

ECO-5-A2L

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INSTRUCTION MANUAL

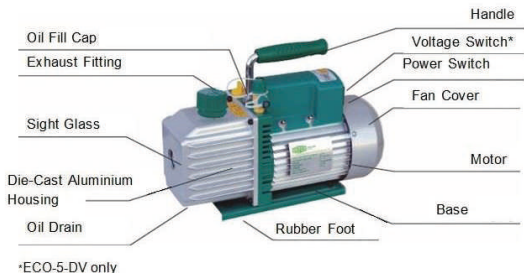
Rotary vane Vacuum Pump



Operating and maintenance instructions

ECO-5-A2L

safe for A2L



ECO-5-A2L Rotary vane vacuum pump

Thank you for choosing a REFCO vacuum pump. We are proud of each and every REFCO product and are dedicated to ensuring our products always perform reliably. Please read the following operating instructions thoroughly and follow our suggestions –they will give you the information you need to run, maintain and prolong the life of your pump.

Please observe the warning signs!



They are indicated by this symbol:

This international symbol warns of hazards which could lead to serious injury or material damages.

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Important safety notices



Before using the vacuum pump, please read the operating instructions carefully, as they contain important information concerning the proper operation, maintenance and disposal of the vacuum pump.



The vacuum pump should only be operated on a fused power supply and must be correctly grounded



REFCO products have been specially designed and manufactured for use by trained refrigeration service engineers. Because of the high pressures and the chemical and physical gases used in refrigeration systems, REFCO cannot be held responsible or liable for any accidents, injuries or deaths. REFCO explicitly states that their products must only be sold to professionally-trained experts.

Use

The REFCO vacuum pumps have been especially designed and manufactured for the evacuation of closed vessels and units in the field of refrigeration and air-conditioning. The pump must always be operated by a qualified professional technician!



This pump should only be operated by qualified personnel.

Suitable protective equipment like gloves, goggles and safety footwear should be worn when working with refrigeration systems.



The vacuum pump **must not** be used as a compressor or to build up pressure with air or other gases.



The vacuum pump **must not** be operated in flammable environments or places where explosive gas could be present.



The vacuum pump **must not** be used in connection with aggressive liquids and gases such as i.e. ammonia or pure oxygen which could cause damage to parts and components of the pump.



Combustible refrigerants such as i.e. R600a, R600, R290, must be vented through the exhaust to the outside of buildings by means of a venting hose.



The vacuum pump **must not** be used to pump liquids such as i.e. water, fuels, oils, beverages, other liquid food, liquid refuse or feces.

Contents of delivery

- Vacuum pump oil
- Power supply cords
- Multilingual instructions of use

Transport



Carry the vacuum pump on the designated handle only!



Keep the pump leveled and secured during transport to avoid oil spillage. Oil spillage could cause damage to the electric motor.

Set up operation

1) Select voltage (only applies to ECO-5-DV)

Before commissioning, use the voltage switch to select the correct supply voltage (110V or 220V). The motors of the vacuum pump are designed to be used with an operating voltage of +/- 10% of the normal rating.

Please check that the voltage and frequency match the values indicated on the rating plate. Before connecting the pump to the power supply, ensure that the switch is set to OFF.



The vacuum pump should only be operated on a fused power supply.

2) Before using the vacuum pump

The vacuum pump is delivered without any oil in the reservoir. Before initial commissioning, it must therefore be filled with the oil supplied. To do this, make sure the vacuum pump is in a horizontal position, remove the oil fill cap and pour in the oil until it reaches the lower part of the sight glass. The exact quantity of oil required is given in the technical data.

After filling with the oil, screw the oil fill cap back on. Remove the flare cap from the intake port to start the pump. Switch on the pump, and when it is running well, replace the cap. It can take between 2 and 30 seconds for the pump to run well, depending on the ambient temperature. Once the pump has been running for about 1 minute, check the oil level in the sight glass. The oil should reach the oil level line. Add more oil if necessary.

Caution: When the pump is running, the oil should reach the oil level line on the sight glass. Too little oil will result in a poor vacuum while too much oil can sometimes result in oil being sprayed from the exhaust port.

DO NOT OVERFILL! When the pump reaches operating temperature, the oil expands, meaning that the oil level of a running pump is higher than when the pump is switched off. To check the oil level, start the pump with the intake port closed. Check the oil level on the sight glass. Fill with more oil if necessary.



Be careful when touching the pump, as parts or surfaces may be hot.



The exhaust gases of the vacuum pump consist of oil mist and the gases or steam that have been taken in. Over pressure on the exhaust valve should be avoided.

Check the oil condition through the sight glass at regular intervals while the vacuum pump is in use. If the oil is cloudy, dark or dirty, or if the oil level in the oil reservoir has increased, the oil has been contaminated. The oil should then be changed immediately. Ensure that, during operation, the pump, and in particular the side of the fan, is not covered with any objects, cloths, foils/films etc. A restriction of the air flow can lead to an automatic pump shut off due to overheating



Caution – the pump will restart automatically after cooling!

3) Shutdown

To prolong the pump's lifespan and to ensure it can be easily switched on, the instructions below must be followed when switching the pump off.

- (1) Close the manifold valve between the pump and the system.
- (2) Remove the hose from the pump inlet port.
- (3) Cover the inlet port opening to prevent dirt getting in.

Maintenance / Oil change

The condition and type of oil are extremely important in achieving the best possible vacuum. **We recommend only using high-performance REFCO vacuum pump oil (DV44/45/46).**

This oil has been produced especially to ensure optimal viscosity both at normal temperatures and in cold weather.

It should be replaced after 20 operating hours at the latest or in case of heavy contamination (dark or cloudy oil).

The oil should also be changed after suctioning off contaminated coolants. In particular, moisture/water left in the pump until its next use can cause corrosion damage to the pump.



During repair and maintenance work where personnel may be put at risk by moving or live parts, the vacuum pump must be disconnected from the electricity supply by pulling out the power plug or operating the main switch and also secured against unintentional restart. Non-compliance or improper electrical connections can cause electric shocks.



BE CAREFUL WHEN TOUCHING THE PUMP. SURFACES MAY BECOME EXTREMELY HOT. RISK OF BURNING.



Dirty/contaminated oil can damage the vacuum pump.

How to change the oil:

- Allow the pump to run until it reaches operating temperature. Then switch it off and pull out the power plug.
- Unscrew the drain plug and drain the contaminated oil into a suitable container.
- Plug in the power plug–switch on the pump. Let the pump run for approx. 10-20 seconds with open intake port, so that any residual oil will be pushed out of the pump.
- Switch off the pump–pull out the power plug.
- Pour out or drain off any residual oil. If the oil stops flowing, tilt the pump and drain off the oil.
- Screw the oil drain plug on tightly again.

- Remove the oil fill cap and fill the reservoir with fresh oil until it reaches the lower edge of the sight glass.
- Ensure that all intake ports are closed, then switch on the pump and let it run for a minute before checking the oil level. If the oil is under the fill line, slowly add some more oil (while the pump is running) until it reaches the oil fill line. Replace the oil fill cap and ensure that the intake port and container lid are closed.



For heavily contaminated oil, we recommend repeating the oil change after a run time of 30 minutes, to rinse out all the contaminants.

To achieve the best results and to avoid damaging the pump, REFCO oils DV-44, DV-45, DV-46 or DV-48 should be used.



Waste oil must be disposed of according to the applicable regulations by the pump operator.

Further maintenance work should be carried out by a specialist.

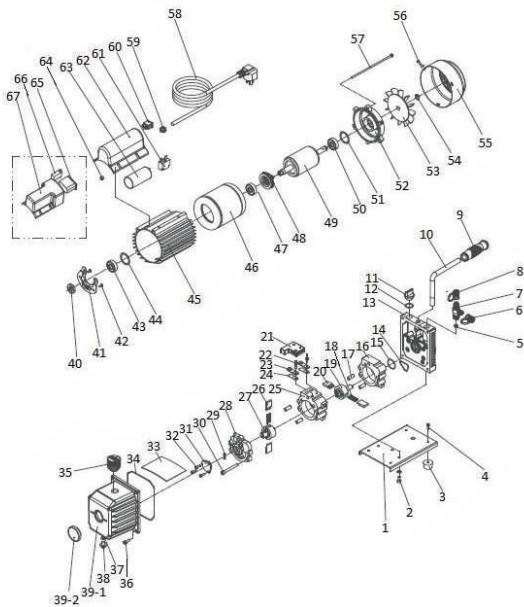
Troubleshooting

Fault	Cause	Solution
Pump does not achieve a vacuum	Loose cap on intake port	Screw the cap on tightly
	O-ring in the intake port cap is faulty	Replace O-ring
	Oil level too low	Refill oil
	Oil is muddy (cloudy) or contaminated	Change oil
	Pipe leaking	Check pipe, seal it
	Pump is worn out after lengthy use	Repair or replace pump
Pump is difficult to start	Oil too cold	Place the pump in a warm environment.
	Supply voltage is too low	Pump is designed to work at +/- 10% of the supply voltage For ECO-5-DV, use the voltage switch to select the correct voltage (110V or 220V)
	The connection cable is too long	Use a shorter connection cable.
	Non-REFCO oil -too viscous	Replace with original oil
	Pump dirty/contaminated	Change oil
Motor does not start	Motor too hot	Let it cool down
	Cable faulty	Replace cable
	Capacitor faulty	Replace capacitor
	Switch faulty	Replace switch
Pump is losing oil	Oil housing seal faulty	Replace seal
	Oil draining screw leaking	Seal with thread sealant
Sprayed oil on the oil mist separator	Oil container overfilled	Drain off excess oil
Formation of oil mist	Operating pressure = atmospheric pressure	Oil mist reduces after the build-up of suction pressure
Oil level not visible	Oil quantity too low	Add oil
Oil dirty/cloudy	Dirty coolant/oil sucked in	Change oil
Pump makes noise	Fan is faulty	Replace fan
	Engine mount is faulty	Call customer service

Technical Data

Model	ECO-5-A2L
Type	Dual stage vacuum pump
Voltage	115V / 60 Hz
Free Air Displacement	5 CFM, 142 L/min
Ultimate vacuum	2 Pa, 0,02 mbar, 15 microns
Motor	1/2 HP
Intake Fitting	1/4" + 3/8" Flare
Oil capacity	11 oz
Dimensions (in)	13.5 x 5.5 x 10
Net weight (lbs)	23

Exploded view drawing



1	Base	35	Exhaust and oil inlet fitting
2	Screw	36	Screw
3	Rubber feet	37	O ring
4	Screw	38	Oil drain plug
5	Filter	39-1	Oil housing
6	Inlet fitting cap	39-2	Sight glass
7	Inlet fitting	40	Seal
8	Inlet fitting cap	41	Centrifugal switch base
9	Handle sheath	42	Cross screw
10	Handle	43	Bearing
11	Oil fill cap	44	Gasket
12	O ring	45	Motor hull
13	Trestle	46	Motor stator
14	O ring	47	Bearing
15	O ring	48	Centrifugal switch
16	Fore stator	49	Motor rotor
17	Round pin	50	Bearing
18	Spring	51	Gasket
19	Fore rotor	52	Motor cover
20	Fore rotary vane	53	Fan
21	Anti-oil cover	54	Elastic collar
22	Screw	55	Fan cover
23	Control plate	56	Cross-drive screw
24	Displacing valve	57	Cross-drive screw
25	Back stator	58	Power supply cord
26	Back rotary vane	59	Insulating bushing
27	Back rotor	60	Power switch
28	Pump back cover	61	Thermal protector
29	Oil pump rotary vane	62	Junction box
30	Screw	63	Capacitor
31	Oil pump back cover	64	Cap nut
32	Screw	65	Powerswitch with socket
33	Anti-oil plate	66	Conversion switch
34	Housing gasket	67	Junction box

Warranty

REFCO Manufacturing Ltd has been certified in accordance with DIN EN ISO 9001: 2008. Regular quality control checks as well as an accurate manufacturing process guarantee reliable functionality and are the basis for the REFCO guarantee, in accordance with the General Terms and Conditions of Sale and Delivery applicable on the day of delivery. Damages arising from obvious maltreatment or wear are excluded from the guarantee. Improper use, use of the vacuum pump for purposes other than those specified by the manufacturer, use of the wrong oil or the opening of the pump by the operator during the guarantee period will void warranty! For repairs during the warranty period, the vacuum pump must be sent to the seller of the pump, at the expense and risk of the sender.

Replacement parts

It is extremely important to use the correct materials for replacement parts, otherwise the pump's performance can be affected or the pump could be damaged.

When ordering replacement parts, please give the pump model and serial number (see rating plate).

Environment

The Vacuum pump has been developed for long term use. REFCO takes energy saving and environmental impact into consideration when procuring materials and manufacturing its products. REFCO Manufacturing Ltd feels responsible for all of its products throughout their entire lifespan and has therefore been certified in accordance with DIN EN ISO 14001: 2004. When decommissioning the device, users should observe the disposal regulations applicable in their country. Oil and other components must be disposed of in an environmentally-friendly manner.



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