

SERVICE AND PARTS MANUAL FOR BLOWER MODEL

EN6, EN858, EN909, EN979, EN14

**DIRECT DRIVE REGENERATIVE
BLOWER**



AMETEK Dynamic Fluid Solutions
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AMETEK

Your Choice. Our Commitment.™

WARRANTY, INSTALLATION, MAINTENANCE AND TROUBLESHOOTING INSTRUCTIONS



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1. AMETEK Rotron DR, EN and HiE regenerative direct drive blowers are guaranteed for one full year from the date of installation (limited to 18 months from the date of shipment) to the original purchaser only. Should the blower fail we will evaluate the failure. If failure is determined to be workmanship or material defect related, we will at our option repair or replace the blower.
2. AMETEK Rotron Minispiral, Revaflow, Multiflow, Nautilair, remote drive blowers, moisture separators, packaged units, CP blowers, Nasty Gas™ models and special built (EO) products are guaranteed for one full year from date of shipment for workmanship and material defect to the original purchaser only. Should the blower fail, If failure is determined to be workmanship or material defect related, we will at our option repair or replace the blower.
3. **Parts Policy** - AMETEK Rotron spare parts and accessories are guaranteed for three months from date of shipment for workmanship and material defect to the original purchaser only. If failure is determined to be workmanship or material defect related we will at our option repair or replace the part.

Corrective Action - A written report will be provided indicating reason(s) for failure, with suggestions for corrective action. Subsequent customer failures due to abuse, misuse, misapplication or repeat offense will not be covered. AMETEK Rotron will then notify you of your options. Any failed unit that is tampered with by attempting repair or diagnosis will void the warranty, unless authorized by the factory.

Terms and Conditions - Our warranty covers repairs or replacement of regenerative blowers only, and will not cover labor for installation, outbound and inbound shipping costs, accessories or other items not considered integral blower parts. Charges may be incurred on products returned for reasons other than failures covered by their appropriate warranty. Out-of-warranty product and in warranty product returned for failures determined to be caused by abuse, misuse, or repeat offense will be subject to an evaluation charge. Maximum liability will in no case exceed the value of the product purchased. Damage resulting from mishandling during shipment is not covered by this warranty. It is the responsibility of the purchaser to file claims with the carrier. Other terms and conditions of sale are stated on the back of the order acknowledgement.

Installation Instructions for SL, DR, EN, CP, and HiE Series Blowers

1. **Bolt It Down** - Any blower must be secured against movement prior to starting or testing to prevent injury or damage. The blower does not vibrate much more than a standard electric motor.
2. **Filtration** - All blowers should be filtered prior to starting. Care must be taken so that no foreign material enters the blower. If foreign material does enter the blower, it could cause internal damage or may exit at extremely high velocity.

Should excessive amounts of material pass through the blower, it is suggested that the cover(s) and impeller(s) be removed periodically and cleaned to avoid impeller imbalance. Impeller

imbalance greatly speeds bearing wear, thus reducing blower life. Disassembling the blower will void warranty, so contact the factory for cleaning authorization.

- Support the Piping** - The blower flanges and nozzles are designed as connection points only and are not designed to be support members.

Caution: Plastic piping should not be used on blowers larger than 1 HP that are operating near their maximum pressure or suction point. Blower housing and nearby piping temperatures can exceed 200°F. Access by personnel to the blower or nearby piping should be limited, guarded, or marked, to prevent danger of burns.

- Wiring** - Blowlers must be wired and protected/fused in accordance with local and national electrical codes. All blowlers must be grounded to prevent electrical shock. Slo-Blo or time delay fuses should be used to bypass the first second of start-up amperage.
- Pressure/Suction Maximums** - The maximum pressure and/or suction listed on the model label should not be exceeded. This can be monitored by means of a pressure or suction gage (available from Rotron), installed in the piping at the blower outlet or inlet. Also, if problems do arise, the Rotron Field representative will need to know the operating pressure/suction to properly diagnose the problem.
- Excess Air** - Bleed excess air off. DO NOT throttle to reduce flow. When bleeding off excess air, the blower draws less power and runs cooler.

Note: Remote Drive (Motorless) Blowlers - Properly designed and installed guards should be used on all belts, pulleys, couplings, etc. Observe maximum remote drive speed allowable. Due to the range of uses, drive guards are the responsibility of the customer or user. Belts should be tensioned using belt gauge.

Maintenance Procedure

When properly piped, filtered, and applied, little or no routine maintenance is required. Keep the filter clean. Also, all standard models in the DR, EN, CP, and HiE series have sealed bearings that require no maintenance. Bearing should be changed after 15,000 to 20,000 hours, on average. Replacement bearing information is specified on the chart below.

Bearing Part Number	Size	Seal Material	Grease	Heat Stabilized
510217 510218 510219	205 206 207	Polyacrylic	Nye Rheotemp 500 30% +/- 5% Fill	Yes – 325 F
510449 516440 516648	203 202 307	Buna N	Exxon Polyrex Grease	NO
516840 516841 516842 516843 516844 516845 516846 516847	206 207 208 210 309 310 311 313	Buna N	Exxon Polyrex Grease	NO

Troubleshooting

		POSSIBLE CAUSE	OUT OF WARRANTY REMEDY ***
IMPELLER DOES NOT TURN	Humming Sound	<ol style="list-style-type: none"> * One phase of power line not connected * One phase of stator winding open Bearings defective Impeller jammed by foreign material Impeller jammed against housing or cover ** Capacitor open 	<ol style="list-style-type: none"> Connect Rewind or buy new motor Change bearings Clean and add filter Adjust Change capacitor
	No Sound	<ol style="list-style-type: none"> * Two phases of power line not connected * Two phases of stator winding open 	<ol style="list-style-type: none"> Connect Rewind or buy new motor
IMPELLER TURNS	Blown Fuse	<ol style="list-style-type: none"> Insufficient fuse capacity Short circuit 	<ol style="list-style-type: none"> Use time delay fuse of proper rating Repair
	Motor Overheated Or Protector Trips	<ol style="list-style-type: none"> High or low voltage * Operating in single phase condition Bearings defective Impeller rubbing against housing or cover Impeller or air passage clogged by foreign material Unit operating beyond performance range Capacitor shorted * One phase of stator winding short circuited 	<ol style="list-style-type: none"> Check input voltage Check connections Check bearings Adjust Clean and add filter Reduce system pressure/vacuum Change capacitor Rewind or buy new motor
	Abnormal Sound	<ol style="list-style-type: none"> Impeller rubbing against housing or cover Impeller or air passages clogged by foreign material Bearings defective 	<ol style="list-style-type: none"> Adjust Clean and add filter Change bearings
	Performance Below Standard	<ol style="list-style-type: none"> Leak in piping Piping and air passages clogged Impeller rotation reversed Leak in blower Low voltage 	<ol style="list-style-type: none"> Tighten Clean Check wiring Tighten cover, flange Check input voltage
<p>* 3 phase units ** 1 phase units *** Disassembly and repair of new blowers or motors will void the Rotron warranty. Factory should be contacted prior to any attempt to field repair an in-warranty unit.</p>			

Blower Disassembly:

WARNING: Attempting to repair or diagnose a blower may void Rotron's warranty. It may also be difficult to successfully disassemble and reassemble the unit.

- 1) Disconnect the power leads. **CAUTION:** Be sure the power is disconnected before doing any work whatsoever on the unit.
- 2) Remove or separate piping and/or mufflers and filters from the unit.
- 3) Remove the cover bolts and then the cover. **NOTE:** Some units are equipped with seals. It is mandatory that these seals be replaced once the unit has been opened.
- 4) Remove the impeller bolt and washers and then remove the impeller. **NOTE:** Never pry on the edges of the impeller. Use a puller as necessary.
- 5) Carefully note the number and location of the shims. Remove and set them aside. **NOTE:** If the disassembly was for inspection and cleaning the unit may now be reassembled by reversing the above steps. If motor servicing or replacement and/or impeller replacement is required the same shims may not be used. It will be necessary to re-shim the impeller according to the procedure explained under assembly.

- 6) Remove the housing bolts and remove the motor assembly (arbor/housing on remote drive models).
- 7) Arbor disassembly (Applicable on remote drive models only):
 - a) Slide the bearing retraining sleeve off the shaft at the blower end.
 - b) Remove the four (4) screws and the bearing retaining plate from the blower end.
 - c) Lift the shaft assembly far enough out of the arbor to allow removal of the blower end snap ring.
 - d) Remove the shaft assembly from the arbor.
 - e) If necessary, remove the shaft dust seal from the pulley end of the arbor.

Muffler Material Replacement:

- 1) Remove the manifold cover bolts and them manifold cover.
- 2) The muffler material can now be removed and replaced if necessary. On blowers with fiberglass acoustical wrap the tubular retaining screens with the fiberglass matting before sliding the muffler pads over the screens.
- 3) Reassemble by reversing the procedure.

NOTE: On DR068 models with tubular mufflers it is necessary to remove the cover and impeller accessing the muffler material from the housing cavity.

Blower Reassembly:

- 1) Place the assembled motor (assembled arbor assembly for remote drive models) against the rear of the housing and fasten with the bolts and washer.
- 2) To ensure the impeller is centered within the housing cavity re-shim the impeller according to the procedure outlined below.
- 3) If blower had a seal replace the seal with a new one.
- 4) Place the impeller onto the shaft making sure the shaft key is in place and fasten with the bolt, washer and spacer as applicable. Torque the impeller bolt per the table below. Once fastened carefully rotate the impeller to be sure it turns freely.
- 5) Replace the cover and fasten with bolts.
- 6) Reconnect the power leads to the motor per the motor nameplate.

Bolt Size	Torque Pound-Force-Foot
1/4-20	6.25 +/- 0.25
5/16-18	11.5 +/- 0.25
3/8-16	20.0 +/- 0.5
1/2-13	49.0 +/- 1
5/8 -11	90.0 +/- 2

Impeller Shimming Procedure:

WARNING: This unit may be difficult to shim. Extreme care may be exercised.

Tools Needed: Machinist's Parallel Bar
Vernier Caliper with depth measuring capability
Feeler gauges or depth gauge

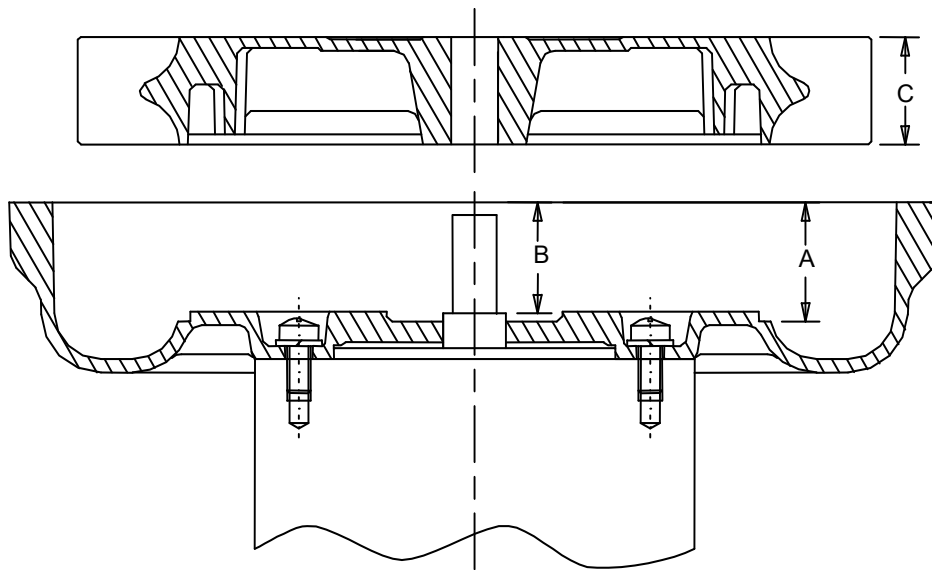
Measure the Following:

- Distance from the flange face to the housing (A)
- Distance from the flange face to the motor shaft shoulder (B)
- Impeller Thickness (C)

Measurements (A) and (B) are made by laying the parallel bar across the housing flange face and measuring to the proper points. Each measurement should be made at three points, and the average of the readings should be used.

$$\text{Shim Thickness} = B - (A+C)/2$$

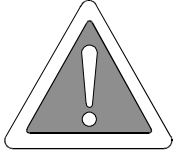
After the impeller installation (step #4 above) the impeller/cover clearance can be checked with feeler gauges, laying the parallel bar across the housing flange face. This clearance should nominally be (A-C)/2.



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EXPLOSION-PROOF BLOWERS



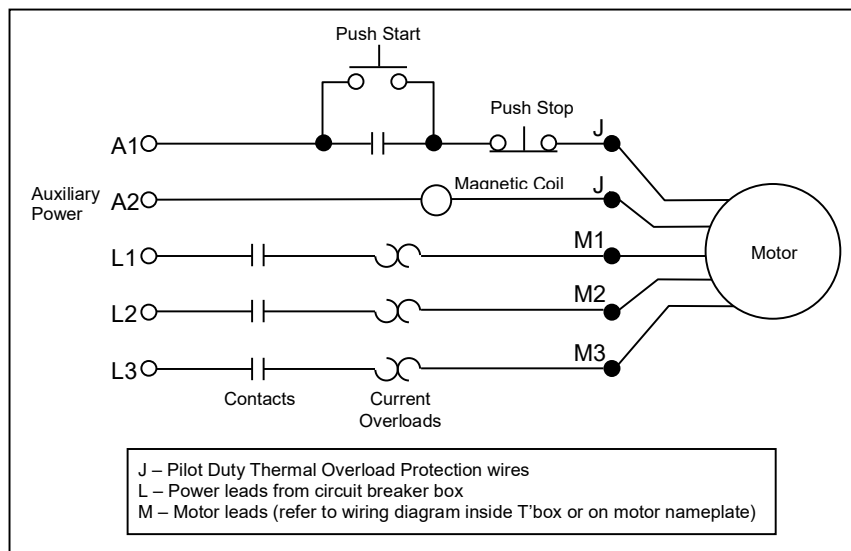
IMPORTANT: Read before wiring this Explosion-proof Blower

This AMETEK Rotron Explosion-proof Regenerative Blower may be equipped with Pilot Duty Thermal Overload (PDTO) or Automatic Thermal Overload (ATO) protection. When properly wired to a motor starter, this protection limits the motor winding temperature rise per the National Electric Code (NEC) article 500. Failure to properly wire this blower is an NEC violation and could cause an explosion. AMETEK Rotron assumes no responsibilities for damages incurred by negligent use of this product, and will not warranty a blower on which the PDTO is not properly connected. Some blowers 1 HP and under do not require PDTO and have built in ATO. Consult the factory if verification of wiring connections is required.

In all cases, follow the motor controller manufacturer's instructions. The following schematic is for conceptual understanding only, and may not apply to all motor/controller combinations.

The manufacturer's wiring diagram found on the motor takes precedent over reference diagrams supplied by AMETEK Rotron Technical Motor Division.

Schematic



The schematic is shown for a three phase motor. For a single phase motor disregard L3 and M3. Pushing the START button completes the auxiliary control circuit, allowing current to flow through the magnetic coil. The contacts are magnetically closed, starting the motor and latching the auxiliary circuit. The motor will continue to run until the STOP push button is depressed, the motor reaches the overload temperature, or the current sensing overloads trip out.

If you have any questions, contact AMETEK Rotron at 914-246-3401 for the location of your area representative.

POLICY REGARDING INSTALLATION OF AMETEK ROTRON REGENERATIVE BLOWERS IN HAZARDOUS LOCATIONS

AMETEK Rotron will not knowingly specify, design or build any regenerative blower for installation in a hazardous, explosive location without the proper NEMA motor enclosure. AMETEK Rotron does not recognize sealed blowers as a substitute for explosion-proof motors. Sealed units with standard TEFC motors should never be utilized where local, state, and/or federal codes specify the use of explosion-proof equipment.

AMETEK Rotron has a complete line of regenerative blowers with explosion-proof motors. Division 1 & 2, Class I, Group D; Class II, Groups F & G requirements are met with these standard explosion-proof blowers.

AMETEK Rotron will not knowingly specify, design or build any regenerative blower for installation in a hazardous, corrosive environment without the proper surface treatment and sealing options.

AMETEK Rotron has a complete line of Chemical Processing and Nasty Gas™ regenerative blowers with Chem-Tough™, stainless steel parts, and seals.

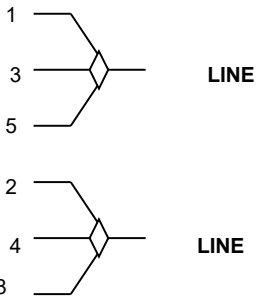
AMETEK Rotron offers general application guidance; however, suitability of the particular blower selection is ultimately the responsibility of the purchaser, not the manufacturer of the blower.

FS2 Rev B 3/10/98

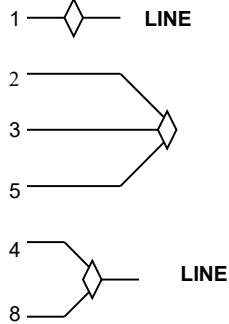
WIRING DIAGRAMS, XP MOTORS

H. 1Ø, 6 WIRE

115 VAC



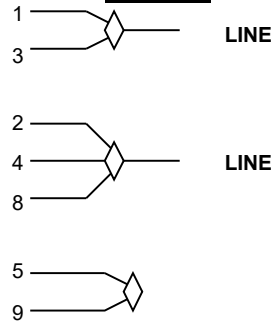
230 VAC



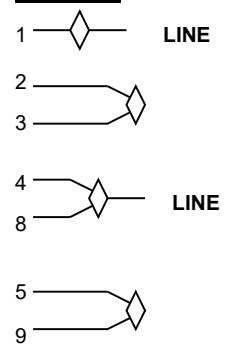
INTERCHANGE LEADWIRES 5 & 8 to REVERSE ROTATION

I. 1Ø, 7 WIRE

115 VAC



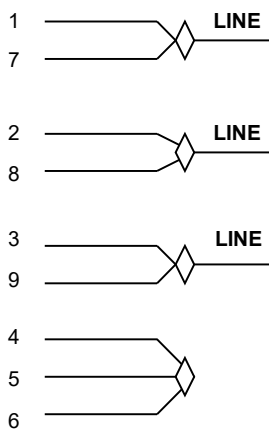
230 VAC



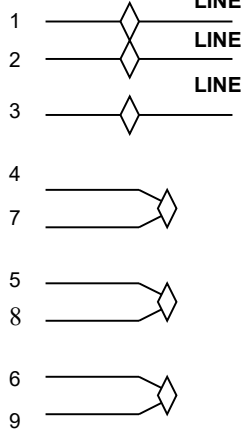
INTERCHANGE LEADWIRES 5 & 8 to REVERSE ROTATION

K. 3Ø, 9 WIRE

230 VAC

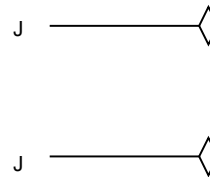


460 VAC



INTERCHANGE ANY TWO LEAD LINES TO REVERSE ROTATION

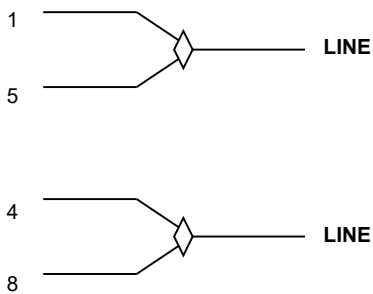
L. PILOT DUTY THERMAL OVERLOADS



HOOK J LEADS TO CONTROL CIRCUITRY

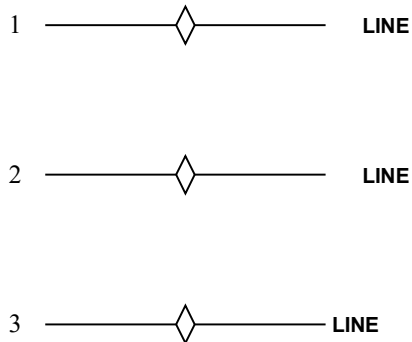
M. 1Ø 230 VAC

SINGLE VOLTAGE



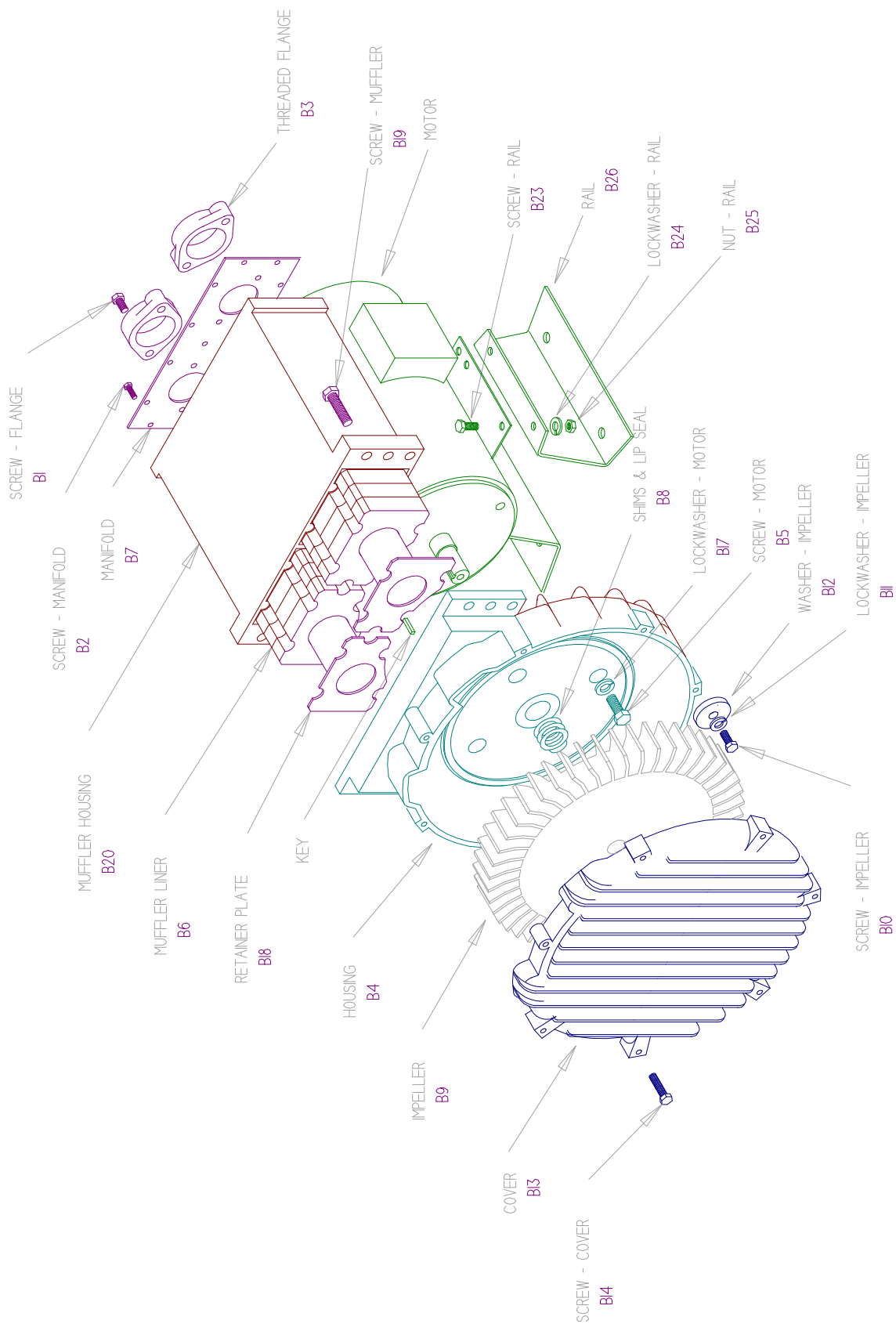
INTERCHANGE LEADWIRES 5 & 8 TO REVERSE ROTATION

N. 3Ø 575 VAC

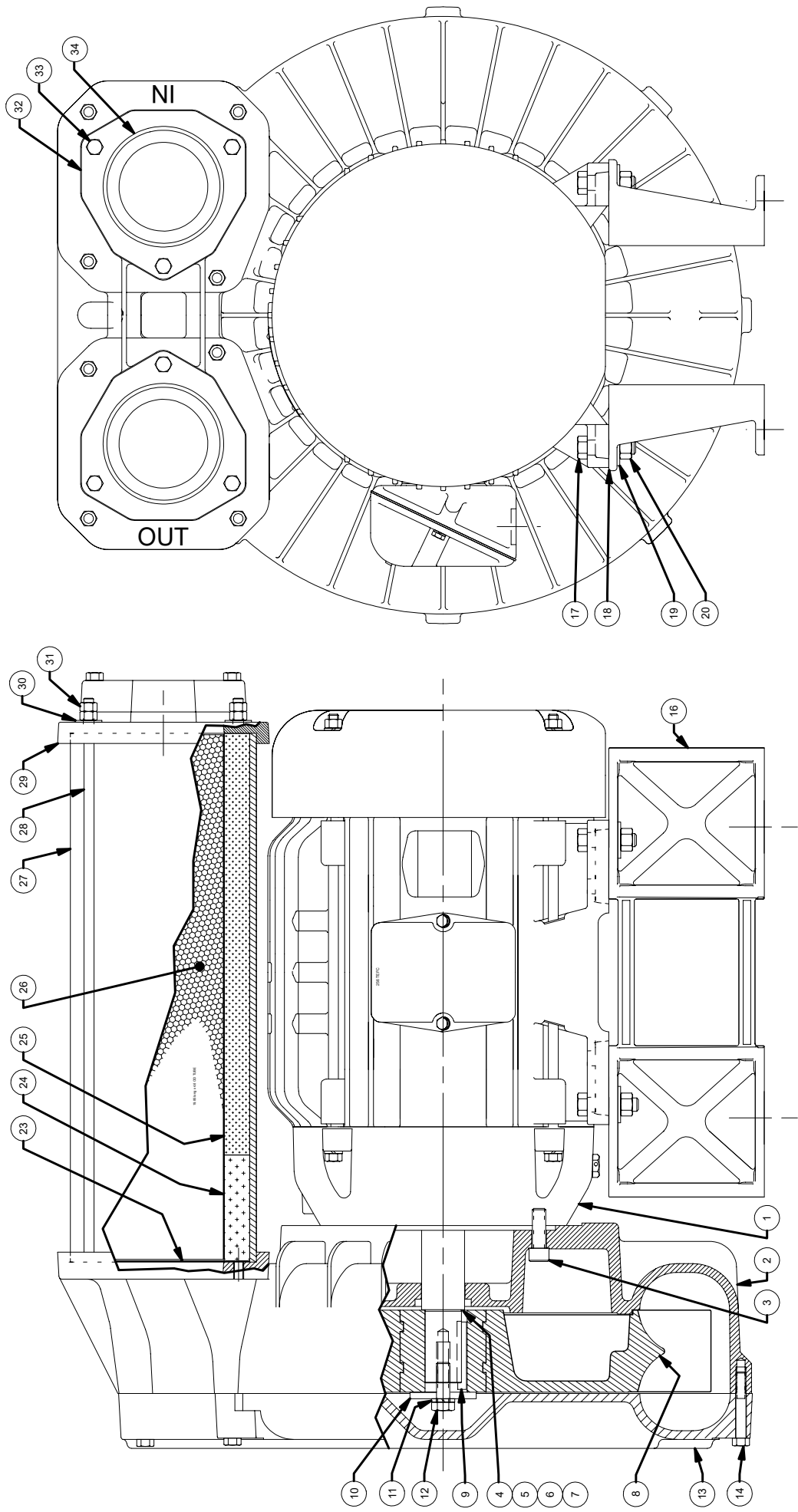


INTERCHANGE ANY TWO LEAD LINES TO REVERSE ROTATION

ASSEMBLY DIAGRAM EN6 EN808 EN909 EN14



ASSEMBLY DIAGRAM "B"



EN 6/858/909/14

Service and Parts Manual

Model:

Part No.:

Parts Breakdown

EN6 EN858 EN909 EN14 EN979
 038361 038744 038629 081741 080724
 038180 038745 038634 081736 038762 038760 080724
 038438 080070 080071 081743 038761

Item No.	Qty. Req'd	Description	EN6	EN858	EN909	EN14	EN979
M3	1	Key Motor Shaft	510212	511532	511532	515066	511532 551570
B1	6	Screw, Flange (4 pcs)	120065	155067	140016	140016	140016 140016
B2		Screw, Manifold	Not Used	Not Used	Not Used	Not Used	Not Used Not Used
B3	2	Flange	See Next Page	511614	529912	529912	529912 529912
	2	O-ring	Not Used	Not Used	155377	155377	155377 155377
B4	1	Elbow 90°	See Next Page	Not Used	Not Used	Not Used	Not Used Not Used
B5	4	Housing	516747	516764	515356	516799	516797 551560
B6	7	Screw, Hsg./Motor	251792	155034	140014	see below	120205 120205
	2	Muffler Material (Gray)	Not Used	551736 (10 pcs)	551738 (2 pcs)	552477 (12)	551740 (12) 551740 (8) 551571
	2	Muffler Material (White)	Not Used	551737	551739	552483	551741 551741 Not Used
B8	2	Finger Guard	Not Used	Not Used	551730	Not Used	551744 551744 Not Used
	*	Shim .002"	272703	511547	511547	515991	511547 511547
	*	Shim .005"	272704	511548	511548	515992	511548 511548
	*	Shim .010"	272705	511549	511549	515993	511549 511549
	*	Shim .020"	272706	511550	511550	515994	511550 511550
	*	Shim .030"	Not Used	Not Used	Not Used	Not Used	Not Used Not Used
B9	1	Impeller	515484	515249	552544	515509	515683 551566
B10	1	Bolt, Impeller	251791	120210	140015	120210	155068 120251 140015
B11	1	Lockwasher, Impeller	251787	251788	251788	251788	251788 251788 Not Used
B12	1	Washer, Impeller	Not Used	511529	Not Used	Not Used	Not Used Not Used
B13	1	Cover	515488	515247	515359	515910	515910 551409
B14	8	Screw, Cover	155170	140016	140016	155069	155069 155512
B15	1	Eye Bolt	Not Used	140019	Not Used	140019	140019 Not Used
B16	1	Spacer, Impeller Bolt	478336	515555	511529	515990	515990 511529
		Shaft Sleeve	Not Used	Not Used	Not Used	Not Used	Not Used Not Used
B17		Lockwasher, Housing	Not Used	Not Used	Not Used	Not Used	Not Used Not Used
B18	2	Screen, Muffler Retaining,	Not Used	551723	551725	552479	551727 551727 551611
B19	6	Bolt, Muffler Hsg/Hsg	Not Used	155025	155025 (4 pcs)	155067	155067 155512
B19A	4	Bolt, Muffler/Housing	Not Used	120214	120214 (3)	120214	120214 120214 Not Used
B20	1	Muffler Housing	Not Used	550019	529932	552428	550039 551422
	1	Muffler Discrete	522948	Not Used	Not Used	Not Used	Not Used Not Used
		Bolt, Motor/Muffler	Not Used	Not Used	Not Used	Not Used	Not Used Not Used
B21		Heat Slinger	Not Used	Not Used	Not Used	Not Used	Not Used Not Used
B22		Guard Heat slinger	Not Used	Not Used	Not Used	Not Used	Not Used Not Used
B23	4	Bolt, Rail	251791	120007	140016	120205	155067 120256
B24	4	Lockwasher Rail	251787	251787	251787	251788	251788 251788
B24A	8	Washer, Rail/Motor	Not Used	Not Used	155091	see below	Not Used (4) 155091

OBSOLETE

*As needed **Viewed looking at inlet/outlet ports

B25	6	Nut, Rail	251789	251789	251789	(4 pcs) 251789	(4 pcs) 155070	(4 pcs) 155070	155070
B26	2	Rail Mounting	478338	595301	551584	see below	551658	551658	551658
	1	Lip Seal	516691	516693	516693	516693	516694	516693	516693

Model	Part No.	Motor	Wiring Diagram	Specific Parts	Bearing, Rear (M1)	Impeller End (M2)
EN6F5L	038361	529475	M + L	B3 Flange 511480 (2 pcs) Elbow 120153 (2 pcs)		
EN6F72L	038180	500297	K + L	B3 Flange 478341 (2 pcs) Elbow Not Used, Screen Guard, Flange 511479 (2 pcs)	510217	510218
EN6F86L	038438	529634	N + L	B3 Flange 478341 (2 pcs) , Elbow Not Used Screen Guard, Flange 511479 (2 pcs)		
EN858BD72WL	038744	515556	K + L			
EN858BD86WL	038745	529627	N + L		516840	516844
EN858BA72W	080070	515558	K + L			
EN909BG72WL	038629	511512	K + L			
EN909BG86WL	038634	529631	N + L			
EN909BD72WL	080071	515556	K + L		516842	516844
EN909BG72WL	081741	511512	K + L	B5 140016 B26 551584,B24A not used		
EN909BG86WL	081736	529631	N + L	B5 140016 B26 551584,B24A not used		
EN909BD72WL	081743	515556	K + L	B5 155092 B26 595301,B24A 155091 (20 pcs)	516842	516844
EN14DX86MWL	038762	529632	N + L			
EN14DX72MWL	038761	516095	P + L		516844	516846
EN14BK72MWL	038760	511513	K + L		516842	516844
EN979BK72WL	080724	551637	K + L		516842	516844

* As needed ***Viewed looking at inlet/outlet ports

Use Assembly Diagram "B"

EN/CP 14
Service and Parts Manual
 Model:
 Part No.:

Parts Breakdown

EN14
 081486
 081487

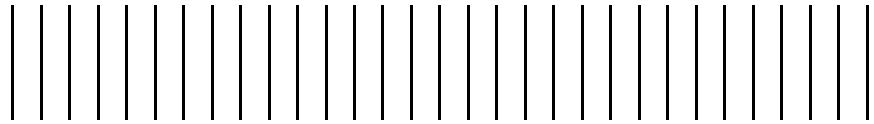
EN14
 081485

REF #	QTY	Description	See below	See below
1	1	Motor	See below	See below
2	1	Housing	552373	552375
3	4	Housing to mtr bolts	120266	155067
4	*	Shim	515991	511547
5	*	Shim	515992	511548
6	*	Shim	515993	511549
7	*	Shim	515994	511550
8	1	Impeller	515509	515683
9	1	Mtr shaft Key	155066	511532
10	1	Impeller washer	515990	515990
11	1	Impeller lockwasher	251788	251788
12	1	Impeller bolt	155068	120251
13	1	Cover	515910	515910
14	8	Cover screws	155069	155069
15		Not used	Not used	Not used
16	2	Mounting Rails	551658	551658
17	4	Rail Bolts	120205	155025
18	4	Rail spacers	Not used	Not used
19	4	Rail lockwashers	251788	251788
20	4	Rail -Nuts	155070	155070
21	4	Rail washers	155091	155091
22		Not used	Not used	Not used
23	2	Finger guard screen	552322	552322
24	2	Muffler foam (hi temp)	552328	552328
25	2	Muffler foam (regular)	552327	552327
26	2	Retainer	552332	552332
27	2	Muffler tube	552324	552324
28	8	Muffler Tie Rod	552325	552325
29	1	Connector plate	552298	552298
30	8	Muffler washer	155091	155091

*As needed ***Viewed looking at inlet/outlet ports

31	16	Muffler tie rod nuts	251789	251789	251789
32	2	Flange	529912	529912	529912
	2	Flange - O-Ring	155377	155377	155377
33	6	Flange bolts	140016	140016	140016
34		Flange Cap.	Not used	Not used	Not used
35		Not used	Not used	Not used	Not used
36		Nameplate- Blower	Not used	Not used	Not used
37		Rotation Sticker	Not used	Not used	Not used
38		Not used	Not used	Not used	Not used
39					
40		Lip Seal	516694	516694	516693
41					
42					

Model	Part #	Motor	Wiring Diagram	Specific Parts	Bearing, Rear (M1)	Beari Impeller E
EN14DX86MWL	081487	529632	N + L		516844	5168
EN14DX72MWL	081486	516095	K + L			
EN14BK72MWL	081485	511513	K + L		516842	5168



* As needed **Viewed looking at inlet/outlet ports

