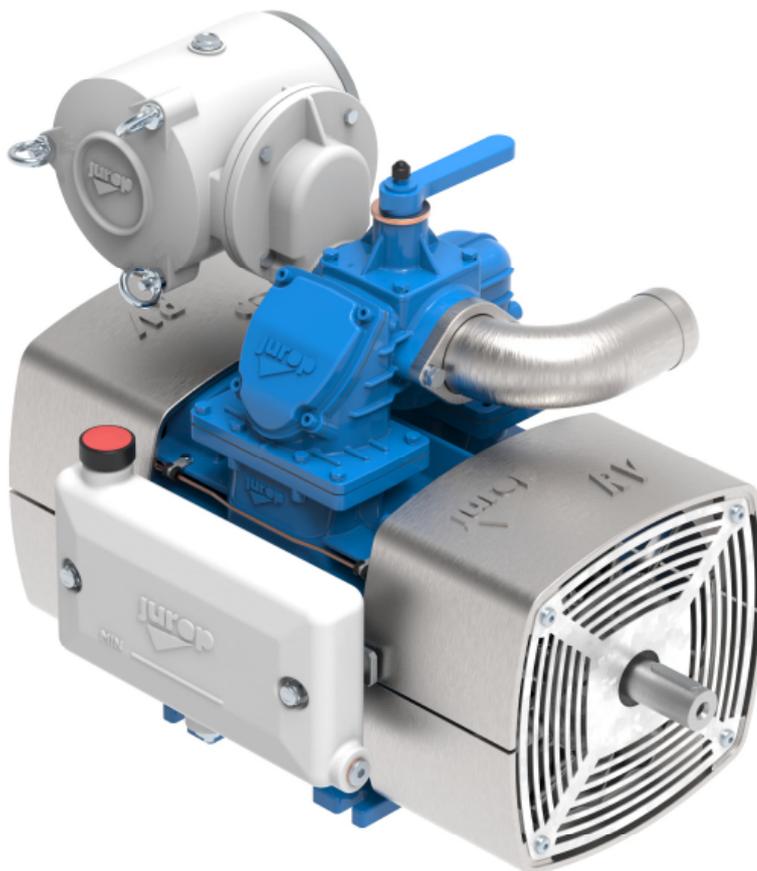


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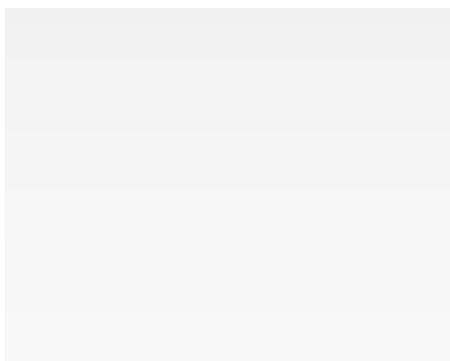
RV360 - RV520



ORIGINAL INSTRUCTIONS



## INSTALLATION, USE AND MAINTENANCE MANUAL



Rev. 11  
20-10-2021

COMPANY WITH  
QUALITY SYSTEM  
CERTIFIED BY DNV  
ISO 9001

COMPANY WITH  
ENVIRONMENTAL SYSTEM  
CERTIFIED BY DNV  
ISO 14001

2021 – **Juop** – Azzano Decimo (PN)

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# 1. General warnings

## 1.1. Introduction

- This booklet contains the necessary instructions for a correct installation, running, use and maintenance of the pump, as well as some practical suggestions for a safe operating.
- The knowledge of the following pages will grant a long and trouble-free operation of the pump.
- Following the instructions below contributes to limiting pump repair expenses by extending its duration, as well as preventing hazardous situations, thereby increasing its reliability.
- If the pump is driven by an hydraulic motor please refer to manufacturer's specific manual.
- It is recommended to:
  - Understand and apply carefully the instructions before running the pump.
  - Keep the booklet at hand and have it known to all operators.
- Below is a brief description of the symbols used in this manual.

|  |  |
|--|--|
|  | If these safety rules are not respected, operators can be injured and the pump or oilers damaged remarkably. |
|  | If these safety rules are not respected, the pump or system can be damaged.                                  |
|  | Suggestions for an environment friendly use of the pump.   |
|  | Suggestions for an environment friendly use of the pump.   |

- The graphic representations and photographs contained in this manual are there to illustrate the product in the parts that make it up and in specific operating phases. Though the model shown in the manual may differ from the one purchased, the operating principle at the base of the illustrated operating phase is the same.
- Pump has to be fitted with its own tag reporting the following data: Model, Serial number, Year, Max speed, Max pressure.



Pic. 1.1

## 1.2. Spare part request

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

EXAMPLE:

|  |              |
|--|--------------|
| a) The model of the pump (see pump tag):         | RV 520       |
| b) The serial number of the pump (see pump tag): | K90001       |
| c) A description of the parts (see parts list):  | VANE         |
| d) The quantity (see parts list):                | N°5 PZ       |
| e) The code number of the part (see parts list): | 16016 069 00 |

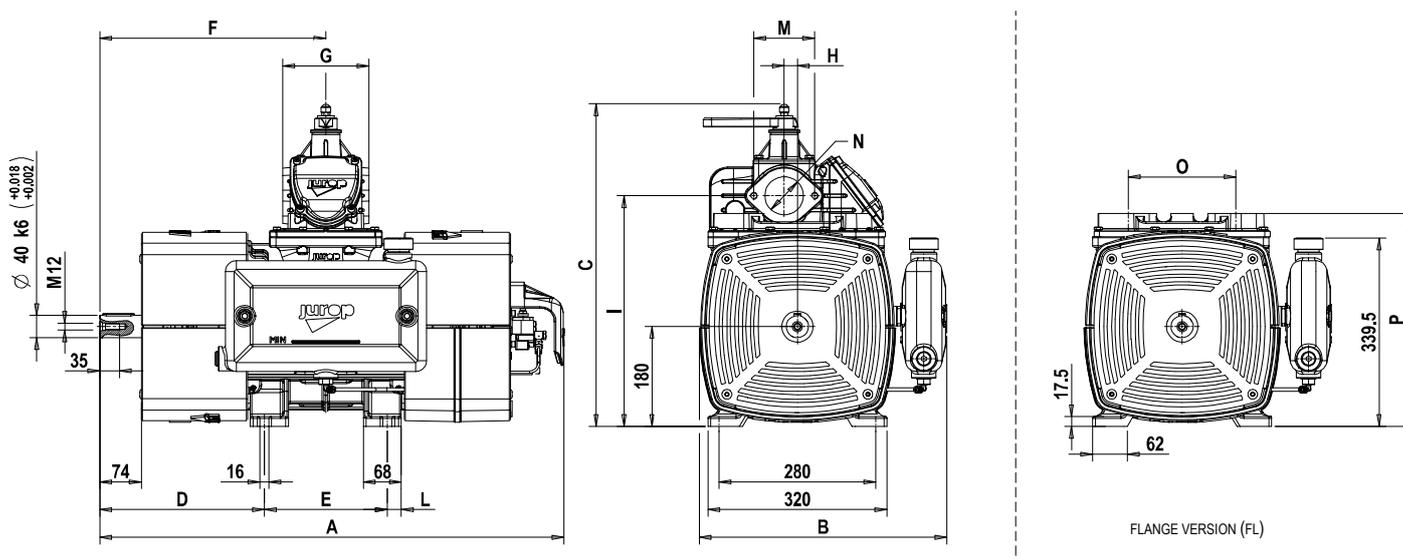
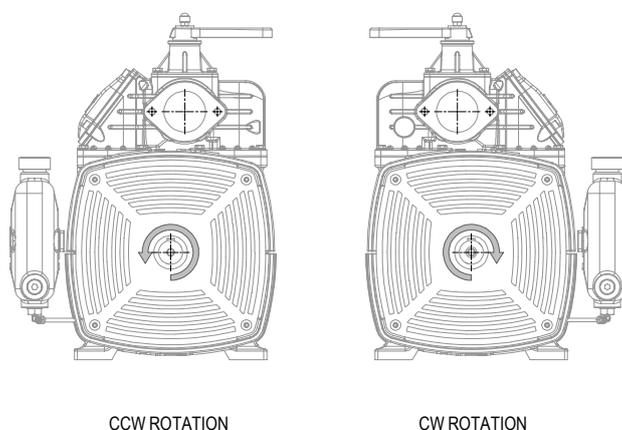
## 1.3. Warranty terms and conditions

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

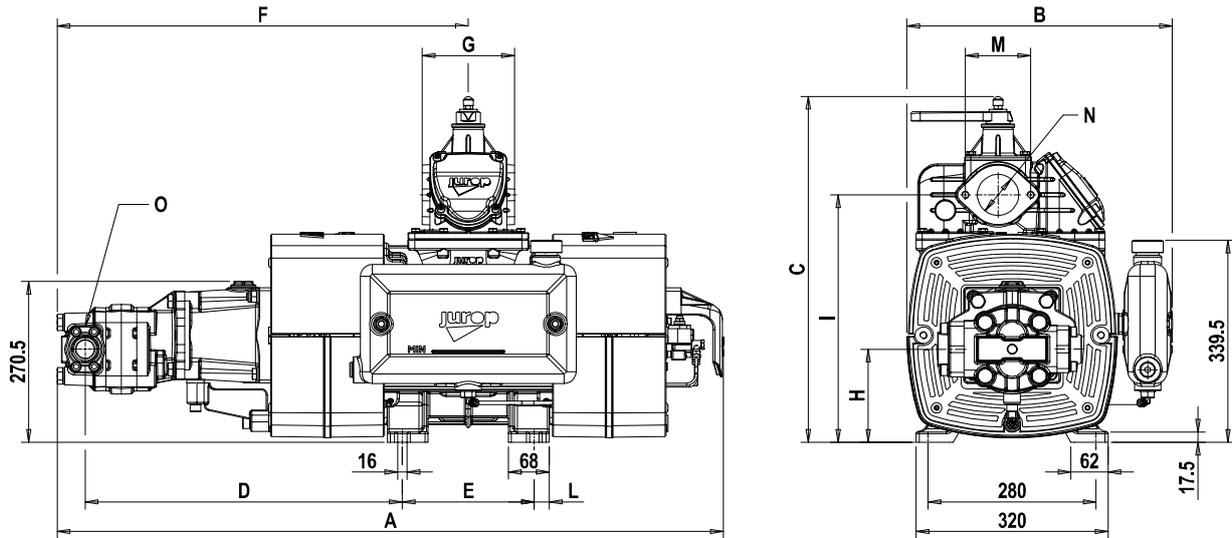
## 2. Technical data

- The RV models are rotary vacuum pumps cooled by high efficiency contraposed fans. The airflow reduces the temperature of the internal parts normally subjected to wear like bearings, vanes and sealings.
- The RV models are suitable for heavy-duty operation. The pumps are equipped with an automatic lubrication system and a positive displacement pump. The oil tank is side-mounted. The oil piping are made in copper.
- A pneumatic or hydraulic version of the built-in 4-way vacuum/pressure manifold is available on request.
- The non-return valve is integrated in the pump manifold.
- There are two tangential vanes inspection ports, on the pump housing.
- The RV models are available in flanged version (FL).
- Drive system:
  - Direct with smooth shaft;
  - With hydraulic motor.

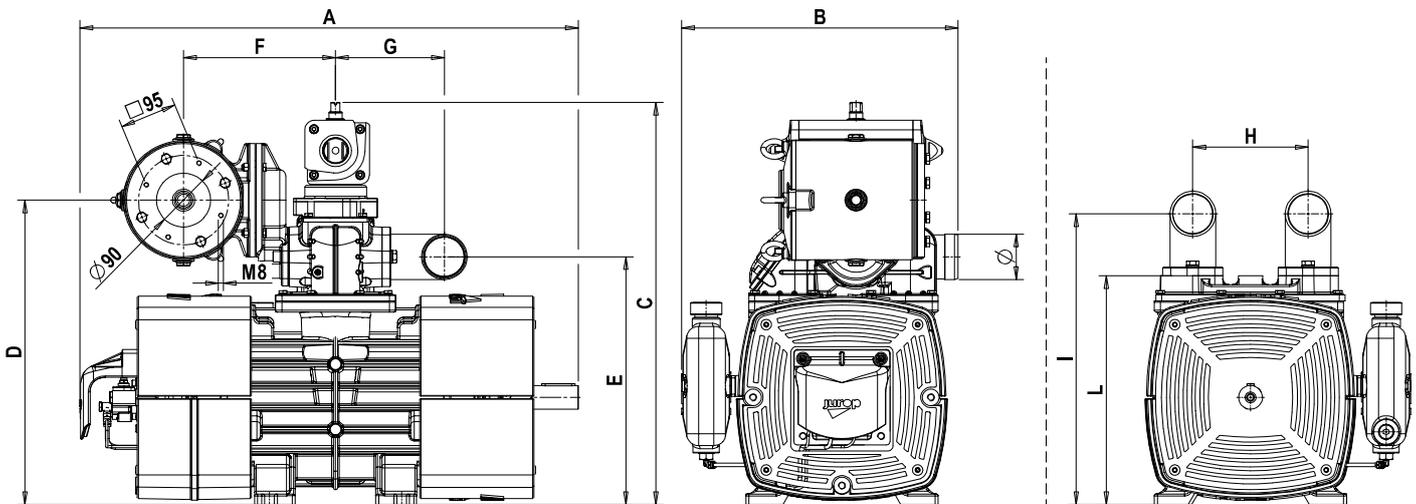
### 2.1. Dimensions and arrangement



|        | [mm] | A   | B     | C     | D   | E   | F   | G   | H    | I   | L    | M   | N    | O   | P   |
|--------|------|-----|-------|-------|-----|-----|-----|-----|------|-----|------|-----|------|-----|-----|
| RV 360 |      | 830 | 442,5 | 581,5 | 294 | 220 | 404 | 154 | 23,5 | 416 | 25   | 109 | Ø 69 | 192 | 384 |
| RV 520 |      | 975 | 438,5 | 605   | 334 | 286 | 477 | 162 | 15,5 | 429 | 29,5 | 95  | Ø 84 | 210 | 392 |

**RV with hydraulic transmission**


|            | [mm] | A    | B     | C     | D   | E   | F     | G   | H   | I   | L    | M   | N    | O in    | O out   |
|------------|------|------|-------|-------|-----|-----|-------|-----|-----|-----|------|-----|------|---------|---------|
| RV 360 HYD |      | 1111 | 442,5 | 581,5 | 529 | 220 | 685,5 | 154 | 156 | 416 | 25   | 109 | Ø 69 | G 1 1/4 | G 1 1/2 |
| RV 520 HYD |      | 1239 | 438,5 | 605   | 527 | 286 | 741   | 162 | 149 | 429 | 29,5 | 95  | Ø 84 | G 3/4   | G 1"    |

**RV with accessories**


FLANGE VERSION (FL)

|        | [mm] | A   | B     | C     | D   | E   | F   | G   | H   | I   | L   |
|--------|------|-----|-------|-------|-----|-----|-----|-----|-----|-----|-----|
| RV 360 |      | 830 | 460,5 | 675   | 511 | 416 | 253 | 181 | 192 | 488 | 384 |
| RV 520 |      | 975 | 463,5 | 696,5 | 477 | 429 | 279 | 175 | 210 | 486 | 392 |

|                     | Ø   | RV 360 | RV 520 |
|---------------------|-----|--------|--------|
| ADJUSTABLE CONVEYOR | 76  | •      |        |
|                     | 80  |        | •      |
|                     | 100 |        | •      |
| FIXED CONVEYOR      | 76  | •      |        |
|                     | 80  | •      | •      |
|                     | 100 |        | •      |

## 2.2. Performances

| Performances  |               |                   | RV 360 | RV 520 |
|---|---------------|-------------------|--------|--------|
| Air flow under free air condition   |               | l/min             | 10200  | 14700  |
|   |               | m <sup>3</sup> /h | 612    | 882    |
| Air flow 60% vacuum rate  |               | l/min             | 9400   | 12915  |
|   |               | m <sup>3</sup> /h | 564    | 775    |
| Max. vacuum at continuous duty  |               | %                 | 80     | 80     |
| Max. vacuum   |               | %                 | 95     | 95     |
| Power required at free port   |               | kW                | 14 kW  | 19     |
| Power required at max. vacuum   |               | kW                | 11 kW  | 16     |
| Airflow at 0.5 relative bar (1.5 abs.)  |               | kW                | 18     | 24     |
| Airflow at 1.0 relative bar (2.0 abs.)  |               | kW                | 22     | 30     |
| Max. relative pressure  |               | bar (bar abs)     | 1 (2)  | 1 (2)  |
| Sound pressure level Lp(A) - Pump with exhaust silencer; distance: 7m in open field | vuoto 60%     | dB(A)             | 74     | 76     |
| Oil consumption   |               | g/h               | 140    | 160    |
| Oil tank capacity   |               | l                 | 4      | 4      |
| Weight  | RV...D        | kg                | 175    | 234    |
|   | RV...D (FL)   | kg                | 166    | 210    |
|   | RV...HYD      | kg                | 205    | 250    |
|   | RV...HYD (FL) | kg                | 196    | 240    |

### REFERENCE CONDITIONS

|                                     |  |  |
|-------------------------------------|--|--|
| Conveyed gas: air                   | Vacuum condition: atmospheric discharge. | Absolute reference pressure: 1013mbar    |
| Ambient reference temperature: 20°C | Vacuum functioning: free outlet          | Pressure condition: atmospheric suction. |
| Vacuum pump operating at max. speed | Actual performance may vary of +/- 5%.   |  |

### Flow / Power

| Model  | Free ports        | Vacuum rate |       |       |       |       |      | Abs. pressure |         |         |       |
|--------|-------------------|-------------|-------|-------|-------|-------|------|---------------|---------|---------|-------|
|        |                   | 20%         | 40%   | 60%   | 70%   | 80%   | 90%  | 1,5 bar       | 1,8 bar | 2,0 bar |       |
| RV 360 | m <sup>3</sup> /h | 612         | 605   | 595   | 564   | 453   | 310  | 106           | 570     | 550     | 540   |
|        | l/min             | 10200       | 10080 | 9913  | 9400  | 7550  | 5166 | 1766          | 9496    | 9163    | 8997  |
|        | kW                | 14          | 13,5  | 13    | 12,6  | 12,3  | 11,9 | 11,2          | 18      | 20,5    | 22    |
| RV 520 | m <sup>3</sup> /h | 882         | 860   | 840   | 775   | 670   | 480  | 150           | 780     | 740     | 712   |
|        | l/min             | 14700       | 14330 | 14000 | 12915 | 11165 | 8000 | 2500          | 13165   | 12330   | 11865 |
|        | kW                | 19          | 18,2  | 17,7  | 16,9  | 16,4  | 16,2 | 16,1          | 24      | 27,5    | 30    |

Data at nominal speed

Actual performance may vary of +/- 5%.

## 2.3. Sound pressure level

| Lw (A)  |                   |         |        |
|---|-------------------|---------|--------|
| Noise power of the only pump, without drive transmission suction group, mufflers. |                   | [dB(A)] |        |
| RPM   | VACUUM / PRESSURE | RV 360  | RV 520 |
| NOMINAL SPEED   | vac 80%           | 89      | 91     |
|   | Δ press 0,6 bar   | 100     | 102    |

## 2.4. Usage limitations

| Modello | Max. Speed – Operating speed (RPM) |          |          | P <sub>2</sub> (bar ABS) | T <sub>2</sub> (°C) | T <sub>2</sub> - T <sub>1</sub> (°C) | Room Temperature |
|---------|------------------------------------|----------|----------|--------------------------|---------------------|--------------------------------------|------------------|
|         |                                    | Ordinary |          |                          |                     |                                      |                  |
| RV 360  | 800 rpm                            | 1100 rpm | 1300 rpm | 2,0 bar                  | 180°C               | 150°C                                | -20 / +40°C      |
| RV 520  | 800 rpm                            | 1100 rpm | 1300 rpm | 2,0 bar                  | 180°C               | 150°C                                | -20 / +40°C      |

P<sub>1</sub>: absolute pressure during suction

P<sub>2</sub>: absolute pressure during delivery

T<sub>1</sub>: temperature during suction

T<sub>2</sub>: temperature during delivery

## 2.5. Lubrication

Recommended oils: *Mineral oil anti-wear*

| Room T°    | Viscosity  | ENI      | ESSO     | SHELL            | TOTAL          | MOBIL      | BP             | TEXACO       | Q8          |
|------------|------------|----------|----------|------------------|----------------|------------|----------------|--------------|-------------|
| Under 10°C | ISO VG 46  | Acer 46  | Nuto 46  | Morlina S2 B 46  | Drosera MS 46  | Nuto H 46  | Bartran HV 46  | Rando HD 46  | Shubert 46  |
| Over 10°C  | ISO VG 150 | Acer 150 | Nuto 150 | Morlina S2 B 150 | Drosera MS 150 | Nuto H 150 | Bartran HV 150 | Rando HD 150 | Shubert 150 |

## 3. Safety and accident prevention



**Attention:**  
Carefully apply these prescriptions.

### 3.1. General recommendations

- When transporting the compressor use proper slinging. Store the compressor in stable places.
- Installation and maintenance must be carried out with the unit totally disengaged from its drive system and must be performed by qualified personnel.
- Use adequate clothing (avoid ties, loose sleeves, necklaces and so on) and suitable protection equipment (gloves, protection glasses, boots...).
- Before each maintenance operation, stop the pump and restore the atmospheric pressure.
- Make sure that all the parts of the unit are idle and cool, before performing any maintenance operation.
- To prevent errors and hazardous situations, establish what each operator is responsible for in the different maintenance operations.
- Do not start the machine if the protection devices provided for transmissions are removed. Replace damaged part.
- Final manufacturer must make the transmission inaccessible by means of a fixed guard or interlocked movable guard.
- Operators working nearby must avoid prolonged exposure to the noise emitted by the aspirator, if not equipped with the proper ear-protection devices (IPDs recommended: ear protectors).
- When the pump is running, some parts may reach very high temperatures (above 70°C). Use all necessary precautions to avoid contact.
- Avoid accidental suction of solids: solids may be projected at high speed through the exhaust manifold and cause injuries. A filter must be mounted on the suction line (Mesh 55).
- Pressure relief valve: point the air flux away from the operators.
- Do not use the aspirator over its designed limits: the machine may be damaged and the operator may be injured.



**Do not exceed the speed and the power supply parameters indicated in the technical tables (see par 2.2 – 2.4).**

- Based on the final use of the decompressor, the insertion in the housing machine and the typology of the same, the designer of the

housing machine must apply safety signals (pictograms) to warn the operator on the risk still present. These pictograms essentially refer to three categories:

- Signals prescribing the use of Individual Protection Devices (IPDs) such as, in this case, the use of gloves and ear protectors.
- Signals indicating to pay particular attention to the dangers related to the machine's components, such as: risk of dragging in the transmission equipment and contact with hot surfaces.
- Signals indicating specific parts of the machine for an easier identification, such as: greasing points, oil tanks, etc.

### 3.2. Intended use

- The vacuum pumps RV are designed to convey filtered air into systems for the vacuum production (example: systems for the suction of powders or liquid wastes). Any other usage shall be considered improper.
- Do not sack toxic substances and inflammable or explosive gasses, since the internal components of the pump may reach high temperatures.



**Avoid suction of toxic (poisonous) explosive or flammable gasses because internal components may reach high temperatures.**

- Avoid suction of liquids or solids; they can seriously damage the pump.



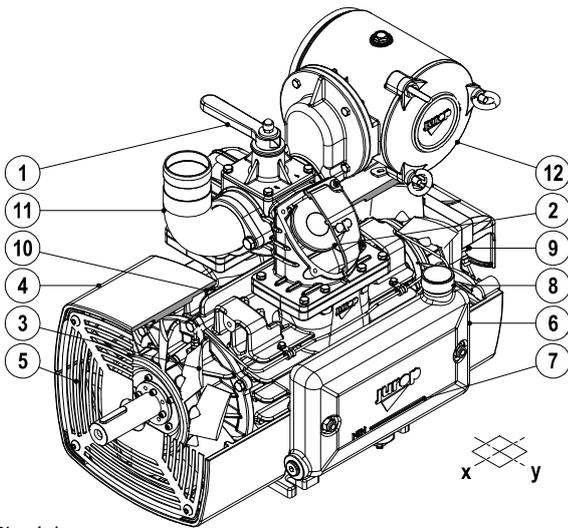
**Attention: liquids or solids infiltrations can seriously damage the pump.**

- Do not run the pump over its designed operating limits (see par. 2.5): it may break and transmission can be damaged.

### 3.3. Conveyed fluids

- RV are suitable for conveying filtered air. Before conveying other kind of gasses, verify compatibility with pump's characteristics.
- The machine was not designed and built to operate in environments with potentially explosive atmosphere (outdoor or indoor).
- Please contact JUROP's Technical dept. if necessary.

## 4. Installation



Pic. 4.1

|     |   |
|-----|---|
| 1.  | Manifold                                |
| 2.  | Non return valve                        |
| 3.  | Girante raffreddamento                  |
| 4.  | Air cooling conveyors                   |
| 5.  | Fan protection                          |
| 6.  | Oil Tank                                |
| 7.  | Oil level                               |
| 8.  | Oil filler cap                          |
| 9.  | Lubrication pump                        |
| 10. | Vane inspection ports                   |
| 11. | Fixed / turning conveyor (upon request) |
| 12. | Suction filter kit (upon request)       |

### 4.1. Checking upon receipt

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

### 4.2. Storing in the warehouse

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

### 4.3. Movimentazione e installazione

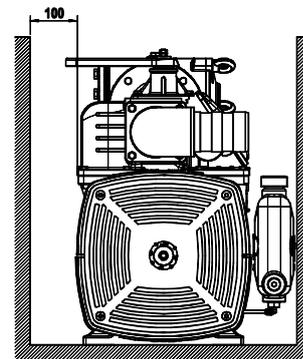
- Before each movement, verify that the lifting equipment has a suitable capacity (check the weight of the decompressor, possibly showed in this manual, in the paragraph 2.2).
- Do not lift the packaging or the machine when moving more than 50 cm from the ground. Proceed with the final lifting only near the installation point.
- Harness the machine with suitable straps / chains near the main body, paying attention to the position of the mass centre of gravity to ensure the load stability.



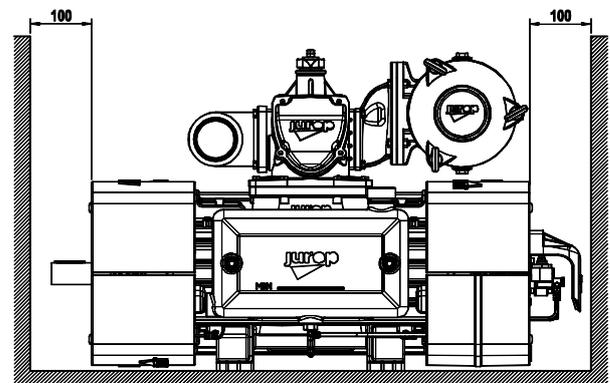
**Warning: do not stand under the machine when it is lifted during the installation.**

### 4.4. Mounting

- The mounted aspirator must be accessible for maintenance and firmly fixed on a frame or angled base with a 3° max inclination on X and Y axes (see Fig. 4.1). The structure must be fit to avoid flexions or vibrations.
- Provide enough space for air ventilation and disposal of heat when pump is running. See Fig. 4.2 and 4.3 for indication of the distance to be respected.

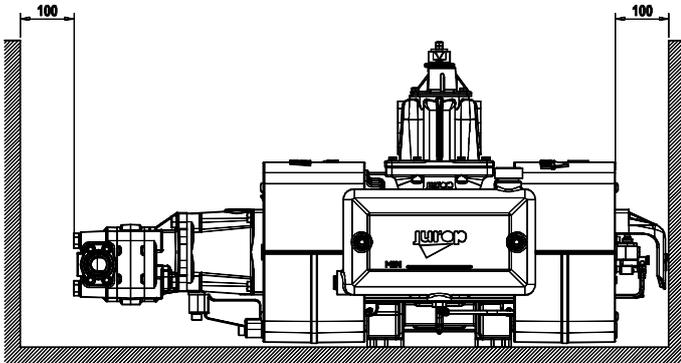


Pic. 4.2



Pic. 4.3

- Provide the necessary space to reach all points of lubrication control (oil level), and the oil tank filler cap, the lever of the 4-way switch, vanes inspection ports.
- The oil tank is mounted on the suction side of the housing. Thus, the rotary direction determines the pump overall dimensions. See also paragraph 2.1.
- In case of RV with hydraulic motor, provide the necessary space to disassemble the motor itself and proceed with joint lubrication.



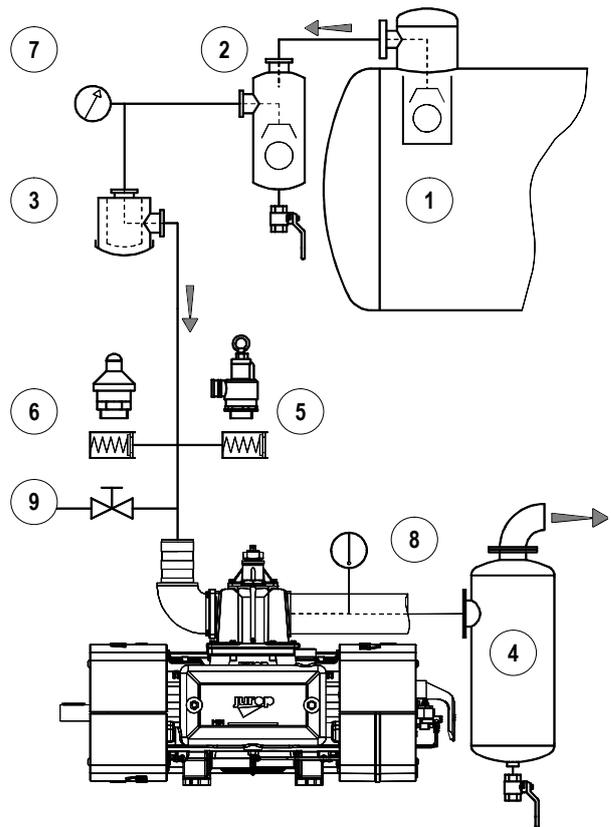
Pic. 4.4

- In the event that the decompressor is electrically isolated, connect it to the ground or make it equipotential with the housing machine. Check that the paint does not prevent its passage.

**4.5. Vacuum - pressure line**

- See figure 4.5.
- In order to avoid the suction of liquids, a primary flow shutoff valve (Pos. 1) and a secondary shutoff (Pos. 2) are to be mounted on the suction line. If necessary, also apply a suction filter (Pos. 3) to prevent solids from entering.
- The silencer (Pos. 4) applied to the pump exhaust - besides reducing the noise level - is designed to separate the oil mist expelled from the pump outlet port. The separator must be easily drained from oil and condensate accumulated at regular intervals.
- The diameter of the vacuum or pressure line pipes must be properly dimensioned to the pump flow and, in any case, it must be larger than the diameter of the ports.
- The pipes weight or their dilatations must not solicit the pump housing. Use high temperature resistant rubber connections.
- Before mounting, remove the port protections. All pipes and line components must be clean.
- Avoid restrictions and tight curves as much as possible, if not strictly necessary.
- Exhaust pipe can reach high temperatures. Hence, they must be properly isolated.
- An over-pressure safety relief valve (Pos. 5) should be mounted in order to prevent the overloading of the vacuum pump. Mount the valve near the pump without applying any gate valves on the line.
- A vacuum relief valve (Pos. 6) should be applied to limit the maximum vacuum rate at 80% in order to prevent the pump running at continuous duty from overheating.
- Venting shutter (Pos. 9): it is also useful to cool down the overheated pumps as well as for their internal wash-up. Direct the air flow away from the operators.

- Thermostat (Pos. 8): it must be installed at maximum 150 mm from the exhaust port. The sensitive element must reach the pipe centre. Safety thermostat on manifold is supplied on request.



Pic. 4.5

|   |                           |   |                       |
|---|---------------------------|---|-----------------------|
| 1 | Primary shutoff           | 6 | Vacuum relief valve   |
| 2 | Secondary shutoff         | 7 | Manometer -1 / +3 bar |
| 3 | Suction filter            | 8 | Thermostat            |
| 4 | Silencer – oil separator  | 9 | Venting shutter       |
| 5 | Overpressure safety valve |   |                       |

**4.6. Vacuum-pressure inverter: remote control actuators**

- A specific design of the vacuum-pressure diverter available on request enables the application of a pneumatic or hydraulic angular actuator (90°).
- See the exploded view at the end of the manual for spare parts.

|                  | Pneumatic actuator              | Hydraulic actuator     |
|------------------|---------------------------------|------------------------|
| Fluid            | Filtered, dried compressed air  | Hydraulic oil ISO-L-HM |
| Filtration       | ISO 8573-1 classe 4 (15 micron) | ISO 4406 21/19/16      |
| Temperature      | °C -20 ÷ +80                    | -20 ÷ +80              |
| Rated pressure   | bar 5.6                         | 150                    |
| Maximum pressure | bar 8.4                         | 200                    |
| Supply holes     | G 1/4                           | G 1/8                  |

**Hydraulic actuator installation**

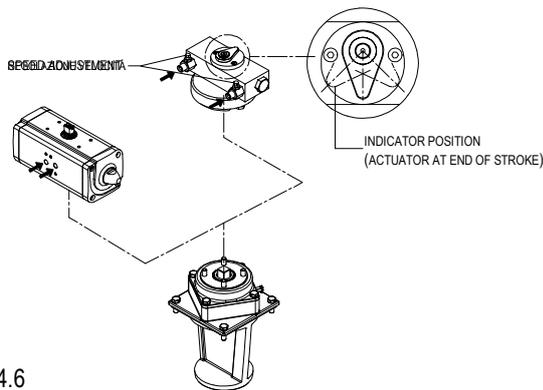
- Adjust movement speed using the two built-in valves.
- Use a closed-centre distributor or apply a block valve.

**Pneumatic actuator installation**

- Adjust movement speed by applying two unidirectional flow control valves.

**For both actuators**

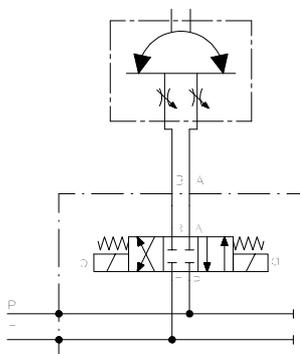
- Adjust speed: full rotation should not take less than 1 second.
- Fluid filtration: ensure a level equal to or greater than the recommended value.
- In the event of a (hydraulic or pneumatic) supply failure, the suction unit inverter will remain in the same position it was when the failure occurred.



Pic. 4.6

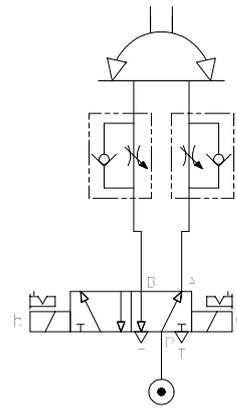
**Maintenance**

- The diverter is adjusted before shipment and does not usually require further adjustments.
- Diverter lubrication:
  - Use NLGI 2 Lithium grease. Quantity: 80-100 grams for 1000 working cycles.
  - A bleeder hole covered by a filter is preventing the hole to overfill. Clean the filter whenever clogged.
- Hydraulic actuator: the control valves are equipped with an internal metal filter. Disassemble and clean if movement stops.
- Pneumatic actuator: for non-dried air, use temperature 0 ÷ +80°C.
- The following figure shows a possible schematic view of a correct hydraulic connection.



Pic. 4.7

- The following figure shows a possible schematic view of a pneumatic connection.



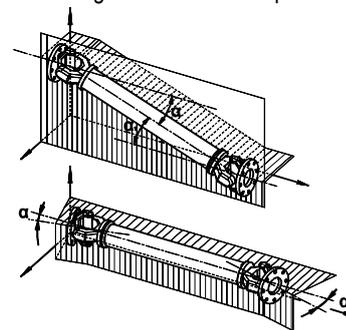
Pic. 4.8

- In case of interruption of the pneumatic or hydraulic supply, the inverter of the suction unit remains in the same position it was when the failure occurred

**4.7. Pump mounting - Drive connection**

**A) Cardan shaft drive**

- Use telescopic cardan shafts.
- In order to achieve a uniform motion of the driven shaft, the following requirements must be met (see Pic. 4.8):
  - Equal working angle  $\alpha$  and  $\alpha_1$  of both couplings;
  - The internal fork joints must be coplanar;
  - Both driven and driving shafts must be coplanar.



Pic. 4.9

- It is also recommended working with limited articulated joint angles (max 15° at 1000 rpm and max 11° at 1300 rpm) and disengaging the transmission for those operations requiring great angles (steering or lifting).

**Follow the rotation direction as indicated on the pump front conveyor protection. Follow the instructions of the cardan shaft's manufacturer.**

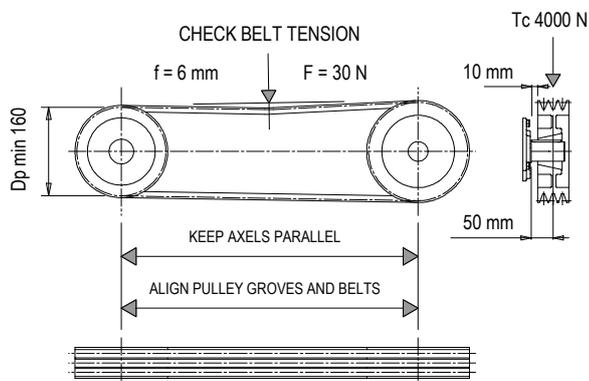
- Use the cardan guard supplied with the pump, by fixing it to the pump itself.

**Use the cardan guard supplied with the pump, by fixing it to the pump itself. In any case, the installation, by the final installer, must comply with the current EC accident prevention regulations and must be compatible with the geometry of the protection cap supplied with the machine.**

• The protection must not be removed; in case of removal, it is the responsibility of the final installer to provide for suitable guards according to the assembly.

• It is the responsibility of the final installer to provide for suitable guards, in presence of transmission shafts exposed during normal operation.

**B) Belt drive**



Pic. 4.10

- Install a suitable pulley on the smooth shaft as close as possible to the pump: 50 mm. Taper lock pulley are suggested.
- Apply an adequate belt tension (see manufacturer's data). See list below (T. Max).
- Do not use driven or driving pulleys with a pitch diameter inferior to 160 mm. Small pulleys require a high belt tension, which may cause premature wear to the bearing or transmission damages.
- Let the air circulate freely to cool down the pump. Provide protections, which ensure adequate ventilation.
- A limited speed ratio will extend the belts life and reduce stress on the shafts. When possible prefer:
  - Pulleys with a pitch diameter bigger than the one indicated, Dp=180mm;
  - Engines or power take-offs with a speed similar to the one of the pump.

|                           | RV 360   | RV 520   |
|---------------------------|----------|----------|
| Max speed (rpm)           | 1300 rpm | 1300 rpm |
| T. Max                    | 4000 N   | 4000 N   |
| L. Max                    | 50 mm    | 50 mm    |
| Drive min. pulley p. diam | 160 mm   | 160 mm   |
| Nr. Grooves               | 3        | 4        |
| Belts                     | XPB      | XPB      |

**C) Hydraulic drive**

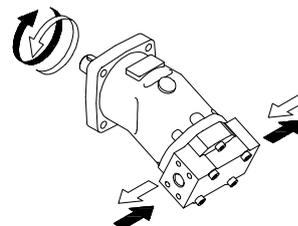
|                             | RV 360             |             | RV 520             |             |
|-----------------------------|--------------------|-------------|--------------------|-------------|
|                             | Vac. Max.          | 0,5 bar rel | Vac. Max.          | 0,5 bar rel |
| Displacement                | 61 cc/rev          |             | 72 cc/rev          |             |
| Operating pressure          | 130 bar            | 160 bar     | 150 bar            | 185 bar     |
| Flow                        | 83 l/min (1300rpm) |             | 99 l/min (1300rpm) |             |
| Max pressure draining line  | 5 bar              |             | 5 bar              |             |
| Max. pressure motor exhaust | 5 bar              |             | 5 bar              |             |
| Max. pressure               | 180 bar            |             | 250 bar            |             |

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

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

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

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



Pic. 4.11

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

• **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.

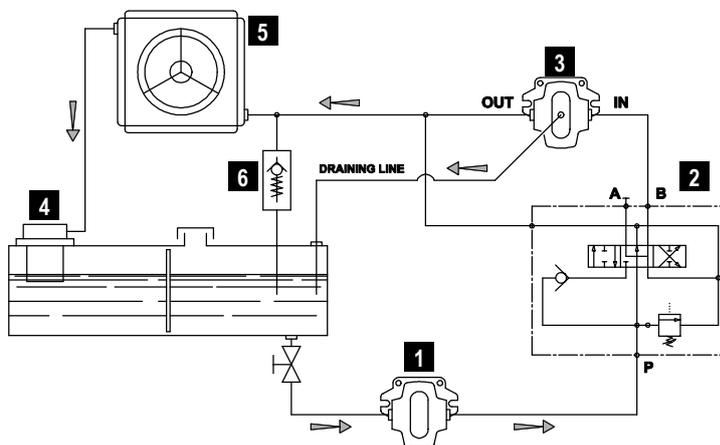


Fig. 4.12

|   |             |    |                |
|---|-------------|----|----------------|
| 1 | HDR pump    | 4  | Oil filter     |
| 2 | Distributor | 5* | Heat exchanger |
| 3 | HYD motor   | 6* | Safety valve   |

\* optional components

• **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.
- The machine/system manufacturer is responsible for dimensioning the lines.

 **The machine/system manufacturer is responsible for dimensioning the lines.**

## 5. Start up

### 5.1. Starting-up of the pump

- Check the side mounted tank oil level.
- Riempire il serbatoio olio sino al livello massimo.
- In order to choose the most suitable oil, see paragraph 2.6.
- 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 loading and operating speed for vibrations or unusual noises.

 **This vacuum pump is designed to work at maximum speed, but for longer operating we recommend the pump be run at working speed (see par. 2.5).**

- To reduce the vacuum rate to 80% max.
- Prepare adequately transmission.

### 5.2. Operating precautions

- Run the vacuum pump at a room temperature of -20°C e +40°C.
- Running at continuous duty: see paragraph 2.2.
- Do not make the vacuum pump overheat. Maximum air temperature on exhaust (or delivery) side: 160- 180°C.
  - If maximum temperature allowed is reached, in order to prevent damages to the internal parts, it is recommended:
    - To reduce the vacuum rate or the working pressure by opening the venting port;
    - To reduce the pump speed according to list at paragraph 2.4.
    - To start running the pump again only when temperature at exhaust is below acceptable values.
  - Do not operate the pump without lubrication: it may cause quick wear and possible breakdown of vanes.
    - Do not start running the pump under load: that causes stress to the drive system and the hydraulic motor.
      - Check rotation speed. The vacuum pump must:
        - Never exceed the maximum speed: it may cause overheating;
        - Never run below the minimum speed: this may cause an anomalous wear of the housing;

- 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.
- In vehicles do not direct compressor's discharge to the intake of the engine.
  - Control the air flow by adjusting the rotation speed: do not use the pressure relief valve to discharge the exceeding flow.
  - Once the needed vacuum rate has been reached, we recommend reducing the vacuum pump speed to its working speed (see par. 2.4): this allows keeping the achieved vacuum/pressure rate constant. The pump speed can also be reduced to values lower than the working speed during the tank discharging phase (with the 4-way valve in pressure mode) without increasing the draining time.
  - Thus, exhaust temperature is reduced, vane durability is increased and both oil consumption and power absorption are reduced.

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

• After operation in dusty environments, after accidental sucking of liquids inside the pump or before a long inoperativity period it is recommended to wash the pump inside according to the following procedure:

1. Before washing the pump, be sure that it has cooled down. To obtain this in a short time, it is possible to run the pump for a few minutes at zero vacuum conditions, or stop it at all;

 **Attention: Do not carry out this operation on very hot pumps (for example after a working day) until they have cooled down.**

2. Use 1-2 liters of water mixed with a non-flammable detergent. We suggest some product like Henkel Bonderite C-NE 5225: 5% concentration in water. This detergent grants a good protection against rust and oxidation.
3. Use one of the openings placed in the vacuum line (closet on the pump) to suck some water mixed with detergent.
4. Start the pump at low speed leaving opened all the suction valves in the tank, in order to keep low the vacuum rate (max vac. 10-20%). Let the detergent mix entering the pump very slowly.
5. The detergent mix stays suspended in the pump inside, before being expelled through the exhaust silencer.
6. After keeping the pump speed for a while to make the product reaching the internal parts, it is necessary to dry the pump preventing oxidation. When the detergent mix is finished, continue running the pump at the lowest possible vacuum rate for a few minutes, then close venting and suction valves up to 50-60%

maximum, for a couple of minutes. With this operation the pump will dry from the heated air and protected from the chemical attack of the detergent.

- Washing the pump with this detergent guarantees a protection after some days of inoperativity. If the pump is not used for more than two weeks, after having washed and dried the inner parts as described above, it is recommended to suck slowly 200 cc anti-rust and water-repellent protective oil (or, if not available, a very fluid gear oil).

 **Attention: do not carry out also this operation on very hot pumps (for example after a working day) until they have cooled down.**

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

## 6. Maintenance

### 6.1. Ordinary maintenance

- Any interventions must be performed when the machine is cold, stopped and switched off.
- Installation and maintenance must be operated only by qualified personnel wearing the proper clothes and the necessary tools as well as protection devices.
- Use suitable protection equipment (gloves, protection glasses, boots...)
- In the following table summarizes the main controls to be performed and the frequency of intervention.

| Operating Condition    | Maintenance Area    | Check   | 8H | 50H | 500H | 1000H |
|------------------------|---------------------|---|----|-----|------|-------|
| OPERATING              | Vacuum Line         | Operating pressure                              |    |     |      |       |
|                        |                     | Check safety valve                              |    |     |      |       |
|                        | Transmission / Pump | Rotation speed                                  |    |     |      |       |
|                        |                     | Sound pressure level (also HDR motor)           |    |     |      |       |
| STANDSTILL             | Vacuum Line         | Drain the oil gathered in the exhaust separator |    |     |      |       |
|                        |                     | Clean filter and vacuum line shutoff            |    |     |      |       |
|                        |                     | 4-way changeover valve: check and lubricate     |    |     |      |       |
|                        |                     | Clean suction filter                            |    |     |      |       |
|                        | Pump                | Side mounted tank oil level (1)                 |    |     |      |       |
|                        |                     | Clean fan protections                           |    |     |      |       |
|                        |                     | Check vanes wear                                |    |     |      |       |
|                        |                     | Pump's inner washing (2)                        |    |     |      |       |
|                        | Overall             | Greasing  |    |     |      |       |
|                        |                     | Check cardan shaft drive                        |    |     |      |       |
|                        |                     | Check transmission pulley                       |    |     |      |       |
| Swing valve wear check |                     |   |    |     |      |       |

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

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

#### Checking lubrication

- Check the correct operation of the system / lubrication circuit.

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

#### 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. See Fig. 6.1.

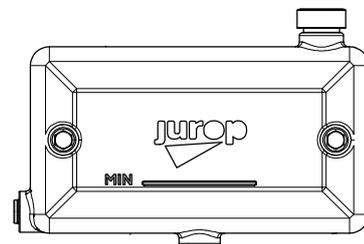


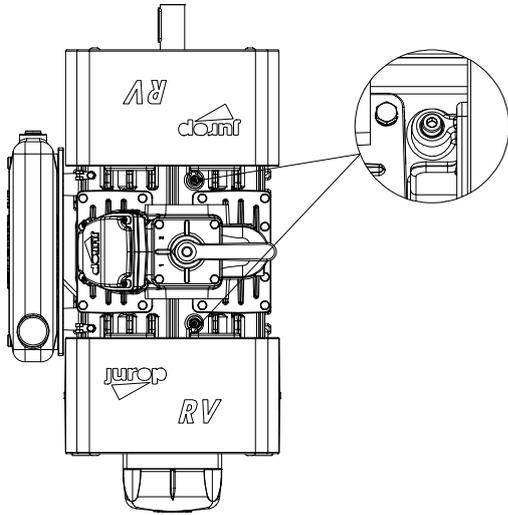
Fig. 6.1

- Tank capacity: 4l.
- Use pure fresh oil.

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

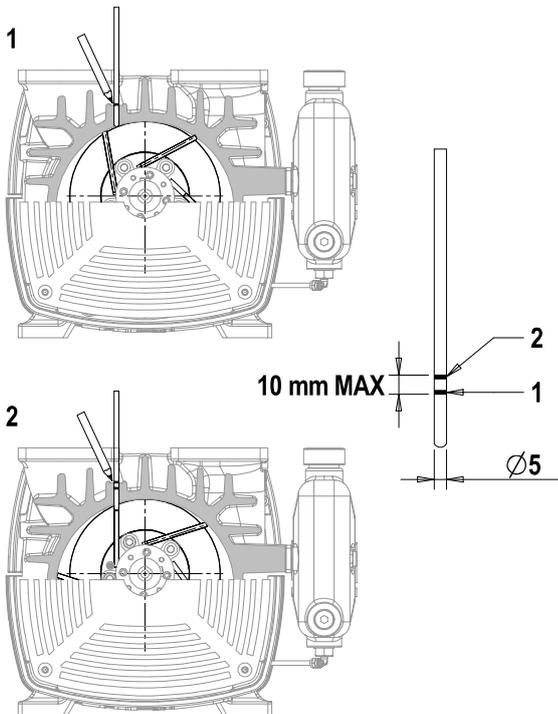
**Checking the vanes wear**

- Unscrew the vanes wear check-plug on the front flange. Pic. 6.2.
- Turn the shaft by hand until vanes appearance.
- Vanes usually slip on seat bottom due to gravity. Check their right entry in the seat.



Pic. 6.2

- Inserire, come in Fig. 6.3, un’astina Ø 5 mm con l’estremità conica verso l’interno della pompa (astina in dotazione).
- Insert a Ø 5 mm stick until it touches the rotor and then mark (see Fig. 6.3).
- Turn the rotor slowly until the stick touches the vane in idle position in its seat. The vanes slide to the bottom of the seat due to gravity: check they really do and mark again on the stick.
- Repeat the same procedure for all the vanes. If wear exceeds 10 mm: replace the vanes as soon as possible.



Pic. 6.3

- Maximum acceptable wear: 12 mm. Immediately replace: vanes are likely to break down.
- Replace all the pump vanes at the same time.

**Replace the vanes when their wear exceeds 12 mm (L – L min): they may break. Replace all vanes at the same time.**

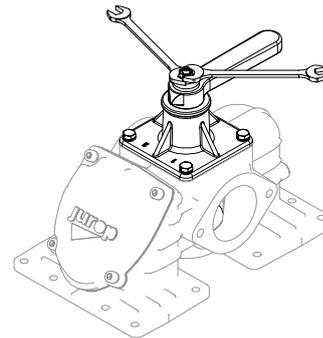
- Replace the cap after the measurement.

**6.2. Extraordinary maintenance**

- Except for the cases described below, extraordinary maintenance on a RV must be carried out by specialized personnel only; otherwise the guarantee will be invalidated.
- All extraordinary maintenance interventions must be carried out when the machine is cold, stopped and switched off. Implement the safety instructions reported in the “Safety and accident prevention” Chapter, before performing any maintenance operation.

**Follow the safety prescriptions as described in Cap. “Safety and accident prevention”.**

**Adjusting the 4-way valve**

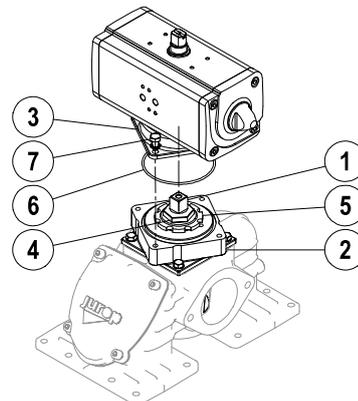


Pic. 6.4

- For pumps equipped with handle for manual operation or actuator.
- Adjust the screws to avoid the valve blocking in its seat (see Fig. 6.4).

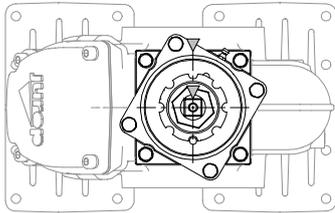
**Attention: do not exceed with the adjustment: possible vacuum loss.**

**Adjusting the pneumatically operated 4-way valve**

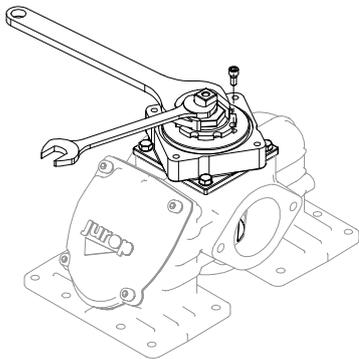


Pic. 6.5

- In case of reduced performance or difficult rotation of the valve in its seat, it is necessary to adjust the operating play.
- Unscrew the 4 screws M8x16 (7) which fasten the top cover (3) to the inferior support (2).
- Clean the inner part from the lubricant.
- “Mark” the initial position of the cock (P1). When mounting the cock back in place, it must be in the same position.

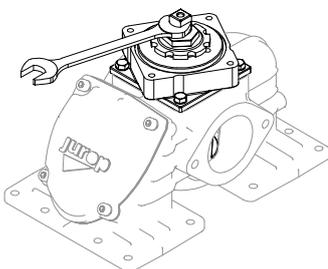


- Turn the valve until one of the cock regulation ferrules (P6) coincides with one of the threaded holes on the inferior flange (P2). Block temporarily the nut ferrule with a screw.
- Hold the valve in place with a 17 mm spanner and loosen the nut (P4) over the ferrule by 1/2 - 3/4 turn with a 36 mm spanner.



Pic. 6.6

- Valve adjustment: turn the valve clockwise by 1/8 turn (45°) in order to lower it (in case of excessive play between the valve and its seat and of reduced performance) or anticlockwise by 1/8 turn (45°) to raise it (in case of difficult rotation of the valve in its seat).
- Hold the valve in place with the spanner and fasten the nut (P4) above the ferrule.

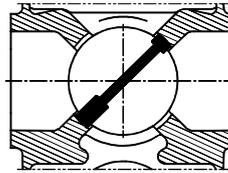


Pic. 6.7

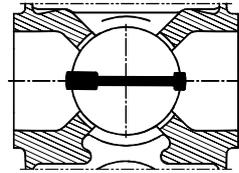
- Remove the screw which temporarily blocks the ferrule and check for the correct rotation of the valve by adjusting the shaft frame. Repeat the valve adjustment, if necessary.

**Attention: get the valve back into the previously “marked” position. Otherwise, the valve may work improperly.**

- The valve - in both its end stroke positions - must separate the air flow sucked from the pump outlet air. The pump may be started in order to check for the proper functioning.



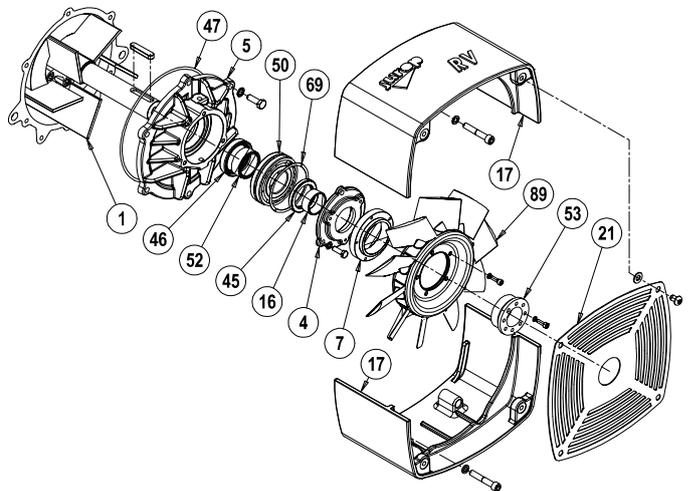
CORRECT POSITION



INCORRECT POSITION

- Lubricate the areas near the ferrule in order to guarantee the lubrication of parts undergoing wear.
- Set the top cover back into place. Do not forget the OR-Ring (6). Fasten the 4 screws.

**Replacing the vanes**



Pic. 6.8

| Pos. | Code       | Description             | Q.ty |
|------|------------|-------------------------|------|
| 1    | 1601605900 | VANE (RV 360)           | 5    |
|      | 1601606900 | VANE (RV 520)           | 5    |
| 16   | 1626001100 | FRONT OIL SEAL BUSHING. | 1    |
| 35   | 1680707300 | SEAL CAP GASKET         | 1    |
| 45   | 4022200044 | OIL SEAL 65X45X8        | 1    |
| 46   | 4022200113 | ROTOR SEAL 70X55X15     | 1    |
| 47   | 4022200309 | O-RING 4875             | 1    |
| 51   | 4023130035 | BUSHING 55X45X22        | 1    |

- Remove the vacuum pump from its bearing frame and wash it before disassembling.
- We recommend that you work on the pump front.
- The following drawings refers to RV520. For RV360 see spare part data sheet drawings at the end of this manual.
- Material that is subject to wear: replace.

**Disassembling**

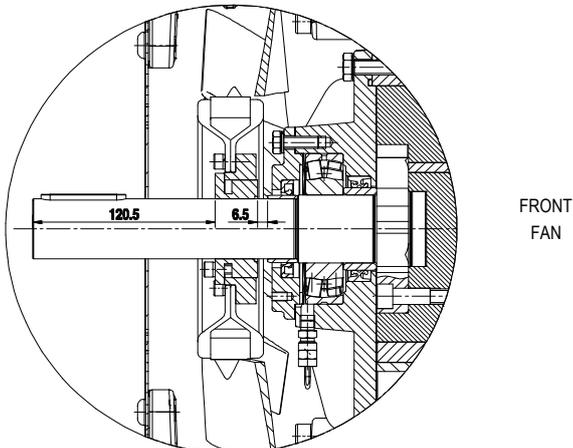
- Disconnect the drive system, if this is the case, and check conditions.
- Hydraulic drive: mark the position of the driven shaft on the pump shaft.
- Remove the conveyor protection (21).
- Remove the aluminium conveyors (17).
- Loosen the 4 screws which blocks the locking set (53) and remove the cooling fan (89) with the hub (7).
- Remove the seal cap (4). Do not lose compensation ring (69) and seal cap gasket (35).
- Remove the vacuum pump flange (5) by using the threaded holes to extract it. Do not lose OR-Ring (47).
- Hold the shaft before extracting the flange: the rotor weight must not solicit the internal components.
- Extract the worn vanes (1).
- Complete disassembling;
  - Extract bearing (50) and seal (46) from the pump flange (5);
  - Extract seal (45) from the seal cap (4).

**Checking the wear condition**

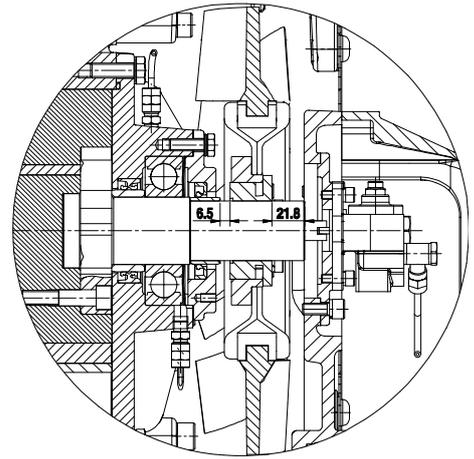
- Check the condition of following parts:
  - Seals and gaskets: they may be worn or have been damaged during disassembling.
  - Bushings: we recommend they be replaced if remarkably scratched.
  - A grinder may be needed to cut them for removal. Prevent iron filings from entering the pump.
  - Check whether the seal and the corresponding bushing need to be replaced also on the pump rear according to their general condition.

**Reassembly**

- Oil and then insert all vanes in their seats.
- Vacuum pump flange (5): insert seal and bearing if they have been previously removed or need to be replaced.
- Seal cap (4): insert the new oil seal if replacement has been needed.
- Bushings on pump axle: new bushings may need to be warmed before reassembly. Align them properly.



FRONT  
FAN

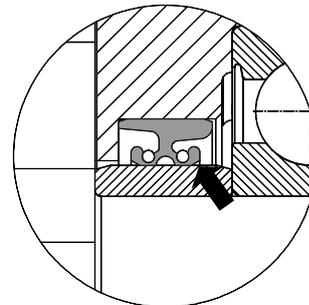


REAR  
FAN

Pic. 6.9

- Reassemble the parts in the following sequence:
  - Vacuum pump flange: do not damage the seal while inserting it on to the axis. Correctly centre and fasten the screws. Properly align the bearing into its seat.
  - Front seal cap: do not damage the seal while inserting it on to the axis and fasten the screws.
  - Fan with docking set.
    - Respect the correct distance from the axis head.
    - Fasten the 4 screws of the docking set with 10 Nm coupling.
  - Reassembly the conveyors and their protection.

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



Pic. 6.10

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

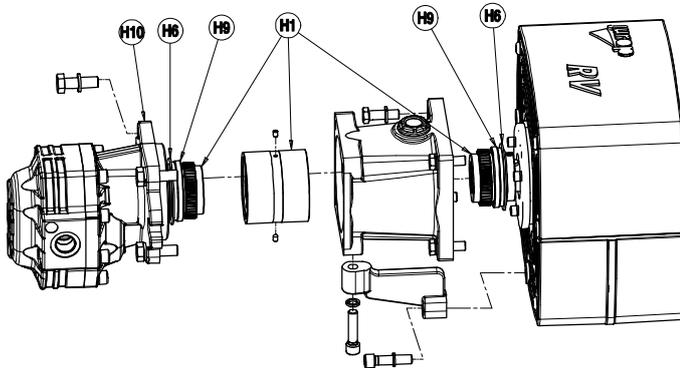
**Mounting the hydraulic drive**

- We recommend the drive coupling be oiled when vanes are being replaced. See Pic. 6.11.
- However lubricate the drive coupling every 1500 hours.

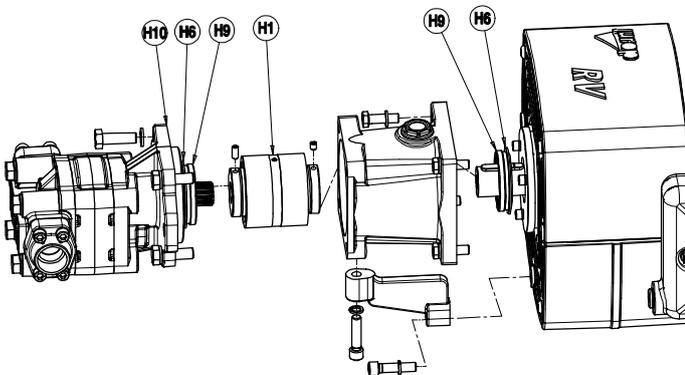
 **We recommend the drive coupling be oiled every 1500 hours.**

- Apply coupling hub (H1) to vacuum pump axis respecting the position marked during disassembly: the grain must go back into the seat on the rim.

**RV 360**



**RV 520**

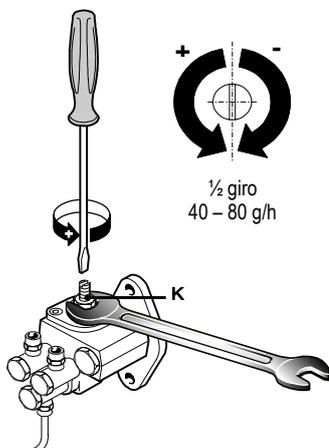


Pic. 6.11

- Mount the coupling (H1) and lubricate internally with NLGI 2 Lithium grease. Provide an adequate quantity of fat, in order to have a medium filling.
- Reassembly the motor without forcing onto the seals (H9).

**Adjusting the self-lubricating pump**

- The automatic lubricating pump is adjusted by the manufacturer before the shipping.



Pic. 6.12

- If consumption noticeably differs from the indicated value, adjust it as follows:

- Remove the upper protection cover;
- Using a screwdriver and a 10 mm wrench, adjust the adjusting screw (K). Close the nut and remount the upper protection cover;
- It is advisable to turn the screw of 1/4 of turn and verify the actual consumption.

**Do not reduce oil consumption below the value indicated in par. 2.3 (for functioning at speeds different from the maximum, flow is proportionate to rotating speed).**

- 1/2 turn of the adjusting screw causes a variation in the flow of approximately 40 - 80 g/h, depending on using conditions.

## 7. Malfunctions: troubleshooting

### PROBLEMS

| THE VACUUM PUMP OVERHEATS                             |   |
|---|---|
| Cause   | Solution  |
| • Insufficient or absent lubrication                  | • Verify oil and rings. Check oil pump efficiency                                   |
| • Low tank oil level                                  | • Fill tank with oil  |
| • Excessive rotation speed                            | • Reduce rpm to the prescribed working speed  |
| • Prolonged functioning at max vacuum rate            | • Reduce vacuum rate  |
| • Poor ventilation                                    | • Provide enough room around the pump. Verify fan conditions. Clean fan protections |
| • Vacuum and/or exhaust line of insufficient diameter | • Check dimensioning  |

| THE VACUUM PUMP DOES NOT ROTATE                |   |
|--|---|
| Cause  | Solution  |
| • Broken vanes:                                | • Clean inner chambers, replace vanes                                   |
| - due to infiltrated solids                    | • Check the secondary shutoff and filters of the suction line and clean |
| - 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 running it. Avoid suction of water        |

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

| UNUSUAL OIL CONSUMPTION              |   |
|--------------------------------------|---|
| Cause                                | Solution                                |
| • Insufficient or absent lubrication | • Check and adjust the lubricating pump |

## 8. Scrapping

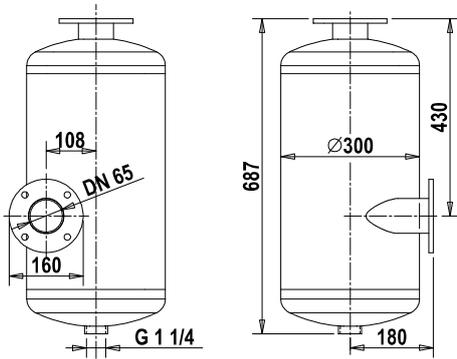
• Recycling materials allow reducing the environmental impact and respecting the environment.

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

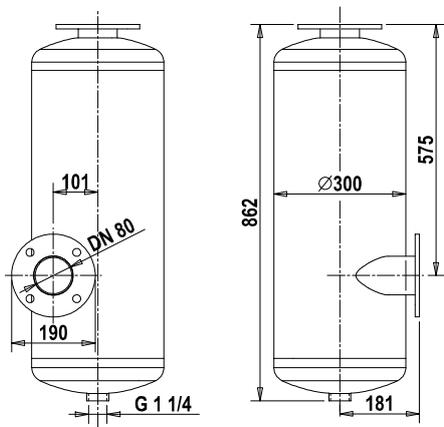


**Do not dispose of in the environment. Dispose of in compliance with the standards in force.**

| Material | Cast Iron | Steel | Alluminum | Copper | Bronze | Vane | Oil | Gasket |
|----------|-----------|-------|-----------|--------|--------|------|-----|--------|
| RV 360   | 82        | 7     | 9,1       | 0,1    | 0,1    | 0,6  | 0,6 | 0,7    |
| RV 520   | 85        | 5     | 7,5       | 0,1    | 0,1    | 0,7  | 0,5 | 0,5    |

**9. Accessories**
**Silencers / Oil separators**


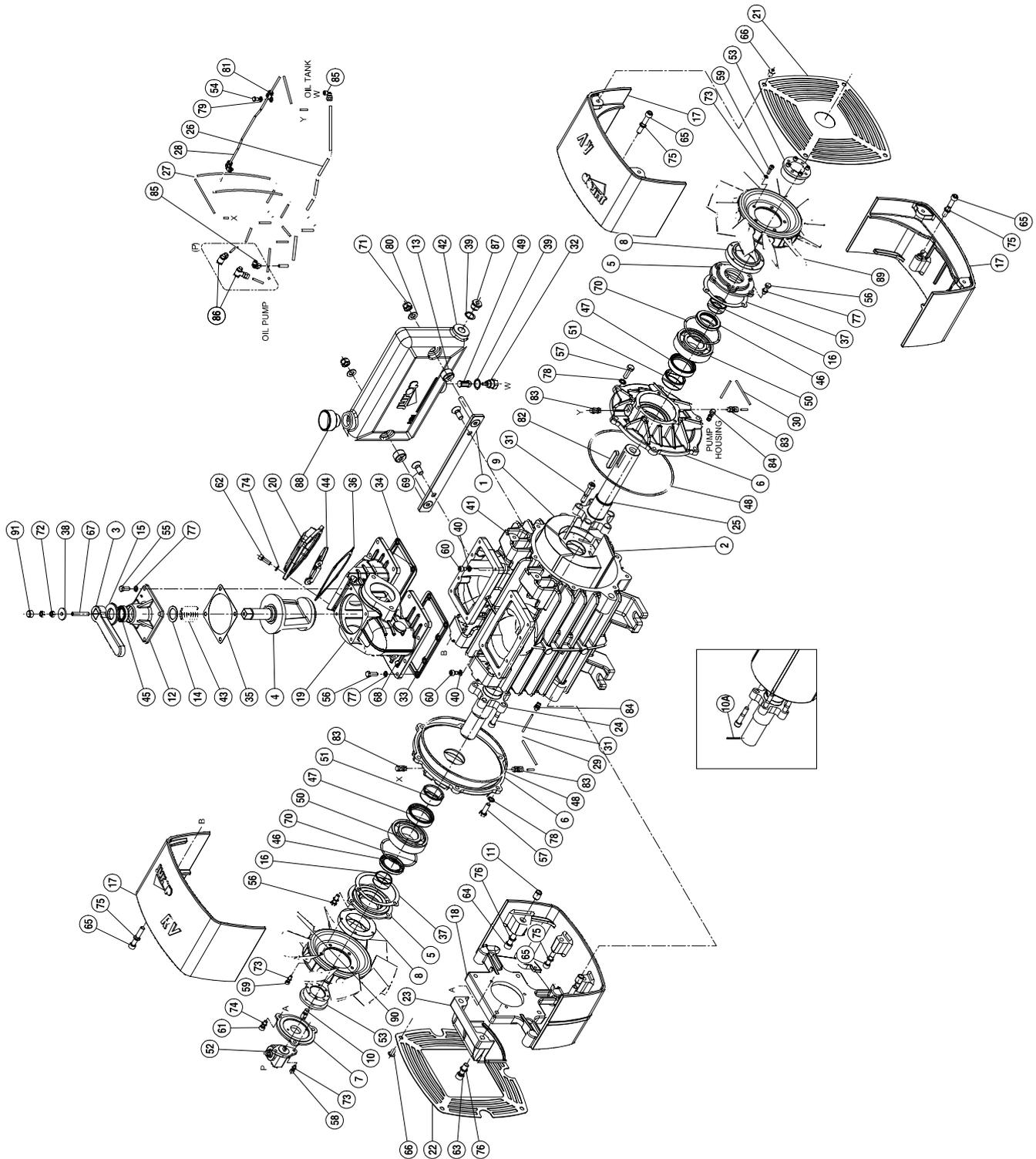
|          |                       |
|----------|-----------------------|
| MODEL    | RV 360                |
| TYPE     | DISCHARGE             |
| CODE     | 15470 043 00          |
| MAX FLOW | 540 m <sup>3</sup> /h |
| OIL TRAP | 3,8 l                 |
| WEIGHT   | 27 kg                 |



|          |                       |
|----------|-----------------------|
| MODEL    | RV 520                |
| TYPE     | DISCHARGE             |
| CODE     | 15470 D2C B0          |
| MAX FLOW | 912 m <sup>3</sup> /h |
| OIL TRAP | 4,4 l                 |
| WEIGHT   | 35 kg                 |

**Note:** Direct the silencer discharge output away from the silencer suction inlet in order to prevent the input of hot fluids into the injection inlet.

RV 360



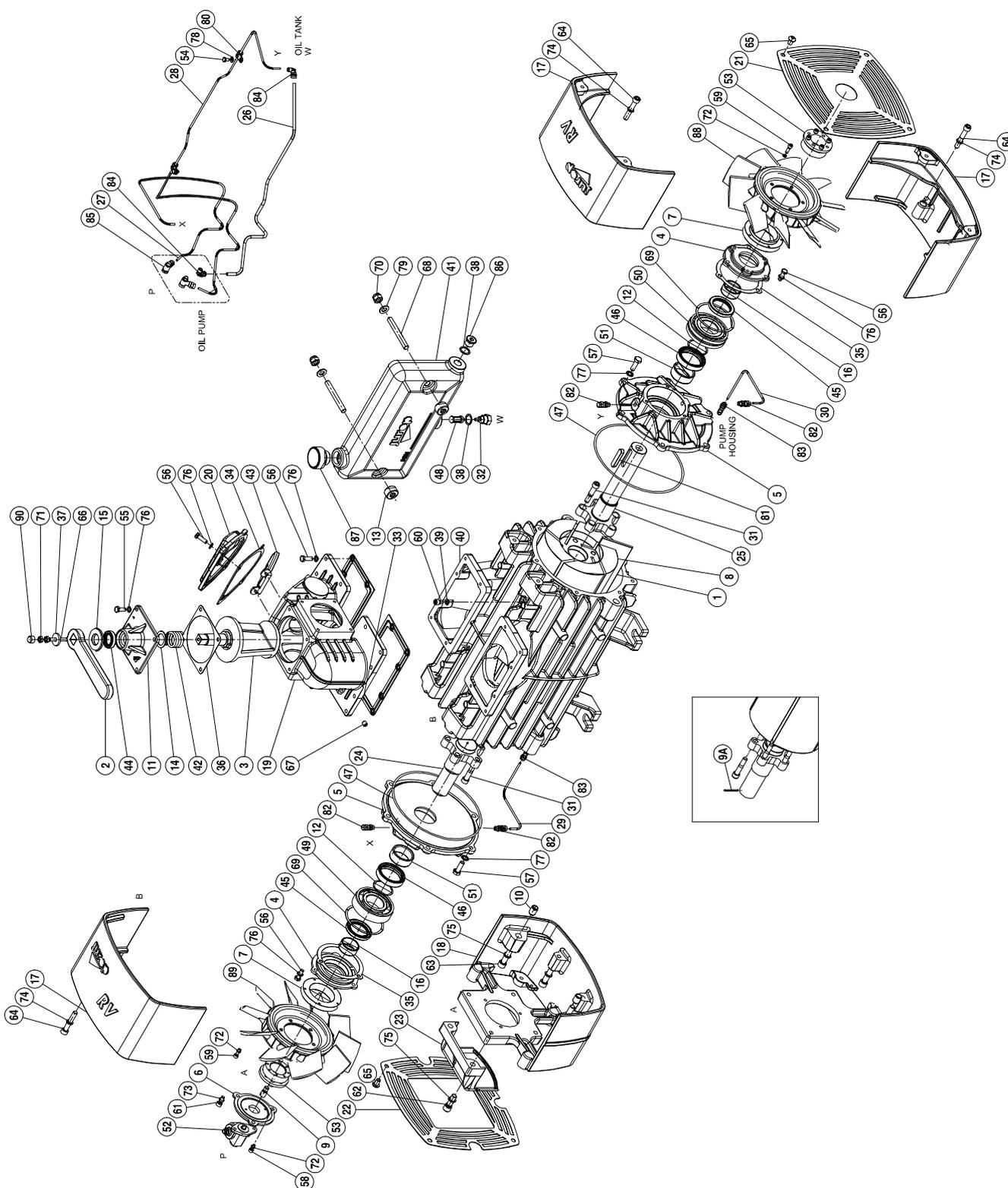
PICTURE SHOWS:  
RV 360 CW ROTATION - CODE: A460809440  
RV 360 CCW ROTATION - CODE: A460909440 (Box)

RV 360: A46...

**RV 360**

| Pos. | Code       | Description                          | Q.ty | Pos. | Code       | Description                         | Q.ty |
|------|------------|--------------------------------------|------|------|------------|-------------------------------------|------|
| 1    | 1513053300 | SIDE MOUNTED OIL TANK SUPPORT        | 1    | 53   | 4025428111 | SHRINK-DISK RCK16 40X65             | 2    |
| 2    | 1601605900 | RV 360 VANE                          | 5    | 54   | 4026101301 | SCREW TE 8,8 M6X10 GALV.            | 2    |
| 3    | 1605500000 | HANDLE                               | 1    | 55   | 4026102806 | SCREW TE 8.8 M8X20 GALV.            | 4    |
| 4    | 1608501700 | INSIDE VALVE                         | 1    | 56   | 4026102807 | SCREW TE 8,8 M 8X25 GALV.           | 18   |
| 5    | 1610508200 | FLANGE                               | 2    | 57   | 4026102908 | SCREW TE 8.8 M10X30 GALV.           | 12   |
| 6    | 1610513900 | FLANGE                               | 2    | 58   | 4026121305 | SCREW TCEI 8,8 M 6X16 GALV.         | 2    |
| 7    | 16105CF2B0 | OIL PUMP FLANGE                      | 1    | 59   | 4026121307 | SCREW TCEI 8,8 M 6X20 GALV.         | 10   |
| 8    | 1611001400 | FUN HUB                              | 2    | 60   | 4026121401 | SCREW TCEI 8,8 M 8X25 GALV.         | 2    |
| 9    | 1621503500 | RV 360 ROTOR                         | 1    | 61   | 4026121405 | SCREW TCEI 8,8 M 8X20 GALV.         | 3    |
| 10   | 1622002600 | OIL PUMP DRIVE                       | 1    | 62   | 4026121407 | SCREW TCEI 8,8 M 8X25 GALV.         | 4    |
| 10 A | 4026414617 | PIN 3X40 (FOR RV360 CCW)             | 1    | 63   | 4026121710 | SCREW TCEI 8,8 M 12X35 GALV.        | 2    |
| 11   | 1622010200 | CONVEYOR DOWEL PIN                   | 2    | 64   | 4026121719 | SCREW TCEI 8,8 M 12X80 GALV.        | 2    |
| 12   | 1623100000 | INSIDE VALVE COVER                   | 1    | 65   | 4026121815 | SCREW TCEI 8,8 M 10X60 GALV.        | 8    |
| 13   | 1624042800 | SIDE OIL TANK SPACER                 | 2    | 66   | 4026122005 | SCREW TBEI 10,9 M 10X15 GALV.       | 8    |
| 14   | 162409YKBO | SPRING SPACER                        | 1    | 67   | 4026135415 | GRUB SCREW 12,9 M 8X50 GALV.        | 1    |
| 15   | 1624202300 | INSIDE VALVE SPACER                  | 1    | 68   | 4026135504 | GRUB SCREW 12.9 M 10X10 GALV.       | 1    |
| 16   | 1626001100 | SEAL BUSHING                         | 2    | 69   | 4026155909 | SCREW TSPEI 10,9 M 12X30 ZINC.      | 2    |
| 17   | 1627105100 | RV CONVEYOR                          | 3    | 70   | 4026300025 | COMPENSATION RING                   | 2    |
| 18   | 1627105200 | RV CONVEYOR WITH SUPPORT             | 1    | 71   | 4026305508 | SELF-LOCKING NUT M12                | 2    |
| 19   | 16275014E0 | MANIFOLD                             | 1    | 72   | 4026308005 | NUT M8 GALV.                        | 2    |
| 20   | 16401098E0 | CLAPET COVER                         | 1    | 73   | 4026350503 | WASHER GROWER 6 GALV.               | 12   |
| 21   | 1642008300 | CONVEYOR PROTECTION                  | 1    | 74   | 4026350505 | WASHER GROWER 8 GALV.               | 3    |
| 22   | 1642008400 | CONVEYOR WITH SUPPORT PROTECTION     | 1    | 75   | 4026350506 | WASHER GROWER 10 GALV.              | 8    |
| 23   | 1642100200 | REAR OIL PUMP PROTECTION             | 1    | 76   | 4026350508 | WASHER GROWER 12 GALV.              | 4    |
| 24   | 1650022100 | REAR SHAFT                           | 1    | 77   | 4026350706 | WASHER GROWER 8 FLAT SEC. GALV.     | 25   |
| 25   | 1650022200 | FRONT SHAFT                          | 1    | 78   | 4026351506 | WASHER M10 GALV.                    | 12   |
| 26   | 16630040E0 | PIPE TANK RV360 RH                   | 1    | 79   | 4026357003 | FLAT WASHER M6 GALV.                | 2    |
|      | 16630041E0 | PIPE TANK RV360 LH                   | 1    | 80   | 4026357007 | FLAT WASHER M12 GALV.               | 2    |
| 27   | 1663069900 | OIL PUMP – REAR FLANGE OIL LINE      | 1    | 81   | 4026426703 | RUBBER BAND D.6,5                   | 2    |
| 28   | 1663064400 | OIL PUMP – ANTERIOR FLANGE RV360 RH  | 1    | 82   | 4026501006 | TAB 12X8X56                         | 1    |
|      | 1663065000 | OIL PUMP – ANTERIOR FLANGE RV360 LH  | 1    | 83   | 4026702000 | CONNECTION 4X1/8                    | 4    |
| 29   | 1663064600 | REAR RH/ANTERIOR LH HOUSING OIL LINE | 1    | 84   | 4026706000 | CONNECTION 90° 4X1/8                | 2    |
|      | 1663064800 | ANTERIOR RH/REAR LH HOUSING OIL LINE | 1    | 85   | 4026706003 | CONNECTION 90° 6X1/8                | 2    |
| 30   | 1663064800 | ANTERIOR RH/REAR LH HOUSING OIL LINE | 1    | 86   | 4026706101 | ADJUSTABLE CONNECTION 4X1/8         | 2    |
|      | 1663064600 | REAR RH/ANTERIOR LH HOUSING OIL LINE | 1    | 87   | 4026904503 | PLUG M20X1,5                        | 1    |
| 31   | 1672001600 | SPECIAL SCREW TCEI M10X1,5           | 10   | 88   | 4026910103 | PLUG G1                             | 1    |
| 32   | 1673001000 | OIL FILTER PLUG                      | 1    | 89   | 4028360000 | FRONT FAN (FOR RV360 RIGHT VERSION) | 1    |
| 33   | 1680611400 | DISCHARGE SIDE MANIFOLD GASKET       | 1    |      | 4028360001 | FRONT FAN (FOR RV360 LEFT VERSION)  | 1    |
| 34   | 1680611500 | SUCTION SIDE MANIFOLD GASKET         | 1    | 90   | 4028360001 | REAR FAN (FOR RV360 RIGHT VERSION)  | 1    |
| 35   | 1680700200 | INSIDE VALVE COVER GASKET            | 1    |      | 4028360000 | REAR FAN (FOR RV360 LEFT VERSION)   | 1    |
| 36   | 16807020E0 | CLAPET COVER GASKET                  | 1    | 91   | 4029602701 | NUT M8 PROTECTION                   | 1    |
| 37   | 1680707300 | FRONT FLANGE COVER                   | 2    |      |            |                                     |      |
| 38   | 1685002800 | WASHER FE 30X8,5 SP.4 GALV.          | 1    |      | 1892005900 | KIT GASKET RV360                    | 1    |
| 39   | 1685100300 | WASHER D 20 ALU                      | 2    |      | 1892006400 | KIT ANTERIOR SHAFT RV360-520        | 1    |
| 40   | 1685100800 | WASHER 8X14X1,5                      | 2    |      | 1892006500 | KIT REAR SHAFT RV360-520            | 1    |
| 41   | 1687509300 | RV 360 HOUSING                       | 1    |      |            |                                     |      |
| 42   | 1687600000 | SIDE OIL TANK                        | 1    |      |            |                                     |      |
| 43   | 1691000000 | SPRING                               | 1    |      |            |                                     |      |
| 44   | 18930009E0 | CLAPET DN100 WITH OR                 | 1    |      |            |                                     |      |
| 45   | 4022200030 | SEAL 41X27X10 GP NBR                 | 1    |      |            |                                     |      |
| 46   | 4022200044 | SEAL 65X45X8                         | 2    |      |            |                                     |      |
| 47   | 4022200113 | SEAL 70X55X15 VITON                  | 2    |      |            |                                     |      |
| 48   | 4022200309 | O-RING 4875 VITON                    | 2    |      |            |                                     |      |
| 49   | 4022300001 | FILTER IN NYLON D.6                  | 1    |      |            |                                     |      |
| 50   | 4023100047 | BEARING 6309/C3                      | 2    |      |            |                                     |      |
| 51   | 4023130035 | BUSHING 55X45X22                     | 2    |      |            |                                     |      |
| 52   | 4024251000 | 2-WAY RH OIL PUMP                    | 1    |      |            |                                     |      |
|      | 4024251500 | 2-WAY LH OIL PUMP                    | 1    |      |            |                                     |      |

**RV 520**



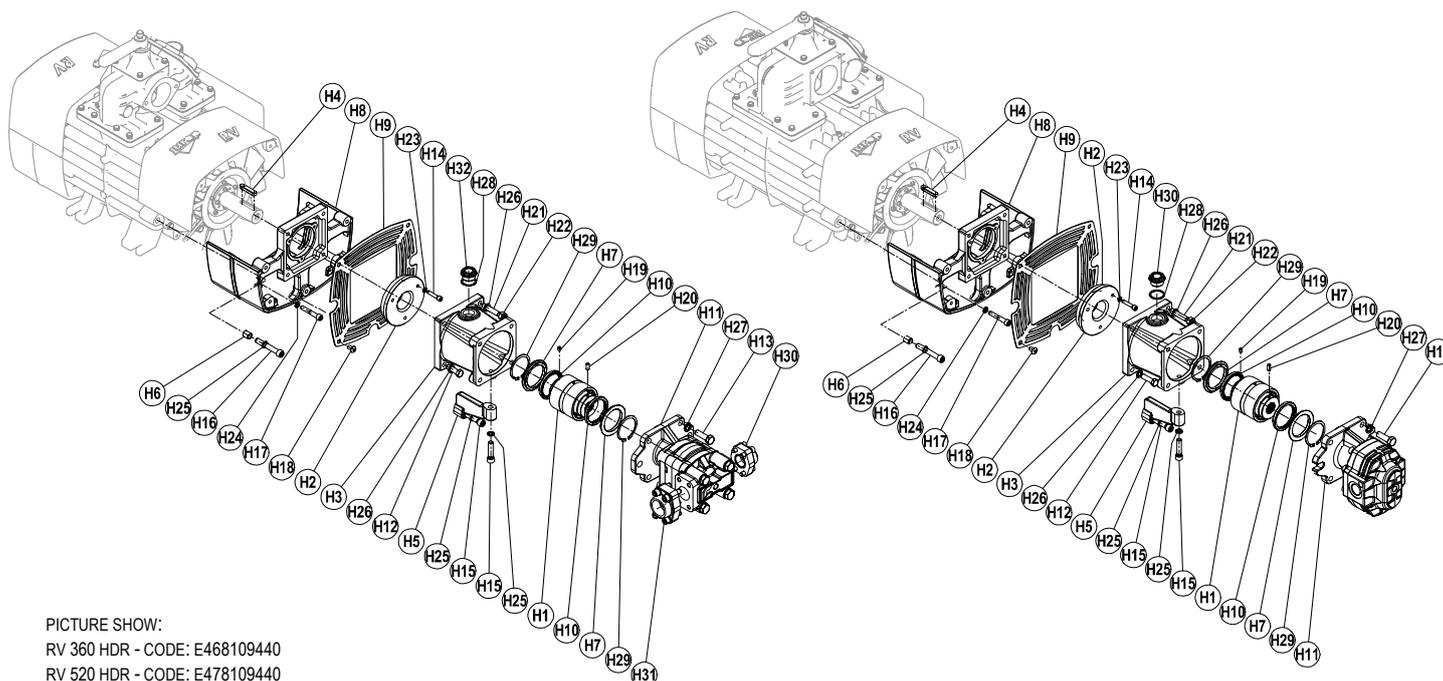
PICTURE SHOWS:  
RV 520 CW ROTATION - CODE: A470809440  
RV 520 CCW ROTATION - CODE: A470909440 (Box)

RV 520: A47...

**RV 520**

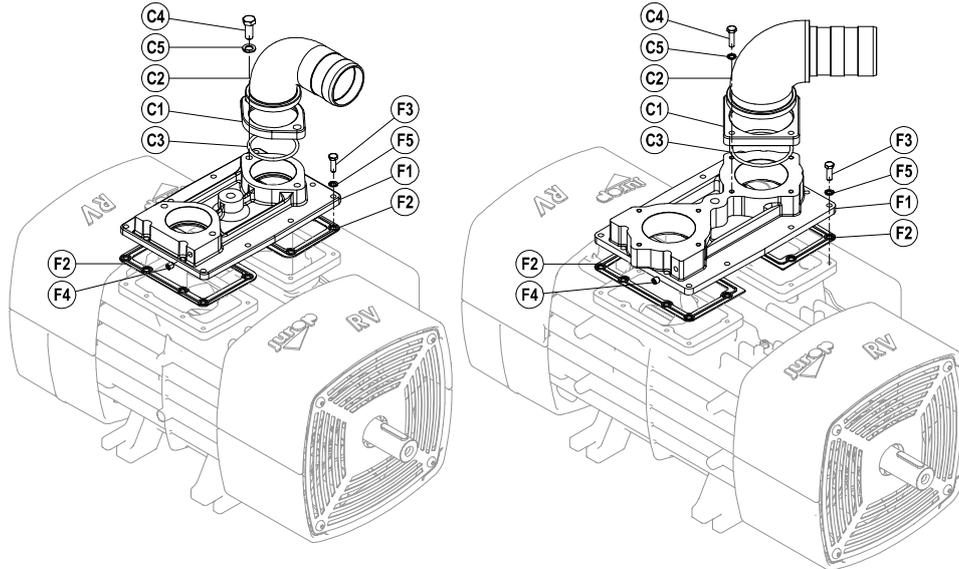
| Pos. | Code       | Description                          | Q.ty | Pos. | Code       | Description                         | Q.ty |
|------|------------|--------------------------------------|------|------|------------|-------------------------------------|------|
| 1    | 1601606900 | RV 520 VANE                          | 5    | 53   | 4025428111 | SHRINK-DISK RCK16 40X65             | 2    |
| 2    | 1605500100 | HANDLE                               | 1    | 54   | 4026101301 | SCREW TE 8,8 M 6X10 ZINC.           | 2    |
| 3    | 1608502500 | INSIDE VALVE                         | 1    | 55   | 4026102806 | SCREW TE 8.8 M 8X20 ZINC.           | 4    |
| 4    | 1610508200 | FLANGE                               | 2    | 56   | 4026102807 | SCREW TE 8,8 M 8X25 ZINC.           | 22   |
| 5    | 1610513900 | FLANGE                               | 2    | 57   | 4026102908 | SCREW TE 8.8 M 10X30 ZINC.          | 12   |
| 6    | 16105CF2B0 | OIL PUMP FLANGE                      | 1    | 58   | 4026121305 | SCREW TCEI 8,8 M 6X16 ZINC.         | 2    |
| 7    | 1611001400 | FAN HUB                              | 2    | 59   | 4026121307 | SCREW TCEI 8,8 M 6X20 ZINC.         | 10   |
| 8    | 1621507900 | RV 520 ROTOR                         | 1    | 60   | 4026121401 | SCREW TCEI 8,8 M 8X12 ZINC.         | 2    |
| 9    | 1622002600 | OIL PUMP DRIVE                       | 1    | 61   | 4026121405 | SCREW TCEI 8,8 M 8X20 ZINC.         | 3    |
| 9 A  | 4026414617 | PIN 3X40 (FOR RV 520 CCW)            | 1    | 62   | 4026121710 | SCREW TCEI 8,8 M 12X35 ZINC.        | 2    |
| 10   | 1622010200 | CONVEYOR DOWEL PIN                   | 2    | 63   | 4026121719 | SCREW TCEI 8,8 M12X80 ZINC.         | 4    |
| 11   | 1623100500 | INSIDE VALVE COVER                   | 1    | 64   | 4026121815 | SCREW TCEI 8,8 M 10X60 ZINC.        | 6    |
| 12   | 1624042100 | SHAFT SPACER                         | 2    | 65   | 4026122005 | SCREW TBEI 10,9 M 10X15 ZINC.       | 8    |
| 13   | 1624042800 | SIDE OIL TANK SPACER                 | 2    | 66   | 4026135415 | GRUB SCREW 12,9 M 8X50              | 1    |
| 14   | 162409YKB0 | SPRING SPACER                        | 1    | 67   | 4026135504 | GRUB SCREW 12,9 M 10X10             | 1    |
| 15   | 1624202300 | INSIDE VALVE SPACER                  | 1    | 68   | 4026171211 | STUD SCREW. 8,8 M 12X80 ZINC        | 2    |
| 16   | 1626001100 | SEAL BUSHING                         | 2    | 69   | 4026300025 | COMPENSATION RING LMKAS100C         | 2    |
| 17   | 1627105100 | CONVEYOR                             | 3    | 70   | 4026305508 | SELF-LOCKING NUT M12.               | 2    |
| 18   | 1627105200 | CONVEYOR WITH SUPPORT                | 1    | 71   | 4026308005 | NUT M8 GALV.                        | 2    |
| 19   | 16275007E0 | MANIFOLD                             | 1    | 72   | 4026350503 | WASHER GROWER 6 ZINC.               | 12   |
| 20   | 16401008E0 | CLAPET COVER                         | 1    | 73   | 4026350505 | WASHER GROWER 8 ZINC.               | 3    |
| 21   | 1642008300 | CONVEYOR PROTECTION                  | 1    | 74   | 4026350506 | WASHER GROWER 10 ZINC.              | 6    |
| 22   | 1642008400 | CONVEYOR WITH SUPPORT PROTECTION     | 1    | 75   | 4026350508 | WASHER GROWER 12 ZINC.              | 6    |
| 23   | 1642100200 | REAR OIL PUMP PROTECTION             | 1    | 76   | 4026350706 | WASHER GROWER 8 ZINC. PIATTA        | 26   |
| 24   | 1650022100 | RV REAR SHAFT                        | 1    | 77   | 4026351506 | WASHER M10 ZINC.                    | 12   |
| 25   | 1650022200 | RV FRONT SHAFT                       | 1    | 78   | 4026357003 | FLAT WASHER M6 ZINC.                | 2    |
| 26   | 16630050E0 | PIPE TANK RV520 RH                   | 1    | 79   | 4026357007 | FLAT WASHER M12 ZINC.               | 2    |
|      | 16630051E0 | PIPE TANK RV520 LH                   | 1    | 80   | 4026426703 | RUBBER BAND D.6,5                   | 2    |
| 27   | 1663069900 | OIL PUMP – REAR FLANGE OIL LINE      | 1    | 81   | 4026501006 | TAB 12X8X56                         | 1    |
| 28   | 1663064500 | OIL PUMP – ANTERIOR FLANGE RV520 RH  | 1    | 82   | 4026702000 | CONNECTION UN.DIR. 4X1/8            | 4    |
|      | 1663065100 | OIL PUMP – ANTERIOR FLANGE RV520 LH  | 1    | 83   | 4026706000 | CONNECTION UNIV.90°4X1/8            | 2    |
| 29   | 1663064700 | REAR RH/ANTERIOR LH HOUSING OIL LINE | 1    | 84   | 4026706003 | CONNECTION 90° 6X1/8                | 2    |
|      | 1663064900 | ANTERIOR RH/REAR LH HOUSING OIL LINE | 1    | 85   | 4026706101 | ADJUSTABLE CONNECTION 4-1/8         | 2    |
| 30   | 1663064900 | ANTERIOR RH/REAR LH HOUSING OIL LINE | 1    | 86   | 4026904503 | PLUG M20X1,5                        | 1    |
|      | 1663064700 | REAR RH/ANTERIOR LH HOUSING OIL LINE | 1    | 87   | 4026910103 | PLUG G1                             | 1    |
| 31   | 1672001600 | SPECIAL SCREW TCEI M10X1,5           | 10   | 88   | 4028360000 | FRONT FAN (FOR RV520 RIGHT VERSION) | 1    |
| 32   | 1673001000 | OIL FILTER PLUG                      | 1    |      | 4028360001 | FRONT FAN (FOR RV520 LEFT VERSION)  | 1    |
| 33   | 1680610200 | MANIFOLD GASKET                      | 2    | 89   | 4028360001 | REAR FAN (FOR RV520 RIGHT VERSION)  | 1    |
| 34   | 16807011E0 | CLAPET COVER GASKET                  | 1    |      | 4028360000 | REAR FAN (FOR RV520 LEFT VERSION)   | 1    |
| 35   | 1680707300 | FRONT FLANGE GASKET                  | 2    | 90   | 4029602701 | NUT M8 PROTECTION                   | 1    |
| 36   | 1680707800 | INSIDE VALVE COVER GASKET            | 1    |      |            |                                     |      |
| 37   | 1685002800 | WASHER FE 30X8,5 SP.4 ZINC.          | 1    |      | 1892006000 | KIT GASKET RV 520                   | 1    |
| 38   | 1685100300 | WASHER D20 ALU                       | 2    |      | 1892006400 | KIT SHAFT ANTERIEUR RV 360-520      | 1    |
| 39   | 1685100800 | WASHER 8X14X1,5                      | 2    |      | 1892006500 | KIT REAR SHAFT RV 360-520           | 1    |
| 40   | 1687509400 | RV 520 HOUSING                       | 1    |      |            |                                     |      |
| 41   | 1687600000 | SIDE OIL TANK                        | 1    |      |            |                                     |      |
| 42   | 1691000000 | SPRING                               | 1    |      |            |                                     |      |
| 43   | 18930008E0 | CLAPET                               | 1    |      |            |                                     |      |
| 44   | 4022200030 | SEAL 41X27X10 GP NBR1                | 1    |      |            |                                     |      |
| 45   | 4022200044 | SEAL 65X45X8                         | 2    |      |            |                                     |      |
| 46   | 4022200113 | SEAL 70X55X15 VITON                  | 2    |      |            |                                     |      |
| 47   | 4022200309 | O-RING 4875 VITON                    | 2    |      |            |                                     |      |
| 48   | 4022300001 | FILTER IN NYLON D.6                  | 1    |      |            |                                     |      |
| 49   | 4023100047 | BEARING 6309/C3                      | 1    |      |            |                                     |      |
| 50   | 4023105008 | BEARING 21309 E/C3                   | 1    |      |            |                                     |      |
| 51   | 4023130035 | BUSHING 55X45X22                     | 2    |      |            |                                     |      |
| 52   | 4024251000 | 2-WAY RH OIL PUMP                    | 1    |      |            |                                     |      |
|      | 4024251500 | 2-WAY LH OIL PUMP                    | 1    |      |            |                                     |      |

**RV 360-520 HYD**



PICTURE SHOW:  
RV 360 HDR - CODE: E468109440  
RV 520 HDR - CODE: E478109440

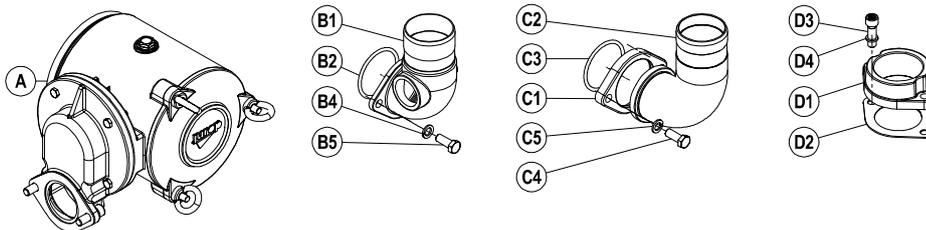
| Pos.              | Code       | Description                         | Q.ty | Pos.              | Code       | Description                      | Q.ty |
|-------------------|------------|-------------------------------------|------|-------------------|------------|----------------------------------|------|
| <b>RV 360 HYD</b> |            |                                     |      | <b>RV 520 HYD</b> |            |                                  |      |
| H1 *              | 1470106700 | HDR RV COUPLING                     | 1    | H1 *              | 1470106700 | HDR RV COUPLING                  | 1    |
| H2                | 1610052300 | HDR RV FLANGE COUPLING              | 1    | H2                | 1610052300 | HDR RV FLANGE COUPLING           | 1    |
| H3                | 1612501000 | HDR MOTOR MOUNTING FLANGE           | 1    | H3                | 1612501000 | HDR MOTOR MOUNTING FLANGE        | 1    |
| H4                | 1617015500 | TAB RV360-520 HDR                   | 1    | H4                | 1617015500 | TAB RV360-520 HDR                | 1    |
| H5                | 16171001E0 | SQUARE HDR                          | 1    | H5                | 16171001E0 | SQUARE HDR                       | 1    |
| H6                | 1622010200 | RV CONVEYOR DOWEL PIN               | 4    | H6                | 1622010200 | RV CONVEYOR DOWEL PIN            | 4    |
| H7 *              | 1624042300 | HDR RV COUPLING SEAL SPACER         | 2    | H7 *              | 1624042300 | HDR RV COUPLING SEAL SPACER      | 2    |
| H8                | 1627105200 | RV CONVEYOR WITH SUPPORT            | 2    | H8                | 1627105200 | RV CONVEYOR WITH SUPPORT         | 2    |
| H9                | 1642008400 | CONVEYOR WITH SUPPORT PROTECTION    | 2    | H9                | 1642008400 | CONVEYOR WITH SUPPORT PROTECTION | 2    |
| H10 *             | 4022200011 | SEAL A 64X80X8 NBR                  | 2    | H10 *             | 4022200011 | SEAL A 64X80X8 NBR               | 2    |
| H11               | 4024107009 | RV360 HYDRAULIC MOTOR               | 1    | H11               | 4024107001 | RV520 HYDRAULIC MOTOR            | 1    |
| H12               | 4026103004 | SCREW TE 8,8 M12X40 UNI5739 GALV.   | 4    | H12               | 4026103004 | SCREW TE 8,8 M12X40 GALV.        | 2    |
| H13               | 4026103111 | SCREW TE 8,8 M14X45 GALV.           | 4    | H13               | 4026103111 | SCREW TE 8,8 M14X45 GALV.        | 4    |
| H14               | 4026121409 | SCREW TCEI 8,8 M8X40 UNI5931 GALV.  | 3    | H14               | 4026121409 | SCREW TCEI 8,8 M8X40 GALV.       | 3    |
| H15               | 4026121713 | SCREW TCEI 8,8 M12X80 UNI5931 GALV. | 2    | H15               | 4026121713 | SCREW TCEI 8,8 M12X50 GALV.      | 2    |
| H16               | 4026121719 | SCREW TCEI 8,8 M10X60 UNI5931 GALV. | 4    | H16               | 4026121719 | SCREW TCEI 8,8 M12X80 GALV.      | 6    |
| H17               | 4026121815 | SCREW TBEI 10,9 M10X15 GALV.        | 8    | H17               | 4026121815 | SCREW TCEI 8,8 M10X60 GALV.      | 6    |
| H18               | 4026122005 | SCREW 12,9 M8X12                    | 8    | H18               | 4026122005 | SCREW TBEI 10,9 M10X15 GALV.     | 8    |
| H19 *             | 4026136005 | SCREW 12,9 M8X20                    | 1    | H19 *             | 4026136005 | SCREW 12,9 M8X12                 | 1    |
| H20 *             | 4026136009 | SCREW TCEI 8,8 M8X40 UNI5931 GALV.  | 1    | H20 *             | 4026136009 | SCREW 12,9 M8X20                 | 1    |
| H21               | 4026171203 | SCREW 8,8 M12X40 GALV.              | 2    | H21               | 4026171203 | SCREW 8,8 M12X40 GALV.           | 2    |
| H22               | 4026305508 | SELF-LOCKING NUT M12                | 4    | H22               | 4026305508 | SELF-LOCKING NUT M12             | 4    |
| H23               | 4026350505 | WASHER GROWER 8 GALV.               | 6    | H23               | 4026350505 | WASHER GROWER 8 GALV.            | 6    |
| H24               | 4026350506 | WASHER GROWER 10 GALV.              | 8    | H24               | 4026350506 | WASHER GROWER 10 GALV.           | 6    |
| H25               | 4026350508 | WASHER GROWER 12 GALV.              | 8    | H25               | 4026350508 | WASHER GROWER 12 GALV.           | 10   |
| H26               | 4026350709 | WASHER GROWER 12 FLAT SEC. GALV.    | 4    | H26               | 4026350709 | WASHER GROWER 12 GALV.           | 4    |
| H27               | 4026350710 | WASHER GROWER 14 FLAT SEC. GALV.    | 4    | H27               | 4026350710 | WASHER GROWER 14 GALV.           | 4    |
| H28               | 4026359001 | WASHER 40X33,5X1,5                  | 1    | H28               | 4026359001 | WASHER 40X33,5X1,5               | 1    |
| H29 *             | 4026510040 | SEEGER E63 UNI7435-30               | 2    | H29 *             | 4026510040 | SEEGER E63 UNI7435-30            | 2    |
| H30               | 4026711003 | SAE G1"1/4 FLANGE                   | 1    | H30               | 4026904003 | PLUG G1 GALV.                    | 1    |
| H31               | 4026711004 | SAE G1"1/2 FLANGE                   | 1    |                   |            |                                  |      |
| H32               | 4026904003 | PLUG G1 GALV.                       | 1    |                   |            |                                  |      |
| *                 | 1892006300 | COMPLETE JOINT KIT RV HDR           |      | *                 | 1892006300 | COMPLETE JOINT KIT RV HDR        |      |

**RV 360-520 FL**


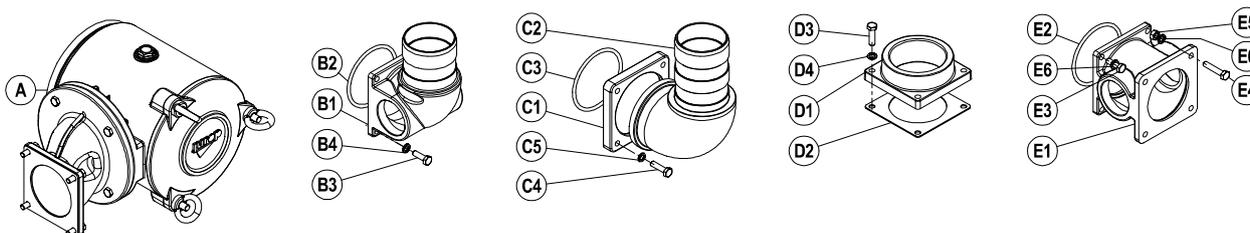
| Pos.             | Code              | Description                       | Q.ty | Pos.             | Code              | Description                      | Q.ty |
|------------------|-------------------|-----------------------------------|------|------------------|-------------------|----------------------------------|------|
| <b>RV 360 FL</b> |                   |                                   |      | <b>RV 520 FL</b> |                   |                                  |      |
| F1               | 1627505500        | FLANGED MANIFOLD                  | 1    | F1               | 1627504800        | FLANGED MANIFOLD                 | 1    |
|                  | 1627505600        | THREADED MANIFOLD (G2" ½)         | 1    |                  | 1627504900        | THREADED MANIFOLD (G4)           | 1    |
| F2               | 1680611400        | DISCHARGE SIDE MANIFOLD GASKET    | 1    | F2               | 1680610200        | MANIFOLD GASKET                  | 2    |
|                  | 1680611500        | SUCTION SIDE MANIFOLD GASKET      | 1    | F3               | 4026102807        | SCREW TE 8,8 M8X25 UNI5931 GALV. | 12   |
| F3               | 4026102807        | SCREW TE 8,8 M8X25 UNI5931 GALV.  | 12   | F4               | 4026135504        | SCREW 12,9 M10X10 GALV.          | 1    |
| F4               | 4026135504        | SCREW 12,9 M10X10 GALV.           | 1    | F5               | 4026350706        | WASHER GROWER 8 FLAT SEC. GALV.  | 12   |
| F5               | 4026350706        | WASHER GROWER 8 FLAT SEC. GALV.   | 12   |                  | <b>1852103900</b> | <b>ADJUSTABLE CONVEYOR Ø80</b>   |      |
|                  | <b>1852109000</b> | <b>ADJUSTABLE CONVEYOR Ø76</b>    |      |                  | <b>1852104000</b> | <b>ADJUSTABLE CONVEYOR Ø100</b>  |      |
| C1               | 1610100000        | CONVEYOR FLANGE                   | 1    | C1               | 1610101100        | CONVEYOR FLANGE                  | 1    |
| C2               | 1627100500        | CONVEYOR Ø76                      | 1    | C2               | 1627102700        | CONVEYOR Ø80                     | 1    |
| C3               | 4022200307        | O-RING 6287                       | 1    |                  | 1627102400        | CONVEYOR Ø100                    | 1    |
| C4               | 4026103002        | SCREW TE M12X30 UNI5739 GALV.     | 2    | C3               | 4022200310        | O-RING 6362                      | 1    |
| C5               | 4026350709        | WASHER GROWER 12 FLAT. SEC. GALV. | 2    | C4               | 4026102808        | SCREW TE M8X30 UNI5739 GALV.     | 4    |
|                  |                   |                                   |      | C5               | 4026350706        | WASHER GROWER 8 FLAT SEC. GALV.  | 4    |

**RV ACCESSORIES**

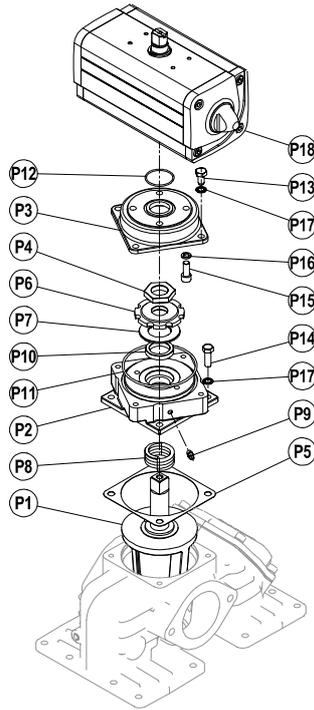
**RV 360**



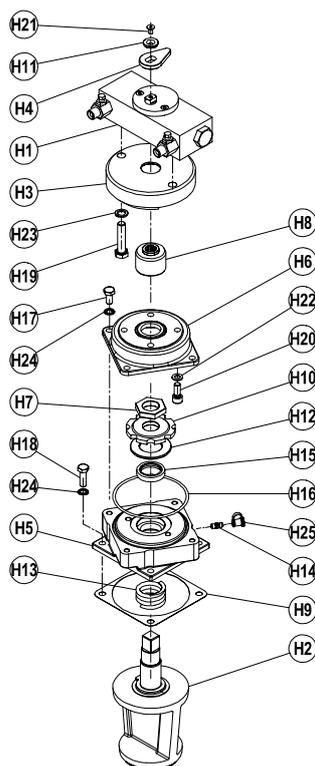
**RV 520**



| Pos.          | Code       | Description                       | Q.ty | Pos.          | Code       | Description                      | Q.ty |
|---------------|------------|-----------------------------------|------|---------------|------------|----------------------------------|------|
| <b>RV 360</b> |            |                                   |      | <b>RV 520</b> |            |                                  |      |
| A             | 18521CNGB0 | SUCTION UNIT WITH FILTER          |      | A             | 185212L4B0 | SUCTION UNIT WITH FILTER         |      |
|               | 1852108900 | FIXED SUCTION CONVEYOR Ø76        |      |               | 1852103400 | FIXED SUCTION CONVEYOR Ø80       |      |
|               | 1852108600 | FIXED SUCTION CONVEYOR Ø80        |      |               | 1852103500 | FIXED SUCTION CONVEYOR Ø100      |      |
| B1            | 1627100200 | SUCTION CONVEYOR Ø76              | 1    | C1            | 1627101300 | SUCTION CONVEYOR Ø80             | 1    |
|               | 1627100300 | SUCTION CONVEYOR Ø80              | 1    |               | 1627101200 | SUCTION CONVEYOR Ø100            | 1    |
| B2            | 4022200307 | O-RING 6287 VITON                 | 1    | C2            | 4022200310 | O-RING 6362                      | 1    |
| B3            | 4026103002 | SCREW TE M12X30 ZINC.             | 2    | C3            | 4026102807 | SCREW TE M8X25 GALV.             | 4    |
| B4            | 4026350709 | WASHER GROWER 12                  | 2    | C4            | 4026350706 | WASHER GROWER 8 FLAT SEC. GALV.  | 4    |
|               | 1852109000 | ADJUSTABLE CONVEYOR Ø76           |      |               | 1852103900 | ADJUSTABLE CONVEYOR Ø80          |      |
| C1            | 1610100000 | CONVEYOR FLANGE                   | 1    |               | 1852104000 | ADJUSTABLE CONVEYOR Ø100         |      |
| C2            | 1627100500 | CONVEYOR Ø76                      | 1    | C1            | 1610101100 | CONVEYOR FLANGE                  | 1    |
| C3            | 4022200307 | O-RING 6287                       | 1    | C2            | 1627102700 | CONVEYOR Ø80                     | 1    |
| C4            | 4026103002 | SCREW TE M12X30 UNI5739 GALV.     | 2    |               | 1627102400 | CONVEYOR Ø100                    | 1    |
| C5            | 4026350709 | WASHER GROWER 12 FLAT. SEC. GALV. | 2    | C3            | 4022200310 | O-RING 6362                      | 1    |
|               | 1852111600 | FLANGE 2" ½ NPT KIT               |      | C4            | 4026102808 | SCREW TE M8X30 UNI5739 GALV.     | 4    |
| D1            | 1610101400 | FLANGE 2" ½ NPT                   | 1    | C5            | 4026350706 | WASHER GROWER 8 FLAT SEC. GALV.  | 4    |
| D2            | 1680614500 | MANIFOLD GASKET                   | 1    |               | 1852111700 | FLANGE 3" NPT                    |      |
| D3            | 4026121711 | SCREW TCEI 8,8 M12X40 GALV.       | 2    | D1            | 1610101500 | FLANGE 3" NPT                    | 1    |
| D4            | 4026350508 | WASHER GROWER 12 GALV.            | 2    | D2            | 1680709900 | MANIFOLD GASKET                  | 1    |
|               |            |                                   |      | D3            | 4026102808 | SCREW TCEI 8,8 M8X30 GALV.       | 4    |
|               |            |                                   |      | D4            | 4026350706 | WASHER GROWER 8 GALV.            | 4    |
|               |            |                                   |      |               | 1852104100 | KIT FOR SAFETY VALVE             |      |
|               |            |                                   |      | E1            | 1627102500 | SAFETY VALVE G2 SUPPORT          | 1    |
|               |            |                                   |      | E2            | 4022200310 | O-RING 6362                      | 1    |
|               |            |                                   |      | E3            | 4026102807 | SCREW TE 8,8 M8X25 UNI5739 GALV. | 4    |
|               |            |                                   |      | E4            | 4026102810 | SCREW TE 8,8 M8X40 UNI5739 GALV. | 4    |
|               |            |                                   |      | E5            | 4026308005 | NUT M8 UNI5588 GALV.             | 4    |
|               |            |                                   |      | E6            | 4026350706 | WASHER GROWER 8 FLAT SEC. GALV.  | 8    |



| Pos. | Code              | Description                         | Q.ty | Pos. | Code              | Description                         | Q.ty |
|------|-------------------|-------------------------------------|------|------|-------------------|-------------------------------------|------|
|      |                   | <b>RV 360</b>                       |      |      |                   | <b>RV 520</b>                       |      |
|      | <b>143028B7B0</b> | <b>PNEUMATIC OPERATED 4-WAY KIT</b> |      |      | <b>143028GZB0</b> | <b>PNEUMATIC OPERATED 4-WAY KIT</b> |      |
| P1   | 160858KNB0        | INSIDE VALVE                        | 1    | P1   | 160858KBB0        | INSIDE VALVE                        |      |
| P2   | 161258B4B0        | SUPPORT FLANGE                      | 1    | P2   | 161258H0B0        | SUPPORT FLANGE                      | 1    |
| P3   | 1640580QB0        | COVER                               | 1    | P3   | 1640580QB0        | COVER                               | 1    |
| P4   | 167007ZAB0        | NUT                                 | 1    | P4   | 167007ZAB0        | NUT                                 | 1    |
| P5   | 1680700200        | GASKET                              | 1    | P5   | 1680707800        | CONVEYOR-CAP GASKET                 | 1    |
| P6   | 168409PQB0        | WASHER                              | 1    | P6   | 168409PQB0        | WASHER                              | 1    |
| P7   | 168529TFB0        | SPACER                              | 1    | P7   | 168529TFB0        | SPACER                              | 1    |
| P8   | 1691000200        | SPRING                              | 1    | P8   | 1691000200        | SPRING                              | 1    |
| P9   | 4022100100        | GREASER M6X1                        | 1    | P9   | 4022100100        | GREASER M6X1                        | 1    |
| P10  | 4022200005        | SEAL 37X27X7                        | 1    | P10  | 4022200005        | SEAL 37X27X7                        | 1    |
| P11  | 4022200330        | OR SEAL 3375                        | 1    | P11  | 4022200330        | OR SEAL 3375                        | 1    |
| P12  | 4022200331        | OR SEAL 2137                        | 1    | P12  | 4022200331        | OR SEAL 2137                        | 1    |
| P13  | 4026102804        | SCREW TE M8X16                      | 4    | P13  | 4026102804        | SCREW TE M8X16                      | 1    |
| P14  | 4026102807        | SCREW TE M8X25                      | 4    | P14  | 4026102807        | SCREW TE M8X25 GALV.                | 4    |
| P15  | 4026121405        | SCREW TCEI M8X20                    | 4    | P15  | 4026121405        | SCREW TCEI M8X20 GALV.              | 4    |
| P16  | 4026350505        | WASHER GROWER 8 GALV.               | 4    | P16  | 4026350505        | WASHER GROWER 8 GALV.               | 4    |
| P17  | 4026351505        | WASHER M8                           | 8    | P17  | 4026351505        | WASHER M8 GALV.                     | 4    |
| P18  | 4027100405        | PNEUMATIC ACTUATOR                  | 1    | P18  | 4027100405        | PNEUMATIC ACTUATOR                  | 8    |



| Pos.          | Code              | Description                         | Q.ty | Pos.          | Code              | Description                         | Q.ty |
|---------------|-------------------|-------------------------------------|------|---------------|-------------------|-------------------------------------|------|
| <b>RV 360</b> |                   |                                     |      | <b>RV 520</b> |                   |                                     |      |
|               | <b>14302033E0</b> | <b>HYDRAULIC OPERATED 4-WAY KIT</b> |      |               | <b>14302032E0</b> | <b>HYDRAULIC OPERATED 4-WAY KIT</b> |      |
| H1            | 14302031E0        | HYDRAULIC ACTUATOR                  | 1    | H1            | 14302031E0        | HYDRAULIC ACTUATOR                  | 1    |
| H2            | 160858KNB0        | INSIDE VALVE                        | 1    | H2            | 160858KBB0        | INSIDE VALVE                        | 1    |
| H3            | 16100416E0        | HYDRAULIC ACTUATOR FLANGE           | 1    | H3            | 16100416E0        | HYDRAULIC ACTUATOR FLANGE           | 1    |
| H4            | 16120286K0        | PLATE                               | 1    | H4            | 16120286K0        | PLATE                               | 1    |
| H5            | 161258B4B0        | SUPPORT FLANGE                      | 1    | H5            | 161258H0B0        | SUPPORT FLANGE                      | 1    |
| H6            | 1640580QB0        | COVER                               | 1    | H6            | 1640580QB0        | COVER                               | 1    |
| H7            | 167007ZAB0        | NUT                                 | 1    | H7            | 167007ZAB0        | NUT                                 | 1    |
| H8            | 16732001E0        | COUPLER                             | 1    | H8            | 16732001E0        | COUPLER                             | 1    |
| H9            | 1680700200        | CONVEYOR-CAP GASKET                 | 1    | H9            | 1680707800        | CONVEYOR-CAP GASKET                 | 1    |
| H10           | 168409PQB0        | RING NUT                            | 1    | H10           | 168409PQB0        | RING NUT                            | 1    |
| H11           | 16850007E0        | WASHER M5                           | 1    | H11           | 16850007E0        | WASHER M5                           | 1    |
| H12           | 168529TFB0        | SPACER                              | 1    | H12           | 168529TFB0        | SPACER                              | 1    |
| H13           | 1691000200        | SPRING                              | 1    | H13           | 1691000200        | SPRING                              | 1    |
| H14           | 4022100100        | GREASER M6X1                        | 1    | H14           | 4022100100        | GREASER M6X1                        | 1    |
| H15           | 4022200005        | Y-SEAL 37X27X7                      | 1    | H15           | 4022200005        | Y-SEAL 37X27X7                      | 1    |
| H16           | 4022200330        | O-RING 3375                         | 1    | H16           | 4022200330        | O-RING 3375                         | 1    |
| H17           | 4026102804        | SCREW TE M8X16 GALV.                | 4    | H17           | 4026102804        | SCREW TE M8X16 GALV.                | 4    |
| H18           | 4026102807        | SCREW TE M8X25 GALV.                | 4    | H18           | 4026102807        | SCREW TE M8X25 GALV.                | 4    |
| H19           | 4026102911        | SCREW TE M10X45 GALV.               | 2    | H19           | 4026102911        | SCREW TE M10X45 GALV.               | 2    |
| H20           | 4026121405        | SCREW TCEI M8X20 GALV.              | 4    | H20           | 4026121405        | SCREW TCEI M8X20 GALV.              | 4    |
| H21           | 4026155002        | SCREW INOX304 TSPEI M5X10           | 1    | H21           | 4026155002        | SCREW INOX304 TSPEI M5X10           | 1    |
| H22           | 4026312B01        | WASHER DA 8                         | 4    | H22           | 4026312B01        | WASHER DA 8                         | 4    |
| H23           | 4026350708        | WASHER M8 GALV.                     | 2    | H23           | 4026350708        | WASHER GROWER 10 GALV.              | 2    |
| H24           | 4026351505        | SCREW TE M8X25 GALV.                | 8    | H24           | 4026351505        | WASHER M8 GALV.                     | 8    |
| H25           | 4029602700        | PROTECTION CAP                      | 1    | H25           | 4029602700        | PROTECTION CAP                      | 1    |

## 10. Cooling fans installation instructions

### Material

| Code       | Description                                     |
|------------|---|
| 4025428111 | 4 SCREW LOCKING COLLAR                          |
| 4028360000 | CLOCKWISE ROTATION FAN                          |
| 4028360001 | COUNTER CLOCKWISE ROTATION FAN                  |
| 1611001400 | FAN HUB   |
| 4046850012 | THREAD-LOCKER MEDIUM RESISTANCE LOCTITE 243 (*) |

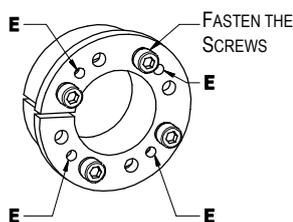
(\*): 10 cc tube available upon request.

### Before installation

- Clean all the components: remove dirt and particles that can prevent a correct assembly.
- Prepare the locking element:
  - Align bushing keys.
  - Apply medium resistance thread-locker on the locking screw threads. Pour on the thread evenly.
  - Fasten the 4 screws and leave them loose by at least 2 full turns.
- Do not use the threaded holes that can be seen on the locking collar front. These are used for the disassemble.



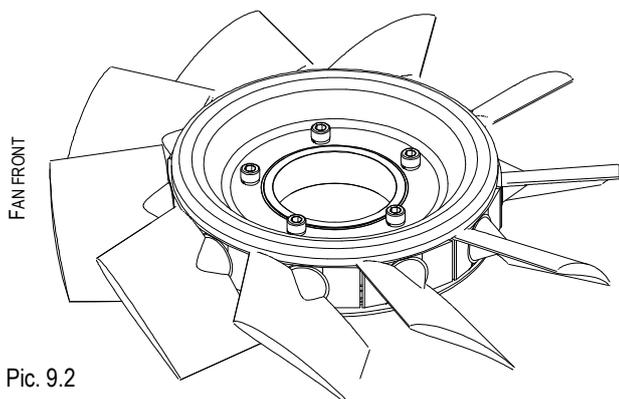
**Do not use the threaded holes that can be seen on the locking collar front. These are used for the disassemble.**



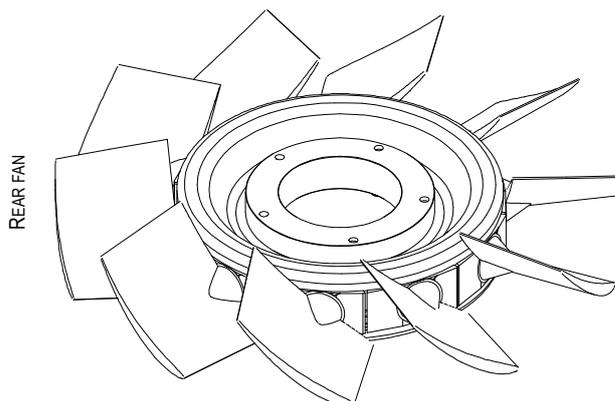
Pic. 9.1

E: Threaded holes for disassembly

- Install the steel hub and the fan by means of the 5 screws and washers.
- Apply medium resistance thread-locker on the locking screw threads. Pour on the thread evenly.
- Fasten the screws following a cross shake pattern.
- Check the screw fastening twice to be sure they have been evenly tightened.



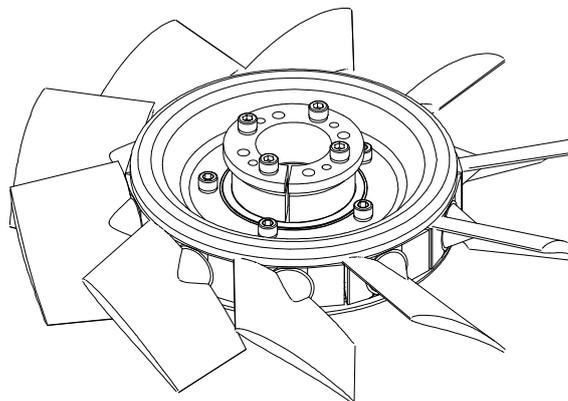
Pic. 9.2



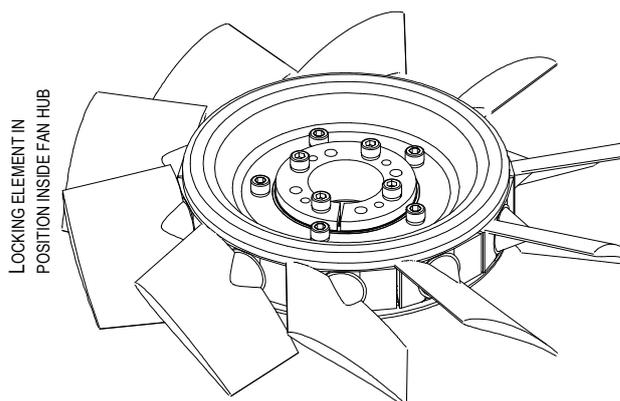
Pic. 9.3

### Installation

- Insert the locking collar inside the fan hub as shown in pictures below, until in touch with the fan hub.



Pic. 9.4



Pic. 9.5

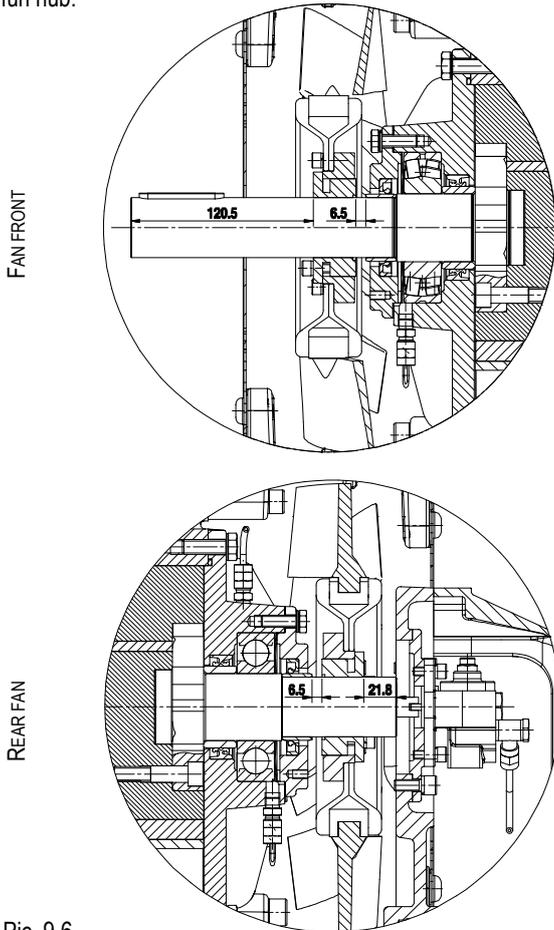
- Install pre assembled fan on the shaft.
- Be careful to respect the suggested distance of 9 mm in between the fan hub and the end of stroke on the shaft.



**Respect the suggested distance of 9 mm in between the fan hub and the end of stroke on the shaft.**

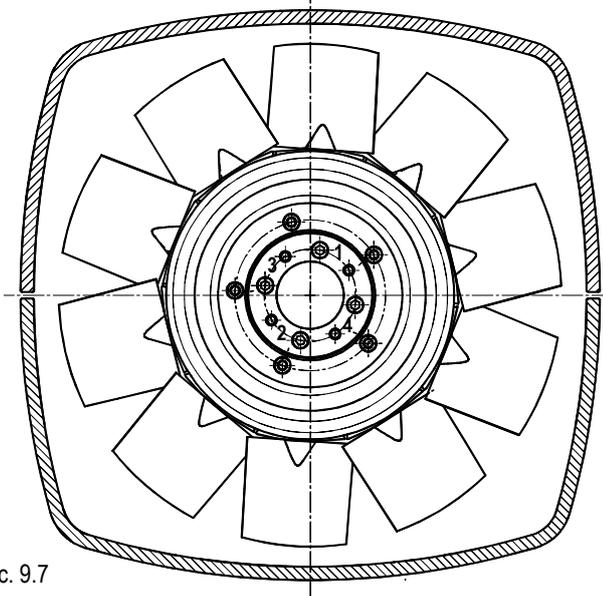
- Use a spacer to keep the suggested distance.

- Bring in position, and keep the locking element in touch with the fan hub.



Pic. 9.6

- Use just 4 screws with Torque=17Nm:
  - 1° time: Tighten the 4 screws on the locking collar (Torque=17Nm) Fasten them following a cross shaped pattern;
  - 2° time: Lower the torque to 16Nm and fasten the screws again, always following a cross-shaped pattern.
  - 3° time: If necessary, check one last time the screws (Torque=16Nm) to be sure that they have been tightened evenly.

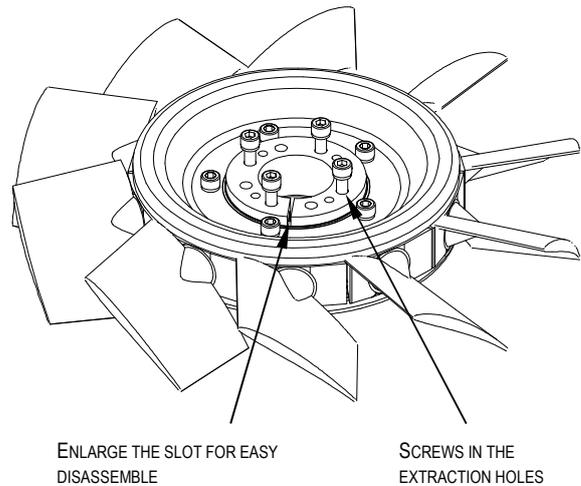


Pic. 9.7

### Disassemble

- Remove the 4 screws that keep the locking collar in place (Pic. 9.8).
- If possible, use an impulse screwdriver.
- Heat the hub with if the screws are stuck because of dirt, rust or if thread locking glue has been used.
- Once the two parts of the locking collar separate, it's possible to remove the fan from the shaft.
- If needed, insert a flat head screwdriver in the crack, to help the removal.

 **Heat the hub with if the screws are stuck because of dirt, rust or if thread locking glue has been used.**



Pic. 9.8

| <b>Model</b> | <b>Issue date</b> | <b>Revision No.</b> | <b>Revision date</b> | <b>Filled out by</b> | <b>Viewed by</b> |
|--------------|-------------------|---------------------|----------------------|----------------------|------------------|
| RV 360 - 520 | 10-09-2013        | 11                  | 20-10-2021           | U.T.                 | A.T.             |

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