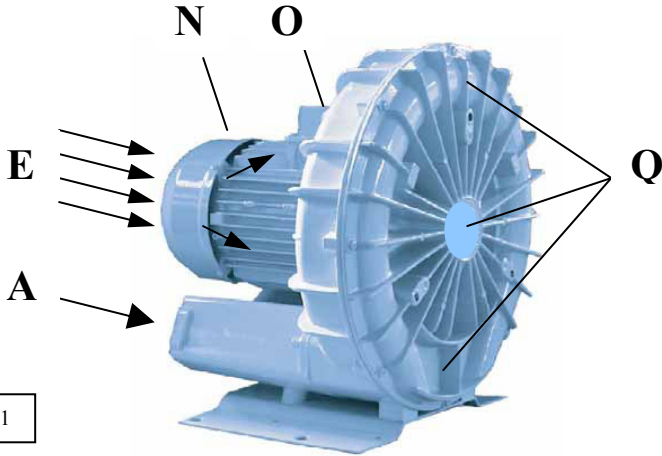


**Side channel vacuum pumps
Side channel compressors**



picture 1

Pump ranges

These operating instructions concern the following side channel vacuum pumps and compressors: **RUBIN**. The performance curves showing capacity against vacuum or pressure can be seen in the data sheets D100 to D115.

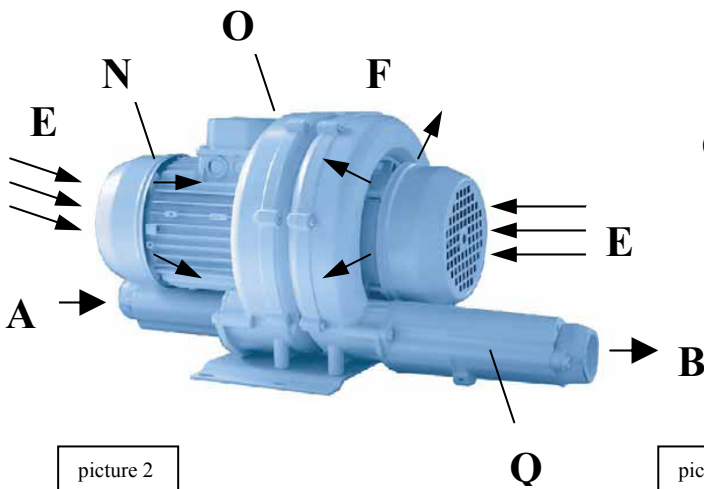
Description

All **RUBIN** models work according the dynamic compression principle utilising a non contact rotating impellor. They have a built-in motor. A high efficiency double-flow impellor is fitted on the motor shaft. All models - with one exception, **RUBIN 85 H** – use the motor fan for cooling. The model **RUBIN 85 H** (picture 2) has an additional cooling fan at the reversed site, looking at the motor.

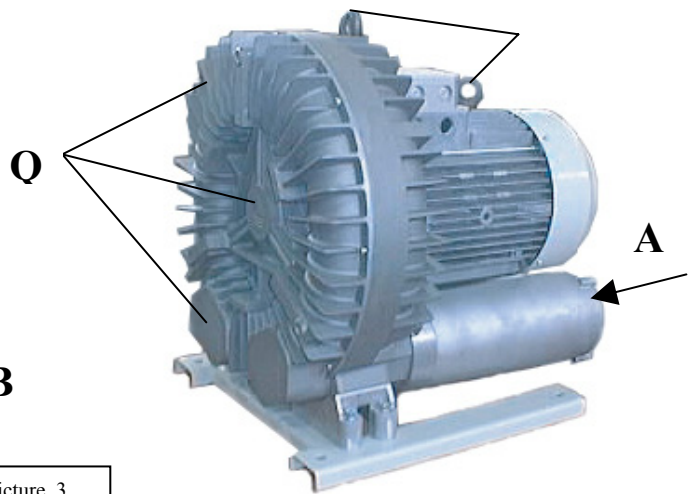
Air inlet and outlets have built-in silencers. Both the inlet and outlet have an inside connection thread corresponding to DIN IDO 228.

Versions of the **RUBIN** have on the suction and pressure side different connection flanges. All the parts are made from a special aluminium alloy except for motor rotor, stator and shaft.

Optional accessories: As required, vacuum or pressure limiting valve, non-return valve, Suction filter, motor starter, vacuum/pressure change or valve.



picture 2



picture 3

Suitability

⚠ The units RUBIN are suitable for use in the industrial field i.e. the protection equipments corresponds to EN DIN 294 table 4, for people aged 14 and above.

RUBIN models can be operated as vacuum pump or compressors in the same technical version. They are suitable for use with air of a relative humidity up to 90% but not aggressive gases. Versions with reduced leakage rate are available. The tightness of each unit depends on the shaft seal. The shaft seal life time relates directly to the operating conditions.

⚠ Dangerous mixtures (i.e. inflammable or explosive gases or vapours) must not be handled.
⚠ The ambient and suction temperatures must be between 5 and 40°C. For temperatures outside this range please contact your supplier.

The maximum permissible pressure difference for vacuum and pressure depends upon the motor rating. This is indicated on the data plate (N) and is shown in the data sheet for standard voltages and frequency:

RUBIN 40 D100; RUBIN 90 D101; RUBIN 140 D102; RUBIN 220 D103; RUBIN 340 D104; RUBIN 620 D105; RUBIN 1200 D106; RUBIN 1500 D107; RUBIN 2200 D108; RUBIN 160 D109; RUBIN 540P D110; RUBIN 85H D111; RUBIN 135H D112; RUBIN 215H D113; RUBIN 335H D114; RUBIN 370 D115

Operating above this pressure differences the motor would be overloaded. As well as considering the maximum allowable pressure difference, the amperage must also be checked against the data plate (N).

The loading of each unit depends on the specific gravity of the gas handled. Therefore when handling gases other than air, there are other pressure difference limits to be considered. Please contact the supplier for further advice.

If it is possible for the flow to be throttled more than the allowed limits, then the use of vacuum or pressure limitation valves (optional accessories) should be considered.

The maximum permissible internal pressure is 3.5 bar (abs.). With this pressure the performance is reduced. Standard version can not be operated in potentially explosive areas.

⚠ For all applications where an unplanned shut down of the blower could possibly cause harm to persons or installations, the corresponding safety backup system must be installed.

Handling and setting up (pictures 1, 2 and 3):

⚠ Pumps that have reached operating temperature may have a surface temperature at position (Q) of more than 70° C . WARNING! Do Not Touch.

The blower, especially when the units are built-in, the cooling air entries (E) and the cooling air exits (F) must have a minimum distance of 10 cm from any obstruction. The discharged cooling air must not be re-circulated. RUBIN units can be operated in different positions.

RUBIN models can be installed on a solid floor without bolting down. When fitting onto framework we recommend using anti-vibration mounts.

⚠ For installations that are higher than 1000 m above sea level there will be a loss in capacity. For further advise please contact your supplier.

Installation (pictures 1, 2 and 3):

For operation and installation follow any relevant national standards that are in operation.

1. When on vacuum operation connect the suction pipe at (A) and when on pressure operation connect the pressure pipe at (B).

Long and/or small bore pipe-work should be avoided as this tends to reduce the capacity of the blower.

2. The electrical data can be found on the data plate (N) or the motor data plate. The motors correspond to DIN EN 60034 and have IP 55 protection and insulation class F. The connection diagram can be found in the motor terminal box (unless a special plug connection is fitted). Check the electrical data of the motor for compatibility with your available supply (voltage, frequency, permissible current etc.)
3. Connect the motor via motor starter. (It is advisable to use thermal overload motor starters to protect the motor and wiring. All cabling used on starters should be secured with good quality cable clamps.
We recommend that motor starters should be used that are fitted with a time delayed trip resulting from running beyond the amperage setting. When the unit is started cold over-amperage may occur for a short time.

⚠ The electrical installation may only be made by a qualified electrician under the observance of EN 60204. The main switch must be provided by the operator.

Initial Operation (pictures 1 and 2)

Maximum number of starts per hour: 10

1. Initially switch the pump on and off for a few seconds to check the direction of rotation against the direction arrow (O).
2. When installed on the application and under the highest possible load conditions, the pressure differences on the unit may not be higher than the max. allowable pressure differences shown on the data plate (N).



Note: If these values are exceeded when the unit is running on normal operating temperature an unloading of the unit is required by utilising limitation valves

3. A comparison of the measured current amperage with the max. current amperage on the data plate (N) is not advisable, because the current amperage depends on the voltage.

Potential risks for operating personnel

Noise Emission: The worst noise level considering direction and intensity (sound power), measured according to DIN ISO 3746-1979 (as per 3. GSGV) are shown in the table at the back. When working permanently in the vicinity of an operation unit we recommend wearing ear protection to avoid any damage to hearing.

Maintenance and Servicing



When maintaining these units and where a situation exists where personnel could be hurt by moving parts or by live electrical parts the blower must be isolated by totally disconnecting the electrical supply. It is imperative that the unit cannot be re-started during the maintenance operation. Do not maintain a blower that is at its normal operating temperature as there is a danger from hot parts.

The pressure leading pipes must be ventilated before dismantling.

These side channel vacuum pumps and compressors need no maintenance apart from filtration.



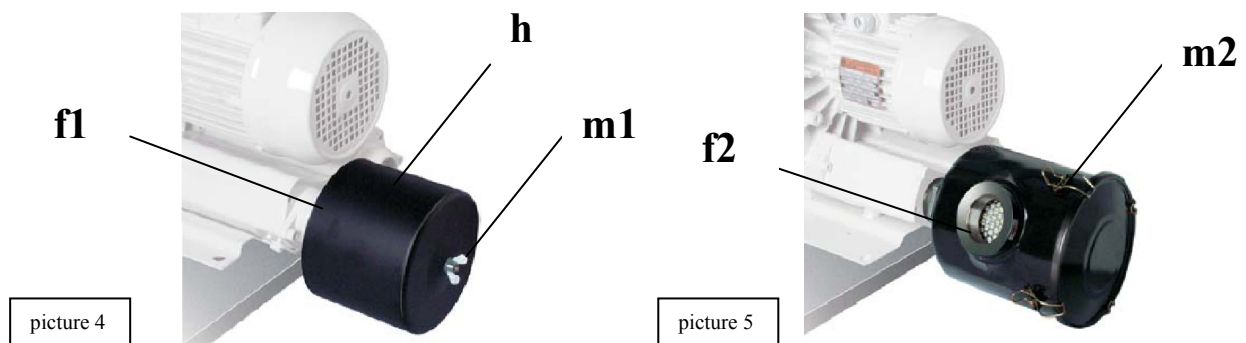
The capacity of the blower can be reduced if the air inlet filters are not maintained correctly.

Additional filter (optional accessories):

The suction filter should be cleaned every 250 operating hours and the filter cartridges changed every 3000 operating hours. How to do: Unscrew wing nut (m1). Remove filter cover (h) and filter cartridge (f1). The filter cartridge can be cleaned by knocking out by hand and/or by using compressed air. Replace the filter cartridge if necessary. Re-assemble in reversed order (see picture 4). The filter cartridge (f2) of the vacuum tight suction filter must be cleaned regularly, again depending upon the amount of contamination. Cleaning can be achieved by washing or by blowing out with compressed air. Replace the Filter cartridge (f2) if necessary. The cartridge (f2) can be removed completely by undoing the relevant retaining clips (m2). (see picture 5).

Bearings:

The units have bearings that are greased for life and require no maintenance.



Trouble Shooting

1. Blower does not reach operating speed when starting:

- 1.1 Check that the incoming voltage and frequency corresponds with the motor data plate.
- 1.2 Check the connections at the motor terminal block.

2. Motor starter cuts out the blower:

- 2.1 Problem as per 1.1 and 1.2

- 2.2 Incorrect setting at the motor starter

- 2.3 Motor starter trips too fast.

Solution: Use a motor starter with a time delay trip which consider the short over - amperage during the (cold) start.(version as per IEC 947-4)

- 2.4 Blower is overloaded, i.e. pressure difference is too high.

Solution: Increase the inlet or outlet diameter of the application, on pipe-work increase the diameter of the pipe-work, avoid restrictions in the line. Limit the pressure difference by Limitation valves (optional accessories).

- 2.5 Motor rating selected was too small.

Solution: If available use a blower with the next motor size. Exchange of the motor only is not possible (built-in motor).

3. Required pressure difference can not be achieved:

- 3.1 Blower or motor rating selected, was too small.

- 3.2 Filters are contaminated.

- 3.3 Pressure loss in the pipe work too high.

Solution: Use bigger pipe diameter, avoid restrictions.

- 3.4 Leaks on the system

4. Blower operates at an abnormally high temperature:

- 4.1 Ambient or suction temperature is too hot.

- 4.2 Pressure difference is higher than permitted.

- 4.3 Cooling air flow is restricted.

5. Exhaust noise (vacuum pump) or suction noise (compressor) are unacceptable:

Solution: Use an additional silencer (optional accessories).

Appendix

Repair on Site: For all repairs on site an electrician must disconnect the motor so that an accidental start of the unit cannot happen. All engineers are recommended to consult the original manufacturer or one of the subsidiaries, agents or service agents, especially if it is a repair under warranty. The address of the nearest repair workshop can be obtained from the manufacturer on application. After a repair or before re-installation follow the instructions as shown under the headings "Installation and Initial Operation".

Lifting and Transport: To lift and transport units **RUBIN 340** to **RUBIN 2200** the eye bolt (R) on the blower must be used. The weight of the blowers are shown in the accompanying table.

Storage: **RUBIN** units must be stored in dry ambient conditions with normal humidity. We recommend for a relative humidity of over 80% that the blower units should be stored in a closed container with the appropriate drying agent.

Disposal: The wearing parts (as listed in the spare part lists) should be disposed with due regard to health and safety regulations valid for the country of operation.

Spare Part Lists: E100 to E115

RUBIN	<i>#on request</i>	40	90	140	160	220	340	540P	620	1200	1500	2200	85H	135H	215H	335H
Noise level (max.)	dB(A)	50 Hz	67	68	74	88	78	82	84	88	88	#	74	75	82	84
		60 Hz	70	71	76	89	81	85	88	90	90	#	78	78	85	88
sound power (max.)	dB(A)	50 Hz	-	-	-	97	-	-	93	97	97	#	-	-	-	93
		60 Hz	-	-	-	98	-	-	97	99	99	#	-	-	-	97
Weight (max.)	kg	7	10	18	62	22	32	59	112	205	155	166	16	25	31	60
Length (max.)	mm	220	271	302	502	295	357	530	604	719	659	740	540	543	597	709
Width	mm	200	245	302	480	334	395	395	530	570	570	600	245	302	334	395
Height	mm	220	251	319	544	341	416	416	584	624	633	610	251	319	341	416