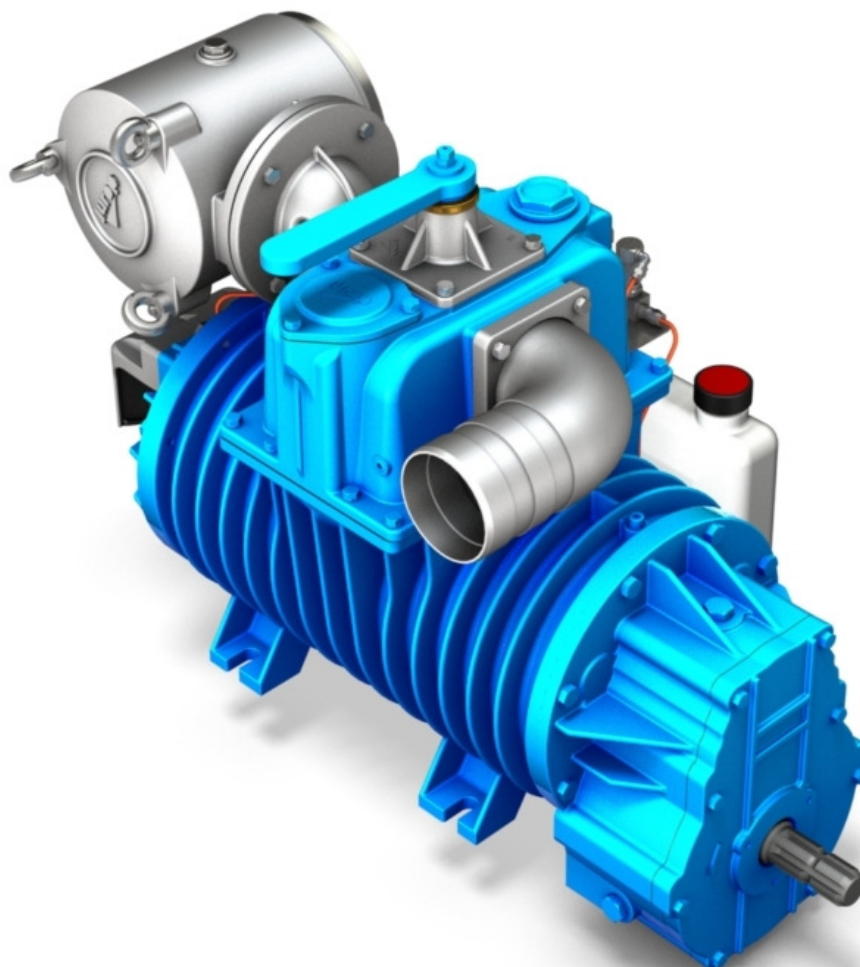


EN

PN 130 - 140 - 155 - 155R



ORIGINAL INSTRUCTIONS



INSTALLATION, USE AND
MAINTENANCE MANUAL

Jurop

COMPANY WITH
QUALITY SYSTEM
CERTIFIED BY DNV GL
= ISO 9001 =

Rev. 08
19-05-2017

2017 – **Juop** – Azzano Decimo (PN)

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1. General warnings

1.1. Introduction

- This booklet contains the necessary instructions for a correct installation, running, use and maintenance of the pump, as well as some practical suggestions for a safe operating.
- The knowledge of the following pages will grant a long and trouble-free operation of the pump.
- Following the instructions below contributes to limiting pump repair expenses by extending its duration, as well as preventing hazardous situations, thereby increasing its reliability.
- It is recommended to:
 - Understand and apply carefully the instructions before running the pump.
 - Keep the booklet at hand and have it known to all operators.

Below is a brief description of the symbols used in this manual.



If these safety rules are not respected, operators can be injured and the pump or oilers damaged remarkably.



If these safety rules are not respected, the pump or system can be damaged.



Suggestions for an environment friendly use of the pump.



Useful information for an easy usage and maintenance of the pump.

- The graphic representations and photographs contained in this manual are there to illustrate the product in the parts that make it up and in specific operating phases. Though the model shown in the manual may differ from the one purchased, the operating principle at the base of the illustrated operating phase is the same.

- Pump has to be fitted with its own tag reporting the following data: Model, Serial number, Year, Max speed, Max pressure.

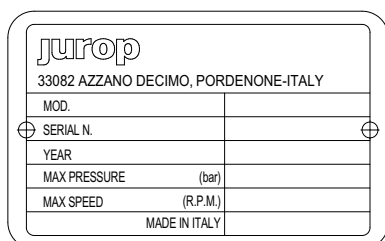


Fig. 1.1

1.2. Spare part request

- Use only **genuine spare parts** for maintenance and repairs. To order spare parts, provide the following details:

EXAMPLE:

- | | |
|--|--------------|
| a) The model of the pump (see pump tag): | PN130 |
| b) The serial number of the pump (see pump tag): | K40001 |
| c) A description of the parts (see parts list): | Oil tank |
| d) The quantity (see parts list): | n°1 pz |
| e) The code number of the part (see parts list): | 15840 094 00 |

1.3. Warranty terms and conditions

- Compliance with the installation, use and maintenance instructions provided by this manual **is crucial for the recognition of warranty** against defective parts.

2. Technical data

Pump PN130 – PN140 – PN155

- Rotary vacuum pump with radial vanes and air cooling system.
- Automatic lubrication with volumetric pump and side mounted tank.
- Built-in vacuum-pressure change-over valve.
- Check valve installed on the pump inlet.
- .
- Aluminium conveyors.
- Direct drive with smooth shaft, right or left rotation.
- Gear box drive (splined shaft ASAE 1 3/8) 540 rpm or 1000 rpm, left rotation.
- Direct drive with splined shaft ASAE 1 3/8, left rotation.
- Hydraulic drive with gear motor, left rotation.

Pump PN155R

As model PN155. In addition:

- Extra air injection cooling system.
- High resistant vanes.

Other features on request

- Rotation other than the standard one.
- Pneumatic or hydraulic actuator for the 4-way valve.
- Flanged manifolds are available on request.

Weight	PN130	PN140	PN155 - PN155R
Direct drive	165 kg	173 kg	194 kg
With multiplier (540 rpm or 1000 rpm)	186 kg	194 kg	216 kg
Hydraulic drive with gear motor	197 kg	205 kg	227 kg

2.1. Dimensions PN130 – PN140

Versions smooth shaft and splined shaft – PN130 – PN140

PN130 D smooth shaft, L rotation - cod. A450909410

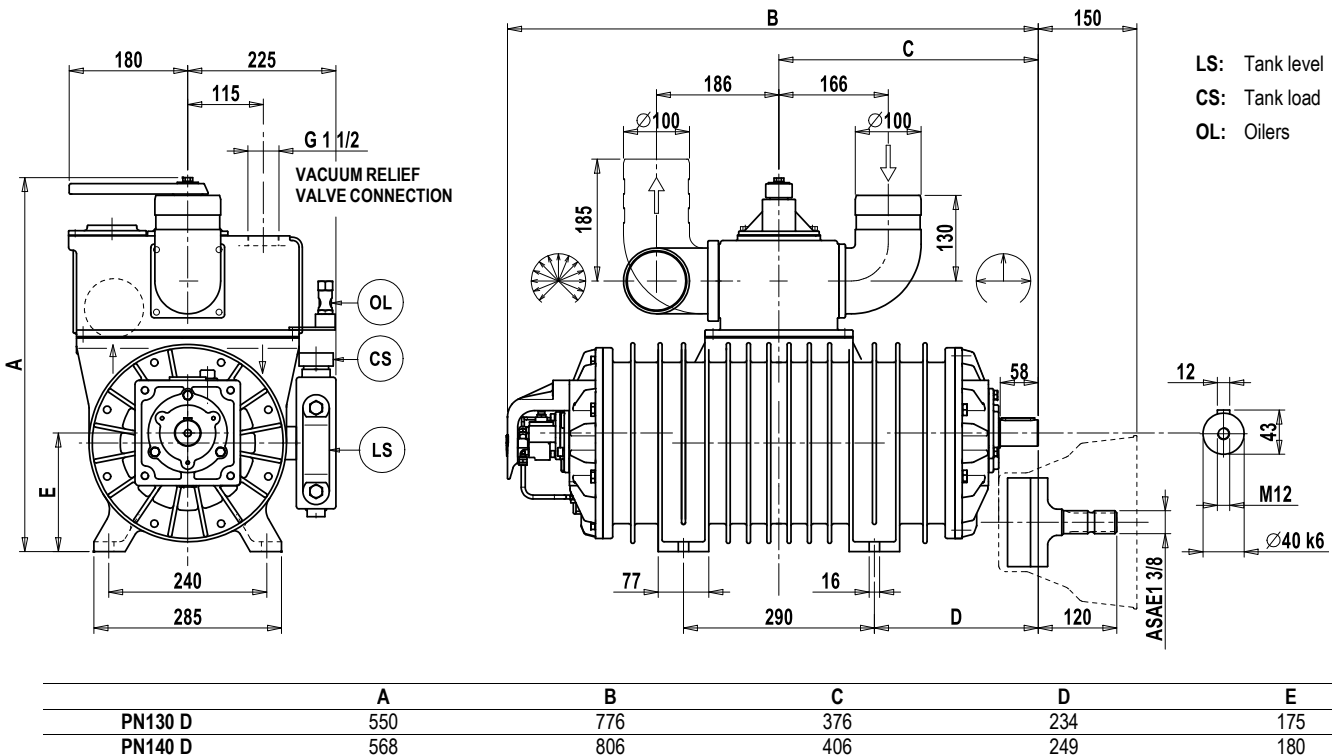
PN130 D smooth shaft, R rotation - cod. A450809410

PN130 D left splined shaft - cod. A450709410

PN140 D smooth shaft, L rotation - cod. A200909410

PN140 D smooth shaft, R rotation - cod. A200809410

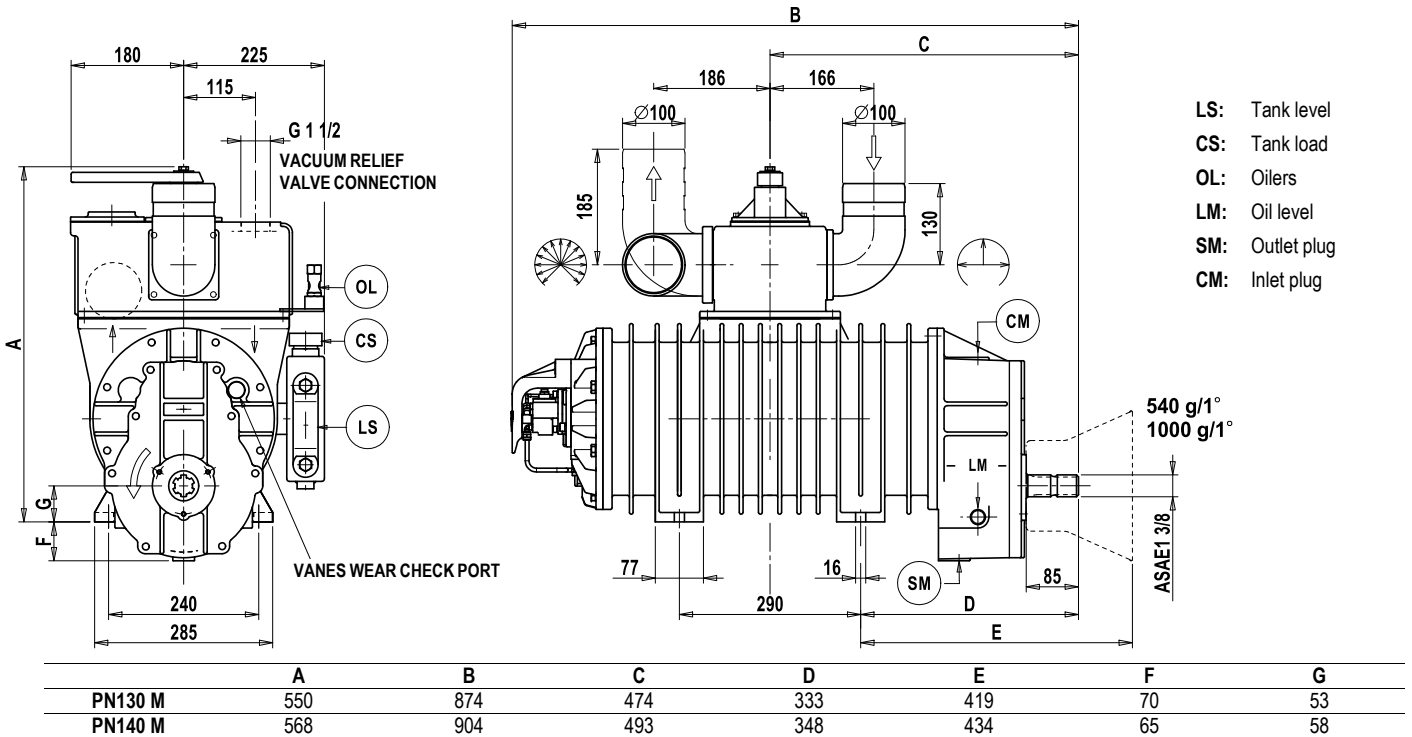
PN140 D left splined shaft - cod. A200709410



Versions with multiplier – PN130 – PN140

PN130 M 540 rpm, L rotation – cod. A453209410
PN140 M 540 rpm, L rotation – cod. A203209410

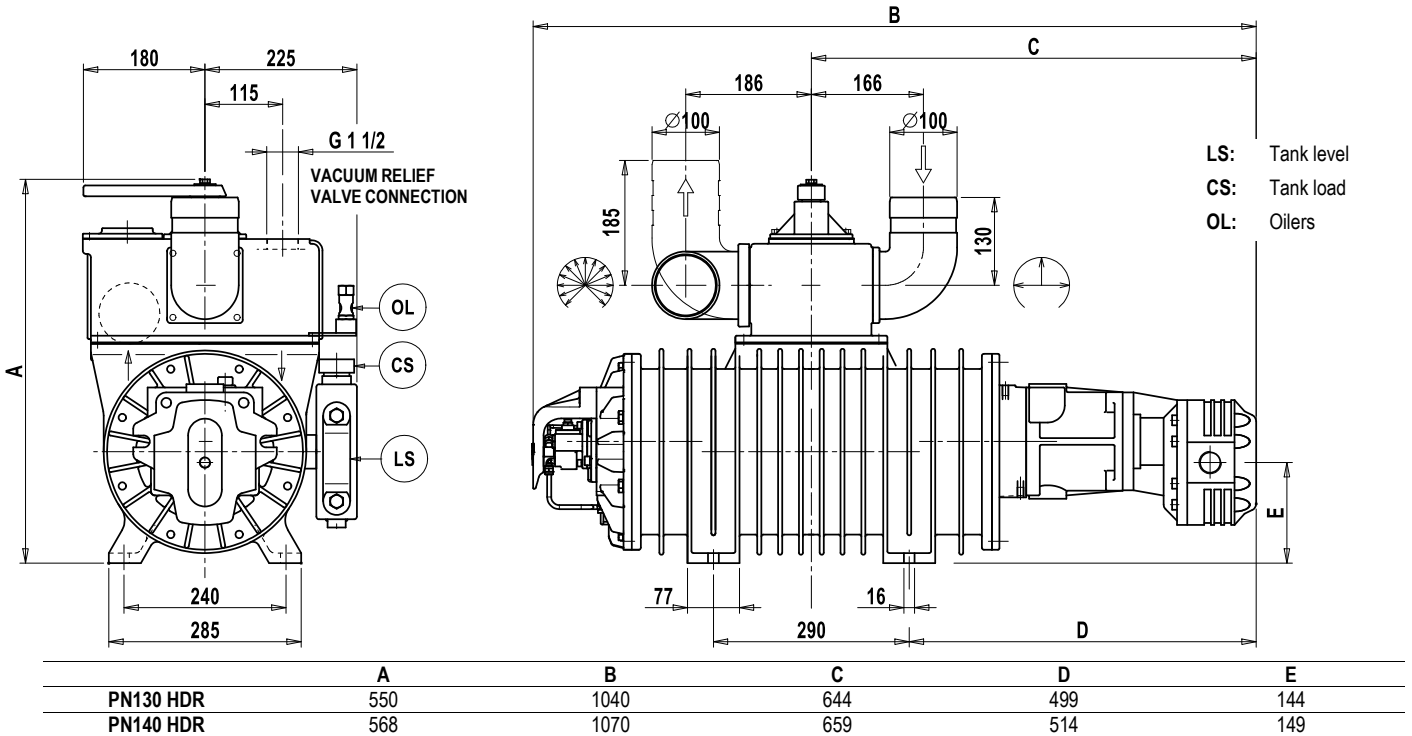
PN130 M 1000 rpm, L rotation – cod. A453509410
PN140 M 1000 rpm, L rotation – cod. A203509410



Hydraulic versions – PN130 – PN140

PN130 HDR, L rotation – cod. E458009410
PN140 HDR, L rotation – cod. E208009410

PN130 HDR, L rotation – cod. E458109410
PN140 HDR, L rotation – cod. E208109410



Hydraulic power parameters.

Motor Displacement	Operating Pressure	Max. Flow
72 cc/giro	150 bar	100 l/min

2.2. Dimensions PN155 – PN155R

Versions smooth shaft and splined shaft – PN155 – PN155R

PN155 D smooth shaft, L rotation – cod. A350709410

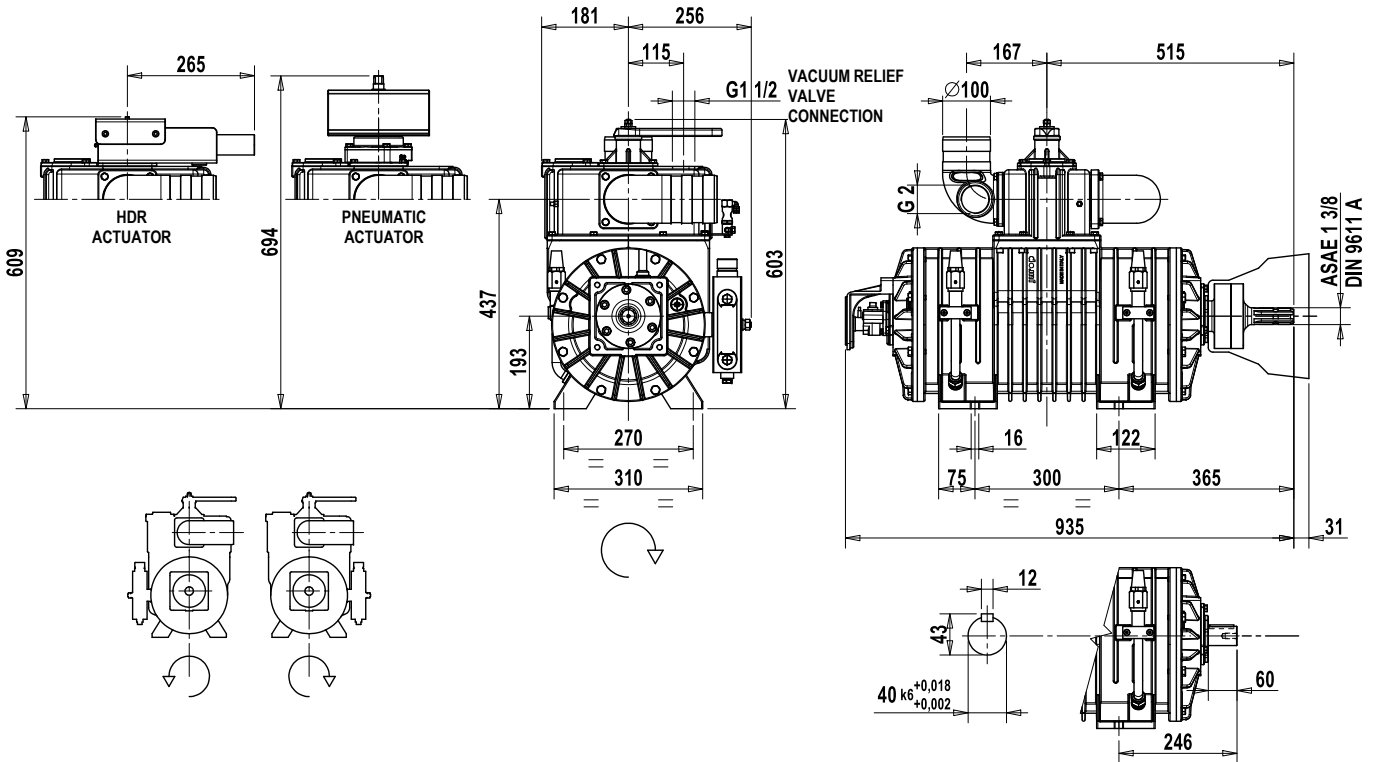
PN155 D left splined shaft – cod. A350909410

PN155R D smooth shaft, L rotation – cod. A360709410

PN155R D left splined shaft – cod. A360909410

PN155 D smooth shaft, R rotation – cod. A350809410

PN155R D smooth shaft, R rotation – cod. A360809410



Note: pumps PN155 and PN155R are also available for the American market, with smooth board with size in inches.

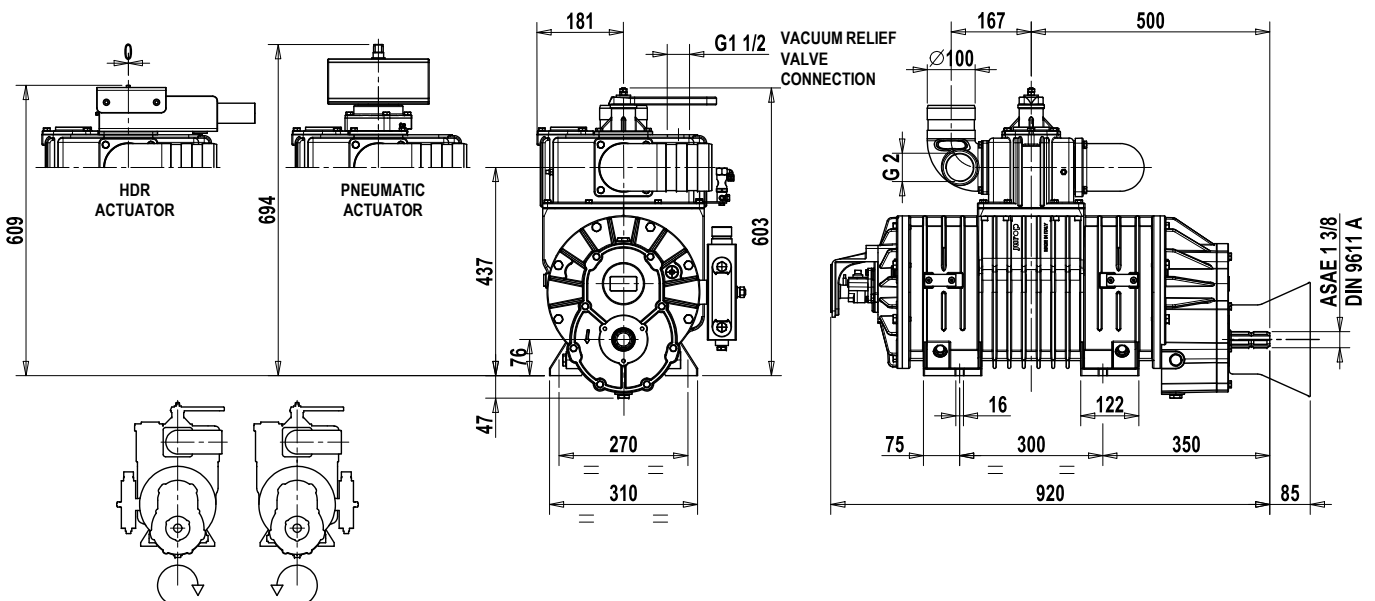
Versions with multiplier – PN155 – PN155R

PN155 M 540 rpm, L rotation – cod. A353209410

PN155R M 540 rpm, L rotation – cod. A363209410

PN155 M 1000 rpm, L rotation – cod. A353509410

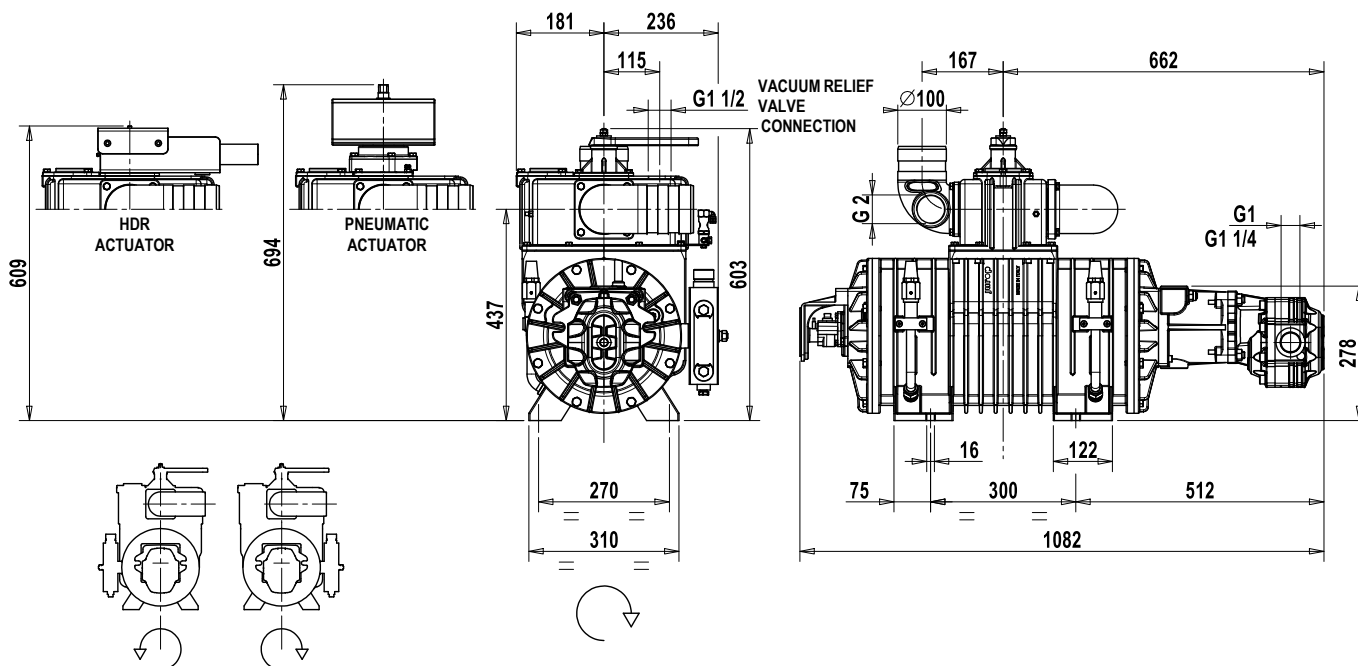
PN155R M 1000 rpm, L rotation – cod. A363509410



Hydraulic versions – PN155 – PN155R

PN155 HDR, right rotation – cod. E358109410

PN155R HDR, right rotation – cod. E368109410

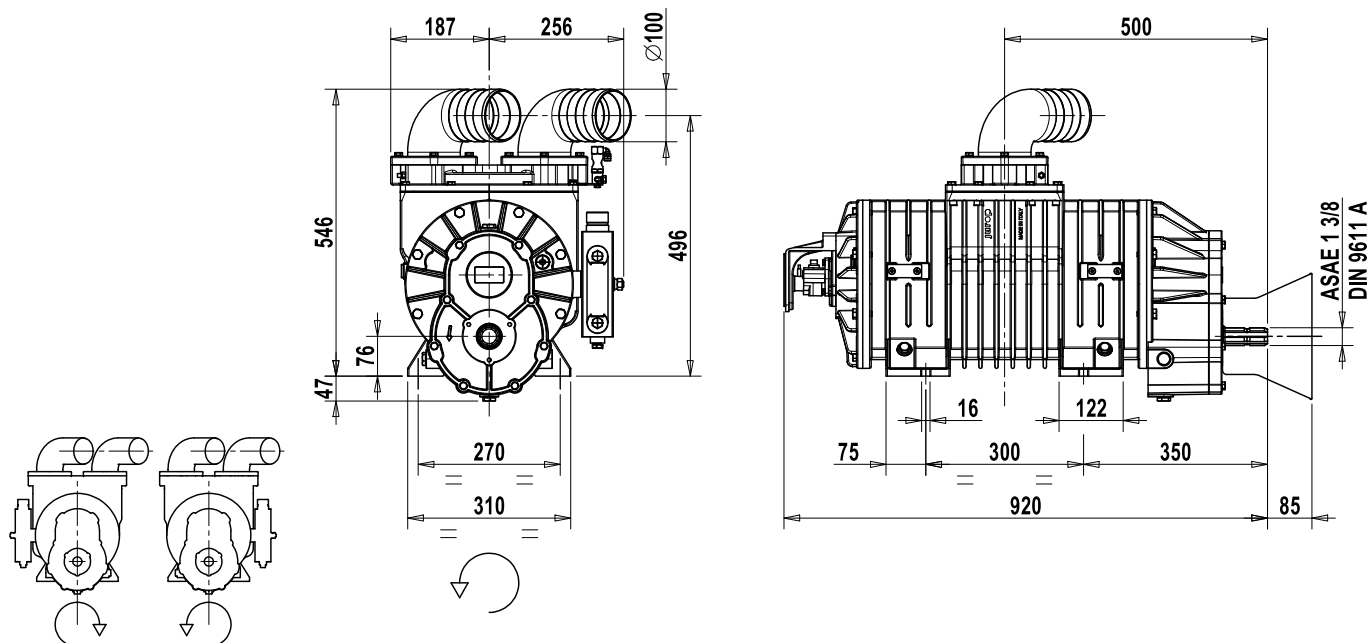


Hydraulic power parameters.

Motor Displacement	Operating Pressure	Max. Flow
86 cc/giro	140 bar	100 l/min

Versions with aluminium conveyors

PN155 FL 540 rpm, left rotation – cod. A353219410


Note: The vacuum pump PN155 may be equipped with aluminium conveyors.

- Kit fixed conveyor $\varnothing 100$ with valve connection: cod. 18521 035 00
- Kit swivelling conveyor $\varnothing 100$: cod. 18521 040 00
- Kit valve connection: cod. 18521 041 00

2.3. Usage limitations

Pump	Max. Speed – Operating speed (RPM)			P ₂ (bar ABS)	T ₂ (°C)	T ₂ - T ₁ (°C)
	M - 540	M - 1000	D - HDR			
PN130 – PN140	540 – 460 rpm	1000 – 850 rpm	1350 – 1100 rpm	2 bar	150°C	130°C
PN155 – PN155R	540 – 470 rpm	1000 – 900 rpm	1150 – 1000 rpm	2 bar (*)	150°C	130°C

P1: absolute pressure during suction
P2: absolute pressure during delivery

T1: temperature during suction
T2: temperature during delivery

(*) : Belt drive only for PN155 D and PN155R D: P2= 1,5 abs bar

2.4. Performances

Performances referred to vacuum pump operating at max. speed.

Pump	Air flow (free air condition)	Air flow at 60% vac.	Max. vacuum	Power required at max. vacuum	Vacuum at continuous duty	Oil consumption	Sound p. level (**)
PN130	12900 l/min	11400 l/min	94%	19 kW	60%	240 g/h	78 dB (A)
PN140	13850 l/min	12300 l/min	92%	19 kW	60%	240 g/h	79 dB (A)
PN155	15200 l/min	13500 l/min	93%	19 kW 23 kW (2 bar abs)	60% (PN155) 70% (PN155R)	240 g/h	79 dB (A)

(**) : Only when decompressor at max. speed, 60% vacuum rate, 7 m distance in open field.

REFERENCE CONDITIONS

Conveyed gas: air

Functioning in free air

Reference abs. pressure: 1.013 mbar

Reference temperature: 20°C

Vacuum functioning: free outlet

Pressure functioning: free inlet

2.5. Lubrication

Recommended lubricants: SIDE MOUNTED OIL TANK LEVEL

Room Temp.	Viscosity	Type	ENI	ESSO	SHELL	TOTAL	MOBIL	BP	TEXACO HAVOLINE
Under 10°C	ISO VG 46	Olio minerale	Acer 46	Nuto 46	Morlina oil 46	Drosera MS 46	Nuto H 46	Bartran HV 46	Rando HD 46
Over 10°C	ISO VG 150	Olio minerale	Acer 150	Nuto 150	Morlina oil 150	Drosera MS 150	Nuto H 150	Bartran HV 150	Rando HD 150

Recommended lubricants: GEAR BOX OIL

Viscosity	Type	ENI	ESSO	SHELL	TOTAL	MOBIL	BP	TEXACO HAVOLINE
ISO VG 220	Olio minerale EP	Blasia 220	Spartan EP 220	Omala oil 220	Carter EP 220	Mobilgear 630	Energol GR XP 220	Meropa 220

3. Safety and accident prevention



Attention: carefully apply these prescriptions.

3.1. General recommendations

- Installation and maintenance must be carried out with the unit totally disengaged from its drive system and must be performed by qualified personnel.
- Use adequate clothing (avoid ties, loose sleeves, necklaces and so on) and suitable protection equipments (gloves, protection glasses, boots...).
- To prevent errors and hazardous situations, establish what each operator is responsible for in the different maintenance operations.
- When transporting the pump, use proper slinging. Store the pump in stable places.
- Make sure that all the parts of the unit are idle and cool, before performing any maintenance operation.
- Before each maintenance operation, stop the pump and restore the atmospheric pressure.
- When the pump is running, some parts may reach very high temperatures (above 100°C). Use all necessary precautions to avoid contact.
- Operators working nearby must avoid prolonged exposure to the noise emitted by the aspirator, if not equipped with the proper ear-protection devices.
- Avoid accidental suction of solids: solids may be projected at high speed through the exhaust manifold and cause injuries.
- Do not start the machine if the protection devices provided for transmissions are removed. Replace damaged parts.
- Pressure relief valve: point the air flux away from the operators.

- Do not use the aspirator over its designed limits: the machine may be damaged and the operator may be injured.



Do not exceed the power supply parameters indicated in the technical tables (see par. 2.3).

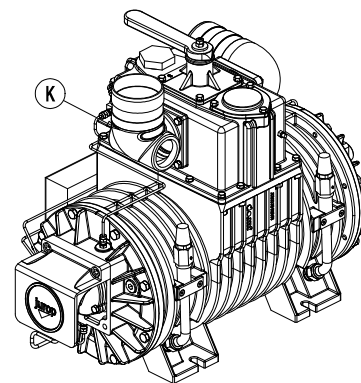
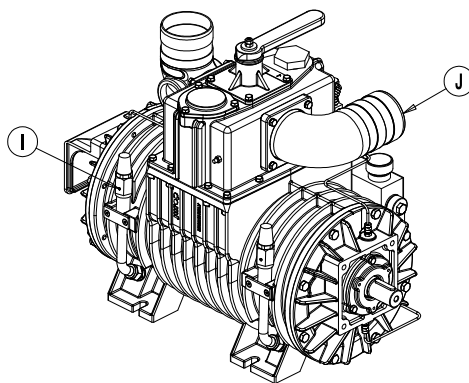
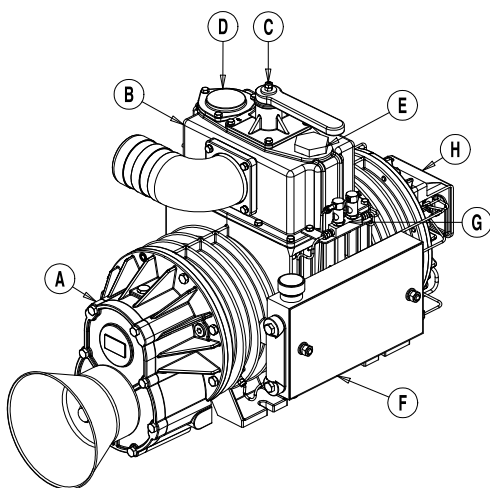
3.2. Intended use

- The vacuum pump PN130, PN140 and PN155 are designed to convey filtered air into systems for the vacuum production or for the suction of powders or liquid wastes. Any other usage shall be considered improper.
- Do not sack toxic substances and inflammable or explosive gasses, since the internal components of the pump may reach high temperatures.
- Liquids or solids infiltrations can seriously damage the pump.
- Do not run the pump over its designed operating limits (see par. 2.3): it may break and transmission can be damaged.

4. Installation

Legend main components

- | | | |
|------------------------------------|-----------------------------------|--|
| A. Multiplier gear box | E. Vacuum relief valve connection | I. Air injection valve (only for PN155) |
| B. Manifold | F. Oil tank | J. Swivelling conveyor |
| C. Vacuum – pressure manifold | G. Oilers | K. Conveyor with safety valve connection |
| D. Non return valve (clapet-valve) | H. Lubrication pump | |



4.1. Checking upon receipt

- When the goods are delivered, make sure that all parts listed on the delivery note are in perfect condition and have suffered no damage during shipping.
- Make sure the vacuum pump has its identification plate affixed on the front cover. Pumps without such identification are to be considered anonymous and potentially dangerous: in such an event, they must not be used, otherwise the manufacturer will be deemed free from any liability whatsoever.

4.2 Storing in the warehouse

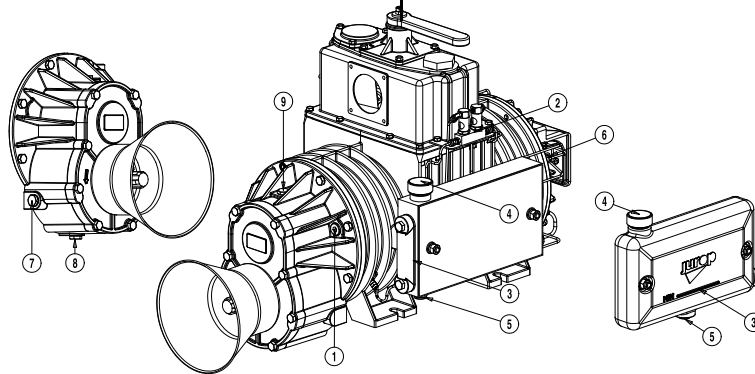
- If the pump will not be installed inside a short time after delivery:
 - Remove the guards from the ports and spray a film of protective oil over the inner surfaces of the body, rotors and sides. Then attach again the guards;
 - Store in a closed and dry place. Renew the preserving oil periodically.
- To temporarily store a used pump, follow the instructions below:
 - Thoroughly clean the pump.
- Equip the pump with suitable anti-corrosion protection.

4.3. Mounting

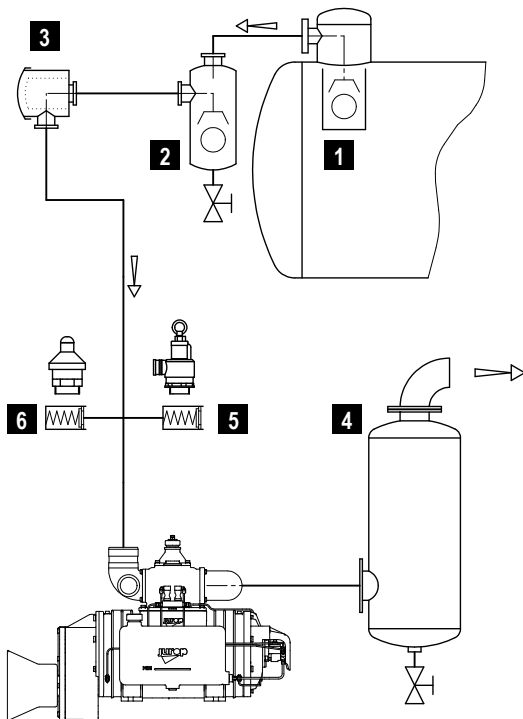
- The pump must be assembled for an easy access for maintenance operations and secured rigidly to a frame or levelled base (max. 3° slant to the horizontal plane). The base must be such as to avoid vibrations, bending or deformation.
- The oil tank is mounted on the suction side of the unit. Thus, the rotation direction determines the pump overall dimensions. See par. 2.1.
- Make sure there is enough room around the pump for the air for the cooling system to freely circulate and avoid exposure to dirt and debris.

Prepare enough room for an easy access to:

1. Vanes wear check port
2. Oilers
3. Oil tank level
4. Oil tank inlet plug
5. Oil tank outlet plug
6. Self-lubricating pump
7. Gear box oil level
8. Gear box oil outlet plug
9. Gear box oil inlet plug
10. 4-way valve handle



4.4. Vacuum – Pressure line



VACUUM-PRESSURE LINE COMPONENTS

1	Primary flow shutoff valve
2	Secondary shutoff
3	Suction filter
4	Exhaust silencer with oil separator
5 (*)	Over-pressure safety relief valve
6 (*)	Vacuum relief valve

* optional components

- In order to avoid accidental suction of liquids inside the pump, install a primary (pos. 1) and a secondary flow shutoffs (pos. 2). If necessary, install also a suction filter (pos. 3) to protect from solids infiltration.

- The exhaust silencer is designed to reduce the noise level and to separate the oil mist coming out from the pump outlet port. The separator must be periodically drained from oil and condensate accumulated in the separator during the normal pump functioning.

- The diameter of the vacuum/pressure line pipes must be properly dimensioned to the pump flow and, in any case, larger than the diameter of the ports (Ø100 is recommended).

- The pipes weight must not solicit the body of the pump. Use high temperature resistant rubber connections.

- Before mounting the vacuum line to the pump, remove the port protections. Pipes and all line components must be clean.

- Avoid restrictions and tight curves as much as possible if not strictly necessary.

- Exhaust pipes can reach high temperatures. Hence, they must be properly isolated.

- Max. pressure safety valve on delivery: mount it close to the pump. The valve flow must prevent the PN130 - PN140 - PN155 from exceeding the absolute operating pressure (see par. "Usage limitations") or, in any case, the maximum pressure allowed by the system. Do not apply gate valves on the line.

- Over-pressure safety relief valve (pos. 6): to apply if necessary to limit the vacuum rate in the system.

4.5. Pump mounting - Drive connection

A) Cardan shaft drive

- Use telescopic cardan shafts.

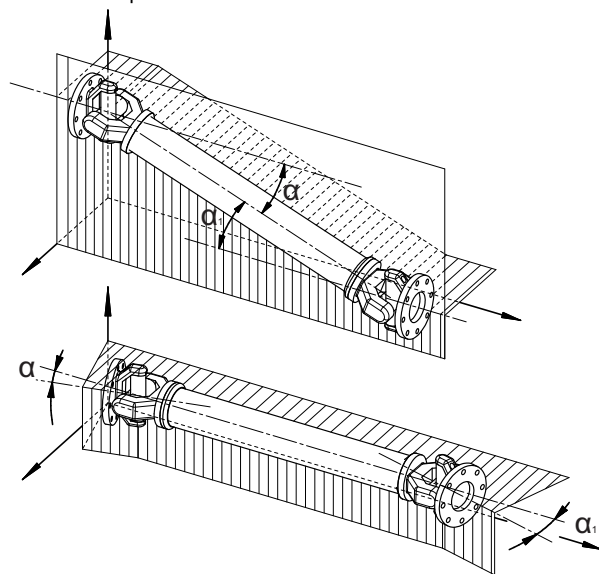


Fig. 4.1

- In order to achieve a uniform motion of the driven shaft, the following requirements must be met (see Fig. 4.1):

- Equal working angle α and α_1 of both couplings.
- The internal fork joints must be coplanar.
- Both driven and driving shafts must be coplanar.

- It is also recommended working with limited articulated joint angles (max. 15°) and disengaging the transmission for those operations requiring great angles (steering or lifting).

Follow the rotation direction as indicated on the front flange. Follow the instructions of the cardan shaft's manufacturer.

- Use the protection that comes with the pump shaft.

Use the cardan protection supplied with the pump. The pump installation must fulfil the current EC injury prevention specifications.

B) Belt drive

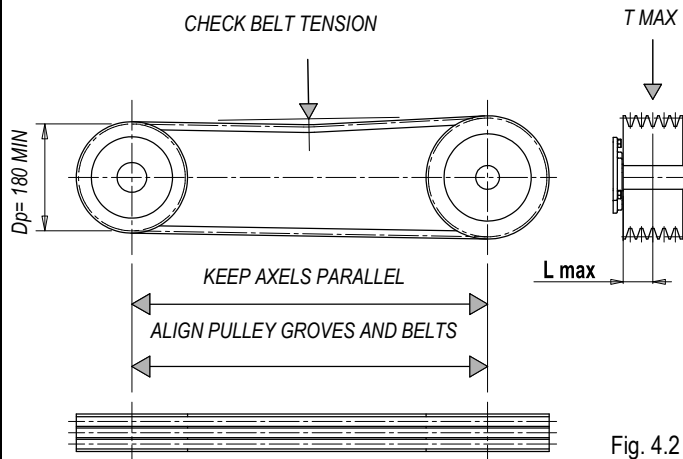


Fig. 4.2

- Install a suitable pulley on the smooth shaft as close as possible to the pump: L max 35 mm.

- Apply an adequate belt tension (see manufacturer's data). T Max 3000N.

- Do not use driven or driving pulleys with a pitch diameter inferior to 180 mm. Small pulleys require a high belt tension which may cause premature wear to the bearing or transmission troubleshooting.

- If the pump PN155 is run through a belt drive, its working pressure must not exceed 1.5 abs. bars to prevent it from absorbing a power requiring an excessive belt tension. There is no limit to the operation in vacuum.

Attention: If the pump PN155 is run through a belt drive, its working pressure must not exceed 1.5 abs.

Pump	Drive min. pulley p. diam.	Belts	Max. Speed	Max. Pressure	Max. Vacuum.
PN130	180 mm	SPB x 3	1350 rpm	2 bar abs	94%
PN140	180 mm	SPB x 3	1350 rpm	2 bar abs	92%
PN155	180 mm	XPB x 3	1150 rpm	1,5 bar abs	93%

C) Hydraulic drive

Motor features for pump PN130 - PN140

Displacement	Max. operating pressure	Max pressure draining line	Max. press. motor exhaust
72 cc/rev	235 bar	5 bar	5bar

Motor features for pump PN155

Displacement	Max. operating pressure	Max pressure draining line	Max. press. motor exhaust
86 cc/rev	220 bar	5 bar	5bar

• **Fluid:** mineral oil for hydraulic systems in compliance with ISO/DIN.

Temperature	Optimum viscosity ale	Max. viscosity allowed
-20 / +80 °C	12 – 100 cSt	750 cSt

• **Filtration:** class 19/16 contamination according to ISO 4406 to be obtained with a $\beta_x = 75$ filter.

• **Check circuit connections:** they must be applied in the same rotation direction as that indicated by the arrow on the pump front flange.

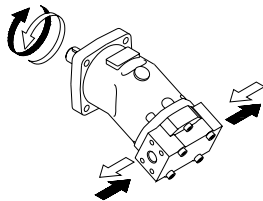


Fig. 4.3

• **Draining:** connect directly to the tank above the maximum oil level. Operating without draining line may damage the motor.

1	Hdr pump	4	Oil filter
2	Distributor	5 *	Heat exchanger
3	Hdr motor	6 *	Safety valve

* optional components

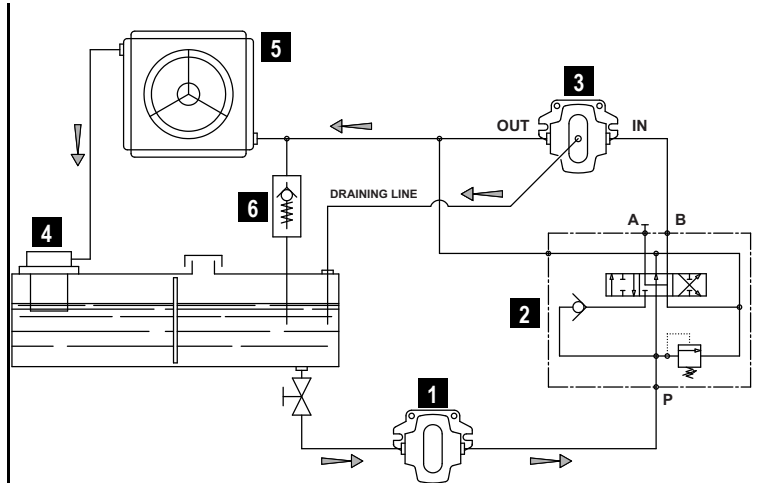


Fig. 4.4

• **Distributor:** open-centre distributor in central idle position (vacuum pump off). It must be equipped with an adjustable overpressure safety valve.

• **Motor pipeline:** outlet pipe must not be of a smaller diameter than that of the inlet port. Inlet pipes always have a diameter smaller than outlet pipes. Choose preferably flexible pipes to avoid vibration transmission.

• **Tank:** with suction pipe and return separated by baffles. If necessary, use a heat exchanger to avoid oil heating above 70-80°C and protect it from extreme pressure with a pressure relief valve. Minimum approximate capacity: as twice as the circulation flow.

• **Starting-up:** be sure that the system is well cleaned and pour oil into the tank and into the motor housing (necessary to lubricate the internal bearings).

• Vent the circuit and adjust the overpressure safety valve to the lowest possible value.

• Check the oil tank level.

• Increase pressure and rotation speed until operating values are reached.

5. Start up

5.1. Starting-up of the pump

- Check oil levels in gearbox and side mounted tank.
- Check that all protection devices are correctly installed.
- Check that there are no obstacles in the vacuum line.
- Check rotation direction: open all system valves and start running slowly.

Do not rotate in the wrong direction: this may damage the vacuum pump. Follow the arrow indicated on the front flange.

- Check which position of the four-way integrated valve lever allows vacuum or pressure functioning.
- Close the valve and increase vacuum rate (or operating pressure).

- Check that the lubricating pump works properly. Oil must regularly drip into the oilers. Typically (with degree of vacuum > 50%) about **40 drops/min** (at maximum speed).
- Check loading and operating speed for vibrations or unusual noises.

This vacuum pump is designed to work at maximum speed, but for longer operating we recommend the pump be run at working speed (see par. 2.3). Adequately prepare the transmission

- Prepare adequately transmission.

5.2. Operating precautions

- Do not make the vacuum pump overheat: maximum air temperature on exhaust (or delivery) side: 150°C.
- Do not operate the pump without lubrication: it may cause quick wear and possible breakdown of vanes.
- Do not start running the pump under load: this may damage the drive system or the hydraulic motor.
- Check the rotation speed: it must never exceed the operating limits indicated on the identification plate of the vacuum pump.
- Do not accidentally operate the pump in the wrong direction: it may break the vanes.
- Do not convey the exceeding delivery outlet towards the suction port, otherwise it will suck warm gas.
- Control the air flow by adjusting the rotation speed: do not use the pressure relief valve to discharge the exceeding flow.
- Internal wash-up is necessary after prolonged inactivity, after working in dusty environments or in case of accidental suction of liquids.

Such operation must be carried out only on cooled pumps.

1. Disconnect the exhaust silencer, if possible;

2. Start running the pump at low speed;
3. Suck some water (about 1-2 litres) through the inlet port;
4. Then suck oil (about 1 litre) to complete the wash-up and lubricate internal components.



In case the exhaust line cannot be disconnected, drain the liquids accumulated in the separator of the exhaust silencer.

- Once the needed vacuum rate has been reached, we recommend reducing the vacuum pump speed to its working speed (see par. 2.3): this allows keeping the achieved vacuum/pressure rate constant. The pump speed can also be reduced to values lower than the working speed during the tank discharging phase (with the 4-way valve in pressure mode) without increasing the draining time.
- Thus, exhaust temperature is reduced, vane durability is increased and both oil consumption and power absorption are reduced.



Once the needed vacuum rate has been reached, we recommend reducing the vacuum pump speed to its working speed.

6. Maintenance

- Installation and maintenance must be operated only by qualified personnel wearing the proper clothes and the necessary tools as well as protection devices.
- In the following table summarizes the main controls to be performed and the frequency of intervention.

Operating Condition	Maintenance Area	Checking	8H	50H	500H	1500H
OPERATING	Transmission	Rotation speed	■			
		Lubrication: dripping into oilers	■			
	Pump	Working pressure	■			
		Noise level	■			
STANDSTILL	Pump	Clean oilers glasses	■			
		Clean filter and vacuum line shutoff - Drain the oil gathered in the exhaust separator.	■			
		Check vanes wear		■		
		Check pressure relief valve condition			■	
		Side mounted tank oil level	■			
		Gearbox oil level			■	
		Gearbox oil change (*)				■
		Pump's inner washing (**)				

(*) In order to choose the most suitable oil, see paragraph 2.5.

(**) After operation in dusty environments, after accidental sucking of liquids inside the pump or before a long inoperativity period it is recommended to wash the pump inside according to the procedure described at paragraph 5.2.

6.1. Ordinary maintenance

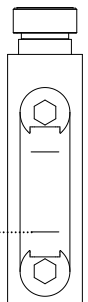
Checking the drip oilers

- Check dripping into the oilers.
- Be sure it is regular (about **40 drops/min** at max. speed, with degree of vacuum > 50%) to grant a correct lubrication of the pump. At lower speeds, the number of drops must be directly proportional.

Checking the side mounted oil tank level

- Do not run the pump with oil level under the minimum level: that may lead to dry functioning and cause serious damages.
- Tank capacity: **4l**.
- Use pure fresh oil.


MIN



Do not re-use the exhausted oil gathered on the bottom of the exhaust silencer.

Checking the vanes wear PN130M – PN140M – PN155-155R

- Unscrew the vanes wear check-plug on the housing.
- Turn the shaft until you see the vane.
- The vanes should slide to the bottom of the seat due to gravity: check they really do.

 **Replace the vanes when their wear exceeds 10 mm (L – L min): they may break.**

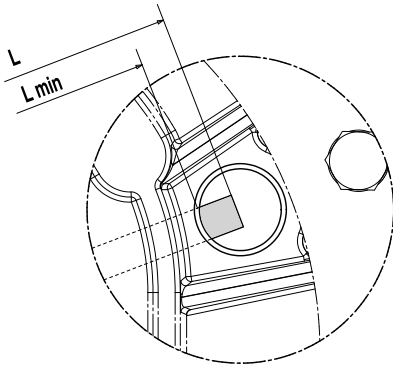


Fig. 6.1

- Replace all vanes at the same time.

Checking the vanes wear PN130D – PN130HDR – PN140D – PN140HDR

- Remove the plug and insert a metal rod $\varnothing 6$ with a tapered end.
- Rest first the rod against the rotor and mark the spot.
- Afterwards turn slowly the drive shaft until the rod connects with the vane (inserted in its slot) and mark also this spot. If the distance between the two spots is more than 10 mm the vanes have to be changed.

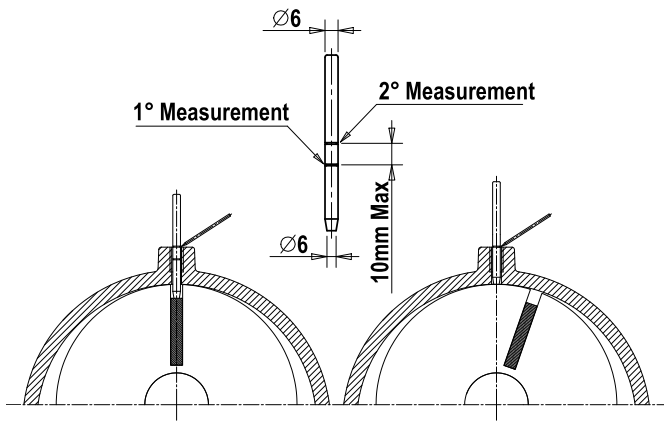

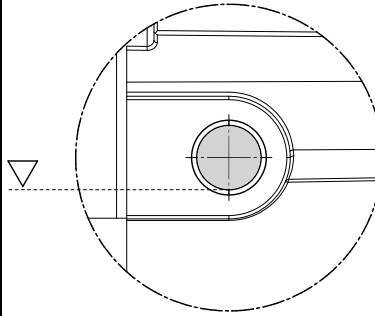


Fig. 6.2

 **An excessive wear of the vanes most likely will result in the breakage of the vane itself because the guiding function of the rotor's slot will not be sufficient anymore with a reduced width of the vanes. Vanes breakage may cause serious damages on the inside parts of the pump.**


- At the end of this checking do not forget to replace the plug on the port.

Checking the gear box oil level



- Check the level when the pump is cooled: it must almost reach the threaded port. Refill if necessary.
- For a complete replacement, 0.7 litres are required. Use mineral oil with EP additives for gears and transmissions.

- When changing the oil, also replace the outlet plug washer.

 **Dispose of exhausted oil as provided by current specification.**

6.2. Extraordinary maintenance

- Before starting any extraordinary maintenance operation, be sure the pump stands still and follow the safety prescriptions as described in Cap. 3.

Adjusting the 4-way valve

- For pumps equipped with handle for manual operation or hydraulic actuator.
- Adjust the screws to avoid the valve blocking in its seat.

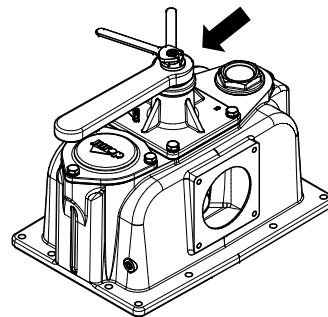



Fig. 6.3

 **Attention: do not exceed with the adjustment: possible vacuum loss.**

- For pumps equipped with changeover valve with hydraulic actuator: see the integrated part at the end of these instructions.

Replacing the vanes

- Remove the vacuum pump from its bearing frame and wash it before disassembling.
- Disconnect the lubricating piping.
- Remove the screws fixing the rear flange and use the two threaded holes to remove the flange – bearing – seal housing. If necessary, hold the rotor by inserting a wooden block, protecting the internal bearings from damage.
- Remove the bearing from the rear flange and replace the seal if damaged.

- Lubricate with oil the new vanes before inserting them inside each groove of the rotor.
- Reinstall all components in the following order: rear flange, seal ring, bearing, compensation ring, gasket and flange with lubricating pump (we recommend the pivot-key be correctly fitted onto the shaft groove).

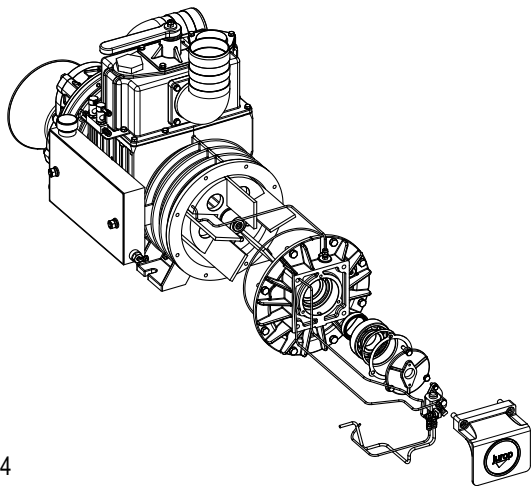
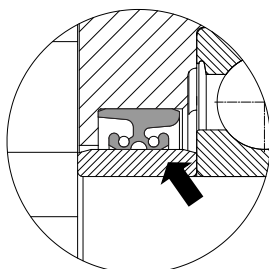


Fig. 6.4

! Do not damage components during assembly by forcing them exceedingly.



- Do not flip the seal ring during rotation of the shaft. Do not leave foreign objects inside the pump.

Adjusting the self-lubricating pump

- The automatic lubricating pump is adjusted by the manufacturer before the shipping.
- If consumption noticeably differs from the indicated value, adjust it as follows:
 - Remove the upper protection cover;
 - Using a screwdriver and a 10 mm wrench, adjust the adjusting screw (K). Close the nut and remount the upper protection cover;

- It is advisable to turn the screw of ¼ of turn and verify the actual consumption.

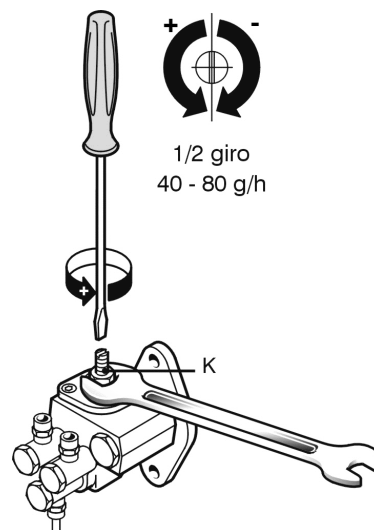


Fig. 6.5

! Do not reduce oil consumption below the value indicated in par. 2.4 (for functioning at speeds different from the maximum, flow is proportionate to rotating speed).

- ½ turn of the adjusting screw causes a variation in the flow of appr. 40 - 80 g/h, depending on using conditions.

Replacing gearbox components

- The pump with a 540 rpm gear box can be transformed into a pump with a 1000 rpm gear box (and vice versa):
 - Take down the gearbox as illustrated. Remove also the drive shaft's pinion;
 - Install the new pinion closing the nut;
 - Mount the gear wheel including bearings and seals on the front cover, properly aligning components. This housing may now be installed in the gear box: fit the bearing in the internal housing on the flange;
 - Properly engage gears, replace the cover's gaskets to complete gear replacement. Insert the parallel pin, which maintains the correct alignment.

See Fig. 6.6.

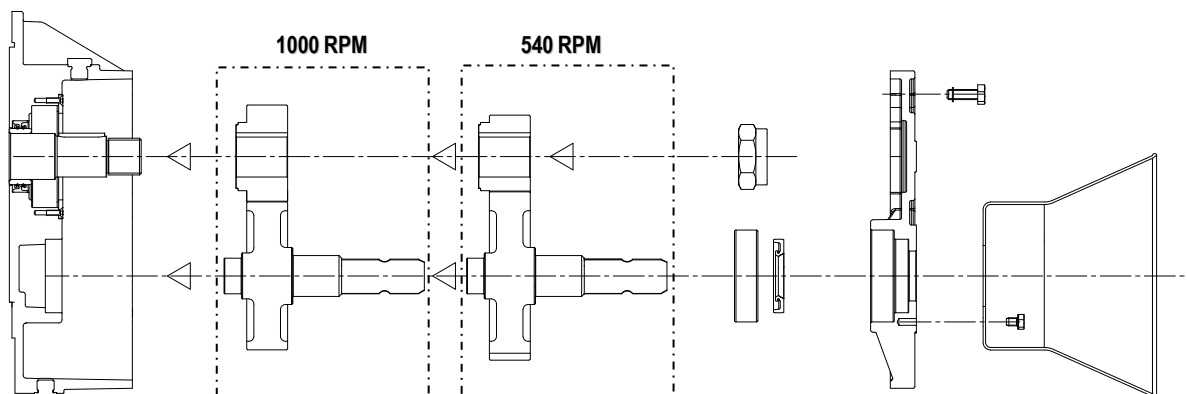


Fig. 6.6

7. Malfunctions: troubleshooting

PROBLEMS

The vacuum pump overheats

Cause	Solution
• Insufficient or absent lubrication	• Verify oil and rings. Check oil pump efficiency
• Low tank oil level	• Fill tank with oil
• Excessive rotation speed	• Reduce rpm to the prescribed working speed
• Prolonged functioning at max vacuum rate	• Reduce vacuum rate
• Vacuum and/or exhaust line of insufficient diameter	• Check dimensioning

The vacuum pump does not rotate

Cause	Solution
• Broken vanes: - due to infiltrated solids - due to insufficient lubrication	• Clean inner chambers, replace vanes • Check the secondary shutoff and filters of the suction line • Check the oil pump
• Power transmission breakdown	• Check and replace the damaged parts
• Ice inside the pump (during the cold season)	• Remove ice and slowly start running it. Avoid suction of water

Reduced performances

Cause	Solution
• Four way changeover valve in idle position	• Move the lever to vacuum or pressure mode end stroke
• Four way changeover valve not correctly registered	• Adjust the functioning play and lubricate
• Worn vanes	• Replace vanes
• The non-return valve leaks	• Clean or replace if necessary
• Worn seal rings	• Replace
• Tank gate valves or gaskets leak	• Replace damaged or worn parts
• Tank connection pipes leak or are obstructed	• Replace damaged pipes
• Obstructed primary shutoff or suction filter	• Remove and clean
• Encrusted exhaust port	• Remove and clean
• Vacuum line components are too small dimensioned	• Verify dimensions for pump maximum performances
• Obstructed rubber couplings	• Replace

Unusual oil consumption

Cause	Solution
• Insufficient or absent lubrication	• Check and adjust the lubricating pump

8. Scrapping

• Recycling materials allow reducing the environmental impact and respecting the environment.

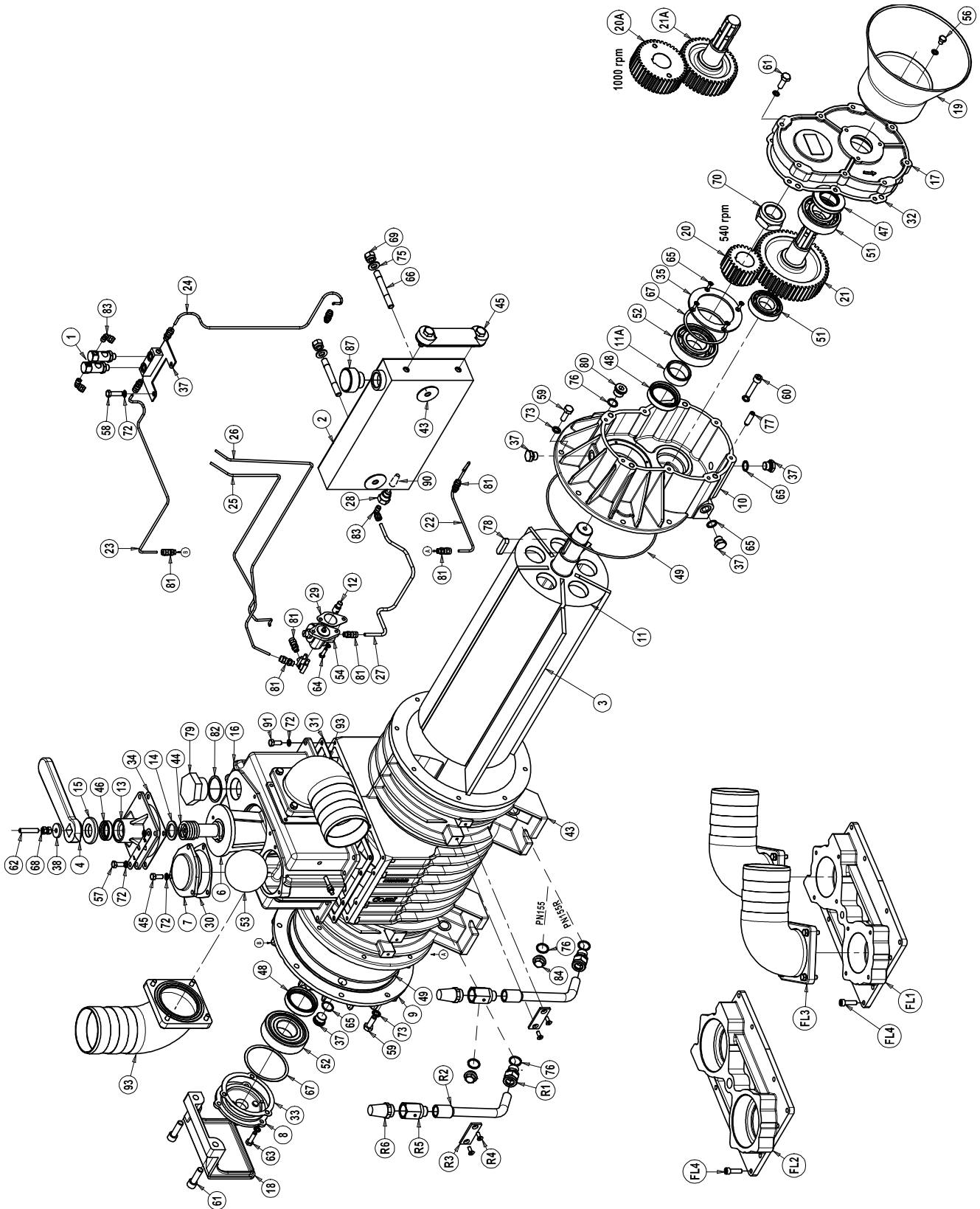


Do not dispose of in the environment. Dispose of in compliance with the standards in force.

• Before scrapping the machine, the following materials need to be separated and suitably disposed of:

Material	Cast Iron	Steel	Alluminum	Copper	Bronze	Rubber	Vane	Oil	Plastic
PN 130	86 %	11 %	0.7 %	0.3 %	0.1 %	0.3 %	0.9 %	0.5 %	0.2 %
PN 140	86 %	11 %	0.6 %	0.3 %	0.1 %	0.3 %	0.8 %	0.5 %	0.2 %
PN 155 / R	87 %	11 %	0.6 %	0.3 %	0.0 %	0.1 %	0.9 %	0.5 %	0.2 %

PN130 M – PN140 M – PN155 M – PN155R M



PN 130 M

Pos.	Code	Description	Qty	Pos.	Code	Description	Qty
1	1401200700	DRIP OILER	2	48	4022200113	PUMP ROTOR SEAL RING	2
2	1587009400	OIL TANK	1	49	4022200323	O RING 4850 VITON	2
3	1601607000	VANE PN130	4	50	4023100020	BEARING 6207	1
4	1605500100	COCK LEVER	1	51	4023100040	BEARING 6308	1
5	1608100000	DRIP OILER DISTRIBUTOR	1	52	4023100046	BEARING 6309	1
6	1608502500	COCK	1	53	4023250502	RUBBER BALL Ø90	1
7	1610509800	MANIFOLD SMALL FLANGE	1	54	4024251000	OIL PUMP CW ROTATION	1
8	1610512900	OIL PUMP FLANGE	1		4024251500	2 WAY – OIL PUMP LEFT	1
9	1610512800	FLANGE	1	55	4026101301	SCREW M6X10	2
10	1610512700	GEAR BOX FLANGE	1	56	4026102802	GALV. SCREW TE M8X12	3
11	1521507100	PUMP ROTOR PN130	1	57	4026102806	GALV. SCREW TE M8X20	3
12	1622002600	OIL PUMP PIVOT	1	58	4026102808	GALV. SCREW E TE M8X30	2
13	1623100500	COCK MANIFOLD	1	59	4026102908	GALV. SCREW TE M10X30	8
14	162409YKBO	COCK SPRING SPACER	1	60	4026121813	GALV. SCREW TCEI M10X50	2
15	1624202300	COCK REGULATING SPACER	1	61	4026121710	GALV. SCREW TCEI M12X35	2
16	1627504600	MANIFOLD PN140	1	62	4026135414	STUD SCREW M8X45	1
17	1640501200	GEAR BOX COVER	1	63	4026102807	GALV. SCREW TE M8X25	10
18	1642100200	OIL PUMP PROTECTION.	1	64	4026121304	GALV. SCREW TCEI M6X14	2
19	4029602806	DRIVE SHAFT PROTECTION	1	65	4026155503	GALV. SCREW TSPEI M 5X12	4
20	1651005500	GEAR Z 28 (540 RPM)	1	66	4026171211	SCREW M12X80	2
20a	1651010700	GEAR Z 42 (1000 RPM)	1	67	4026300025	COMPENSATION RING	2
21	1651010500	GEAR Z 70 (540 RPM)	1	68	4026308005	HEXAGONAL NUT M8	2
21a	1651010600	GEAR Z 56 (1000 RPM)	1	69	4026305508	SELFBLOCKING NUT M12	2
22	1663062900	FRONT HOUSING TUBE DIRECT LEFT	1	70	4026306115	SELFBLOCKING NUT M36X3	1
23	1663067600	REAR FLANGE SUP. TUBE	1	71	4026351504	WASHER M6	2
24	1663067700	FRONT HOUSING TUBE	1	72	4026351505	SAW-TOOTHED WASHER M8	3
25	1663062600	SUPPLY SHORT TUBE 540 LEFT	1	73	4026351506	SAW-TOOTHED WASHER M10	8
26	1663062700	SUPPLY LONG TUBE 540 LEFT	1	74	4026350508	SAW-TOOTHED WASHER M12	2
27	1663063100	TANK SUCT. TUBE 540 RIGHT	1	75	4026357007	WASHER M12	2
28	1673001000	OIL FITTING	1	76	4026359003	ALU. WASHER 21,5X26X1,5	1
29	1680609700	OIL PUMP GASKET	1	77	4026401806	CYLINDRICAL PIN 10X36	2
30	1680610500	MANIFOLD SMALL FLANGE GASKET	1	78	4026501003	KEY 12X8X40	1
31	1680614300	MANIFOLF GASKET	1	79	4026904005	PLUG G1 1/2	1
32	1680614100	GEAR BOX COVER GASKET	1	80	4026701603	GALV. PLUG G1/2	1
33	1680707300	DIRECT DRIVE FLANGE GASKET	1	81	4026702000	STRAIGHT FIRRING G1/8 - Ø4	6
34	1680707800	MANIFOLD GASKET	1	82	4026702708	COPPER WASHER 1 1/2	1
35	1681006500	PUSHING PLATE	1	83	4026706000	ELBOW FITTING G1/8 - Ø4	2
36	1681100200	DRIP OILER PLATE	1	84	4026904001	BLIND PLUG G1/2	2
37	1684000000	DISCHARGE PLUG G3/8	3	85	4026904503	OIL TANK PLUG	1
38	1685002800	WASHER 30X8.5X4	1	86	4026905002	GALV. HEXAGONAL PLUG G1/4	2
39	1685100000	ALU - WASHER	2	87	4026910103	OIL TANK FPLUG	1
40	1685100100	ALU WASHER 10X16X1,5	2	88	4026910603	HEXAGONAL CONICAL PLUG G3/8	2
41	1685100200	ALU WASHER 17X22X1,5	3	89	1685100300	ALU-WASHER	2
42	1685600200	RUBBER WASHER	2	90	4022300001	OIL PUMP SUCTION FILTER	1
43	1687510300	CORPO PN130	1	91	4026107110	SCREW TE 8.8 M8X25	10
44	1691000000	COCK SPRING	1	92	4026706003	ELBOW FITTING G1/8 – Ø6	2
45	4022106001	OIL TANK DIP STCK	1	93	1852104000	ORIENTABLE AIR CONVEYORS Ø100	2
46	4022200030	SEAL RING 41X27X10	1				
47	4022200040	SEAL RING 72X40X10	1		1892005300	GASKET KIT PN130-140	1

PN 130 FL

Pos.	Code	Description	Qty	Pos.	Code	Description	Qty
FL1	1627504800	FLANGED MANIFOLD	1	FL3	1852104000	SWIVEL ING CONVEYOR KIT D. 100	2
FL2	1627504900	THREADED FLANGED MANIFOLD	1	FL4	4026120406	SCREW TCEI 8X30	12

PN 140 M

Pos.	Code	Description	Qty	Pos.	Code	Description	Qty
1	1401200700	DRIP OILER	2	48	4022200113	PUMP ROTOR SEAL RING	2
2	1587009400	OIL TANK	1	49	4022200323	O RING 4850 VITON	2
3	1601606200	VANE PN140	4	50	4023100020	BEARING 6207	1
4	1605500100	COCK LEVER	1	51	4023100040	BEARING 6308	1
5	1608100000	DRIP OILER DISTRIBUTOR	1	52	4023100046	BEARING 6309	1
6	1608502500	COCK	1	53	4023250502	RUBBER BALL Ø90	1
7	1610509800	MANIFOLD SMALL FLANGE	1	54	4024251000	OIL PUMP CW ROTATION	1
8	1610512900	OIL PUMP FLANGE	1		4024251500	2 WAY – OIL PUMP LEFT	1
9	1610512800	FLANGE	1	55	4026101301	SCREW M6X10	2
10	1610512700	GEAR BOX FLANGE	1	56	4026102802	GALV. SCREW TE M8X12	3
11	1521503500	PUMP ROTOR PN140	1	57	4026102806	GALV. SCREW TE M8X20	3
12	1622002600	OIL PUMP PIVOT	1	58	4026102808	GALV. SCREW E TE M8X30	2
13	1623100500	COCK MANIFOLD	1	59	4026102908	GALV. SCREW TE M10X30	8
14	162409YKBO	COCK SPRING SPACER	1	60	4026121813	GALV. SCREW TCEI M10X50	2
15	1624202300	COCK REGULATING SPACER	1	61	4026121710	GALV. SCREW TCEI M12X35	2
16	1627504600	MANIFOLD PN140	1	62	4026135414	STUD SCREW M8X45	1
17	1640501200	GEAR BOX COVER	1	63	4026102807	GALV. SCREW TE M8X25	10
18	1642100200	OIL PUMP PROTECTION.	1	64	4026121304	GALV. SCREW TCEI M6X14	2
19	4029602806	DRIVE SHAFT PROTECTION	1	65	4026155503	GALV. SCREW TSPEI M 5X12	4
20	1651005500	GEAR Z 28 (540 RPM)	1	66	4026171211	SCREW M12X80	2
20a	1651010700	GEAR Z 42 (1000 RPM)	1	67	4026300025	COMPENSATION RING	2
21	1651010500	GEAR Z 70 (540 RPM)	1	68	4026308005	HEXAGONAL NUT M8	2
21a	1651010600	GEAR Z 56 (1000 RPM)	1	69	4026305508	SELFBLOCKING NUT M12	2
22	1663062900	FRONT HOUSING TUBE DIRECT L LEFT	1	70	4026306115	SELFBLOCKING NUT M36X3	1
23	1663063000	REAR FLANGE SUPPLY TUBE LEFT	1	71	4026351504	WASHER M6	2
24	1663062800	FRONT HOUSING TUBE LEFT	1	72	4026351505	SAW-TOOTHED WASHER M8	3
25	1663062600	SUPPLY SHORT TUBE 540 LEFT	1	73	4026351506	SAW-TOOTHED WASHER M10	8
26	1663062700	SUPPLY LONG TUBE 540 LEFT	1	74	4026350508	SAW-TOOTHED WASHER M12	2
27	1663063100	TANK SUCT. TUBE RIGHT RIGHT	1	75	4026357007	WASHER M12	2
28	1673001000	OIL FITTING	1	76	4026359003	ALU. WASHER 21,5X26X1,5	1
29	1680609700	OIL PUMP GASKET	1	77	4026401806	CYLINDRICAL PIN 10X36	2
30	1680610500	MANIFOLD SMALL FLANGE GASKET	1	78	4026501003	KEY 12X8X40	1
31	1680614300	MANIFOLF GASKET	1	79	4026904005	PLUG G1 1/2	1
32	1680614100	GEAR BOX COVER GASKET	1	80	4026701603	GALV. PLUG G1/2	1
33	1680707300	DIRECT DRIVE FLANGE GASKET	1	81	4026702000	STRAIGHT FIRRING G1/8 - Ø4	6
34	1680707800	MANIFOLD GASKET	1	82	4026702708	COPPER WASHER 1 1/2	1
35	1681006500	PUSHING PLATE	1	83	4026706000	ELBOW FITTING G1/8 - Ø4	2
36	1681100200	DRIP OILER PLATE	1	84	4026904001	BLIND PLUG G1/2	2
37	1684000000	DISCHARGE PLUG G3/8	3	85	4026904503	OIL TANK PLUG	1
38	1685002800	WASHER 30X8.5X4	1	86	4026905002	GALV. HEXAGONAL PLUG G1/4	2
39	1685100000	ALU - WASHER	2	87	4026910103	OIL TANK FPLUG	1
40	1685100100	ALU WASHER 10X16X1,5	2	88	4026910603	HEXAGONAL CONICAL PLUG G3/8	2
41	1685100200	ALU WASHER 17X22X1,5	3	89	1685100300	ALU-WASHER	2
42	1685600200	RUBBER WASHER	2	90	4022300001	OIL PUMP SUCTION FILTER	1
43	1687507600	CORPO PN140	1	91	4026107110	SCREW TE M8X25	10
44	1691000000	COCK SPRING	1	92	4026706003	ELBOW FITTING G1/8 – Ø6	2
45	4022106001	OIL TANK DIP STCK	1	93	1852104000	ORIENTABLE AIR CONVEYORS Ø100	2
46	4022200030	SEAL RING 41X27X10	1				
47	4022200040	SEAL RING 72X40X10	1		1892005300	GASKET KIT PN130-140	1

PN 140 FL

Pos.	Code	Description	Qty	Pos.	Code	Description	Qty
FL1	1627504800	FLANGED MANIFOLD	1	FL3	1852104000	SWIVEL ING CONVEYOR KIT D. 100	2
FL2	1627504900	THREADED FLANGED MANIFOLD	1	FL4	4026120406	SCREW TCEI 8X30	12

PN 155 M

Pos.	Code	Description	Qty	Pos.	Code	Description	Qty
1	1401200700	OIL DRIPPER WITHOUT SETTING	2	48	4022200113	SEAL RING 70X55X15 VITON	2
2	1587009400	OIL TANK	1	49	4022200311	O RING 4975 VITON	2
3	16016AB6B0	VANE PN155	5	50	4023100020	BEARING 6207	1
4	1605500100	COCK HANDLE	1	51	4023100040	BEARING 6308	1
5	1608100000	DRIP OILER DISTRIBUTOR	1	52	4023100046	BEARING 6309	2
6	1608502500	4 WAY COCK	1	53	4023250502	RUBBER BALL	1
7	1610509800	MANIFOLD FLANGE	1	54	4024251000	2 WAY - OIL PUMP RIGHT	1
8	1610512900	AUT. OIL PUMP FLANGE	1		4024251500	2 WAY - OIL PUMP LEFT	1
9	161059RIB0	DIRECT DRIVE FLANGE PN155	1	55	4026101301	GALV. SCREW TE M6X10	2
10	161059TDB0	MULTIPL. 540 RPM FLANGE PN155	1	56	4026102802	GALV. SCREW TE M8X12	3
11	15215BXTB0	ROTOR PUMP PN155	1	57	4026102806	SCREW TE M8X20	10
12	1622002600	OIL PUMP DRIVE PIN	1	58	4026102808	SCREW TE M8X30	2
13	1623100500	COCK CAP	1	59	4026102909	SCREW TE M10X30	22
14	162409YKB0	COCK SPRING SPACER	1	60	4026121813	SCREW TCEI M10X50	2
15	1624202300	COCK SETTING SPACER	1	61	4026121711	SCREW TCEI M12X40	2
16	1627504600	MANIFOLD	1	62	4026135414	STUD SCREW M8X45	1
17	164059V5B0	MULTIPL. 540 RPM COVER PN155 M	1	63	4026140309	SCREW INOX316 TE M 8X30	3
18	1642100200	REAR PROTECTION	1	64	4026141206	SCREW INOX316 TE M6X20	2
19	4029602806	CARDAN SHAFT PROTECTION	1	65	4026155505	SCREW TSPEI M5X16	4
20	1651005300	GEARE Z 25 – 540 RPM	1	66	4026171211	SCREW M12X80	2
20a	165109KFB0	GEAR Z 37 - 1000 RPM	1	67	4026300025	COMPENSATION RING LMKAS100C	2
21	165109KEB0	GEAR Z 53 - 540 RPM	1	68	4026308005	HEXAGONAL NUT M8	2
21a	165109KGB0	GEAR Z 41 - 1000 RPM	1	69	4026305508	HEXAGONAL NUT M12	2
22	16630C14B0	FRONT HOUSING TUBE DIRECT L LEFT	1	70	4026306115	SELFBLOCKING NUT M36X3	1
23	16630C18B0	FRONT HOUSING TUBE 540 RPM LEFT	1	71	4026351504	SAW-TOOTHED WASHER M6	2
24	16630C19B0	TANK SUCT. TUBE 540 RIGHT/ DD RIGHT	1	72	4026351505	SAW-TOOTHED WASHER M8	30
25	1663062600	SUPPLY SHORT TUBE 540 LEFT	1	73	4026351506	SAW-TOOTHED WASHER M10	12
26	1663062700	SUPPLY LONG TUBE 540 LEFT	1	74	4026351504	GALV. SAW-TOOTHED WASHER M6	2
27	1663071RB0	REAR FLANGE SUPPLY TUBE 540 LEFT	1	75	4026357007	GALV. FLAT WASHER M12	2
28	1673001000	FILTER FITTING	1	76	4026359003	ALU. WASHER 21,5X26X1,5	3
29	1680609700	AUT. OIL PUMP GASKET	1	77	4026401806	CYLINDRICAL PIN 10X36	2
30	1680610500	MANIFOLD FLANGE GASKET	1	78	4026501004	KEY 12X8X45	1
31	1680614300	MANIFOLD GASKET	1	79	4026700911	PLUG G1 1/2	1
32	16807BCNB0	540 COVER GASKET. PN155 M	1	80	4026701603	GALV. PLUG G1/2	4
33	1680707300	DIRECT DRIVE FLANGE GASKET	1	81	4026702000	STRAIGHT FITTING. Ø 4X1/8	6
34	1680707800	CAP GASKET	1	82	4026702708	COPPER WASHER 1 1/2	1
35	1681006500	COMPENS. RING PUSHING PLATE	1	83	4026706000	FITTING 90° 4X1/8	2
36	1681100200	OIL DRIPPER SUPORTING PLATE	1	84	4026904001	BLIND PLUG G1/2	2
37	1684000000	DISCHARGE PLUG G3/8	3	85	4026904503	PLUG M20X1,5	1
38	1685002800	WASHER 30X8,5X4	1	86	4026905002	GALV. HEXAGONAL PLUG G1/4	2
39	1685100000	OIL DRIPPER ALU WASHER	2	87	4026910103	PLASTIC VENT PLUG G1	1
40	1685100100	ALU WASHER 10X16X1,5	2	88	4026910603	HEXAGONAL CONICAL PLUG G3/8	2
41	1685100200	ALU WASHER 17X22X1,5	4	89	1685100300	ALU. WASHER	1
42	1685600200	OIL TANK PLASTIC WASHER	2	90	4022300001	OIL PUMP SUCTION FILTER	1
43	16875AB9B0	PUMP HOUSING155	1	91	4026107110	SCREW TE M8X25	10
44	1691000000	COCK SPRING	1	92	4026706003	FITTING 90° 6X1/8	2
45	4022106001	VERTIC. SIGHT LEVEL	1	93	1852104000	SWIVEL ING CONVEYOR KIT D. 100	2
46	4022200030	SEAL RING 41X27X10	1				
47	4022200040	SEAL RING 72X40X10	1		18920CZRB0	GASKET KIT PN155	1

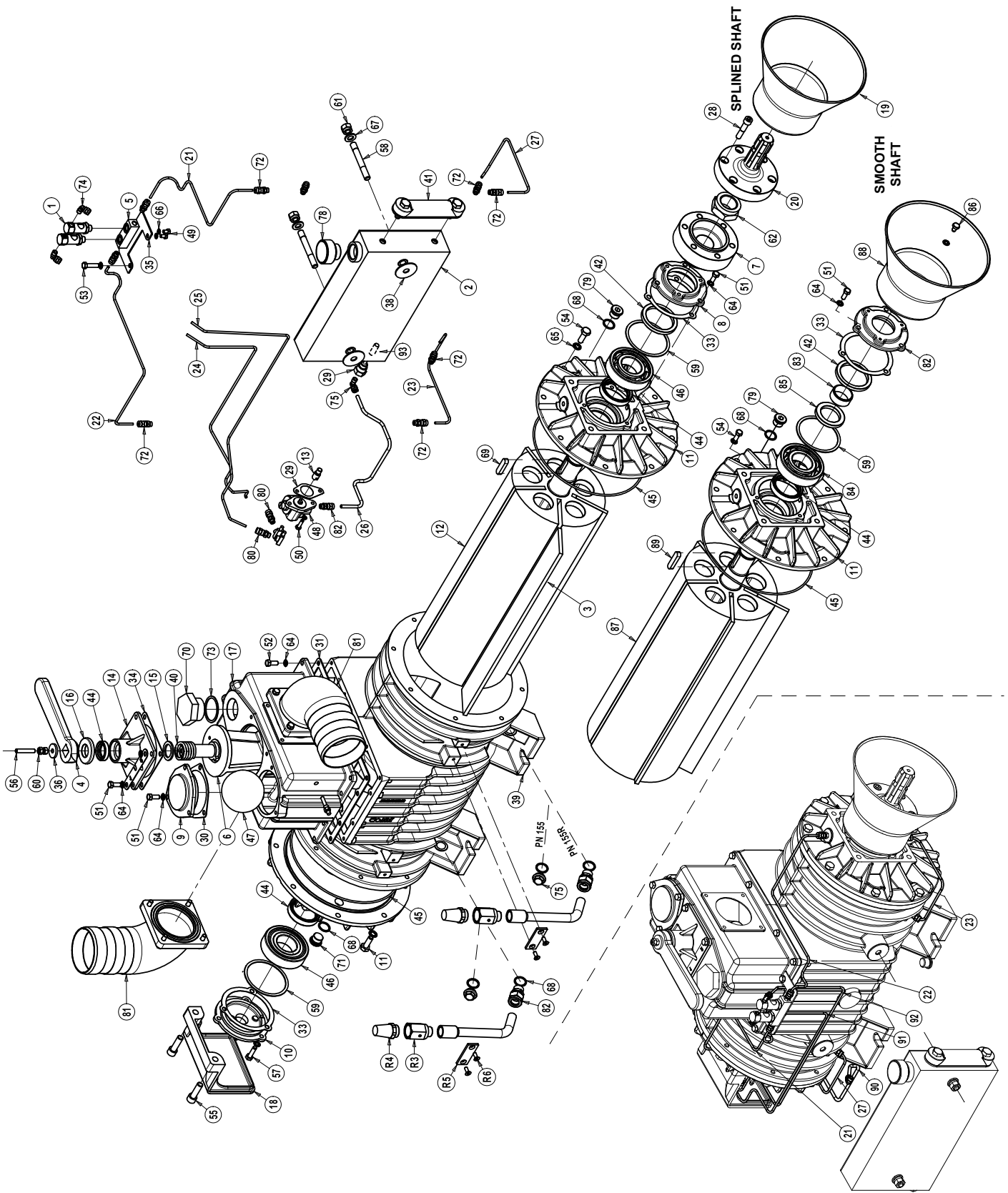
PN 155 FL – PN 155R FL

Pos.	Code	Description	Qty	Pos.	Code	Description	Qty
FL1	1627504800	FLANGED MANIFOLD	1	FL3	1852104000	SWIVEL ING CONVEYOR KIT D. 100	2
FL2	1627504900	THREADED FLANGED MANIFOLD	1	FL4	4026120406	SCREW TCEI 8X30	12

PN 155R M (version R not available for PN130-PN140)

Pos.	Code	Description	Qty	Pos.	Code	Description	Qty
R1	4026701301	BRASS FITTING 1/2X18	2	R5	1493300200	VALVE G1/2 MALE	2
R2	1663014000	FILTER HOLDER TUBE	2	R6	4022301004	SILENCER FILTER G3/4	2
R3	1681006600	TUBE HOLDER PLATE	2	R7	16016BXNB0	VANE F57 PN155 R	5
R4	4026155605	SCREW TSPEI 10.9 M6X16	4				

PN130 D – PN140 D – PN155 D – PN155R D



PN 130 D – Splined shaft

Pos.	Code	Description	Qty	Pos.	Code	Description	Qty
1	1401200700	OIL DRIPPER WITHOUT SETTING	2	45	4022200323	O RING 4850 VITON	2
2	1587009400	OIL TANK	1	46	4023100046	BEARING 6309	2
3	1601607000	VANE PN130	5	47	4023250502	RUBBER BALL	1
4	1605500100	COCK HANDLE	1	48	4024251000	OIL PUMP – 2 WAYS RIGHT	1
5	1608100000	OIL DRIPPER DISTRIBUTOR	1		4024251500	OIL PUMP – 2 WAYS LEFT	1
6	1608502500	4 WAY COCK	1	48A	4026414617	ELASTIC PIN 3X40 (ONLY FOR SX)	1
7	1610052800	DRIVE FLANGE PN155 D	1	49	4026101301	GALV. SCREW TE M6X10	2
8	16105BBBB0	FRONT BEARING FLANGE PN155 DIRECT	1	50	4026102704	SCREW TE M6X16	1
9	1610509800	MANIFOLD FLANGE	1	51	4026102806	SCREW TE M8X20	10
10	1610512900	AUT. OIL PUMP FLANGE	1	52	4026102807	SCREW TE M8X25	10
11	1610512800	DIRECT DRIVE FLANGE PN155	2	53	4026102808	SCREW TE M8X30	2
12	1521507100	ROTOR PN130	1	54	4026102908	SCREW TE M10X30	16
13	1622002600	OIL PUMP DRIVE PIN	1	55	4026121711	SCREW TCEI M12X40	2
14	1623100500	COCK CAP	1	56	4026135414	SCREW PEG M8X45	1
15	162409YKB0	COCK SPRING SPACER	1	57	4026140309	SCREW INOX 316 TE M8X30	3
16	1624202300	COCK REGUL. SPACER	1	58	4026171211	STUD SCREW M12X80	2
17	1627504600	MANIFOLD	1	59	4026300025	COMPENSATION RING LMKAS100C	1
18	1642100200	REAR PROTECTION	1	60	4026308005	HEXAG. NUT M8	2
19	16426CR1B0	CARDAN SHAFT PROTECTION	1	61	4026305508	SELF-LOCKING NUT M12	2
20	16500B6XB0	SPLINED SHAFT 1 3/8 PN155	1	62	4026306115	SELF-LOCKING NUT M36X3	1
21	1663068300	FRONT FLANGE OIL TUBE PN130 RIGHT	1	63	4026351504	SAW-TOOTHED WASHER M6	2
22	1663067600	REAR FLANGE OIL TUBE PN130 LEFT	1	64	4026351505	SAW-TOOTHED WASHER M8	25
23	1663062900	FRONT HOUSING OIL TUBE DIRECT LEFT	1	65	4026351506	SAW-TOOTHED WASHER M10	16
24	1663062600	SUPPLY SHORT TUBE 540 LEFT	1	66	4026351504	SAW-TOOTHED WASHER M6	2
25	1663062700	SUPPLY LONG TUBE 540 LEFT	1	67	4026357007	GALV. FLAT WASHER M12	2
26	1663063100	REAR FLANGE OIL TUBE M. LEFT	1	68	-		
27	1663071SB0	FRONT FLANGE OIL TUBE PN HDR RIGHT	1	69	4026501003	KEY 12X8X40	1
28	1672001600	SPECIAL SCREW TCEI M10X1,5	6	70	4026700911	PLUG G1 1/2	1
29	1673001000	FILTER FITTING	1	71	4026701603	GALV. PLUG G1/2	2
30	1680609700	AUT. OIL PUMP GASKET	1	72	4026702000	STRAIGHT FITTING. Ø4XG1/8	11
31	1680610500	MANIFOLD FLANGE GASKET	1	73	4026702708	COPPER WASHER 1 1/2	1
32	1680614300	MANIFOLD GASKET	1	74	4026706000	FITTING 90° Ø4XG1/8	3
33	1680707300	FRONT FLANGE GASKET DIRECT DRIVE	2	75	4026904001	PLUG 1/2	2
34	1680707800	CAP GASKET	1	76	4026904503	PLUG M20X1,5	1
35	1681100200	OIL DRIPPER SUPPORT PLATE	1	77	4026905002	HEXAGONAL GALVANIZED PLUG G1/4	2
36	1685002800	WASHER 30X8,5X4	1	78	4026910103	PLASTIC VENT PLUG G1	1
37	1685100000	OIL DRIPPER ALU WASHER	2	79	-		
38	1685600200	OIL TANK PLASTIC WASHER	2	80	4026706101	SWIVELING FITTING G1/8-Ø4	1
39	1687510300	PN130 HOUSING	1	81	1852104000	SWIVELING CONVEYOR KIT D. 100	2
40	1691000000	COCK SPRING	1	90	1663015XB0	SUCTION HOSE	1
41	4022106001	VERTICAL SIGHT LEVEL	1	91	16630C12B0	SHORT SUPPLY PIPE	1
42	4022200011	SEAL RING A 64X80X8	1	92	16630C13B0	DISCHARGE HOSE LONG	1
43	4022200030	SEAL RING 41X27X10	1	93	4022300001	FILTER	1
44	4022200113	SEAL RING 70X55X15 VITON	2		1892005300	GASKET KIT PN130-140	1

PN 130 D – Smooth shaft

Pos.	Code	Description	Qty	Pos.	Code	Description	Qty
82	1610508200	DIRECT DRIVE FLANGE	1	86	4026102802	SCREW M8X12	3
83	1626001100	BUSHING P.D.	1	87	1521507200	ROTOR PUMP PN130	1
4	4023115057	BEARING NJ309 ECJ	1	88	4029602806	CARDAN SHAFT PROTECTION	1
85	4022200044	SEAL RING 45X65X8	1	89	4026501005	KEY 12X8X50	1

PN 140 D – Splined shaft

Pos.	Code	Description	Qty	Pos.	Code	Description	Qty
1	1401200700	OIL DRIPPER WITHOUT SETTING	2	45	4022200323	O RING 4850 VITON	2
2	1587009400	OIL TANK	1	46	4023100046	BEARING 6309	2
3	1601606200	VANE PN140	5	47	4023250502	RUBBER BALL	1
4	1605500100	COCK HANDLE	1	48	4024251000	OIL PUMP – 2 WAYS RIGHT	1
5	1608100000	OIL DRIPPER DISTRIBUTOR	1		4024251500	OIL PUMP – 2 WAYS LEFT	1
6	1608502500	4 WAY COCK	1	48A	4026414617	ELASTIC PIN 3X40 (ONLY FOR SX)	1
7	1610052800	DRIVE FLANGE PN130-140	1	49	4026101301	GALV. SCREW TE M6X10	2
8	16105BBBB0	FRONT BEARING FLANGE PN155 DIRECT	1	50	4026102704	SCREW TE M6X16	1
9	1610509800	MANIFOLD FLANGE	1	51	4026102806	SCREW TE M8X20	10
10	1610512900	AUT. OIL PUMP FLANGE	1	52	4026102807	SCREW TE M8X25	10
11	1610512800	DIRECT DRIVE FLANGE PN155	2	53	4026102808	SCREW TE M8X30	2
12	1521503500	ROTOR PN140	1	54	4026102908	SCREW TE M10X30	16
13	1622002600	OIL PUMP DRIVE PIN	1	55	4026121711	SCREW TCEI M12X40	2
14	1623100500	COCK CAP	1	56	4026135414	SCREW PEG M8X45	1
15	162409YKB0	COCK SPRING SPACER	1	57	4026140309	SCREW INOX 316 TE M8X30	3
16	1624202300	COCK REGUL. SPACER	1	58	4026171211	STUD SCREW M12X80	2
17	1627504600	MANIFOLD	1	59	4026300025	COMPENSATION RING LMKAS100C	1
18	1642100200	REAR PROTECTION	1	60	4026308005	HEXAG. NUT M8	2
19	16426CR1B0	CARDAN SHAFT PROTECTION	1	61	4026305508	SELF-LOCKING NUT M12	2
20	16500B6XB0	SPLINED SHAFT 1 3/8 PN155	1	62	4026306115	SELF-LOCKING NUT M36X3	1
21	1663071RB0	FRONT FLANGE-HOUSING OIL TUBE	1	63	4026351504	SAW-TOOTHED WASHER M6	2
22	1663063000	REAR FLANGE SUPPLY TUBE LEFT	1	64	4026351505	SAW-TOOTHED WASHER M8	25
23	1663062900	FRONT HOUSING TUBE LEFT	1	65	4026351506	SAW-TOOTHED WASHER M10	16
24	1663062600	SUPPLY SHORT TUBE 540 LEFT	1	66	4026351504	SAW-TOOTHED WASHER M6	2
25	1663062700	SUPPLY LONG TUBE 540 LEFT	1	67	4026357007	GALV. FLAT WASHER M12	2
26	1663063100	TANK SUCT. TUBE 540 RIGHT RIGHT	1	68	-		
27	1663071SB0	HOUSING/FLANGE OIL TUBE	1	69	4026501003	KEY 12X8X40	1
28	1672001600	SPECIAL SCREW TCEI M10X1,5	6	70	4026700911	PLUG G1 1/2	1
29	1673001000	FILTER FITTING	1	71	4026701603	GALV. PLUG G1/2	2
30	1680609700	AUT. OIL PUMP GASKET	1	72	4026702000	STRAIGHT FITTING. Ø4XG1/8	11
31	1680610500	MANIFOLD FLANGE GASKET	1	73	4026702708	COPPER WASHER 1 1/2	1
32	1680614300	MANIFOLD GASKET	1	74	4026706000	FITTING 90° Ø4XG1/8	3
33	1680707300	FRONT FLANGE GASKET DIRECT DRIVE	2	75	4026904001	PLUG 1/2	2
34	1680707800	CAP GASKET	1	76	4026904503	PLUG M20X1,5	1
35	1681100200	OIL DRIPPER SUPPORT PLATE	1	77	4026905002	HEXAGONAL GALVANIZED PLUG G1/4	2
36	1685002800	WASHER 30X8,5X4	1	78	4026910103	PLASTIC VENT PLUG G1	1
37	1685100000	OIL DRIPPER ALU WASHER	2	79	-		
38	1685600200	OIL TANK PLASTIC WASHER	2	80	4026706101	SWIVELING FITTING G1/8-Ø4	1
39	1687507600	PN140 HOUSING	1	81	1852104000	SWIVELING CONVEYOR KIT D. 100	2
40	1691000000	COCK SPRING	1	90	1663015XB0	SUCTION HOSE	1
41	4022106001	VERTICAL SIGHT LEVEL	1	91	16630C12B0	SHORT SUPPLY PIPE	1
42	4022200011	SEAL RING A 64X80X8	1	92	16630C13B0	DISCHARGE HOSE LONG	1
43	4022200030	SEAL RING 41X27X10	1	93	4022300001	FILTRE	1
44	4022200113	SEAL RING 70X55X15 VITON	2				
					1892005300	GASKET KIT PN130-140	1

PN 140 D – Smooth shaft

Pos.	Code	Description	Qty	Pos.	Code	Description	Qty
82	1610508200	DIRECT DRIVE FLANGE	1	86	4026102802	SCREW 8.8 M8X12	3
83	1626001100	BUSHING P.D.	1	87	1521503600	ROTOR PUMP PN130	1
84	4023115057	BEARING NJ309 ECJ	1	88	4029602806	CARDAN SHAFT PROTECTION	1
85	4022200044	SEAL RING 45X65X8	1	89	4026501003	KEY 12X8X50	1

PN 155 D – Splined shaft

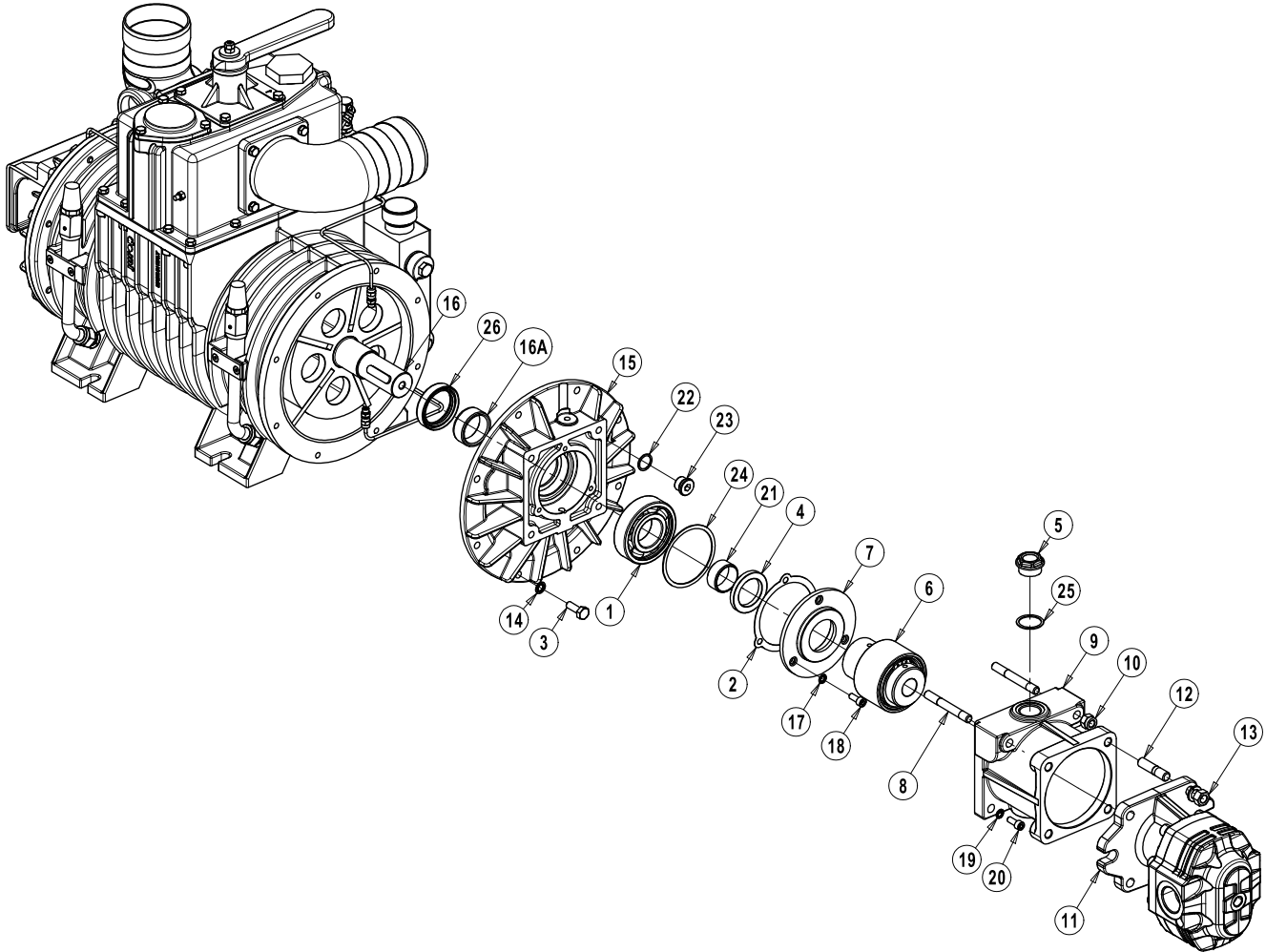
Pos.	Code	Description	Qty	Pos.	Code	Description	Qty
1	1401200700	OIL DRIPPER WITHOUT SETTING	2	45	4022200311	O RING 4975 VITON	2
2	1587009400	OIL TANK	1	46	4023100046	BEARING 6309	2
3	16016AB6B0	VANE PN155	5	47	4023250502	RUBBER BALL	1
4	1605500100	COCK HANDLE	1	48	4024251000	OIL PUMP – 2 WAYS RIGHT	1
5	1608100000	OIL DRIPPER DISTRIBUTOR	1		4024251500	OIL PUMP – 2 WAYS LEFT	1
6	1608502500	4 WAY COCK	1	48A	4026414617	ELASTIC PIN 3X40 (ONLY FOR SX)	1
7	16100B6PB0	DRIVE FLANGE PN155 D	1	49	4026101301	GALV. SCREW TE M6X10	2
8	16105BBBB0	FRONT BEARING FLANGE PN155 DIRECT	1	50	4026102704	SCREW TE M6X16	1
9	1610509800	MANIFOLD FLANGE	1	51	4026102806	SCREW TE M8X20	10
10	1610512900	AUT. OIL PUMP FLANGE	1	52	4026102807	SCREW TE M8X25	10
11	161059RIB0	DIRECT DRIVE FLANGE PN155	2	53	4026102808	SCREW TE M8X30	2
12	15215BXTB0	ROTOR PN155	1	54	4026102908	SCREW TE M10X30	16
13	1622002600	OIL PUMP DRIVE PIN	1	55	4026121711	SCREW TCEI M12X40	2
14	1623100500	COCK CAP	1	56	4026135414	SCREW PEG M8X45	1
15	162409YKB0	COCK SPRING SPACER	1	57	4026140309	SCREW INOX 316 TE M8X30	3
16	1624202300	COCK REGUL. SPACER	1	58	4026171211	STUD SCREW M12X80	2
17	1627504600	MANIFOLD	1	59	4026300025	COMPENSATION RING LMKAS100C	1
18	1642100200	REAR PROTECTION	1	60	4026308005	HEXAG. NUT M8	2
19	16426CR1B0	CARDAN SHAFT PROTECTION	1	61	4026305508	SELF-LOCKING NUT M12	2
20	16500B6XB0	SPLINED SHAFT 1 3/8 PN155	1	62	4026306115	SELF-LOCKING NUT M36X3	1
21	1663071RB0	FRONT FLANGE OIL TUBE PN HDR RIGHT	1	63	4026351504	SAW-TOOTHED WASHER M6	2
22	1663063000	REAR FLANGE OIL TUBE M. LEFT	1	64	4026351505	SAW-TOOTHED WASHER M8	25
23	16630C14B0	FRONT HOUSING OIL TUBE	1	65	4026351506	SAW-TOOTHED WASHER M10	16
24	1663062600	SUPPLY SHORT OIL TUBE DIRECT LEFT	1	66	4026351504	SAW-TOOTHED WASHER M6	2
25	1663062700	SUPPLY LONG OIL TUBE DIRECT LEFT	1	67	4026357007	GALV. FLAT WASHER M12	2
26	16630C19B0	SUCTION TANK OIL TUBE DIRECT LEFT	1	68	4026359003	ALU WASHER 21,5X26X1,5	4
27	16630C15B0	FRONT FLANGE-HOUSING OIL TUBE RIG.	1	69	4026501005	KEY 12X8X50	1
28	1672001600	SPECIAL SCREW TCEI M10X1,5	6	70	4026700911	PLUG G1 1/2	1
29	1673001000	FILTER FITTING	1	71	4026701603	GALV. PLUG G1/2	2
30	1680609700	AUT. OIL PUMP GASKET	1	72	4026702000	STRAIGHT FITTING. Ø4XG1/8	11
31	1680610500	MANIFOLD FLANGE GASKET	1	73	4026702708	COPPER WASHER 1 1/2	1
32	1680614300	MANIFOLD GASKET	1	74	4026706000	FITTING 90° Ø4XG1/8	3
33	1680707300	FRONT FLANGE GASKET DIRECT DRIVE	2	75	4026904001	PLUG 1/2	2
34	1680707800	CAP GASKET	1	76	4026904503	PLUG M20X1,5	1
35	1681006800	COCK PLATE CAP	1	77	4026905002	HEXAGONAL GALVANIZED PLUG G1/4	2
36	1681100200	OIL DRIPPER SUPPORT PLATE	1	78	4026910103	PLASTIC VENT PLUG G1	1
37	1685100000	OIL DRIPPER ALU WASHER	2	79	4026910603	HEXAGONAL CONICAL PLUG G3/8	2
38	1685600200	OIL TANK PLASTIC WASHER	2	80	4026706101	SWIVELING FITTING G1/8-Ø4	1
39	16875AB9B0	PN155 HOUSING	1	81	1852104000	SWIVELING CONVEYOR KIT D. 100	2
40	1691000000	COCK SPRING	1	90	16630C16B0	SUCTION HOSE	1
41	4022106001	VERTICAL SIGHT LEVEL	1	91	16630C12B0	SHORT SUPPLY PIPE	1
42	4022200011	SEAL RING A 64X80X8	1	92	16630C13B0	DISCHARGE HOSE LONG	1
43	4022200030	SEAL RING 41X27X10	1	93	4022300001	FILTRE	1
44	4022200113	SEAL RING 70X55X15 VITON	2				
					18920CZQB0	JOINT KIT PN155	1

PN 155 D – Smooth shaft

Pos.	Code	Description	Qty	Pos.	Code	Description	Qty
82	1610508200	DIRECT DRIVE FLANGE	1	86	4026102802	SCREW M8X12	3
83	1626001100	BUSHING P.D.	1	87	15215BXUB0	ROTORE PUMP PN155	1
84	4023115057	BEARING NJ309 ECJ	1	88	4029602806	CARDAN SHAFT PROTECTION	1
85	4022200044	SEAL RING 45X65X8	1	89	4026501005	KEY 12X8X50	1

PN 155R D – Smooth shaft – Splined shaft

Pos.	Code	Description	Qty	Pos.	Code	Description	Qty
R1	4026701301	COPPER FITTING 1/2X18	2	R5	1493300200	VALVE G1/2 MALE	2
R2	1663014000	FILTER SUPPORT	2	R6	4022301004	SILENCER FILTER G3/4	2
R3	1681006600	PLATE FERMATUBO	2	R7	16016BXNB0	VANE F57 PN155R	5
R4	4026155605	SCREW TSPEI M6X16	4				

PN130 HDR – PN140 HDR – PN155 HDR – PN155R HDR

PN 130 HDR

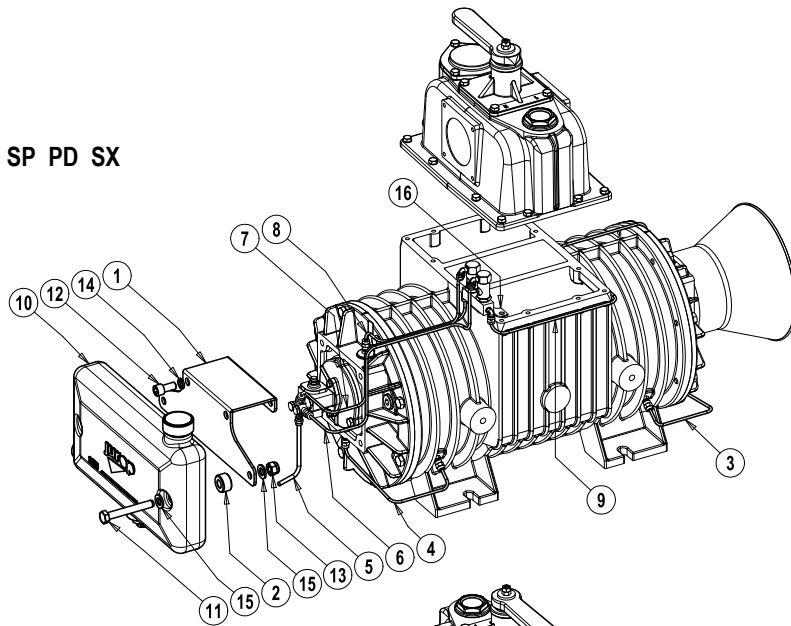
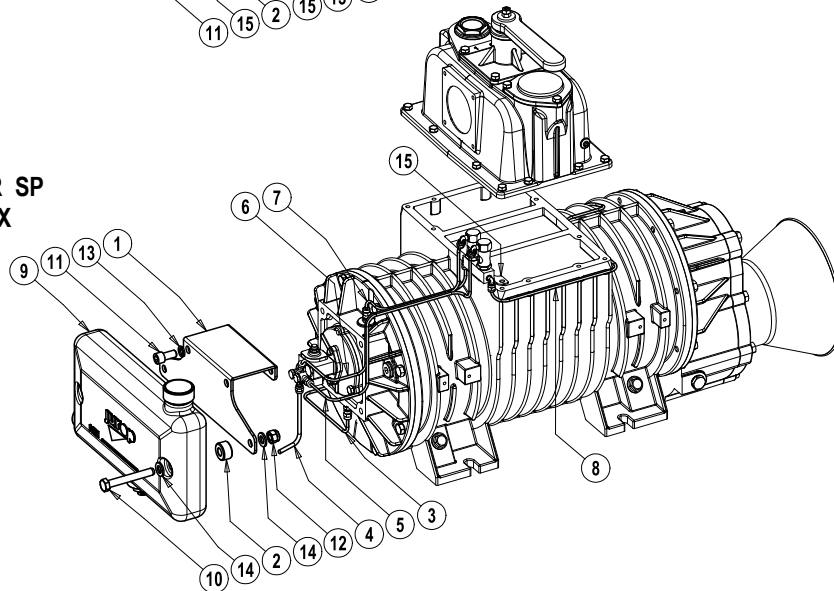
Pos.	Code	Description	Qty	Pos.	Code	Description	Qty
1	4023100046	BEARING 6309	1	14	4026350910	SAW-TOOTHED WASHER M10	8
2	1680707300	GASKET	1	15	1510512800	FLANGE PN140	1
3	4026107211	SCREW M10X30	8	16	1521507200	ROTOR PN 130 HDR	1
4	4022200044	SEAL RING 65X45X8	1	17	4026350909	SAW-TOOTHED WASHER M8	3
5	4026904003	PLUG ½ G	1	18	4026120403	SCREW TCEI M8X20	3
6	1470102300	JOINT HDR PN140	1	19	4026351505	SAW-TOOTHED WASHER M8	2
7	1610021600	HDR TRASMISSION FLANGE	1	20	4026120403	SCREW M8X20	2
8	4026103004	SCREW M8X80	2	21	1626001100	DIRECT DRIVE BUSHING	1
9	1612501000	HDR TRASMISSION HOUSING	1	22	-		
10	4026305508	NUT M12 SELF LOCKING	2	23	-		
11	4024107001	HYDRAULIC MOTOR FM 40.73	1	24	4026300025	COMPENSATING RING	2
12	4026171304	SCREW M14X40	4	25	4026359001	WASHER ALUMINUM 40X33.5X1.5	1
13	4026308008	NUT M14	4	26	4022200113	SEAL RING 70X55X15 VITON	1

PN 140 HDR

Pos.	Code	Description	Qty	Pos.	Code	Description	Qty
1	4023100046	BEARING 6309	1	14	4026350910	SAW-TOOTHED WASHER M10	8
2	1680707300	GASKET	1	15	1510512800	FLANGE PN140	1
3	4026107211	SCREW M10X30	8	16	1521503600	ROTOR PN 140 HDR	1
4	4022200044	SEAL RING 65X45X8	1	17	4026350909	SAW-TOOTHED WASHER M8	3
5	4026904003	PLUG ½ G	1	18	4026120403	SCREW TCEI M8X20	3
6	1470102300	JOINT HDR PN 140	1	19	4026351505	SAW-TOOTHED WASHER M8	2
7	1610021600	HDR TRASMISSION FLANGE	1	20	4026120403	SCREW M8X20	2
8	4026103004	SCREW M8X80	2	21	1626001100	DIRECT DRIVE BUSHING	1
9	1612501000	HDR TRASMISSION HOUSING	1	22	-		
10	4026305508	NUT M12 SELF LOCKING	2	23	-		
11	4024107001	HYDRAULIC MOTOR FM 40.73	1	24	4026300025	ANELLO DI COMPENSAZIONE LMKAS100C	2
12	4026171304	SCREW M14X40	4	25	4026359001	RONDELLA 40X33.5X1.5 ALLUMINIO	1
13	4026308008	NUT M14	4	26	4022200113	SEAL RING 70X55X15 VITON	1

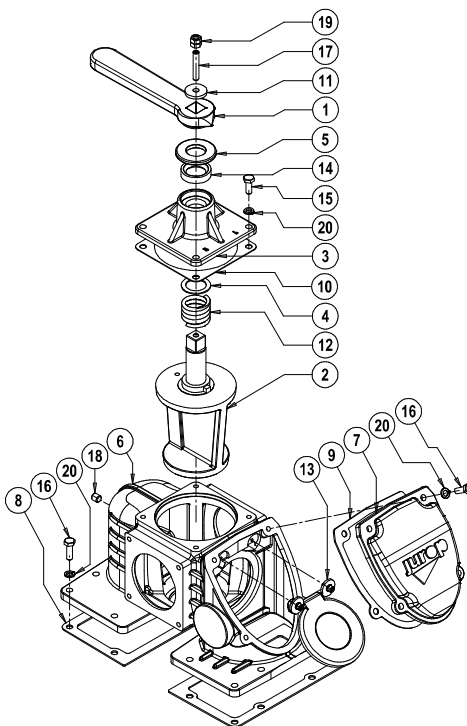
PN 155 HDR – PN155R HDR

Pos.	Code	Description	Qty	Pos.	Code	Description	Qty
1	4023100046	BEARING 6309	1	14	4026350910	SAW-TOOTHED WASHER M10	8
2	1680707300	GASKET	1	15	161059RIB0	FLANGE PN140	1
3	4026107211	SCREW M 10X30	8	16	15215BXUB0	ROTOR PN155 HDR	1
4	4022200044	SEAL RING 65X45X8	1	17	4026350909	SAW-TOOTHED WASHER M8	3
5	4026904003	PLUG ½ G	1	18	4026120403	SCREW TCEI M8X20	3
6	14701BEBB0	JOINT HDR PN 140	1	19	4026351505	SAW-TOOTHED WASHER M8	2
7	1610021600	HDR TRASMISSION FLANGE	1	20	4026120403	SCREW M8X20	2
8	4026171211	SCREW M8X80	2	21	1626001100	DIRECT DRIVE BUSHING	1
9	1612501000	HDR TRASMISSION HOUSING	1	22	4026359003	WASHER ALUMINUM 21,5X26X1,5	3
10	4026305508	NUT M12 SELF LOCKING	2	23	4026701603	PLUGG1/2	4
11	4024107004	HYDRAULIC MOTOR FM 40.73	1	24	4026300025	COMPENSATING RING	2
12	4026171304	SCREW M14X40	4	25	4026359001	WASHER ALUMINUM 40X33.5X1.5	1
13	4026308008	NUT M14	4	26	4022200113	SEAL RING 70X55X15 VITON	1

PN155 – PN155R SP (REAR TANK)
PN155-PN155R SP PD SX

**PN155 – PN155R SP
M540 - M1000 SX**


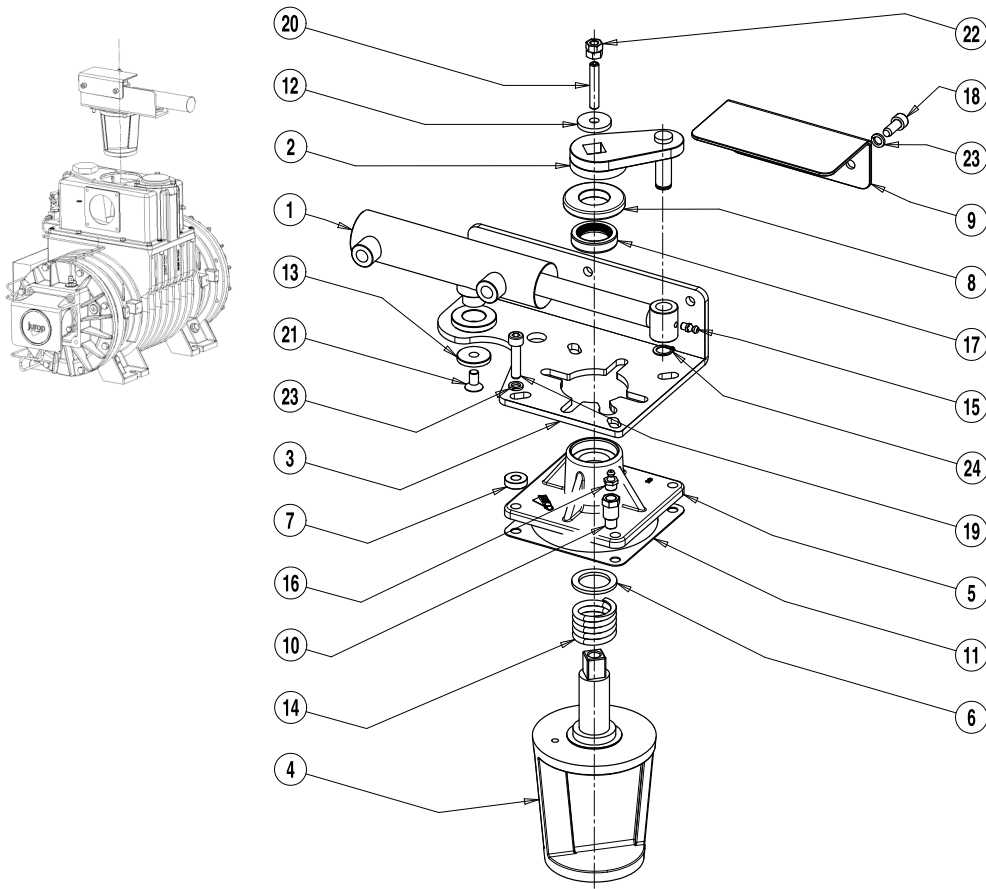
Pos.	Code	Description	Qty	Pos.	Code	Description	Qty
LUBRICATION DIRECT DRIVE				LUBRICATION M540-M1000 SX			
1	1612034000	OIL TANK SUPPORT	1	1	1612034000	OIL TANK SUPPORT	1
2	1624042800	SPACER	2	2	1624042800	SPACER	2
3	16630C14B0	OIL PIPE	1	3	16630C14B0	OIL PIPE	1
4	16630C15B0	OIL PIPE	1	4	1663067000	OIL PIPE	1
5	1663067000	OIL PIPE	1	5	1663067800	OIL PIPE	1
6	1663067800	OIL PIPE	1	6	1663067900	OIL PIPE	1
7	1663067900	OIL PIPE	1	7	1663068000	OIL PIPE	1
8	1663068000	OIL PIPE	1	8	1663068200	OIL PIPE	1
9	1663068100	OIL PIPE	1	9	1687600000	OIL TANK	1
10	1687600000	OIL TANK	1	10	4026103013	SCREW M12X90	2
11	4026103013	SCREW M12X90	2	11	4026121708	SCREW M12X25	2
12	4026121708	SCREW M12X25	2	12	4026305508	NUT M12	2
13	4026305508	NUT M12	2	13	4026350508	GROWER M12	2
14	4026350508	GROWER M12	2	14	4026357007	WASHER PIANA M12	2
15	4026357007	WASHER M12	2	15	1612033900	SUPPORT OILERS	1
16	1612033900	SUPPORT OILERS	1				

PN130-140-155 NEW MANIFOLD



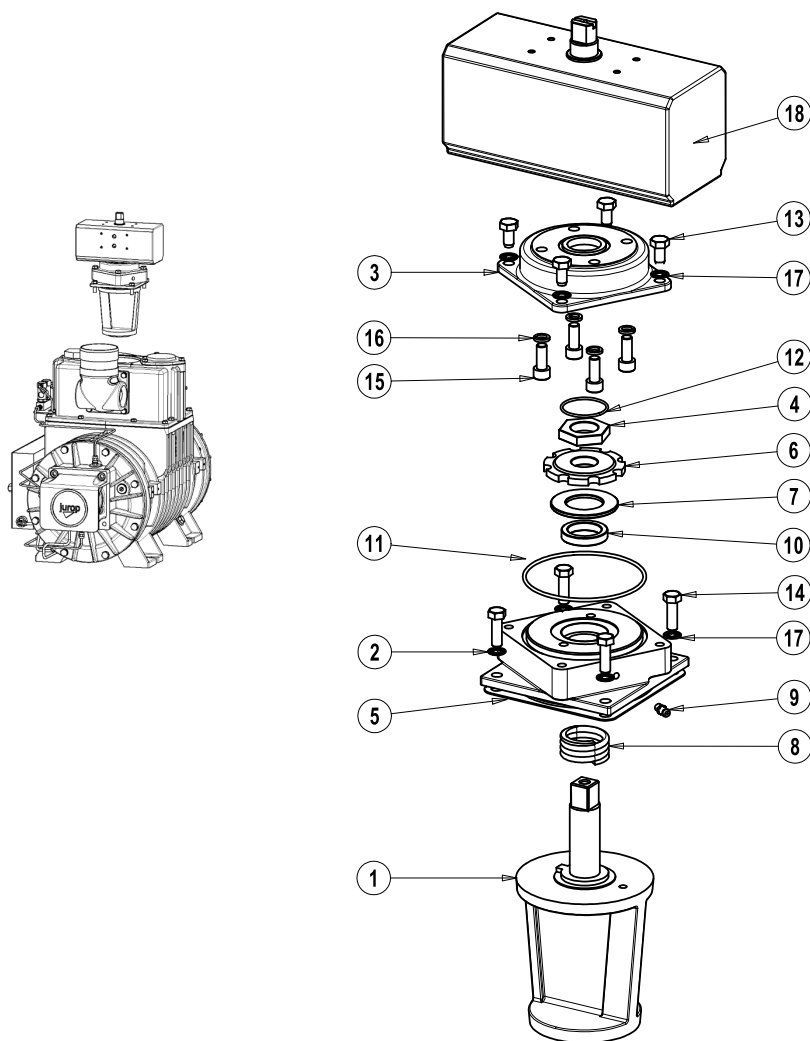
Asymmetrical manifold (with check valve installed on the pump inlet)

Pos.	Code	Description	Qty	Pos.	Code	Description	Qty
1	1605500100	COCK HANDLE	1	11	1685002800	WASHER FE 30X8,5 SP.4 GALV.	1
2	1608502500	COCK	1	12	1691000000	COCK SPRING	1
3	1623100500	COCK COVER	1	13	18930008E0	CLAPET	1
4	162409YKB0	SPACER	1	14	4022200030	SEAL 41X27X10 GP NBR1	1
5	1624202300	SPACER	1	15	4026102806	SCREW TE 8,8 M 8X20 GALV.	4
6	16275007E0	MANIFOLD	1	16	4026102807	SCREW TE 8,8 M 8X25 GALV.	16
7	16401008E0	COVER	1	17	4026135414	SCRE 12,9 M 8X45	1
8	1680610200	GASKET	2	18	4026135504	SCREW 12,9 M 10X10	1
9	16807011E0	GASKET	1	19	4026308005	NUT M 8 ESAG.GALV.	2
10	1680707800	GASKET	1	20	4026350706	WASHERGROWER 8 GALV.	20

HYDRAULIC ACTUATOR

Hydraulic actuator

Pos.	Code	Description	Q.ty	Pos.	Code	Description	Q.ty
1	143027T6B0	HDR ACTUATOR CYLINDER	1	13	168509U0B0	HDR ACTUATOR WASHER	1
2	15020A10B0	LEVA ATTUATORE HDR PN140 – PN155	1	14	1691000000	SPIRING COCK	1
3	151307TJB0	COCK-HDR ACTUATOR BRACKET	1	15	4022100100	STRAIGHT GREASE DISPENSER M6X1	1
4	1608502900	ACTUATOR COCK	1	16	4022100107	STRAIGHT GREASE DISPENSER M10X1	1
5	1623100700	COCK CAP	1	17	4022200030	SEAL RING 41X27X10	1
6	1624027500	SPIRING SPACER	1	18	4026121405	SCREW TCEI M8X20	2
7	1624043400	HDR ACTUATOR LEVER SPACER	4	19	4026121408	SCREW TCEI M8X35	4
8	1624202300	COCK FITTING SPACER	1	20	4026135414	STUD SCREW M8X45	1
9	164206XYB0	HDR ACTUATOR PROTECTION	1	21	4026155705	SCREW M8X16	1
10	1673009700	GREASE DISPENSER CONNECTION	1	22	4026308005	NUT M8	4
11	1680707800	CAP GASKET	1	23	4026350505	WASHER GROWER M8	6
12	1685002800	WASHER 30X8,5X4	1	24	4026510012	SEEGER RING 14	1

PNEUMATIC ACTUATOR



Pneumatic actuator

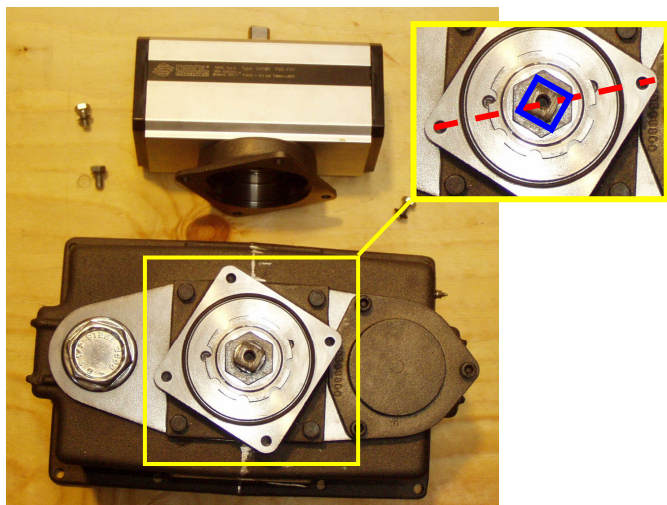
Pos.	Code	Description	Qty	Pos.	Code	Description	Qty
1	160858KBB0	PNEUMATIC ACTUATOR SUPPORT	1	10	4022200005	SEAL RING 37X27X7	1
2	161258H0B0	PNEUMATIC ACTUATOR FLANGE	1	11	4022200330	OR 3375	1
3	1640580QB0	PNEUMATIC ACTUATOR NUT	1	12	4022200331	OR 2137	1
4	167007ZAB0	GASKET	1	13	4026102804	SCREW TE M8X16	4
5	1680707800	ACTUATOR COCK RING-NUT	1	14	4026102807	SCREW TE M8X25	4
6	168409PQB0	SPACER PNEUMATIC ACTUATOR	1	15	4026121407	SCREW TCEI M8X25	4
7	168529TFB0	SPRING	1	16	4026350505	WASHER GROWER M8	4
8	1691000200	STRAIGHT GREASE DISPENSER M6X1	1	17	4026351505	WASHER M 8	8
9	4022100100	INGRASSATORE SFERICO DIR.M6X1	1	18	4027100405	PNEUMATIC ACTUATOR	1

INTEGRATION 1 - ADJUSTING THE 4-WAY VALVE WITH PNM ACTUATOR

• If the adjustment of the 4-way valve position to the manifold seat is needed (due to coupling with an exceeding interference causing difficult or incomplete rotation – or – coupling with an exceeding play causing reduced performances in the vacuum pump), follow the instructions below.

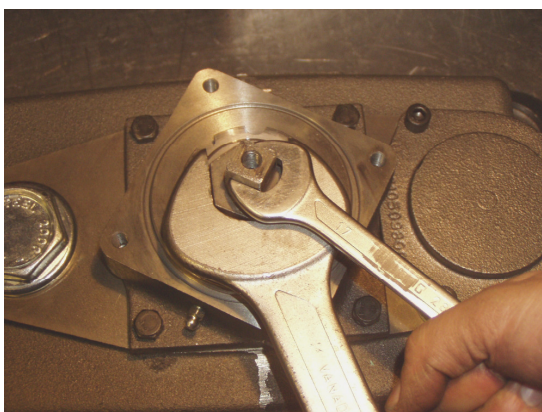
• Unscrew the 4 screws M8x16 which fix the upper cover to the inferior part fastened to the 4-way valve.

• Clean it from the inner lubricant. “Mar” the initial position of the valve as indicated with the broken line by aligning the square to a couple of holes on the mounting.



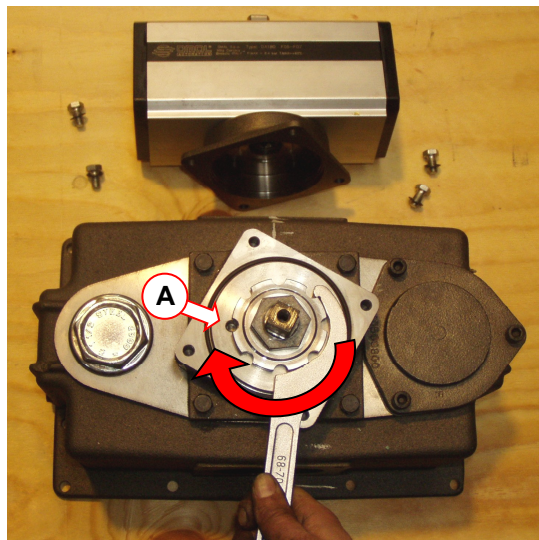
• With a 36mm spanner, loosen the nut above by holding the valve firm with a 17mm spanner.

• The valve can now be vertically lifted.



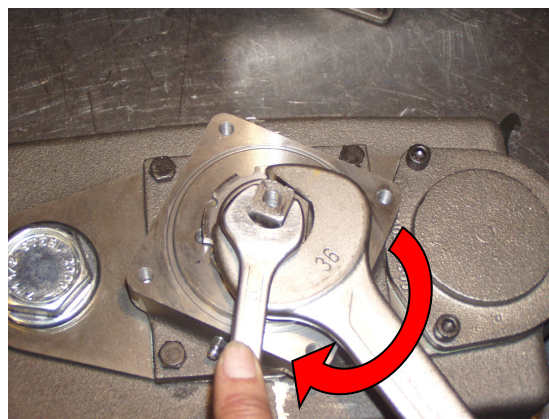
• Adjust the 4-way valve by turning the ring nut with a hook spanner (or other tool) while keeping the valve firm with a 17mm spanner.

• Turning the nut to the right, the valve lifts, turning it to the left, it lowers; each notch is equal to a 0,25 mm shifting of the valve.



• Fasten the nut with a 36mm spanner while keeping the valve firm with the 17mm spanner.

• Turn the valve checking it does not oppose excessive resistance.



⚠ Do not exceed in lifting the deviator: it may not grant a perfect seal and cause a possible vacuum loss.

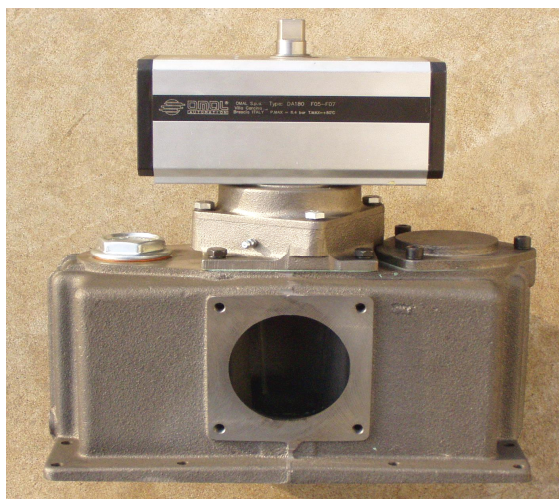
• Lubricate the area around the nut to grant that those parts subject to wear are lubricated.

Instead using the hook spanner, the nut can be fastened and the valve turned to lift it or lower it from its seat as follows.

• Fasten the nut by slightly screwing a M6 screw in the threaded hole (A).

• Turn the valve (1/4 – 1/8 turn) by pushing upon the shank with the 17mm fixed spanner. Then, fasten the lock nut with the 36mm spanner.

• Remove the M6 screw previously screwed.



Place the 4-way valve as marked before the disassembly.

- Mount the upper cover back fastening it with 4 M8 screw and make sure the OR-ring does not get lost.

Model	Issue date	Revision No.	Revision date	Filled out by	Viewed by
PN130-140-155-155R	14-07-2011	08	19-05-2017	U.T.	A.T.

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