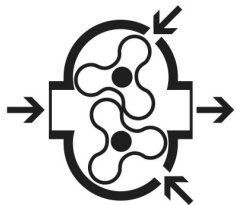
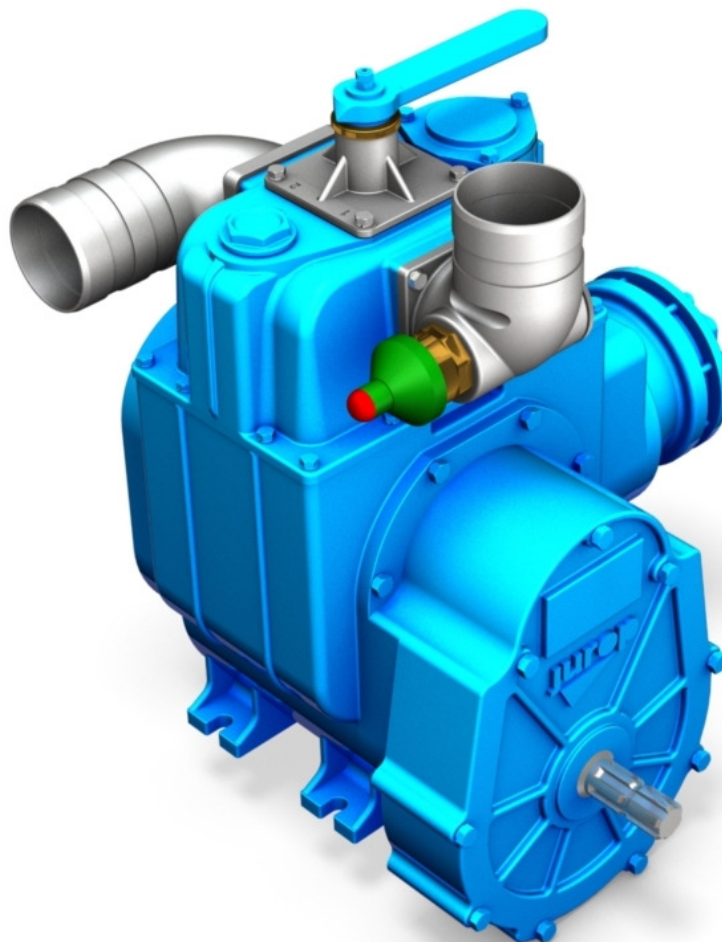


EN

DL 60-200 SERIES



ORIGINAL INSTRUCTIONS



**INSTALLATION, USE AND
MAINTENANCE MANUAL**



Rev. 05
06-02-2018

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

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1. General advises

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.

It is essential to know all the following information to ensure the pump is used correctly and it is also essential to follow the instructions for use and maintenance given in this

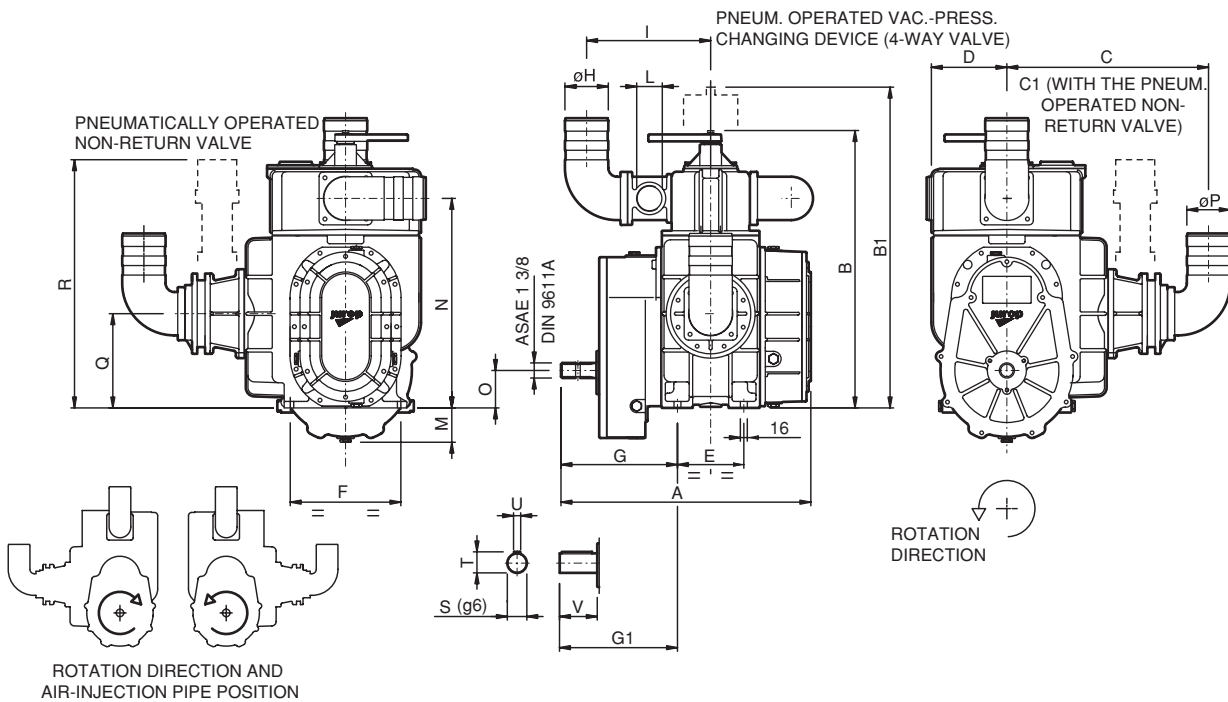
manual also in view of eventual claims for any faulty parts. The manufacturer cannot be held liable for any damages caused by an improper, incorrect unreasonable use.

It is therefore necessary:

- To make known to the users the instructions given in the manual.
- To keep the manual near the machine in a place known to all users.

2. Technical data

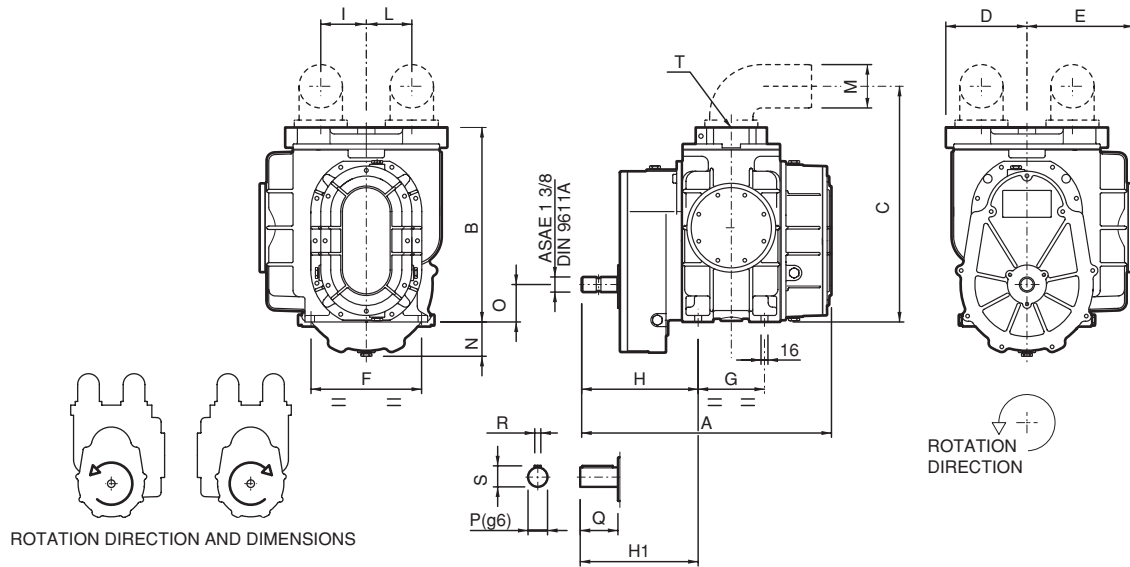
2.1. Dimensions DL



Mod.	A	B	B1	C	C1	D	E	F	G	G1	H	I	L	M	N	O	P	Q	R	S	T	U	V	
	IN											OUT												
DL60	538	593	693	439	-	160	140	225	263	246	80	76	136	G11/2	80	445	85	76	215	-	40	43	12	60
DL80	538	593	693	439	-	160	140	225	263	246	80	76	136	G11/2	80	445	85	76	215	-	40	43	12	60
DL100	588	593	693	439	-	160	190	225	263	246	80	76	136	G11/2	80	445	85	76	215	-	40	43	12	60
DL120	576	640	740	465	440	174	153	255	269	286	100	100	286	G2	80	483	86	100	217	572	45	49	14	66
DL140	576	640	740	465	440	174	153	255	269	286	100	100	286	G2	80	483	86	100	217	572	45	49	14	66
DL170	637	665	765	493	457	174	208	255	269	-	120	120	322	G2	80	497	86	120	217	577	-	-	-	-
DL200	637	665	765	493	457	174	208	255	269	316	120	120	322	G2	80	497	86	120	217	577	45	49	14	96

NOTE : Air-injection system with pneum. operated valve is not available with models DL60, DL80, DL100.
 DL170: available with splined shaft and 600 Rpm, only
 DL200: available with splined shaft or smooth shaft at 1000 Rpm, only

Dimensions DL...FL

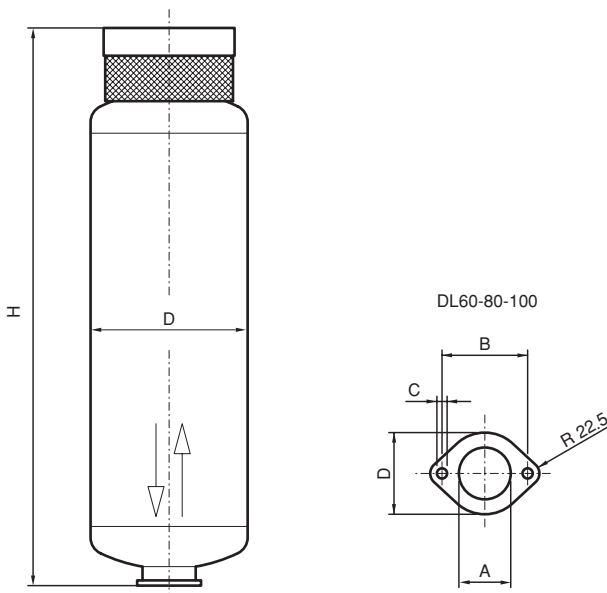


Mod.	A	B	C	D	E	F	G	H	H1	I	L	M**		N	O	P	Q	R	S	T*
												IN	OUT							
DL60 FL	538	414	518	155	220	225	140	263	246	96	96	76	76	80	85	40	60	12	43	G21/2
DL80 FL	538	414	518	155	220	225	140	263	246	96	96	76	76	80	85	40	60	12	43	G21/2
DL100 FL	588	414	518	155	220	225	190	263	246	96	96	76	76	80	85	40	60	12	43	G21/2
DL120 FL	576	449	544	188	246	255	153	269	286	105	105	100	100	80	86	45	66	14	49	G4
DL140 FL	576	449	544	188	246	255	153	269	286	105	105	100	100	80	86	45	66	14	49	G4
DL170 FL	637	449	552	202	246	255	208	269	-	105	105	120	120	80	-	-	-	-	-	G4
DL200 FL	637	449	552	202	246	255	208	269	316	105	105	120	120	80	86	45	96	14	49	G4

* for the threaded manifolds, only

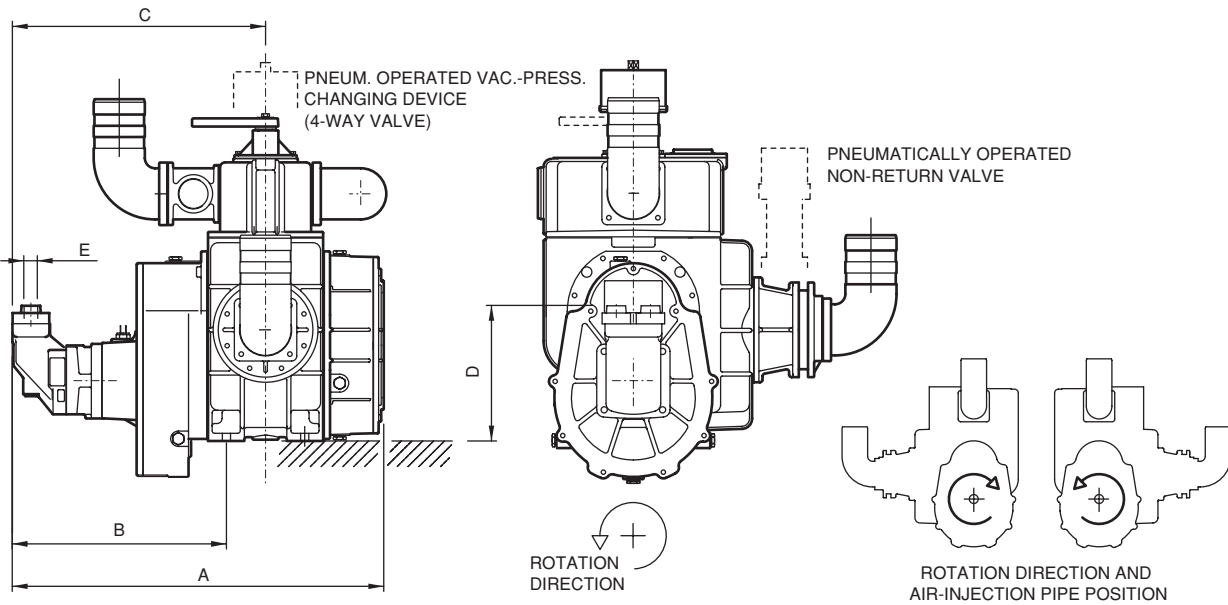
** for executions with conveyors, only

Silencer dimensions



Model	D	H	A	B	C	D	Weight (kg)
DL 60-80-100	250	790	66	109	13	104	20
DL 120-140	300	1070	86	95	9	122	30
DL 170-200	300	1170	102	112	9	142	34

Dimensions DL...HDR



Mod.	Motor displacement HDR (cc/rev)	Motor displacement (cc/rev)		Pressure	A	B	C	D	E
		Nominal	Max						
DL60 HDR	34,3	2400	2600	120	685	410	480	190	G3/4-G1
DL80 HDR	34,3	2400	2500	135	685	410	480	190	G3/4-G1
DL100 HDR	43,7	2400	2500	120	738	412	508	190	G1-G11/4
DL120 HDR	50,7	2300	2400	150	760	452	528	195	G11/4-G11/2
DL140 HDR	40	2300	2400	200	726	418	495	265	G3/4-G3/4
DL200 HDR	40	2600	2700	270	782	418	523	265	G3/4-G3/4

2.2. Technical characteristics

- Positive displacement rotary lobe type vacuum/compressor pump with profiled and synchronized lobes made in high quality cast iron.
- Cooling system by air injection with built-in non-return check-valve.
- Air flow change-over valve (4-way valve) fitted on top of the pump.
- Ball-type non-return check valve fixed on the exhaust side.
- Pivoting suction and exhaust conveyors in aluminium alloy.
- Drive with smooth shaft gearbox (clockwise or counter clockwise rotation on request) or splined (counter clockwise rotation).
- Silencers on the suction port of the injection system and on the exhaust side of the vacuum line.
- Warning system for over-heating of the pump.

Available on request:

- Drive with hydraulic motor and rev counter sensor.
- Pulley for belt drive.
- Pneumatic actuator for the vacuum/pressure change-over valve
- Pneumatically controlled check valve on the air injection system.

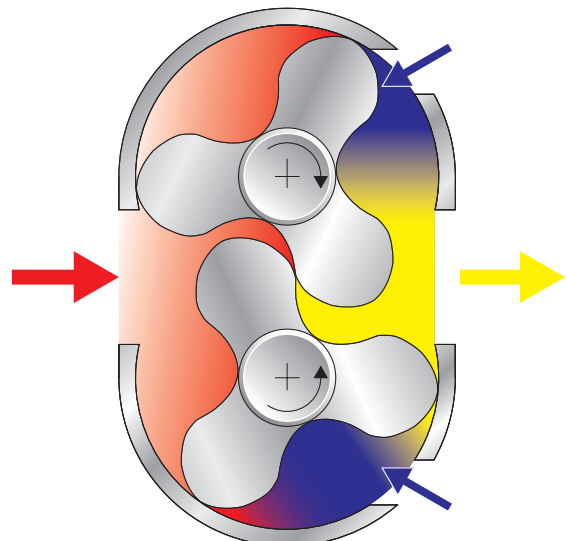


Fig.1

Strongly reduced running costs, compared to the ones of the sliding-vane pump type, are given by:

- No lubricating oil is needed within the pumping chamber since the pump works without friction and consequently there is no oil mist delivered to the atmosphere.
- Limited maintenance due to the fact that there is no touch between rotors and housing eliminating the wear of

these parts.

- Greater autonomy: longer operation under vacuum, permitted by the cooling system that lets air enter the pumping chamber at atmospheric temperature. Thanks to correct timing with the suction vent, the injected air does not reduce volumetric efficiency. While working under pressure the system is not active.

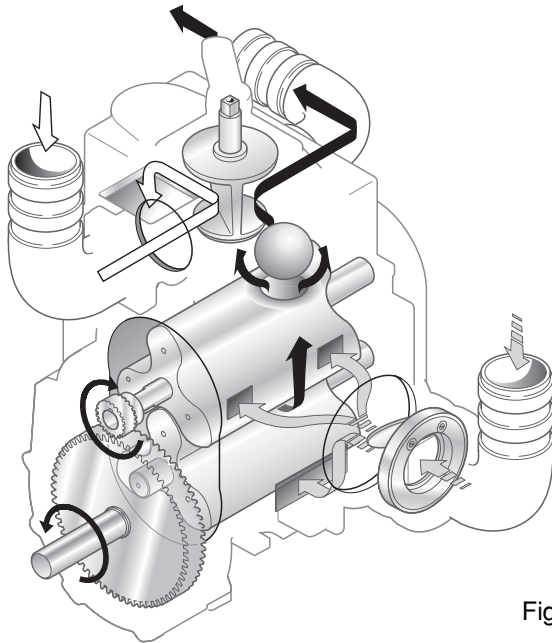


Fig.1a

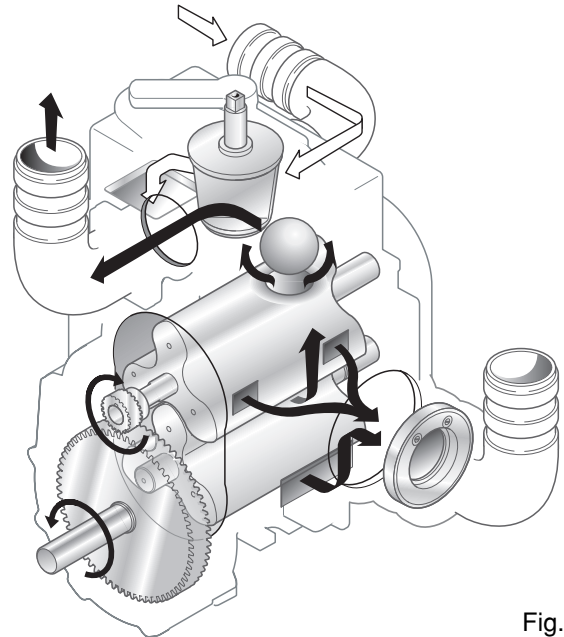


Fig.1b

2.3. Performances

Model		DL 60	DL 80	DL 100	DL 120	DL 140	DL 170	DL 200
Nominal Rpm	min ⁻¹	600-1000	600-1000	600-1000	600-1000	600-1000	600	1000
Max speed	min ⁻¹	660-1100	630-1050	630-1050	630-1050	630-1050	630	1050
Air flow at free air condition	m ³ / h	400	500	625	750	885	1130	1250
Maximum vacuum	%	85	85	85	85	85	85	85
Absolute max pressure	bar	2	2	2	2	2	2	2
Power intake at max vacuum	kW	12	15	18	23	26	31	40
Noise (*)	dB (A)	76	77	77	76	76	78	78
Moment of inertia	kgm ²	0.17	0.18	0.21	0.24	0.26	0.33	0.32
Continuous running (**)								
DL: Vacuum degree	%	70	70	70	70	70	60	70
DL...FL: Abs. Press.	bar	2	2	2	2	2	2	2
Weight	kg	175	175	195	230	220	255	255

*noise of the vacuum pump plus both silencers (injection & exhaust) Running conditions : nominal Rpm, 60 % vacuum rate, distance of 7 metre in open surroundings. Tolerance ±2 dB(A)

** max allowed vacuum rate & max pressure of the vacuum pump at nominal Rpm with a surroundings temperature of 20°C

Running parameters at vacuum condition (nominal Rpm values)

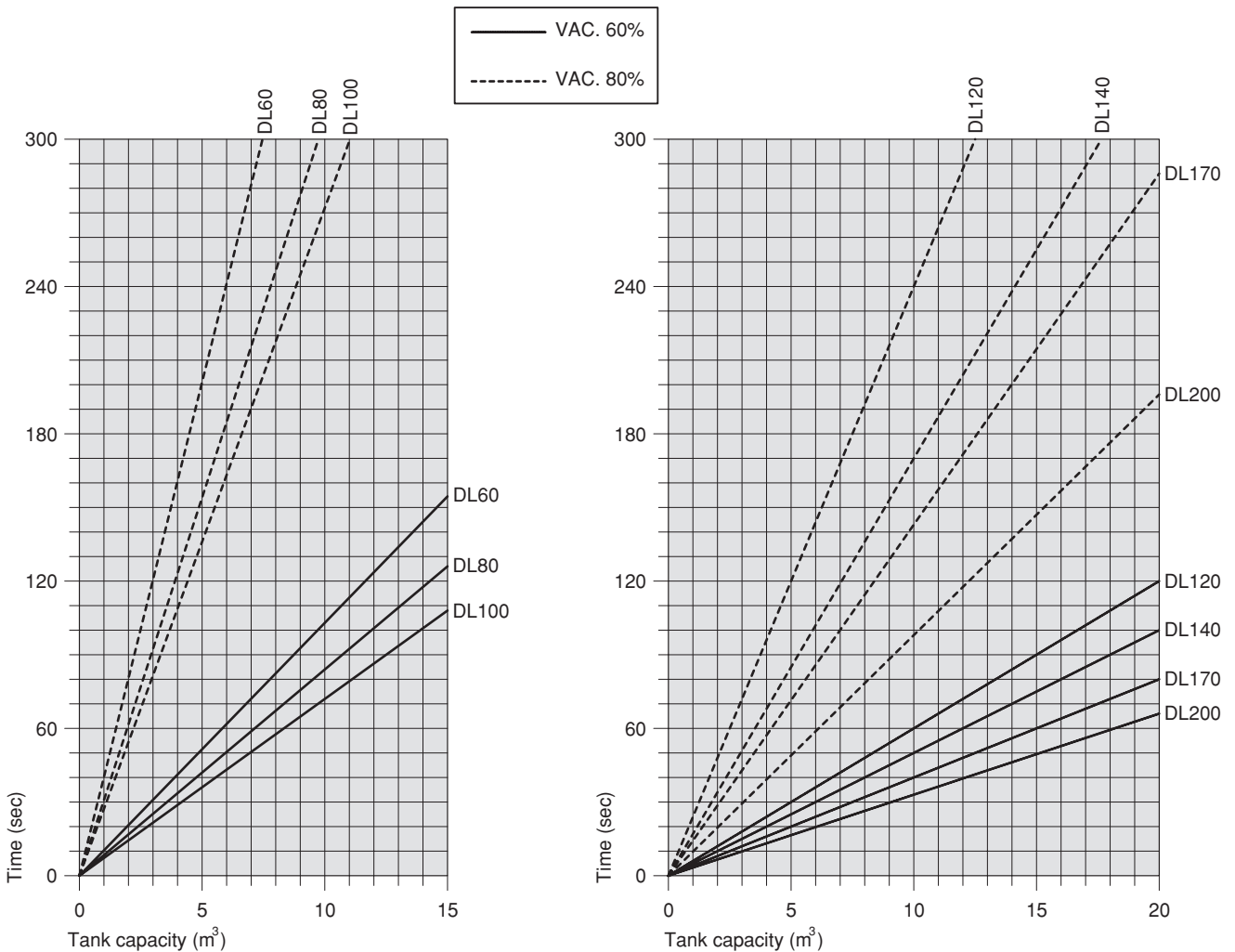
Model		VAC.							PRESSURE	
		20%	30%	40%	50%	60%	70%	80%	1,5 bar	2 bar
DL 60	m ³ /h	360	325	276	218	145	55	20	300	210
	kW	3.4	4.7	6	7.3	8.7	10.1	12	8.7	15.3
DL 80	m ³ /h	480	460	430	378	300	180	40	380	270
	kW	4.5	5.9	7.8	9.2	11	12.7	14.5	10	18.5
DL 100	m ³ /h	580	525	470	400	316	200	60	460	330
	kW	6	8.1	9.8	11.6	13.2	15.2	17.5	13	23
DL 120	m ³ /h	665	605	550	490	400	220	70	600	470
	kW	7.8	9.8	12.2	14.5	17	19.5	22.5	17	29.1
DL 140	m ³ /h	820	760	700	625	555	415	80	680	520
	kW	9.5	12.1	14.5	17.5	20.3	23	26	20.5	34
DL 170	m ³ /h	1020	935	820	700	540	300	100	870	680
	kW	11	14	17.5	20.7	24	27.4	31	23.5	42
DL 200	m ³ /h	1210	1170	1100	1000	850	570	115	1020	830
	kW	15	18	22	25.5	29.2	33.5	38	29	49

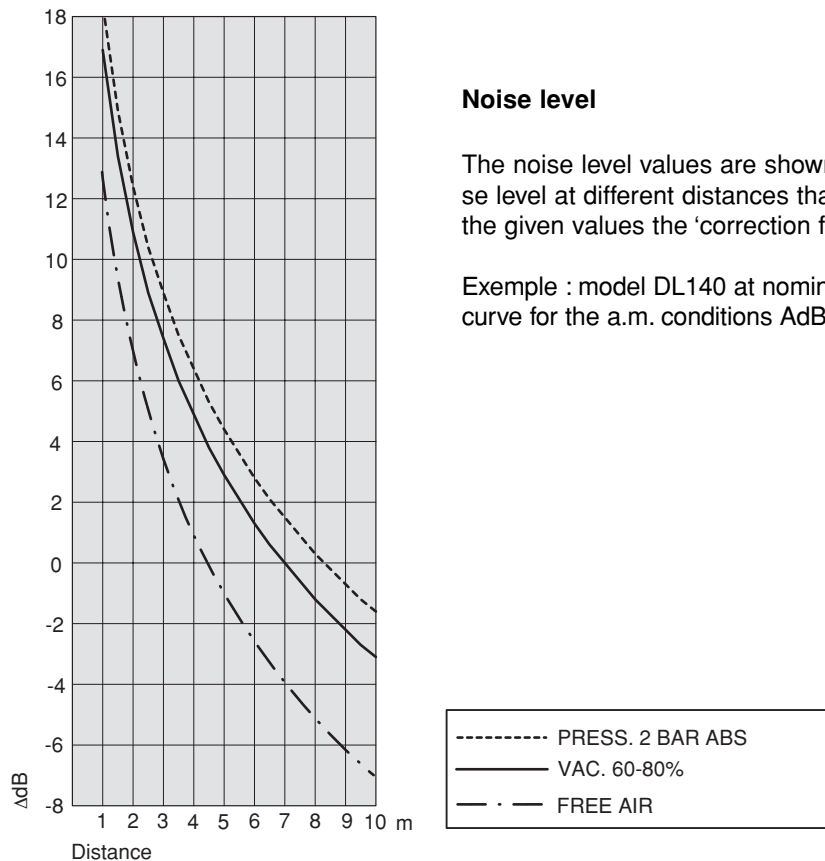
Surroundings conditions: pressure = 1013 mbar. temperature = 20° C, media = air at 1,2 kg/m³ density

Evacuation time

The chart shows the needed time to reach 60% in a tank of a given capacity.

The time will depend however also from the vacuum line tightness.





Noise level

The noise level values are shown at Point 2.3. Performances. To obtain the noise level at different distances than 7 metre, or different pressure values, add to the given values the 'correction factor' ΔdB

Exemple : model DL140 at nominal Rpm, distance 3 metre, free air. On the related curve for the a.m. conditions $AdB = 3,5$. Given noise level $76 + 3,5 = 79,5 dB(A)$

3. Safety and the prevention of accidents.



COMPLY STRICTLY WITH THE FOLLOWING PRESCRIPTIONS.

- When transporting the pump use suitable slings (see weight in the "Performance" paragraph). Rest the pump on stable points to avoid a dangerous situations for the operators.
- Installation and maintenance have to be done with the machine totally disengaged and at surrounding temperature / pressure condition (vent the whole plant) only; and performed by skilled personnel. Operating personnel must wear adequate clothing and protections and use adequate tools for the purpose. Disregarding of said SafetyPrescriptions could result in serious injuries to the operator.
- The pump's body can get very hot. Take all the necessary precautions to avoid any contact with the operator.

- Operators working at short distances from the running pump should avoid to be exposed for long periods of time to the noise of generated by the machine, unless wearing adequate protections.
- Do not insert any object inside the pump's ports because the rotating lobes may cause serious injuries.
- The machine must never be started without the safety devices foreseen for the drive elements. Change any damaged guard.
- General precautions:



The indications marked with this symbol signal an hazard for people's safety and must be known by all users.



The indications marked with this symbol refer to environmental safety and compliance with the relative standards in force.

3.1. Range of application

- Pumps of the DL series can be used as vacuum pumps or as compressors of filtered air on stationary or mobile equipment for creating vacuum, for pneumatic transportation or for the suction inside a tank of liquid or solid waste. Any other use or application has to be considered not suitable for this particular machine. Specifically, this vacuum pump is not designed / suitable for handling toxic (poisonous) explosive or flammable gasses because internal components may reach high temperatures and the same can do the media which is pumped.
- The machine has been designed for a non-continuous running. It is however possible some kind of continuous running according to the given Performances chart (Point "Performances").



Do not use the pump above the given performance values (RPM., pressure or high operating temperatures) that could result in breakdowns and consequent damages of the drive components and to the operators.

- Standard versions with a check valve on the injection system (Fig. 2) for versions without a pneumatic system.
- Versions available on request with a controlled butterfly valve (with check valve functions) on the injection system together with a pneumatic actuator on the vacuum/pressure change-over valve (Fig. 2) for equipment with pressurized air.

4. Installation

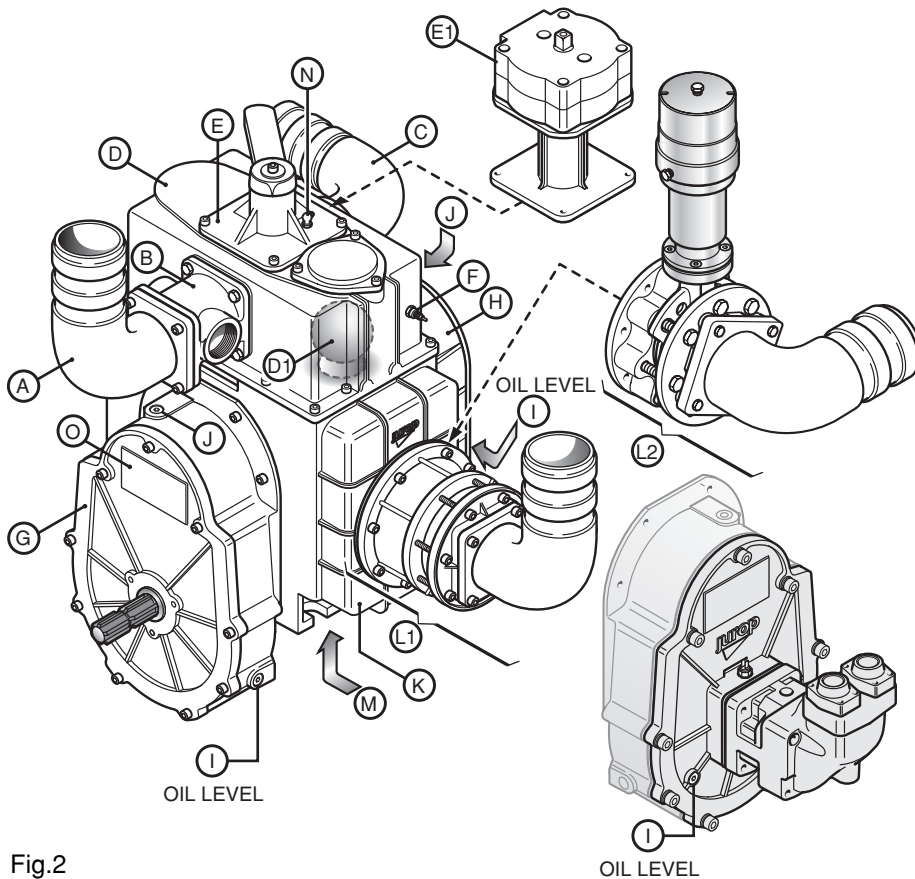


Fig.2

Legend of the components (Fig. 2)

- A. Suction conveyor
- B. Extension-piece with safety valves housing ports
- C. Exhaust conveyor
- D. Manifold
- D1. Internal check valve
- E. Vacuum/Pressure change-over valve
- E1. Pneumatic change-over valve actuator
- F. Safety thermostat (over heating sensor)
- G. Gearbox
- H. Rear drive-gear box (timing gears)
- I. Lubricant level control plug
- J. Lubricant fill up plug
- K. Pump's housing
- L. Air injection cooling system
- L1. Clapet check valve
- L2. Check valve with pneumatic actuator
- M. Liquids drainage port
- N. Greasing point
- O. Identification plate

Needed accessories for a correct running of the pump:

- Silencer on the exhaust-side (Becomming the suction-side during the pressure work-cycle).
- Silencer on suction-side for the cooling system (injection).
- Suction filter mounted between the pump and the secondary shutoff.
- Overheating control device c/w blinking light and acoustic warning buzzer (at 12V or 24V) to be connected to the thermostat (sensor).
- Over-pressure safety relief valve.

4.1. Checking upon receipt

- When the goods arrive make sure that all the parts listed on the delivery note are in perfect condition and have suffered no damage during shipping.
- Make sure the pump has its identification plate affixed on the front cover.

Pumps without such identification are considered anonymous and potentially dangerous: in such a case they must not be used, otherwise the manufacturer will be free from any liability whatsoever. In such an event, contact the manufacturer or retailer.

4.2. Assembly the pump

The pump must be assembled in a place that is easily accessible for maintenance and secured rigidly to a frame or levelled base (maximum 5° slant compared to the horizontal plane). Guarantee enough space around it for the free circulation of air for cooling and avoid exposure to dirt and debris. The base must be such to avoid vibrations, bending and deformation.

Make sure there is enough space to reach the plug on the liquids drainage hole, the greasing points and the fill up points, drainage and oil level control.

DL...HDR: prepare all the connections for the hydraulic plant.

ATTENTION the use of vibration-absorbing pads placed under underneath the machine's base can considerably reduce the noise level of the unit.

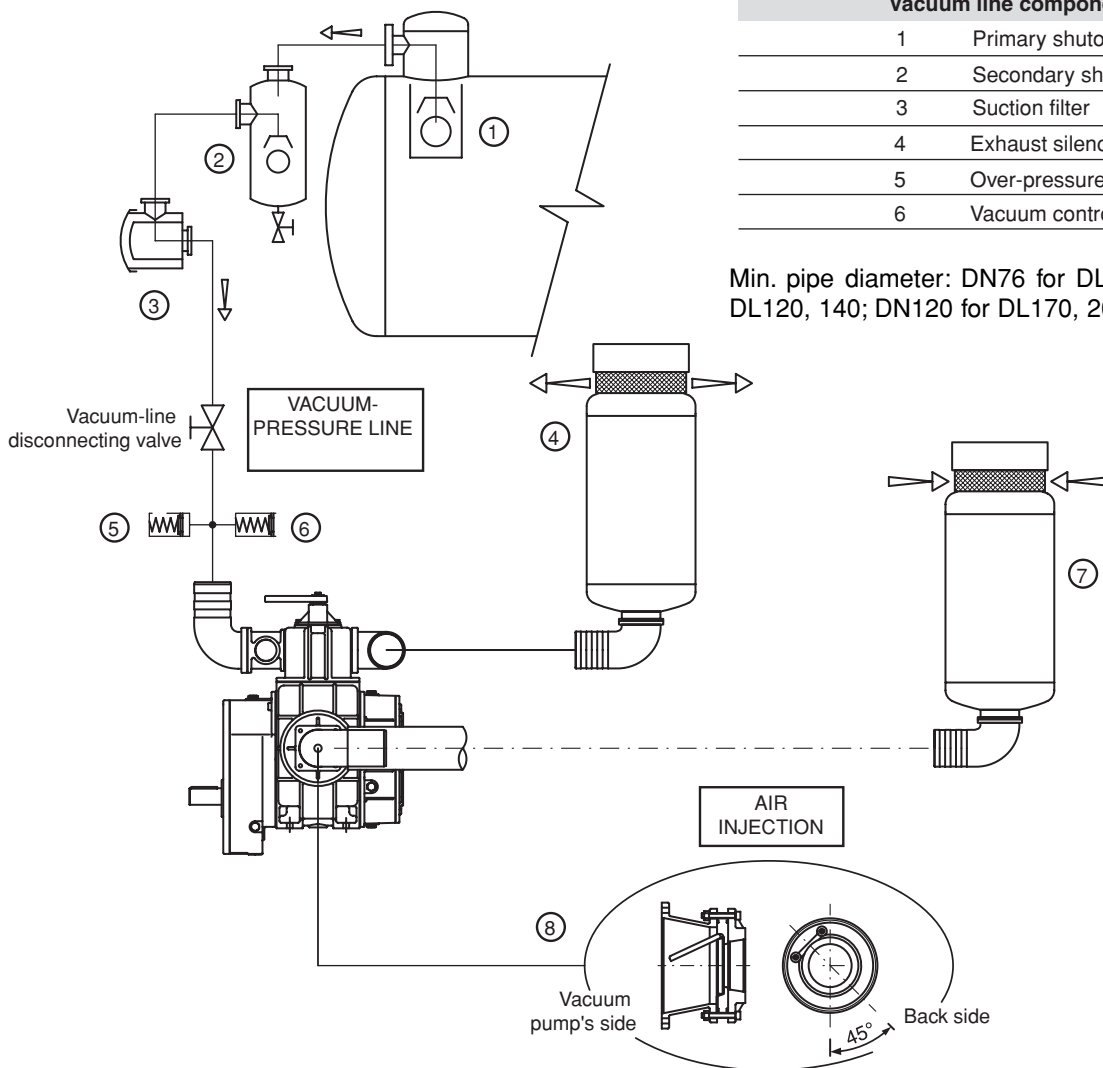
NOTE the rotation direction of the vacuum pump determines the position of the air injection system. See also paragraph "Dimensions".

4.3. Fitting of the vacuum line (DL)

The connecting pipes of the vacuum line have to be of corrosion and heat resistant type
 Inside diameter must not be less than of the pump connections. Average air velocity: 15-25 m/s.
 Before the final connecting make sure that the inside of the

pipings is perfectly clean (see also the attached mounting drawing fig.3).

Connect the pump to the tank through the manifold with the over-pressure valve housing port (see also the components list).



Vacuum line components	
1	Primary shutoff
2	Secondary shutoff
3	Suction filter
4	Exhaust silencer
5	Over-pressure safety relief valve
6	Vacuum control valve

Min. pipe diameter: DN76 for DL60, 80, 100; DN100 for DL120, 140; DN120 for DL170, 200.

Fig.3

Protection of the suction port

To prevent that liquids/media are sucked inside the pump it is necessary to fit on the tank the primary shutoff device of floating-ball type (pos. 1).

The air passage of the shutoff must be at least equal to the one of the suction pipe. In order to prevent costly damages to the system, it is also necessary to further protect the pump against infiltration of foreign bodies/liquids, by means of a secondary shutoff (of floating-ball type for overflow of liquid) fitted between primary and pump (pos. 2) and also by means of a suction filter (for foreign bodies) (pos. 3).

Vacuum/pressure change-over valve

The pneumatic actuator can be installed on the change-over valve at any time using the kit supplied on request.

Exhaust silencer

During its normal running the pump produces noise that it is advisable to be reduced by means of one of the silencers foreseen in the accessories list (pos.4).

It is important to protect the inlet of said item against infiltration of foreign media during the pressure work-cycles. The silencer becomes warm during use: installation position and guards must avoid direct contact with the operators.

During operations the silencer heats-up: positioning of the same and adequate protections are to be taken into consideration in order to prevent direct contacts with the operators.

Safety valves

Over-pressure safety relief valve (pos. 5): it must be dimensioned to discharge the entire air-flow of the pump. The adjustment of this valve has to be kept inside 10% of tolerance of the pump's working pressure (max 2,0 bars absolute pressure) and in any case it has to stay inside the given value of the tank's work pressure



Keep the exhaust direction of this valve clear of the normal walking range of the operator.

Vacuum control valve (pos. 6) has to be fitted on the suction piping, if the tank's characteristics or the vacuum line will need this kind of vacuum- limiting device.

On-off valve on the vacuum line

- Appropriate use (see the "Instructions for Use" paragraph) prevents the pump rotating in the opposite direction when it is stopped at the end of the vacuum phase.

- Use of this valve is recommended (not compulsory) for models with the check valve on the injection system.
- Compulsory application for models fitted with the pneumatically operated non-return valve on the injection system and hydraulic drive.
- Do not apply it on models fitted with the pneumatically operated non-return valve on the injection system controlled as described in Paragraph 4.6. Controls and automatic devices.
- A ball valve is recommended with a passage cross section suitable for the pipe. Max. temperature: 120°C. Working pressure: from -1 to +2 bar rel.

NOTE The check valve inside the manifold prevents the pump rotating in the opposite direction when it is stopped at the end of the pressure phase.

4.4. Air injection system

Installation diagram in fig.3. Connect the silencer to the injection conveyor using a Ø76 (DL60, 80), Ø100 (DL100, 120, 140) or Ø120 (DL170, 200) pipe, avoiding tight bends. In order to grant a perfect functioning of the system the direction and position of the non-return check valve has to be absolutely placed as shown in the installation drawing.

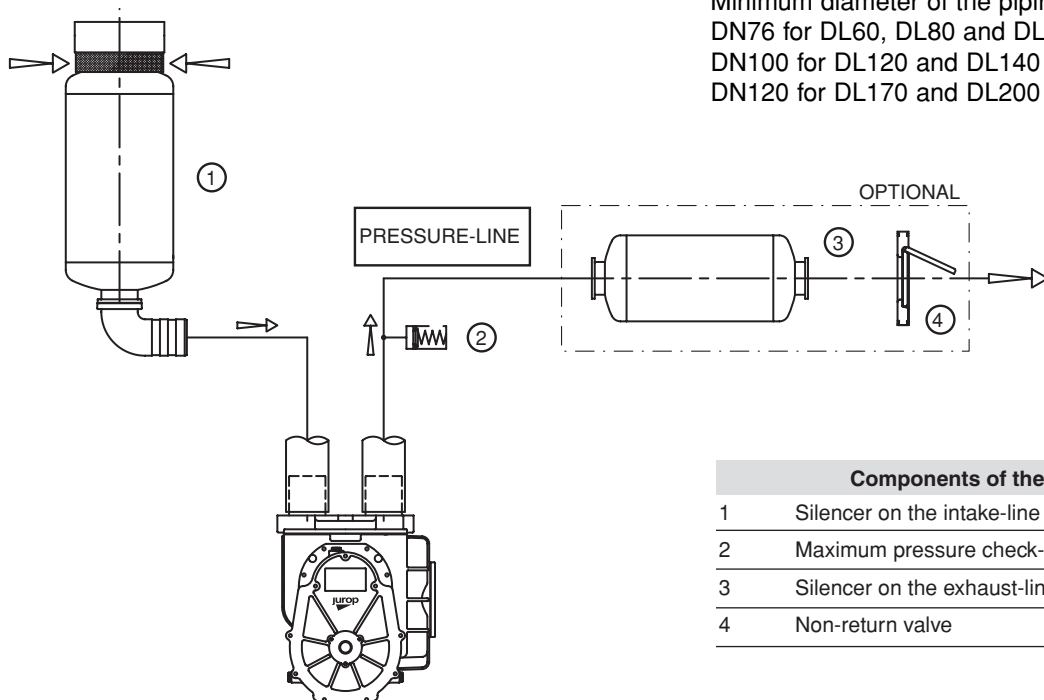
The silencer has to be mounted as close as possible to the pump and it has to be protected from infiltration of water or other foreign bodies.

It is suggested to use the 'original' Jurop silencer.

Vacuum line components

7	Injection silencer	8	Check valve
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4.5 Fitting of the pressure-line



Minimum diameter of the piping
 DN76 for DL60, DL80 and DL100
 DN100 for DL120 and DL140
 DN120 for DL170 and DL200

Components of the pressure-line

1	Silencer on the intake-line
2	Maximum pressure check-valve
3	Silencer on the exhaust-line
4	Non-return valve

Protection of the intake-line

It is necessary to avoid that the pump sucks in its insides foreign media like liquids and solids because this could cause serious damages to the pump itself.

Maximum pressure check-valve : dimensioned for the total air-flow discharge of the pump. The adjustment of the work-pressure of the valve has not to exceed 10% of the recommended maximum work-pressure of the pump itself.



Convey the discharged air-flow in a safe direction for the operating personnel

Accessories on the pressure-line : it is for the Manufacturer of the vacuum unit to decide if it will be necessary to fit a silencer and a non-return valve (this valve will prevent that the pump starts rotating on the opposite direction, once that it has been stopped).

4.6. Controls and automatic devices

• Overheating alarm (for all models).

Composed of a blinking light and a warning buzzer that have to be connected to the thermostat (sensor). It is available at 12V or 24V. (see attached wiring diagram).

Connect the thermostat placed on the manifold (see also the Components list) according to the diagram of Fig. 4 taking into consideration the thermostat characteristics : Voltage from 6V to 24V with DC, from 6V to 12V with AC. Maximum power : 3W.

It has to be mounted in a protected position in order to keep it free from water & other damaging media. Prepare the necessary connections for the electrical feeding. If the box supplied as an accessory is not used, make a check circuit as illustrated in fig. 4.

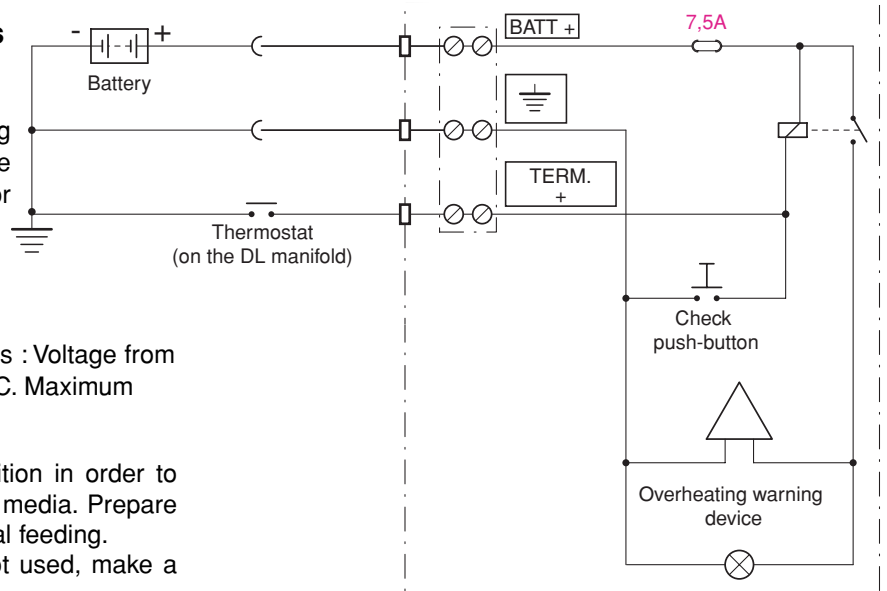


Fig. 4

• Check valve control with pneumatic actuator on the injection cooling system (if supplied).

A correct application will avoid that the pump rotates in the opposite direction at the end of the vacuum work-cycle (see also Paragraph 6 "How to use the pump"). It is suggested the application combined with the pneumatically operated vacuum-pressure changing device.

Prepare the control circuit so that the check valve is always closed except in the vacuum phase with the pump working. Comply with the logical sequence shown in Fig. 5

The pneumatic control circuit represented in Fig. 5 is recommended.

WORKING SEQUENCE OF THE NON-RETURN VALVE

	4-way position	
	Vacuum	Pressure
PTO On	Open	Open
PTO Off	Closed	Closed

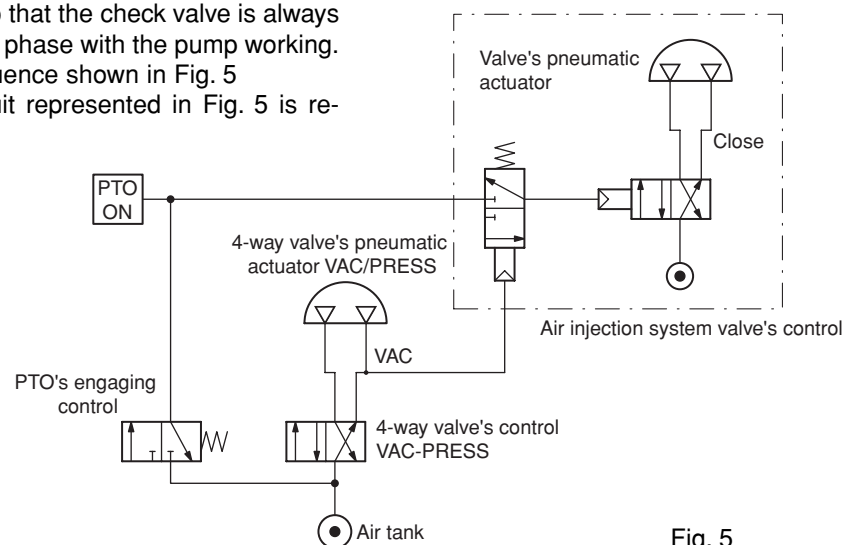


Fig. 5

Working pressure of the pneumatic actuator on the check valve: 5-8 bar.



Install the air injection system and the overheating alarm system correctly.

If these components do not work properly, pump efficiency is reduced because the internal parts seize resulting in damage to the driving elements and to the operator.

4.7 Drive

On request all the components needed for the drive are supplied.

4.7.1 Belt drive

The pulley must be installed on the smooth pump shaft jutting-out as little as possible. Follow the indications in Fig. 6.

Upon request suitable belt-pulley c/w tapered bushing is available:

Model	PD (Pitch diameter)	n° of grooves	Min PD of the drive/driven pulleys
DL 60-80-100	250	3 SPB	180
DL120-140	250	4 SPB	180
DL 200	250	5 SPB	180

NOTE For the drive do not use pulleys with a pitch diameter below the one indicated above. Pulleys that are too small, even if mounted on the motor require considerable belt pull that can lead to early wear of the bearings or drive malfunctions.

4.7.2 Mechanical transmission

We suggest using telescopic type cardan shafts.

Apply these conditions to obtain an uniform rotation:

- Same joint's angles α and α_1
- Internal yokes of the cardan shaft have to be coplanar.
- Driving shaft and driven shaft have to be coplanar.

For permanent installations do not exceed an angle of 10° - 15° .

WARNING Little joint's angles make a uniform rotation of the driven shaft and so a less noisy pump.

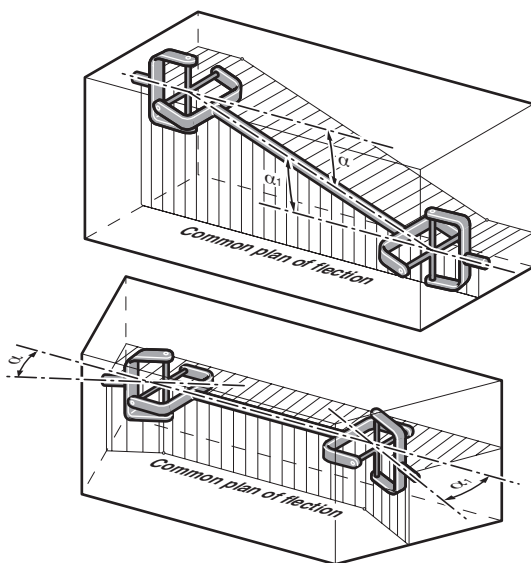


Fig. 7

Essential rules for using on towed agricultural machines:

- Check length of the drive compared to the minimum and maximum elongation conditions: overlapping of the pipes must be at least 1/3 of the working tubes' length.



With every kind of transmission & drive the rotation direction of the pump shaft has to be the one shown by the arrow on top of the shaft itself.

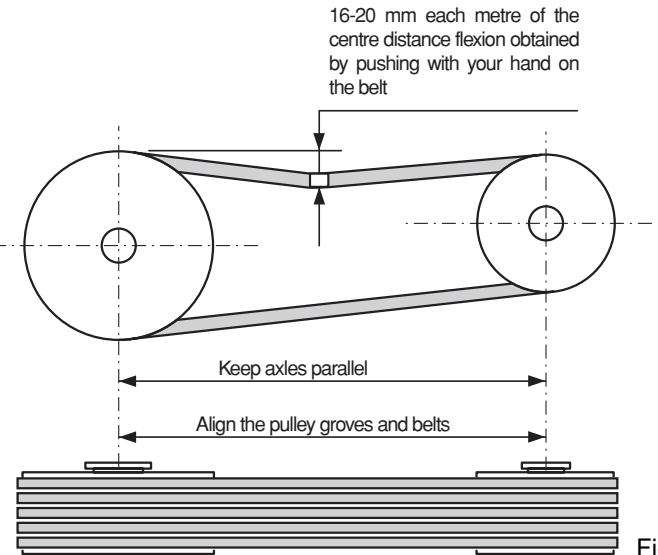


Fig. 6

- Work with limited articulated joint angles (approximately 30° max.) and possibly the same for both joints. Disengage the drive for manoeuvres where the joints work at great angles (steering or lifting).
- We suggest using a torque limiting device to safeguard the drive and the vacuum pump.
- When choosing the cardan shaft for permanent installations or for agricultural machines, for its use and maintenance, please follow the manufacturer's instructions if more restricting than those given above.
- All the DL models are delivered with a cardanshaft protection supplied separately (see the spare parts catalogue, Pump axle guard). Its assembly is recommended using the three M8x12 screws and the plain washers supplied with the pump.
- Do not step on the shaft protection. A torque limiting device is allowed on the drive side. In all cases, the protection must overlap the cardan shaft by at least 50 mm (Fig. 8).

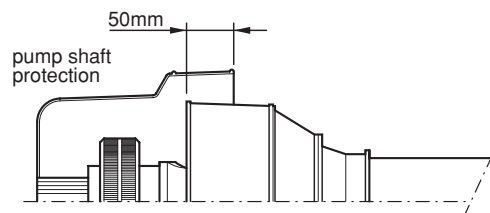


Fig. 8



Drive protection and how the whole equipment is constructed, where the pump has been installed, must comply with the CE directive 2006/42. Do not use the machine with damaged or tampered protections.

4.7.3 Hydraulic drive with gearmotor (models DL 60÷120 HDR)

- Make sure the circuit connections are coherent with the direction in which the pump axle turns.
See the "Dimensions" paragraph.
- Pipes: with a nominal diameter at least equal to that of the motor ports. The diameter of the motor inlet pipe is always smaller than the discharge. Connection between the distributor control and motor must be as short as possible and it is necessary to mount a piece of flexible pipe to reduce the transmission of vibrations. The components must be kept clean.
- Oil return line : to be connected as shown in the diagram. A faulty oil return line will probably damage the hydraulic motor.
- Distributor: with open ports in the rest position. Nominal capacity and pressure must be suitable for the used motor. The distributor must be fitted with an adjustable over-pressure safety relief valve.
- Fluid: mineral oil to ISO standards. Recommended viscosity range: 12-100 mm²/s.
- Filtering: $\beta_{25} = 75$. Fit the filter on the discharge.
- Tank: approximate minimum capacity is about twice the quantity of oil circulating (in l/min). Feeding and return

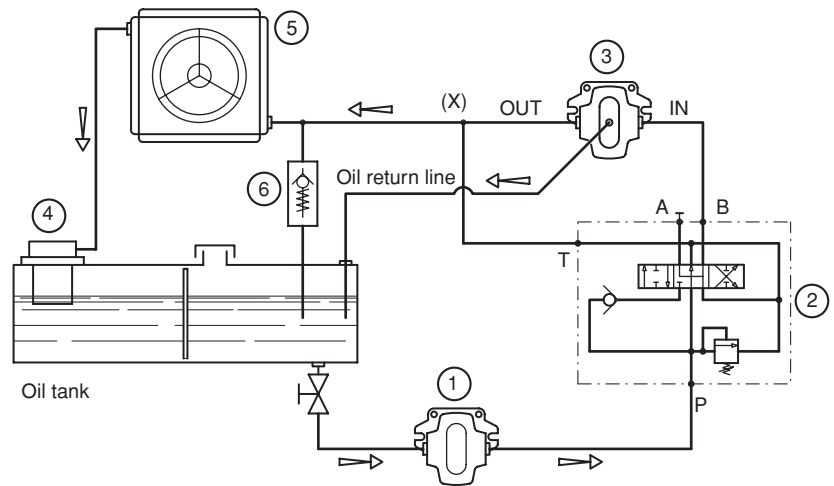
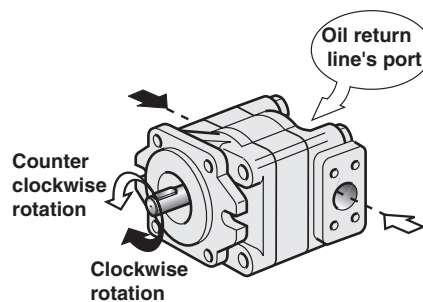


Fig. 9



Components of the low pressure hydraulic circuit

1	Hydraulic pump
2	Control with over-pressure safety relief valve
3	Hydraulic motor
4	Filter on the exhaust
5	Heat exchanger
6	Safety valve (3 bar)

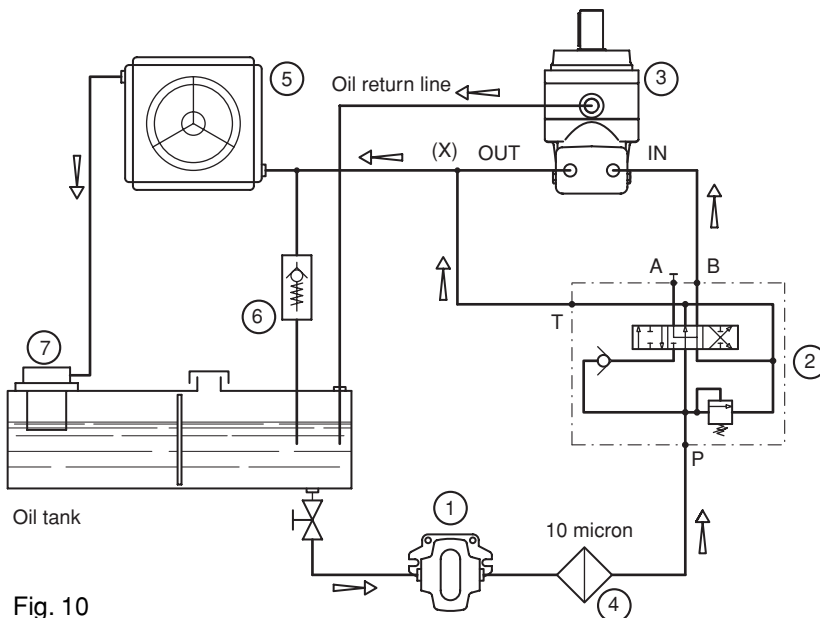
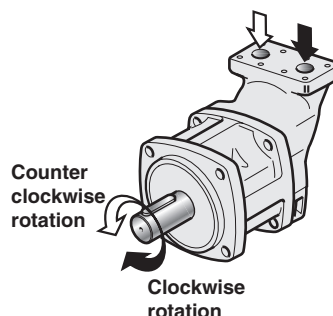


Fig. 10

Components of the high pressure hydraulic circuit

1	Hydraulic pump
2	Distributor with over-pressure safety relief valve
3	Hydraulic HDR motor
4	Filter on delivery line
5	Heat exchanger
6	Safety valve (3 bar)
7	60 micron filter on the exhaust



pipes spaced and separated by partitions. If necessary use a heat exchanger to avoid overheating the oil (max 70°C) with a safety valve to avoid pressure peaks should the circuit be obstructed.

- Pump: on the basis of the power takeoff available and its speed, determine the type and size of the pump according to the operating parameters of the hydraulic system.
- Starting: make sure the system is perfectly clean and put oil in the tank, using a filter. Vent off the circuit. Adjust the pressure limiting valve to the lowest possible value, checking the level of the oil in the tank. Increase pressure and rotation until the working values are reached.

4.7.4 Hydraulic drive with high pressure motor (DL 140-200 HDR)

- Distributor: has to be with open centres in the rest position type.
- Pipes lines: average speed through pipes under pressure must be 3-5 m/s.
- Fluid oil: must be of type for hydraulic systems (DIN 51524), i.e. type A for automatic drives or API CD for motors. Recommended kinematic viscosity when working: 15-30 mm²/s. At start up kinematic viscosity should not exceed 1,000 mm²/s. When working minimum viscosity should be 10 mm²/s.

- **Filtering:** absolute filtering 10 µm type with micro fibre cartridges on the pump delivery side. Contamination class ISO 4406 18/13.
- **Oil tank:** approximate minimum capacity is about twice the quantity of oil flowing (in l/min). Feeding and return pipes spaced and separated by partitions. If necessary use a heat exchanger to avoid overheating the oil (70°C max) with a safety valve to avoid pressure peaks should the circuit be obstructed.
- **Drainage:** Connect one of the two drainage ports to the tank.
 - Motor body should never be without oil. Drain into the tank under the free surface or bend the pipe into a U (see fig. 11)
- **Max. pressure:** 6 bar; **rate of flow:** approx. 10 l/min; **max. temperature** 90°C.
- **Starting:** make sure the system is perfectly clean and put oil in the tank, using a filter. Also fill the motor body with oil: this is necessary to lubricate the internal bearings. Bleed off the circuit. Adjust the pressure limiting valve to the lowest possible value, checking the level of the oil in the tank. Increase pressure and rotation speed until the working values are reached.

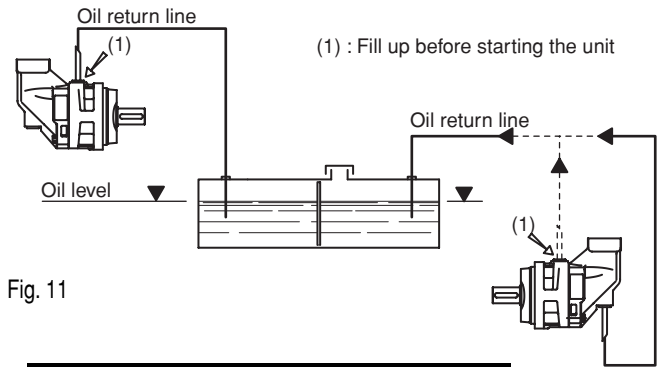


Fig. 11

NOTES FOR THE VACUUM UNIT MANUFACTURER



- On all the DL ... HDR models use the inductive rev counter sensor, available on request, to check rotation speed. Connect to an electronic rev counter, set for a max. 1.5 kHz inductive sensor adjusted for z=30 (e.g. VDO 3619 12-24V).
- Connect the distributor discharge line to the system discharge line, as close as possible to the motor (point X of the HDR circuit): recommended for DL ... HDR with a non return check valve on the injection system.
- All DL ... HDR models: to prevent rotation in the opposite direction at the end of the vacuum phase (see also the "Use precautions" paragraph) we suggest using the check valve with the pneumatic actuator on the injection cooling system.

5. Starting the system

Check the oil level in both gearboxes. If necessary fill-up with the oil type indicated in the lubrication chart.

- Set in open position all the valves of the vacuum line. Start the pump slowly for a few seconds in order to check the rotation direction. Check the right functioning of the air-flow change-over valve (vacuum/pressure) fig.12.

The suction conveyor with extension c/w a threaded hole for the safety valve will probably be installed on the front (drive side) of the pump.

This conveyor can be installed at the back: in this case operation of the vacuum/pressure change-over valve will be opposite to that described above.

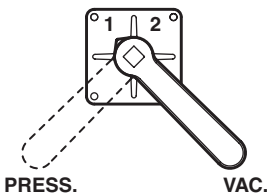


Fig. 12

Transmission	Lever pos.	Operation
DL Sx; DL...HDR Sx	1	Pressure
	2	Suction
DL Dx; DL...HDR Dx	1	Suction
	2	Pressure

NOTE Right is clockwise rotation while left is counter clockwise rotation, looking at the pump from the shaft side.

- Check that the overheating warning system is properly working by means of the "check push button". Check efficiency of the system that controls the check valve and the pneumatic actuator on the vacuum/pressure change-over valve (if installed). Check rotation speed which should be no higher than the maximum value indicated in the "Performance" paragraph. Check the proper functioning of the safety valves on the vacuum line.

6. How use the pump

Pumps with non-return check valve on the injection system.

Suction phase: it is necessary to use the on-off valve on the vacuum line to prevent the pump rotating in the opposite direction when stopping and the simultaneous and ra-

pid loss of vacuum from inside the tank. Proceed as follows:

- When the level of liquid wanted inside the tank is reached, close the on-off valve on the vacuum line (see the installation diagram, Fig. 3).
- Switch the pump off within about 1 minute.

- Close the suction shutoff valve on the tank when the liquid is no longer being sucked up or open the venting valve to re-establish atmospheric pressure inside the tank.
- Open the on-off valve on the vacuum line. The pump is ready to start again.



All the pumps.

- The vacuum pump gives the best performance if the Rpm is kept at the given nominal value (see also Paragraph 2.3. Performances). The pump can be run at lower Rpm but for short periods of time only. Differently from the sliding-vane pump type, to reduce the Rpm will not result to lower discharge temperatures and, with long working cycles, the DL Pump will reach higher temperatures.
- Running of the pump at pressure condition:
 - Do not convey (again) to the pump the air discharged through the overpressure valve
 - Adjust the air-flow by means of the Rpm . Do not use the overpressure valve for discharging the exceeding air-flow. Do not reduce the intake & exhaust pipes diameter below the indicated parameters.

WARNING Strictly avoid that the pump rotates in the opposite direction because it will cause damages to the drive

and/or to the unit. The rotation in the opposite direction is a consequence of the natural flow of atmospheric air, once that the pump has been stopped, through the injection system, toward the tank that still is at vacuum condition. In case of a significative difference between atmosphere (+ 1 bar) and tank (- ? bar) the large quantity of air flowing through the pump can manage to set the lobes into a considerable fast rotation for a few seconds. At the same time however, the vacuum percentage will rapidly decrease.

- On models DL ... FL used as a compressor-blower : fit a non-return valve on the intake. Port. This will keep the existing pressure inside the tank.
- On models DL: use a valve with pneumatic actuator (see Par. 4. Installation). Fit also a vacuum line disconnecting valve (see Par. 4.3. Fitting of the vacuum line). Reduce the Rpm and eventually vent the tank to atmospheric conditions before stopping the vacuum pump or use a braking system on the drive to the pump.

This phenomenon is caused by the natural inlet of air through the pump's injection system from outside into the tank still under vacuum.

The air flow through the pump can make the rotors reach high speed for a few seconds. At the same time the vacuum degree reduce quickly.

7. Operating precautions



The manufacturer declines all responsibility for damages caused by not following the instructions for installation, use and maintenance contained in this handbook



The pumps and change-over valve lever get hot during use. Do not touch them with your bare hands: danger of burns.

Operate the change-over valve lever wearing protective gloves. Also avoid touching the silencer and the flow of air at the exhaust.



RPM, work-pressure and temperature have to be kept inside the values set for in this manual. Maximum temperature at exhaust: 160°C measured along the pipeline at 150 mm from the manifold.

- The overheating alarm warns the operator that the pump has reached the maximum allowed temperature. **If and when it starts-up (buzzer and warning lamp.) it is absolutely necessary to STOP the pump and wait for the temperature to drop.** If possible, it is suggested to have the pump rotating at "free air condition" (vacuum rate: 0 %) in order to speed up the cooling process.

TAKE CARE: in case the overheating system starts-up to often, it means that the pump is operating at the maxi-

imum of its performances capacity. Consequently it is advisable to set the RPM and reduce both the vacuum rate and operating time.

Check frequently, using the push button, that the system is working trouble free.

- Models with the injection system fitted with the non-return check valve: do not start the pump with the suction shutoff valve in closed position.
- Avoid the DL ... HDR type pumps from rotating in the opposite direction and in all cases when it could cause damage to the drive.

This can happen when there is a quick loss of the vacuum rate from the tank, due to the faulty mounting or use of the non-return check valves.

- If the machine has been operating in a dusty area, or the pump has been accidentally entered by foreign liquids or after a long period of time of inactivity, it is strongly recommended to wash the inside of the pump:
 - Open the gate-valve/s of the tank and with the pump rotating at very low RPM, suck-up a few litres of clean water through the pump itself.
 - Drain-out all the water through the ports set for this function underneath both the pump housing and silencer..
 - Close again the draining ports and let the pump suck-up some lubricating oil.
 - Drain the oil from the pump and from the silencer as previously mentioned.



The effluents of this operation have to be disposed as prescribed by local rules.

8. Periodical checks

The user can only carry out what is authorised in this instruction handbook. Anything else is forbidden. For machines working in particularly difficult conditions, carry out the checks more frequently.

Daily:

- Check the proper working of the overheating alarm system after having powered it correctly.
- Check that the check valve on the injection cooling system is working properly.
- Clean the filters.
- Check working pressure during operation.

Every 50 working hours.

- Check the level of oil in the front and rear gear boxes. If frequent refilling up is called for it means that the seal rings are worn (see also "Troubleshooting"). In all cases however do not put too much oil in: the correct level is up to the check port.

Brand	ENI	ESSO	SHELL	TOTAL	MOBIL
ISO VG320 (oil)	BLASIA 320	SPARTAN EP 320	OMALA OIL 320	CARTER EP 320	MOBILGEAR 632
NLGI 2 (grease)	GR MU EP2	GP GREASE NLGI 2	ALVANIA EP2	MULTIS EP2	MOBILUX EP2

- Adjust, if needed, the vacuum-pressure changing device (4-way valve) and keep it well greased. By operating on the upper nut (manual type) or on the threaded washer (pneumatic type) the sizing of the elements will be avoided. Do not overdo it in order to avoid vacuum-degree losses (see Fig. 13).
- Check that the safety valves are working properly.
- Clean out the dirt that has collected on the bottom of the silencers.
- Clean the hot air breather vent under the manifold (Fig. 14).
- Check the condition of the drive according to the manufacturer's instructions.

Every 500 working hours:

Change the oil inside the front gearbox and inside the rear drive gears. Viscosity of the oil according to the here above given chart.

- Collect and dispose of the spent oil according to the existing local rules.

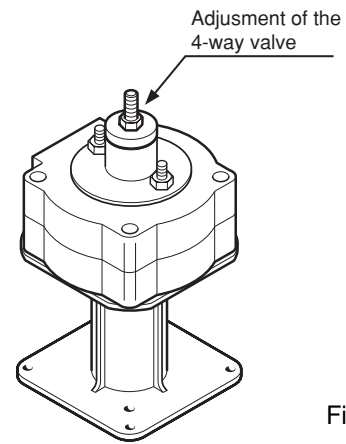


Fig. 13

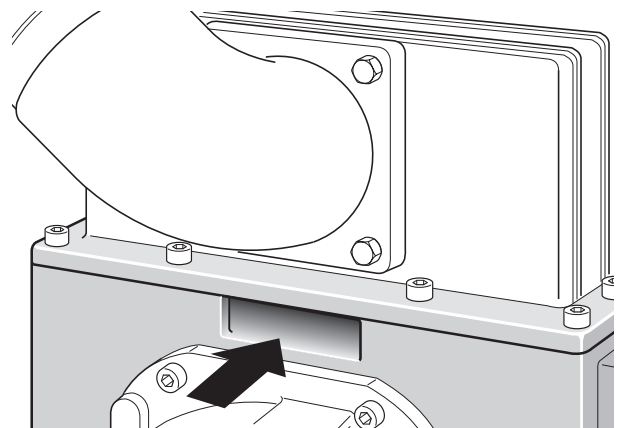
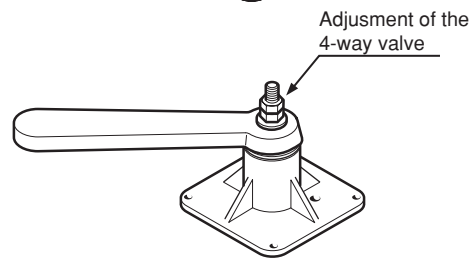


Fig. 14

Model	Front gear box	Rear gear box
DL60-80-100	0,75L	0,4L
DL120-140-170-200	0,8L	0,8L
DL60-80-100HDR	1,7L	0,4L
DL120-140-170-200HDR	1,6L	0,8L

9. Troubleshooting: cause and remedies

The pump is overheating

Cause	Remedies
• Rotation speed is too high	• Reduce speed
• Rotation speed is too slow.	• Possible only for short periods of time. Set to nominal speed
• Extended operation with a high rate of vacuum	• Either reduce the rate of vacuum or operating times
• The air injection filter is dirty	• Clean the filter
• The air injection cooling system is not working efficiently	• Check correct assembly and operation (see "Installation")
• The diameter of the vacuum and exhaust line is not big enough	• Check pipe lines dimensions

Reduced performance

Cause	Remedies
• The vacuum/pressure change-over valve is in the neutral position	• Move the lever to the end of stroke. Adjust change over position
• O-rings worn off	• Change them
• The shutoff valves or seals on the tank are worn off	• Change them
• The pipes connecting to the tank are leaking or clogged	• Change any damaged pipe
• The float valve or suction filter clogged	• Remove and clean
• Components on the vacuum line are under dimensioned	• Check dimensions for maximum performance
• Safety valves and the vacuum control valve are no longer correctly adjusted	• Check correct adjustment

Other problems

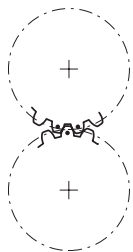
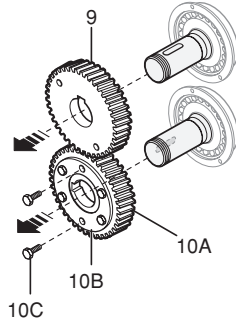
Malfunction	Remedies
• The vacuum/pressure change-over valve has difficulty in turning.	• Adjust change over position and grease if necessary.
• The gears are noisy.	• Check the level of oil in the gear boxes
• Frequent refilling up of oil in the gear boxes (no external leaks).	• The O-rings are worn. Change them.

10. Instructions for remounting.

The DL series of vacuum pumps require no maintenance if needed pump be taken apart only by skilled personnel. If, due to accidental causes, it is necessary to change some of the inside components, please keep in mind the following instructions.

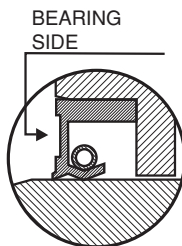
- The phase gears placed in the rear transmission box, can be disassembled by the extractor holes or removing two of the screws blocking the driven gear, in order to use its threaded holes.

ATTENTION: Do not remove more than two screws from the driven gear. You have to avoid oil contact between the hub and the gear. In both the cases could be modified the rotors phase



- Remount the gears contained in the rear gear box on the original axes, observing the correct timing given by the marks on the wheels. Change the keys if they show signs of wear on the sides.
- Lock the screws on the driven gear with a torque of 6 kgm (DL120-140-170-200) or 3.2 kgm (DL60-80-100). Helicoidal toothing: refit the gears and push into position together without forcing on the cotters. Don't damage the cotters.

- Fit the rotor seal-rings with the metal shield facing the bearings (the metal spring facing the pump body) to guarantee the seal-ring. Insert high temperature resistant grease in the cavity of the seals.
- Do not damage or turn the seal lip over when remounting. Do not use worn seal bushings again.
- You have to replace the oil discharge plugs washers to avoid leakages from the tank.



Pay attention working on the gearbox smooth shaft

Disassembling:

- Use the extraction holes to disassemble the roll bearings from the shaft

Assembling:

- First of all, you have to mount the rear roll bearing (50) on the shaft and then you can assemble the group with the internal gearbox flange (68).
- Put on the gearbox cover (41B) replacing first the gasket (13).
- Now you can mount the front roll bearing (51). **ATTENTION:** you must not force the roll bearing housing to avoid the gearbox internal flange damaging.
- Protect the tab hole with adhesive tape
- Replace the oil seal (17B) before mounting the front flange (41C). Be careful inserting the oil seal on the shaft: the adhesive tape can avoid to damage it in the tab hole edges.

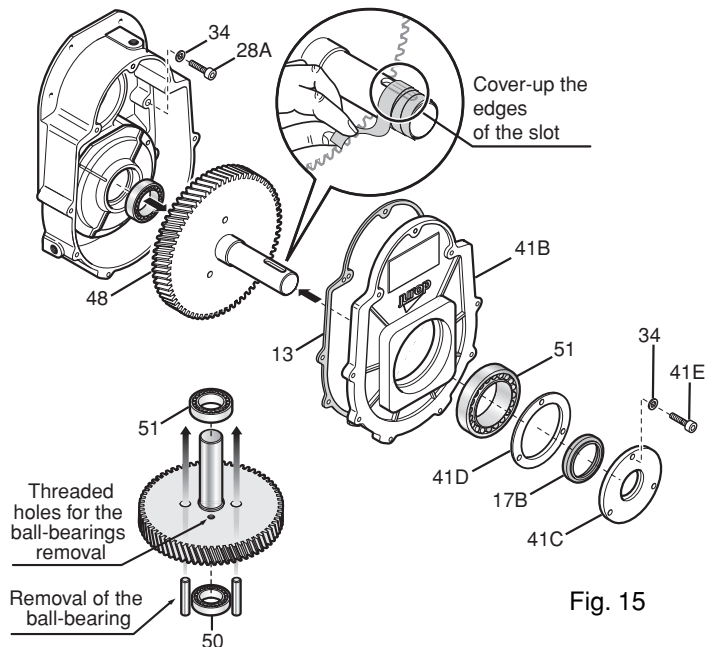


Fig. 15

11. Spare parts

The following information must be given when ordering spare parts:

- Find the following on the spare parts tables:
 - name
 - code
 - no. pieces
(e.g. three-lobe; code 16215.038.00 ; 1 pc)
- find on the plate:
 - Type of pump
 - serial number
(e.g.: DL140 ; serial number H100131)

12. Scrapping



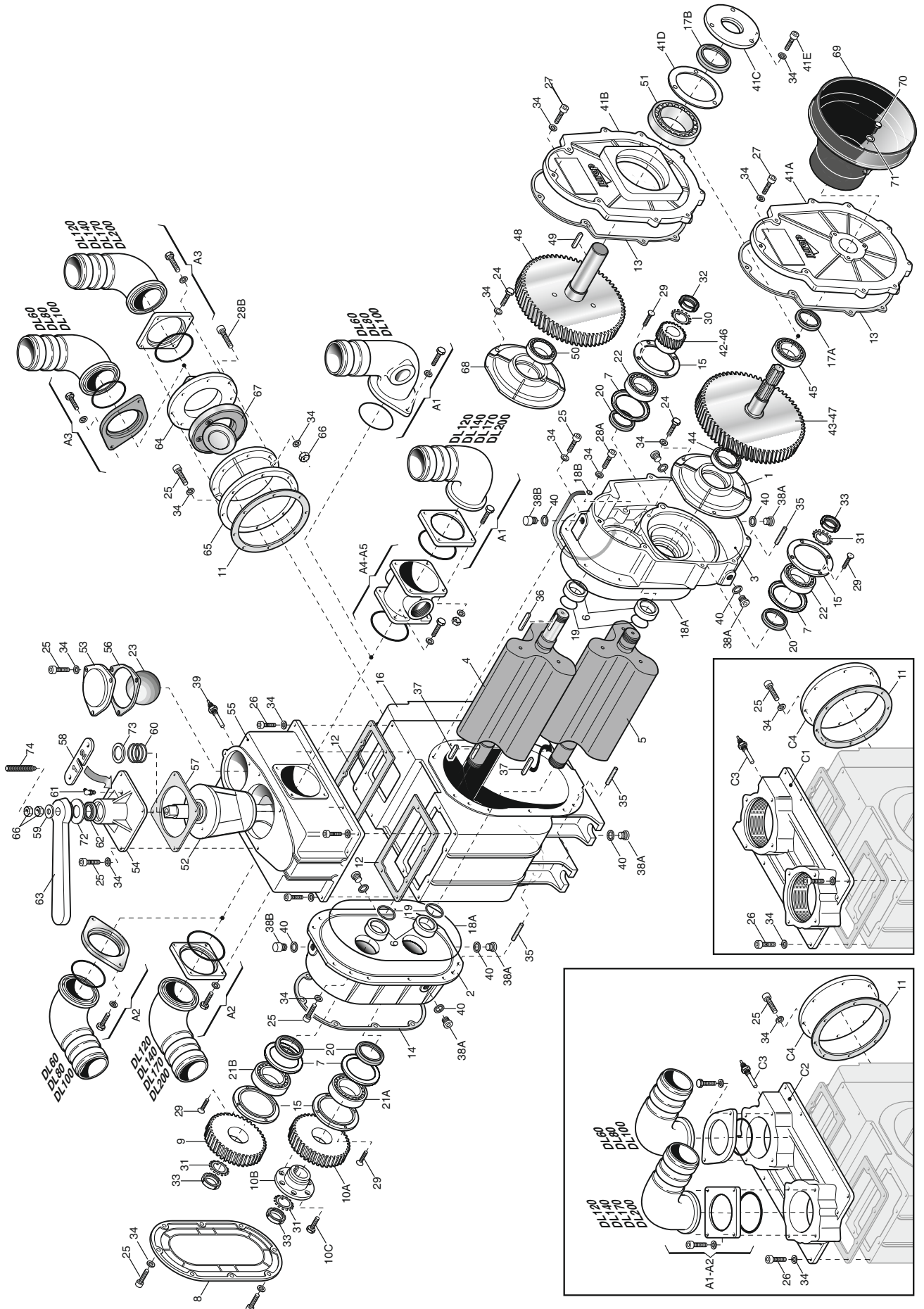
Before demolishing the vacuum pump the following materials must be divided and disposed of appropriately:

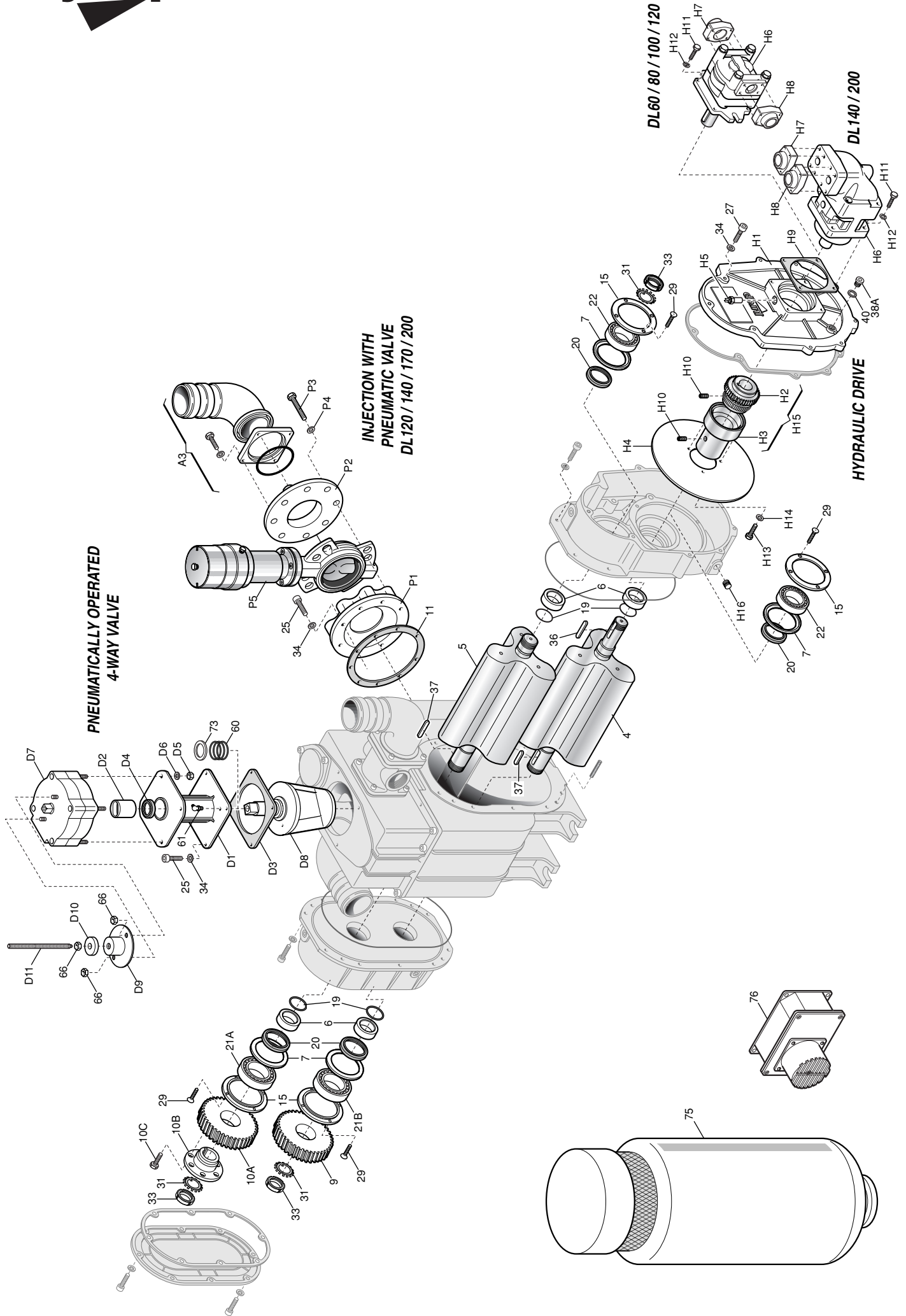
- lubricating oil
- parts in rubber and plastic
- parts in cast iron, steel and aluminium

Do not just throw the pump away.
Do not use the parts removed for scraping as spare parts.

Failure to comply with the above relieves the manufacturer from all and every responsibility and is a sign of negligent use of the product.

13. Parts list DL vacuum pumps line





Parts list DL 60

Pos.	Code	Description	Q.ty	Pos.	Code	Description	Q.ty
1	1610511100	Flange	1	COD. 1852104700 CONVEYOR Ø80 KIT COMPONENTS			
2	1610511600	Rear flange	1	1627100300	Conveyor Ø80 mm	1	
3	1610511700	Front flange	1	4022200307	OR 6287 VITON	1	
4	1621504400	Driving lobe	1	4026103003	Screw M12x35	2	
5	1621504500	Driven lobe	1	4026350609	Washer	2	
6	1624025800	Bushing	4	COD. 1852104800 CONVEYOR Ø76 KIT COMPONENTS			
7	1624025900	Spacer	4	1627100500	Conveyor Ø76 mm	1	
8	1640101900	Rear cover	1	4022200307	OR 6287 VITON	1	
9	1651009400	Gear	1	4026103003	Screw M12x35	2	
10A	1651009500	Gear	1	4026350609	Washer	2	
10B	1611001100	Shaft	1	1610100000	Flange	1	
10C	4026141408	Screw 10.9 M8x22	6	CONVEYOR'S THREADED FLANGE			
11	1680611800	Gasket	1	C1	1627505600	Flanged threaded conveyor	1
12A	1680611400	Gasket	1	26	4026120406	Screw M8x30	12
12B	1680611500	Gasket	1	34	4026350505	Washer	12
13	1680612100	Gasket	1	C3	4028250203	Thermostat	1
14	1680611700	Gasket	1	C4	1610512000	Flange	1
15	1681007500	Bearing plate	4	11	1680611800	Gasket	1
16	1687506600	Pump housing	1	25	4026120405	Screw M8x25	8
17A	4022200040	Seal 72x40x10	1	34	4026350505	Washer	8
17B	4022200040	Seal 72x40x10	1	MANIFOLD'S FLANGE FOR CONVEYOR CONNECTION			
18A	4022200311	OR 4950 VITON	2	C2	1627505500	Flanged conveyor	1
18B	4022200317	OR 108 VITON	6	26	4026120406	Screw M8x30	12
19	4022200316	OR 2137 VITON	4	34	4026350505	Washer	12
20	4022202804	Seal 80x60x7	4	C3	4028250203	Thermostat	1
21A	4023100039	Bearing 6308 C3	1	C4	1610512000	Flange	1
21B	4023100039	Bearing 6308 C3	1	11	1680611800	Gasket	1
22	4023110031	Bearing NU308 ECJ C3	2	25	4026120405	Screw M8x25	8
23	4023250501	Rubber ball	1	34	4026350505	Washer	8
24	4026107110	Screw M8x25	3	PNEUMATICALLY OPERATED 4-WAY VALVE			
25	4026120405	Screw M8x25	37	D1	1613101800	Supporting piece	1
26	4026120406	Screw M8x30	12	D2	1676000500	Connecting piece	1
27	4026120407	Screw M8x35	9	D3	1680700200	Gasket	1
28A	4026120409	Screw M8x45	6	D4	4022200030	Seal 41x27x10	1
28B	4026120411	Screw M8x55	8	D5	4026308003	Nut M6	4
29	4026155505	Screw M5x16	16	D6	4026351504	Washer	4
30	4026306307	Washer	1	D7	4027100410	Actuator	1
31	4026306308	Washer	3	D8	1608503200	Conveying piece	1
32	4026306507	Ring nut M35x1,5	1	D9	1624027200	Spacer	1
33	4026306508	Ring nut M40x1,5	3	D10	1624202400	Bronze spacer	1
34	4026350505	Washer	78	D11	1672001800	Stud screw	1
35	4026401806	Pin 10x35	10	25	4026120405	Screw M8x25	4
36	4026500909	Cotter 10x8x50	2	34	4026350505	Washer	4
37	4026501001	Cotter 12x8x32	1	60	1691000000	Spring	1
38A	4026701602	Plug G3/8	7	61	4022100107	Greaser	1
38B	4026910102	Venting plug G3/8	2	66	4026300805	Nut M8	3
39	4028250201	Thermostat	1	73	1624027500	Spring's spacer	1
40	1685100200	Washer 17x22x1,5	9	HYDRAULIC DRIVE			
41A	1640002500	Front cover for splined shaft	1	H1	1640002700	Front cover	1
41B	1640501000	Front cover for smooth shaft	1	H2	1576001000	Joint (motor side)	1
41C	1610512400	External flange	1	H3	1655002600	Joint (lobe side)	1
41D	1680708800	External flange gasket	1	H4	1647000200	Disc	1
41E	4026107108	Screw M8x20	3	H5	4028321601	Rpm sensor	1
42	1651008100	Gear Z 32 - 600 rpm	1	H6	4024107022	Hydraulic motor	1
43	1651008300	Gear Z 128 - 600 rpm	1	H7	4026711001	Flange G3/4	1
44	4023100017	Bearing 6206 C3	1	H8	4026711002	Flange G1	1
45	4023100039	Bearing 6308 C3	1	H9	1680612000	Gasket	1
46	1651008200	Gear Z 47 - 1000 rpm	1	H10	4026136005	Screw M8x12	2
47	1651008400	Gear Z 113 splined shaft - 1000 rpm	1	H11	4026103004	Screw M12x40	4
48	1651008500	Gear Z 113 smooth shaft - 1000 rpm	1	H12	4026350709	Washer	4
49	4026501006	Cotter 12x8x56	1	H13	4026102704	Screw M6x16	3
50	4023105006	Bearing 21308 CC C3	1	H14	4026351602	Washer	3
51	4023105002	Bearing 22206 CC C3	1	H15	1470105000	Complete joint	1
52	1608503100	Conveyor	1	H16	4026701702	Plug	2
53	1610510800	Flange	1	38	4026701602	Plug G3/8	1
54	1623100000	Cover	1	40	1685100200	Alu washer	1
55	1627505300	Manifold	1	Note: Injection system with pneumatic valve not available Conveyor's extension kit not available			
56	1680611600	Gasket	1	1892003200	Kit of gaskets for DL60-80-100	1	
57	1680700200	Gasket	1				
58	-	Not used					
59	1685002800	Washer 30x8,5x4	1				
60	1691000000	Spring	1				
61	4022100107	Greaser	1				
62	4022200030	Seal 41x27x10	1				
63	1605500100	Handle	1				
64	1610511200	Flange	1				
65	1627505400	Manifold	1				
66	4026308005	Nut M8	8				
67	4027400411	Non-return valve	1				
68	1610511300	Inside flange	1				
69	4029602806	Protection	1				
70	4026101404	Screw M8x12	3				
71	4026356002	Washer M8	3				
72	1624202300	Spacer	1				
73	1624027500	Spring spacer	1				
74	4026135414	Screw M8x45	1				
75	1445004700	Silencer	1				
76	1406601400	Warning element at 12V	1				
	1406601500	Warning element at 24V	1				
A1	1852104700	Intake conveyor ø80	1				
A2	1852104800	Exhaust conveyor ø76	1				
A3	1852104800	Injection conveyor ø76	1				
A4	-	not used					
A5	-	not used					

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Pos.	Code	Description	Q.ty
1	1610511100	Flange	1
2	1610511600	Rear flange	1
3	1610511700	Front flange	1
4	1621505000	Driving lobe	1
5	1621505100	Driven lobe	1
6	1624025800	Bushing	4
7	1624025900	Spacer	4
8	1640101900	Rear cover	1
9	1651009400	Gear	1
10A	1651009500	Gear	1
10B	1611001100	Shaft	1
10C	4026141408	Screw 10.9 M8x22	6
11	1680611800	Gasket	1
12A	1680611400	Gasket	1
12B	1680611500	Gasket	1
13	1680612100	Gasket	1
14	1680611700	Gasket	1
15	1681007500	Bearing plate	4
16	1687506900	Pump housing	1
17A	4022200040	Seal 72x40x10	1
17B	4022200040	Seal 72x40x10	1
18A	4022200311	OR 4975 VITON	2
18B	4022200317	OR 108 VITON	6
19	4022200316	OR 2137 VITON	4
20	4022202804	Seal 80x60x7	4
21A	4023100039	Bearing 6308 C3	1
21B	4023100039	Bearing 6308 C3	1
22	4023110031	Bearing NU308 ECJ C3	2
23	4023250501	Rubber ball	1
24	4026107110	Screw M8x25	3
25	4026120405	Screw M8x25	37
26	4026120406	Screw M8x30	12
27	4026120407	Screw M8x35	9
28A	4026120409	Screw M8x45	6
28B	4026120411	Screw M8x55	8
29	4026155505	Screw M5x16	16
30	4026306307	Washer	1
31	4026306308	Washer	3
32	4026306507	Ring nut M35x1,5	1
33	4026306508	Ring nut M40x1,5	3
34	4026350505	Washer	78
35	4026401806	Pin 10x35	10
36	4026500909	Cotter 10x8x50	1
37	4026501001	Cotter 12x8x32	2
38A	4026701602	Plug G3/8	7
38B	4026910102	Venting plug G3/8	2
39	4028250201	Thermostat	1
40	1685100200	Washer 17x22x1,5	9
41A	1640002500	Front cover for splined shaft	1
41B	1640501000	Front cover for smooth shaft	1
41C	1610512400	External flange	1
41D	1680708800	External flange gasket	1
41E	4026107108	Screw M8x20	3
42	1651008100	Gear Z 32 - 600 rpm	1
43	1651008300	Gear Z 128 - 600 rpm	1
44	4023100017	Bearing 6206 C3	1
45	4023100039	Bearing 6308 C3	1
46	1651008200	Gear Z 47 - 1000 rpm	1
47	1651008400	Gear Z 113 splined shaft - 1000 rpm	1
48	1651008500	Gear Z 113 smooth shaft - 1000 rpm	1
49	4026501006	Cotter 12x8x56	1
50	4023105006	Bearing 21308 CC C3	1
51	4023105002	Bearing 22206 CC C3	1
52	1608503100	Conveyor	1
53	1610510800	Flange	1
54	1623100000	Cover	1
55	1627505300	Manifold	1
56	1680611600	Gasket	1
57	1680700200	Gasket	1
58	-	not used	
59	1685002800	Washer 30x8,5x4	1
60	1691000000	Spring	1
61	4022100107	Greaser	1
62	4022200030	Seal 41x27x10	1
63	1605500100	Handle	1
64	1610511200	Flange	1
65	1627505400	Manifold	1
66	4026308005	Nut M8	8
67	4027400411	Non-return valve	1
68	1610511300	Inside flange	1
69	4029602806	Protection	1
70	4026101404	Screw M8x12	3
71	4026356002	Washer M8	3
72	1624202300	Spacer	1
73	1624027500	Spring spacer	1
74	4026135414	Screw M8x45	1
75	1445004700	Silencer	1
76	1406601400	Warning element at 12V	1
	1406601500	Warning element at 24V	1
A1	1852104700	Intake conveyor ø80	1
A2	1852104800	Exhaust conveyor ø76	1
A3	1852104800	Injection conveyor ø76	1
A4	-	not used	
A5	-	not used	

Pos.	Code	Description	Q.ty
COD. 1852104700 CONVEYOR Ø80 KIT COMPONENTS			
	1627100300	Conveyor Ø80 mm	1
	4022200307	OR 6287 VITON	1
	4026103003	Screw M12x35	2
	4026350609	Washer	2
COD. 1852104800 CONVEYOR Ø76 KIT COMPONENTS			
	1627100500	Conveyor Ø76 mm	1
	4022200307	OR 6287 VITON	1
	4026103003	Screw M12x35	2
	4026350609	Washer	2
	1610100000	Flange	1
CONVEYOR'S THREADED FLANGE			
C1	1627505600	Flanged threaded conveyor	1
26	4026120406	Screw M8x30	12
34	4026350505	Washer	12
C3	4028250203	Thermostat	1
C4	1610512000	Flange	1
11	1680611800	Gasket	1
25	4026120405	Screw M8x25	8
34	4026350505	Washer	8
MANIFOLD'S FLANGE FOR CONVEYOR CONNECTION			
C2	1627505500	Flanged conveyor	1
26	4026120406	Screw M8x30	12
34	4026350505	Washer	12
C3	4028250203	Thermostat	1
C4	1610512000	Flange	1
11	1680611800	Gasket	1
25	4026120405	Screw M8x25	8
34	4026350505	Washer	8
PNEUMATICALLY OPERATED 4-WAY VALVE			
D1	1613101800	Supporting piece	1
D2	1676000500	Connecting piece	1
D3	1680700200	Gasket	1
D4	4022200030	Seal 41x27x10	1
D5	4026308003	Nut M6	4
D6	4026351504	Washer	4
D7	4027100410	Actuator	1
D8	1608503200	Conveying piece	1
D9	1624027200	Spacer	1
D10	1624202400	Bronze spacer	1
D11	1672001800	Stud screw	1
25	4026120405	Screw M8x25	4
34	4026350505	Washer	4
60	1691000000	Spring	1
61	4022100107	Greaser	1
66	4026308005	Nut M8	3
73	1624027500	Spring's spacer	1
HYDRAULIC DRIVE			
H1	1640002700	Front cover	1
H2	1576001000	Joint (motor side)	1
H3	1655002600	Joint (lobe side)	1
H4	1647000200	Disc	1
H5	4028321601	Rpm sensor	1
H6	4024107022	Hydraulic motor	1
H7	4026711001	Flange G3/4	1
H8	4026711002	Flange G1	1
H9	1680612000	Gasket	1
H10	4026136005	Screw M8x12	2
H11	4026103004	Screw M12x40	4
H12	4026350709	Washer	4
H13	4026102704	Screw M6x16	3
H14	4026351602	Washer	3
H15	1470105000	Complete joint	1
H16	4026701702	Plug	2
38	4026701602	Plug G3/8	1
40	1685100200	Alu washer	1
Note: Injection system with pneumatic valve not available Conveyor's extension kit not available			
	1892003200	Kit of gaskets for DL60-80-100	1

Parts list DL 100

Pos.	Code	Description	Q.ty
1	1610511100	Flange	1
2	1610511600	Rear flange	1
3	1610511700	Front flange	1
4	1621505200	Driving lobe	1
5	1621505300	Driven lobe	1
6	1624025800	Bushing	4
7	1624025900	Spacer	4
8	1640101900	Rear cover	1
9	1651009400	Gear	1
10A	1651009500	Gear	1
10B	1611001100	Shaft	1
10C	4026141408	Screw 10.9 M8x22	6
11	1680611800	Gasket	1
12A	1680611400	Gasket	1
12B	1680611500	Gasket	1
13	1680612100	Gasket	1
14	1680611700	Gasket	1
15	1681007500	Bearing plate	4
16	1687507000	Pump housing	1
17A	4022200040	Seal 72x40x10	1
17B	4022200040	Seal 72x40x10	1
18A	4022200311	OR 4975 VITON	2
18B	4022200317	OR 108 VITON	6
19	4022200316	OR 2137 VITON	4
20	4022202804	Seal 80x60x7	4
21A	4023100039	Bearing 6308 C3	1
21B	4023100039	Bearing 6308 C3	1
22	4023110031	Bearing NU308 ECJ C3	2
23	4023250501	Rubber ball	1
24	4026107110	Screw M8x25	3
25	4026120405	Screw M8x25	37
26	4026120406	Screw M8x30	12
27	4026120407	Screw M8x35	9
28A	4026120409	Screw M8x45	6
28B	4026120411	Screw M8x55	8
29	4026155505	Screw M5x16	16
30	4026306307	Washer	1
31	4026306308	Washer	3
32	4026306507	Ring nut M35x1,5	1
33	4026306508	Ring nut M40x1,5	3
34	4026350505	Washer	78
35	4026401806	Pin 10x35	10
36	4026500909	Cotter 10x8x50	1
37	4026501001	Cotter 12x8x32	2
38A	4026701602	Plug G3/8	7
38B	4026910102	Venting plug G3/8	1
39	4028250201	Thermostat	2
40	1685100200	Washer 17x22x1,5	9
41A	1640002500	Front cover for splined shaft	1
41B	1640501000	Front cover for smooth shaft	1
41C	1610512400	External flange	1
41D	1680708800	External flange gasket	1
41E	4026107108	Screw M8x20	3
42	1651008100	Gear Z 32 - 600 rpm	1
43	1651008300	Gear Z 128 - 600 rpm	1
44	4023100017	Bearing 6206 C3	1
45	4023100039	Bearing 6308 C3	1
46	1651008200	Gear Z 47 - 1000 rpm	1
47	1651008400	Gear Z 113 splined shaft - 1000 rpm	1
48	1651008500	Gear Z 113 smooth shaft - 1000 rpm	1
49	4026501006	Cotter 12x8x56	1
50	4023105006	Bearing 21308 CC C3	1
51	4023105002	Bearing 22206 CC C3	1
52	1608503100	Conveyor	1
53	1610510800	Flange	1
54	1623100000	Cover	1
55	1627505300	Manifold	1
56	1680611600	Gasket	1
57	1680700200	Gasket	1
58	-	not used	
59	1685002800	Washer 30x8,5x4	1
60	1691000000	Spring	1
61	4022100107	Greaser	1
62	4022200030	Seal 41x27x10	1
63	1605500100	Handle	1
64	1610511200	Flange	1
65	1627505400	Manifold	1
66	4026308005	Nut M8	8
67	4027400411	Non-return valve	1
68	1610511300	Inside flange	1
69	4029602806	Protection	1
70	4026101404	Screw M8x12	3
71	4026356002	Washer M8	3
72	1624202300	Spacer	1
73	1624027500	Spring spacer	1
74	4026135414	Screw M8x45	1
75	1445004700	Silencer	1
76	1406601400	Warning element at 12V	1
	1406601500	Warning element at 24V	1
A1	1852104700	Intake conveyor ø80	1
A2	1852104800	Exhaust conveyor ø76	1
A3	1852104800	Injection conveyour ø76	1
A4	-	not used	
A5	-	not used	

Pos.	Code	Description	Q.ty
COD. 1852104700 CONVEYOR Ø80 KIT COMPONENTS			
	1627100300	Conveyor Ø80 mm	1
	4022200307	OR 6287 VITON	1
	4026103003	Screw M12x35	2
	4026350609	Washer	2
COD. 1852104800 CONVEYOR Ø76 KIT COMPONENTS			
	1627100500	Conveyor Ø76 mm	1
	4022200307	OR 6287 VITON	1
	4026103003	Screw M12x35	2
	4026350609	Washer	2
	1610100000	Flange	1
CONVEYOR'S THREADED FLANGE			
C1	1627505600	Flanged threaded conveyor	1
26	4026120406	Screw M8x30	12
34	4026350505	Washer	12
C3	4028250203	Thermostat	1
C4	1610512000	Flange	1
11	1680611800	Gasket	1
25	4026120405	Screw M8x25	8
34	4026350505	Washer	8
MANIFOLD'S FLANGE FOR CONVEYOR CONNECTION			
C2	1627505500	Flanged conveyor	1
26	4026120406	Screw M8x30	12
34	4026350505	Washer	12
C3	4028250203	Thermostat	1
C4	1610512000	Flange	1
11	1680611800	Gasket	1
25	4026120405	Screw M8x25	8
34	4026350505	Washer	8
PNEUMATICALLY OPERATED 4-WAY VALVE			
D1	1613101800	Supporting piece	1
D2	1676000500	Connecting piece	1
D3	1680700200	Gasket	1
D4	4022200030	Seal 41x27x10	1
D5	4026308003	Nut M6	4
D6	4026351504	Washer	4
D7	4027100410	Actuator	1
D8	1608503200	Conveying piece	1
D9	1624027200	Spacer	1
D10	1624202400	Bronze spacer	1
D11	1672001800	Stud screw	1
25	4026120405	Screw M8x25	4
34	4026350505	Washer	4
60	1691000000	Spring	1
61	4022100107	Greaser	1
66	4026300805	Nut M8	3
73	1624027500	Spring's spacer	1
HYDRAULIC DRIVE			
H1	1640002700	Front cover	1
H2	1576001000	Joint (motor side)	1
H3	1655002600	Joint (lobe side)	1
H4	1647000200	Disc	1
H5	4028321601	Rpm sensor	1
H6	4024107023	Hydraulic motor	1
H7	4026711002	Flange G1	1
H8	4026711003	Flange G1 1/4	1
H9	1680612000	Gasket	1
H10	4026136005	Screw M8x12	2
H11	4026103004	Screw M12x40	4
H12	4026350709	Washer	4
H13	4026102704	Screw M6x16	3
H14	4026351602	Washer	3
H15	1470105000	Complete joint	1
H16	4026701702	Plug	2
38	4026701602	Plug 3/8	1
40	1685100200	Alu washer	1
Note: Injection system with pneumatic valve not available Conveyor's extension kit not available			
	1892003200	Kit of gaskets for DL60-80-100	1

Part list DL 120

Pos.	Code	Description	Q.ty	Pos.	Codice	Descrizione	Q.tà
1	1610509500	Flange	1	A4	1852104100	Kit for safety valve	1
2	1610509600	Rear flange	1	A5	1852104200	Kit for conveyors	1
3	1610509700	Front flange	1		1852104000	Ø100 CONVEYOR KIT	
4	1621504200	Driving lobe	1		1610101100	Flange	1
5	1621504300	Driven lobe	1		1627102400	Conveyor Ø100	1
6	1624020100	Bushing	4		4022200310	OR 6362 VITON	1
7	1624021100	Spacer	4		4026102808	Screw TE 8.8 M8X30 zinc.	4
8	1640101800	Rear cover	1		4026350706	Washer Grower M8	4
9	1651009000	Gear	1		1852104100	SAFETY VALVE Ø100 MOUNTING KIT	
10A	1651009100	Gear	1		1627102500	Fitting piece	1
10B	1611001000	Shaft	1		4022200310	OR 6362 VITON	1
10C	4026141508	Screw TE 10.9 M10X3	6		4026102810	Screw TE 8.8 M8X40 zinc.	4
11	1680610100	Gasket	1		4026350706	Washer Grower M8	8
12A	1680610200	Gasket	1		4026308005	Nut M8	4
12B	1680610200	Gasket	1		1852104200	CONVEYOR Ø100 EXTENSION KIT	
13	1680610300	Gasket	1		1627102600	Extension	1
14	1680610400	Gasket	1		4022200310	OR 6362 VITON	1
15	1681007300	Bearing plate	4		4026102810	Screw TE 8.8 M8X40 zinc.	4
16	1687506500	Pump housing DL120	1		4026350706	Washer Grower M8	8
	16875AVIB0	Pump housing DL120 C	1		4026308005	Nut M8	4
17A	4022200036	Seal 62X45X10	1				
17B	4022200044	Seal 65X45X8	1				
18A	4022200312	OR 41150 VITON	2	C1	1627504900	Flanged threaded conveyor	1
18B	4022200317	OR 108 VITON	6	C3	4028250206	Thermostat	1
19	4022200313	OR 2162 VITON	4	C4	1610511800	Flange	1
20	4022202805	Seal 85X65X10	4	11	1680610100	Gasket	1
21A	4023100047	Bearing 6309/C3	1	25	4026121407	Screw TCEI 8.8 M8X25 zinc.	8
21B	4023100047	Bearing 6309/C3	1	26	4026120406	Screw TCEI 8.8 M8X30	12
22	4023110051	Bearing NU 309 ECJ/C3	2	34	4026350505	Washer Grower M8	20
23	4023250502	Rubber ball Ø90	1				
24	4026102807	Screw TE 8.8 M8X25 zinc.	3				
25	4026121407	Screw TCEI 8.8 M8X25 zinc.	37	C2	1627504800	Flanged conveyor	1
26	4026120406	Screw TCEI 8.8 M8X30	12	C3	4028250206	Thermostat	1
27	4026121408	Screw TCEI 8.8 M8X35 zinc.	9	C4	1610511800	Flange	1
28A	4026121418	Screw TCEI 8.8 M8X55 zinc.	6	11	1680610100	Gasket	1
28B	4026121418	Screw TCEI 8.8 M8X55 zinc.	8	25	4026121407	Screw TCEI 8.8 M8X25 zinc.	8
29	4026155505	Screw E TSPEI M5X16 zinc.	16	26	4026120406	Screw TCEI 8.8 M8X30	12
30	4026306307	Washer M35x1,5	1	34	4026350505	Washer Grower M8	20
31	4026306309	Washer M45x1,5	3				
32	4026306507	Ring nut M35x1,5	1				
33	4026306509	Ring nut M45x1,5	3	D1	1613101600	Supporting piece	1
34	4026350505	Washer Grower M8	78	D2	1676000500	Connecting piece	1
35	4026401806	Pin 10x36	10	D3	1680707800	Gasket	1
36	4026500908	Cotter 10X8X45	1	D4	4022200030	Seal 41X27X10	1
37	4026501601	Cotter 14X9X40	2	D5	4026308003	Nut M6	4
38A	4026701602	Plug G3/8 zinc.	7	D6	4026351504	Washer M6	4
38B	4026910102	Plug G3/8	2	D7	4027100410	Actuator	1
39	4028250201	Thermostat	2	D8	1608502900	Conveying piece	1
40	1685100200	Washer 17x22x1,5	9	D9	1624027200	Spacer	1
41A	1640001600	Front cover for splined shaft	1	D10	1624202400	Bronze spacer	1
41B	1640500900	Front cover for smooth shaft	1	D11	1672001800	Stud screw	1
41C	1610512300	External flange	1	25	4026121407	Screw TCEI 8.8 M8X25 zinc.	4
41D	1680708700	External flange gasket	1	34	4026350505	Washer Grower M8	4
41E	4026120402	Screw TCEI 8.8 M8X18	3	60	1691000000	Spring	1
42	1651005800	Gear Z27 – 600 rpm	1	61	4022100107	Greaser 45° M10X1	1
43	1651006000	Gear Z 103 – 600 rpm	1	66	4026308005	Nut M8	3
44	4023100031	Bearing 6208/C3	1	73	1624027500	Spring's spacer	1
45	4023100047	Bearing 6309/C3	1				
46	1651005900	Gear Z40 – 1000 rpm	1				
47	1651006100	Gear Z 90 splined shaft – 1000 rpm	1	P1	1610510300	Manifold flange	1
48	1651009300	Gear Z 90 smooth shaft – 1000 rpm	1	P2	1610510400	Conveyor flange	1
49	4026501603	Cotter 14X9X50	1	P3	4026103218	Screw M16X80 zinc.	8
50	4023105004	Bearing 21307 CC/C3	1	P4	4026350611	Washer Grower M16	8
51	4023105008	Bearing 21309 EC/C3	1	P5	4027402703	Pneumatic non-return valve	1
52	1608502500	Conveyor	1	25	4026121407	Screw TCEI 8.8 M8X25 zinc.	8
53	1610509800	Flange	1	34	4026350505	Washer Grower M8	8
54	1623100700	Cover	1				
55	1627504600	Manifold	1				
56	1680610500	Gasket	1	H1	1640002600	Front cover	1
57	1680707800	Gasket	1	H2	1576000800	Joint (motor side)	1
58	1681006800	Disc	1	H3	1655002200	Joint (lobe side)	1
59	1685002800	Washer 30X8,5X4	1	H4	1647000200	Disc	1
60	1691000000	Spring	1	H5	4028321601	RPM sensor	1
61	4022100107	Greaser 45° M10X1	1	H6	4024107026	Hydraulic motor	1
62	4022200030	Seal 41X27X10	1	H7	4026711003	Flange G1 1/4	1
63	1605500100	Handle	1	H8	4026711004	Flange G1 1/2	1
64	1610510200	Flange	1	H9	1680611900	Gasket	1
65	1627505000	Manifold	1	H10	4026136005	Screw senza testa M8X12	2
66	4026308005	Nut M8	8	H11	4026103004	Screw TE M12X40	4
67	4027400412	Non-return valve	1	H12	4026350709	Washer Grower M12	4
68	1610511400	Inside flange	1	H13	4026102704	Screw TE M6X16	3
69	16426CR1B0	Protection	1	H14	4026351602	Washer	3
70	4026101404	Screw TE 4.8 M8X12 zinc.	3	H15	1470105100	Complete joint	1
71	4026356002	Washer M8	3	H16	4026701702	Plug G3/8	2
72	1624202300	Spacer	1	38	4026701602	Plug G3/8 zinc.	1
73	1624027500	Spring spacer	1	40	1685100200	Alu washer 17x22x1,5	1
74	4026135414	Screw M8X45	1				
75	1445004010	Silencer	1				
76	1406601400	Waring element at 12V	1	(*)	16100CUGB0	CONVEYOR'S THREADED FLANGE DL 120 C	2
	1406601500	Waring element at 24V	1		16807CUPB0	Flange	2
					4026103210	Gasket	8
A1	1852104000	Intake conveyor Ø100	1		4026350711	Screw TE 8.8 M16X4 zinc.	2
A2	1852104000	Exhaust conveyor Ø100	1			Washer Grower 16	8
A3	1852104000	Injection conveyour Ø100	1		1892003300	Kit of gaskets DL120-140	1

Parts list DL 140

Pos.	Code	Description	Q.ty
1	1610509500	Flange	1
2	1610509600	Rear flange	1
3	1610509700	Front flange	1
4	1621503800	Driving lobe	1
5	1621503900	Driven lobe	1
6	1624020100	Bushing	4
7	1624021100	Spacer	4
8	1640101800	Rear cover	1
9	1651009000	Gear	1
10A	1651009100	Gear	1
10B	1611001000	Shaft	1
10C	4026141508	Screw 10.9 M10x30	6
11	1680610100	Gasket	1
12A	1680610200	Gasket	1
12B	1680610200	Gasket	1
13	1680610300	Gasket	1
14	1680610400	Gasket	1
15	1681007300	Bearing plate	4
16	1687506300	Pump housing	1
17A	4022200036	Seal 62x45x10	1
17B	4022200044	Seal 65x45x8	1
18A	4022200312	OR 41150 VITON	2
18B	4022200317	OR 108 VITON	6
19	4022200313	OR 2162 VITON	4
20	4022202805	Seal 85x65x10	4
21A	4023100047	Bearing 6309 C3	1
21B	4023100047	Bearing 6309 C3	1
22	4023110051	Bearing NU309 ECJ C3	2
23	4023250502	Rubber ball	1
24	4026107110	Screw M8x25	3
25	4026120405	Screw M8x25	37
26	4026120406	Screw M8x30	12
27	4026120407	Screw M8x35	9
28A	4026120411	Screw M8x55	6
28B	4026120411	Screw M8x55	8
29	4026155505	Screw M5x16	16
30	4026306307	Washer	1
31	4026306309	Washer	3
32	4026306507	Ring nut M35x1,5	1
33	4026306509	Ring nut M45x1,5	3
34	4026350505	Washer	78
35	4026401806	Pin 10x35	10
36	4026500908	Cotter 10x8x45	1
37	4026501601	Cotter 14x9x40	2
38A	4026701602	Plug G3/8	7
38B	4026910102	Venting plug G3/8	2
39	4028250201	Thermostat	1
40	1685100200	Washer 17x22x1,5	9
41A	1640001600	Front cover for splined shaft	1
41B	1640500900	Front cover for smooth shaft	1
41C	1610512300	External flange	1
41D	1680708700	External flange gasket	1
41E	4026120402	Screw M8x18	3
42	1651005800	Gear Z 27 - 600 rpm	1
43	1651006000	Gear Z 103 - 600 rpm	1
44	4023100031	Bearing 6208 C3	1
45	4023100047	Bearing 6309 C3	1
46	1651005900	Gear Z 40 - 1000 rpm	1
47	1651006100	Gear Z 90 splined shaft - 1000 rpm	1
48	1651009300	Gear Z 90 smooth shaft - 1000 rpm	1
49	4026501603	Cotter 14x9x50	1
50	4023105004	Bearing 21307 CC C3	1
51	4023105008	Bearing 21309E C3	1
52	1608502500	Conveyor	1
53	1610509800	Flange	1
54	1623100700	Cover	1
55	1627504600	Manifold	1
56	1680610500	Gasket	1
57	1680707800	Gasket	1
58	1681006800	Plate	1
59	1685002800	Washer 30x8,5x4	1
60	1691000000	Spring	1
61	4022100107	Greaser	1
62	4022200030	Seal 41x27x10	1
63	1605500100	Handle	1
64	1610510200	Flange	1
65	1627505000	Manifold	1
66	4026308005	Nut M8	8
67	4027400412	Non-return valve	1
68	1610511400	Inside flange	1
69	4029602807	Protection	1
70	4026101404	Screw M8x12	3
71	4026356002	Washer M8	3
72	1624202300	Spacer	1
73	1624027500	Spring spacer	1
74	4026135414	Screw M8x45	1
75	1445004010	Silencer	1
76	1406601400	Warning element at 12V	1
	1406601500	Warning element at 24V	1
A1	1852104000	Intake conveyor	1
A2	1852104000	Exhaust conveyor	1
A3	1852104000	Injection conveyor	1
A4	1852104100	Kit for safety valve	1
A5	1852104200	Kit for conveyors	1

Pos.	Code	Description	Q.ty
COD. 1852104000 Ø100 CONVEYOR KIT			
	1610101100	Flange	1
	1627102400	Conveyor Ø100 mm	1
	40222000310	OR 6362 VITON	1
	4026102808	Washer	4
	4026350706	Rondella Grower M 8	4
COD. 1852104100 SAFETY VALVE Ø100 MOUNTING KIT			
	1627102500	Fitting piece	1
	40222000310	OR 6362 VITON	1
	4026102810	Screw M8x40	4
	4026350706	Washer	8
	4026308005	Nut M8	4
COD. 1852104200 CONVEYOR Ø100 EXTENSION KIT			
	1627102600	Extension	1
	40222000310	OR 6362 VITON	1
	4026102810	Screw M8x40	4
	4026350706	Washer	8
	4026308005	Nut M8	4
CONVEYOR'S THREADED FLANGE			
C1	1627504900	Flanged threaded conveyor	1
C3	4028250206	Thermostat	1
C4	1610511800	Flange	1
11	1680610100	Gasket	1
25	4026120405	Screw M8x25	8
26	4026120406	Screw M8x30	12
34	4026350505	Washer	20
MANIFOLD'S FLANGE FOR CONVEYORS CONNECTION			
C2	1627504800	Flanged conveyor	1
C3	4028250206	Thermostat	1
C4	1610511800	Flange	1
11	1680610100	Gasket	1
25	4026120405	Screw M8x25	8
26	4026120406	Screw M8x30	12
34	4026350505	Washer	20
PNEUMATICALLY OPERATED 4-WAY VALVE			
D1	1613101600	Supporting piece	1
D2	1676000500	Connecting piece	1
D3	1680707800	Gasket	1
D4	4022200030	Seal 41x27x10	1
D5	4026308003	Nut M6	4
D6	4026351504	Washer	4
D7	4027100410	Actuator	1
D8	1608502900	Conveying piece	1
D9	1624027200	Spacer	1
D10	1624020240	Bronze spacer	1
D11	1672001800	Stud screw	1
25	4026120405	Screw M8x25	4
34	4026350505	Washer	4
60	1691000000	Spring	1
61	4022100107	Greaser	1
66	4026300805	Nut M8	3
73	1624027500	Spring's spacer	1
INJECTION WITH PNEUMATIC VALVE			
P1	1610510300	Manifold flange	1
P2	1610510400	Conveyor flange	1
P3	4026103218	Screw M16x80 gal.	8
P4	4026350611	Washer	8
P5	4027402703	Pneumatic non-return valve	1
25	4026120405	Screw M8x25	8
34	4026350505	Washer	8
HYDRAULIC DRIVE			
H1	1640002400	Front cover	1
H2	1576000900	Joint (motor side)	1
H3	1655002200	Joint (lobe side)	1
H4	1647000200	Disc	1
H5	4028321601	Rpm sensor	1
H6	4024107801	Hydraulic motor	1
H7	4026711252	Flange G3/4	1
H8	4026711252	Flange G3/4	1
H9	1680611900	Gasket	1
H10	4026136005	Screw M8x12	2
H11	4026103004	Screw M12x40	4
H12	4026350709	Washer	4
H13	4026102704	Screw M6x16	3
H14	4026351602	Washer	3
H15	1470105200	Complete joint	1
H16	4026701702	Plug G3/8	2
38	4026701602	Plug G3/8	1
40	1685100200	Alu washer	1
	1892003300	Kit of gaskets DL120-140	1

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Pos.	Code	Description	Q.ty	Pos.	Code	Description	Q.ty
1	1610509500	Flange	1	COD. 1852104300 Ø120 CONVEYOR KIT			
2	1610509600	Rear flange	1	1610101200	Flange	1	
3	1610509700	Front flange	1	1627102900	Conveyor Ø120 mm	1	
4	1621504000	Driving lobe	1	4022200314	OR 193 VITON	1	
5	1621504100	Driven lobe	1	4026102808	Screw M8x30	4	
6	1624020100	Bushing	4	4026350706	Washer	4	
7	1624021100	Spacer	4	COD. 1852104400 SAFETY VALVE Ø120 MOUNTING KIT			
8	1640101800	Rear cover	1	1627103000	Fitting piece	1	
9	1651009000	Gear	1	4022200314	OR 193 VITON	1	
10A	1651009100	Gear	1	4026102810	Screw M8x40	4	
10B	1611001000	Shaft	1	4026350706	Washer	8	
10C	4026141508	Screw 10.9 M10x30	6	4026308005	Nut M8	4	
11	1680612300	Gasket	1	COD. 1852104500 CONVEYOR Ø120 EXTENSION KIT			
12A	1680611200	Gasket	1	1627103100	Extension	1	
12B	1680611300	Gasket	1	4022200314	OR 193 VITON	1	
13	1680610300	Gasket	1	4026102810	Screw M8x40	4	
14	1680610400	Gasket	1	4026350706	Washer	8	
15	1681007300	Bearing plate	4	4026308005	Nut M8	4	
16	1687506400	Pump housing	1	CONVEYOR'S THREADED FLANGE			
17A	4022200036	Seal 62x45x10	1	C1	1627505900	Flanged threaded conveyor	1
17B	-	-	-	C4	1610511900	Flange	1
18A	4022200312	OR 41150 VITON	2	11	1680612300	Gasket	1
18B	4022200317	OR 108 VITON	6	25	4026120405	Screw M8x25	8
19	4022200313	OR 2162 VITON	4	26	4026120406	Screw M8x30	12
20	4022202805	Seal 85x65x10	4	34	4026350505	Washer	20
21A	4023100047	Bearing 6309 C3	1	MANIFOLD'S FLANGE FOR CONVEYORS CONNECTION			
21B	4023116051	Bearing NUP309ECJ C3	1	C2	1627505800	Flanged conveyor	1
22	4023110051	Bearing NU309ECJ C3	2	C4	1610511900	Flange	1
23	4023255053	Rubber ball	1	11	1680612300	Gasket	1
24	4026107110	Screw M8x25	3	25	4026120405	Screw M8x25	8
25	4026120405	Screw M8x25	37	26	4026120406	Screw M8x30	12
26	4026120406	Screw M8x30	12	34	4026350505	Washer	20
27	4026120407	Screw M8x35	9	PNEUMATICALLY OPERATED 4-WAY VALVE			
28A	4026120411	Screw M8x55	6	D1	1613101700	Supporting piece	1
28B	4026120411	Screw M8x55	8	D2	1676000500	Connecting piece	1
29	4026155505	Screw M5x16	16	D3	1680612200	Gasket	1
30	4026306307	Washer	1	D4	4022200030	Seal 41x27x10	1
31	4026306309	Washer	3	D5	4026308003	Nut M6	4
32	4026306507	Ring nut M35x1,5	1	D6	4026351504	Washer	4
33	4026306509	Ring nut M45x1,5	3	D7	4027100410	Actuator	1
34	4026350505	Washer	75	D8	1608503000	Conveying piece	1
35	4026401806	Pin 10x35	10	D9	1624027200	Spacer	1
36	4026500908	Cotter 10x8x45	1	D10	1624202400	Bronze spacer	1
37	4026501601	Cotter 14x9x40	2	D11	1672001800	Stud screw	1
38A	4026701602	Plug G3/8	7	25	4026120405	Screw M8x25	4
38B	4026910102	Venting plug G3/8	2	34	4026350505	Washer	4
39	4028250201	Thermostat	1	60	1691000000	Spring	1
40	1685100200	Washer 17x22x1,5	9	61	4022100107	Greaser	1
41A	1640001600	Front cover for splined shaft	1	66	4026300805	Nut M8	3
41B	-	-	-	73	1624027500	Spring's spacer	1
41C	-	-	-	INJECTION WITH PNEUMATIC VALVE			
41D	-	-	-	P1	1610510600	Manifold flange	1
41E	-	-	-	P2	1610511500	Conveyor flange	1
42	1651007400	Gear Z 27 - 600 rpm	1	P3	4026103218	Screw M16x80 galv.	8
43	1651007300	Gear Z 103 - 600 rpm	1	P4	4026350611	Washer	8
44	4023100031	Bearing 6208 C3	1	P5	4027402704	Pneumatic non-return valve	1
45	4023100047	Bearing 6309 C3	1	25	4026120405	Screw M8x25	8
46	-	Not used	-	34	4026350505	Washer	8
47	-	Not used	-	Note :			
48	-	Not used	-	Hydraulic drive not available			
49	-	Not used	-	1892003400	Kit of gaskets DL170-200	1	
50	-	Not used	-				
51	-	Not used	-				
52	1608502600	Conveyor	1				
53	1610510700	Flange	1				
54	1623100600	Cover	1				
55	1627505100	Manifold	1				
56	1680611100	Gasket	1				
57	1680612200	Gasket	1				
58	1681007600	Plate	1				
59	1685002800	Washer 30x8,5x4	1				
60	1691000000	Spring	1				
61	4022100107	Greaser	1				
62	4022200030	Seal 41x27x10	1				
63	1605500100	Handle	1				
64	1610510500	Flange	1				
65	1627505200	Manifold	1				
66	4026308005	Nut M8	8				
67	4027400413	Non-return valve	1				
68	-	Not used	-				
69	4029602807	Protection	1				
70	4026101404	Screw M8x12	3				
71	4026356002	Washer M8	3				
72	1624020300	Spacer	1				
73	1624027500	Spring spacer	1				
74	4026135414	Screw M8x45	1				
75	1445004310	Silencer	1				
76	1406601400	Warning element at 12V	1				
	1406601500	Warning element at 24V	1				
A1	1852104300	Intake conveyor	1				
A2	1852104300	Exhaust conveyor	1				
A3	1852104300	Injection conveyour	1				
A4	1852104400	Kit for safety valve	1				
A5	1852104500	Kit for conveyors	1				

Parts list serie DL 200

Pos.	Code	Description	Q.ty	Pos.	Code	Description	Q.ty
1	1610509500	Flange	1	COD. 1852104300 Ø120 CONVEYOR KIT			
2	1610509600	Rear flange	1	1610101200	Flange	1	
3	1610509700	Front flange	1	1627102900	Conveyor Ø120 mm	1	
4	1621504000	Driving lobe	1	4022200314	OR 193 VITON	1	
5	1621504100	Driven lobe	1	4026102808	Screw M8x30	4	
6	1624020100	Bushing	4	4026350706	Washer	4	
7	1624021100	Spacer	4	COD. 1852104400 SAFETY VALVE Ø120 MOUNTING KIT			
8	1640101800	Rear cover	1	1627103000	Fitting piece	1	
9	1651009000	Gear	1	4022200314	OR 193 VITON	1	
10A	1651009100	Gear	1	4026102810	Screw M8x40	4	
10B	1611001000	Shaft	1	4026350706	Washer	8	
10C	4026141508	Screw 10.9 M10x30	6	4026308005	Nut M8	4	
11	1680612300	Gasket	1	COD. 1852104500 CONVEYOR Ø120 EXTENSION KIT			
12A	1680611200	Gasket	1	1627103100	Extension	1	
12B	1680611300	Gasket	1	4022200314	OR 193 VITON	1	
13	1680610300	Gasket	1	4026102810	Screw M8x40	4	
14	1680610400	Gasket	1	4026350706	Washer	8	
15	1681007300	Bearing plate	4	4026308005	Nut M8	4	
16	1687506400	Pump housing	1	CONVEYOR'S THREADED FLANGE			
17A	4022200036	Seal 62x45x10	1	C1	1627505900	Flanged threaded conveyor	1
17B	4022200044	Seal 65x45x8	1	C4	1610511900	Flange	1
18A	4022200312	OR 41150 VITON	2	11	1680612300	Gasket	1
18B	4022200317	OR 108 VITON	6	25	4026120405	Screw M8x25	8
19	4022200313	OR 2162 VITON	4	26	4026120406	Screw M8x30	12
20	4022202805	Seal 85x65x10	4	34	4026350505	Washer	20
21A	4023100047	Bearing 6309 C3	1	MANIFOLD'S FLANGE FOR CONVEYORS CONNECTION			
21B	4023116051	Bearing NUP309ECJ C3	1	C2	1627505800	Flanged conveyor	1
22	4023110051	Bearing NU309ECJ C3	2	C4	1610511900	Flange	1
23	4023250503	Rubber ball	1	11	1680612300	Gasket	1
24	4026107110	Screw M8x25	3	25	4026120405	Screw M8x25	8
25	4026120405	Screw M8x25	37	26	4026120406	Screw M8x30	12
26	4026120406	Screw M8x30	12	34	4026350505	Washer	20
27	4026120407	Screw M8x35	9	PNEUMATICALLY OPERATED 4-WAY VALVE			
28A	4026120411	Screw M8x55	6	D1	1613101700	Supporting piece	1
28B	4026120411	Screw M8x55	8	D2	1676000500	Connecting piece	1
29	4026155505	Screw M5x16	16	D3	1680612200	Gasket	1
30	4026306307	Washer	1	D4	4022200030	Seal 41x27x10	1
31	4026306309	Washer	3	D5	4026308003	Nut M6	4
32	4026306507	Ring nut M35x1,5	1	D6	4026351504	Washer	4
33	4026306509	Ring nut M45x1,5	3	D7	4027100410	Actuator	1
34	4026350505	Washer	78	D8	1608503000	Conveying piece	1
35	4026401806	Pin 10x35	10	D9	1624027200	Spacer	1
36	4026500908	Cotter 10x8x45	2	D10	1624202400	Bronze spacer	1
37	4026501601	Cotter 14x9x40	1	D11	1672001800	Stud screw	1
38A	4026701602	Plug G3/8	7	25	4026120405	Screw M8x25	4
38B	4026910102	Venting plug G3/8	2	34	4026350505	Washer	4
39	4028250201	Thermostat	1	60	1691000000	Spring	1
40	1685100200	Washer 17x22x1,5	9	61	4022100107	Greaser	1
41A	1640001600	Front cover for splined shaft	1	66	4026300805	Nut M8	3
41B	1640500900	Front cover for smooth shaft	1	73	1624027500	Spring's spacer	1
41C	1610512300	Front cover flange	1	INJECTION WITH PNEUMATIC VALVE			
41D	1680708700	Front cover flange gasket	1	P1	1610510600	Manifold flange	1
41E	4026120402	Screw M8x18	3	P2	1610511500	Conveyor flange	1
42	-	Not used		P3	4026103218	Screw M16x80 galv.	8
43	-	Not used		P4	4026350611	Washer	8
44	4023100031	Bearing 6208 C3	1	P5	4027402704	Pneumatic non-return valve	1
45	4023100047	Bearing 6308 C3	1	25	4026120405	Screw M8x25	8
46	1651007700	Gear Z 36 - 1000 rpm	1	34	4026350505	Washer	8
47	1651007800	Gear Z 94 splined shaft - 1000 rpm	1	HYDRAULIC DRIVE			
48	1651009200	Gear Z 94 smooth shaft - 1000 rpm	1	H1	1640002400	Front cover	1
49	4026501607	Cotter 14x9x80	1	H2	1576000900	Joint (motor side)	1
50	4023105004	Bearing 21307CC C3	1	H3	1655002200	Joint (lobe side)	1
51	4023105008	Bearing 21309E C3	1	H4	1647000200	Disc	1
52	1608502600	Conveyor	1	H5	4028321601	Rpm sensor	1
53	1610510700	Flange	1	H6	4024107801	Hydraulic motor	1
54	1623100600	Cover	1	H7	4026711252	Flange G3/4	1
55	1627505100	Manifold	1	H8	4026711252	Flange G3/4	1
56	1680611100	Gasket	1	H9	1680611900	Gasket	1
57	1680612200	Gasket	1	H10	4026136005	Screw M8x12	2
58	1681007600	Plate	1	H11	4026103004	Screw M12x40	4
59	1685002800	Washer 30x8,5x4	1	H12	4026350709	Washer	4
60	1691000000	Spring	1	H13	4026102704	Screw M6x16	3
61	4022100107	Greaser	1	H14	4026351602	Washer	3
62	4022200030	Seal 41x27x10	1	H15	1470105200	Complete joint	1
63	1605500100	Handle	1	H16	4026701702	Plug G3/8	2
64	1610510500	Flange	1	38	4026701602	Plug G3/8	1
65	1627505200	Manifold	1	40	1685100200	Alu washer	1
66	4026308005	Nut M8	8	Kit of gaskets DL170-200			
67	4027400413	Non-return valve	1				
68	1610511400	Inside flange	1				
69	4029602807	Protection	1				
70	4026101404	Screw M8x12	3				
71	4026356002	Washer	3				
72	1624202300	Spacer	1				
73	1624027500	Spring spacer	1				
74	4026135414	Screw M8x45	1				
75	1445004310	Silencer	1				
76	1406601400	Warning element at 12V	1				
	1406601500	Warning element at 24V	1				
A1	1852104300	Intake conveyor	1				
A2	1852104300	Exhaust conveyor	1				
A3	1852104300	Injection conveyor	1				
A4	1852104400	Kit for safety valve	1				
A5	1852104500	Kit for conveyors	1				

Notes

Dotted lines for writing notes.

Model	Issue date	Revision No.	Revision date	Filled out by	Viewed by
DL 60-200 SERIES	05-09-2002	05	06-02-2018	U.T.	A.T.

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Juop SpA reserves the right to modify the products described in this manual without prior notice.