AIRTECH® VACUUM

Installation
and
Operating Manual

L-Series Vacuum Pumps

Models L12 – L250D

INSTALLATION & OPERATING MANUAL

L-SERIES SINGLE STAGE ROTARY VANE
VACUUM PUMPS

L12 - L250D

Please read the manual before operating the vacuum pump.

TABLE OF CONTENTS

This manual is written to cover L-Series Model vacuum pumps. The model number is stamped into the nameplate. The number will appear as follows: LXXX-GX or HXXX-GX.

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 F.O.B. from our factory or 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 is evenly supported on its rubber feet. Leave 12-18” 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 Airtech for motor and starter information.

Correct direction of rotation is marked by an arrow on the motor fan housing and is counterclockwise 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 at the power connection.

1.4 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 the 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 Airtech Inc. 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 Airtech Inc. 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 Airtech pumps:

Pump Model	Inlet Size	Exhaust Size
L12/L21	1/2 " NPT	Open Grid
L25/L40	1 1/4" NPT	1 1/4" NPT
L63/L100	1 1/4" NPT	1 1/4" NPT
L160/L230	2" NPT	1 1/2" NPT
L160C/L250D	2" NPT	2" NPT

1.5 Oil Filling

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

Non-detergent oil should be used. Airtech recommends either ATO-1000 for normal duty operation or ATO-2000 for severe duty operation. ATO 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.

When Airtech (ATO) oils are used in a new pump or an exchange pump, the warranty period is extended. Consult Airtech Inc. for time extension.

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

OIL

Pump Model	Capacity (Qt)
L12/L21	.5
L25/L40	1.0
L63/L100	2.0
L160/L230	7.0
L160C/L250D	7.0

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

2.0 OPERATION

2.1 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 ¾ mark 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.

2.2 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 Airtech Inc. for proper check valves.

2.3 Gas Ballast

L-Series pumps are equipped with a gas ballast. The gas ballast valve is located between the inlet port and the exhaust box. Its main function is to prevent water vapor from condensing in the pump that causes emulsification of the oil resulting in possible pump failure.

In applications, when the quantity of water vapor 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 vapor from condensing in the pump.

3.0 MAINTENANCE

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

3.1 Pump Oil

3.1.1 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 colored in an operating pump. This may be normal aeration of the oil. If the oil appears milky or dark colored, 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 ¼ mark of the top sight glass. Oil must be added through the oil fill port only.

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

3.1.2 Oil Type and Quantity

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

3.1.3 Oil Change

When using ATO-1000 oil, it is recommended to change the oil every 500-750 operating hours.

When using ATO-2000 oil, it is recommended to change the oil ever 750-1000 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.

3.1.4 Oil Spin-On Filter

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

Pump Model	Airtech Part No.
L25-L100	ATOF-51348
L160-L250D	ATOF-51452

3.2 Inline (Inlet) Filter

Check inline (inlet) filter on a weekly basis. The filter cartridge should be cleaned or replaced when dirty. Consult Airtech Inc. 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.

3.3 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 reading of 3 psig 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.

3.4 Maintenance Chart

See the motor manufacturer's manual for the periodic motor maintenance.

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

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.

3.5 Overhaul Kit and Accessories

An overhaul kit contains a set of gaskets, O-rings, vanes, bearing, bearing sleeves, shaft seals and taper pins. Please consult Airtech Inc. parts department for information.

4.0 PROBLEM SOLVING

4.1 Problem

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

4.1.1 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.

4.1.2 Possible Cause

Inlet screen clogged with debris.

Remedy: clean screen and check inlet filter element.

4.1.3 Possible Cause

Shaft seal leak.

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

4.1.4 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; call Airtech for exchange program

4.1.5 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.

4.1.6 Possible Cause

No oil or low oil level in reservoir.

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

4.1.7 Possible Cause

Vacuum fitting or hose is not leak tight.

Remedy: check hose and pipe connections for leaks.

4.1.8 Possible Cause

Radial clearance between rotor and cylinder are no longer adequate.

Remedy: overhaul pump or call Airtech Inc. for exchange program.

4.2 Problem

Pump runs very noisy.

4.2.1 Possible Cause

Coupling insert is worn.

Remedy: replace coupling insert in motor/pump coupling.

4.2.2 Possible Cause
Vanes stuck
Remedy: follow flush procedure from 4.1.4 or replace vane or call Airtech Inc. for exchange program.

4.2.3 Possible Cause
Bearing noise
Remedy: replace bearings or call Airtech Inc. for exchange program.

4.3 Problem
Pump starts, but labors and draws high amperage.

4.3.1 Possible Cause
Oil is too viscous.
Remedy: drain and change with fresh oil.

4.3.2 Possible Cause
Exhaust filter is clogged.
Remedy: replace exhaust filters, maintain proper oil condition, oil level and use ATO oil.
- make sure inlet filter is operational preventing particulate carryover.

4.3.3 Possible Cause
Loose connection in motor terminal box wired for wrong voltage.
Remedy: check wiring diagram for proper connections; tighten or replace loose connections.

4.3.4 Possible Cause
Foreign particles in pump. Broken vanes or seized bearings.
Remedy: overhaul pump or call Airtech Inc. for exchange program.

4.3.5 Possible Cause
Pump is overfilled with oil or wrong kind of oil is in pump.
Remedy: drain oil; use correct type of ATO oil.

4.3.6 Possible Cause
Pump runs in wrong direction.
Remedy: check for correct rotation. If incorrect, switch any two leads.

4.4 Problem
Pump will not start.

4.4.1 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 to 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 valve.
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 Airtech Inc. for exchange program.

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

4.5.1 Possible Cause
- Exhaust filters are not properly installed with O-ring; Filter media is damaged.
Remedy: check exhaust filter placement and replace if needed.

4.5.2 Possible Cause
Exhaust filters are clogged with foreign particles.
Remedy: replace filter and O-ring.

4.5.3 Possible Cause
Oil is not recirculating properly.
Remedy: check oil quality and make certain oil lines are clean.

4.6 Problem
Pump is running too hot. (Typical operating temperature of the L-Series pumps is 120-200º Fahrenheit.)

4.6.1 Possible Cause
Not enough oil in the oil reservoir or oil is badly burned or carbonized.
Remedy: drain oil and refill with proper ATO oil; change oil more frequently.

4.6.2 Possible Cause
Not enough air ventilation to pump
Remedy: clean radiator and motor fins. Make certain a sufficient amount of fresh air is supplied to the pump.

4.7 Problem
Pump will not operate (seized up).

4.7.1 Possible Cause
Pump operated without oil and vanes broke
Remedy: Call Airtech Inc for exchange program

4.7.2 Possible Cause
Liquid carry over into pump cylinder broke vanes while pump was running.
Remedy: Install knock-out pot at inlet of pump

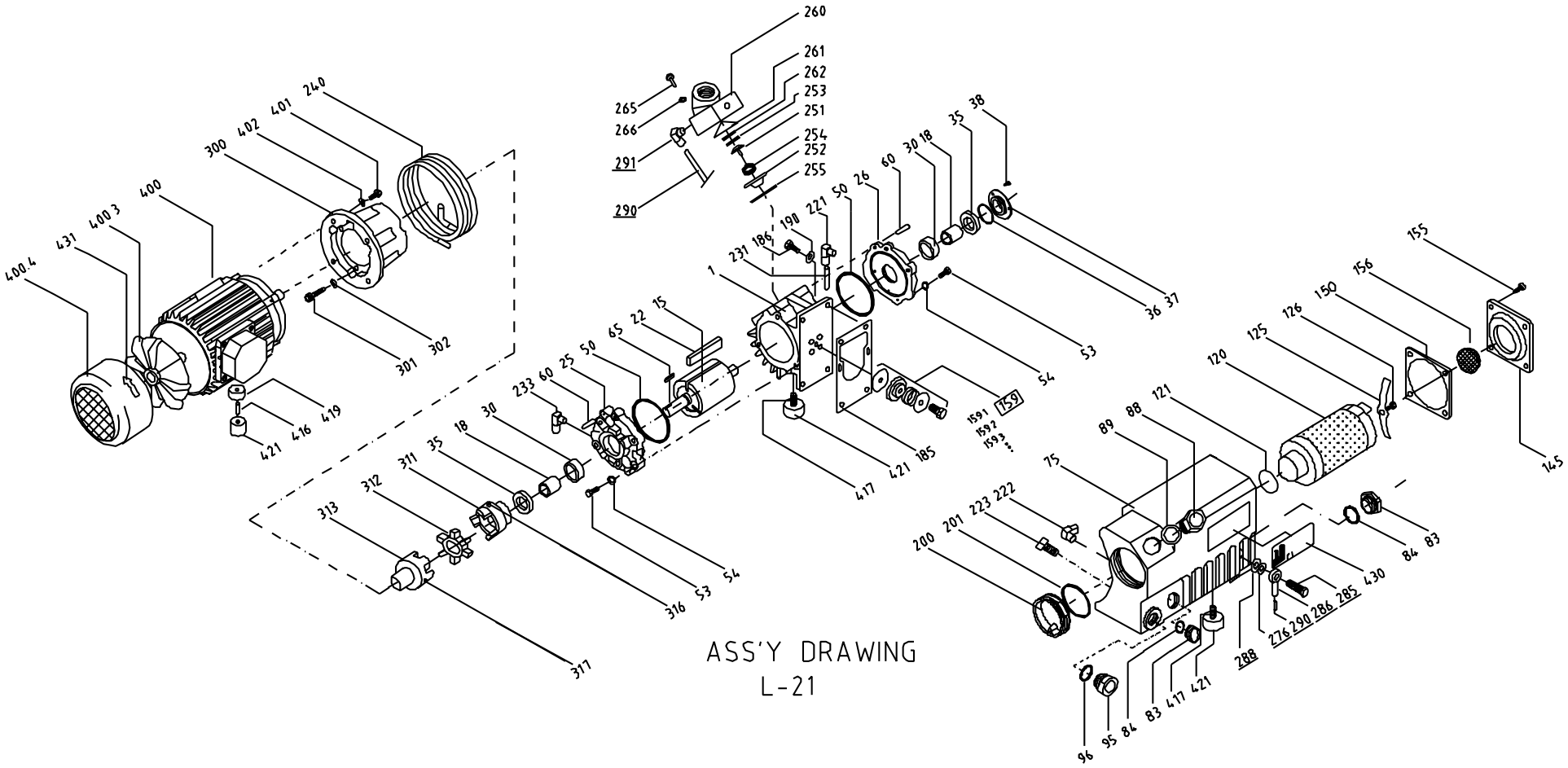
5.0 Motor and Electrical Data

Pump Model

	12	21	25	40	63	100	160	160C	230	250D
US Mfg.										
HP	0.5	1	1.5	2	3	5	5	7.5	7.5	10
RPM	1725	3600	1725	1725	1725	1725	1725	1725	1725	1725
Full Load Amp	2.6/1.3	3.2/1.6	5.3/5/2.5	6.5/6.2/3.1	9/8.6/4.3	14/ 13.4/6.7	14/ 13.4/6.7	22/20/10	22/20/10	28.5/ 28.4/14.2
Voltage	230/460	230/460	208/ 230/460	208/ 230/460	208/ 230/460	208/ 230/460	208/ 230/460	208/ 230/460	208/ 230/460	208/ 230/460

6.0 Technical Data

	Type	12	21	25	40	63	100	160	160C	230	250D
Displacement	CFM	7	15	21	31	45	70	112	117	155	180
Guaranteed											
End Vac-L	TORR	2	2	2	2	2	2	2	2	2	2
End Vac-H	TORR	NA	NA	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Max Sound Level	dB(A)	59	62	67	67	70	70	73	79	74	81
Motor Size	3PH	0.5	1	1.5	2	3	5	5	7.5	7.5	10
Pump Rotation Speed	RPM	1725	3600	1725	1725	1725	1725	1725	1725	1725	1725
Oil Capacity	Qt.	0.5	0.5	1	1	2	2	7	7	7	7
Inlet Connection	NPT- (in.)	1/2	1/2	1 1/4	1 1/4	1 1/4	1 1/4	2	2	2	2
Weight	LBS.	42	42	103	116	168	185	306	415	377	460

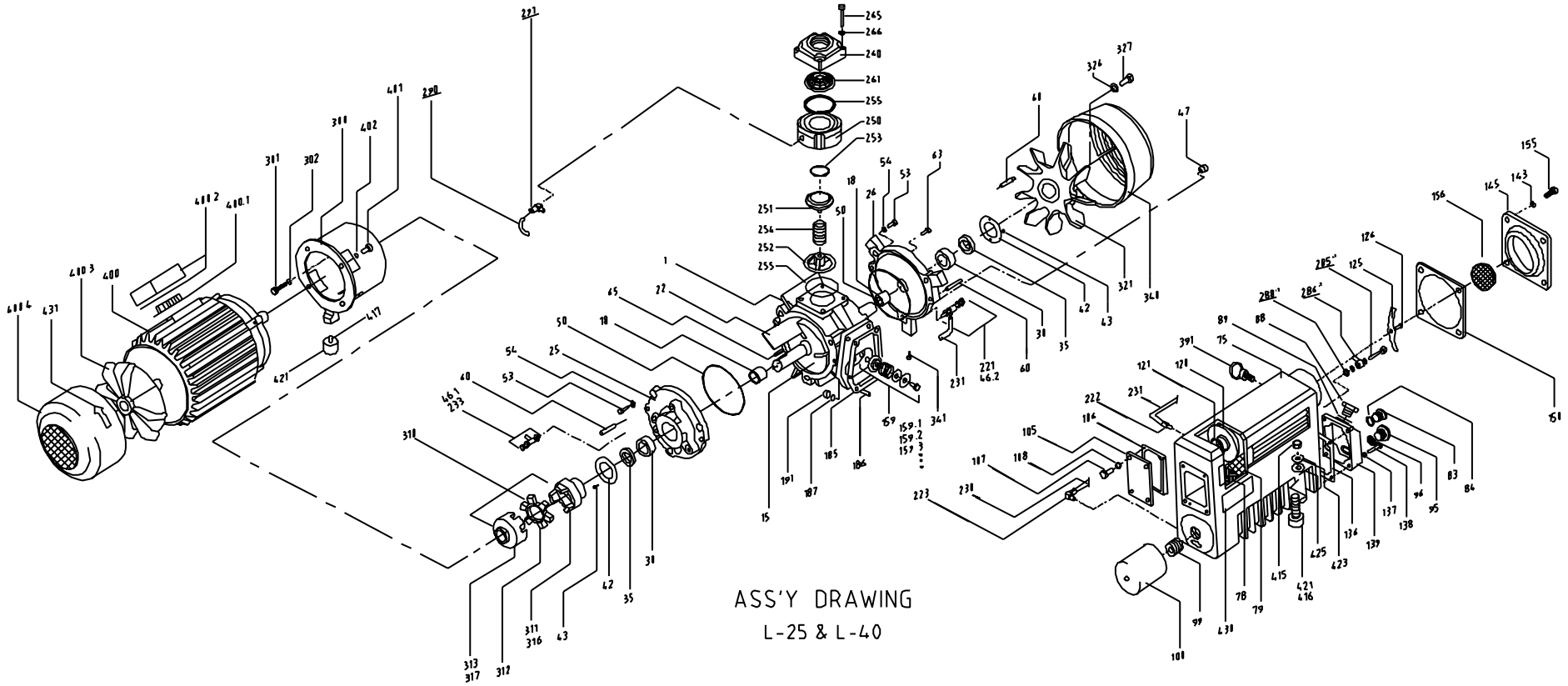


ASS'Y DRAWING
L-21

L12, L21

DESCRIPTIONS

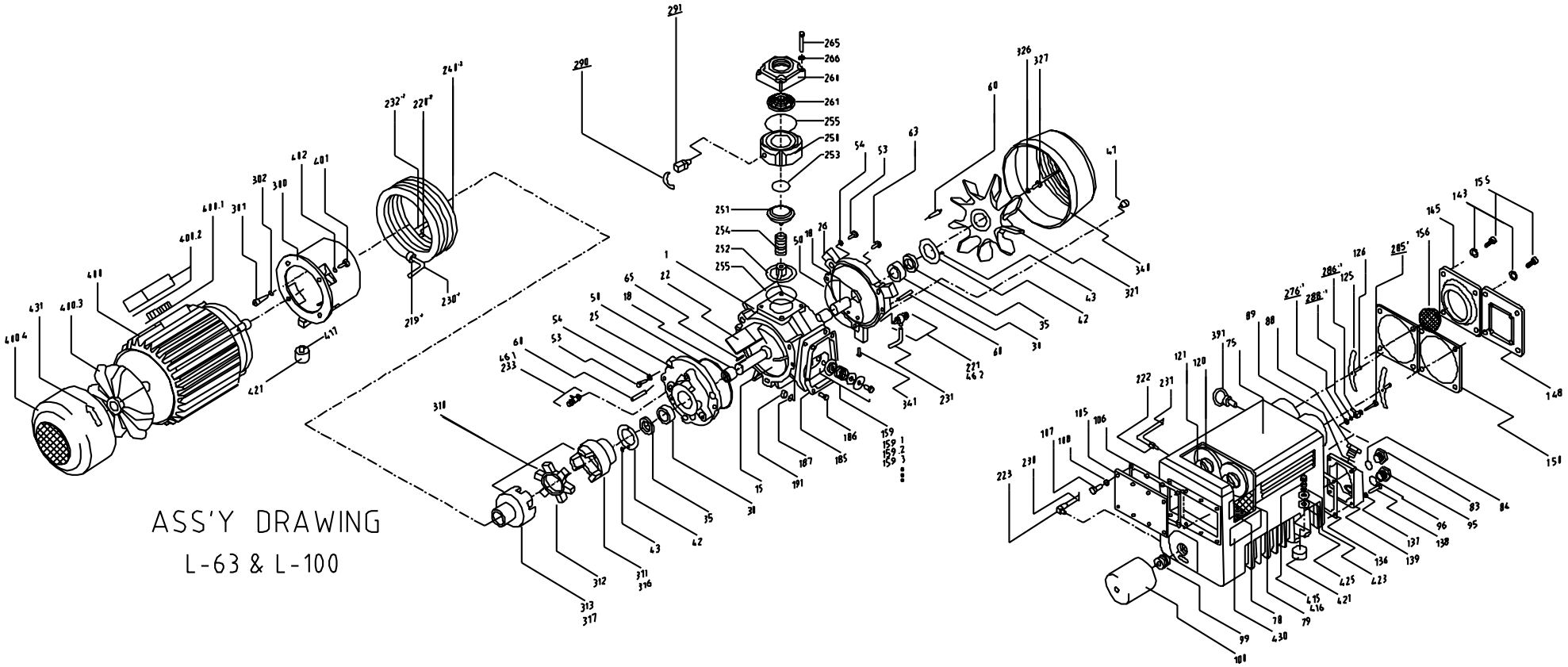
Pos. No.	L12, 21	Pos. No.	L12, 21	Pos. No.	L12, 21
1	Cylinder	156	Outlet screen	275	Oil return valve
15	Rotor	159	Exhaust valve ass'y	276	Sealing ring
18	Bearing sleeve	159-1	Exhaust valve fixed bolt	285	Hollow-core screw
22	Vane	159-2	Exhaust valve washer	286	Banjo fitting
25	A-end plate	159-3	Exhaust valve spring	288	Sealing ring
26	B-end plate	159-4	Exhaust valve plate	290	Return oil tube
30	Bearing	159-5	Exhaust valve lock nut	291	Elbow hydraulic fitting
35	Shaft seal	159-6	Exhaust valve seat plate	300	Motor mounting bracket
36	Bracket o-ring	185	Cylinder gasket	301	Allen bolt
37	Bracket	186	Allen bolt	302	Spring lock washer
38	Hexagon head screw	190	Spring lock washer	311	Coupling, pump side
50	End plate o-ring	200	Drum plug	312	Coupling insert
53	Hexagon head screw	201	Drum plug o-ring	313	Coupling, Motor side
54	Spring lock washer	221	Elbow hydraulic fitting	316	Set screw
60	Taper pin	222	Elbow hydraulic fitting	317	Set screw
65	Shaft key	223	Straight hydraulic fitting	400	Motor
75	Oil sump	231	Oil tube(B)	400.3	Motor fan blade
83	Oil sight glass, convex	233	Elbow hydraulic fitting	400.4	Motor fan cover
84	Oil sight glass gasket	240	Cooling spiral	401	Hexagon head screw
88	Oil fill plug	251	Check valve plate	402	Spring lock washer
89	Oil fill plug o-ring	252	Check valve guide	416	Slotted set screw
95	Oil drain plug	253	Check valve plate o-ring	417	Slotted set screw
96	Oil drain plug o-ring	254	Check valve spring	419	Sleeve
120	Exhaust filter	255	In-let port o-ring	421	Rubber foot
121	Exhaust filter o-ring	260	Inlet flange	430	Name plate
125	Filter spring	261	Inlet screen	431	Directional arrow label
126	Slotted cheese head screw	262	Retaining ring for bores	490	Gasket Kit
145	Exhaust cover (w/ threaded flange)	265	Hexagon head screw	500.00	Maintenance Kit
150	Exhaust cover gasket	266	Spring lock washer		
155	Allen bolt	270	Plug		



L25, L40

DESCRIPTIONS

Pos. No.	L25, L40	Pos. No.	L25, L40	Pos. No.	L25, L40
1	Cylinder	159-2	Exhaust valve washer	391	Eye bolt
15	Rotor	159-3	Exhaust valve spring	400	Motor(IEC)
18	Bearing sleeve	159-4	Exhaust valve plate	400.3	Motor Fan Blade(IEC)
22	Vane	159-5	Exhaust valve lock nut	400.4	Motor fan cover(IEC)
25	A-end plate	159-6	Exhaust valve seat plate	401	Hexagon head screw
26	B-end plate	185	Cylinder gasket	402	Spring lock washer
30	Bearing	186	Stud	415	Hexagon nut
35	Shaft seal	187	Spring lock washer	416	Slotted set screw
42	Supporting ring	191	Hexagon nut	417	Slotted set screw
43	Hexagon head screw	221	BSLM hydraulic fitting	421	Rubber foot
46.1	Sealing ring	222	Straight hydrulic fitting	423	Spring lock washer
46.2	Sealing ring	223	Elbow hydraulic fitting	425	Washer
46.3	Sealing ring	230	Oil tube(A)	430	Name plate
47	Plug	231	Oil tube(B)	431	Directional arrow label
50	End plate o-ring	233	BSLM hydraulic fitting	470	BSLM hydraulic fitting
53	Hexagon head screw	250	Inlet flange, lower housing	471	Oil tube(C)
54	Spring lock washer	251	Check valve plate	472	Nonreturn valve
60	Taper pin	252	Check valve guide	474	Air filter
63	Plug	253	Check valve plate o-ring	480	Gas Ballast Ass'y
65	Shaft key	254	Check valve spring	490	Gasket Kit
75	Oil sump	255	Inlet part o-ring	500	Maintenance Kit
78	Steel demister	260	Inlet flange	600	Motor(NEMA)
88	Oil fill plug	261	Inlet screen	600.3	Motor Fan(NEMA)
89	Oil fill plug o-ring	265	Allen bolt	600.4	Motor Fan Cover(NEMA)
95	Oil drain plug	266	Spring lock washer	601	Hexagon head screw(NEMA)
96	Oil drain plug o-ring	270	Plug	602	Spring lock washer(NEMA)
99	Theaded fitting	275	Oil return valve	613	Coupling, Motor side(NEMA)
100	Oil filter	276	Sealing ring	630	Motor Mounting Bracket(NEMA)
105	Oil sump cover plate	285	Hollow-core screw		
106	Oil sump cover gasket	286	Banjo fitting		
107	Allen bolt	288	Sealing ring		
108	Sealing ring	290	Return oil tube		
120	Exhaust filter	291	Elbow hydraulic fitting		
121	Exhaust filter o-ring	300	Motor mounting bracket		
125	Filter spring	301	Allen bolt		
126	Slotted cheese head screw	302	Spring lock washer		
136	Service cover gasket	310	Coupling		
137	Sealing ring	311	Coupling, pump side		
138	Allen bolt	312	Coupling insert		
139	Service cover	313	Coupling, Motor side		
143	Sealing ring	316	Set screw		
145	Exhaust cover (w/ threaded flange)	317	Set screw		
150	Exhaust cover gasket	321	Pump shaft end fan		
155	Allen bolt	326	Washer		
156	Outlet screen	327	Hexagon head screw		
159	Exhaust valve ass'y	340	Fan hood		
159-1	Exhaust valve fixed bolt	341	Hexagon head screw		



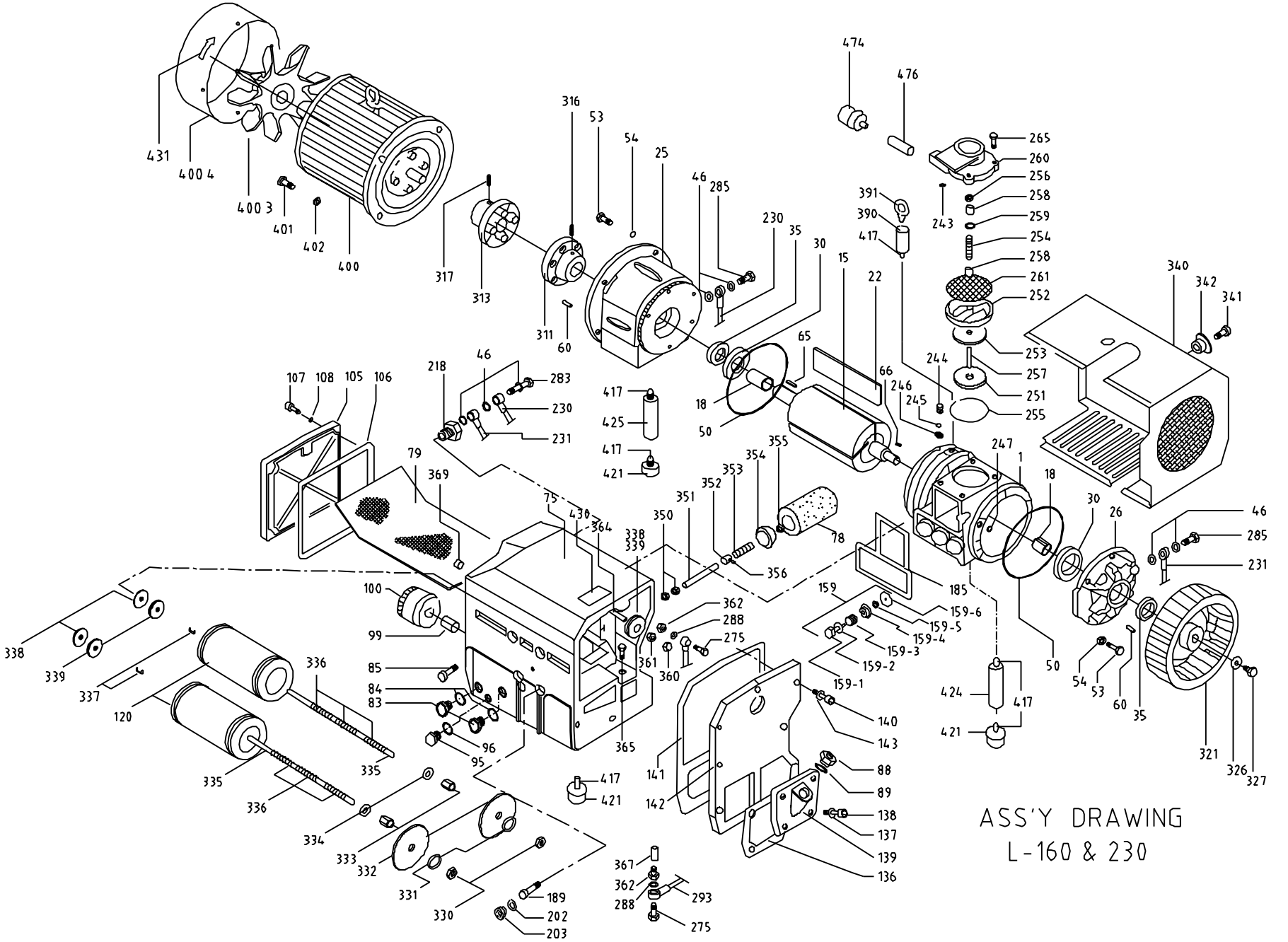
ASS'Y DRAWING

L-63 & L-100

L63, 100

DESCRIPTIONS

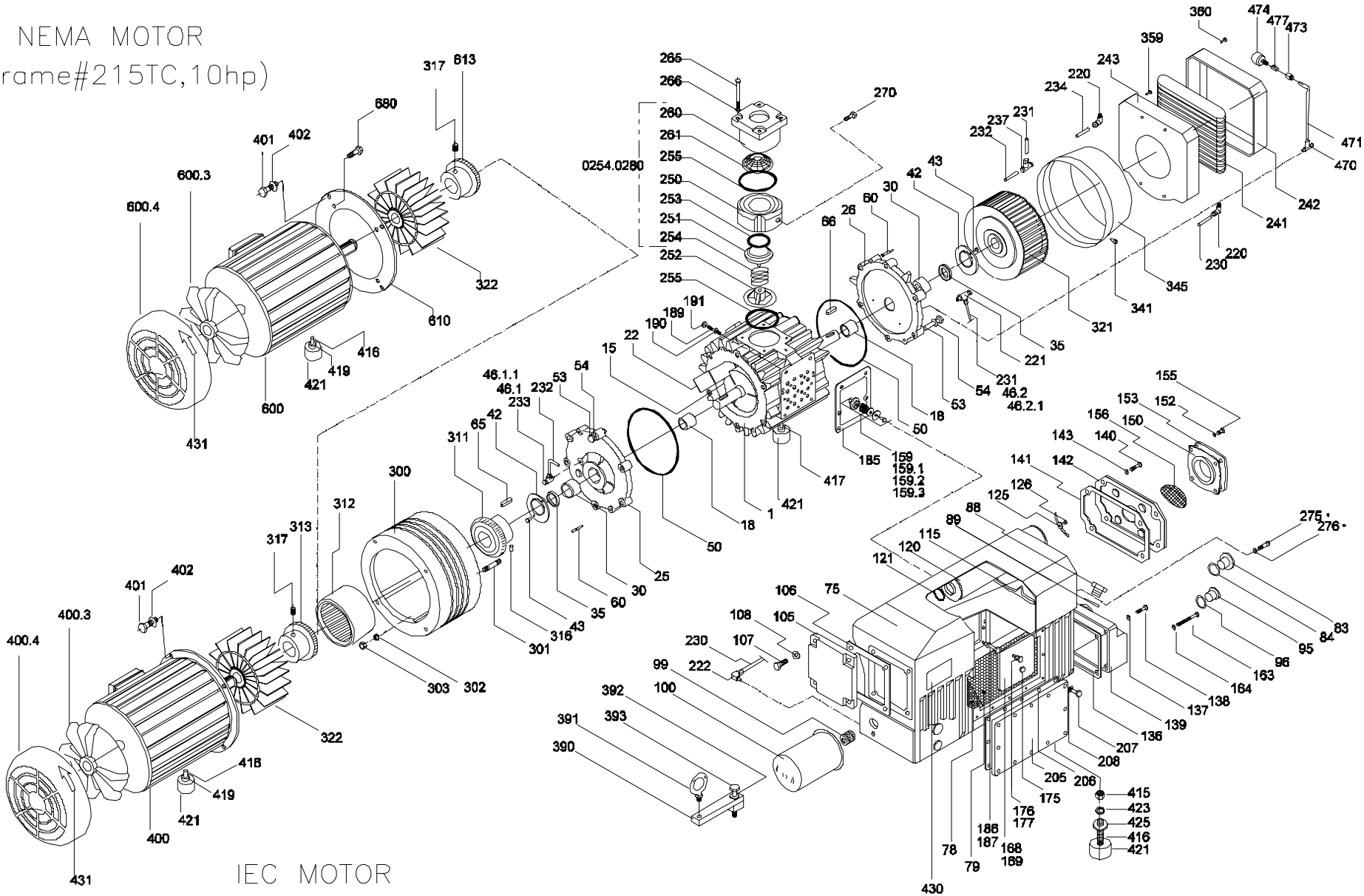
Pos. No.	L63, L100	Pos. No.	L63, L100	Pos. No.	L63, L100
1	Cylinder	139	Service cover	300	Motor mounting bracket
15	Rotor	143	Sealing ring	301	Allen bolt
18	Bearing sleeve	145	Exhaust cover (w/ threaded flange)	302	Spring lock washer
22	Vane	148	Exhaust cover (blocked)	310	Coupling
25	A-end plate	150	Exhaust cover gasket	311	Coupling, pump side
26	B-end plate	155	Allen bolt	312	Coupling insert
30	Bearing	156	Outlet screen	313	Coupling, Motor side
35	Shaft seal	159	Exhaust valve ass'y	316	Set screw
42	Supporting ring	159-1	Exhaust valve fixed bolt	317	Set screw
43	Hexagon head screw	159-2	Exhaust valve washer	321	Pump shaft end fan
46.1	Sealing ring	159-3	Exhaust valve spring	326	Washer
46.2	Sealing ring	159-4	Exhaust valve plate	327	Hexagon bolt
46.3	Sealing ring	159-5	Exhaust valve lock nut	340	Fan hood
47	Plug	159-6	Exhaust valve seat plate	341	Hexagon head screw
50	End plate o-ring	185	Cylinder gasket	391	Eye bolt
53	Hexagon head screw	186	Stud	400	Motor(IEC)
54	Spring lock washer	187	Spring lock washer	400,3	Motor fan blade(IEC)
60	Taper pin	191	Hexagon nut	400,4	Motor fan cover(IEC)
63	Plug	221	BSLM hydraulic fitting	401	Hexagon head screw
65	Shaft key	222	Straight hydrulic fitting	402	Spring lock washer
75	Oil Sump	223	Elbow hydraulic fitting	415	Hexagon nut
78	Steel demister	230	Oil tube(A)	416	Slotted set screw
79	Sheet metal baffle	231	Oil tube(B)	417	Slotted set screw
83	Oil sight glass, convex	233	BSLM hydraulic fitting	421	Rubber foot
84	Oil sight glass, gasket	250	Inlet flange, lower housing	423	Spring lock washer
88	Oil fill plug	251	Check valve plate	425	Washer
89	Oil fill plug o-ring	252	Check valve guide	430	Name plate
95	Oil drain plug	253	Check valve plate o-ring	431	Directional arrow label
96	Oil drain plug o-ring	254	Check valve spring	470	BSLM hydraulic fitting
99	Theaded fitting	255	Inlet part o-ring	471	Oil tube(C)
100	Oil filter	260	Inlet flange	472	Nonreturn valve
105	Oil sump cover plate	261	Inlet screen	474	Air filter
106	Oil sump cover gasket	265	Allen bolt	480	Gas Ballast Ass'y
107	Allen bolt	266	Spring lock washer	490	Gasket Kit
108	Sealing ring	270	Plug	500	Maintenance Kit
120	Exhaust filter	275	Oil return valve	600	Motor(NEMA)
121	Exhaust filter o-ring	276	Sealing ring	600.3	Motor Fan(NEMA)
125	Filter spring	285	Hollow-core screw	600.4	Motor Fan Cover(NEMA)
126	Slotted cheese head screw	286	Banjo fitting	601	Hexagon head screw(NEMA)
136	Service cover gasket	288	Sealing ring	602	Spring lock washer(NEMA)
137	Sealing ring	290	Return oil tube	613	Coupling, Motor side(NEMA)
138	Allen bolt	291	Elbow hydraulic fitting	630	Motor Mounting Bracket(NEMA)



L160, 230

DESCRIPTIONS

Pos. No.	L160, L230	Pos. No.	L160, L230	Pos. No.	L160, L230	Pos. No.	L160, L230
1	Cylinder	**159**	Exhaust valve ass'y	**317**	Set screw	**425**	Rubber foot support
15	Rotor	**159-1**	Exhaust valve fixed bolt	**321**	Pump shaft end fan	**430**	Name plate
18	Bearing sleeve	**159-2**	Exhaust valve washer	**326**	Washer	**431**	Directional Arrow
22	Vane	**159-3**	Exhaust valve spring	**327**	Hexagon head screw	**474**	Air filter
25	A-end plate, motor side	**159-4**	Exhaust valve plate	**330**	Hexagon nut	**476**	Ball valve
25	A-end plate	**159-5**	Exhaust valve lock nut	**331**	Washer	**490**	Gasket Kit
26	B-end plate	**159-6**	Exhaust valve seat plate	**332**	Exhaust filter cover	**500**	Maintenance Kit
30	Bearing	**185**	Cylinder gasket	**333**	Hexagon nut	**600**	Motor(NEMA)
35	Shaft seal	**189**	Allen bolt	**334**	Washer	**600.3**	Motor Fan(NEMA)
46	Sealing ring	**202**	O- ring	**335**	Separator valve stud	**600.4**	Motor Fan Cover(NEMA)
50	End plate o-ring	**203**	Locking screw	**336**	Separator valve spring	**601**	Hexagon head screw(NEMA)
53	Allen bolt	**218**	Socket	**337**	Flat spring	**602**	Spring lock washer(NEMA)
54	Spring Lock washer	**230**	Oil tube(A)	**338**	Separator valve flat-ring	**613**	Coupling, Motor side(NEMA)
60	Taper pin	**231**	Oil tube(B)	**339**	Separator valve support	**630**	Motor Mounting Bracket(NEMA)
65	A-shaft key	**243**	Gas ballast o-ring	**340**	Fan food		
66	B-shaft key	**244**	Ball guide	**341**	Allen bolt		
75	Oil sump	**245**	Ball	**342**	Cover holder		
78	Seal demister	**246**	Ball guide o-ring	**350**	Hexagon nut		
79	Steel metal baffle	**247**	End plate o-ring for gas ballast	**351**	Stud		
83	Oil sight glass,convex	**251**	Check valve plate	**352**	Adjusting ring		
84	Oil sight glass,gasket	**252**	Check valve guide	**353**	Deminster spring		
85	Allen bolt	**253**	Check valve plate flat-ring	**354**	Demister cover		
88	Oil fill plug	**254**	Check valve spring	**355**	Hexagon nut		
89	Oil fill plug o-ring	**255**	Inlet part o-ring	**356**	Set screw		
95	Oil drain plug	**256**	Hexagon nut	**360**	Hexagon nut		
96	Oil drain plug o-ring	**257**	Check valve plate stud	**361**	Washer		
99	Threaded fitting	**258**	Distance bushing	**362**	Connecting bolt		
100	Oil filter	**259**	O- ring	**365**	Hexagon head screw		
105	Oil sump cover	**260**	Inlet flange	**366**	Float		
106	Oil sump cover gasket	**261**	Inlet screen	**367**	Float valve nozzle		
107	Allen bolt	**265**	Allen bolt	**369**	Hexagon nut		
108	Sealing ring	**275**	Hollow-core screw	**390**	Adapter for eye bolt		
120	Exhaust filter	**283**	Hollow-core screw	**391**	Eye bolt		
136	Service cover gasket	**285**	Hollow-core screw	**400**	Motor		
137	Sealing ring	**288**	Sealing ring	**400.3**	Motor Fan		
138	Allen bolt	**300**	Motor Mounting Bracket (IEC)	**400.4**	Motor Fan Cover		
139	Service cover	**301**	Allen bolt	**401**	Hexagon head screw		
140	Allen bolt	**302**	Spring lock washer	**402**	Spring lock washer		
141	Separator cover gasket	**311**	Coupling, pump side	**417**	Slotted set screw		
142	Separator cover plate	**313**	Coupling, Motor side	**421**	Rubber foot		
143	Sealing ring	**316**	Set screw	**424**	Rubber foot support		


NEMA MOTOR
(frame#215TC,10hp)
IEC MOTOR
0254.0280
L160C, 250D

DESCRIPTIONS

Pos.	L160C, L250D
1	Cylinder
15	Rotor
18	Bearing sleeve
22	Vane
25	A-End plate
26	B-End plate
30	Bearing
35	Shaft seal
42	Supporting ring
43	Hexagon head screw
46.1	Sealing ring
46.1.1	Sealing ring
46.2	Sealing ring
46.2.1	Sealing ring
46.3	Sealing ring
46.3.1	Sealing ring
47	Plug
50	End plate o-ring
53	Hexagon head screw
54	Spring lock washer
60	Taper pin
65	A-Shaft key
66	B-Shaft key
75	Oil sump
78	Steel demister
79	Sheet metal baffle
83	Oil sight glass, convex
84	Oil sight glass gasket
88	Oil fill plug
89	Oil fill plug o-ring
95	Oil drain plug
96	Oil drain plug o-ring
99	Threaded fitting
100	Oil filter
105	Oil sump cover plate
106	Oil sump cover gasket
107	Allen bolt
108	Sealing ring
115	Filter bracket

Pos.	L160C, L250D
120	Exhaust filter
121	Exhaust filter o-ring
125	Filter spring
126	Slotted cheese head screw
136	Service cover gasket
137	Sealing ring
138	Allen bolt
139	Service cover
140	Allen bolt
141	Separator cover gasket
142	Separator cover plate
143	Sealing ring
150	Exhaust cover gasket
152	Sealing ring
153	Exhaust threaded cover
155	Allen bolt
156	Outlet screen
159	Exhaust valve assembly
159-1	Exhaust valve fixed bolt
159-2	Exhaust valve washer
159-3	Exhaust valve spring
159-4	Exhaust valve plate
159-5	Exhaust valve lock nut
159-6	Exhaust valve seat plate
163	Allen bolt
164	Sealing ring
168	Valve cover plate o-ring
169	Valve cover plate
175	Plug
176	Hexagon nut
177	Stud bolt
185	Cylinder gasket
186	Allen bolt
187	Spring lock washer
189	Stud
190	Spring lock washer
191	Hexagon nut
205	Side cover plate
206	Side cover plate gasket

Pos.	L160C, L250D
207	Allen bolt
208	Sealing ring
219	Straight hydraulic fitting
220	Straight hydraulic fitting
221	BSLM hydraulic fitting
222	Elbow hydraulic fitting
223	Elbow hydraulic fitting
230	Oil tube(A)
231	Oil tube(B)
232	Oil tube (A-1)
233	BSLM hydraulic fitting
237	Hydraulic Fitting
240	Cooling spiral
241	Radiator
242	Radiator Cover (Front)
243	Radiator Cover (Rear)
250	Inlet flange, lower housing
251	Check valve plate
252	Check valve guide
253	Check valve plate o-ring
254	Check valve spring
255	In-let part o-ring
260	Inlet flange
261	Inlet screen
265	Allen bolt
266	Spring lock washer
270	Plug
275	Oil return valve
276	Sealing ring
280	Inlet Valve Assy
285	Hollow-core screw
286	Banjo fitting
288	Sealing ring
290	Return oil tube
291	Elbow hydraulic fitting
300	Motor mounting bracket
301	Stud
302	Spring lock washer
312	Coupling Insert, S Flex

Pos.	L160C, L250D
311	Coupling, pump side
313	Coupling, Motor side
316	Set screw
317	Set screw
321	Pump shaft end fan
322	Motor shaft end fan
340	Fan hood
341	Hexagon head screw
345	Fan Cover
359	Allen Bolt
360	Allen Bolt
390	Adapter for eye bolt
391	Eye bolt
392	Spring lock washer
393	Hexagon head screw
400	Motor
400,3	Motor fan blade
400,4	Motor fan cover
401	Hexagon head screw
402	Spring lock washer
415	Hexagon nut
416	Slotted set screw
417	Slotted set screw
419	Sleeve
421	Rubber foot
423	Sping Lock Washer
425	Washer
430	Name plate
431	Directional arrow label
470	BSLM hydraulic fitting
471	Oil tube(C)
472	Nonreturn valve
473	Fitting
474	Air filter
477	Fitting
480	Gas ballast assembly

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