



Use and maintenance
manual, liquid cooled
vacuum pump

LC 300
LC 420



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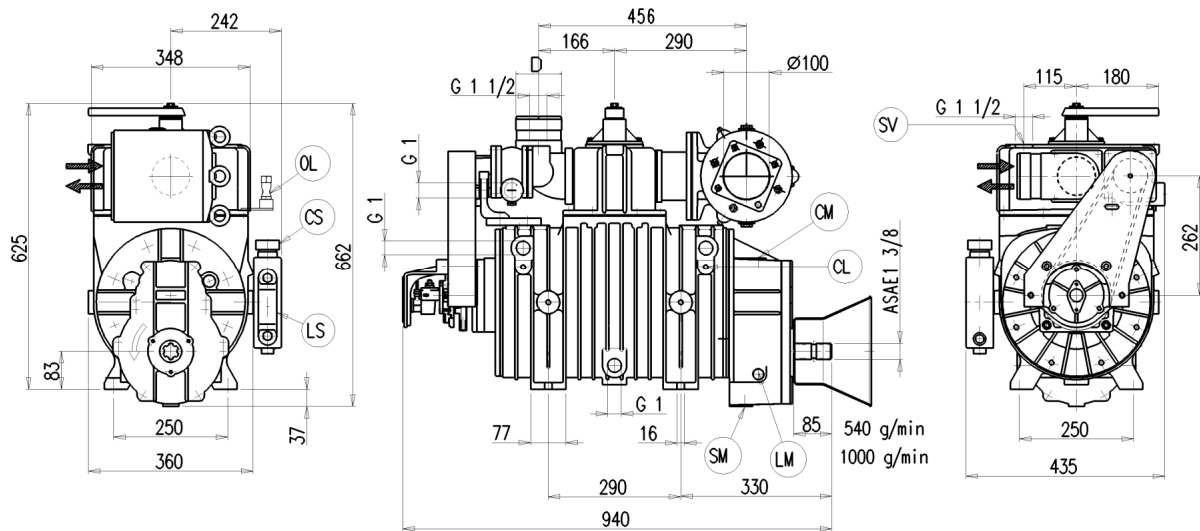
1. CONSTRUCTION FEATURES

- Four-vane rotary pump with liquid cooled housing, suitable even for major duty operating conditions with high volumetric efficiency and low noise. It has two inlet liquid points on the lower part of its body and four outlet points on the upper part. They do not interfere with the side mounted oil tank.
- Automatic lubricating pump, accessible from the outside for an easy and quick adjusting. Copper oil piping, complete with sight glass drip oilers for a continuous check of the lubrication system.
- Side mounted oil tank with level spy hole. The oil tank can be mounted either on the right or left side of the pump to grant an easy oil checking and filling up. The outside mounting of the oil tank grants a better cooling of the oil itself.
- Heavy duty vanes (asbestos free), radially disposed on the rotor: reduced wear for a long-lasting lifetime. Vanes wear checking ports on the pump body: they do not interfere with the side mounted oil tank.
- Built-in vacuum-pressure changeover 4-way valve, manually operated: on request, hydraulic or pneumatic operated actuators available.
- Non return valve (rubber ball) integrated in the pump manifold
- Swivelling conveyors, made of aluminium alloy: various sizes available.
- Cooling water temperature: a mechanic thermometer can be inserted into one of the outlet holes. A metal capillary operates the pointer that can be mounted on a visible point near the pump. Delivered on request. Exhaust air temperature: the manifold is equipped with a housing for the safety thermostat (intervention temperature: 150° C). Delivered on request.
- Built-in suction air filter. It can be mounted horizontally whereas the suction hole can be swivelled either towards the right or the left side, for an easy pump installation and the following cleaning operations and maintenances. The space required to remove the inner cartridge of the suction filter do not exceed the overall dimensions of the pump. Cleansing agents suction points for the internal wash-up of the pump (recommended in case sewage has been sucked).
- Drive system:
 - Direct with smooth shaft
 - With gear box (ASAE 1 3/8) 540 rpm o 1000 rpm, left rotation
 - With hydraulic motor

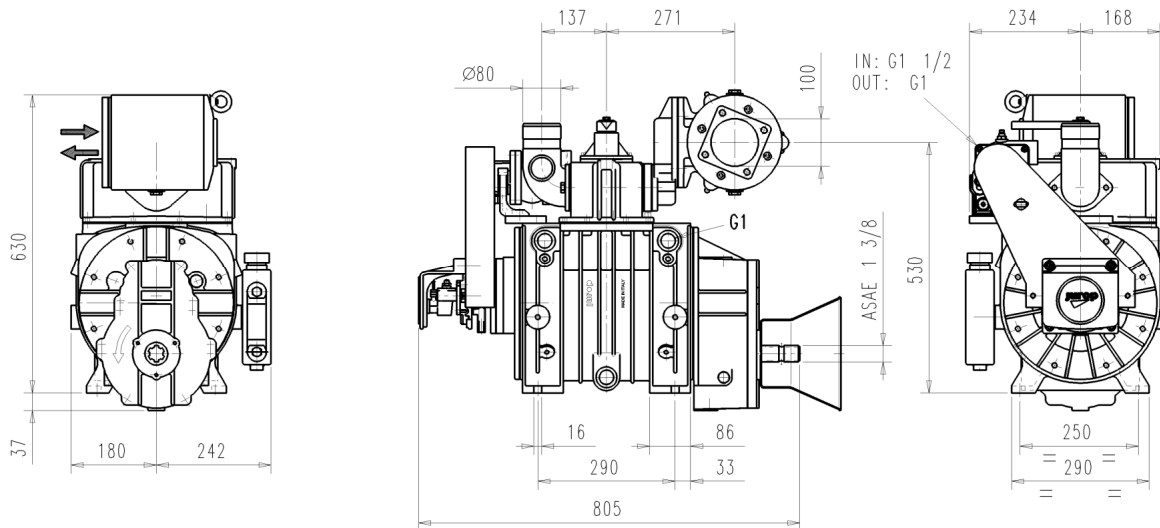
2. TECHNICAL DATA

DIMENSIONS [mm]

LC420 M – SX

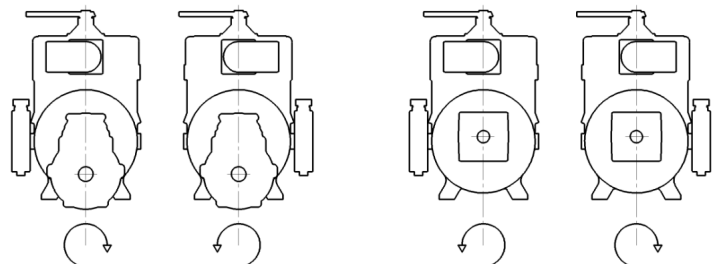


LC300 M – SX

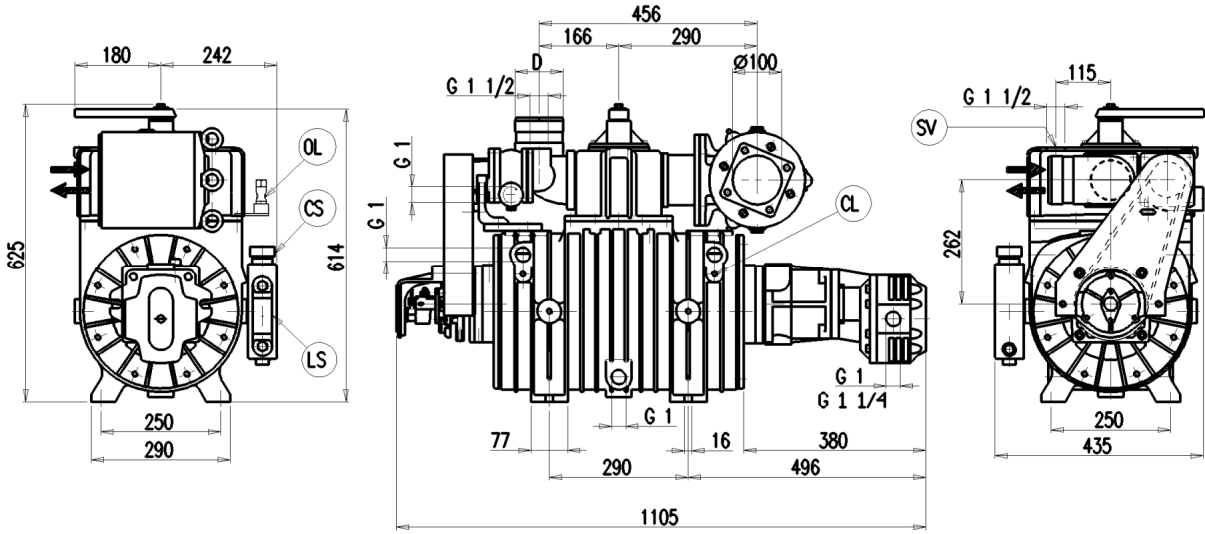


NOTE

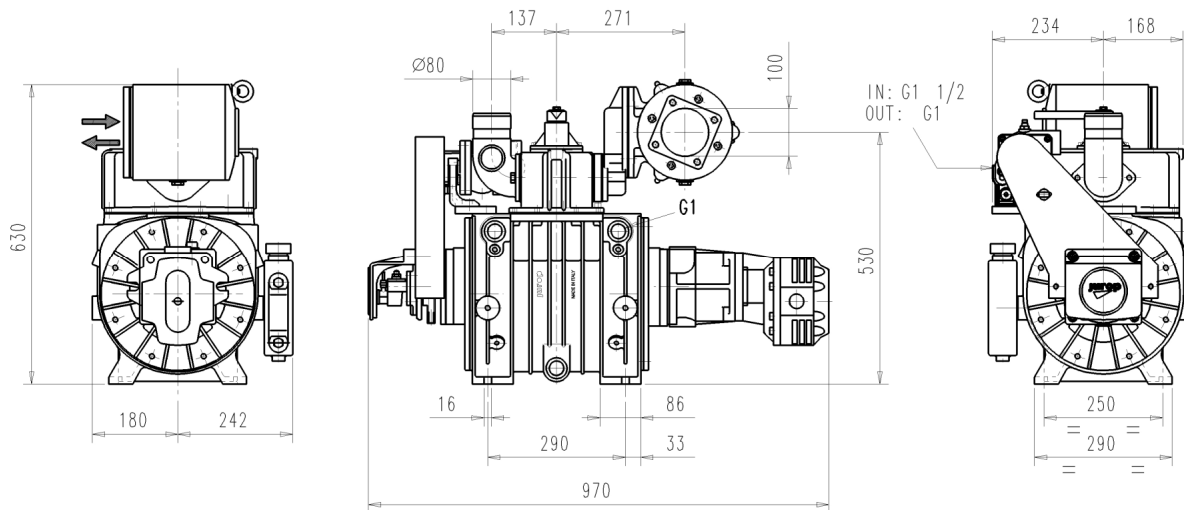
The position of the tank depends on the rotation direction of the pump. The illustration shows the standard position. On request, the pumps are delivered with the tank mounted on the opposite side.



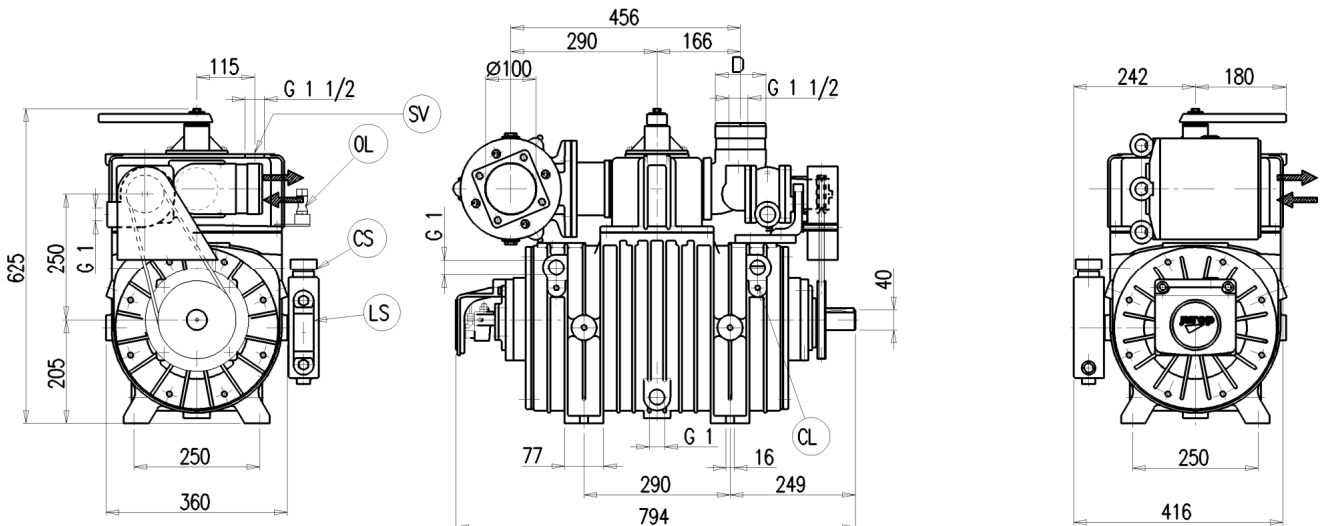
LC420 HDR – SX



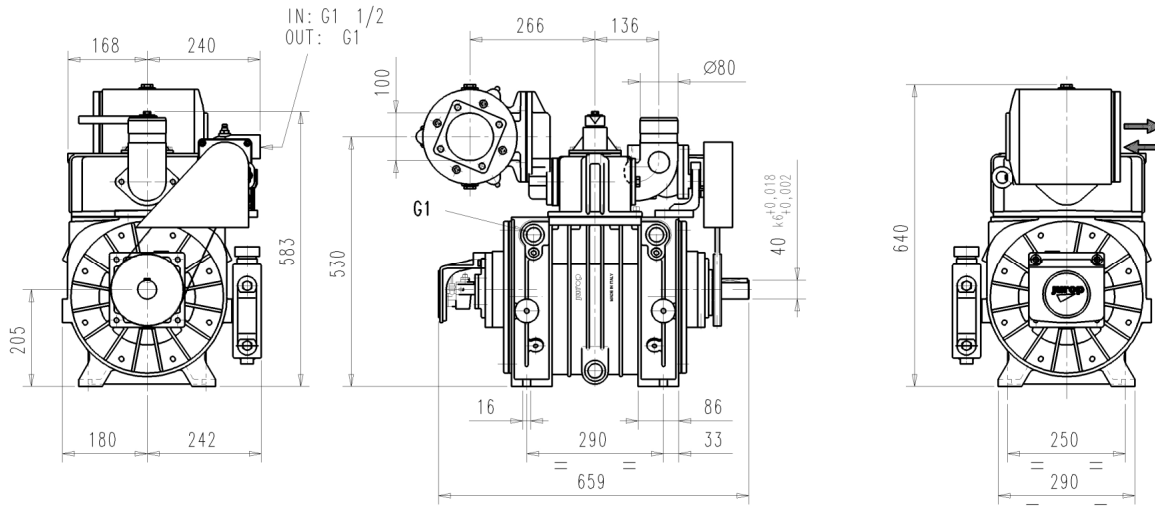
LC300 HDR – SX



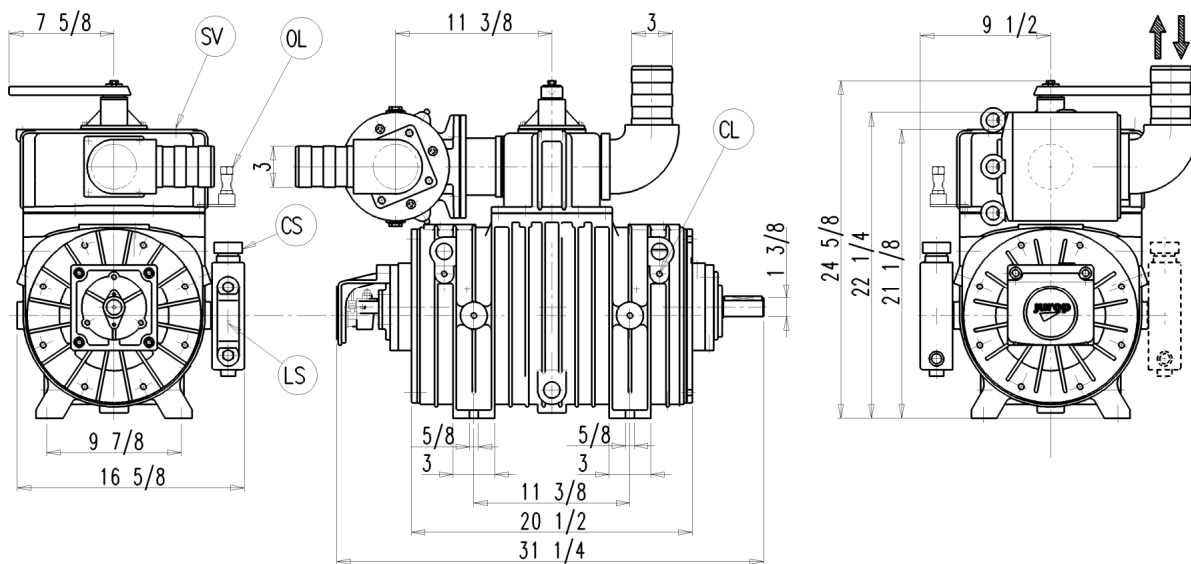
LC420 DIR – SX



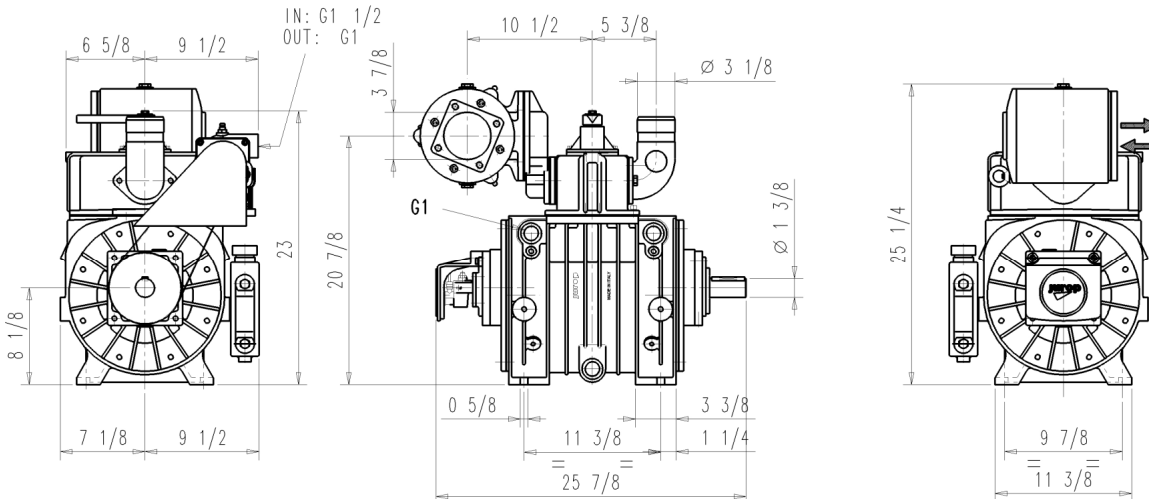
LC300 DIR – SX



LC420 D USA – SX [all dimensions in inches]



LC300 D USA – SX [all dimensions in inches]



LEGEND OF LUBRICATION AND VANES WEAR CHECK-POINTS

PUMP LUBRICATION			HOUSING	GEARBOX		
LS: Tank level	CS: Tank filling point	OL: Oilers	CL : Vanes wear checking	LM: Oil level	SM: Outlet plug	CM: Inlet plug

WEIGHT

Model	LC300 D	LC300 M	LC300 HDR	LC420 D	LC420 M	LC420 HDR
Weight (kg)	195	200	205	210	215	220

NORMAL USE OF THE PUMP



The LC pumps are designed to convey filtered air into plants for vacuum production or for the suction of powders or liquid wastes. Do not suck 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.

USAGE LIMITATIONS

MAX. SPEED – OPERATING SPEED				P_2 (ABS bar)	T_2 (°C)	$T_2 - T_1$ (°C)
LC ... M 540	LC ... M 1000	LC ... DIR	LC ... HDR	Max	Max	Max
540 - 460	1000 - 850	1300 - 1100	1300 - 1100	2.0	150°C	130°C

P_1 : absolute pressure during suction
 P_2 : absolute pressure during delivery

T_1 : temperature during suction
 T_2 : temperature during delivery

PERFORMANCES

		LC300	LC420
Air flow under free air condition	l/min m ³ /h	8500 510	12000 720
Air flow 60% vacuum rate	l/min m ³ /h	6415 385	9000 540
Air flow 80% vacuum rate	l/min m ³ /h	3450 207	4833 290
Max. vacuum at continuous duty (*)	%	80	
Max. vacuum	%	92	
Power required at max. vacuum	kW	14	18
Power required at 0.5 relative bar (1.5 abs.)	kW	12	16
Power required at 1.0 relative bar (2.0 abs.)	kW	17	24
Max. relative pressure (abs.)	bar	1 (2,0)	
Air flow at 0.5 relative bar (1.5 abs.)	l/min m ³ /h	7500 454	10830 650
Air flow at 1.0 relative bar (2,0 abs.)	l/min m ³ /h	7000 420	9830 590
Oil consumption	g/h	200	220
Oil tank capacity	litres	4	
Recycle pump speed	rpm	2700	
Heat exchange rate	Kcal/h	6000	8000

(*): at nominal speed and room temperature of 20° C.

Pressure operation: free inlet

Vacuum operation: free outlet

FLOW - POWER

	Free port	Vacuum						Pressure			
		0%	20%	40%	60%	70%	80%	90%	1.4 bar	1.8 bar	2.0 bar
LC 420	m ³ /h	720	670	620	540	400	290	16	650	610	590
	l/min	12000	11170	10330	9000	6670	4833	270	10830	10170	9830
	kW	11	12	14	15	16	16,5	17	16	21	24
LC 300	m ³ /h	510	480	444	385	285	207	10	460	435	420
	l/min	8500	8000	7400	6420	4760	3450	190	7660	7250	7000
	kW	8	9	10	11	12	13	14	11	15	17

Room condition: P = 1013 mbar, T = 20° C

Conveyed fluid: air density 1.2 kg/m³.

Vacuum pump at max. speed.

SOUND PRESSURE LEVEL

	LC300	LC420
Max. speed, 60% vacuum rate	70 db(A)	73 db(A)
Max. speed, 90% vacuum rate	73 db(A)	75 db(A)

(*): Noise of pump + exhaust silencer.
Distance: 7m in open field.

3. SAFETY AND ACCIDENTS PREVENTION



CAREFULLY OBSERVE THE FOLLOWING RULES

- When transporting the pump, use proper slinging. Store the pump in stable places.
- Installation and maintenance must be operated only by qualified personnel wearing the proper clothes and the necessary tools as well as protection devices.
- Before each maintenance operation:
 - Stop the pump and restore the atmospheric pressure.
 - Disengage the drive system.
 - Only operate after the pump has cooled down.
- 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 injure the operators.
- 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 design limits: the machine may be damage and the operator may be injured.

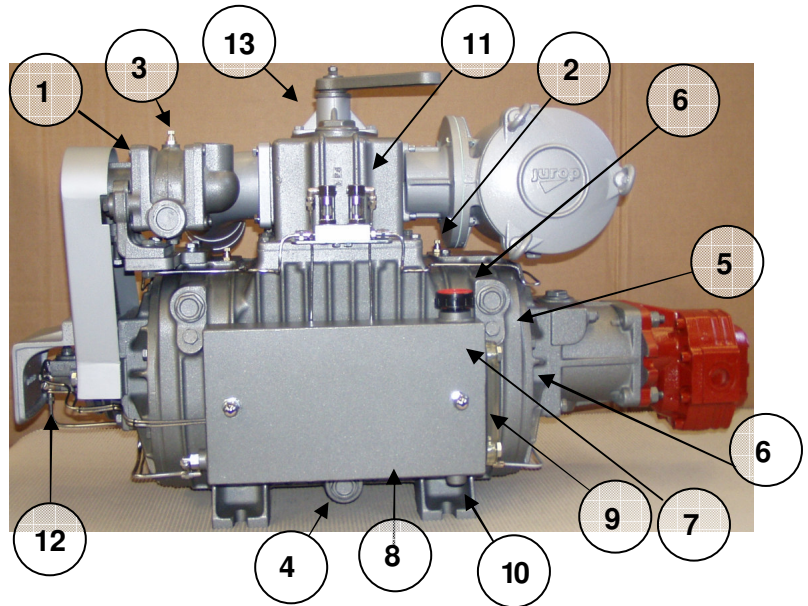


Dispose of exhausted oil (accumulated in the silencer's separator at the exhaust) and the oil used in the vacuum pump maintenance (internal wash-up or periodical replacement in the gear box) as provided by current specifications.

4. INSTALLATION

LEGEND OF MAIN COMPONENTS

1. Water recycle pump
2. Venting valve on pump housing
3. Venting valve on water recycle pump
4. Cooling water inlet
5. Cooling water outlet
6. Vanes check-port
7. Oil filling port
8. Lubricating oil tank
9. Oil level
10. Oil tank emptying port
11. Oilers
12. Self-lubricating pump
13. Vacuum – pressure change valve

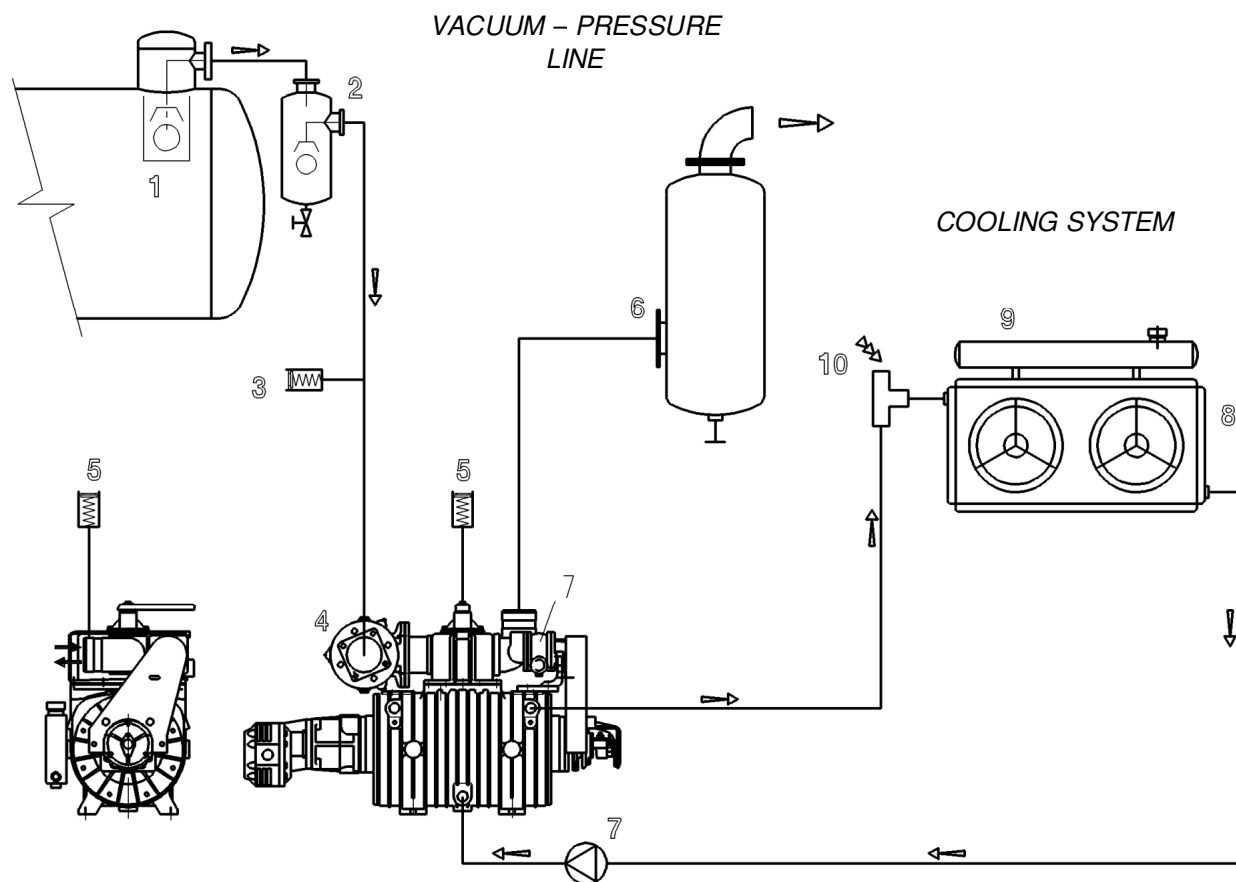


MOUNTING

- The mounted aspirator must be accessible for maintenance and firmly fixed on a frame or angled base (with a 3° max inclination). The structure must be fit to avoid flexions or vibrations.
- Make sure that there is enough free room around the pump for a correct air cooling circulation and protect the pump from the exposure to dirt and debris.
- Prepare the necessary space for an easy access to the lubrication check-points (tank level and gear box, oilers) and to the oil tank filling port, the four-way manifold handle, and the vane wear inspection ports.

VACUUM – PRESSURE LINE

- 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. 4) to protect from solids infiltration.
- The exhaust silencer (pos. 6) 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.
- 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.



Pos.	Description
1	Primary flow shutoff valve
2	Secondary shutoff
3	Vacuum relief valve*
4	Suction filter*
5	Over-pressure safety relief valve

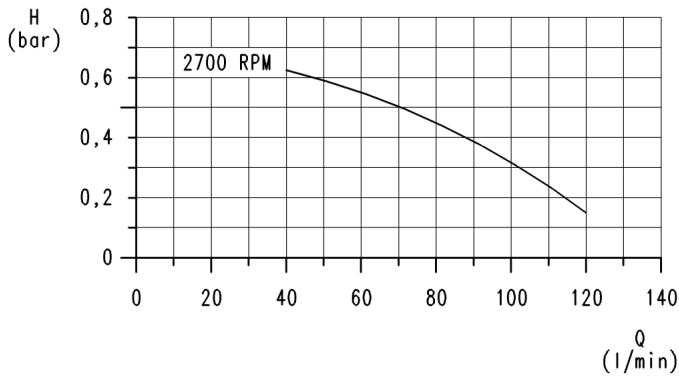
Pos.	Description
6	Silencer - oil separator
7	Recycle pump
8	Water – air heat exchanger
9	Expansion tank
10	Exchanger inlet port

- Safety valves:
 - Overpressure safety valve (pos. 5): mount it close to the pump. The valve flow must prevent the LC 420 pump from exceeding the absolute pressure of 2.0 bars or the maximum pressure allowed by the system. Do not apply gate valves on the line.
 - Vacuum control valve (pos. 6): install if necessary to limit the vacuum rate of the system.

COOLING SYSTEM

- It is composed of:
 - Centrifugal recycle pump.
 - Heat exchanger with electric fans operated by a thermostat.
 - Expansion tank.

The heat exchanger must dissipate the heat power indicated in paragraph “Performances”.



Characteristic curve "Flow - Head" of the recycle pump.

The cooling liquid temperature must not exceed 60°C.

The air flow generated by the exchanger fans must be kept free of obstacles.

5. DRIVE

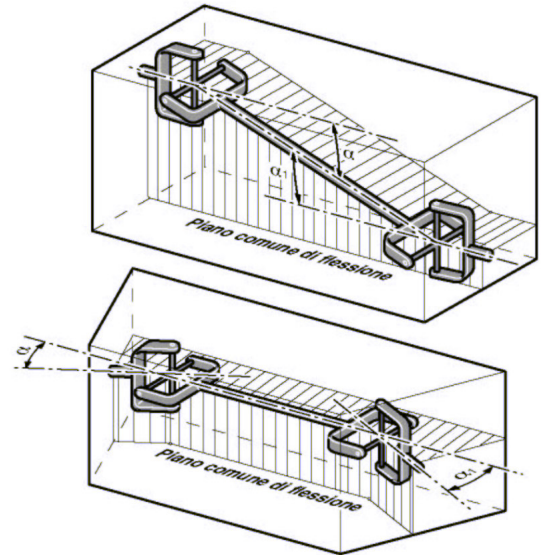
CARDAN SHAFT DRIVE


Use telescopic cardan shafts. In order to achieve a uniform motion of the driven shaft, the following requirements must be met:

- 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.

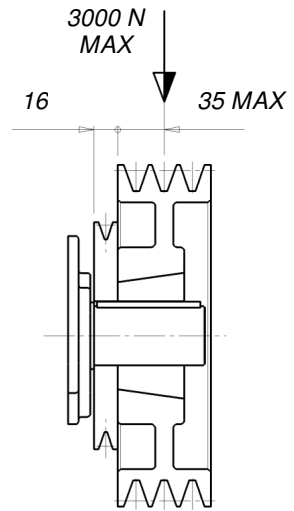
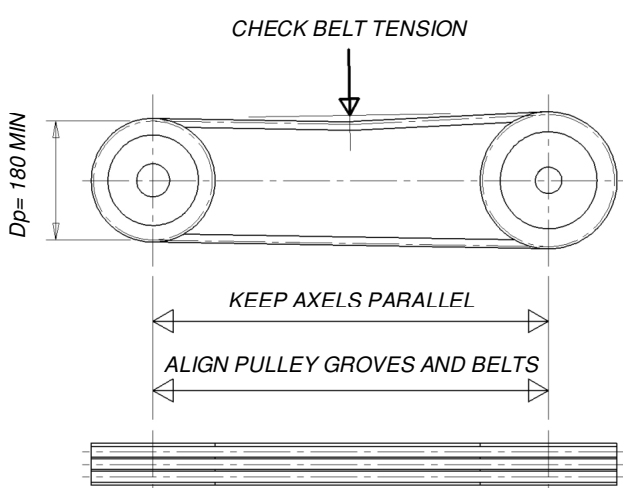
It is also recommended working with limited articulated joint angles (max. 15°) and disengaging the transmission for those operations requiring great angles (steering or lifting).

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



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

BELT DRIVE





- Install a suitable pulley on the smooth shaft as close as possible to the pump: max 35 mm.
- Apply an adequate belt tension (see manufacturer's data). 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.

Drive min. pulley pitch diam. mm	Belts	LC pump max. speed rpm
180	XPB x 3	1300

NOTE

A limited speed ratio allows a longer belts life while reducing stress on the shafts. When possible, prefer:

- pulleys with a pitch diameter bigger than the one indicated;
- motors or power take-offs with a speed similar to the one of the pump.

HYDRAULIC DRIVE

• **Motor features**

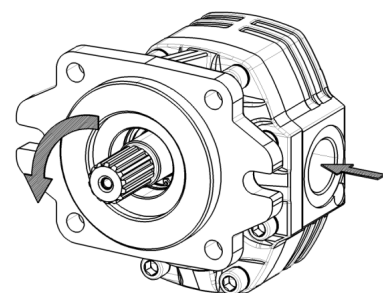
Model	Displacement cc/rev	Operating pressure (max. vac.) bar	Operating pressure (1 rel. bar) bar	Flow (at 1300 rpm) l/min	Max pressure draining line bar	Max. pressure motor exhaust bar
LC300	61	125	150	83	5	5
LC420	72	135	175	98		

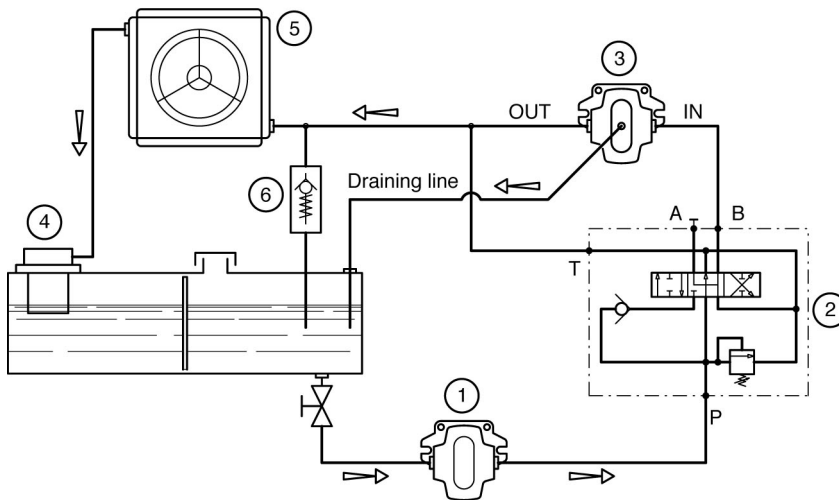
• **Fluid:** mineral oil for hydraulic systems in compliance with ISO/DIN.

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

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

**DRAINING
PORT**





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

*: optional components

- **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.

6. START-UP

Lubrication.

- Fill in the oil tank to its maximum capacity.
- Check the oil level in the gear box (if the pump is provided with it)
- In order to choose the most suitable oil, see paragraph "Lubrication".

Cooling.

- Unscrew the vent valves on the housing and recycling pump, pour the cooling fluid through the port near the exchanger.
- Screw the vent valves and start running the cooling system in order to expel the air bubbles inside it. Then, adjust the level by filling up the expansion tank on the exchanger: it must be half filled (approximately).
- The cooling system we designed has a capacity of 25-30 litres. Use a mixture of demineralised water and antifreeze liquid at a concentration suitable to room temperature (usually between 25 and 50%).



Carefully vent the cooling circuit.

Vacuum line

- Open all valves of the vacuum-pressure system.
- Open all gate valves and remove any possible obstacle from the line.

PRECAUTIONS WHEN STARTING THE SYSTEM

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 40 drops/min (at maximum speed).

Check loading and operating speed for vibrations or unusual noises.

WARNING



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. "Usage limitations"). Adequately prepare the transmission.

7. OPERATING PRECAUTIONS



- Do not make the vacuum pump overheat: maximum air temperature on exhaust (or delivery) side: 150°C.
- Do not operate it 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.
 - Disconnect the exhaust silencer, if possible.
 - Start running the pump at low speed.
 - Suck some water (about 1-2 litres) through the inlet port.
 - 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.

WARNING



Rotation speed.

Once the needed vacuum rate has been reached, we recommend reducing the vacuum pump speed to its working speed (see paragraph “Usage limitations”): 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.

8. ORDINARY MAINTENANCE



Before starting any maintenance operation, follow the safety prescriptions as described in paragraph “Safety and accidents prevention”.

Pump operation condition	CHECKING	FREQUENCY
Operating	Lubrication: dripping into oilers	D
	Rotating speed	D
	Working pressure	D
Standstill	Side mounted tank oil level	D
	Empty the oil gathered in the exhaust silencer.	D
	Check vanes wear	W
	Clean filter and vacuum line shutoff	W
	Check pressure relief valve condition	M
	Gear box oil level	M
	Gear box oil change	1500 h

Frequency: **D:** daily **W:** weekly **M:** monthly

CHECKING THE DRIP OILERS

Check dripping into the oilers.

Be sure it is regular (app. 40 drops/min at max. speed) to grant a correct lubrication of the pump. At lower speeds, the number of drops must be directly proportional.



If the pump is run without lubrication, the internal components may quickly damaged due to overheating. Stop the vacuum pump and check the oil level and the lubricating pump.



Do not use the exhausted oil gathered on the bottom of the exhaust silencer again. Dispose of the oil as provided by current specifications.

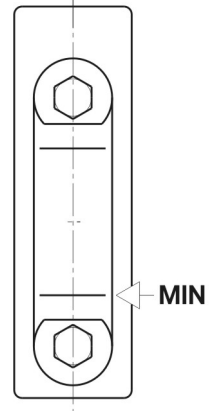
CHECKING THE SIDE MOUNTED OIL TANK LEVEL



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

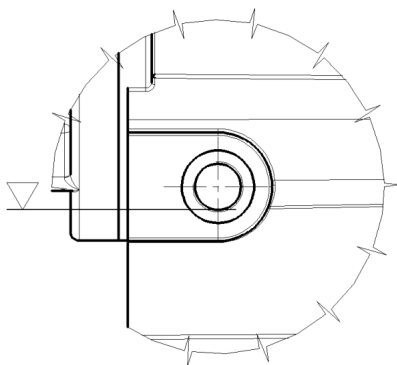
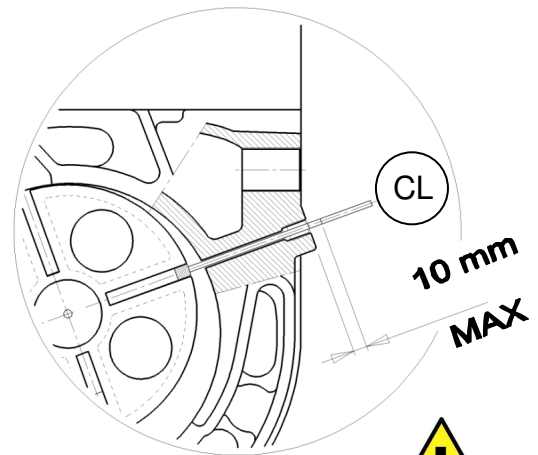
Recommended lubricants

Room temp.	Viscosity		AGIP	ESSO	SHELL	ELF	MOBIL	BP
Above 10°C	ISO VG 46	Mineral oil	RADULA 46	NURAY 46	VITREA 46	MOVIXA 46	RUBREX 300	ENERGOL CS 46
Below 10°C	ISO VG 150	Mineral oil	RADULA 150	NURAY 150	VITREA 150	MOVIXA 150	RUBREX 900	ENERGOL CS 150



CHECKING THE VANES WEAR

- Unscrew the vanes wear check-plug (pos. CL) 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.
- Insert a rod of 6 mm Ø with its conic end towards the pump (rod supplied with pump).
- Turn the shaft manually and touch the outside diameter of the rotor with the checking rod, mark it a first time. Keep turning the shaft till the rod falls inside a vane groove. Mark it again and measure the gap between the two marks.
- If this gap exceeds 10 mm, then the vanes must be replaced.
- At the end of this procedure, do not forget to replace the plug.
- Replace all vanes at the same time.



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. Dispose of exhausted oil as prescribed by current specifications.

Recommended lubricants

Viscosity	Type	AGIP	ESSO	SHELL	ELF	MOBIL	BP
ISO VG 220	EP mineral oil	BLASIA 220	SPARTAN EP 220	OMALA OIL 220	REDUCTELF SP 220	MOBILGEAR 630	ENERGOL GR XP 220



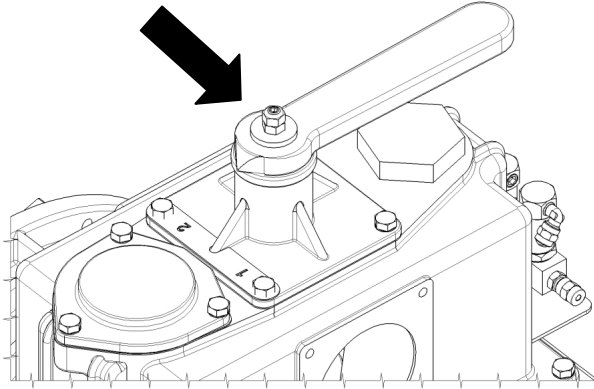
Dispose of exhausted oil as provided by current specification.

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

9. EXTRAORDINARY MAINTENANCE



Before starting any extraordinary maintenance operation, be sure the pump stands still and follow the safety prescriptions as described in paragraph "Safety and accidents prevention".



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.



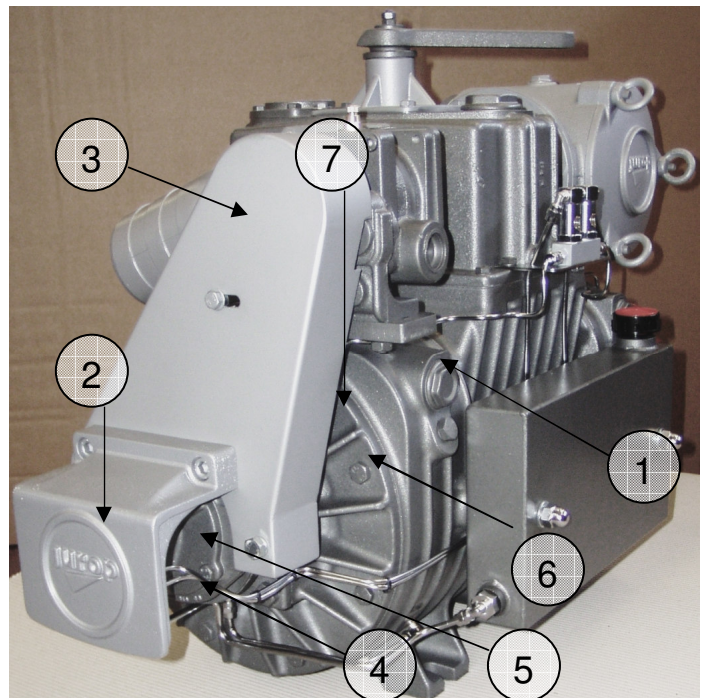
Do not exceed with the adjustment: possible vacuum loss.

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

REPLACING VANES

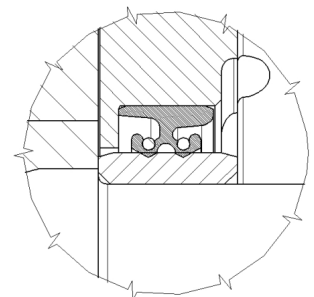
When replacing the vanes proceed as follows:

- Remove the vacuum pump from its bearing frame and wash it before disassembling.
- Drain the cooling liquid from the pump housing (1)
- Remove the water pump cover (2) and the carter (3)
- Disconnect lubricating pipes (4).
- Remove the lubricating pump (5).
- Remove the screws (6) fixing the rear flange (7) 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 broken.
- Lubricate with oil the new vanes before inserting those inside each groove of the rotor.
- Reinstall all the components in the following order: rear flange, seal ring (non), bearing, compensation ring, gasket and flange with lubricating pump (we recommend to fit correctly the pivot-key on the shaft groove).
- Tighten the nuts (pos. 6) by means of a dynamometric wrench adjusted at 88 Nm.
- Refill the cooling system and re-install the pipeline.



CAUTION

Do not damage components during assembly by forcing them exceedingly. Do not flip the seal ring during rotation of the shaft. Do not leave objects inside the pump.



ADJUSTING THE LUBRICATING PUMP

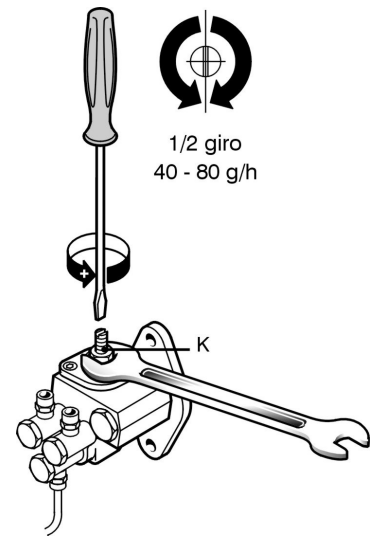
The automatic lubricating pump is adjusted by the manufacturer before the shipping. If consumption is different from the indicated value, adjust as follows.

- Remove the upper protection cover.
- Using a screwdriver and a 10 mm wrench, adjust the adjusting screw (K). Close the nut and put back the upper protection cover. It is advisable to turn the screw of $\frac{1}{4}$ of turn and verify the actual consumption.

CAUTION



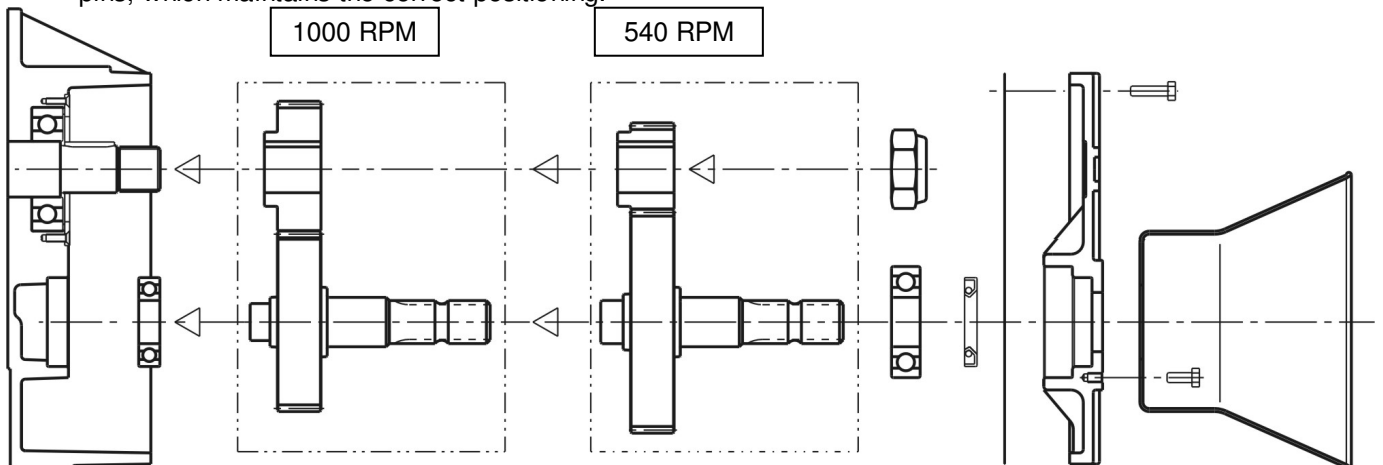
Do not reduce oil consumption below the value indicated in the "Performance" paragraph (for functioning at speeds different from the maximum, flow is proportionate to the rotating speed). $\frac{1}{2}$ turn of the adjusting screw causes a flow variation of about 40 - 80 d/h, depending on using conditions.



REPLACING GEAR BOX COMPONENTS

The pump with a 540 rpm gear box can be transformed into a pump with a 1000 rpm gear box (and vice versa).

- Remove the gearbox as above described. Remove also the pinion from the drive shaft.
- Install the new pinion and tight the nut as prescribed.
- Mount the new gear wheel including bearings and seals on their housings in the front cover, properly aligned. This assembly can now be installed in the gear box: fit the front bearing in the specific seat of the flange/cover.
- Properly engage gears, replace the cover's gaskets to complete correctly the job. Insert the aligning pins, which maintains the correct positioning.



10. TROUBLE SHOOTING

The vacuum pump overheats	
Insufficient or absent lubrication	Verify oil and rings. Check oil pump efficiency
Low oil level	Fill the oil tank
Too high rotation speed	Reduce rpm to the prescribed one
Prolonged functioning at the max vacuum rate	Reduce vacuum rate
Vacuum and/or exhaust line of insufficient diameter	Check dimensionino

The vacuum pump does not rotate	
Broken vanes:	Clean inside chambers, replace vanes
- due to infiltrated solids	Check the secondary shutoff and filters of the suction line
- due to insufficient lubrication	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. Avoid suction of water

Performances loss	
Four way changeover valve in idle position	Move the lever in vacuum or in pressure mode
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 the pump's maximum performances
Obstructed rubber couplings	Replace

Unusual oil consumption	
Insufficient or absent lubrication	Check and adjust the lubricating pump

11. SCRAPPING

Before dismantling, the following components must be properly disassembled and divided:

- Lubricating oil
- Rubber and plastic parts
- Cast iron, steel and aluminium parts

Do not leave in the environment.

Do not use dismantled parts as spare parts

12. SPARES PARTS

REQUETING SPARE PARTS

To order spare parts, give the following information

Find in the parts list:

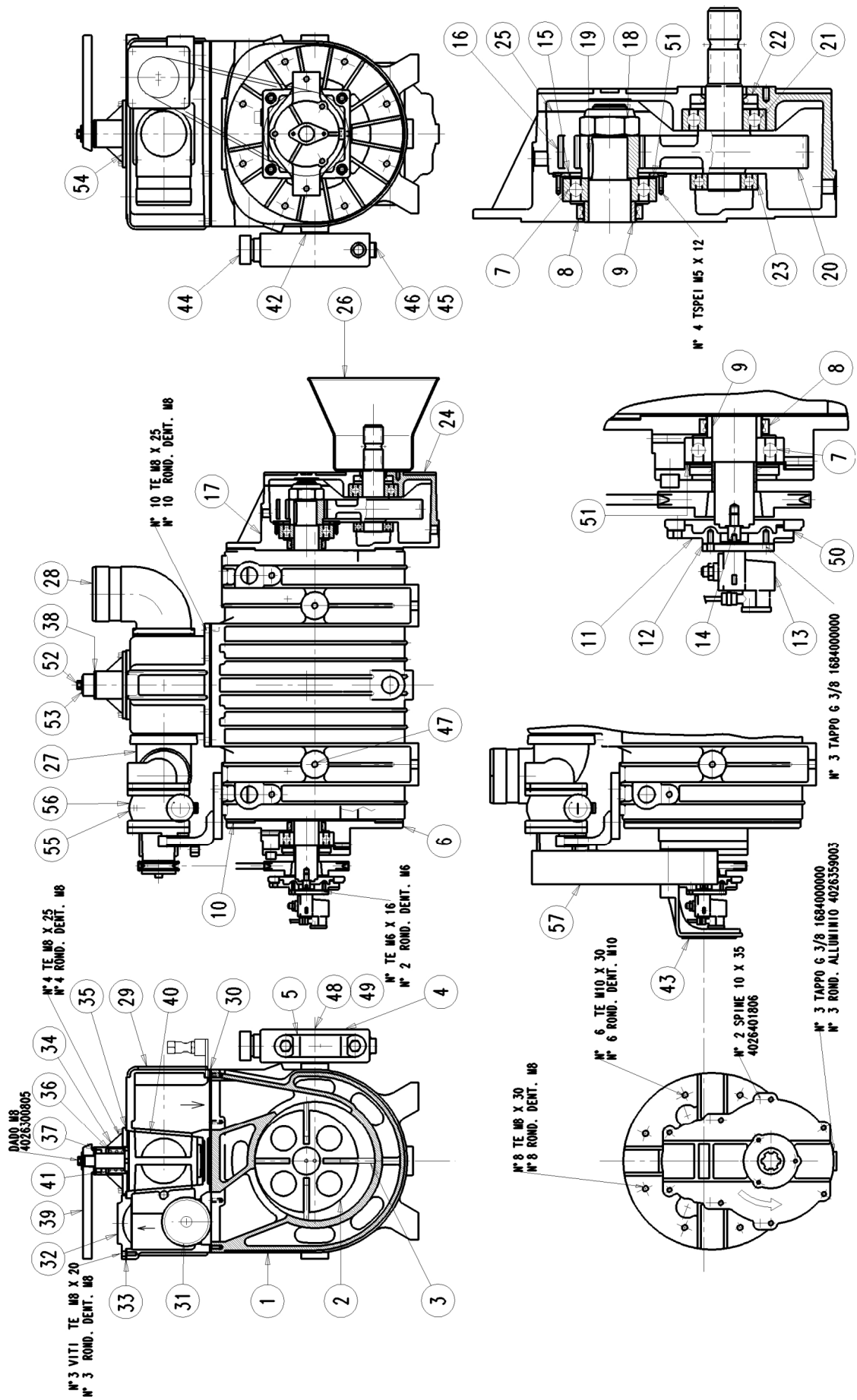
- code
- name
- quantity

(Ex. : cod. 1601606200 ; Vane; 4 pz

Find on the suction plate:

- model
- serial number

(Es. : LC 420 ; H60013



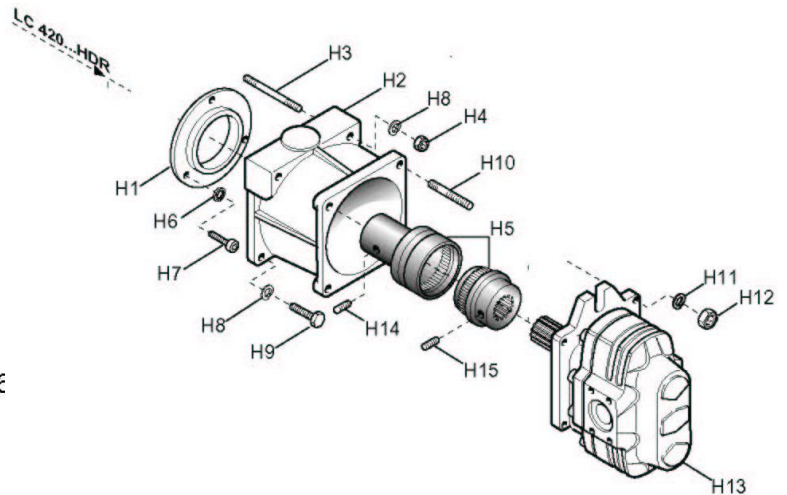
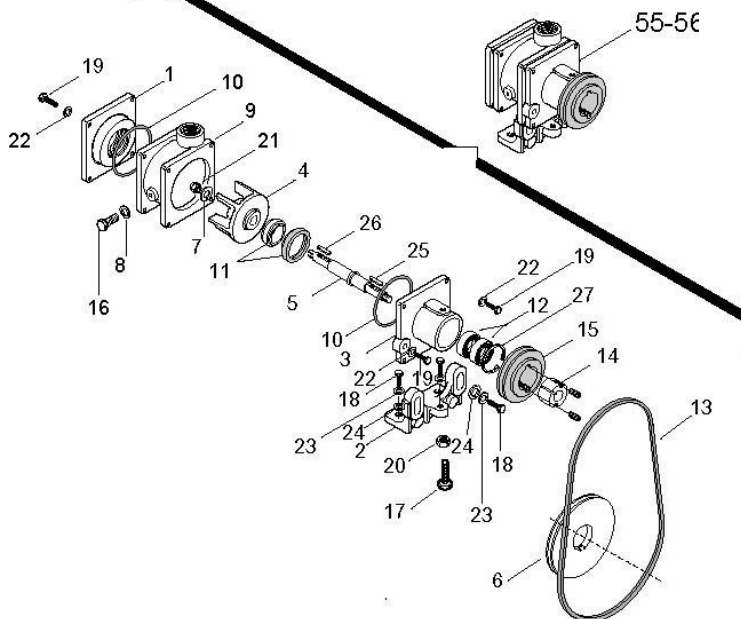
Pos	Reference	Description	Q.ty				
1	1687508200	Pump housing LC 420	1	35	1680707800	Manifold gasket LC 420	1
	16875BHDB0	Pump housing LC 300	1		1680700200	Manifold gasket LC 300	1
2	1521505800	Pump rotor LC 420	1	36	1691000000	Cock spring	1
	1521506800	Pump rotor LC 300	1	37	4022200030	Seal ring 41x27x10	1
3	1601606300	Vane LC 420	4	38	1624202300	Cock regulating spacer	1
	1601606400	Vane LC 300	4	39	1605500100	Cock lever	1
4	146704XCB0	Oil tank	1	40	1608502500	Cock LC 420	1
5	4022106001	Oil tank dip stck	1		1608503100	Cock LC 300	1
6	1610513500	Flange	1	41	1624027500	Cock spring spacer LC 420	1
7	4023100046	Bearing 6309 C3	2		1624027500	Cock spring spacer LC 300	1
8	4022200113	Pump rotor seal ring	2	42	1685600200	Rubber washer	2
9	1624037600	Seal ring bushing 45/60/22	2	43	1642100200	Oil pump protection. (optional)	1
10	1680709800	Gasket	2	44	4026910103	Oil tank plug	1
11	1610512900	Oil pump flange	1	45	4026904503	Oil tank plug	1
12	1680609700	Oil pump gasket	1	46	1685100300	Alu-washer	2
13	4024251000	Oil pump cw rotation	1	47	4026171211	Screw M12x80	2
14	1622002600	Oil pump pivot	1	48	4026305508	Selflocking nut M12	2
15	1681006500	Pushing plate	1	49	4026357007	Washer M12	2
16	1651005500	Gear z 28 (540 rpm)	1	50	1680707300	Oil pump flange gasket	1
	1651010700	Gear z 42 (1000 rpm)	1	51	4026300025	Compensation ring	2
17	1610513600	Gear box flange	1	52	4026135414	Screw M8x45	1
18	4026306115	Selflocking nut M36x3	1	53	1685002800	Washer 30x8.5x4	1
19	4026501003	Key 12x8x40	1	54	1681006800	Vacuum-pressure plate	1
20	1651010500	Gear z 70 (540 rpm)	1	55	1407200800	Water recycling pump cw	1
	1651010600	Gear z 56 (1000 rpm)	1	56	1407200900	Water recycling pump ccw	1
21	4023100040	Bearing 6308	1		154201TSB0	Water recycling pump cw cover LC420	1
22	4022200040	Seal ring 72x40x10	1		154201TUB0	Water recycling pump ccw cover LC420	1
23	4023100120	Bearing 6207	1	57	15420DATB0	Water recycling pump cw cover LC300	1
24	1640501200	Gear box cover	1		15420DAVB0	Water recycling pump ccw cover LC 300	1
25	1680614100	Gear box cover gasket	1	58	1680710000	Oil pump flange gasket	1
26	1642600100	Drive shaft protection	1	59	1613501400	Oil pump support	1
27	1852104000	Orientable air conveyors KitØ100LC420	1	60	1626001100	bushing	1
	1852104800	Orientable air conveyors Kit Ø76LC300	1		189207X0B0	Kit gasket molt.	
28	1852103500	Fix air conveyors Kit Ø100 LC 420	1				
	1687504700	Fix air conveyors Kit Ø100 LC 300	1				
29	1627506100	Manifold LC 420	1				
	1627505300	Manifold LC 300	1				
30	1680614300	Manifold gasket LC 420	1				
	1680611400	Discharge Manifold gasket LC300	1				
	1680611500	Suction Manifold gasket LC300	1				
31	4023250502	Rubber ball Ø90	1				
	4023250501	Rubber ball Ø80	1				
32	1610509800	Manifold small flange	1				
33	1680610500	Manifold small flange gasket LC420	1				
	1680611600	Manifold small flange gasket LC300	1				
34	1623100500	Cock manifold LC 420	1				
	1623100000	Cock manifold LC 300	1				

WATER RECYCLING PUMP SPARES CATALOGUE

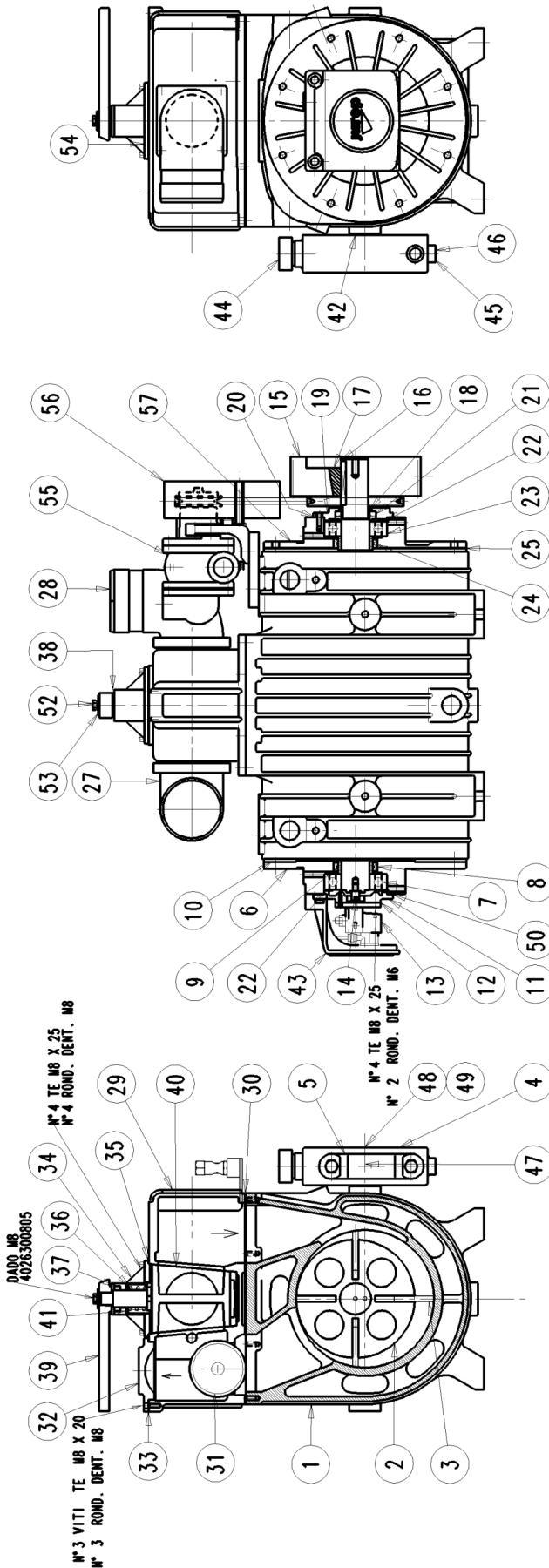
Pos	Reference	Description	Q.ty
55	1407200800	Water recycling pump cw	1
56	1407200900	Water recycling pump ccw	1
1	1610506500	Water pump rear flange	1
2	1613500900	Water pump support bracket	1
3	1613501000	Water pump front flange	1
4	1621502800	Water pump impeller	1
5	1650009700	Water pump shaft	1
6	1653502100	Water pump pulley SPZ 150x1	1
7	1685002400	Safety washer	1
8	1685100800	Washer Ø 8 AL	1
9	1687504500	Water pump housing	1
10	4022200235	OR 4325	2
11	4022216915	Water pump mech. seal	1
12	4023100516	Bearing 6004 RS1	2
13	4025350021	Belt SPZ 975 texrope	1
14	4025422300	Cone bushing 2820 Ø 16	1
15	4025422402	Pulley SPZ 71 X 1	1
16	4026101403	Screw 4.8 M 8x10	1
17	4026102914	Screw 8.8 M 10x60	1
18	4026107214	Screw 8.8 M 10x40 5739	4
19	4026120401	Screw 8.8 M 8x16	10
20	4026308006	Nut M10 5588	1
21	4026322106	Nut M12 sp.	1
22	4026350505	Grower washer 8	10
23	4026350608	Grower washer 10 1751	4
24	4026357006	Flat washer M 10	6
25	4026500605	Tab 5x5x18	1
26	4026500609	Tab 5x5x28	1
27	4026510525	Seeger ring I 42 7437	1

HDR MOTOR SPARES CATALOGUE

Pos	Reference	Description	Q.ty
H1	1610021600	Centering flange	1
H2	1612501000	Bracket	1
H3	4026171211	Stud screw M12x80	2
H4	4026305508	Nut M127473	2
H5	1470102300	Coupling	1
H6	4026350909	Washer M8	3
H7	4026120403	Screw M8x20 5931	3
H8	4026350609	Washer grower M121751	2
H9	4026107313	Stud screw M12x805739	2
H10	4026171304	Stud screw M14x405911	4
H11	4026350610	Grower washer M141751	4
H12	4026300808	Nut M14 galvanized	4
H13	4024107001	Motr.hdr 72 CC LC420	1
	4024107009	Motor. hdr 61 CC LC300	1
H14	4026136003	Dowel pin M8 x 8 5927	1
H15	4026136006	Dowel pin M8 x14	1



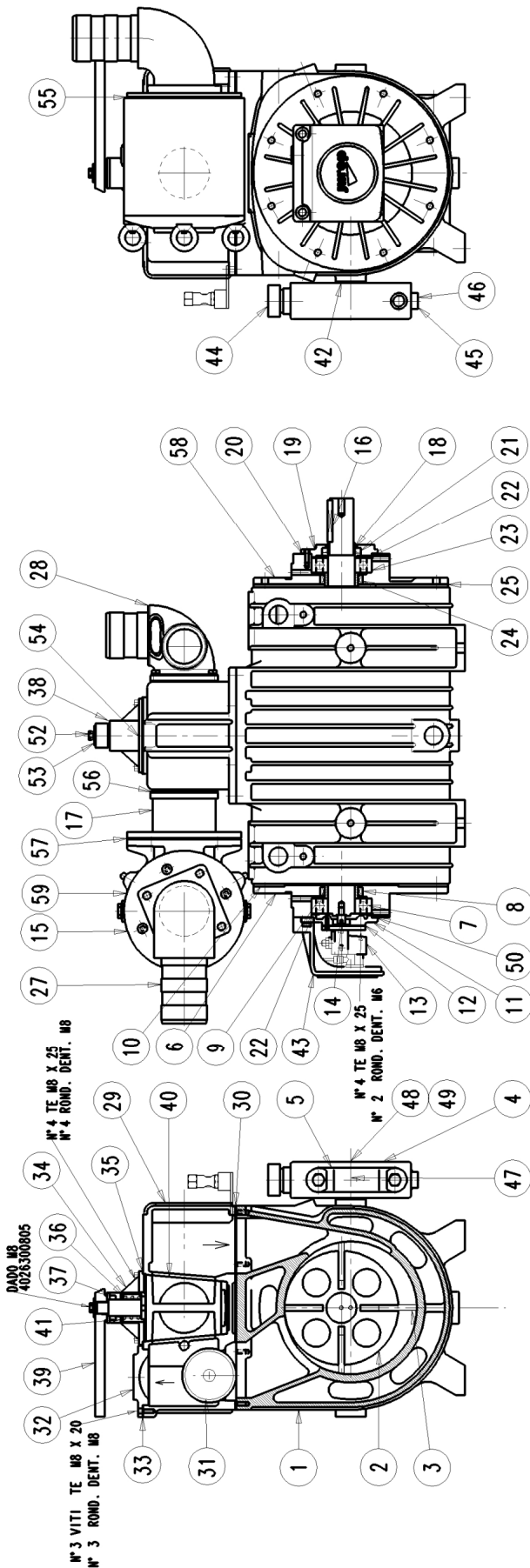
LC 300 D - LC 420 D DIRECT DRIVE SPARES



Pos	Reference	Description	Q.ty
1	1687508200	Pump housing LC 420	1
	16875BHDB0	Pump housing LC 300	1
2	1521505900	Pump rotor LC 420 D	1
	1521506500	Pump rotor LC 300 D	1
3	1601606300	Vane LC 420	4
	1601606400	Vane LC 300	4
4	146704XCB0	Oil tank	1
5	4022106001	Oil tank dip stck	1
6	1610513500	Flange	1
7	4023100046	Bearing 6309 C3	2
8	4022200113	Pump rotor seal ring	2
9	1624037600	Seal ring bushing 45/60/22	2
10	1680709800	Gasket	2
11	1610512900	Oil pump flange	1
12	1680609700	Oil pump gasket	1
13	4024251000	Oil pump cw rotation	1
14	1622002600	Oil pump pivot	1
15	4025426461	3 grooves pulley SPB 200 X 3	1
16	4026501008	Key 12 x 8 x 70	1
17	4025426005	Cone bushing 2517 Ø 40	1
18	1626001100	Seal ring bushing 40/45/20	1
19	1610508200	Direct drive small flange	1
20	1680707300	Front small flange gasket	1
21	4022200044	Seal ring 65/45/8	1
22	4026300025	Compensation ring	2
23	4023100046	Bearing 6309	1
24	4022200113	Seal ring	1
25	1680709800	Flange gasket	1
26	1642600100	Drive shaft protection	1
27	1852104000	Orientable air conveyors Kit Ø100LC420	1
	1852104800	Orientable air conveyors Kit Ø76 LC300	1
28	1852103500	Fix air conveyors Kit Ø100 LC 420	1
	1687504700	Fix air conveyors Kit Ø80 LC 300	1
29	1627506100	Manifold LC 420	1
	1627505300	Manifold LC 300	1
30	1680614300	Manifold gasket LC 420	1
	1680611400	Discharge Manifold gasket LC 300	1
	1680611500	Suction Manifold gasket LC 300	1
31	4023250502	Rubber ball Ø90	1
	4023250501	Rubber ball Ø90	1
32	1610509800	Manifold small flange LC 420	1
	1610510800	Manifold small flange LC 300	1
33	1680610500	Manifold small flange gasket LC420	1
	1610510800	Manifold small flange gasket LC300	1
34	1623100500	Cock manifold LC 420	1
	1623100000	Cock manifold LC 300	1
35	1680707800	Manifold gasket LC 420	1
	1680700200	Manifold gasket LC 300	1
36	1691000000	Cock spring	1
37	4022200030	Cock spring 41x27x10	1
38	1624202300	Cock regulating spacer	1
39	1605500100	Cock lever	1
40	1608502500	Cock LC 420	1
	1608503100	Cock LC 300	1
41	1624027500	Cock spring spacer	1
42	1685600200	Rubber washer	2
43	1642100200	Oil pump protection.	1
44	4026910103	Oil tank plug	1
45	4026904503	Oil tank plug	1
46	1685100300	Alu-washer	2
47	4026171211	Screw M12x80	2

48	4026305508	Selfblocking nut M12	2
49	4026357007	Washer M12	2
50	1680707300	Oil pump flange gasket.	1
51	4026300025	Compensation ring	2
52	4026135414	Screw M8x45	1
53	1685002800	Washer 30 x 8.5 x 4	1
54	1681006800	Vacuum-pressure plate	1
55	1407200800	Water recycling pump cw	1
	1407200900	Water recycling pump ccw	1
	154201TVB0	Water recycling pump cw cover LC420	1
	15201TWB0	Water recycle. pump ccw cover LC420	1
56	15420DAWB0	Water recycling pump cw cover LC300	1
	15420DAXB0	Water recycle. pump ccw cover LC300	1
57	1610513500	Flange	1
	189207X2B0	Kit gasket dir	

LC 300 D USA – LC 420 D USA SPARES CATLOGUE



Pos	Reference	Description	Q.ty
1	1687508200	Pump housing LC420	1
	16875BHDB0	Pump housing LC 300	1
2	1521505700	Pump rotor dir LC 420	1
	1521506400	Pump rotor dir LC 300	1
3	1601606300	Vane LC 420	4
	1601606400	Vane LC 300	4
4	1587009400	Oil tank	1
5	4022106001	Oil tank dip stck	1
6	1610513500	Flange	1
7	4023100046	Bearing 6309 C3	2
8	4022200113	Pump rotor seal ring	2
9	1624037600	Seal ring bushing 45/60/22	2
10	1680709800	Gasket	2
11	1610512900	Oil pump flange	1
12	1680609700	Oil pump gasket	1
13	4024251000	Oil pump cw rotation	1
14	1622002600	Oil pump pivot	1
15	1445002900	Filter	1
16	4026501008	Key 12 x 8 x 70	1
17	1627104400	Collettore per filtro LC 420	1
	1627104500	Collettore per filtro LC 300	1
18	1626001100	Seal ring bushing 40/45/20	1
19	1610508200	Direct drive small flange	1
20	1680707300	Front small flange gasket	1
21	4022200044	Seal ring 65/45/8	1
22	4026300025	Compensation ring	2
23	4023100046	Bearing 6309	1
24	4022200113	Seal ring	1
25	1680709800	Flange gasket	1
26	1642600100	Drive shaft protection	1
27	1852103800	Orient. air conveyors Kit Ø76 (3")	1
28	1852104800	Fix air conveyors Kit Ø76 (3")LC420	1
	1852103800	Fix air conveyors Kit Ø76 (3")LC300	1
29	1627506100	Manifold LC420	1
	1627505300	Manifold LC300	1
30	1680614300	Manifold gasket LC 420	1
	1680611400	Discharge Manifold gasket LC 300	1
	1680611500	Suction Manifold gasket LC 300	1
31	4023250502	Rubber ball Ø90 LC 420	1
	4023250501	Rubber ball Ø80 LC 300	1
32	1610509800	Manifold small flange LC 420	1
	1610510800	Manifold small flange LC 420	1
33	1680610500	Manifold small flange gasket LC420	1
	1680611600	Manifold small flange gasket LC300	1
34	1623100500	Cock manifold LC420	1
	1623100000	Cock manifold LC300	1
35	1680707800	Manifold gasket LC420	1
	1680700200	Manifold gasket LC300	1
36	1691000000	Cock spring	1
37	4022200030	Cock spring 41x27x10	1
38	1624202300	Cock regulating spacer	1
39	1605500100	Cock lever	1
40	1608502500	Cock LC420	1
	1608503100	Cock LC300	1
41	1624027500	Cock spring spacer LC420	1
	1624027500	Cock spring spacer LC300	1
42	1685600200	Rubber washer	2
43	1642100200	Oil pump protection.	1
44	4026910103	Oil tank fplug	1
45	4026904503	Oil tank plug	1
46	1685100300	Alu-washer	2
47	4026171211	Screw M12x80	2
48	4026305508	Selfblocking nut M12	2

49	4026357007	Washer M12	2
50	1680707300	Oil pump flange gasket.	1
51	4026300025	Compensation ring	2
52	4026135414	Screw M8x45	1
53	1685002800	Washer 30 x 8.5 x 4	1
54	1681006800	Vacuum-pressure plate	1
55	1680609200	Gasket	1
56	1680709900	Gasket	1
57	1680609100	Gasket	1
58	1610513500	Flange	1
59	1610051600	Flange	1
	189207X2B0	Kit gasket	

LUBRICATION LINE SPARES CATALOGUE

LC 300 - 420 D / LC 300 - 420 HDR / LC 300 - 420 USA

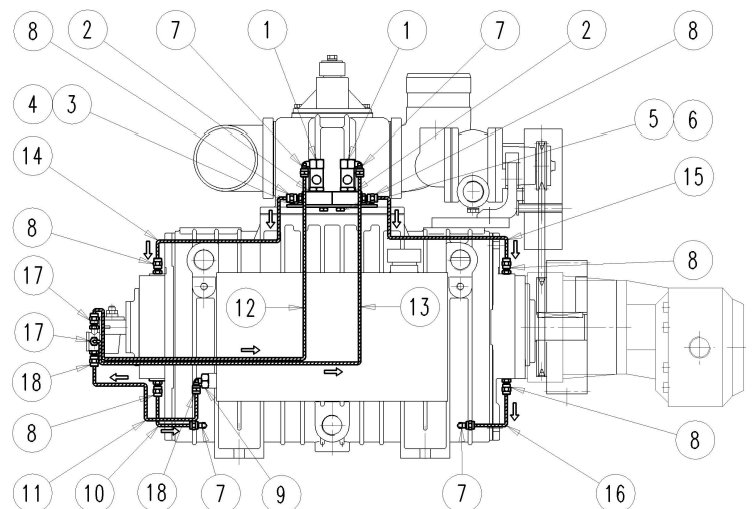
Pos	Reference	Description	Q.ty
1	1401200700	Oil dripper automatic lubrication	2
2	1685100000	Alu washer	2
3	4026350909	Washer M8 6798	2
4	4026107111	Screw UNI 5739 M8 x 30 8.8	2
5	4026102704	Screw UNI 5739 M6 x 16 8.8	2
6	4026350908	Washer M6 6798	2
7	4026706000	Fitting 90 1/8"-Ø4	5
8	4026702000	Fitting 1/8"-Ø4	9
9	1673001000	Oil fitting	1
	4022300001	Oil suction filter	1
10	166301T0B0	Housing-rear flange oil line Dir- HDR-USA sx	1
	166301SZB0	Housing-rear flange oil line Dir- HDR-USA dx	1
	166301SWB0	Suction oil tank oil line Dir dxLC420	1
	16630D5MB0	Suction oil tank oil line Dir dxLC300	1
	166301SXB0	Suction oil tank oil line Dir sx LC420	1
	16630D5PB0	Suction oil tank oil line Dir sx LC300	1
11	166301SVB0	Suction oil tank oil line HDR dx LC420	1
	16630D5LB0	Suction oil tank oil line HDR dx LC300	1
	166301SUB0	Suction oil tank oil line HDR sx LC 420	1
	16630D5JB0	Suction oil tank oil line HDR sx LC 300	1
	166303QWB0	Suction oil tank oil line USA LC 420	1
		Suction oil tank oil line USA LC 300	1
	1663062600	Short discharge oil line Dir-USA dx LC420	1
	16630D5WB0	Short discharge oil line Dir-USA dx LC300	1
	166301T5B0	Short discharge oil line Dir-USA sx LC420	1
12	16630D5XB0	Short discharge oil line Dir-USA sx LC300	1
	166301T4B0	Long discharge oil line HDR dx LC420	1
	16630D5VB0	Long discharge oil line HDR dx LC300	1
	166301T2B0	Long discharge oil line HDR sx LC420	1
	166305DUB0	Long discharge oil line HDR sx LC300	1
	1663062700	Long discharge oil line Dir-USA dx LC420	1
	16630D50B0	Long discharge oil line Dir-USA dx LC300	1
	166301T8B0	Long discharge oil line Dir-USA sx LC420	1
13	1663056IB0	Long discharge oil line Dir-USA sx LC300	1
	166301T7B0	Long discharge oil line HDR dx LC420	1
	16630D5ZB0	Long discharge oil line HDR dx LC300	1
	166301T6B0	Long discharge oil line HDR sx LC420	1
	16630D5YB0	Long discharge oil line HDR sx LC300	1
	166301T1B0	Rear flange oil line Dir-HDR-USA dx LC420	1
14	16630D5TB0	Rear flange oil line Dir-HDR-USA dx LC300	1
	166301STB0	Rear flange oil line Dir-HDR-USA sx LC420	1
	16630D5SB0	Rear flange oil line Dir-HDR-USA sx LC300	1
	166301STB0	Front flange oil line Dir-HDR-USA dx LC420	1
15	16630D5SB0	Front flange oil line Dir-HDR-USA dx LC300	1
	166301T1B0	Front flange oil line Dir-HDR-USA sx LC420	1
	16630D5TB0	Front flange oil line Dir-HDR-USA sx LC300	1
16	166301T0B0	Housing-front flange oil line Dir - HDR-USA dx	1
	166301SZB0	Housing-front flange oil line Dir-HDR-USA sx	1
17	4026706101	Orientable pressure fitting G1/8"-Ø4	2
18	4026706003	Elbow fitting G1/8"-Ø6	2

LC 300 - 420 M

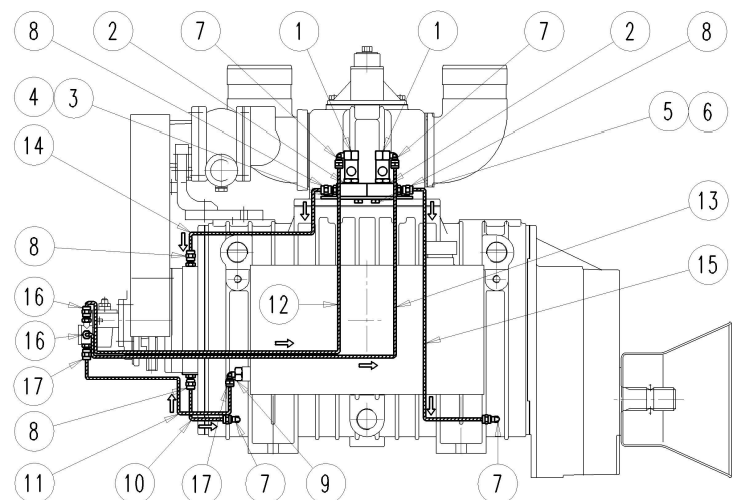
Pos	Reference	Description	Q.ty
1	1401200700	Oil dripper automatic lubrication	2
2	1685100000	Alu washer	2
3	1608100000	Drip oiler distributor	1
4	1681100100	Drip oiler plate	1
5	4026101301	Screw M6x10	2

6	4026351504	Washer M6	2
7	4026702000	Straight fitting G1/8" - Ø4	7
8	4026706000	Elbow fitting G1/8" - Ø4	5
9	1673001000	Oil fitting	1
	4022300001	Oil suction filter	1
10	166301SZB0	Housing-rear flange oil line	1
	166301SVB0	Suction oil tank oil line LC420	1
11	16630D5LB0	Suction oil tank oil line LC300	1
12	166301T4B0	Short discharge oil line LC420	1
	16630D5VB0	Short discharge oil line LC300	1
13	166301T7B0	Long discharge oil line LC420	1
	16630D5ZB0	Long discharge oil line LC300	1
14	166301T1B0	Rear flange oil line LC420	1
	16630D5TB0	Rear flange oil line LC300	1
15	166301SYB0	Front flange oil line molt. LC420	1
	16630D5QB0	Front flange oil line molt. LC300	1
16	4026706101	Orientable pressure fitting G1/8"-Ø4	2
17	4026706003	Elbow fitting G1/8"-Ø6	2

LC 300 - 420 D / LC 300 - 420 HDR / LC 300 - 420 USA



LC300 - 420 M



Series	Issuing date	Revision n.	Revision date	Compiled by	Confirmed by
LC	05.05.2008	00	05.05.2008	U. T.	A. T.

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