

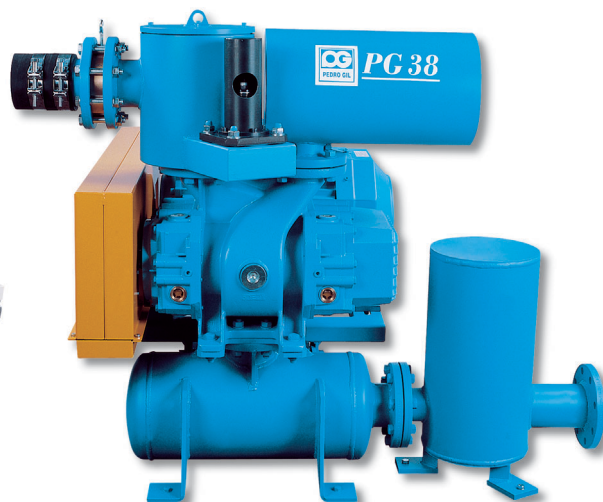
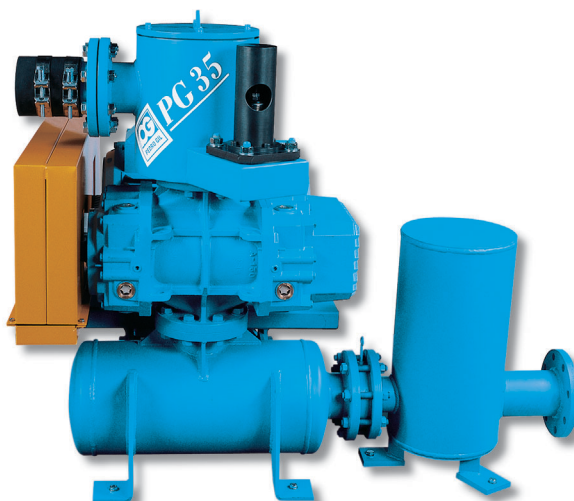
ROTARY PISTON BLOWERS

(ROOTS-type compressors)



INSTRUCTION MANUAL
for starting and maintenance

MODEL: RN - RNT - RNT/E
RNF
RNG - RNGT - RNGT/E
RNP - RNPT
RS



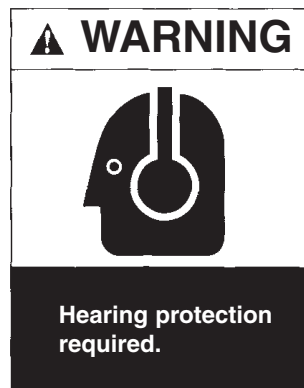
MODEL	SIZE	SERIAL N°

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SAFETY INSTRUCTIONS

- Do not use the machine before reading the enclosed instruction manual
- Use suitable protection and the necessary equipment for the possible hazards arising from the installation and use of this equipment



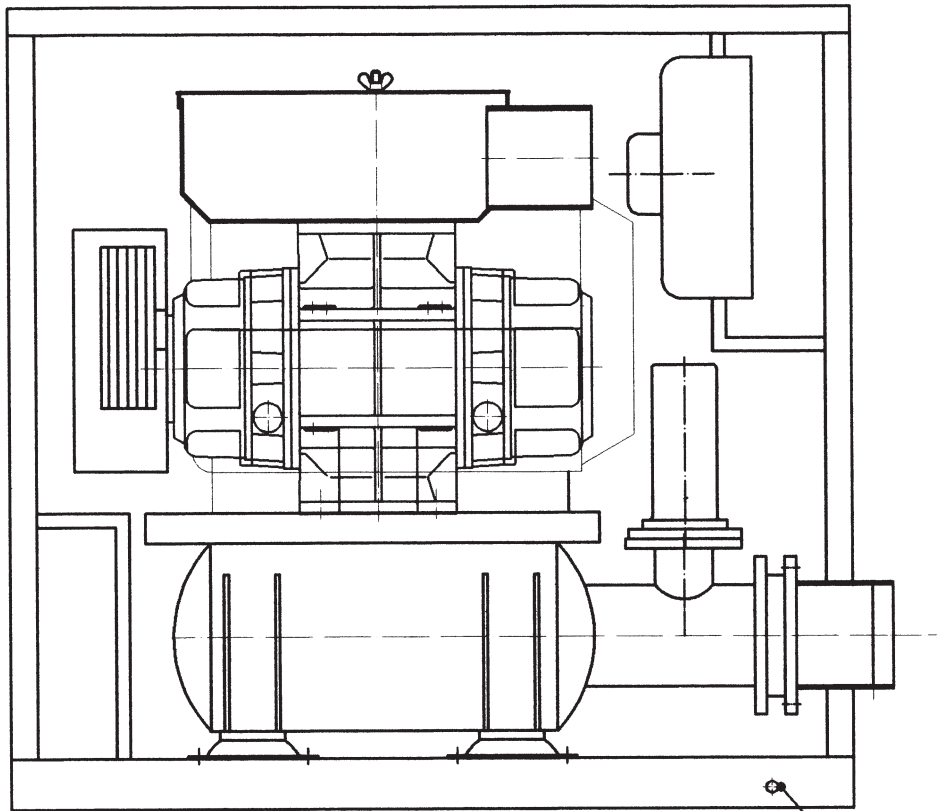
SAFETY WARNINGS

- Keep your body and clothes away from the rotating machinery and the intake and exit openings.
- Ears must be protected from the high noise levels.
- The high temperatures of the blower may cause burns if touched.
- The protection for the drive belts and coupling must be correctly fitted.
- The mounting for the blower and the motor must be checked.

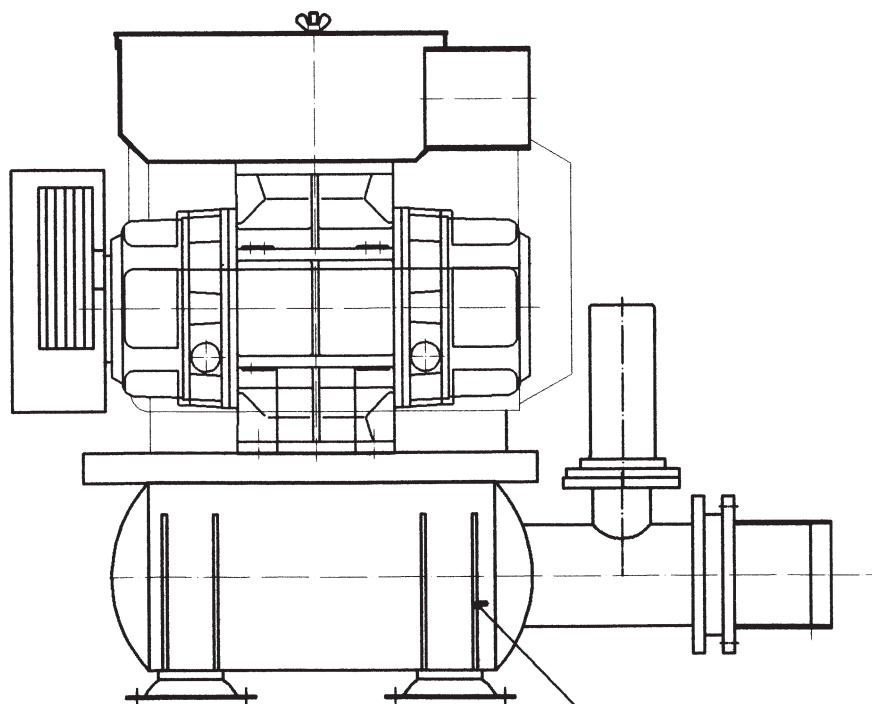
WARNING

The safety precautions set out above can be seen on stickers on each of the machines supplied. Under no circumstances should the stickers be removed, painted over or covered. Non-fulfilment of or lack of attention given to these safety warnings could lead to serious injury to workers operating or maintaining the machine.

POSITION OF EARTHING CONNECTIONS



EARTHING THE CABIN



EARTHING THE UNIT



1.0 FOREWORD

PEDRO GIL, S.A. (hereinafter PG), has produced this manual to provide the necessary information to carry out the safe, correct and efficient procedures for the starting and maintenance of the blowers and compact units it manufactures. The workers responsible for these operations must have read and understood this manual.

This machine has been manufactured and assembled according to the guidelines set out in European safety regulations. This manual makes up a part of the documentation required by the aforementioned regulations and adds to them by providing specific instructions for PG machinery, with the intention of maximising safety, for both workers and materials.

2.0 SAFETY INSTRUCTIONS

- Do not start up the unit before reading the instruction manual.
- Disconnect the power supply when you need to work with the machine or one of its components.
- Use suitable protection and the equipment necessary for any possible hazards arising from the operation or installation of this machine
- Keep your body and clothes away from the rotating machinery and the intake and exit openings of air or gases to be propelled.
- Without a cabin, ears must be protected from noise levels.
- The temperatures generated by compression within the blower can cause burns.
- The protection for the drive must always be attached and fitted correctly. If, for any reason, the unit is to be disassembled, it must be stopped beforehand.
- The mountings for the blower, motor and accessories must be inspected regularly.
- If the blower unit incorporates a soundproof cabin, it will not start up until all of the panels and the door have been positioned correctly and closed. If it is necessary to move the panel where the fan is located, it must always have stopped before removal.
- In order to avoid shock from static electricity, connect the earths for both the muffler bed and the soundproof cabin, as necessary (see diagram). The earth connection must be made using a cable with a minimum diameter of 16 mm².
- Do not use the blower unless these limits regarding operating conditions are fulfilled.
- An emergency stop button must be provided so the blower can be stopped if necessary.
- Never start up the blower when either the suction or thrust clamps, or both, are open.
- When cleaning or removing grease from the blower, always do so when the machine is cold, using non-toxic liquids or mixtures. Some of these fluids can react violently to heat.
- If the machinery has to be manipulated, this must be carried out by persons qualified to do so.
- If you have any problems or doubts, please contact our technical service.
Tel.: +34937537171
Fax: +34937537300
e-mail: ventas@pedrogil.com
- All PG blowers are designed and manufactured in accordance with the current European regulations. However, we recommend that these safety and maintenance instructions, which form a part of the aforementioned regulations, are strictly followed.

3.0 RECEPTION AT PLANT

Machinery and accessories should be protected from any possible knocks during transportation. The machine should be inspected on arrival at its destination.

Check that:

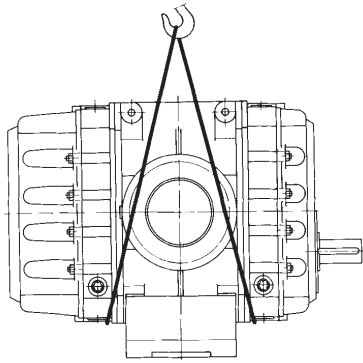
- No damage has occurred.
- The entire order has been delivered.
- The technical data shown on the plate with the blower specifications coincides with the order made.

4.0 METHODS OF LOADING AND UNLOADING

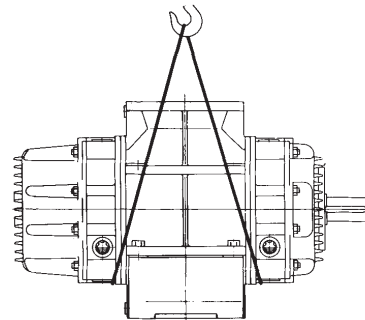
- Never hang the machine by its shaft. See diagrams.

4.1 STORAGE

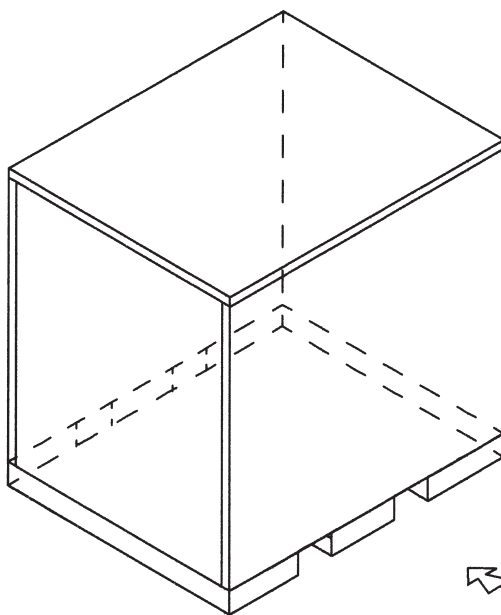
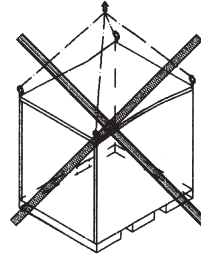
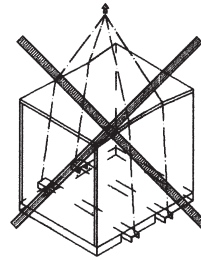
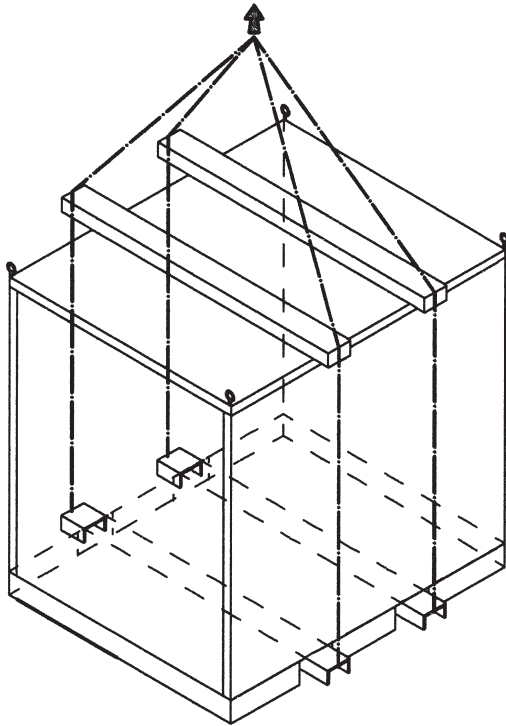
- The storage of blowers and blower units is highly important to ensure that they remain in perfect condition.
- They must be stored in a dry, sheltered area.
- In the case of long-term storage, fill both sumps with oil to the normal level.
- Protect the interior of the machine, the pistons and the moving parts with anti-corrosion oil.
- Manually turn the blower shaft and the motor on a regular basis, to ensure that the bearings do not seize up.



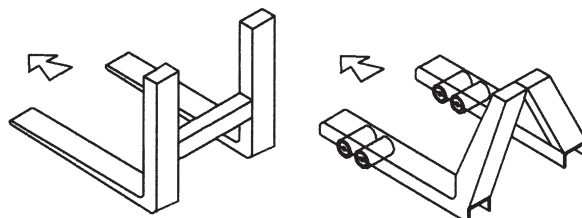
RN/A TYPE

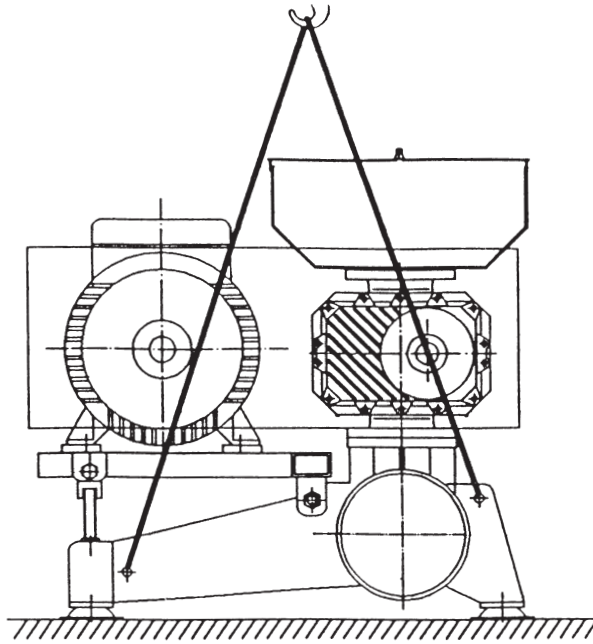


RN/B TYPE

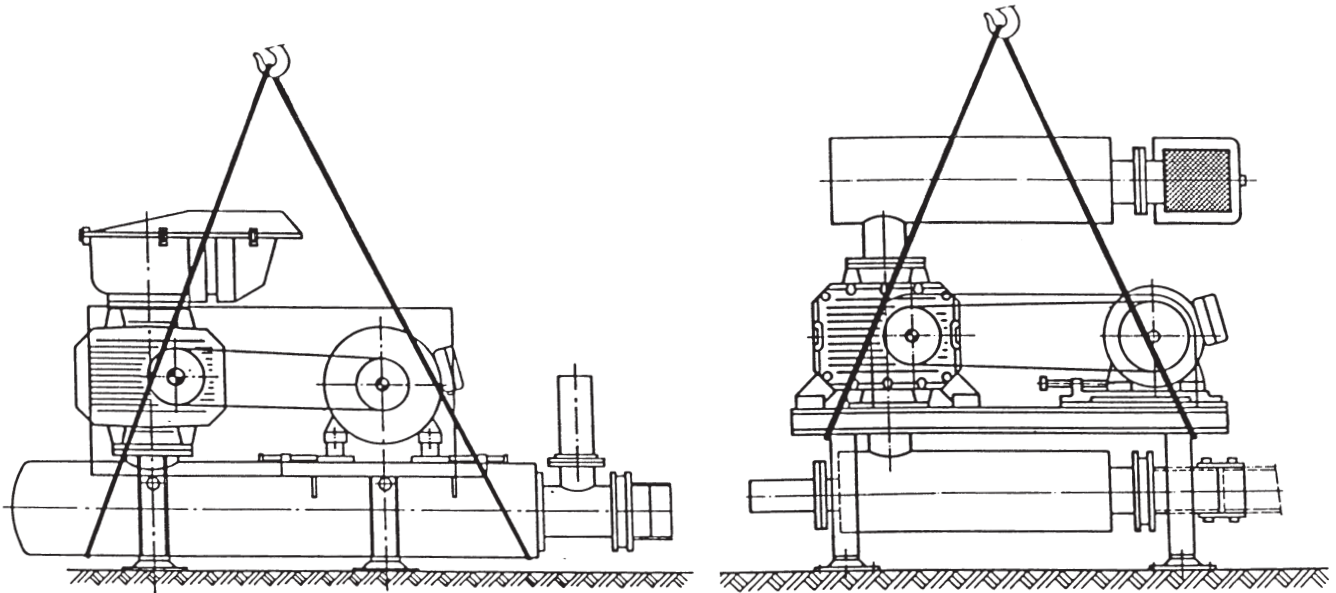


**LOADING AND UNLOADING
BLOWER UNIT
WITH CABIN**





ASSEMBLY: PG-30 / 35 / 38



ASSEMBLY: B-51.F

ASSEMBLY: B-51.c

5.0 ASSEMBLY AND PREPARATION FOR STARTING

- Before locating the unit or blower, the surface must be completely clean and dry, and free of any oil.
- The surface of the base must be scrubbed and clean, as well as the holes for the anchor bolts. Blow them with clean air if possible.
- The surface of the base must be completely smooth.
- After locating and supporting the machine, the surface must be drilled, and without moving the unit, the anchor bolts must be fixed in place. If the unit is installed onto the base of the cabin, the same procedure is carried out from the base.
- The connection with the thrust or suction tube (in which case it operates at low pressure) will be as stable as possible, through the rubber hose or axial compensator.
- If the unit is located in a room, check that the air intake is balanced and correct.
- Install an earth for the motor, muffler bed and soundproof cabin, to prevent charging and discharging of static electricity.
- In order to connect the electric motor, it is VERY IMPORTANT to know the type of start up and check the connections in the junction box. The technical and service data, shown on the specifications plate and the connection diagram must be checked. The motor comes with its own instruction manual. THIS WORK MUST BE CARRIED OUT BY SUITABLY QUALIFIED PERSONNEL.

- The motor is installed on a tilting base (PG-30/PG-35/PG38 units). Do not forget to leave enough cable to be able to change the belts and tighten them more easily.
- NOW FILL WITH OIL TO THE CORRECT LEVEL.

5.1 STARTING

- First follow the instructions in section 2.0
- Ensure that it has been filled with oil.
- Re-tighten and check the filling and emptying caps.
- Check the TURNING DIRECTION of the blower, indicated by the arrow shown, by starting and stopping the motor after 1 second. Always look straight at the blower axis.
- Ensure that the installation tube is free of any obstacles and all the flow valves are open.
- Check that the suction side is free of any blockage and the filter cartridge is clean, if the unit has been stored or located in a dusty atmosphere.
- The unit is ready for start up.

5.2 START-UP

If starting without load:

- Run it for 30 seconds and then stop it again, checking that the blower slows down gradually, without making any strange noises.
- The safety valve is delivered unset. (see section 6.0 Setting the safety valve)
- Re-start the blower unit and check all the safety devices.
- The blower unit is ready for SERVICE.

5.3 PRECAUTION

If you intend to stop the blower for more than 3 weeks, we recommend that you follow the instructions in section 4.1 Storage

6.0 SETTING THE SAFETY VALVE.

This valve is solely designed to protect the blower from an overload and it should be situated such that between the blower and the valve there is no closing mechanism. It is not to be used as a regulating valve.

The safety valve is delivered unset.

The reason for this is to have the valve installed at 100% capacity, as the operating pressure usually varies with respect to what was established in the order, thereby producing poor setting, either under or over.

- To set the valve, remove the hood covering the spring.
- Start up the blower unit in normal operating mode. The valve should then open.
- Tighten the spring by adjusting the nut at the top until the valve closes.
When it is closed, turn the nut one more time, then fasten it in that position with the locking nut.
- Refit the hood.

The valve is set at the optimum point.

6.1 INSTALLING THE FREQUENCY CONVERTER.

- Follow the instruction manual.
- The frequency converter to be used must be suitable for operating with constant torque.
- Both minimum and maximum frequencies must be set to avoid problems with lubrication and excessively high temperatures when it is too low, or surpass the maximum speed when it is too high.

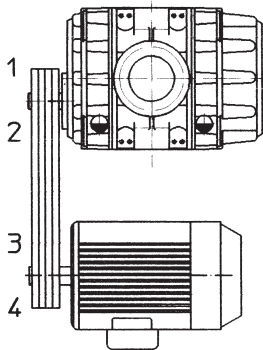
WARNING: Earthing

With converter drive, particular attention must be paid to the earthing devices to ensure:

- 1.- Correct operation of all the protection devices and relays for general safety.
- 2.- A minimum or acceptable level of electromagnetic interference.
- 3.- An acceptable tension in the bearings of both the motor and the blower to avoid current and bearing faults.
- 4.- The electric cable connecting the variator to the motor must be screened.

6.2 INSTALLATION OF MOTOR WITH REVERSIBLE POLES.

- Follow the instruction manual.
- Every time the speed is reversed, the motor must be at zero revs.



7.0 ALIGNMENT OF PULLEYS

The alignment of the pulleys can be carried out with the help of a thread or steel rule.

Parallel alignment of the axles is attained when the taught thread or rule touch the pulleys at points 1, 2, 3, and 4 in a straight line.

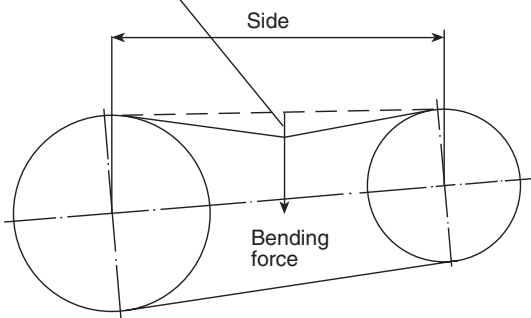
7.1 TIGHTENING AND REPLACEMENT OF BELTS

We recommend that the full set of belts is always replaced.

Tension is measured by the perpendicular force required on the drag side.

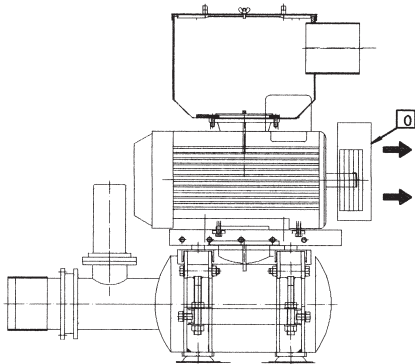
Re-tighten the belts after two hours' service.

BENDING = 1 mm per 100 mm on the drag side.

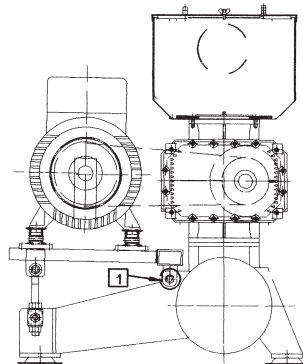


ARROW FOR FORCE

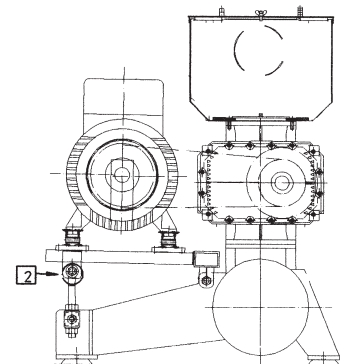
Section	kg
SPZ	2,5
SPA	5
SPB	7,5
SPC	12,5



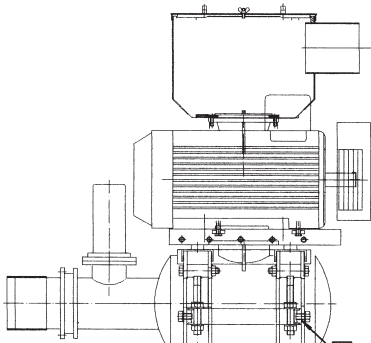
DISMANTLE PROTECTION (Pos. 0)



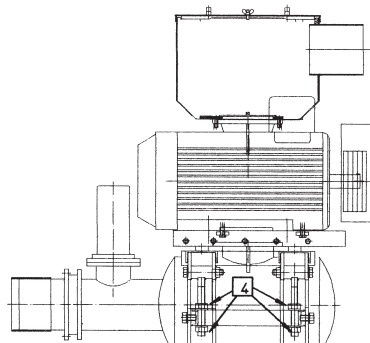
LOOSEN LOCKING NUTS FOR THE BASE (Pos. 1)



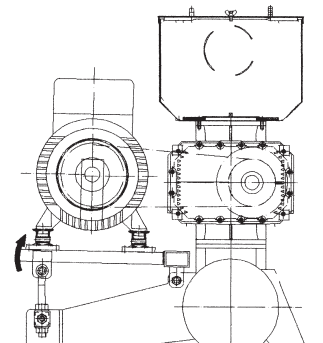
LOOSEN EDGE NUTS TENSOR (Pos. 2)



LOOSEN NUTS SIDES (Pos. 3)

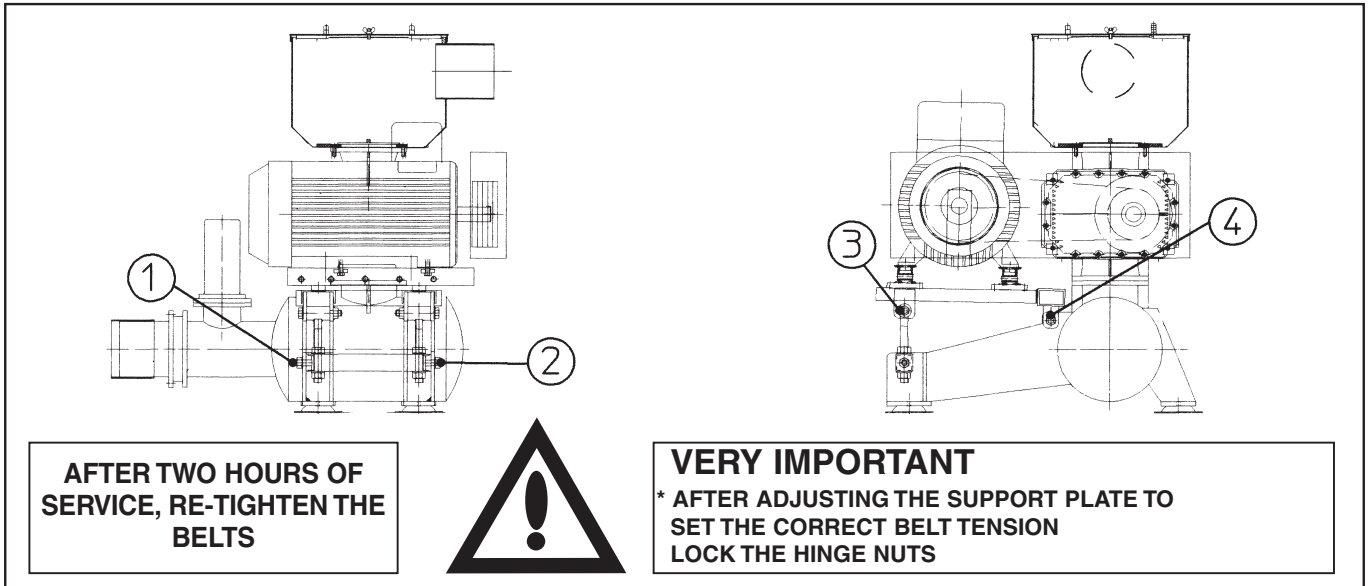


ADJUST TENSION NUTS TO LIFT PLATE (Pos. 4)



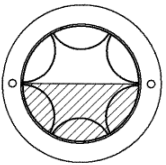
REPLACE BELTS

TIGHTENING AND REPLACEMENT OF BELTS



8.0 OIL.

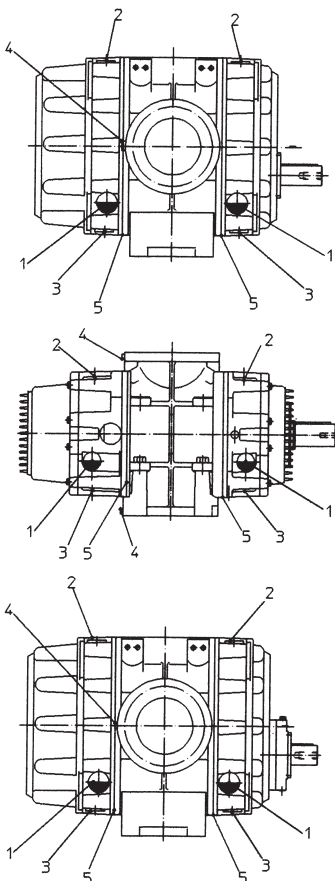
Oli splash provides lubrication to both gears and bearings.



Correct oil level is indicated in the drawing.

IMPORTANT

Excess filling will provoke an increase in the oil temperature, and therefore incorrect mechanical operation of the blower. This can also produce oil loss to the compression chamber. In blowers with pressurised lubrication, and pressurised lubrication with an oil cooler, the oil pump is assembled on the sump opposite the drive side.



1 Oil level sight glass

2 Oil filling cap

3 Oil emptying cap

4 Pressure connection:

Connection for measurement instrumentation.

Up to blower size

33.30 = 1/4" G

From the size 34 = 1/2" G

5 Condensation exit (bleed)

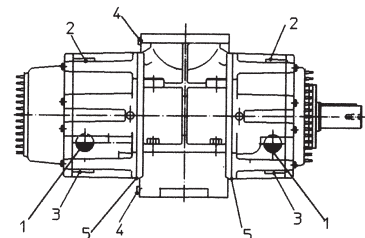
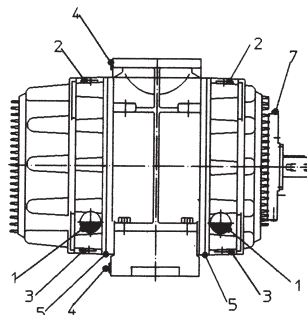
Size 60 = 1/8" G

Sizes 30 to 33 = 1/4" G

Sizes 34 to 27 = 1/2" G

In blowers for air, it is open to the atmosphere.

In blowers for enclosed gas, piped off to low pressure clamp, etc., the system necessary is adopted, depending on the gas and the operating conditions.



8.1 OIL TABLE

In order to ensure blower gear long life and proper lubrication, it is necessary to turbine oil with a viscosity grade as shown below.

On our machines it is essential to use oil with a minimum viscosity at 40 °C between 198 and 242 cSt (ISO VG-220). This type of oil maintains all its characteristics in blowers that discharge gases at a maximum temperature of 110 °C at blower exit.

Higher discharge temperatures require increased oil viscosity. In these cases oil with a minimum viscosity at 40 °C between 290 and 400 cSt (ISO VG-320) should be used.

N.B.

As regards brands of lubricating oil, C.M. Pedro Gil recommends using quality names, with no specific preferences.

These are 5 litres cans available for customers whose needs do not justify the purchase of 50 litre or 200 litre barrels.

**Service up to 110 °C
ISO VG-220 oil viscosity**

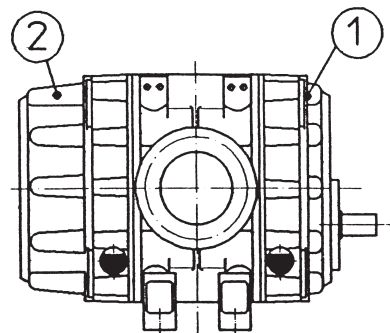
**Service above 110 °C
ISO VG-320 oil viscosity**

Warnings:

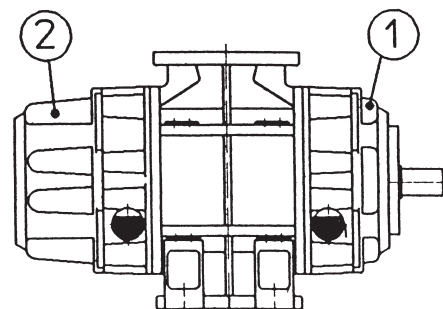
We do not recommend the use of different quality oils as, depending on circumstances, different oil mixtures may cause problems. The barrels should be kept air-tight until use to prevent oil contact with external air humidity.

RN	RNT	Application A			Application B		
		TOTAL	1	2	TOTAL	1	2
60					0,76	0,26	0,5
20	30	0,62	0,21	0,41	0,98	0,31	0,67
21	31	1,1	0,38	0,72	1,61	0,56	1,05
22	32	1,58	0,54	1,04	2,45	0,8	1,65
23	33	3,05	1,05	2	4,69	1,58	3,11
24	34	4,95	1,7	3,25	8,5	3	5,5
25	35	7,5	2,5	5	12,5	4	8,5
26	36	16	6	10	27	9	18
27		27	9	18	35	12	23

Estimated quantities. It is absolutely necessary to check the blower oil level.

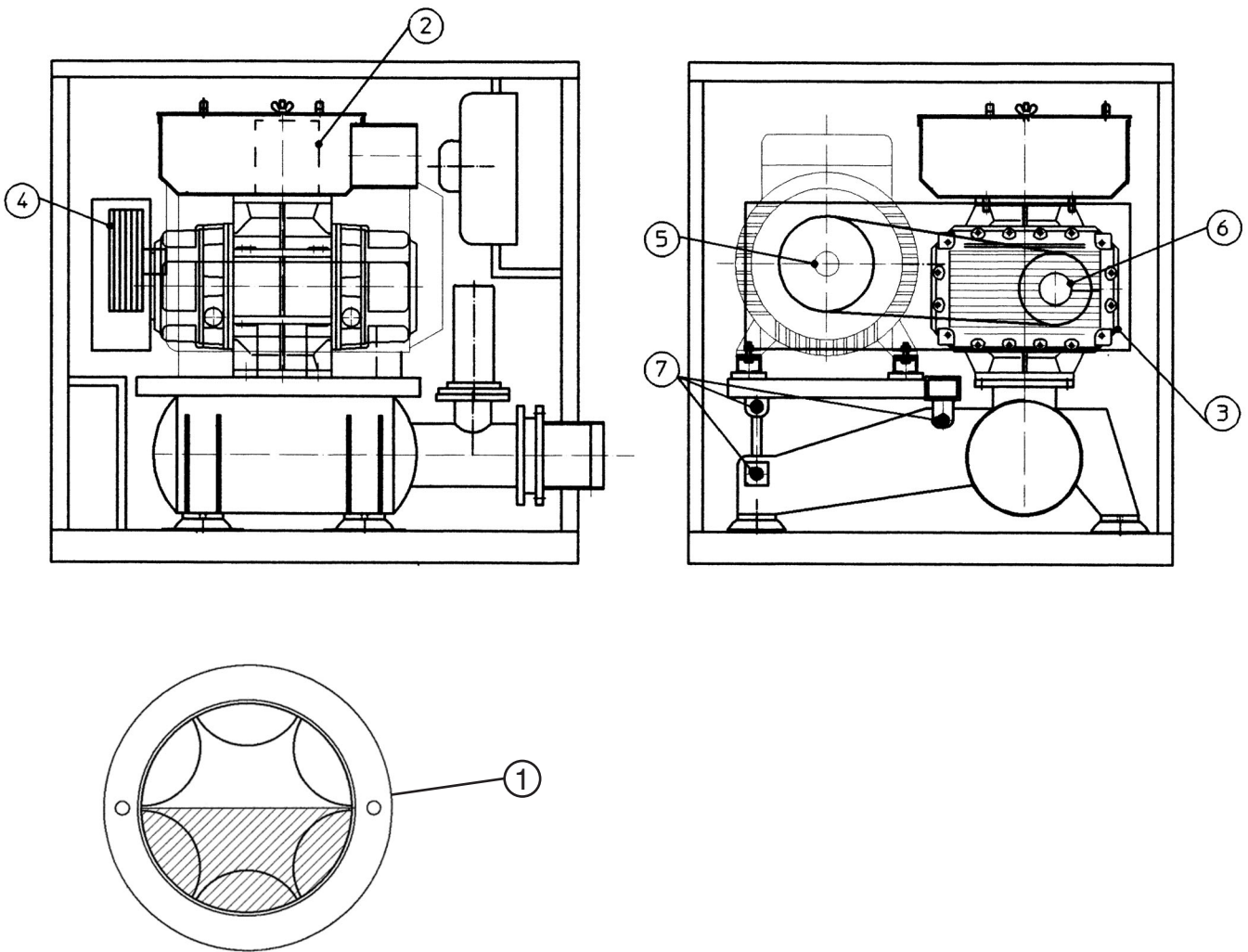


APPLICATION A



APPLICATION B

9.0 MAIN POINTS FOR MAINTENANCE



- 1- Check the oil level of the sumps with the machine stopped.
- 2- Regularly clean the filter cartridge. (depending on the environment in which the machine is operating).
- 3- Change the oil in the sumps every 4000 hrs. (first change at 500 hrs).
- 4- Check the condition of the belts regularly.
- 5- Keep the electric motor bearings lubricated according to the manufacturers specifications.
- 6- Check the blower bearings after 20,000 hrs of service.
- 7- After changing the belts, check for correct locking of unit hinge nuts.

9.1 MAINTENANCE PLAN

- After a few hours of service, it is important to re-tighten the belts, as it is during the first few hours when adjustments between the pulleys and belts are required

WEEKLY TASKS

- Check the suction filter, clean it if the pressure loss exceeds 50 mbar.
- Check the oil level.
- Check the unit for vibrations and unusual noises.

AFTER 500 HOURS OF SERVICE, maximum of six months.

- Change the lubrication oil.
- Clean the suction filter.
- Check the level of the coupling, or the alignment of the pulleys and belt tension.
- Turn the blower by hand and check that it moves smoothly.

AFTER 1,000 HOURS OF SERVICE

- Clean the suction filter.
- Check the safety valve.
- Check the non-return valve.
- Check the belt tension.

AFTER 4,000 HOURS OF SERVICE

- Clean the suction filter.
- Take and check samples of the lubrication oil and change the oil if necessary.
- Check the level of the coupling, or the alignment of the pulleys and belt tension.
- Check the safety valve.

AFTER 8,000 HOURS OF SERVICE, maximum of 1 year.

- Clean or change the suction filter.
- Change the oil.
- Check the safety valve.
- Check the level of the coupling, and the condition of elastic parts (drag rubber) and change them occasionally. Check the alignment of the pulleys and belt tension. Check the condition of the belts and change them occasionally.

THE OIL MUST BE CHANGED ONCE A YEAR.

AFTER 20,000 HOURS OF SERVICE

- General inspection by an authorised specialist.

9.2 CLEANING

Rotary piston blowers operate without any contact between the pistons or between the pistons themselves and the body and side covers, which allows these machines to work with fluids containing a limited amount of sediment. The B.4 and B.5 type blowers (vertical fluid movement, from top to bottom), are more suitable than those with horizontal fluid movement.

Moreover, in vertical fluid movement, when the fluids transported are gases that may produce condensation or fluid drag in a continuous and uniform manner (not sudden liquid flow), the compression chamber remains free of fluid due to the action of gravity.

The diversity and different nature of the pumped or transported gases and gaseous mixtures is such that no valid general instructions for cleaning can be provided.

For the blowers to operate smoothly and without friction, the pistons and the body must be completely free of oil, dust or residue.

When operating in difficult conditions, dust, grease or sticky residue, etc. can accumulate, in the interior of the compression chamber. In such cases, the interior of the blower must be washed using industrial detergents or solvents, such as: petrol, tetralin, kerosene, etc., depending on the nature of the sediment. Sticky or encrusted sediments, should be removed using a spatula or a suitable solvent or superheated steam.

To check the blower, the suction and thrust pipes must be disconnected.

The oil level gauges must always be clean. Check them and clean them when visibility is reduced.

After cleaning, the grease must be changed.

In very difficult cases our technical service should be consulted and an occasional visit from one of technical specialists should be requested.

9.3 CLEANING THE FILTERS

The filter cartridges can be used several times.

The cartridge can be easily cleaned when removed.

Cleaning method:

1. With gentle taps.
2. Blowing with compressed air.
3. Washing with cold water.
4. In difficult cases, such as encrusted dirt, or depending on the type of dust, it can be cleaned with a liquid mixture of water and a suitable detergent available on the market.

NOTE: never heat the filter cartridges.

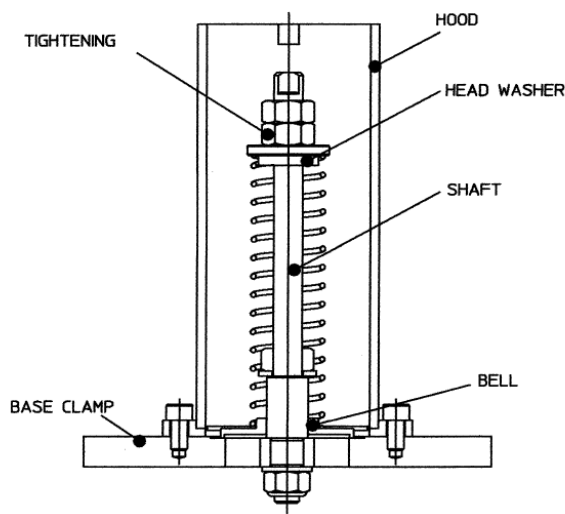
9.4 CHECKING THE FILTER

In difficult working conditions, the filter resistance due to dirt can be controlled with the following instruments:

- Water-column pressure gauge.
- Differential pressure gauges
- Pressure switches.

10.0 PRESSURE RELIEF VALVE

This valve is designed to protect the blower from overloads, and it must be located such that between the blower and the valve there is no closing mechanism.



When assembling the pipe clamp, there must not be any tension in the base clamp.

The material used in the hood, piston and jig bushing is bronze (in special cases, aluminium, stainless steel).

The valve setting is recommended when the blower is installed and commissioned. See section 6.0.

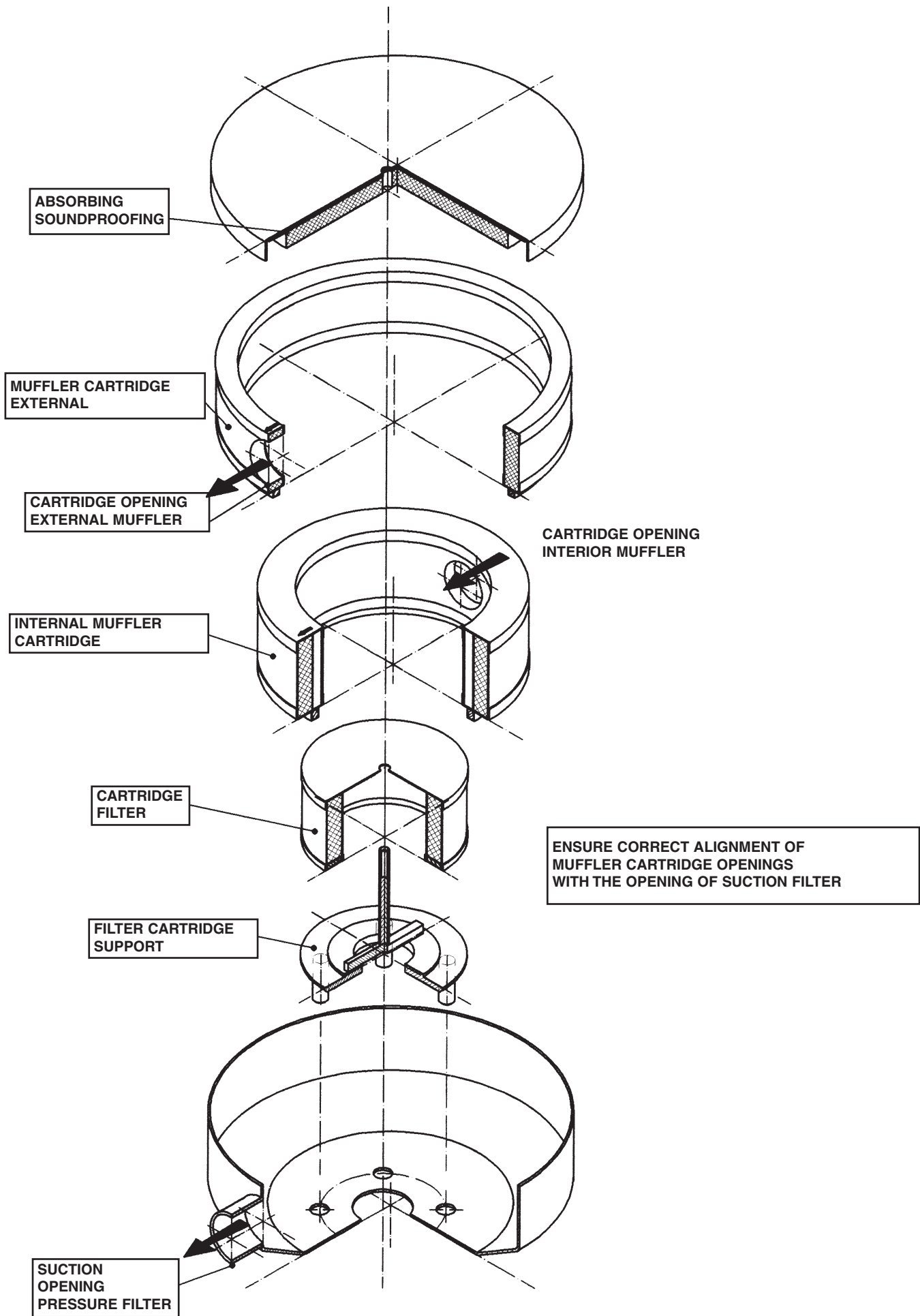
The adjustment is restricted by the limits of the valve spring. If the adjustment is necessary beyond these limits, the spring should be changed.

To make the adjustment or modify the differential pressure, remove the hood and loosen or tighten the adjustment nuts.

The jig bushing does not require any lubrication, but it should be checked for correct operation from time to time. To carry out this check, the differential pressure the valve is set at, which is shown on the specifications plate, has to be produced.

If jammed, disassemble and clean.

11.0 MUFFLER FILTER FOR SUCTION, PG-30



12.0 COMMON OPTIONAL ACCESSORIES.

- 1.- Soundproof cabin
- 2.- Relief valve
- 3.- Vacuum gauge to indicate blockage in the suction filter.
- 4.- Pressure gauge to indicate differential pressure.
- 5.- Pressure switch to limit pressure, electrically controlled.
- 6.- Thermostat to limit temperature of compressed air or gas, also controlled electronically.

13.0 SOUNDPROOF CABIN

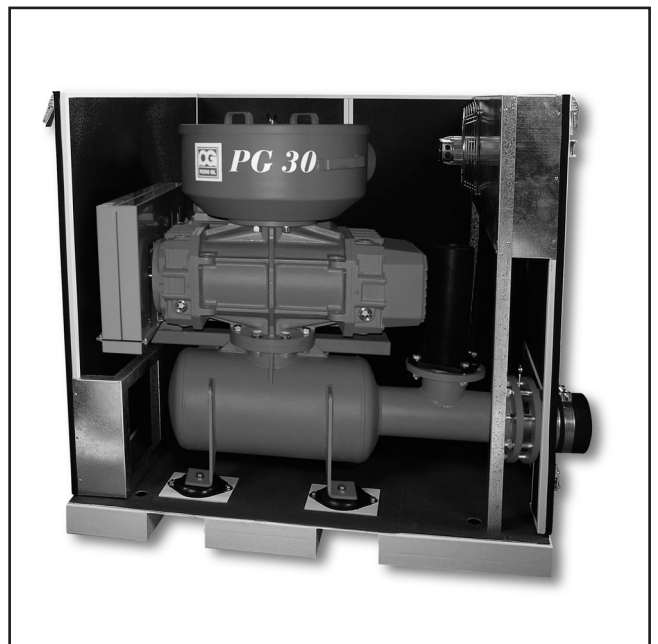
In line with current noise regulations, it has become an essential element in most work environments. PG has carried out noise surveys to significantly improve this product.

It is constructed using panels of galvanised metal sheets, which can be dismantled. Each soundproofing panel contains a layer of polyester noise-absorbing material, which is self-extinguishing, and a waterproof film.

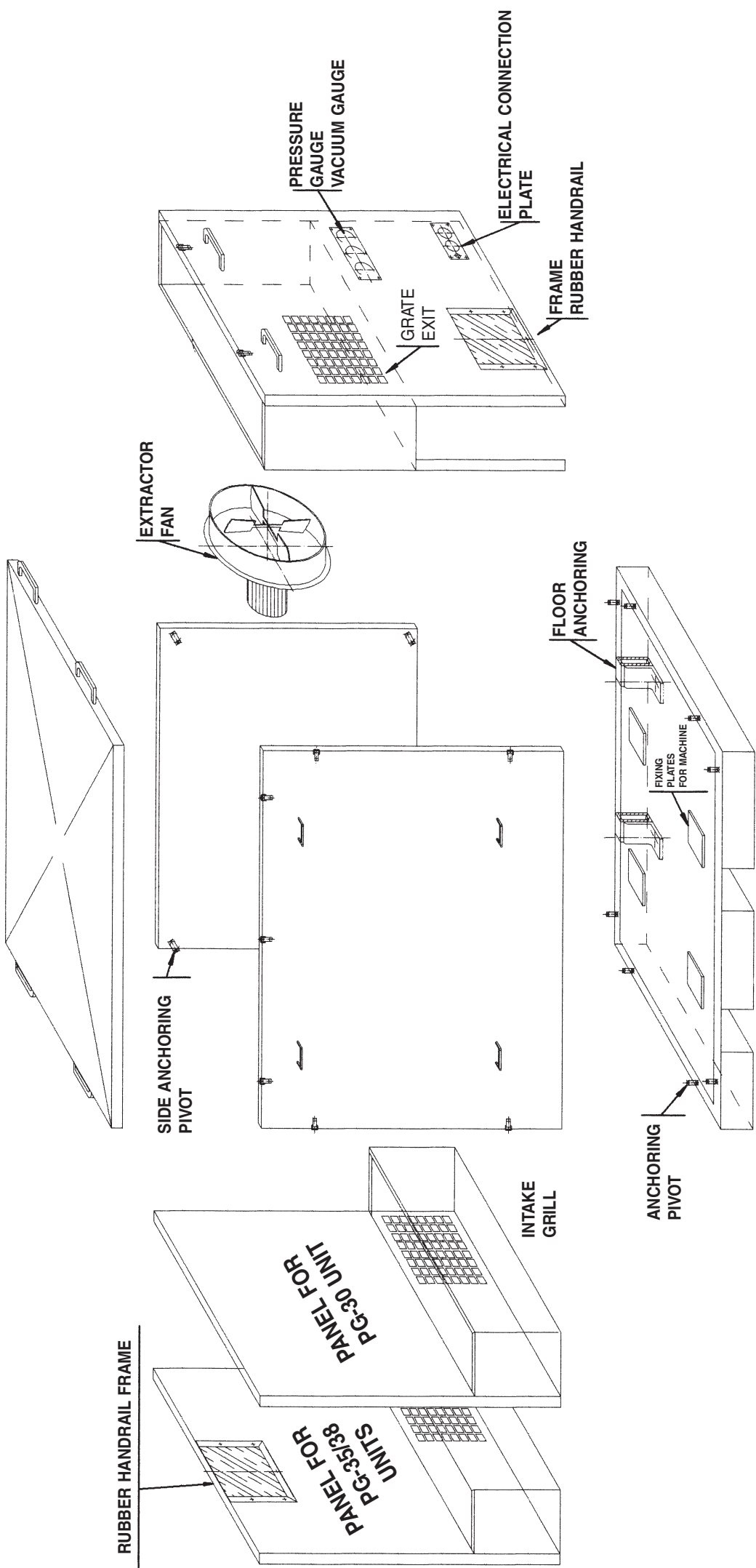
The various panels fit together with self-aligning pivots and they are fixed in position using the instant-opening metal clips.

The cabins for large units (DN-200/DN-250/DN-300) are supplied with a side door. One panel of the cabin is supplied ready for the optional installation of the pressure gauge, vacuum gauge and/or thermometer. It also incorporates a plate to enable access to the electric cabling of the motor inside the cabin. All of the cabins incorporate a compact electrical fan to renew the air inside.

The cabin and the unit are designed as one compact unit, which can be transported as such, thereby easing transportation and later assembly.

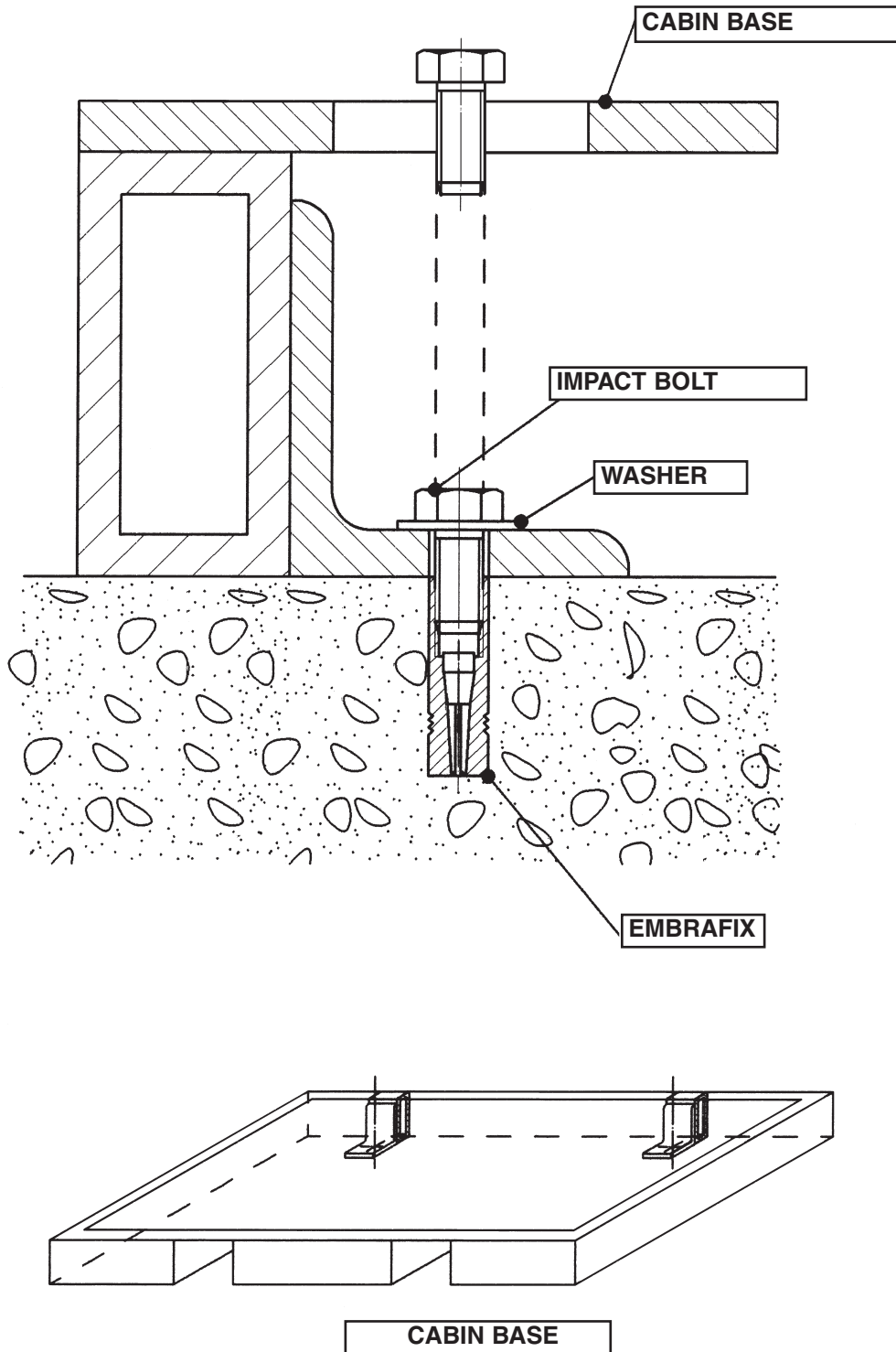


The two possible panels are shown, for a PG-30 or PG-35/38 unit



13.1 PG-30 / PG-35 / PG-38 CABIN

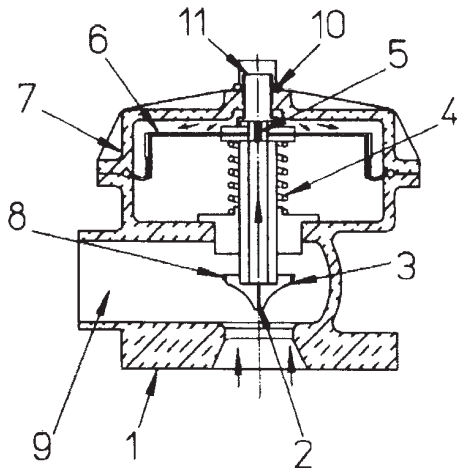
13.2 DETAIL OF BOLT LOCATION IN CABIN BASE



14.0 RELIEF VALVE

General

The PG unloading valve removes the air produced when the blower is started up. This eliminates the negative effect of the overload resulting from the counter-pressure at start-up as well as a gradual start-up.



Installation

The relief valve should be installed between the thrust silencer and the non-return valve as shown in the diagram.

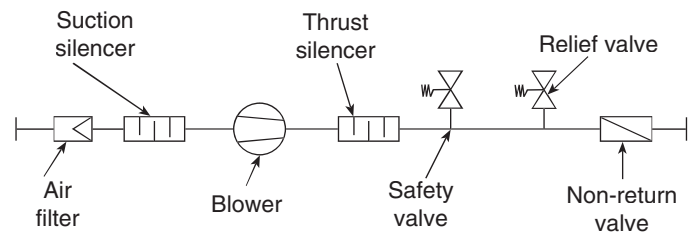
Functioning

When the blower is stopped, the valve is open.

When the blower is started up, the air escapes through the conduit (pos. 9) and at the same time passes through the valve chamber. This produces dynamic pressure, which acts on the top of the membrane (pos. 6) in such a way that it is compressed downwards and closes the valve.

The valve reaction time is regulated by the bolt (pos. 11) in such a way that the greater the dynamic pressure the faster the valve is closed. Once the dynamic pressure has been regulated, the nut (pos. 10) should be tightened to block the system, avoiding any variation in the aforementioned pressure.

- | | | |
|-----------------|-----------------|---------------|
| 1. Body | 5. Upper nozzle | 9. Air outlet |
| 2. Lower nozzle | 6. Membrane | 10. Nut |
| 3. Chamber | 7. Servo cover | 11. Bolt |
| 4. Spring | 8. Ring seal | |



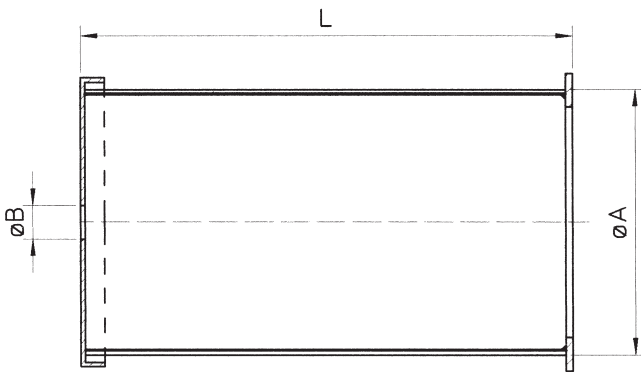
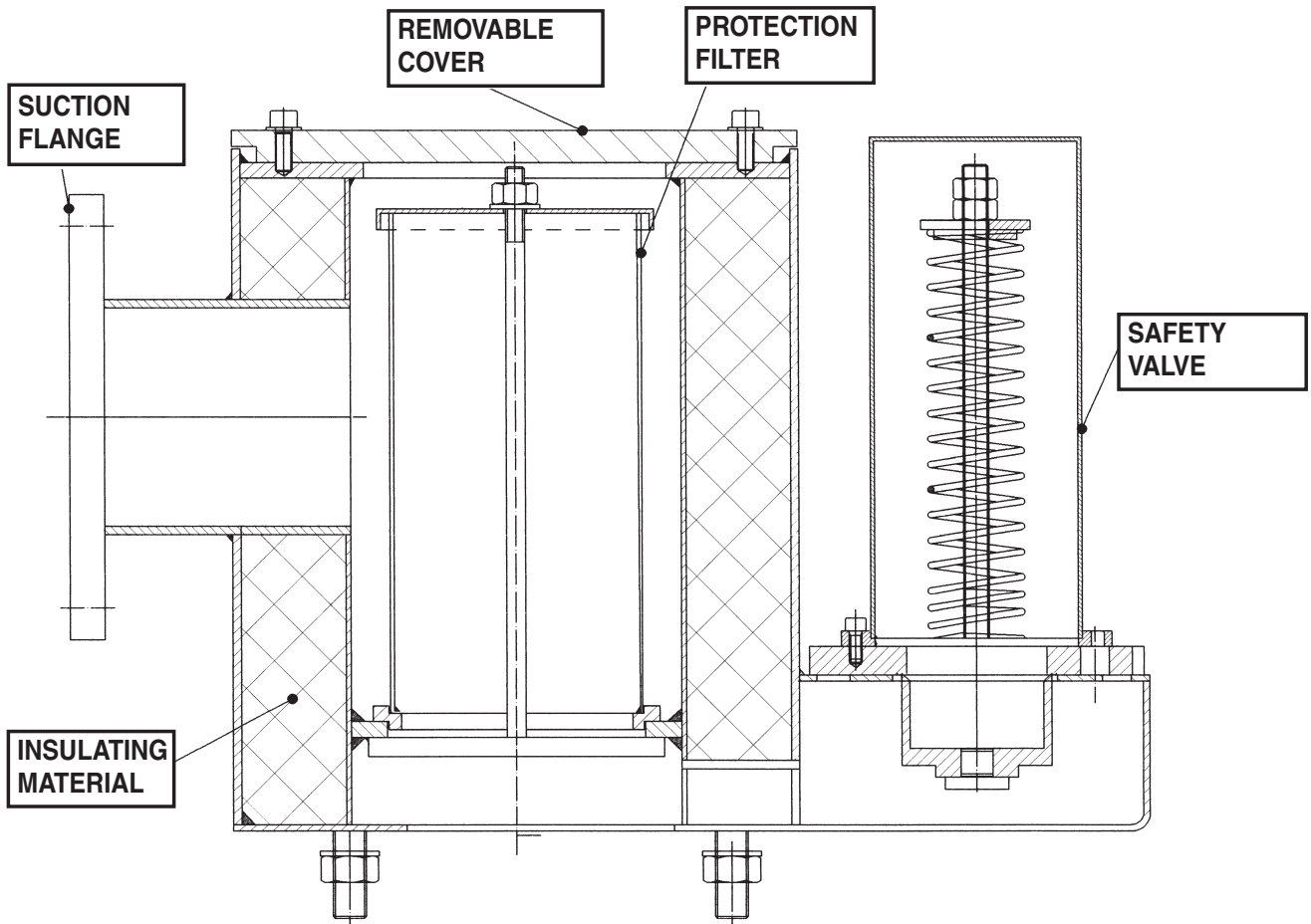
15.0 MAINTENANCE OF THE PROTECTION FILTER APPARATUS FOR PG-35 / PG-38 UNITS

The frequency of the cleaning of the protection filter depends on the type of product and the environment in which the unit operates in. Under normal operating conditions the filter should be cleaned every 6 months.

The procedure is described below:

- 1) Loosen the bolts at the top to be able to remove the cover of the filter unit.
- 2) Ensure that there are no deposits which can fall into the blower when extracting the filter.
- 3) Loosen the bolt at the top of the protection filter before extracting it.
- 4) After extracting the filter, it may be cleaned with compressed air. If the unit is used in a greasy environment, we recommend using a solvent.
- 5) Mount the filter, keeping it free of foreign bodies.
- 6) Before starting the electric motor, turn the blower axis manually and check it turns freely, to ensure the absence of foreign bodies.

15.1 VIEW OF PROTECTION FILTER



**DIMENSIONS OF STARTER FILTER
CARTRIDGE
(NEGATIVE PRESSURE)
(measurements in mm)**

DN	øA	øB	L
50	60	11	170
80	80	11	180
100	110	14	200
150	160	14	310
200	210	18	340
250	290	18	470
300	320	18	530

16.0 DIRECTIVE 94/9/CE. Also CALLED ATEX DIRECTIVE.

- Additional safety instructions.
- This manual is part of the compliance with the ATEX directive. Follow the safety instructions set out in section 2.0 of our manual.
- Check that the Ex classification of the zone where the machine is situated is suitable for the category established for the blower, according to the corresponding declaration or certificate.
- Before opening up the machine or its circuits (see: pipes and installations adjacent to the machine), let the machine and the components cool down and clean out the entire gas circuit to avoid gas leaks and prevent the creation of pockets of gas.
- Use original PG spares.
- Do not use aggressive cleaning fluids, to avoid damaging the existing joints.
- Locate the machine away from dusty areas and do not allow dust to accumulate on it.
- Under no circumstances may the initial operating parameters be altered, such as: suction temperature, differential pressure, blower speed, etc.
- If it is deemed necessary to make a change, consult PG beforehand.
- Check that the safety valve is operating perfectly.
- Eliminate any overload on the blower and suction or thrust clamps.
- Check that the protection filter is in perfect condition, clean and in position.
- Check that all the electric motors and safety devices comply with the guidelines and established category.
- We believe that gas detectors should be installed to control possible leaks.
- In the case of any incident, such as: LEAKS, either of gas or oil, the machine must be stopped immediately.
- To avoid electrostatic charging, connect the earths for both the muffler-bed and the soundproof cabin, as applicable (see diagram). The earth must be made with a cable with a minimum diameter of 16 mm².
- When a frequency variator is installed, contact the supplier of the electric motor.
- The PG blowers and pumps can not convey any explosive mixture, and the suction point can not be from any explosive atmosphere.

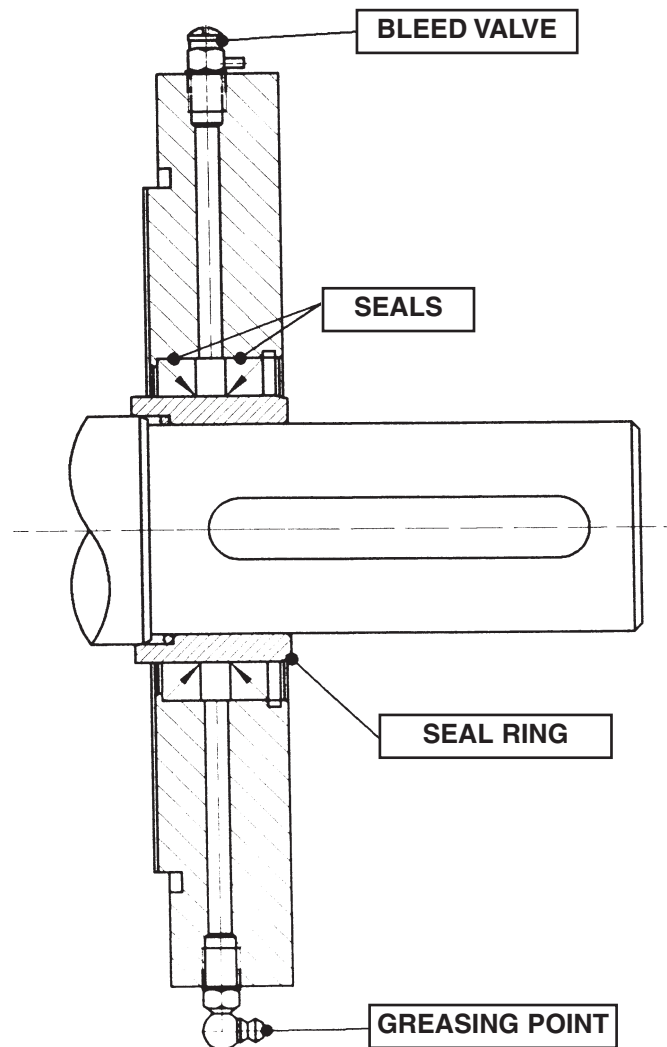
17.0 RNG-TYPE BLOWERS FOR GASES

The instructions for service and maintenance are the normal ones as provided in this book

In contrast to air blowers, the RNGs, for gases, keep the shaft sealed through the incorporation of a grease chamber, located between the two retainers, through which the shaft passes.

It is essential to maintain this chamber to preserve this seal.

In the case of mechanical closure, see the additional instructions.

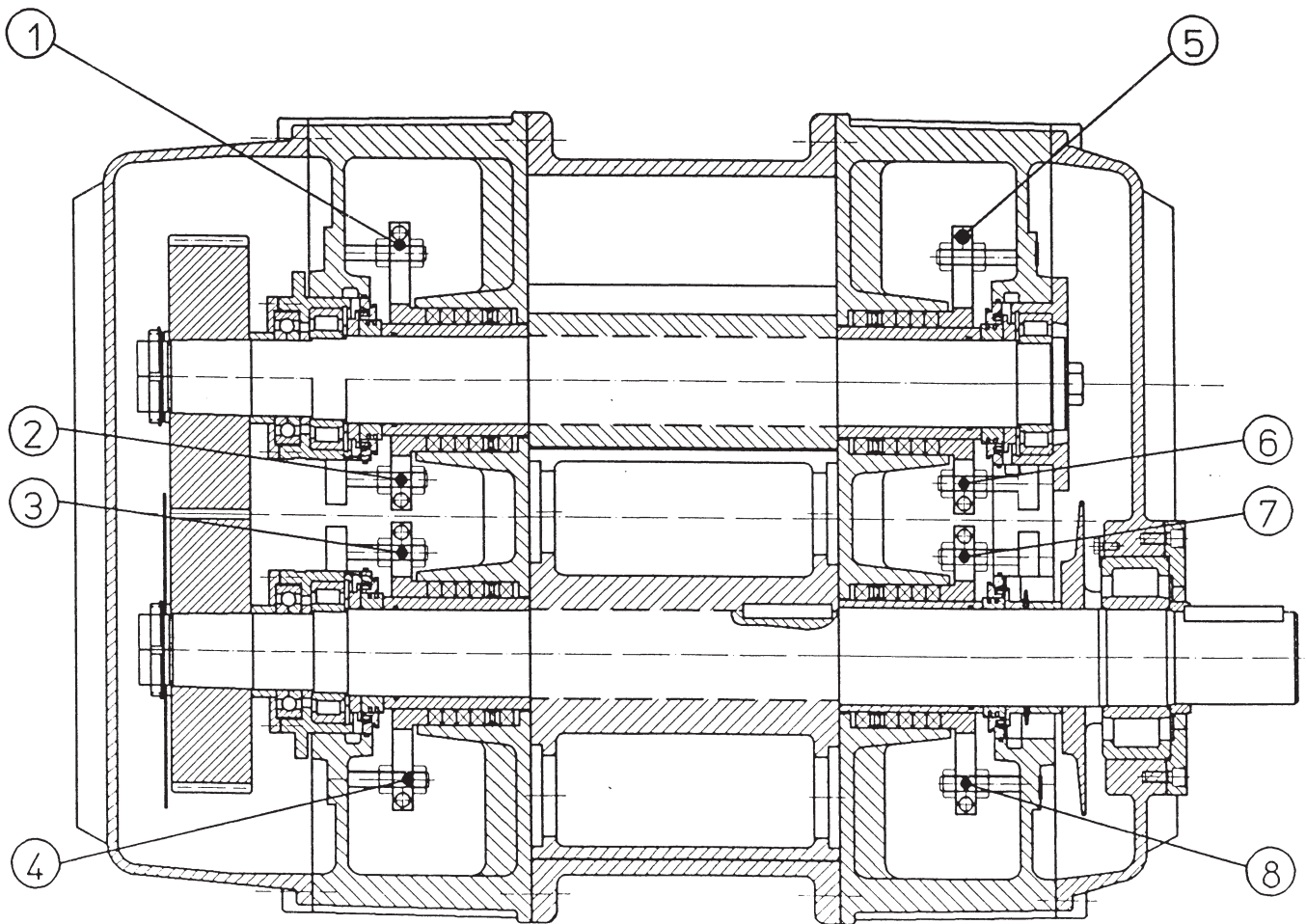


18.0 RS-TYPE BLOWERS WITH GASKETS

The instructions for service and maintenance are the normal ones as provided in this book

The only difference is that the RS-type model has a separate compression chamber with oil-filled sumps, and to seal the shaft it has a gasket.

As the blower is installed in a pressurised pipeline, the gaskets must be adjusted gradually at the points indicated in the diagram. This operation must be carried out with the machine stopped, giving the nutb 1/3 of a turn () and manually checking that the shaft is not jammed.



19.0 POSSIBLE FAULTS AND HOW TO DETECT THEM.

IF UNUSUAL NOISES OR HIGHER THAN NORMAL TEMPERATURES ARE OBSERVED, THE MACHINE MUST BE STOPPED IMMEDIATELY, AND THE CAUSE MUST BE IDENTIFIED AND REPAIRED. DO NOT START UNTIL THE BLOWER HAS BEEN REPAIRED.

THE BLOWER MAKES PECULIAR NOISES

- Base bolts loose.
- Incorrect alignment between the blower and the motor.
- Bolts loose in the coupling.
- Drive belts slack.
- Belts rubbing against the drive protection.
- Mufflers in poor condition.
- Safety valve triggered (open).
- Drive motor (bearings, unbalanced).

EXCESSIVE PLAY BETWEEN SIDES OF GEARS

Dismantle the sump opposite to the drive side and measure the play between the sides along the whole of the circumference of the gears. The gear teeth should be totally dry and clean.

If the average play between the sides is 30 to 50 % greater than the average play value engraved on the gears, then the gears need to be replaced.

EXCESSIVE PLAY IN THE BEARINGS

Measure the tolerance values and compare them with those shown in the bearing catalogues. If the tolerance values are greater, change the bearings. The polyamide cages do not apply.

PISTONS RUBBING AGAINST THE BODY, SIDE COVERS OR EACH OTHER

- Rotary pistons rubbing, along diameter with the body.
- Due to excess load. Measure the working pressures, as well as the temperatures.
- See original data in order.
- Rubbing between the pistons and the body due to dirt.
- There may be dust, solid particles, damp dust, etc.
- Clean the inside of the compression chamber (see cleaning) and check for hairline cracks in the pistons.

RUBBING BETWEEN THE PISTONS AND THE SIDE COVERS

Overheating. Check for cracks in the shaft pivot and the sides. Also check if the oil seal has moved. The rubbing may be caused by excessive play in the bearings.

ROTARY PISTONS OUT OF BALANCE

Due to deposits or worn pistons. Clean or replace them.

If repairing, ensure that they are balanced. Afterwards, check the unit for uniform rotation shaft and piston (eccentricity of shaft)

REHEATING OF BLOWER

- Overheating due to excessive pressure difference.
- Dirt in suction filter. Increase of suction resistance causing reduction of suction flow , resulting in overheating.
- Too much lubricating oil causing additional friction load, which produces heat.
- High oil viscosity also causes overheating. Poor air flow in the machine or blower room. This deficiency causes blowers to heat up. Room temperature increases due to the hot spots in the blowers, motors, pipes and any other machines.
- Surpassing internal tolerance values in the blower causes overheating. Low volume output causes compression heating. Check tolerance values and consult our technical service.

OIL IN COMPRESSION CHAMBER, OIL LOSS

- Casing with excess oil, level too high. Reduce oil level.
- When the machine is stopped, the correct oil level should be according the manual point 9.0.
- Clean the compression chamber with a degreaser.

DRIPPING OR CONDENSATION THROUGH THE DRILLED EXIT HOLES FOR CONDENSED VAPOUR

- If the blower works with air, the drilled exit holes for condensation must be open.
- If the blower works with gas or gases, the drilled exit holes for condensation must be closed, piped off, etc.
- When the blowers work with high differentials or high pressures, there are special solutions depending on the operating conditions and applications.

Causes and solutions for oil loss:

- Excess lubricating oil, correct level.
- Temperature too high, low oil viscosity. Check oil type.
- Sealing sections of labyrinth worn. Change them.
- Incorrect levelling of blower or blower/motor unit. The difference in level must be significant. Check for level and correct it.

OIL LOSS THROUGH FILLING AND EMPTYING CAPS AND OIL LEVEL SIGHT GLASSES

First check tightness and then check the gaskets.

OIL LOSS AT THE RADIAL SEALING JOINT OF THE DRIVE SHAFT PIVOT

Change the radial sealing joint and also the ring fastener. The point of contact with the joint in the ring produces a small scratch or crack, which means that the seal and ring must be changed.

DIRTY LEVEL SIGHT GLASSES

Dismantle and clean glass. If it cannot be completely cleaned, replace it.

INSUFFICIENT SUCTION FLOW

- Faulty blower sizing. Check performance curve. If you do not have it, contact the supplier or manufacturer and ask for it.
- Check the number of revolutions of the blower, and the differential pressure.
- The internal tolerance values of the blower are too big due to wear or low volume output. Check tolerance values, note them down and consult the supplier or manufacturer. It may be necessary to replace the pistons with new ones.
- The blower may be operating with a pressure differential which is too high, thereby reducing the suction flow.
- The resistance in the suction filter is too high. Clean the filter or change it if necessary.

POWER CONSUMPTION HIGHER THAN NORMAL

- The operating conditions are not the same as those specified in the order. In this case, measure and note down the new operating conditions and then calculate the new operating level, and check if the power level is correct.
- An excessively high lubricating oil level may produce a higher consumption. Correct the oil level.
- After either 3 years or 20,000 hours of service, we recommend that a general service be carried out by an authorised specialist.

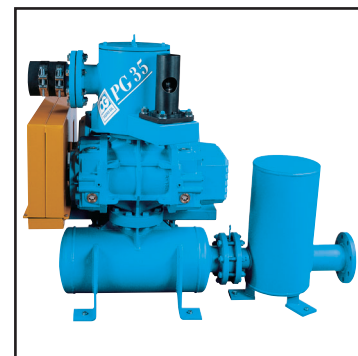
PRODUCT RANGE



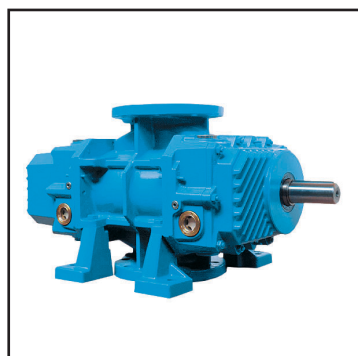
PRESSURE UNIT
PG-30



PRE-ADMISSION UNIT
PG-38



NEGATIVE PRESSURE UNIT
PG-35



FREE-AXLE BLOWER
RNT



VACUUM PUMP
RV

PEDRO GIL S.L. construcciones mecánicas

Salvador Albert i Riera, 9 (Pol. Ind. Vallmorena)
08339 Vilassar de Dalt
Barcelona - Spain
Tel.: +34 93 753 71 71 - FAX: +34 93 753 73 00
www.pedrogil.com
Email: ventas@pedrogil.com