

OPERATING & INSTALLATION INSTRUCTIONS

ESAM SIDE CHANNEL BLOWER



WARNING

Aspiration and compression can be extremely powerful.
Outlets can represent a **DANGER**.

Before switching on the blower, the following precautions **MUST** be taken during installation:

- The blower **MUST** be installed and serviced only by persons authorised and qualified to do so. **NO** operations may be carried out while the blower is running. The motor **MUST** be isolated from electrical power source (and provisions made to ensure it remains isolated) before performing any operation on the blower.

- All open vacuum ports, including vacuum relief valve port, **MUST** be fitted with an air filter.

CAUTION: Operating the unit without filters on all open vacuum ports can result in:

- Foreign particles entering the motor.
- Severe damage to the impeller.
- Objects being violently ejected from the exhaust, potentially causing personal injury or property damage.

Refer Figure 1.

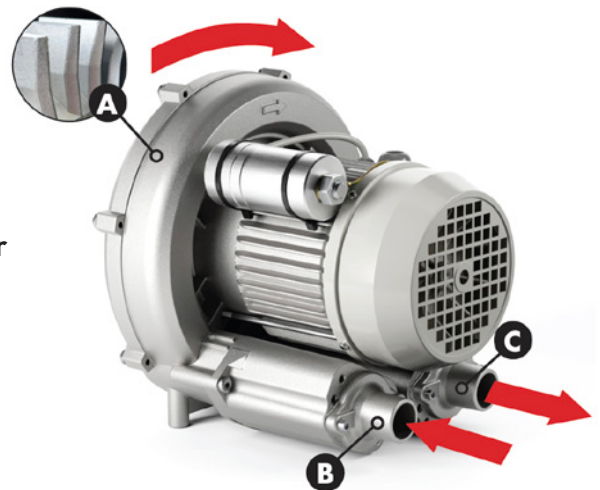


Figure 1.

INSTALLATION & GENERAL INFORMATION

- 1 Use correctly rated equipment and eyebolts when lifting the blowers.

- 2 Read the motor rating plate carefully. The blower is easily identified by referring to the motor's rating plate attached to each unit.

The rating name plate states the:

- A** Model **B** Serial Number **C** Item Code **D** Maximum negative pressure for continuous duty in mbar
- E** Maximum positive pressure for continuous duty in mbar **F** Maximum amperage flow

Refer Figure 2.

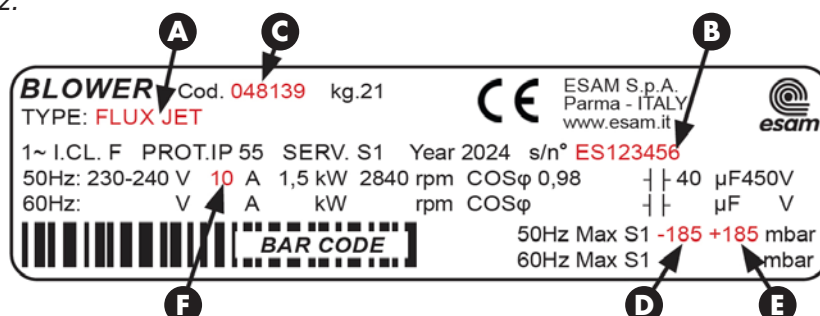


Figure 2.

- 3 For continuous use, do not exceed any of the operating values given on the data plate. Contact ESAM technical department for further information.

- 4 Check the voltage and frequency of the power supply. Incorrect voltage or frequency can cause the unit to fail prematurely.
- 5 The blower **MUST** be protected from over-current with a thermal overload device/magnetic phase protection, set no higher than the blower's maximum current rating stated on motor name plate (refer to example **F** on Figure 2).
- 6 Connection to the electrical supply **MUST** be carried out in accordance with the diagram on the terminal block cover. Electrical connection **MUST** be carried out only by persons qualified to do so. Blower **MUST** be installed in accordance with all relevant standards and local regulations.
- 7 Motors rated above 4.5kW should be installed with a soft starter, star-delta starter, or variable frequency drive (VFD). These devices help limit high starting currents and minimises mechanical stress on the system during startup.

ENVIRONMENT



WARNING

- 8 Air aspirated through the blower **MUST** be filtered and contain **NO** explosive, corrosive or flammable gases.
- 9 The maximum air inlet temperature **MUST** not exceed +40 degrees Celsius or fall below -15 degrees Celsius. ESAM has a range of cartridge filters, in-line filters and intake filters for all blowers. Please refer to the ESAM catalogue or contact ESAM for further information.
- 10 The blower **MUST** be installed in a location with **ADEQUATE VENTILATION** and protected from weather. The unit **MUST** be installed in an area that does not contain corrosive, flammable or explosive materials.
- 11 Protect the blower from adverse weather (water & humidity) and from direct sunshine.
- 12 The blower's baseplate **MUST** be secured to a flat, level surface to prevent any movement or vibration while in operation.
- 13 Remove protective covers from inlet and outlet ports prior to connecting to external piping.
- 14 Barrel union fittings can be used to connect inlet and outlet ports of the blower to external piping. These fittings allow blowers to be easily removed for routine maintenance. Metal fittings **MUST** be used for exhaust piping and PVC pressure pipe for inlet piping connections.
- 15 The three-phase motor turbine **MUST** rotate strictly in the direction of the arrow indicated on the unit (see Figure 4). Correct phase wiring is critical; incorrect electrical connection reverses the inlet and outlet ports, severely reducing unit performance and risking catastrophic damage from water or debris entering the turbine housing.
- 16 All inlet ports **MUST** be fitted with an appropriate filter to prevent foreign matter from entering the turbine housing and damaging the blower.

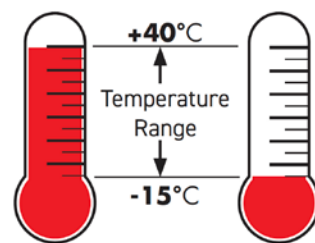


Figure 3.



Figure 4.



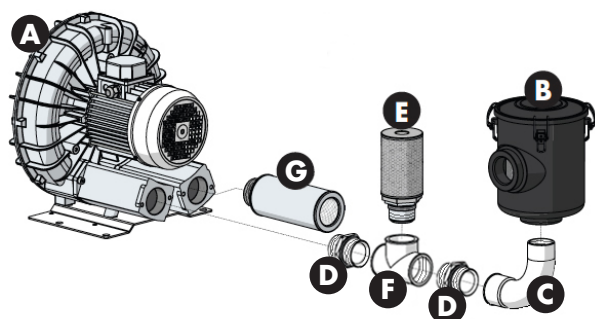
WARNING

- 17 Do not touch Side Channel Blowers during operation. Turbine housings, exhaust snorkel and exhaust piping can be in excess of 100 Degrees Celsius.
- 18 Install the blower taking care that the rating plate is in a position that is easily readable.

VACUUM RELIEF VALVE

Blowers used to provide negative pressure **MUST** be fitted with an ESAM Vacuum Relief Valve. The Vacuum Relief Valve **MUST** be set correctly to limit the maximum pressure (Max S1 mbar) of the blower value stated on the motor's name plate. ESAM Vacuum Relief Valves are available in various sizes. Air intake ports **MUST** be protected with an Inline Filter. An optional Silencer can be used for vacuum applications to use noise.

SINGLE-STAGE SIDE CHANNEL BLOWER



- A** Side Channel Blower **B** Vacuum Filter (Complete) **C** Elbow Fitting
D Nipple **E** Vacuum Relief Valve **F** T-Piece **G** Silencer

TWO-STAGE SIDE CHANNEL BLOWER

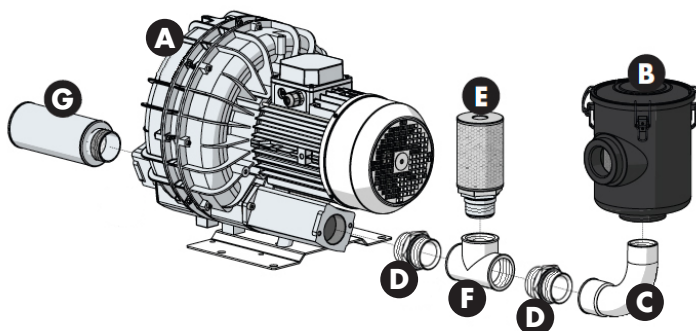
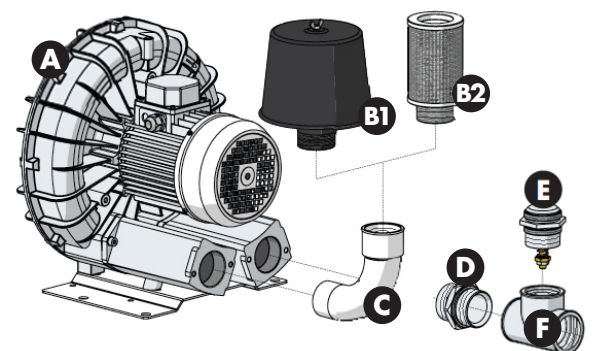


Figure 5.

PRESSURE RELIEF VALVE

Blowers used to provide positive pressure **MUST** be fitted with an ESAM Pressure Relief Valve. Pressure Relief Valves **MUST** be set correctly to limit the maximum pressure (Max S1 mbar) of the blower value stated on the motor's name plate. ESAM Pressure Relief Valves are available in various sizes. Air intake ports **MUST** be protected with an inlet filter.

SINGLE-STAGE SIDE CHANNEL BLOWER



- A** Side Channel Blower **B1** Inlet Filter (Complete) **B2** Mesh Inlet Filter
C Elbow Fitting **D** Nipple **E** Pressure Relief Valve **F** T-Piece

TWO-STAGE SIDE CHANNEL BLOWER

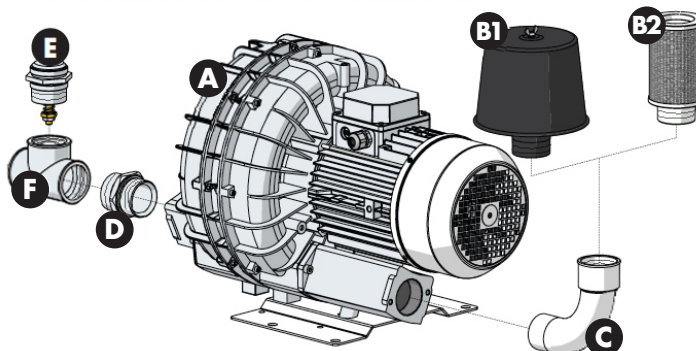


Figure 6.

PIPE CONNECTION

To minimise friction losses and optimise blower performance, use long-radius bends throughout the piping system. Individual pipe angles should not exceed 45 degrees; where a 90-degree turn is required, install two consecutive 45-degree bends (Refer to Fig 7). Additionally, select the largest practicable pipe diameters to maintain efficient airflow.

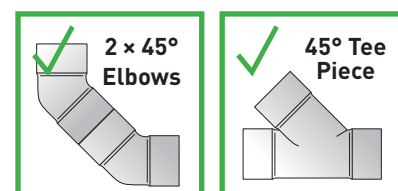


Figure 7.

INSTALLATION

MOUNTING

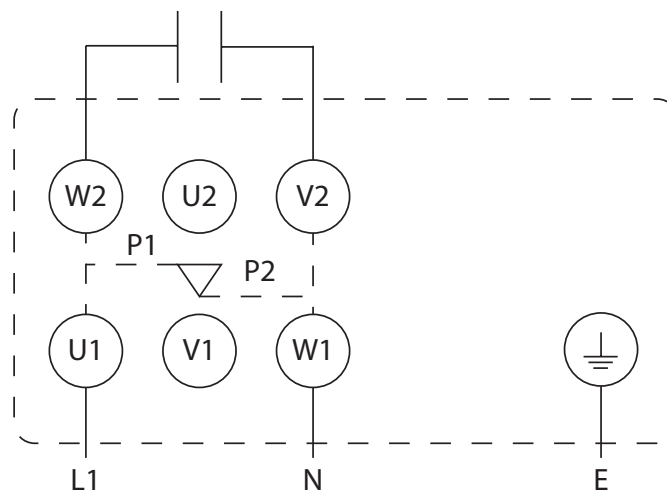
- ❶ The blower **MUST** be installed in a location with adequate ventilation and protected from the weather. It **MUST** not exceed its maximum operating temperature (as stated on the nameplate). Contact the ESAM technical department if the ambient temperature falls outside the permissible range.
- ❷ It **MUST** not exceed its maximum operating temperature.
- ❸ Install the blower elevated above the ground level (above the slab) to prevent contact with standing water or fluid accumulation.
- ❹ Ensure the installation location is not subject to flooding or water pooling under normal or adverse conditions.
- ❺ The blower **MUST** be installed on rubber isolation mounts to prevent vibration transmission and moisture migration from the mounting surface.
- ❻ The blower base plate **MUST** be fastened securely on a solid, flat and level surface. The surface **MUST** be strong and free of vibration. Side channel blowers can also be mounted vertically. Blower accessories (filters) **MUST** always be mounted vertically.
- ❼ Blower exhaust temperatures can elevate significantly under specific operating conditions. To prevent PVC piping from melting, install a section of steel or galvanised metal pipe directly at the exhaust to dissipate heat before transitioning to the PVC pipe network.

Contact the ESAM technical department for further information if required.

ELECTRICAL CONNECTIONS

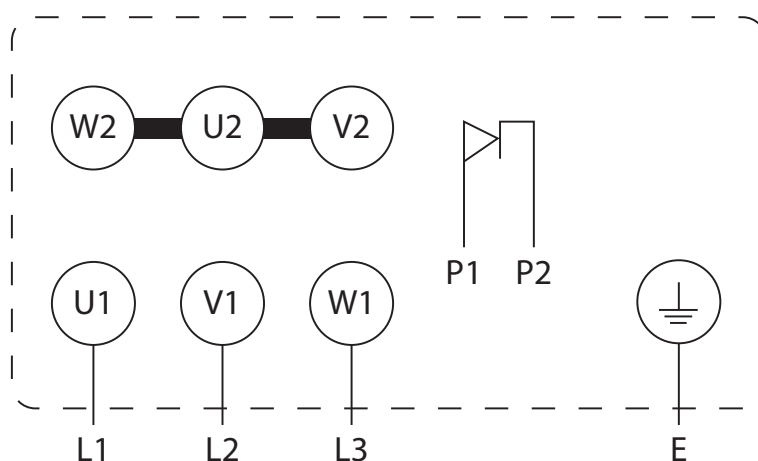
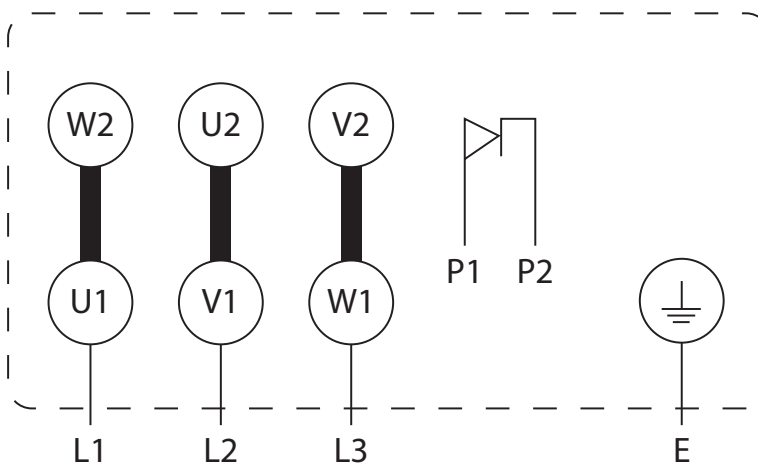
❶ SINGLE PHASE MOTORS (1PH):

- Connect the Earth, Active and Neutral wiring to the motor.
- (P1/P2) PTO Thermal Sensor is connected within the stator windings.



2**THREE PHASE MOTORS (3PH):**

- Connect wiring to the motor, including earth.
- (P1/P2) PTO Thermal sensor (ESAM motors $\leq 5.5\text{kW}$)
Sensor connection to external PTO thermal protection circuit,
(External circuit not included).
- PTC Thermal sensor (ESAM motors $\geq 7.5\text{kW}$)
Sensor connection to external PTC thermal protection circuit,
(External circuit not included).

THREE PHASE WIRING – STAR (Y)**THREE PHASE WIRING – DELTA (Δ)****WARNING****WARNING: ELECTRICAL CONFIGURATION HAZARD**

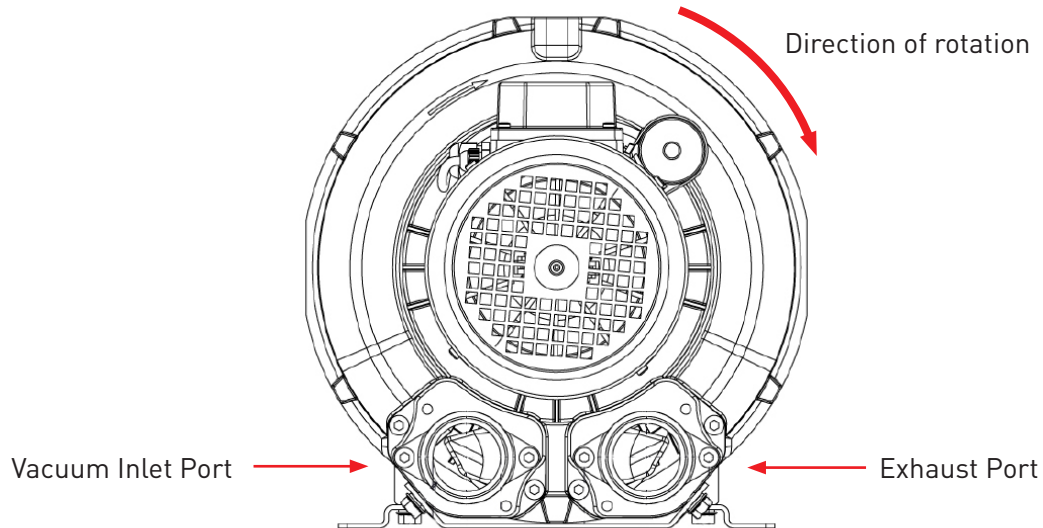
Three-phase motors support either STAR (Y) or DELTA (Δ) wiring configurations. You **MUST** verify the unit data plate to match the wiring configuration to your specific supply voltage.

CRITICAL: Incorrect configuration will cause severe motor damage, electrical failure, or personal injury. Do not apply power if the supply voltage does not match the data plate configuration. Contact the ESAM technical department immediately for assistance if you require further information.

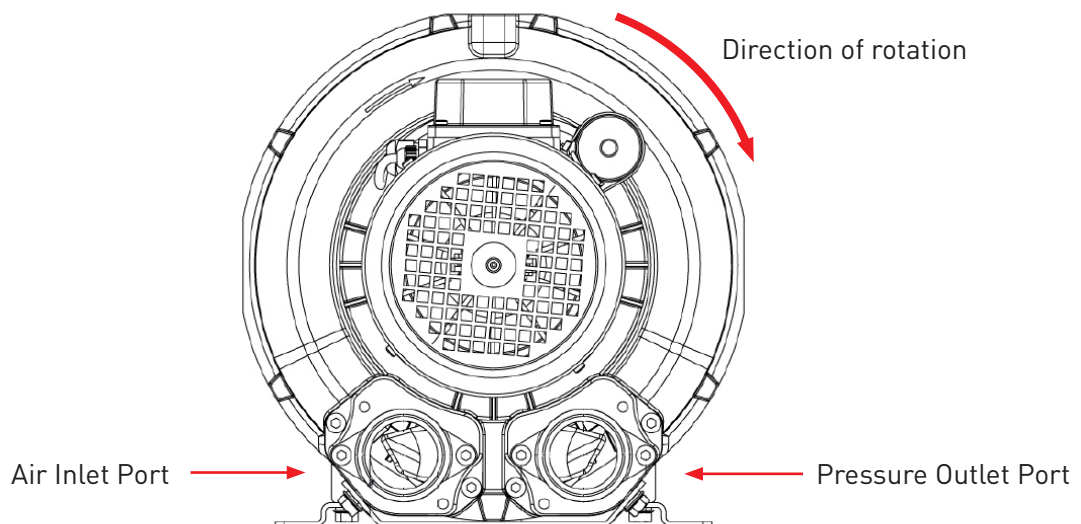
PIPING CONNECTIONS

- 1 Remove clear plastic covers from the air inlet and outlet ports prior to connecting to the inlet and outlet plumbing pipelines.
- 2 Connect the aspirating inlet and blowing outlet as per the "Vacuum or Pressure" application.

VACUUM APPLICATION



PRESSURE APPLICATION



All accessories should be included in the connecting piping manifolds.

Vacuum and pressure applications require different accessories. Information is provided below for vacuum and pressure applications. Accessories are also specific to each ESAM side channel blower model.

Refer to the ESAM Product Catalogue or contact the ESAM technical department for further information.

VACUUM ACCESSORIES

– Blower Inlet Side

- 1** Air Inline Filter
- 2** Vacuum Relief Valve

– Blower Exhaust Side

- 3** Silencer

An Air Inline Filter and Vacuum Relief Valve **MUST** be included in the installation of an ESAM side channel blower used for vacuum applications. The Vacuum Relief Valve is a vital safety component that restricts maximum system pressure, protecting the blower from overload and keeping the motor current within its rated specification.



Failure to install and test the correct operation of these items will void the product warranty.

The inclusion of a silencer on the air outlet (exhaust side) of the side channel blower is optional. Exhaust piping **MUST** be directed to the atmosphere (external of building) to control noise in the plant area. This will also ensure noise and heat are not present in the plant area. All filters **MUST** be installed in the vertical position.

INSTALLATION REFERENCE FOR VACUUM APPLICATION

SINGLE-STAGE SIDE CHANNEL BLOWER

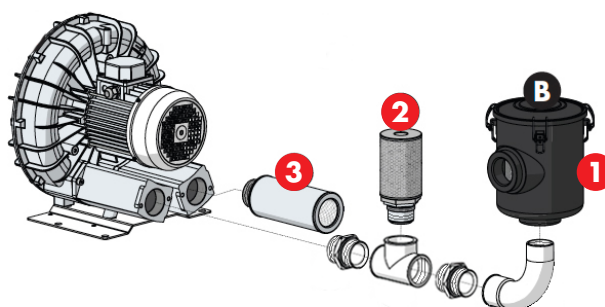


Figure 8.

TWO-STAGE SIDE CHANNEL BLOWER

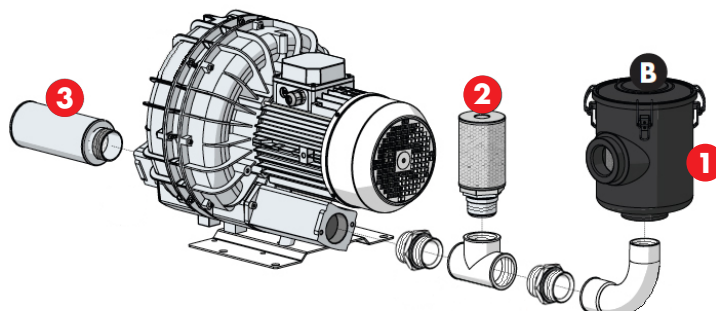


Figure 9.

PRESSURE ACCESSORIES

– Blower Inlet Side

- 1 Air Inlet Filter

– Blower Exhaust Side

- 2 Pressure Relief Valve

An Air Inlet Filter and Pressure Relief Valve **MUST** be included with the installation of an ESAM side channel blower being used for pressure application. The Pressure Relief Valve is a vital safety component that restricts with limits maximum system pressure, protecting the blower from overload and keeping the motor current within its rated specification. All filters **MUST** be installed in the vertical position.



Failure to install and test the correct operation of these items will void the product warranty.

SINGLE-STAGE SIDE CHANNEL BLOWER

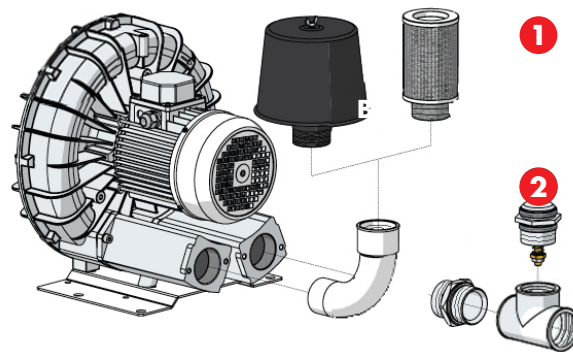


Figure 10.

TWO-STAGE SIDE CHANNEL BLOWER

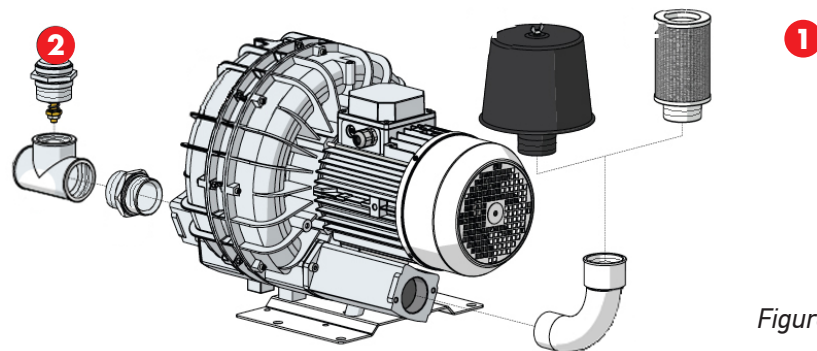


Figure 11.

TESTING

1 PRE-START SAFETY & MECHANICAL CHECKS

Before applying power:

a) CHECK FILTER

Ensure the inlet filters are clean and properly installed. Operating a side channel blower without a filter can severely damage the impeller.

b) RELIEF VALVE CONFIGURATION

When utilising pressure or vacuum relief valves, verify that they are calibrated to the maximum continuous operating pressure (S1 rating) specified on the blower data plate. Note that all relief valves factory-supplied by ESAM are pre-set to match their companion blowers.

2 ELECTRICAL AND ROTATION CHECK

a) VOLTAGE & CURRENT

Verify the power supply voltage and frequency match the blower's nameplate. Ensure your motor overload switch (Circuit Breaker or Moulded Case Circuit Breaker – MCCB) is correctly matched to the current rating on the name plate to protect the motor.

3 NO-LOAD TESTING (INITIAL RUN)

Always perform an initial operational test before connecting the blower to your full process piping.

a) FREE AIR RUN

Start the blower with the inlet and outlet ports completely open.



WARNING

Caution MUST be taken to ensure that no foreign particulate matter enters the blower.

Side channel blowers only work in one direction (marked by an arrow on the housing). Momentarily apply power to the motor (turn the blower on for 1-2 seconds, then off) and observe the rotation of the impeller fan.

If the blower is running backward, it will still operate, but reverse the intake and the exhaust ports. If it is a three-phase motor, swap any two of the three power supply lines to reverse the direction.

b) SOUND CHECK

Listen for abnormal sound during operation.

c) CHECK VIBRATION

Feel the housing for vibration. Check and secure motor fixing bolts if loose.

4 FULL LOAD PERFORMANCE TESTING

Connect the blower to piping manifolds and run under normal operating conditions.

a) MEASURE CURRENT ABSORPTION

Using an electrical clamp meter, measure the electrical current draw. Compare this against the nameplate maximum current rating (FLA) to ensure the motor is not overloaded.

b) PRESSURE / RELIEF VALVE OPERATION

If the pressure rises too high or the system clogs, verify that your relief valves open automatically to protect the blower from operating above the maximum current rating specified on the motor nameplate.

c) PRESSURE/VACUUM CHECK

Install a pressure/vacuum gauge to verify the operating pressure aligns with your system requirements and the blower's max limits.

TROUBLESHOOTING GUIDE

SECTION 1: END-USER (OPERATOR)

This section covers non-invasive, visual, and basic maintenance checks. Always isolate power before inspecting physical components.

Symptom	Potential Cause	Corrective Action
Low or inadequate performance	The air filter is blocked with sediment or dust.	Inspect the air filter. Clean or replace it if it is dirty or older than 12 months.
	Pipework blockage, restriction, or air leaks.	Inspect manifolds and piping. Clear visible obstructions and tighten connections to seal leaks.
	Direction of motor rotation	Check the direction of motor rotation.
Blower is too hot	Air filter is blocked.	Clean or replace the air filter.
	Piping is obstructed.	Turn off the blower and remove obstructions from inlet and outlet lines.
	Inlet air temperature is above 40°C.	Lower the ambient air temperature or cool the inlet air source.
	Relief valve	Check if a relief valve is installed and working correctly.
Blower is noisy or vibrating	Loose mounting hardware.	Tighten all loose mounting bolts and securing fixtures.
	Incorrect installation surface.	Move the blower off hollow surfaces that cause reverberation. Install on a solid base.
	Damaged soft mounts.	Inspect and replace degraded rubber motor mounts.

SECTION 2: MAINTENANCE & SERVICE TECHNICIAN TROUBLESHOOTING

This section covers advanced diagnostics, electrical testing, and mechanical repairs. Only qualified personnel should perform these actions.

Symptom	Potential Cause	Corrective Action
Blower will not start	Incorrect electrical wiring.	Check terminal box connections against the installation wiring diagrams.
	Incorrect or unstable voltage supply.	Measure voltage at motor terminals. Ensure it is within $\pm 10\%$ of the motor's rated power.
	Seized turbine or impeller.	Isolate power. Manually rotate the rotor shaft to check if the turbine spins freely without touching the housing. Check for foreign matter inside the turbine housing.
	Motor Start Capacitor	Check the condition of the Motor Start Capacitor and replace if required.
Motor draws current above the maximum rating	Blocked filter or corroded housing.	Replace the air filter. If the housing is contaminated with foreign matter, contact ESAM technical support.
	Incorrect wiring or low/ fluctuating supply voltage.	Verify terminal box wiring. Measure voltage at the terminals during operation. Contact the power provider if the voltage fluctuates outside the $\pm 10\%$ range.
	Unit exceeding maximum (S1 mBar) pressure limits.	Ensure a relief valve is fitted. Adjust the pressure/vacuum relief valve to limit the maximum pressure. Contact ESAM if connected to a VSD.
Low airflow / pressure or reverse operation	Motor rotating backwards.	Check phase rotation. The correct motor rotation direction is indicated by an arrow on the turbine housing.
	Turbine installed in reverse (after previous service).	Dismantle the housing and check the direction of the turbine fins. Remove and re-install in the correct orientation if required.
	VFD/VSD frequency set too low or too high.	Check VSD control settings. Ensure the frequency (Hz) range settings correspond to the manufacturer's recommendations for the blower. Contact ESAM technical support for further information.
	Worn motor bearings.	Check for bearing play and mechanical noise. Order an ESAM service kit to replace the worn bearings.
	Turbine housing soiled with foreign matter.	Open the housing to clean out debris. Contact ESAM technical support for guidance.
	Damaged or perished gaskets.	Remove old gaskets and install new replacement gasket seals.
High noise or severe vibration	Missing or damaged internal silencer foam.	Replace the foam and cage assembly inside the blower snorkels.
	Turbine touching the housing or a damaged turbine.	Verify operating pressure and temperature are within tolerance. Contact ESAM to arrange a replacement turbine.

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