



**Eurovacuum  
Installations and  
Operating manual  
EV Series  
Vacuum pumps  
Models 0010 - 0630**

**Single Stage Oil Sealed Rotary Vane Pump**



# Eurovacuum EV Series

## Single Stage Oil Sealed Rotary Vane Pumps

**Eurovacuum** Company is offering its various products to meet industrial vacuum needs.

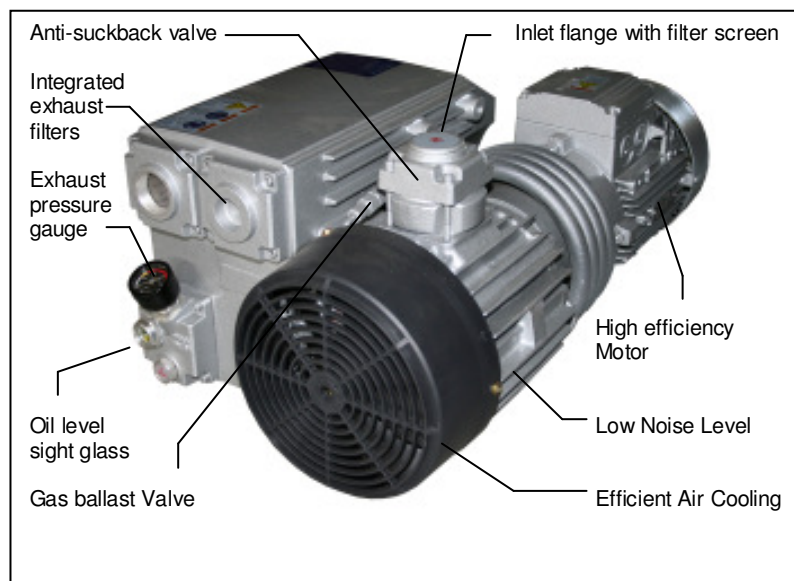
Eurovacuum Company is founded in 2006, with over 30 year experiences in the vacuum Industry its founders have been putting there best efforts continuously to produce high quality Oil Sealed Rotary Vane Pumps, with diverse range of capacity for use in printing, food processing, packaging, plastic moulding, vacuum lifting, hospitals and laboratories or other industrial application.

### Advantages to the User

- High pumping speed also at low pressures
- Low noise level
- Integrated exhaust filter, Discharge Air 99.9% Oil Free
- No oil loss owing to the integrated oil return line
- Air-cooling, no water required
- Low space requirement, easy to install
- Spin-on Oil Filter on all sizes from EV-0030
- Maintenance-friendly
- Compact design
- Anti-Suckback valve to secure the vacuum in the system
- High water vapour tolerance
- Direct drive, Design requires no belts
- Wide range of accessories available for easy adaptation

### Application Examples

- Car industry
- Food industry
- Furnaces and plants
- Laser technology
- Medicinal technology
- Metallurgy
- Power engineering, long-distance energy
- Space simulation
- Vacuum coating



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**It is mandatory that these operating instructions be read and understood prior to the vacuum pump installation and start-up.**

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## INSTALLATION AND OPERATING MANUAL

This manual is written to cover EV-Series Model vacuum pumps. The model number is stamped into the nameplate. The number will appear as follows :  
EV-XXXXL , EV-XXXXN, or EV-XXXXNM.

**Please identify the model number and serial number when ordering parts.**

### 1.0 INSTALLATION

#### 1.1 Unpacking

Inspect the box and pump carefully for any signs of damage incurred in transit. Since all pumps are ordinarily shipped from our regional warehouse, such damage is the normal responsibility of the carrier and should be reported to them.

The vacuum pump is bolted to the skid with studs that are connected through the rubber feet of the pump. Remove the nuts from the underside of the crate and remove the pump. Unscrew the studs from the rubber feet.

The inlet and exhaust of the pump are covered with plastic caps to prevent dirt and other foreign substances from entering the pump. Leave these caps in place until you are ready to pipe the pump to your equipment.

#### 1.2 Location

Install the pump in a horizontal position on a level surface so that the pump can be evenly supported on its rubber feet. Leave 30 ~ 45 cm of access around the pump to allow proper cooling. Also adequate ventilation must be provided for the fans, radiator and motor.

Allow access to the oil sight glass in order to inspect the oil level and the exhaust port for easy access to change the exhaust Filters.

**Do not tip the pump over if filled with oil.**

#### 1.3 Power Requirements

A schematic diagram for the electrical motor terminal connections is located in the junction box of the motor or on the motor nameplate.

The motor must be connected according to the electrical codes through a fused switch in order to protect the motor against electrical or mechanical overload conditions. The overload of the motor starter must be set at a level equal to the full load motor current listed on the motor nameplate.

If the pump is supplied with a motor starter it is preset at the factory according to customer specifications. It is advisable to check that these settings are in line with the voltage at your location. If the voltage is different, please contact Eurovacuum for motor and starter information.

Correct direction of rotation is marked by an arrow on the motor fan housing and is counter clockwise when looking at the motor from the motor's fan side.

**After electrical connections have been made, but prior to filling with oil, the rotation of the motor should be checked. If backward, reverse any two leads of the three phase at the power connection.**



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### 1.3 Vacuum Connections

Use a pipe size that is at least the size of the pump inlet connections. Smaller lines result in a reduced pump capacity.

Pumps operating in parallel on a common main line should have a manual or automatic operated shut-off valve or positive action check valve, installed in the suction line adjacent to the pump suction flange. The built-in anti-suck back valve should not be used as a shut-off valve for the vacuum system. Remove the plastic protective cap from the inlet port prior to connection of pump to the system.

Should process gas contain dust or other foreign particles, a suitable in line (inlet) filter should be connected to the inlet port. Consult Eurovacuum for recommendations.

The vacuum piping should be designed to ensure that no liquids such as condensate or liquid carried over from the process can reach the pump. If this possibility exists, a knock-out liquid separator should be installed. Consult Eurovacuum for recommendations.

If an exhaust manifold is connected, install a drip leg and drain near the pump exhaust to prevent exhaust condensation from entering the exhaust box. The following thread sizes are standard on the Eurovacuum pumps (NPT thread is available upon request)

<b>Pump Model</b>	<b>Inlet Size</b>	<b>Exhaust Size</b>
EV-0010/0016/ 0021	½" G	Open Grid
EV-0030/0045	1¼" G	1¼" G
EV-0065/0100	1¼" G	1¼" G
EV-0160/0215	2" G	1½" G
EV-0175/0250/0300	2" G	2" G
EV-0450/0630	3" G	3" G

### 1.4 Oil Filling

The pump is shipped without oil. After level installation and correct rotation has been established, fill the pump with recommended vacuum pump oil through the oil fill port. Oil level should be at the 3/4 positions on the oil sight glass.

Non-detergent oil should be used. We recommend original Eurovacuum Vacuum Pump oil. Eurovacuum oil is a high quality vacuum oil that will provide longer running time between oil changes, better lubrication at high operating temperatures and prolongs the life of the exhaust filter elements. Oil detergent additives can cause exhaust filters to become clogged and shorten their service life.

#### Ordering information on Eurovacuum oil:

	<b>Mineral oil EV-mineral 100 <u>Article number:</u></b>	<b>Synthetic oil EV-synthetic 500 <u>Article number:</u></b>	<b>Foodgrade oil EV-foodgrade 100 <u>Article number:</u></b>
1 ltr package	100.100	100.200	100.300
2,5 ltr package	100.101	100.201	100.301
5 ltr package	100.102	100.202	100.302
20 ltr package	100.103	100.203	100.303



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The following table gives the approximate quantities of oil required for each model.

<b><u>Pump Model Capacity</u></b>	<b><u>(ltr)</u></b>
EV-0010/0016/0021	0.5
EV-0030/0045	1.0
EV-0065/0100	2.0
EV-0160/0215	5.0
EV-0175/0250/0300	7.0
EV-0450/0630	19.0

**Do not add oil with pump running or through the inlet or exhaust ports! Do not overfill.**

## 2.0 SAFETY

Please read the following safety notice carefully before operating the pump.

### 2.1 General Notices

- Understand fully this installation and operating manual before operation.
- The other person except authorized operator should not operate the pump
- When the pump is not properly working, it should be stopped immediately.
- Eurovacuum shall have no liability for any accident and failure arising from no compliance with instructions in this manual.

### 2.2 Warning labels and its explanation

Following warning labels are shown and attached on EV-series pumps

#### 2.2.1 Read and Understand a manual:

Read and understand operator's manual before using this machine

#### 2.2.2 Burn Hazard:

Hot surface. Do not touch.

#### 2.2.3 Loud noise Hazard:

Loud noise hazard. Ear protection must be worn.

#### 2.2.4 Hazardous Voltage:

Disconnect power before opening. Contact causes severe electrical shock





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### **2.3 Location of the labels**

The labels of 2.2.1 Read and Understand a manual, 2.2.2 Burn Hazard and 2.2.3 Loud noise Hazard shall be shown on the oil sump top of EV-series pump.  
The label of 2.2.4 Hazardous Voltage shall be shown on the cover of motor's terminal box

## **3.0 OPERATION**

### **3.1 Start-up**

Check rotation of the motor as described in paragraph 1.3 Power Requirements.  
Fill the pump with oil as described in paragraph 1.5 - Oil Filling

Start the pump with the inlet closed. Run the pump for a few minutes and then shut down. Check the oil level again and make sure the oil level is between the 3/4 marks and full on the upper oil sight glass.

Add oil, if necessary. Pump oil should only be added when the pump is off and circulating oil has sufficient time to return to the oil sump.

### **3.2 Stopping the pump**

To stop the pump, turn off the power. A built in anti-suck back valve will prevent oil from the oil reservoir being sucked back into the cylinder after the pump is shutdown.

**Do not utilize the anti-suck back valve as a check valve. Consult Eurovacuum for proper check valves.**

### **3.3 Gas Ballast**

EV-N & NM series pumps are equipped with gas ballast. The gas ballast valve is located between the inlet port and the exhaust box. Its main function is to prevent water vapour from condensing in the pump that causes emulsification of the oil resulting in possible pump failure.

In applications, when the quantity of water vapour is moderate, it is recommended to run the pump for 10 minutes to its normal operating temperature, prior to going on process. The pump should also be operated off process for 10 minutes prior to shut down. A slight air bleed (purge) is recommended during these 10-minute cycles to prevent the vapour from condensing in the pump.

### **3.4 Check Valve (Built-In)**

EV-series pumps are equipped with Built-in Check Valve. The valve is located in the inlet flange housing, which is in the upper part of Pump module to prevent oil back to inlet side (system) when the pump is running off.  
(However, it is recommended to install separate check valve in the line of inlet if necessary)

### **3.5 Exhaust Pressure Gauge (Optional)**

This gauge shall be installed on the Oil fill Plug for easy checking of status of saturation of the exhaust filter.



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### 4.0 MAINTENANCE

EV-Series vacuum pumps require very little maintenance. To ensure optimum performance, the following maintenance steps should be followed:

#### 4.1 Pump Oil

##### 4.1.1 Oil Level

Under normal circumstances it should not be necessary to add oil between oil changes. A significant drop in oil level means there is either an oil leak, a defective exhaust filter or O-ring, or a leaking anti-suck back valve. If the pump is smoking excessively, the exhaust filter may be installed improperly.

It is normal for the oil to be foamy or lightly coloured in an operating pump. This may be normal aeration of the oil. If the oil appears milky or dark coloured, it is contaminated or burned and must be changed.

Check the oil level only when the pump is shut off. Replenish oil if it drops below the  $\frac{1}{4}$  mark of the top sight glass.

**Caution: Do not add oil while the pump is running, since hot oil can escape from the oil fill port.**

##### 4.1.2 Oil Type and Quantity

See section 1.5 - Oil Filling - for details on oil type and quantity

##### 4.1.3 Oil Change

When using proper Vacuum Pump Oil, it is recommended to change the oil every 500-750 operating hours.

Oil change frequency is dependent upon the application and ambient temperature. It is recommended that the customer monitor the condition of the oil during this period.

##### 4.1.4 Oil Spin-On Filter

Replace automotive-type spin on filter at every oil change.

<u>Pump Model</u>	<u>Part No.</u>
EV-0030 ~ EV-0100	06100
EV-0160 ~ EV-0300	50100
EV-0450 ~ EV-0630	120100

#### 4.2 Inline (Inlet) Filter

Check inline (inlet) filter on a weekly basis. The filter cartridge should be cleaned or replaced when dirty. Consult Eurovacuum for replacement element information.

**Caution: Depending on the mounting position of the filter, be careful not to allow accumulated foreign material to fall in the pump suction inlet when removing the filter cartridge. Horizontal filter installation is recommended to prevent this.**





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### 4.3 Exhaust Filter

Replace these filters every 9 to 18 months of operation or as necessary. The service life of these filters varies depending upon the application and frequency of oil change. It is necessary to change these filters only when they become clogged. Indications of clogged filters are smoke or oil mist coming from the exhaust of the pump, higher than normal motor current, and the exhaust pressure gauge (Optional) reading 0,6 bar or greater.

**Do not clean or re-use these filters. Filters must be disposed of in a proper way as they might contain toxic substances carried over from the process. Replace O-rings on filter when changing.**

### 4.4 Maintenance Chart

<b>Daily</b>	: visually check oil level and colour.
<b>Weekly</b>	: inspect inline (inlet) filter
<b>Every 2- 6 month</b>	: drain and discard oil from pump while hot. Refill with fresh oil.
<b>Every 9-18 month</b>	: replace exhaust filter elements and O-ring.

For motor - See the motor manufacture's manual for periodic motor maintenance.

**The operating life of the pump is greatly enhanced based on the oil quality and condition of the filters. Periodic maintenance will ensure a reliable operating vacuum pump.**

### 4.5 Gasket Kit, Overhaul Kit and other Parts

A gasket kit contains a set of gaskets and O-rings

A Overhaul (Maintenance) kit contains a set of gaskets, O-rings, vanes, bearing, bearing sleeves, shaft seals and taper pins, oil filter and exhaust filter(s).

Other parts are available. Please consult Eurovacuum parts department for information.

## 5.0 PROBLEM SOLVING

### 5.1 Problem

Pump does not reach end pressure. This is the lower absolute (best vacuum) when running with the inlet closed.

#### 5.1.1 Possible Cause

Oil condition is most often the cause of not reaching end vacuum.

*Remedy* : drain oil from pump and refill with fresh oil. Run pump with fresh oil for 15 minutes then take new pressure reading.

#### 5.1.2 Possible Cause

Inlet screen clogged with debris.

*Remedy* : clean screen and check inlet filter element.

#### 5.1.3 Possible Cause

Shaft seal leak

*Remedy* : replace shaft seal from overhaul kit, or call Eurovacuum for exchange program.



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### 5.1.4 Possible Cause

Vane stuck in rotor slot.

*Remedy* : drain oil with flushing oil. Run pump for 15 minutes and drain. Replace fluid with fresh oil, exhaust filter, and spin on filter.

- replace vane from overhaul kit or call Eurovacuum for exchange program

### 5.1.5 Possible Cause

Anti-suck back valve stuck in closed position due to oil contamination.

*Remedy* : disassemble valve and screen, clean as required. Drain old oil and replace with fresh oil.

### 5.1.6 Possible Cause

No oil or low oil level in reservoir.

*Remedy* : shut down pump, drain balance of oil and refill with fresh oil.

### 5.1.7 Possible Cause

Vacuum fitting or hose is not leak tight.

*Remedy* : check hose and pipe connections for leaks.

### 5.1.8 Possible Cause

Radial clearance between rotor and cylinder are no longer adequate.

*Remedy* : overhaul pump or call Eurovacuum for exchange program.

## 5.2 Problem

Pump runs very noisy.

### 5.2.1 Possible cause

Coupling insert is worn.

*Remedy* : replace coupling insert in motor/pump coupling.

### 5.2.2 Possible Cause

Vanes stuck

*Remedy* : follow flush procedure from 5.1.4 or replace vane or call Eurovacuum for exchange program.

### 5.2.3 Possible Cause

Bearing noise

*Remedy* : replace bearings or call Eurovacuum or exchange program.



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### 5.3 Problem

Pump starts, but labours and draws high amperage.

#### 5.3.1 Possible Cause

Oil is too viscous.

*Remedy* : drain and change with fresh oil.

#### 5.3.2 Possible Cause

Exhaust filter is clogged

*Remedy* : replace exhaust filters, maintain proper oil condition, oil level and use Vacuum pump oil.  
- make sure inlet filter is operational preventing particulate carryover.

#### 5.3.3 Possible Cause

Loose connection in motor terminal box wired for wrong voltage.

*Remedy* : check wiring diagram for proper connections; tighten or replace loose connections.

#### 5.3.4 Possible Cause

Foreign particles in pump. Broken vanes or seized bearings.

*Remedy* : overhaul pump or call Eurovacuum for exchange program.

#### 5.3.5 Possible Cause

Pump is overfilled with oil or wrong kind of oil is in pump.

*Remedy* : drain oil; use correct type of Vacuum pump oil.

#### 5.3.6 Possible Cause

Pump runs in wrong direction.

*Remedy* : check for correct rotation. If incorrect, switch any two leads.

### 5.4 Problem

Pump will not start.

#### 5.4.1 Possible Cause

Supply voltage is not proper or is overloaded. Motor starter overload settings are too low or improper; fuses are burned; wire size is too small or too long causing a voltage drop.

*Remedy* : check voltage supply; overload settings in motor starter for size and settings according to motor nameplate. Install proper size wire. If ambient temperature is high, use the next larger size overloads or adjust settings 5% above motor nameplate value.

*Remedy* : turn pump fan by hand. If it will not turn, remove motor from pump and check motor and pump separately. Repair or replace if needed or call Eurovacuum for exchange program.

### 5.5 Problem

Pump smokes at the exhaust side or expels oil droplets from the exhaust.

#### 5.5.1 Possible Cause

Exhaust filters are not properly installed with O-ring; Filter media is damaged.

*Remedy* : check exhaust filter placement and replace if needed.



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### 5.5.2 Possible Cause

Exhaust filters are clogged with foreign particles.

*Remedy* : replace filter and O-ring.

### 5.5.3 Possible Cause

Oil is not re-circulating properly.

*Remedy* : check oil quality and make certain oil lines are clean.

## 5.6 Problem

Pump is running too hot. (Typical operating temperature of the EV-Series pump is 50 °C ~ 95 °C)

### 5.6.1 Possible Cause

Not enough oil in the oil reservoir or oil is badly burned or carbonized.

*Remedy* : drain oil and refill with proper Eurovacuum oil; change oil more frequently.

### 5.6.2 Possible Cause

Not enough air ventilation to the pump

*Remedy* : clean radiator and motor fins. Make certain a sufficient amount of fresh air is supplied to the pump.

## 5.7 Problem

Pump will not operate (seized up).

### 5.7.1 Possible cause

Pump operated without oil and vanes broke

*Remedy* : Call Eurovacuum for exchange program

### 5.7.2 Possible Cause

Liquid carry over into pump cylinder broke vanes while pump was running.

*Remedy* : Install knock-out pot at inlet of pump



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**6.0 TECHNICAL DATA**

Technical Data		EV-0010		EV-0016		EV-0021	
		50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
Nominal displacement	m <sup>3</sup> /h	10	12	16	19	20	24
Ultimate pressure NM type	mbar	2	2	2	2	2	2
L type	mbar	20	20	20	20	20	20
Motor power	kW	0,4	0,4	0,75	0,75	0,9	0,9
Nominal speed	rpm	1450	1740	1450	1740	2870	3480
Noise level	dB(A)	57	59	58	60	60	62
Operating temperature	°C	77	77	80	80	85	85
Oil capacity	ltr	0,5	0,5	0,5	0,5	0,5	0,5
Weight	kg	20	20	22	22	20	20
Admissible ambient temp.	°C	10 to 40	10 to 40	10 to 40	10 to 40	10 to 40	10 to 40
Connection Inlet	G(BSP)	½"	½"	½"	½"	½"	½"
Outlet	G(BSP)	½"	½"	½"	½"	½"	½"

Technical Data		EV-0030		EV-0045		EV-0065	
		50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
Nominal displacement	m <sup>3</sup> /h	30	36	45	54	65	78
Ultimate pressure N type	mbar	0,5	0,5	0,5	0,5	0,5	0,5
NM type	mbar	2	2	2	2	2	2
L type	mbar	20	20	20	20	20	20
Motor power	kW	1,5	1,5	1,5	1,5	2,2	2,2
Nominal speed	rpm	1450	1740	1450	1740	1450	1740
Noise level	dB(A)	64	67	64	67	65	68
Operating temperature	°C	76	76	78	78	85	85
Oil capacity	ltr	1,0	1,0	1,0	1,0	2,0	2,0
Weight	kg	47	47	53	53	66	66
Admissible ambient temp.	°C	10 to 40	10 to 40	10 to 40	10 to 40	10 to 40	10 to 40
Connection Inlet	G(BSP)	1¼"	1¼"	1¼"	1¼"	1¼"	1¼"
Outlet	G(BSP)	1¼"	1¼"	1¼"	1¼"	1¼"	1¼"

Technical Data		EV-0100		EV-0160		EV-0175	
		50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
Nominal displacement	m <sup>3</sup> /h	100	120	160	120	175	210
Ultimate pressure N type	mbar	0,5	0,5	0,5	0,5	0,5	0,5
NM type	mbar	2	2	-	-	2	2
L type	mbar	20	20	20	20	20	20
Motor power	kW	3,0	3,0	3,7	3,7	5,5	5,5
Nominal speed	rpm	1450	1740	1450	1740	1450	1740
Noise level	dB(A)	65	68	74	77	74	77
Operating temperature	°C	85	85	85	85	85	85
Oil capacity	ltr	2,0	2,0	5,0	52,0	7,0	7,0
Weight	kg	75	75	124	124	164	164
Admissible ambient temp.	°C	10 to 40	10 to 40	10 to 40	10 to 40	10 to 40	10 to 40
Connection Inlet	G(BSP)	1¼"	1¼"	2"	2"	2"	2"
Outlet	G(BSP)	1¼"	1¼"	1½"	1½"	2"	2"



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Technical Data		EV-0215		EV-0250		EV-0300	
		50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz
Nominal displacement	m <sup>3</sup> /h	215	258	250	300	300	360
Ultimate pressure N type	mbar	0,5	0,5	0,5	0,5	0,5	0,5
NM type	mbar	-	-	2	2	2	2
L type	mbar	20	20	20	20	20	20
Motor power	kW	5,5	5,5	7,5	7,5	7,5	8,6
Nominal speed	rpm	1450	1740	1450	1740	1450	1740
Noise level	dB(A)	74	77	74	77	75	78
Operating temperature	°C	85	85	85	85	85	85
Oil capacity	ltr	5,0	5,0	7,0	7,0	7,0	7,0
Weight	kg	145	145	184	184	188	188
Admissible ambient temp.	°C	10 to 40	10 to 40	10 to 40	10 to 40	10 to 40	10 to 40
Connection Inlet	G(BSP)	2"	2"	2"	2"	2"	2"
Outlet	G(BSP)	1½"	1½"	2"	2"	2"	2"

Technical Data		EV-0450		EV-0630	
		50 Hz	60 Hz	50 Hz	60 Hz
Nominal displacement	m <sup>3</sup> /h	448	560	630	780
Ultimate pressure N type	mbar	0,5	0,5	0,5	0,5
NM type	mbar	2	2	2	2
L type	mbar	20	20	20	20
Motor power	kW	11,0	11,0	15,0	18,5
Nominal speed	rpm	980	1160	980	1160
Noise level	dB(A)	76	78	77	79
Operating temperature	°C	80	80	80	80
Oil capacity	ltr	19,0	19,0	19,0	19,0
Weight	kg	491	504	582	703
Admissible ambient temp.	°C	10 to 40	10 to 40	10 to 40	10 to 40
Connection Inlet	G(BSP)	3"	3"	3"	3"
Outlet	G(BSP)	3"	3"	3"	3"

