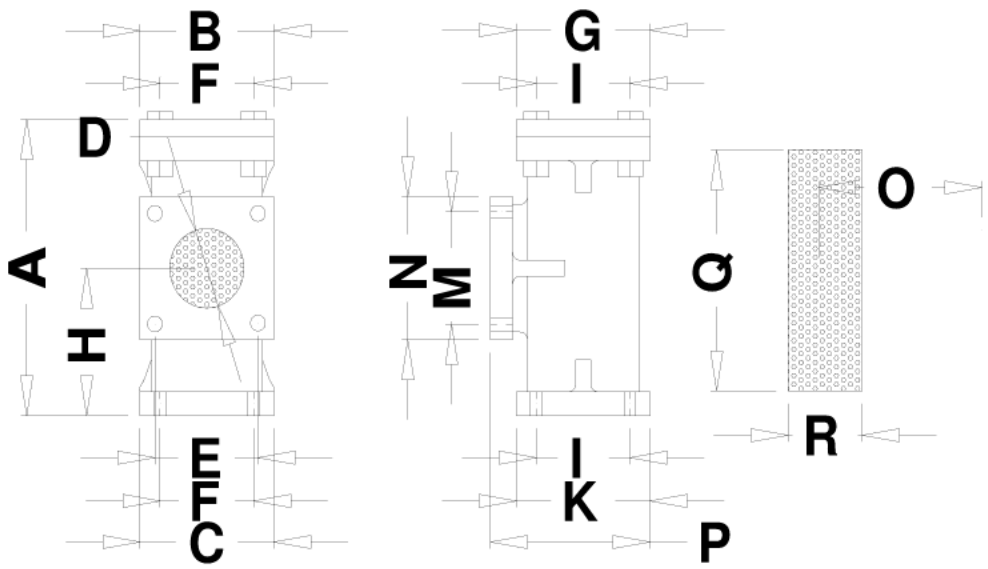
Symptom	Possible cause
Pump not priming	1. Pump not wetted 2. Worn vanes 3. Inlet closed 4. Air leaks in the suction line 5. Strainer clogged 6. Inlet line or valves clogged or too restrictive. 7. Pump speed too low for priming. 8. Relief valve partially open, worn of not sealed properly.
Reduced performance	1. pump speed too low 2. Inlet valves not fully open 3. Air leaks in the inlet line 4. Damaged or worn parts. 5. Vanes installed incorrectly. 6. Relief valve set too low
Noise	1. Excessive vacuum on the pump due to undersized or restricted fittings in the inlet line, pump speed too fast for the viscosity or volatility of the liquid, pump too far from fluid source. 2. Pump not securely mounted. 3. Bearings worn of damaged. 4. Vibration from improperly anchored piping. 5. Bent shaft or drive coupling misaligned. 6. Excessively worn rotor. 7. Relief valve setting too low
Damaged vanes	1. Foreign objects entering the pump. 2. Running the pump dry for extended periods of time. 3. Cavitation. 4. Viscosity too high for the vanes and / or the pump speed. 5. Incompatibility with the liquids pumped. 6. Excessive heat. **7. Vanes installed incorrectly**
Broken shaft	1. Pump / driver misalignment. 2. Viscosity too high for the pump speed.
Mechanical seal leakage	1. Incompatible fluid (mechanical seal corrosion) 2. Ball bearings overgreased. 3. O-rings not replaced after opening.

16. DIMENSIONS



Pump model		A	B	C	D	E	F	G	H	H1	K	L	L1	M	N	P	Q	R	S	U	V	W	Z	ZZ	Weight
SLD2	mm	257	200	195	167	173	16	10	229	221	96	423	343	16	-	104	93	46	204	65	50	48	28	4	36.5kg
	inch	10.11	7.87	7.67	6.57	6.81	0.62	0.39	9.01	8.7	3.78	16.65	13.5	0.62	-	4.09	3.66	1.81	8.03	2.56	1.97	1.89	1.10	0.15	80lbs
SLD2.5	mm	293	216	208	182	189	16	12	262	248	108	465	378	16	-	110	115	57.5	225	67	50	48	30	4	51.5kg
	inch	11.53	8.5	8.18	7.16	7.44	0.62	0.47	10.31	9.76	4.25	18.3	14.88	0.62	-	4.33	4.52	2.26	8.86	2.64	1.97	1.89	1.18	0.15	112lbs
SLD3	mm	268	266	248	220	-	-	12	328	303	127	490	400	17.5	94	143	130	18	237	75	50	51	35	5	81kg
	inch	10.55	10.47	9.76	8.66	-	-	0.47	12.91	11.93	5	19.29	15.75	0.68	3.7	5.62	5.11	0.70	9.33	2.95	1.97	2	1.37	0.19	178.5lbs

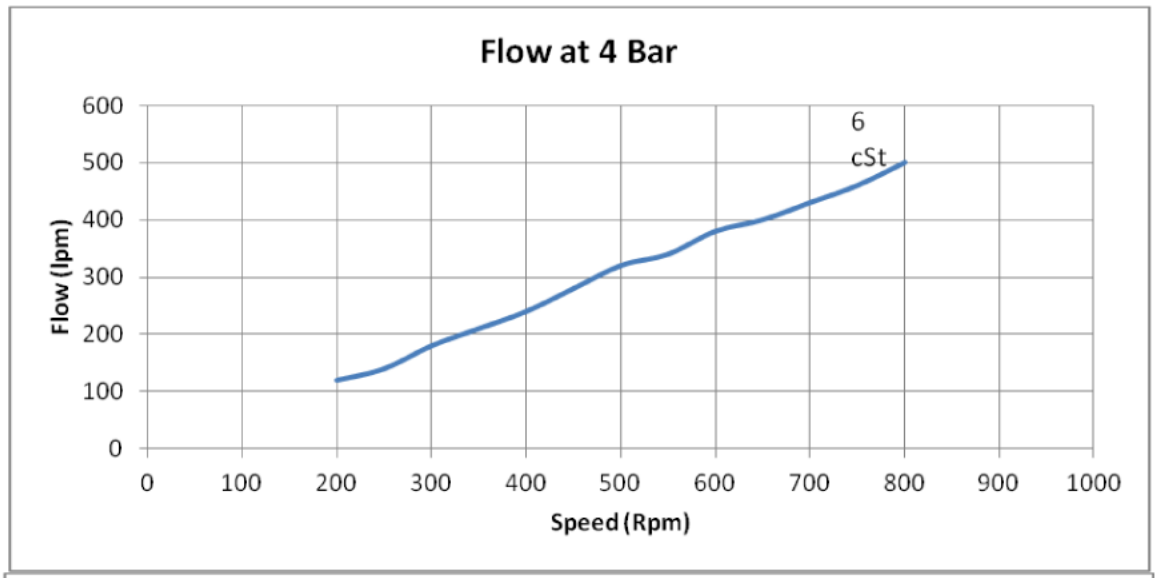
FILTER 2´´ - DIMENSION LIST

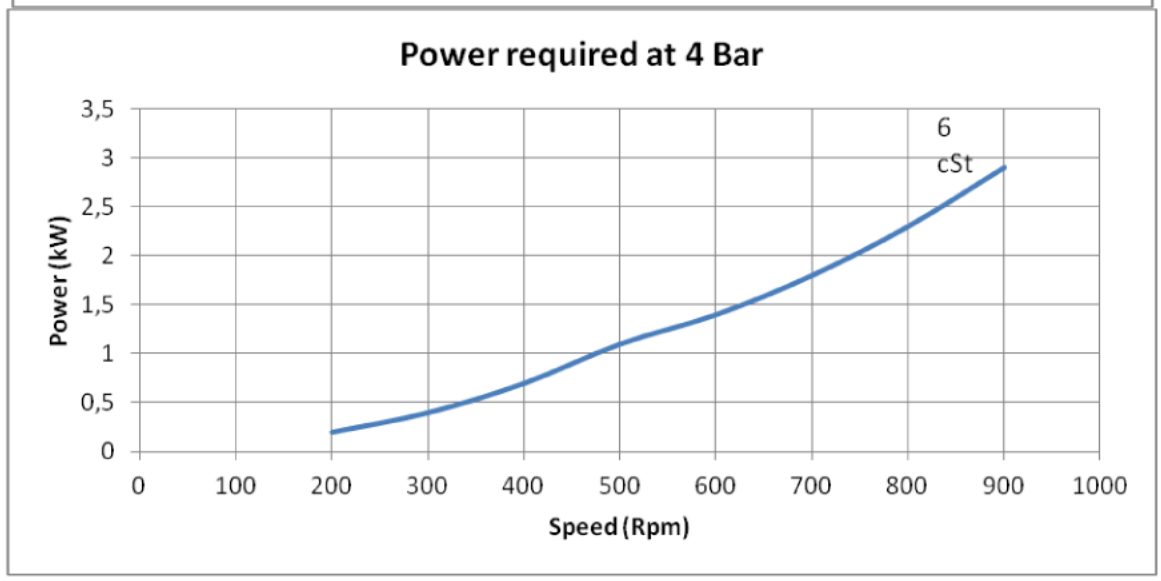


Kind of filter : **FILTER 2´´** type: **FP2**					
DIMENSIONS	mm	DIMENSIONS	mm	DIMENSIONS	
A	191	L	-	W	
B	90	M	65	X	
C	90	N	90	Y	
D	49	O	02	Z	
E	75	P	110	ZZ	
F	65	Q	175		
G	90	R	49		
H	89	S			
I	65	T			
J	-	U			
K	90	V			

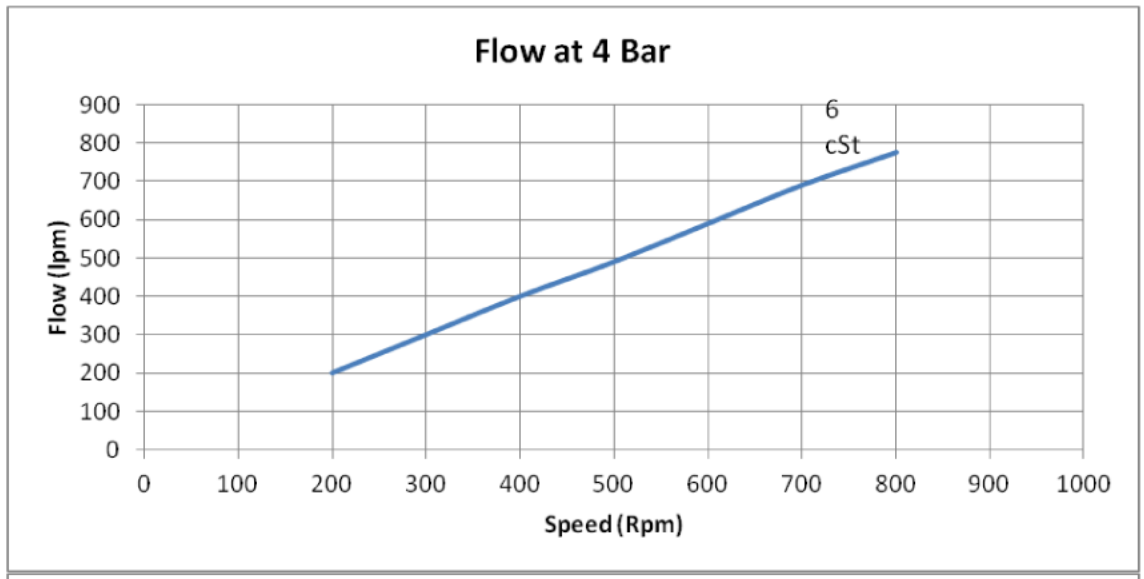
17. PERFORMANCE CURVES

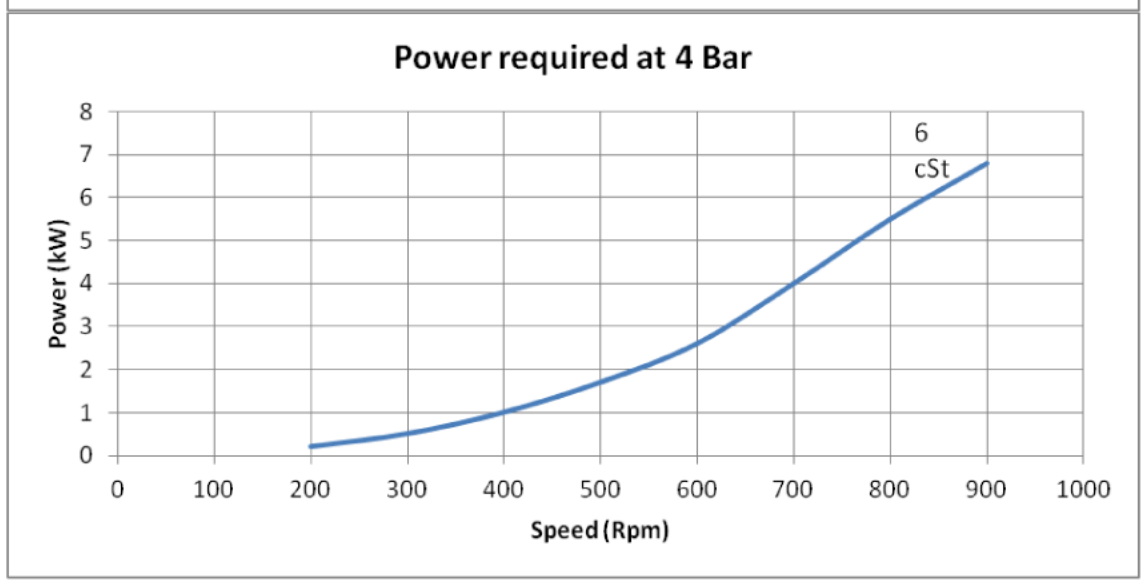
SLD2



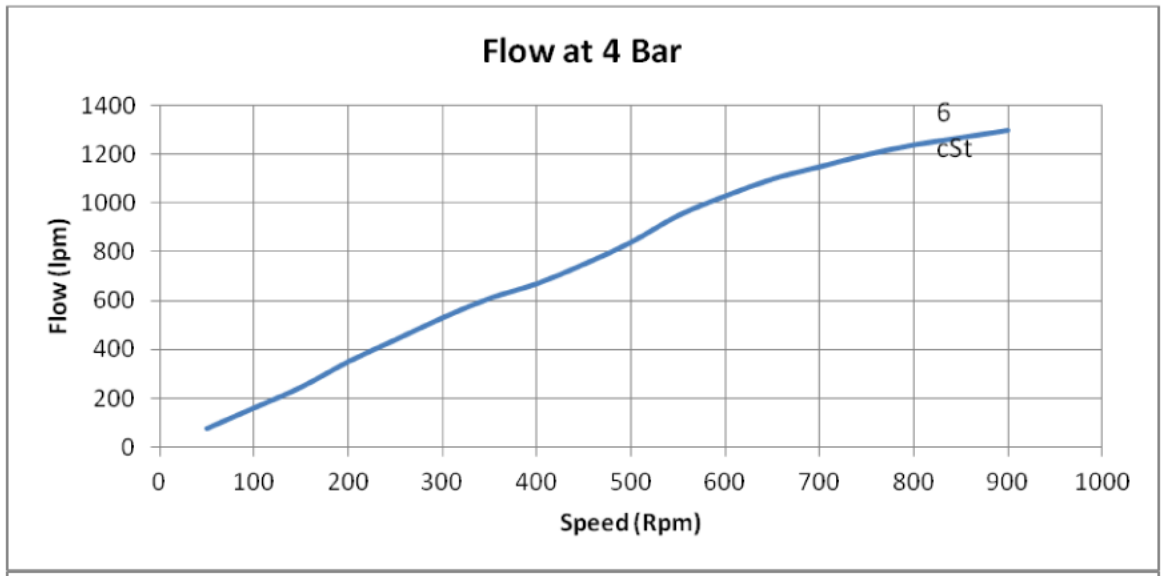


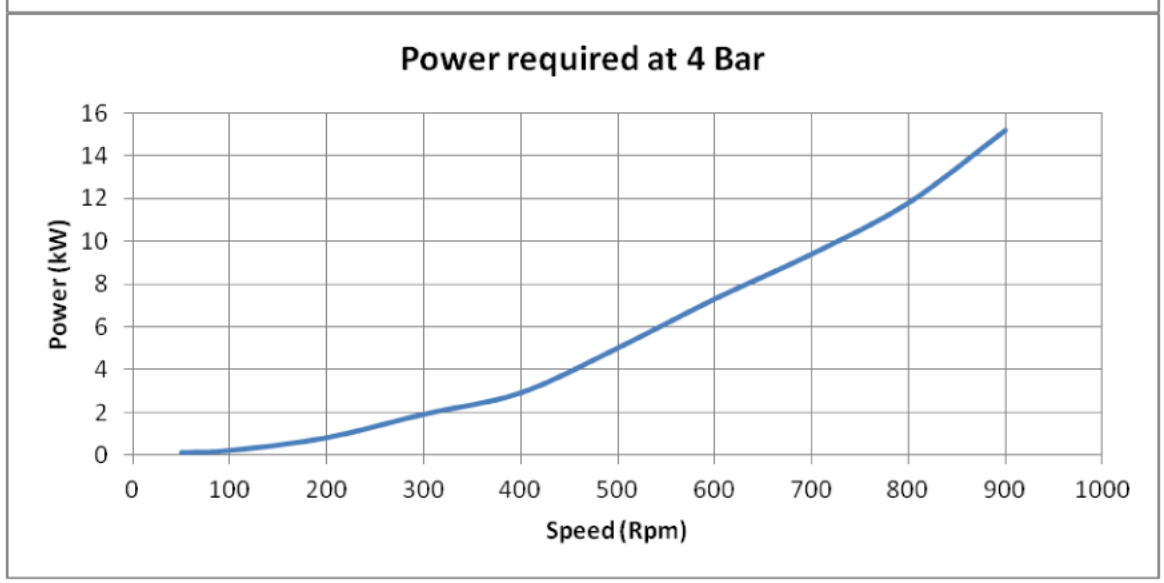
SLD2.5


Flow at 4 Bar
Flow (lpm)
900
800
700
600
500
400
300
200
100
0
0
100
200
300
400
500
600
700
800
900
1000
Speed (Rpm)
6
cSt


Power required at 4 Bar
Power (kW)
8
7
6
5
4
3
2
1
0
0
100
200
300
400
500
600
700
800
900
1000
Speed (Rpm)
6
cSt

SLD3





-The performance curves regard to the pump only. The performance of the pump may vary depending on the application. The measurement took place at the laboratory of EMHKAM PUMPS. The pumping liquid was viscosity 6 cSt petroleum.

18. SERVICE CARD

DATE: / / **REPAIRER**_____

SERVICE NUMBER:_____**PUMP TYPE :**_____

KIND OF WORK / SPARE PART	CHANGE	CLEANING	GRINDING
PUMP BODY			
PUMP COVER (large , front)			
PUMP COVER (large , buck)			
FRONT GASKETS			
GASKETS BEHIND			
O-RING			
FRONT BEARINGS			
BEARINGS BEHIND			
SHAFT			
ROTOR			
VANES			
PUSH RODS			
PUMP COVER (small, front)			
PUMP COVER (small , behind)			
BY-PASS			
EXTERNAL CLEANING			
PAINT			

COMMENTS:

STAMP **SIGNATURE**

DATE: / / **REPAIRER**_____

SERVICE NUMBER:_____**PUMP TYPE :**_____

KIND OF WORK / SPARE PART	CHANGE	CLEANING	GRINDING
PUMP BODY			
PUMP COVER (large , front)			
PUMP COVER (large , buck)			
FRONT GASKETS			
GASKETS BEHIND			
O-RING			
FRONT BEARINGS			
BEARINGS BEHIND			
SHAFT			
ROTOR			
VANES			
PUSH RODS			
PUMP COVER (small, front)			
PUMP COVER (small , behind)			
BY-PASS			
EXTERNAL CLEANING			
PAINT			

COMMENTS:

STAMP **SIGNATURE**