MKS Series

MKS40 – MKS45 – MKS50

MKS55 – MKS60 – MKS65

Use and Maintenance Manual

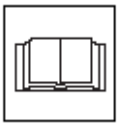
INDEX

1. INTRODUCTION

This manual describes the use and maintenance instructions of the **MKS** pump, and should be carefully read and understood before using the pump.
Correct use and adequate maintenance will guarantee the pump's trouble-free operation for a long time.
The Interpump Group declines any responsibility for damage caused by misuse or the non-observance of the instructions indicated in this manual.
Upon receiving the pump, check that it is complete and in perfect conditions.
Should anything be found out of order, please contact us before installing and starting the pump.

2. SYMBOL DESCRIPTION

Warning Signal



Carefully read the indications in this manual before operating the pump.

Danger Signal
Electrocution danger

Danger Signal
Use face guard

Danger Signal
Use protective glasses

Danger Signal
Use adequate hand protection before operating the pump

Danger Signal
Use appropriate boots

3. SAFETY

3.1 General safety indications

The misuse of pumps and high pressure units, and the non-observance of installation and maintenance instructions may cause severe injury to people and/or damage to property. Anyone requested to assemble or use high pressure units must possess the necessary competence to do so, should be aware of the characteristics of the components assembled/used, and must adopt all the necessary precautions in order to guarantee maximum safety in any operating condition. In the interest of safety, no precaution that is reasonably feasible must be neglected, both by the Manufacturer and the Operator.

3.2 High pressure unit safety requirements

1. The pressure line must always be equipped with a safety valve.
2. High pressure unit components, in particular for those units working outside, must be adequately protected against rain, frost and heat.
3. The unit's electrical parts must be adequately protected from water spray, and must comply with the specific norms in force.
4. High pressure pipes must be correctly sized for the unit's maximum operating pressure, and must only be used within the pressure range indicated by the pipe Manufacturer. The same conditions apply to all other unit accessories where high pressure is involved.
5. The extremities of high pressure pipes must be sheathed and fastened to a steady structure in order to avoid dangerous whiplashes should they burst or should their connections break.
6. Appropriate safety guards must be provided for the pump transmission systems (joints, pulleys and belts, auxiliary drives).

3.3 Safety during operation

The working area of a high pressure system must be clearly signalled. Access must be prohibited to non-authorised personnel and, if possible, the area must be fenced in. The personnel authorised to access this area must be previously trained and informed about the risks that may arise from failures or malfunctions of the high pressure unit.
Before starting the unit, the Operator must check:

1. That the high pressure unit is correctly fed (see paragraph 9.5).
2. That Pump intake filters are perfectly clean; we advise to use a device that indicates the filter's clogging level.
3. That electrical parts are adequately protected and in perfect conditions.
4. That high pressure pipes do not show apparent signs of abrasion, and that fittings are in perfect shape.

Any anomaly or reasonable doubt that may arise before or during operation must be promptly reported, and verified by competent personnel. In these cases, pressure must be immediately released and the high pressure unit stopped.

3.4 General procedures for using nozzles

1. The Operator must always place his own and other worker's safety before any other interest; his actions should always be governed by good sense and responsibility.
2. The Operator must always wear a helmet with a protective visor, waterproof clothing, and appropriate boots capable of guaranteeing grip on wet pavements.

Note: appropriate clothing will effectively protect against water spray, but it may not offer adequate protection against the direct impact of water jets or sprays from a close distance. Some circumstances may require further protection.

3. We advise to employ a team of at least two Operators, able to provide mutual and immediate assistance if needed, and rotate their duties in case of long and heavy work.
4. Access to the work area that is within the water jet's range must be absolutely forbidden; the area must be free of objects that may be unintentionally hit by the pressurised jet, causing damage or dangerous situations.
5. The water jet must only and always be directed towards the work area, even during testing or preliminary inspections.
6. The Operator must always pay attention to the trajectory of the debris removed by the water jet. If necessary, adequate side guards must be provided by the Operator in order to protect anything that may be accidentally exposed.
7. For no reason must the Operator be distracted during operation. The personnel that needs to access the working area must wait for the Operator to suspend his work, and then immediately make his presence known.
8. For safety reasons, it is important that each member of the team is perfectly aware of the intentions and actions of other team members in order to avoid dangerous misunderstandings.
9. The high pressure unit must not be started and brought up to pressure unless each member of the team is in his designated position, and the Operator has already directed the nozzle towards the work area.

3.5 Safety during unit maintenance

1. The maintenance of the high pressure unit must be done within the time intervals indicated by the Manufacturer, who is responsible for the entire unit's compliance with the norms in force.
2. Maintenance must always be carried out by specialised and authorised personnel.
3. Assembly and disassembly of the pump and its various components must be performed exclusively by authorised personnel, using appropriate tools in order to avoid damage to components and connections.
4. To guarantee total reliability and safety, always use original spare parts.

4. PUMP IDENTIFICATION

Each pump is equipped with a rating plate that indicates:

Pump model and version
Serial number
Maximum rpm
Power absorbed Hp - kW
Pressure bar - P.S.I.
Flow rate l/min - G.P.M

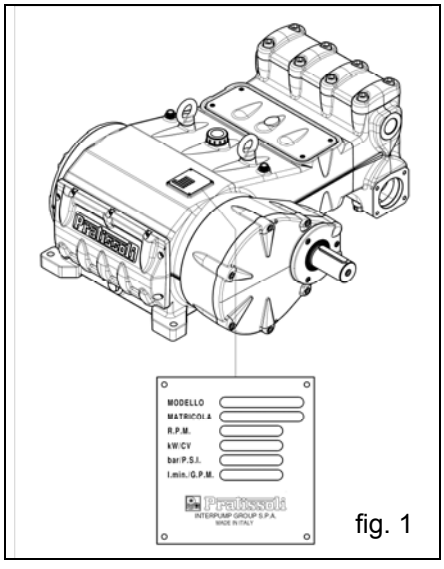


fig. 1

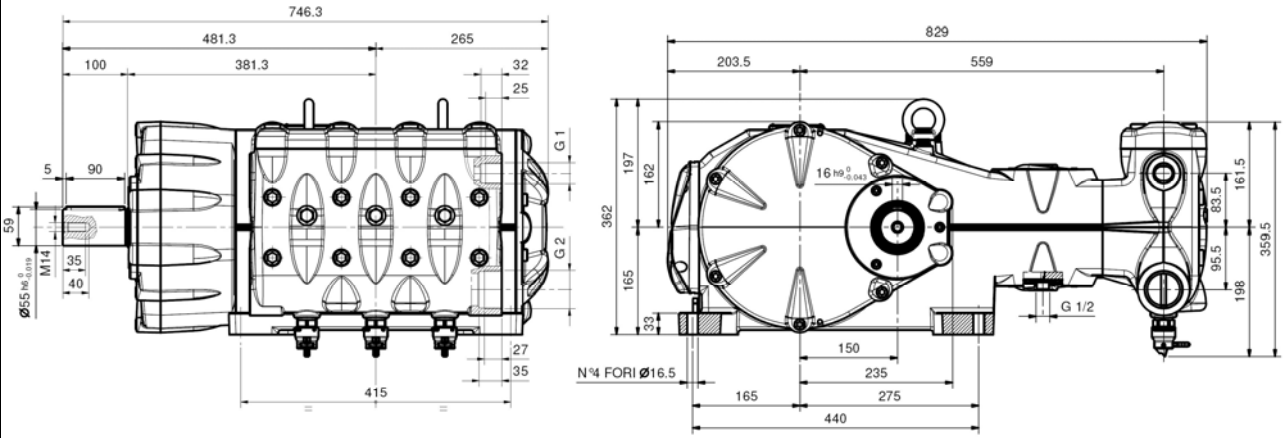
Pump model, version and serial number must always be specified when ordering spare parts.

5. TECHNICAL CHARACTERISTICS

Model	RPM	Flow rate		Pressure		Power	
		l/min	Gpm	bar	psi	kW	Hp
MKS 40	1500	183	48.4	400	5800	140	190
	1800	184	48.6	400	5800	140.5	191
MKS 45	1500	232	61.3	300	4350	133	181
	1800	233	61.6	300	4350	134	182
MKS 50	1500	287	75.8	250	3625	137	186
	1800	288	76.1	250	3625	137.5	187
MKS 55	1500	347	91.7	200	2900	132.5	180
	1800	348	92	200	2900	133	181
MKS 60	1500	413	109.1	170	2465	134	182
	1800	415	109.7	170	2465	134.5	183
MKS 65	1500	485	128.2	150	2175	139	189
	1800	487	128.7	150	2175	140	190

6. DIMENSIONS AND WEIGHT

For dimensions and weight of **MKS 40**, **MKS 45** and **MKS 50** pumps, please refer to fig. 2.



Weight - 378 Kg

fig. 2

For dimensions and weight of **MKS 55**, **MKS 60** and **MKS 65** pumps, please refer to fig. 2/a.

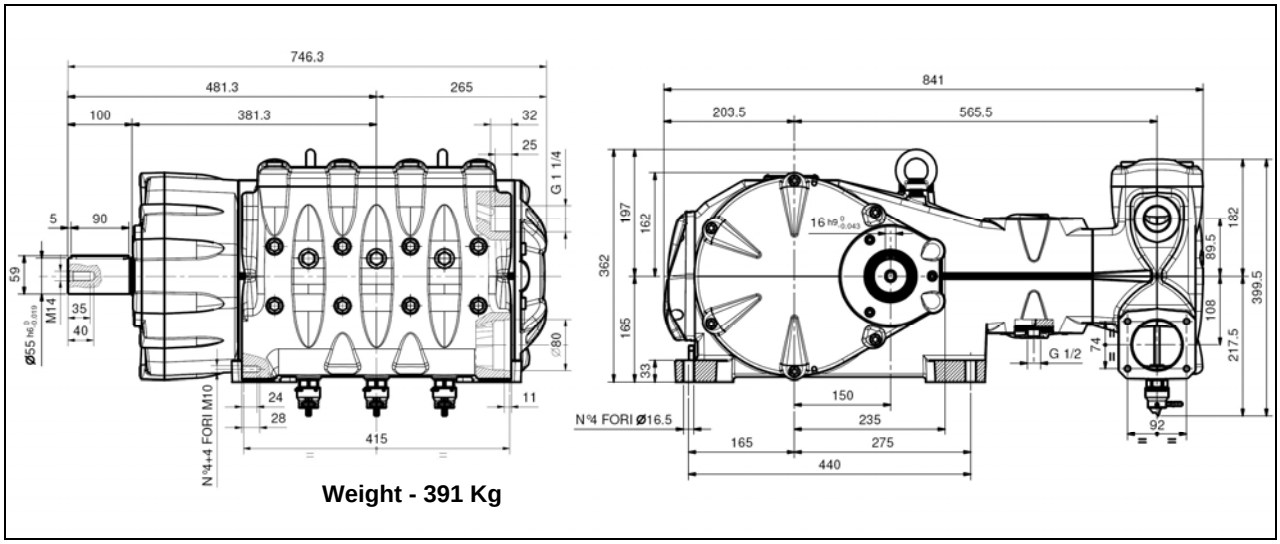


fig. 2/a

For dimensions of pumps **MKS 40, MKS 45 and MKS 50 Hydraulic Pack version**, please refer to fig.2/b.

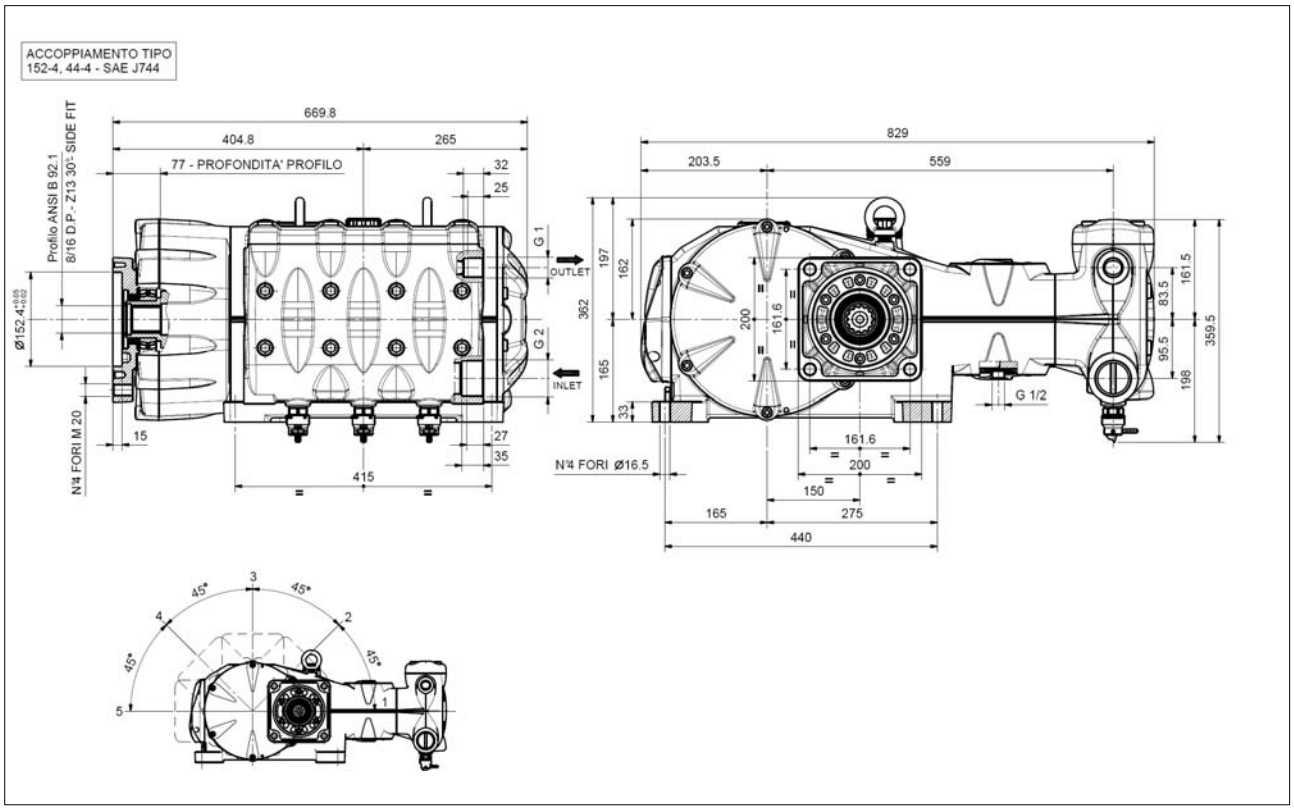


fig. 2/b

For dimensions of pumps **MKS 55, MKS 60 and MKS 65 Hydraulic Pack version** , please refer to fig. 2/c.

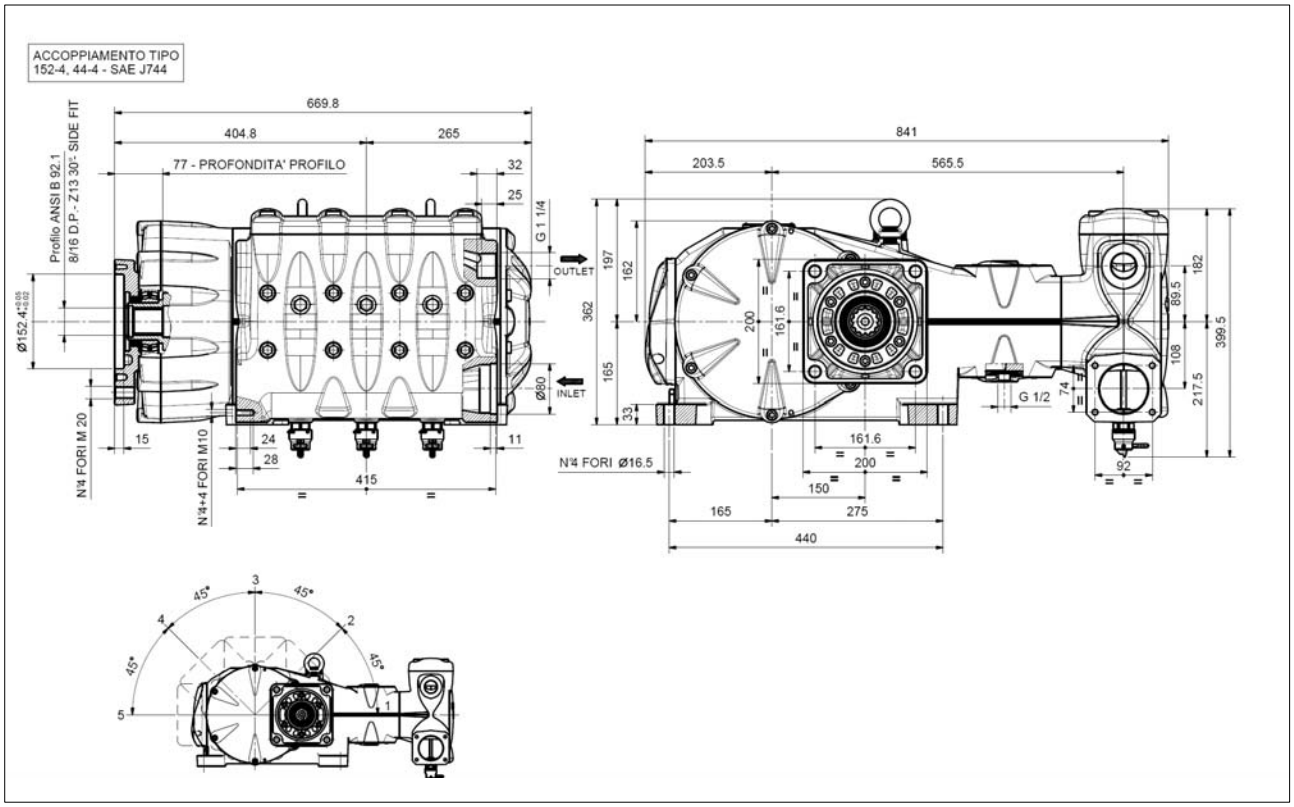


fig. 2/c

ACCOPPIAMENTO TIPO 152-4, 44-4 –SAE J744	SAE J744 STANDARD MOUNT 152-4, 44-4
PROFONDITA' PROFILO	PROFILE DEPTH

7. INFORMATION REGARDING PUMP USE

The **MKS** pump has been designed to operate with filtered water (see paragraph 9.7) at a maximum temperature of 40°C.
Other fluids may be used only upon the approval of the ***Technical Department or Customer Assistance Service.***

7.1 Water temperature

The maximum water temperature allowed is 40°C. Nonetheless, it is possible to use the pump at temperatures of up to 60° for short periods of time. In this case we advise to consult the ***Technical Department or Customer Assistance Service.***

7.2 Maximum flow rate and pressure values

The performance values indicated in the catalogue refer to the maximum performance of the pump. **Regardless** of the power used, pressure and maximum rpm values indicated on the plate may not be exceeded unless expressly authorised by the ***Technical Department or Customer Assistance Service.***

7.3 Lowest rpm

Any rpm value that differs from what indicated in the performance table (see chapter 5) must be expressly authorised by the ***Technical Department or Customer Assistance Service.***

7.4 Recommended lubricant oil types and Manufactures

The pump is delivered with lubricant oil compliant with room temperatures ranging from 0°C to 30°C.
Some recommended lubricant types are indicated in the table below. These lubricants are treated with additives in order to increase corrosion protection and resistance to fatigue (according to DIN 51517 part 2).
As an alternative, Automotive SAE 85W-90 gearing lubricants may also be used.

Hersteller Manufacturer Producteur	Schmieröl Lubricant Lubrifiant
Agip	AGIP ACER 220
ARAL	Aral Degol BG 220
BP	BP Energol HLP 220
Castrol	CASTROL HYSPIN VG 220, CASTROL MAGNA 220
DEA	Falcon CL 220

Hersteller Manufacturer Producteur	Schmie fig. 3 Lubrica... Lubrifiant
elf	ELF POLYTELIS 220, REDUCTELF SP 220
Esso	NUTO 220, TERESSO 220
FINA	FINA CIRKAN 220
FUCHS	RENOLIN 212, RENOLIN DTA 220
Mobil	Mobil DTE Oil BB

Hersteller Manufacturer Producteur	Schmieröl Lubricant Lubrifiant
Shell	Shell Tellus Öl C 220
SRS	Wintershall Ersolan 220, Wintershall Wiolan CN 220
TEXACO	RANDO HD 220
TOTAL	TOTAL Cortis 220

Check the oil level by using the apposite oil level dipstick with minimum and maximum value notches ①, fig.3.
If necessary, refill from the oil cap ③, fig.3.
Correct oil level inspection is done with the pump at room temperature; oil changed with the pump at working temperature, by removing the rear plug ②, fig.3.
Checking and changing oil is carried out as indicated in chapter 11.
The amount required is ~13.5 litres.

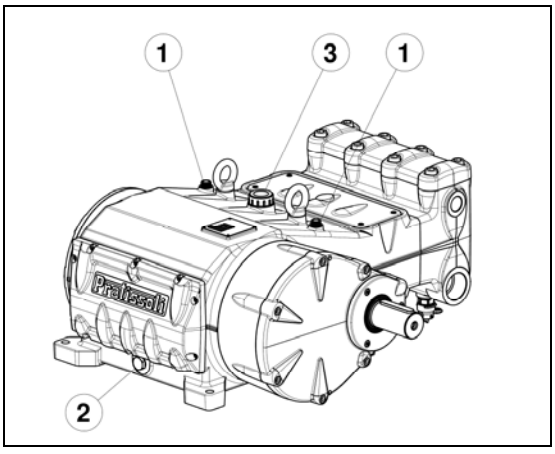
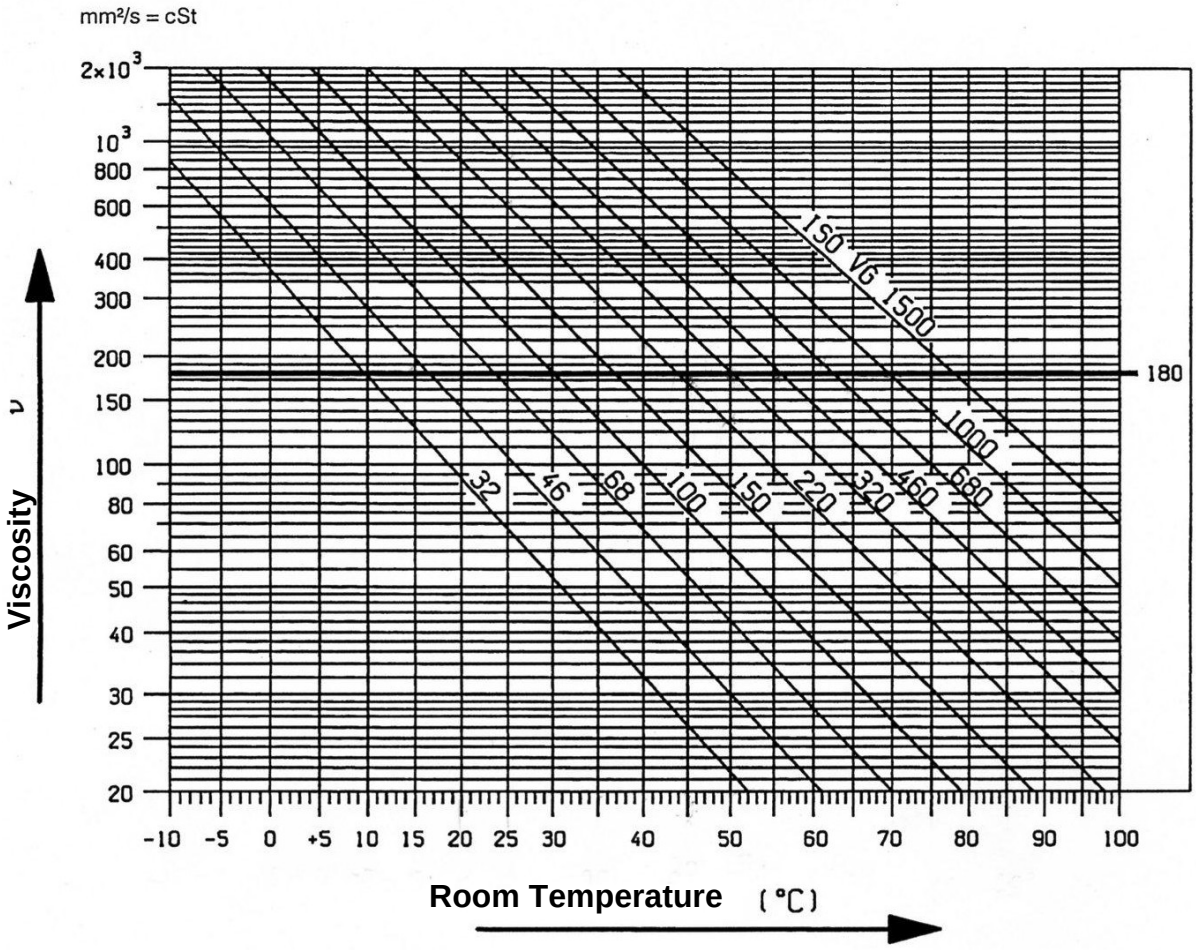


fig.3

In any case, oil must be changed at least once a year since it may deteriorate by oxidation.

For room temperatures not included in the 0°C to 30°C range, follow the indications contained in the diagram below, keeping in mind that the oil must have a minimum viscosity of 180 cSt.

Viscosity / Room Temperature Diagram



Exhausted oil must be collected in an appropriate recipient and disposed of in apposite locations.
In absolutely no case may it be dispersed in the environment.

8. PORTS AND CONNECTIONS

MKS series pumps are provided with (see fig.4 and fig.4/a):

N° 2 inlet ports “IN“: G2” in the versions **MKS 40, MKS 45, MKS 50**
Ø80 mm in the versions **MKS 55, MKS 60, MKS 65**

The line can be connected to either of the two inlet ports; the ones not being used must be hermetically sealed.

N° 2 outlet ports “OUT”: G1” in the versions **MKS 40, MKS 45, MKS 50**
G1 ¼” in the versions **MKS 55, MKS 60, MKS 65**

N° 1 drain port “DRAIN “: with G1/2” hole in the lower cover to monitor any water leakage due to wear of the pressure packings. In case of leaks, please consult the repair manual.
This hole must always be kept open.

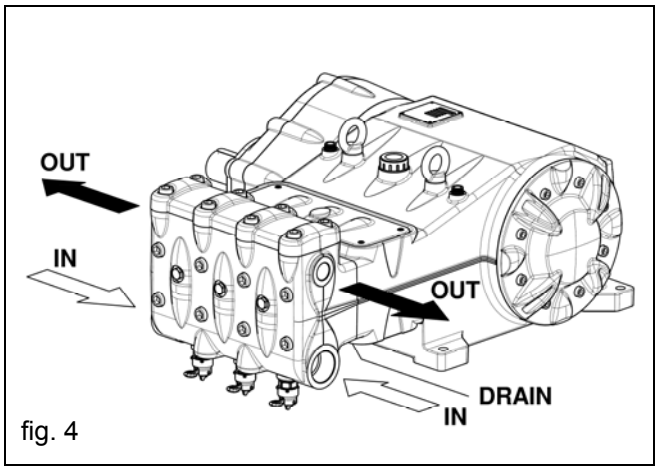


fig. 4

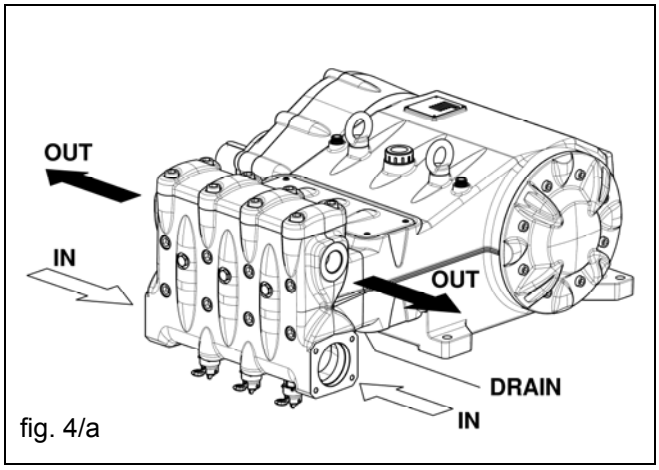


fig. 4/a

9. PUMP INSTALLATION

9.1 Installation

The pump must be installed in a horizontal position using the apposite perforated feet Ø16.5.
The base must be perfectly flat and sufficiently rigid in order to avoid bending and misalignments on the pump / transmission coupling axis due to the torque applied during operation.

The pump is equipped with two lifting eyebolts to facilitate installation, as shown in the following figure.

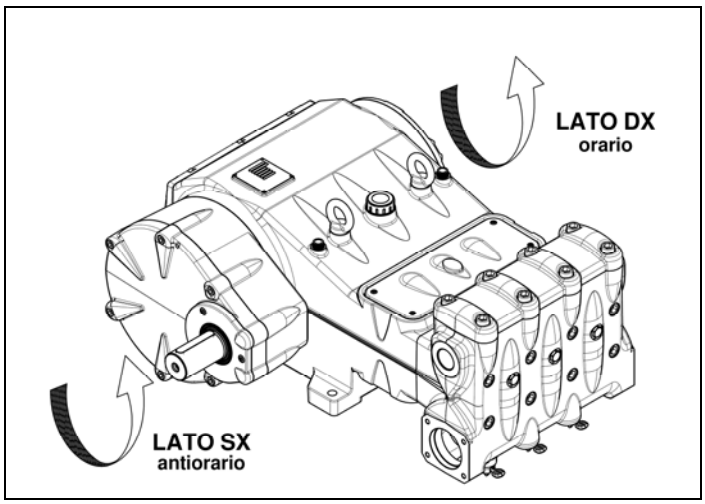
The lifting eyebolts must <u>not</u> be removed.

Eyebolts are designed and sized for the pump weight, additional loads other than the pump weight its self are not allowed.

The pump's shaft (PTO) must not be rigidly connected to the motor unit.
The following transmission types are suggested:
- Flexible joint
- Cardan joint (please respect the maximum working angle indicated by the Manufacturers)
- Belts; for correct application, please contact the ***Technical Department or the Customer Assistance Service***

9.2 Sense of rotation

An arrow situated on the crankcase near the shaft indicates the correct sense of rotation.
Standing in front of the pump head, the sense of rotation must be as shown in fig.5.



Lato Dx	Right Side
Lato Sx	Left Side
orario	clockwise
antiorario	counter-clockwise

fig. 5

9.3 Version change and reducer positioning

A right version pump is defined when:
observing the pump from the head side, the PTO shank of the pump shaft is on the right side.

A left version pump is defined when:
observing the pump from the head side, the PTO shank of the pump shaft is on the left side. (see fig.5).

The version may be changed only by specialised and authorised personnel by carefully following the instructions in the repair manual.

Furthermore, it is possible to position the reducer in 5 different positions, both on the right and left sides, as shown in fig.6.

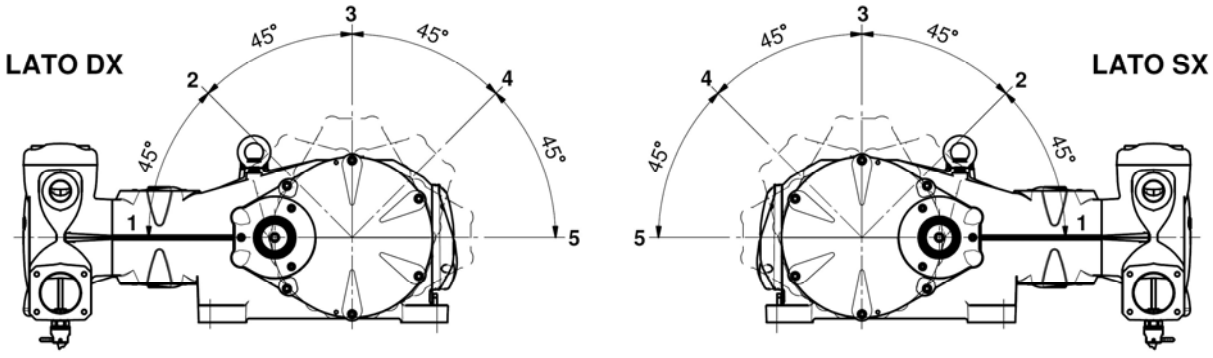


fig. 6

The reducer's position may be changed only by specialised and authorised personnel by carefully following the instructions in the repair manual.

9.4 Hydraulic Connections

In order to isolate the system from the vibrations produced by the pump, we advise to build the first section of the duct near the pump (both for intake and delivery) with flexible tubes. The consistency of the intake section must allow to avoid deformation caused by the depressurisation produced by the pump.

9.5 Pump feeding

MKS pumps must always be installed under positive head, i.e.they must receive water by gravity or by forced feeding, and never suck from a lower level.
The pumps can tolerate minimum NPSH even as low as 1 m. (3.28 ft.), however, to obtain a better volumetric efficiency and above all to avoid cavitation, the minimum NPSH available, measured at the pump inlet flange, will have to be at least equal or higher than the values shown in the chart below.

	MKS 40	MKS 45	MKS 50	MKS 55	MKS 60	MKS 65
$NPSH_r$(ft)	14.8	18	21.3	24.6	26.2	29.5

For the pumps with higher displacement, that is MKS 55 – 60 – 65, it is strongly recommended to use a booster pump to avid cavitation , in view of the geometry of the hydraulic section and of the remarkably high flow rates.
The booster pump must have the following specifications : flow rate at least double than the rated flow rate of the pump, and pressure between 2 and 3 bar (30 to 45 p.s.i.) .
These feeding conditions must be respected in all running conditions.

Booster start-up must always precede piston pump start-up.
In order to protect the pump, we advise to install a pressure switch on the feeding line after the filters.

9.6 Suction line

For the pump's correct operation, the suction line must have the following characteristics:

1. A minimum internal diameter as indicated in the diagram in paragraph 9.9, and in any case equal or greater than the pump head's value.
   Along the duct, avoid localised diameter reductions that may cause pressure drops with subsequent cavitation. Absolutely avoid 90° elbows, connections with other pipes, bottlenecks, counter-slopes, upside-down "U" shaped curves, "T" connections.
2. The selected lay-out must allow to avoid cavitation.
3. It should be perfectly airtight, and built in a way that guarantees perfect sealing over time.
4. Avoid pump emptying when stopping (even partial emptying).
5. Do not use hydraulic-type fittings, 3 or 4 way fittings, adaptors, etc… since they may hinder the pump's performance.
6. Do not install Venturi tubes or injectors for detergent intake.
7. Avoid the use of standing valves, check valves, or any other type of one-way valves.
8. Do not connect the by-pass line from the valve directly to the pump suction line.
9. Provide appropriate baffle plates inside the tank in order to avoid that water flows coming from both the by-pass and feeding lines may create turbulence near the tank's outlet port.
10. Make sure that the suction line is perfectly clean inside before connecting it to the pump
11. The pressure gauge for checking booster pressure must be installed near the piston pump's outlet port, and always after the filters.

9.7 Filtering
On the pump's suction line, install two filters as indicated in fig.7 and fig.7/a.

With the manual adjustment valve.

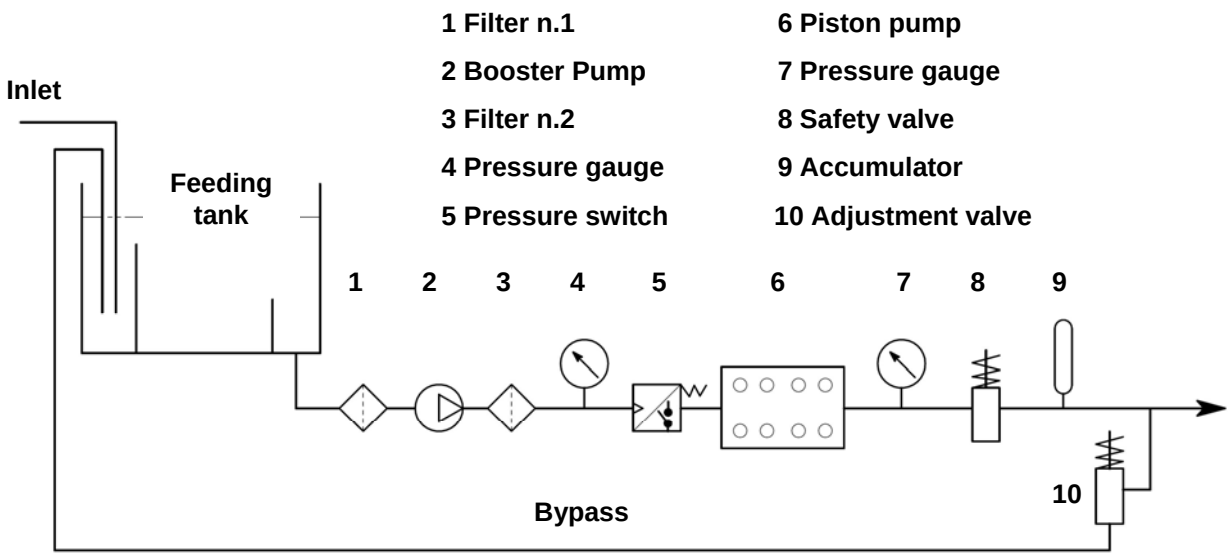


fig. 7

With the pneumatic adjustment valve.

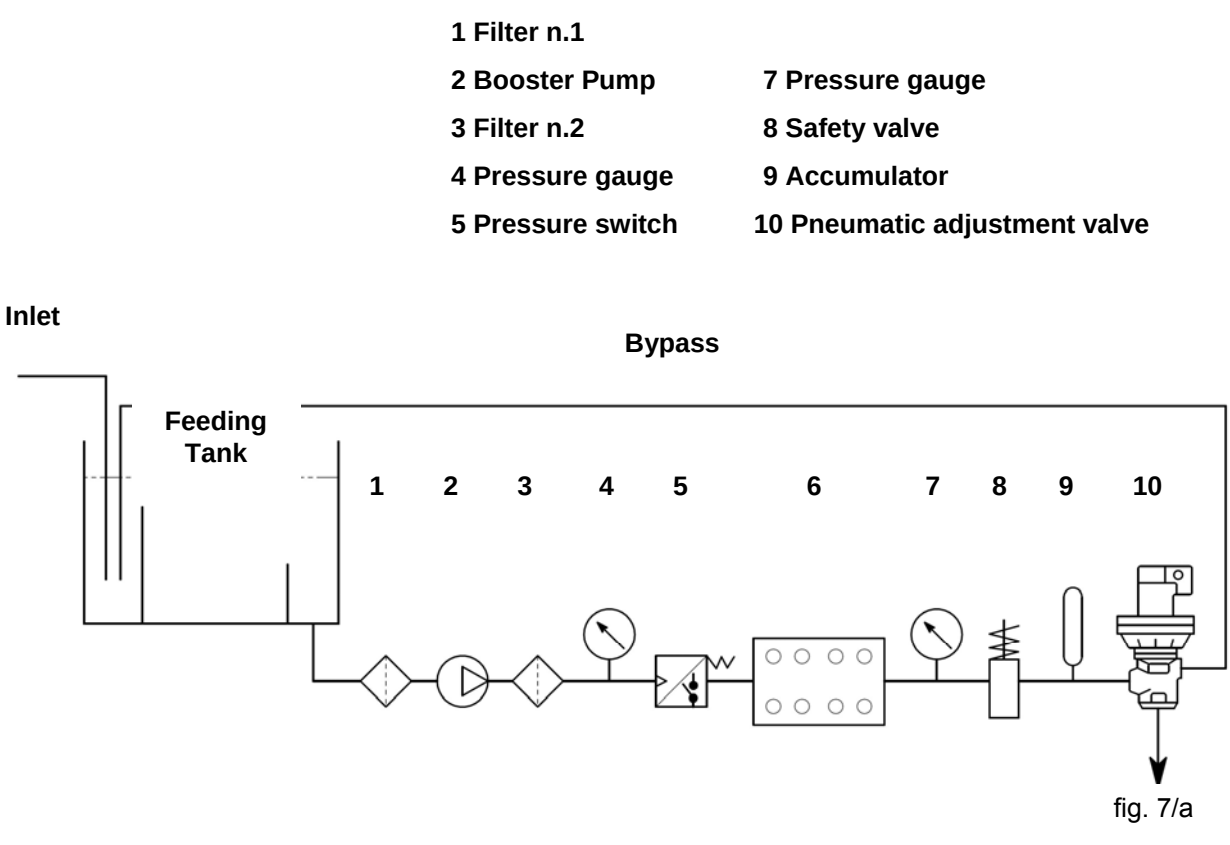


fig. 7/a

The filter must be installed as close as possible to the pump, should allow easy inspection and have the following characteristics:

1. Minimum capacity 3 times greater than the pump's rated flow value.
2. Filter port diameters must not be smaller than the pump inlet ports
3. Filtration degree ranging between 200 and 360 μm.

In order to guarantee correct pump operation, it is important to plan periodical cleaning of the filter depending on actual pump usage, water quality and real clogging conditions.

9.8 Delivery line

To obtain a correct delivery line, please comply with the following installation instructions:

1. The internal diameter of the pump must allow to guarantee correct fluid speed; see diagram in paragraph 9.9.
2. The first section of the pipe connected to the pump must be flexible in order to isolate pump vibrations from the rest of the system.
3. Use high pressure pipes and fittings that guarantee wide safety margins in any working condition.
4. Install a safety valve on the delivery line.
5. Use pressure switches suitable for the pulsating loads typical of piston pumps.
6. In the design phase, take into proper account the pressure drop along the line, since this causes a reduction in usage pressure with respect to the value measured at the pump
7. If the pump pulsations are harmful for particular applications, install an appropriately sized pulsation damper on the delivery line.

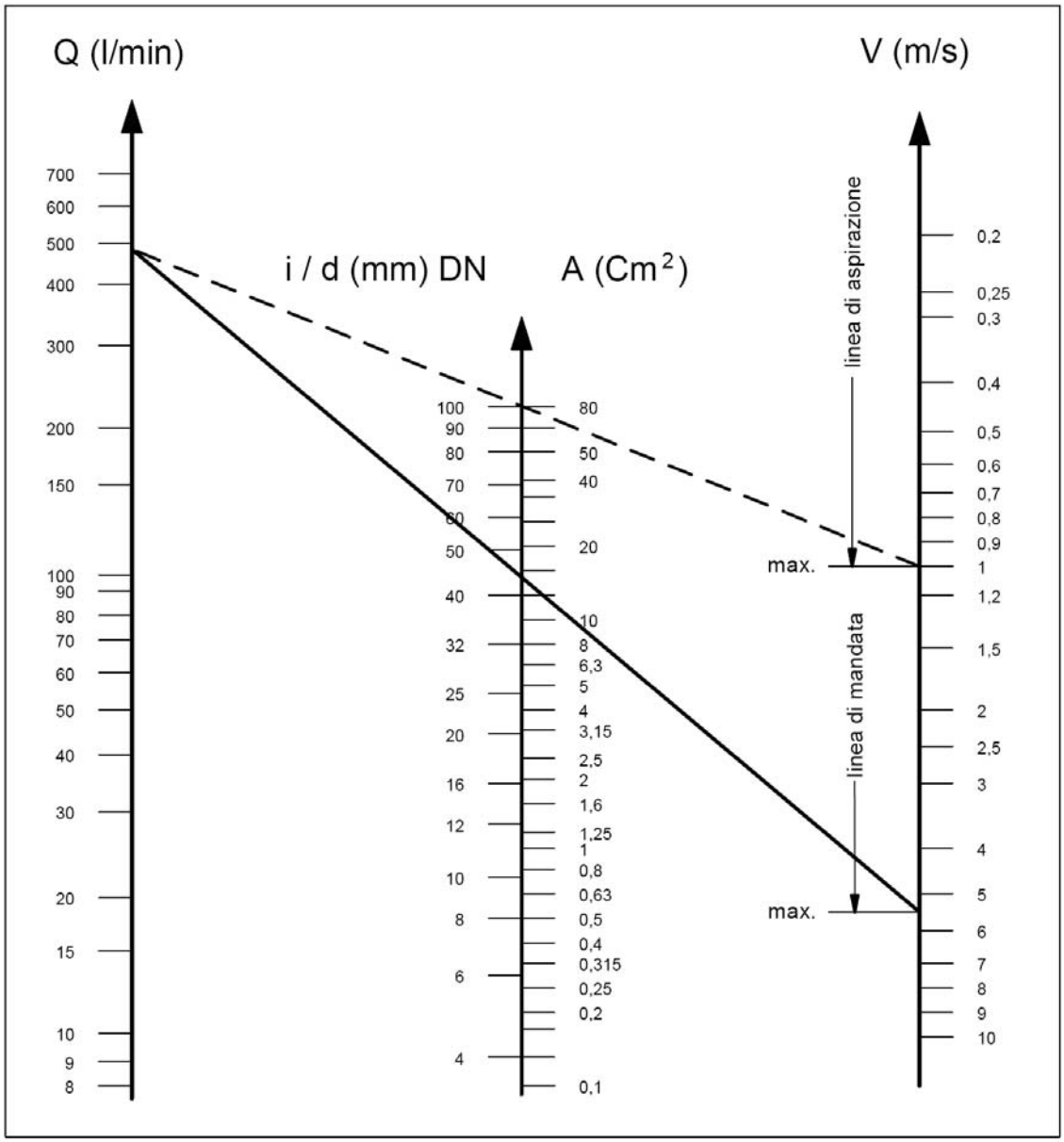
9.9 Internal diameter of the pipeline
To determine the internal diameter of the piping, please refer to the following diagram:

Suction pipe
With a flow rate of ~ 485 l/min and water speed of 1 m/sec. The diagram line that connects the two scales intersects the central scale, indicating the diameters, at a value of ~ 100 mm.

Delivery pipe
With a flow rate of ~ 485 l/min and water speed of 5.5 m/sec. The diagram line that connects the two scales intersects the central scale, indicating the diameters, at a value of ~ 43 mm.

Optimum speed values obtainable with the Booster pump:
- Suction: ≤ 1 m/sec.
- Delivery: ≤ 5.5 m/sec.

Linea di aspirazione	**Suction line**
Linea di mandata	**Delivery line**



The diagram does not take into account the pipe and valve resistance, the pressure drop due to the pipe length, the viscosity and the temperature of the pumped fluid.
If necessary, contact our Technical Department or Customer Assistance Service.

9.10 V-belt transmission
As indicated in paragraph 9.1, only in exceptional cases may the pump be driven by a v-belt system. For correct lay-out sizing, please contact our **Technical Department or Customer Assistance Service.**

10. START-UP AND OPERATION

10.1 Preliminary Inspections
Before start-up, be sure that:

The suction line is connected and up to pressure (see Chapter 9): the pump must never run dry.

1. The suction line must be perfectly airtight.
2. All the On-Off valves between the pump and the feeding source are completely open. The delivery line must discharge freely in order to allow the air in the pump to be expulsed easily thus facilitating pump priming.
3. All suction / delivery connections and fittings must be correctly tightened.
4. Coupling tolerances on the pump / transmission axis (half-joint misalignment, Cardan inclination, belt tightening, etc.) must remain within the limits indicated by the transmission Manufacturer
5. The pump's oil level must be verified using the apposite dipsticks (position 1 fig.8).

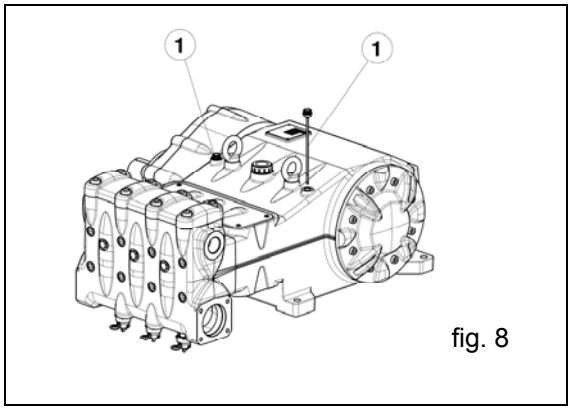


fig. 8

In case the pump has not run for a long period of time, recover the correct operation of the suction valves by opening the three valve-lifting devices (see position 2 fig.9). Be sure to reclose the valves before pump start-up. See fig.10 for the valve positions.

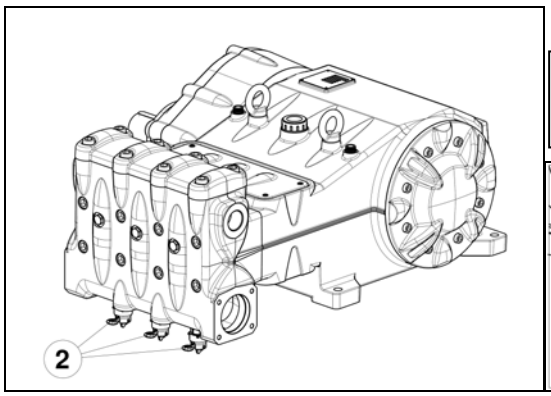


fig. 9

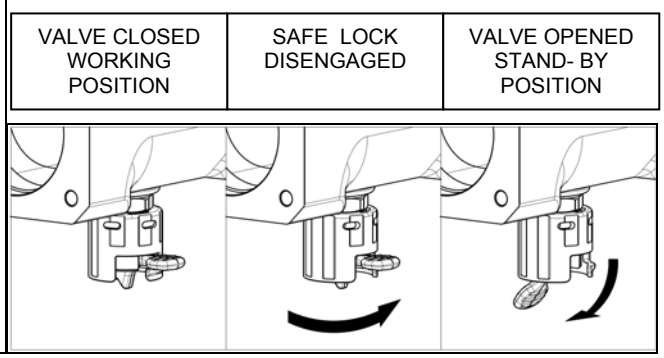


fig. 10

10.2 Start-up

1. When starting the pump for the first time, check for the correct sense of rotation
2. Verify the pump's correct feeding
3. The pump must be started off-load
4. During operation, check that the rotating speed does not exceed the rated value
5. Before putting the pump under pressure let it run for at least 3 minutes
6. Before stopping the pump, release the pressure by acting on the adjustment valve or on any discharging device

In case of priming problems caused by insufficient feeding, it's possible to intervene by removing the three front caps on the head (see position 3 fig.11). (MKS 40 excluded)

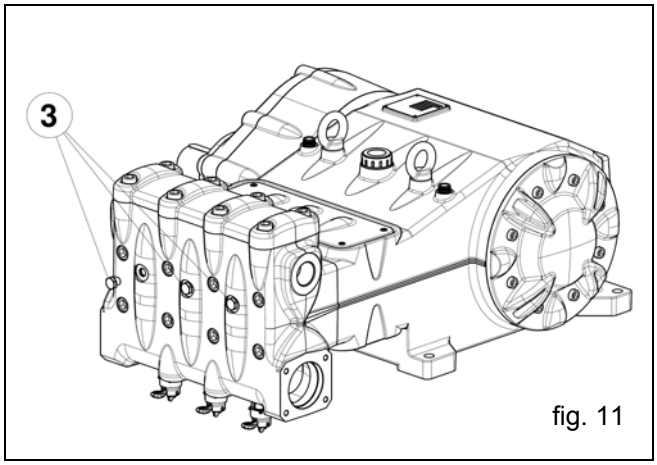


fig. 11

11. PREVENTIVE MAINTENANCE

To guarantee pump reliability and efficiency, respect the maintenance intervals as indicated in the table below.

PREVENTIVE MAINTENANCE	
Every 500 hours	**Every 1500 hours**
Check oil level	Change oil
	Check / Replace *: - Valves - Valves seats - Valve springs - Valve guides
	Check / Replace*: - H.P. packings - L.P. packings

* See Repair manual

12. STOPPING THE PUMP FOR LONG PERIODS

12.1 Filling the pump with an anti-corrosion emulsion or anti-freeze solution by using an external diaphragm pump as in the layout shown in paragraph 9.7

a) Close the filter draining, if open.
b) Be sure that the connecting pipe is clean, spread with grease and connect it to the high pressure outlet port.
c) Fit a suction hose to the membrane pump. Open the pump suction connection and fit hose between it and the membrane pump.
d) Fill the container with the solution / emulsion.
e) Put the free extremities of the suction pipe and the high pressure outlet pipe inside the container.
f) Start up the diaphragm pump.
g) Pump the emulsion until it comes out of the high pressure outlet pipe.
h) Continue pumping for at least another minute; if needed, the emulsion can be re-enforced, by adding for example Shell Donax.
i) Stop the pump, remove the pipe from the suction connection and close it with a plug
j) Remove the pipe from the high pressure outlet port. Clean, grease and plug both connections and the pipes.

12.2 Pipes

a) Before greasing and protecting the pipes according the previously described procedure, dry the connections using compressed air.
b) Cover with polyethylene.
c) Do not wrap them too tightly; be sure there is no folding.

13. PRECAUTIONS AGAINST FREEZING

In areas and periods of the year where there is risk of freezing, follow the instructions indicated in Chapter 12 (see paragraph 12.2).

In the presence of ice, in no case must the pump be started until the entire circuit has been perfectly thawed out; not complying with this indication may cause serious damage to the pump.

14. WARRANTY TERMS

The pumps are guaranteed for a period of time of 12 months from the delivery date or for 1000 hours of operation, with the exception of parts subject to wear.
In any case, please refer to the contract terms for other warranty conditions.
The warranty is void if:

a) The pump has been used for purposes that differ from what agreed.
b) The pump has been fit with an electric or diesel engine with performance greater than what indicated in the table.
c) The required safety devices were un-adjusted or disconnected.
d) The pump was used with accessories or spare parts not supplied by the Interpump Group.
e) Damage was caused by:
    1) improper use
    2) the non-observance of maintenance instructions
    3) use not compliant with operating instructions
    4) insufficient flow rate
    5) faulty installation
    6) incorrect positioning or sizing of the pipes
    7) non authorised design changes
    8) cavitation

15. TROUBLESHOOTING

The pump does not produce any noise:
- The pump is not primed and is running dry
- There is no water in the inlet line
- The valves are blocked
- The delivery line is closed and does not allow the air in the pump to be discharged

The pump pulses irregularly (knocking):
- Air suction
- Insufficient feeding
- Bends, elbows, fittings along the suction line obstruct the fluid's passage
- The inlet filter is dirty or too small
- The booster pump, where provided, supplies insufficient pressure or flow rate
- The pump is not primed due to insufficient head or the delivery line is closed during priming
- The pump is not primed due to valve seizing
- Worn valves
- Worn pressure packings
- Incorrect operation of the pressure adjustment valve
- Transmission problems

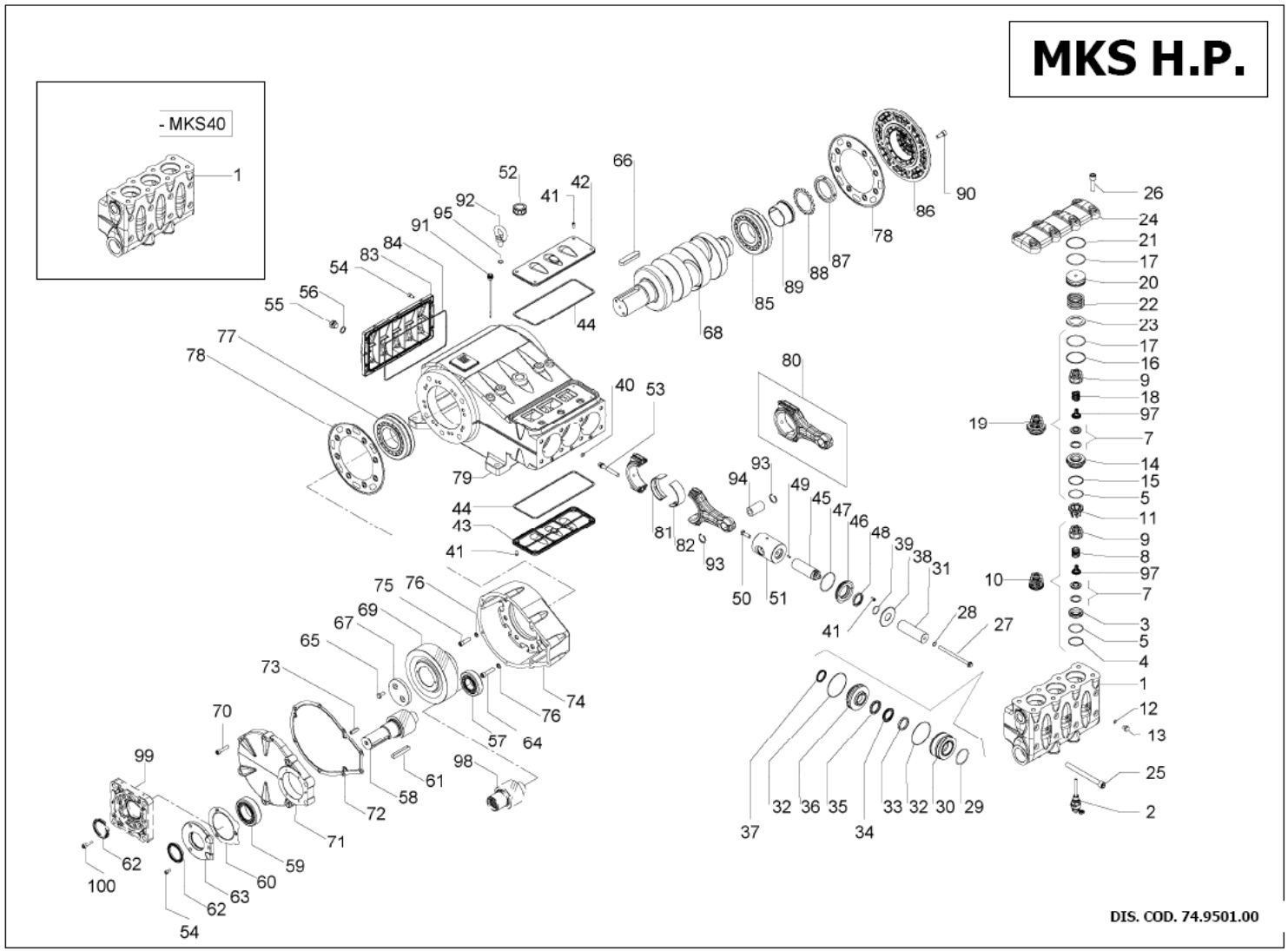
The pump does not deliver the rated flow / is noisy:
- Insufficient feeding (see the causes listed above)
- RPM are less than the rated value
- Excessive amount of water by-passed by the pressure adjustment valve
- Worn valves
- Leakage from the pressure packings
- Cavitation due to:
  1) Wrong sizing of the suction pipe / undersized diameters
  2) Insufficient flow rate
  3) High water temperature

Insufficient pump pressure:
- The nozzle is (or has become) too large
- Insufficient RPM
- Leakage from the pressure packings
- Incorrect operation of the pressure adjustment valve
- Worn valves

Overheated pump:
- The pump is overloaded (pressure or rpm exceed the rated values)
- Oil level is too low, or the oil is not of a suitable type, indicated in Chapter 7 (see paragraph 7.4)
- Incorrect alignment of the joint or the pulleys
- Excessive inclination of the pump during operation

Pipe Vibrations or Knocking:
- Air suction
- Incorrect operation of the pressure adjustment valve
- Valve malfunction
- Irregular drive transmission motion

16. EXPLODED VIEW AND PART LIST



MKS

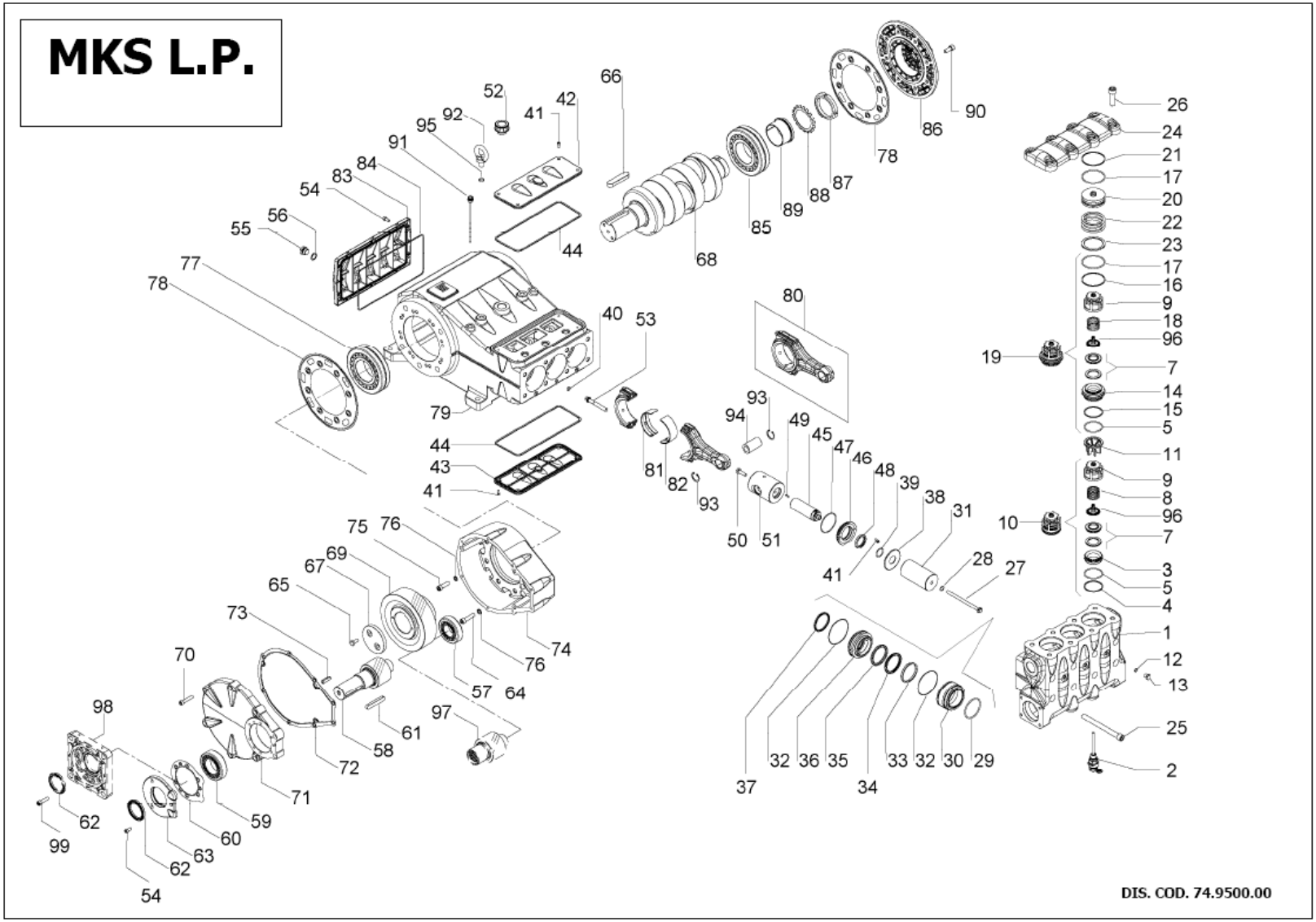
MKS H.P.

KIT RICAMBIO – SPARE KIT		MKS 40	MKS 45	MKS 50
A	Kit tenute pompanti – Plunger packing kit	KIT 2052	KIT 2053	KIT 2054
B	Kit valvole – Valves kit	KIT 2055		
C	Kit tenute complete – Complete seals kit	KIT 2056	KIT 2057	KIT 2058
D	Kit bronzine bielle – Conrod bushing kit	KIT 2076		

Pratissoli

MKS 40 - MKS 45
MKS 50

POS	CODE CODICE	DESCRIPTION DESCRIZIONE	KIT	NR. PCS
1	74.1203.15	Testata Ø 45 – Ø 50 H.P.		1
	74.1205.15	Testata Ø 45 – Ø 50 H.P. – NPT		1
	74.1206.15	Testata Ø 40 H.P.		1
	74.1207.15	Testata Ø 40 H.P. – NPT		1
2	2000.3017.0	Dispositivo apertura valvole asp.		3
3	36.2067.66	Sede valvola aspirazione		3
4	90.5260.00	Anello antiest. Ø 51,5x56x1,5	C	3
5	90.3890.00	OR Ø 50,47x2,62 (3200)	C	6
7	36.2088.01	Valvola sferica - Completa		6
8	94.7600.00	Molla Ø 28.3x30.7		3
9	36.2061.51	Guida valvola aspiraz. / mandata		6
10	36.7151.01	Gruppo valvola aspirazione	B	3
11	74.2106.51	Distanziale guida valvola H.P.	B	3
12	90.3584.00	OR Ø 10.82x1.78 (2043)	C	3
13	98.2046.00	Tappo G 1/4"x13 – INOX		3
14	36.2069.66	Sede valvola mandata		3
15	90.5265.00	Anello antiest. Ø 51.7x56.2x1.5	C	3
16	90.5276.00	Anello antiest .Ø 67.5x72x1.5	C	3
17	90.3911.00	OR Ø 66,35x2,62 (3262)	C	6
18	94.7605.00	Molla Ø 28.5x32		3
19	36.7153.01	Gruppo valvola mandata	B	3
20	74.2110.70	Tappo valvola mandata H.P.		3
21	90.5280.00	Anello antiest. Ø 67.7x72.2x1.5	C	3
22	94.7750.00	Molla Ø 58x45.4		3
23	74.2108.66	Anello sede valvola mand. H.P.		3
24	74.2103.15	Coperchio valvole H.P.		1
25	99.5222.00	Vite M16x180 UNI 5931		8
26	99.5147.00	Vite M16x55 UNI 5931		8
27	74.2104.56	Vite fissaggio pistone		3
28	90.3677.00	OR Ø 14x2 (140-20)	C	3
29	90.4102.00	OR Ø 58,74x3,53 (162)	A-C	3
30	74.2111.56	Camicia pistone Ø 40		3
	74.2112.56	Camicia pistone Ø 45		3
	74.2113.56	Camicia pistone Ø 50		3
31	74.0400.09	Pistone Ø 40x127		3
	74.0401.09	Pistone Ø 45x127		3
	74.0402.09	Pistone Ø 50x127		3
32	90.3722.00	OR Ø 96x2	A-C	6
33	74.1000.92	Anello di testa pistone Ø 40		3
	74.1001.92	Anello di testa pistone Ø 45		3
	74.1002.92	Anello di testa pistone Ø 50		3
34	90.2832.00	Anello ten. Ø 40x55x7.5/4.5 H.P.	A-C	3
	90.2850.00	Anello ten. Ø 45x60x7.5/4.5 H.P.	A-C	3
	90.2863.00	Anello ten. Ø 50x65x7.5/4.5 H.P.	A-C	3
35	90.2838.00	Anello restop Ø 40x55x8/4.5	A-C	3
	90.2848.00	Anello restop Ø 45x60x6.5/3	A-C	3
	90.2865.00	Anello restop Ø 50x65x8/4.5	A-C	3
36	74.2117.68	Supporto guarnizioni Ø 40		3
	74.2118.68	Supporto guarnizioni Ø 45		3
	74.2119.68	Supporto guarnizioni Ø 50		3
37	90.2828.00	Anello ten.alt. Ø 40x48x5,5 L.P.	A-C	3
	90.2846.00	Anello ten.alt. Ø 45x53x5,5 L.P.	A-C	3
	90.2860.00	Anello ten.alt. Ø 50x58x5,5 L.P.	A-C	3
38	74.2133.51	Paraspruzzi		3
39	90.3865.00	OR Ø 29,82x2,62 (3118)	C	3
40	90.3825.00	OR Ø 10.78x2.62 (3043)	A-C	3
41	99.1837.00	Vite M6x14 8.8 - Zinc.		14
42	74.1501.22	Coperchio ispezione chiuso		1
43	74.1502.22	Coperchio ispezione aperto		1
44	90.4500.00	OR Ø 266,06x5,34 (61050)	C	2
45	74.0501.66	Stelo guida pistone		3
46	74.2131.71	Coperchio paraolio guida pist.		3
47	90.3914.00	OR Ø 72,69x2,62 (3287)	C	3
48	90.1679.00	Anello rad. Ø 40x52x7	C	3
49	97.6740.00	Spina elastica Ø 5x16 UNI EN 28748		3
50	99.3697.00	Vite M10x35 UNI 5739		3
51	74.0500.43	Guida pistone		3
52	98.2324.00	Tappo carico olio G 1"		1
53	99.4410.00	Vite serr. biella M12x1.25x87		6
54	99.3045.00	Vite M8x18 UNI5931 - Zinc.		13
55	98.2183.00	Tappo G 1/2"x13 - NICKEL		1
56	96.7514.00	Rosetta Ø 21,5x27x1,5		1
57	91.8580.00	Cuscinetto a rulli 21309CC		1
58	10.0702.35	Pignone Z20 R.2.65 – Elicoid. - (MK/S)		1
	10.0703.35	Pignone Z17 R.3.29 – Elicoid. - (MK)		1
	10.0737.55	Pignone Z23 R.2.22 – Elicoid. - (MKS)		1
59	91.8600.00	Cuscinetto a rulli 22212CC		1
60	74.2129.84	Guarnizione flangia riduttore	C	1
61	91.5030.00	Linguetta 16x10x90 UNI 6604		1
62	90.1800.00	Anello rad. Ø60x80x8	C	1
63	74.2127.22	Flangia riduttore		1
64	99.4335.00	Vite M12x50 UNI 5931		2
65	99.3667.00	Vite M10x25 UNI 5739		2
66	91.5120.00	Linguetta 22x14x100 UNI 6604		1
67	74.2132.55	Fermo corona		1
68	74.0201.35	Albero a gomiti C.72 - (MK)		1
	74.0202.35	Albero a gomiti C.72 - (MKS)		1
69	10.0736.35	Corona Z51 R.2.22 – Elicoid. - (MKS)		1
	10.0705.35	Corona Z53 R.2.65 – Elicoid. - (MK/S)		1
	10.0706.35	Corona Z56 R.3.29 – Elicoid. - (MK)		1
70	99.3730.00	Vite M10x50 UNI 5931		8
71	74.2126.13	Coperchio riduttore		1
72	74.2128.84	Guarnizione scatola riduttore	C	1
73	97.6300.00	Spina Ø 12x40 - B UNI EN 28734		3
74	74.2124.13	Scatola riduttore		1
75	99.4305.00	Vite M12x40 UNI 5931		6
76	96.7170.00	Rondella Ø 12 DIN7980 grower		8
77	91.8850.00	Cuscinetto a rulli 21317CC		1
78	74.2130.84	Guarnizione laterale	C	2
79	74.0101.13	Carter pompa		1
80	74.0302.01	Biella completa		3
81	90.9300.00	Semicusc. testa biella – Inf.	D	3
82	90.9310.00	Semicusc. testa biella - Sup.	D	3
83	74.1600.22	Coperchio carter		1
84	90.4160.00	OR Ø 304,39x3,53 (41200)	C	1
85	91.8852.00	Cuscinetto a rulli 21317CCK		1
86	74.1500.22	Coperchio cuscinetto		1
87	93.0800.00	Ghiera di bloccaggio tipo KM		1
88	96.8300.00	Rosetta di sicurezza tipo MB		1
89	91.8800.00	Bussola di pressione		1
90	99.4280.00	Vite M12x30 UNI 5931		8
91	98.2092.00	Tappo con asta G 3/8"x163		2
92	93.1050.00	Golfare M16 UNI 2947 – Zinc.		2
93	90.0697.00	Anello 35 UNI 7437		6
94	97.7450.00	Spinotto Ø 35x64		3
95	90.3833.00	OR Ø 13.95x2.62 (3056)	C	2
97	36.2090.51	Guida interna valvola		6
98	10.0725.55	Pignone Z20-1500 – Elicoid.		1
99	10.0726.20	Flangia per motore idraulico		1
100	99.3686.00	Vite TCEI M10x30 UNI5931		6


MKS L.P.
DIS. COD. 74.9500.00

MKS

MKS L.P.

KIT RICAMBIO – SPARE KIT		MKS 55	MKS 60	MKS 65
A	Kit tenute pompanti – Plunger packing kit	KIT 2045	KIT 2046	KIT 2047
B	Kit valvole – Valve kit	KIT 2048		
C	Kit tenute complete – Complete seals kit	KIT 2049	KIT 2050	KIT 2051
D	Kit bronzine bielle – Conrod bushing kit	KIT 2076		

Pratissoli

MKS 55 – MKS 60 -MKS 65

POS	CODE CODICE	DESCRIPTION DESCRIZIONE	KIT	NR. PCS
1	74.1201.15	Testata L.P.		1
	74.1204.15	Testata L.P. - NPT		1
2	2000.3016.0	Dispositivo apertura valvole asp.		3
3	36.2066.66	Sede valvola aspirazione		3
4	90.5270.00	Anello antiest. Ø 61.2x67x2	C	3
5	90.4105.00	OR Ø59,92x3,53 (4237)	C	6
7	36.2087.01	Valvola sferica - Completa		6
8	94.7698.00	Molla Ø 41.5x37.9		3
9	36.2060.51	Guida valvola aspiraz. / mandata		6
10	36.7150.01	Gruppo valvola aspirazione	B	3
11	74.2105.51	Distanziale guida valvola L.P.	B	3
12	90.3584.00	OR Ø 10,82x1,78 (2043)	C	3
13	98.2046.00	Tappo G 1/4"x13 - INOX		3
14	36.2068.66	Sede valvola mandata		3
15	90.5273.00	Anello antiest. Ø 61.4x67.2x1.5	C	3
16	90.5290.00	Anello antiest. Ø 77.2x83x1.5	C	3
17	90.4134.00	OR Ø 75,8x3,53 (4300)	B-C	6
18	94.7700.00	Molla Ø 41.5x38.3		3
19	36.7152.01	Gruppo valvola mandata	B	3
20	74.2109.70	Tappo valvola mandata L.P.		3
21	90.5293.00	Anello antiest. Ø 77.4x83.2x1.5	B-C	3
22	94.8000.00	Molla Ø 75x49.6		3
23	74.2107.66	Anello sede valvola mand. L.P.		3
24	74.2101.15	Coperchio valvole L.P.		1
25	99.5222.00	Vite M16x180 UNI 5931		8
26	99.5147.00	Vite M16x55 uni 5931		8
27	74.2104.56	Vite fissaggio pistone		3
28	90.3677.00	OR Ø 14x2 (140-20)	C	3
29	90.4185.00	OR Ø 72x4	A-C	3
30	74.2114.56	Camicia pistone Ø 55		3
	74.2115.56	Camicia pistone Ø 60		3
	74.2116.56	Camicia pistone Ø 65		3
31	74.0403.09	Pistone Ø 55x127		3
	74.0404.09	Pistone Ø 60x127		3
	74.0405.09	Pistone Ø 65x127		3
32	90.3722.00	OR Ø 96x2	A-C	6
33	74.1003.92	Anello di testa pistone Ø 55		3
	74.1004.92	Anello di testa pistone Ø 60		3
	74.1005.92	Anello di testa pistone Ø 65		3
34	90.2873.00	Anello ten. Ø 55x70x7.5/4.5 H.P.	A-C	3
	90.2883.00	Anello ten. Ø 60x76x8/4.8 H.P.	A-C	3
	90.2893.00	Anello ten. Ø 65x80x7.5/4.5 H.P.	A-C	3
35	90.2875.00	Anello RESTOP Ø 55x70x8/4.5	A-C	3
	90.2885.00	Anello RESTOP Ø 60x76x8/4.5	A-C	3
	90.2895.00	Anello RESTOP Ø 65x80x8/4.5	A-C	3
36	74.21206.8	Supporto guarnizioni Ø 55		3
	74.2121.68	Supporto guarnizioni Ø 60		3
	74.2122.68	Supporto guarnizioni Ø 65		3
37	90.2870.00	Anello ten. alt. Ø 55x63x5,5 L.P.	A-C	3
	90.2880.00	Anello ten. alt. Ø 60x68x5,5 L.P.	A-C	3
	90.2890.00	Anello ten. alt. Ø 65x73x5,5 L.P.	A-C	3
38	74.2133.51	Paraspruzzi		3
39	90.3865.00	OR Ø 29,82x2,62 (3118)	C	3
40	90.3825.00	OR Ø 10.78x2.62 (3043)	A-C	3
41	99.1837.00	Vite M6x14 8.8 – Zinc.		14
42	74.1501.22	Coperchio ispezione chiuso		1
43	74.1502.22	Coperchio ispezione aperto		1
44	90.4500.00	OR Ø 266,06x5,34 (61050)	C	2
45	74.0501.66	Stelo guida pistone		3
46	74.2131.71	Coperchio paraolio guida pist.		3
47	90.3914.00	OR Ø 72,69x2,62 (3287)	C	3
48	90.1679.00	Anello rad. Ø 40x52x7	C	3
49	97.6740.00	Spina elastica Ø 5x16 UNI EN 28748		3
50	99.3697.00	Vite M10x35 UNI 5739		3
51	74.0500.43	Guida pistone		3
52	98.2324.00	Tappo carico olio G1"		1
53	99.4410.00	Vite serr. biella M12x1.25x87		6
54	99.3045.00	Vite M8x18 UNI5931 - Zinc.		13
55	98.2183.00	Tappo G 1/2"x13 - NICKEL		1
56	96.7514.00	Rosetta Ø 21,5x27x1,5		1
57	91.8580.00	Cuscinetto a rulli 21309CC		1
58	10.0702.35	Pignone Z20 R.2.65 – Elicoid. - (MK/S)		1
	10.0703.35	Pignone Z17 R.3.29 – Elicoid. - (MK)		1
	10.0737.55	Pignone Z23 R.2.22 – Elicoid. - (MKS)		1
59	91.8600.00	Cuscinetto a rulli 22212CC		1
60	74.2129.84	Guarnizione flangia riduttore	C	1
61	91.5030.00	Linguetta 16x10x90 UNI 6604		1
62	90.1800.00	Anello rad. Ø 60x80x8	C	1
63	74.2127.22	Flangia riduttore		1
64	99.4335.00	Vite M12x50 UNI 5931		2
65	99.3667.00	Vite M10x25 UNI 5739		2
66	91.5120.00	Linguetta 22x14x100 UNI 6604		1
67	74.2132.55	Fermo corona		1
68	74.0202.35	Albero a gomiti C.72 – (MKS)		1
	74.0201.35	Albero a gomiti C.72 – (MK)		1
69	10.0736.35	Corona Z51 R.2.22 – Elicoid. - (MKS)		1
	10.0705.35	Corona Z53 R.2.65 – Elicoid. - (MK/S)		1
	10.0706.35	Corona Z56 R.3.29 – Elicoid. - (MK)		1
70	99.3730.00	Vite M10x50 UNI 5931		8
71	74.2126.13	Coperchio riduttore		1
72	74.2128.84	Guarnizione scatola riduttore	C	1
73	97.6300.00	Spina Ø 12x40 - B UNI EN 28734		3
74	74.2124.13	Scatola riduttore		1
75	99.4305.00	Vite M12x40 UNI 5931		6
76	96.7170.00	Rondella Ø 12 DIN7980 grower		8
77	91.8850.00	Cuscinetto a rulli 21317CC		1
78	74.2130.84	Guarnizione laterale	C	2
79	74.0101.13	Carter pompa		1
80	74.0302.01	Biella completa		3
81	90.9300.00	Semicusc. testa biella – Inf.	D	3
82	90.9310.00	Semicusc. testa biella - Sup.	D	3
83	74.1600.22	Coperchio carter		1
84	90.4160.00	OR Ø 304,39x3,53 (41200)	C	1
85	91.8852.00	Cuscinetto a rulli 21317CCK		1
86	74.1500.22	Coperchio cuscinetto		1
87	93.0800.00	Ghiera di bloccaggio tipo KM		1
88	96.8300.00	Rosetta di sicurezza tipo MB		1
89	91.8800.00	Bussola di pressione		1
90	99.4280.00	Vite M12x30 UNI 5931		8
91	98.2092.00	Tappo con asta G 3/8"x163		2
92	93.1050.00	Golfare M16 UNI 2947 – Zinc.		2
93	90.0697.00	Anello 35 UNI 7437		6
94	97.7450.00	Spinotto Ø 35x64		3
95	90.3833.00	OR Ø 13.95x2.62 (3056)	C	2
96	36.2089.51	Guida interna valvola		6
97	10.0725.55	Pignone Z20-1500 - Elicoid.		1
98	10.0726.20	Flangia per motore idraulico		1
99	99.3686.00	Vite TCEI M10x30 UNI 5931		6

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The information contained in this document may undergo change without prior notice.

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