

SERVICE AND PARTS MANUAL FOR BLOWER MODEL

CP454 – CP656



AMETEK Dynamic Fluid Solutions
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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

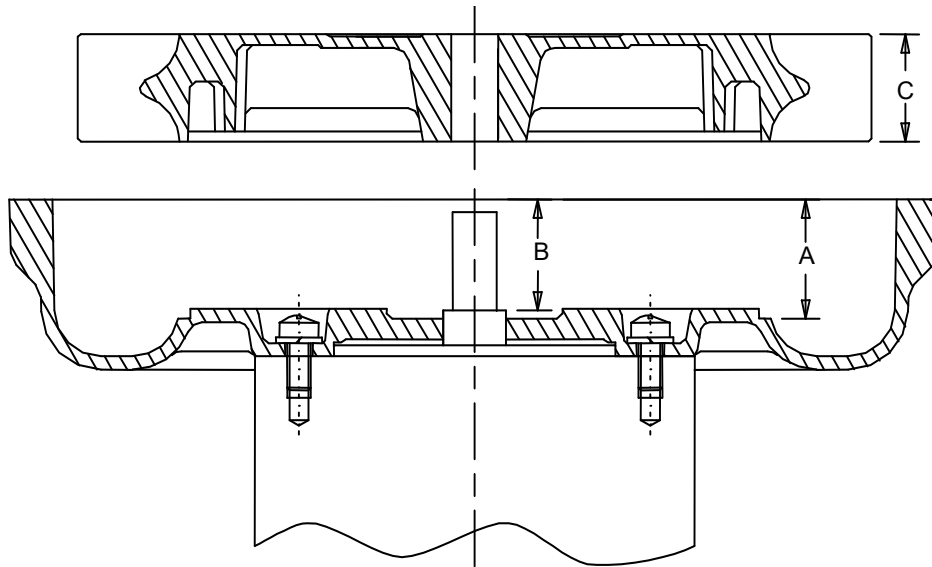
Measure the Following:

- 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.

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

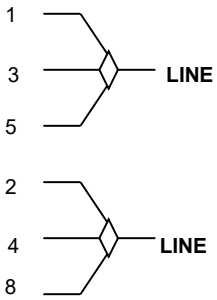
After the impeller installation (step #4 above) the impeller/cover clearance can be checked with feeler gauges, laying the parallel bar across the housing flange face. This clearance should nominally be (A-C)/2.



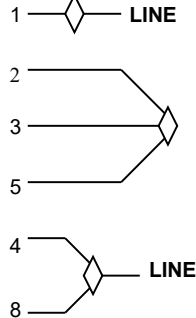
WIRING DIAGRAMS, TEFC and ODP MOTORS

A. 1Ø, 6 WIRE

115 VAC



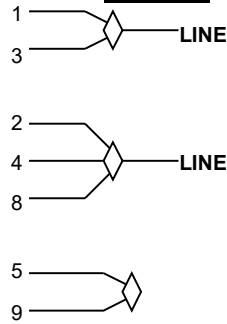
230 VAC



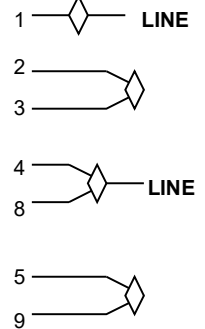
INTERCHANGE LEADWIRES 5 & 8 to REVERSE ROTATION

B. 1Ø, 7 WIRE

115 VAC



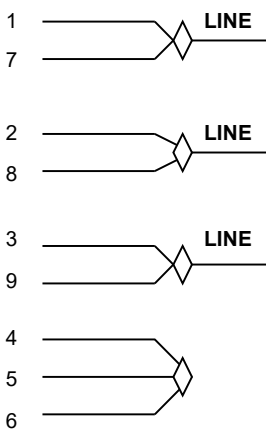
230 VAC



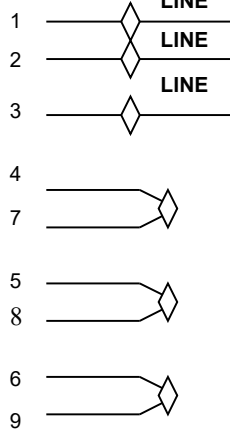
INTERCHANGE LEADWIRES 5 & 8 to REVERSE ROTATION

C. 3Ø, 9 WIRE

230 VAC



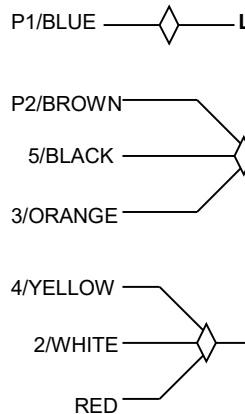
460 VAC



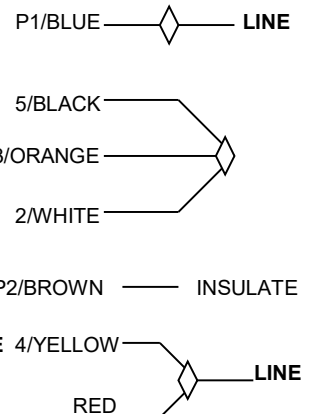
INTERCHANGE ANY TWO LEAD LINES TO REVERSE ROTATION

D. 1Ø, EMERSON 1/8 HP MOTOR

115 VAC



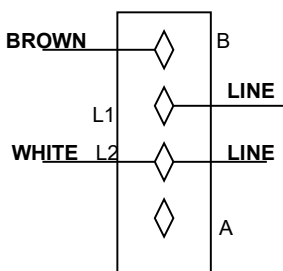
230 VAC



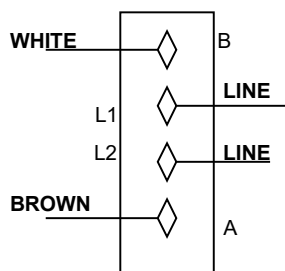
INTERCHANGE RED AND BLACK TO REVERSE ROTATION

E. 1Ø, SPA DUTY WITH TERMINAL STRIPS

LOW 115 VAC

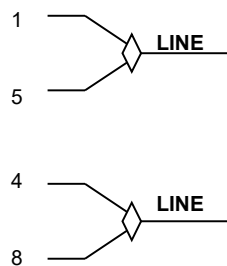


HIGH 230 VAC



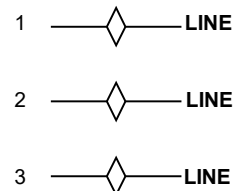
F. 1Ø, 230 VAC

SINGLE VOLTAGE



INTERCHANGE LEAD WIRES 5 & 8 TO REVERSE ROTATION

G. 3Ø, 575 VAC



INTERCHANGE ANY TWO LEAD LINES TO REVERSE ROTATION

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.

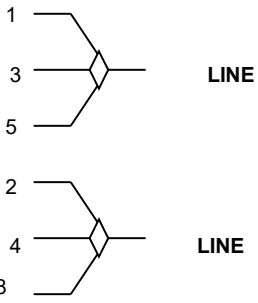
AMETEK Rotron offers general application guidance; however, suitability of the particular blower selection is ultimately the responsibility of the purchaser, not the manufacturer of the blower.

FS2 Rev B 3/10/98

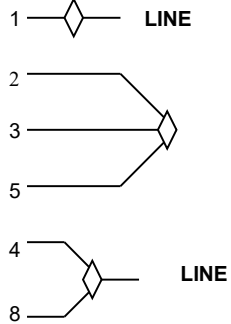
WIRING DIAGRAMS, XP MOTORS

H. 1Ø, 6 WIRE

115 VAC



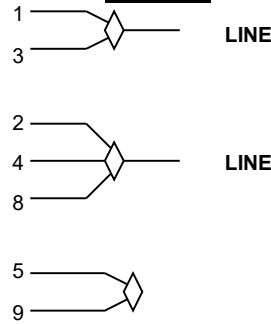
230 VAC



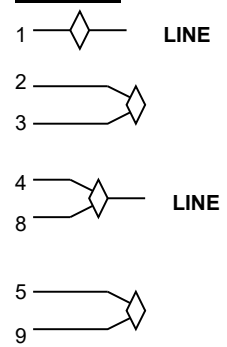
INTERCHANGE LEADWIRES 5 & 8 to REVERSE ROTATION

I. 1Ø, 7 WIRE

115 VAC



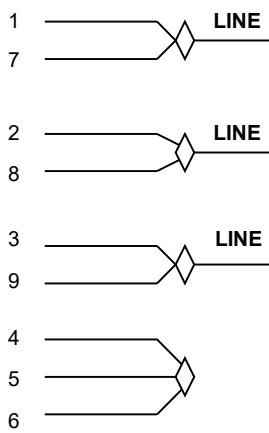
230 VAC



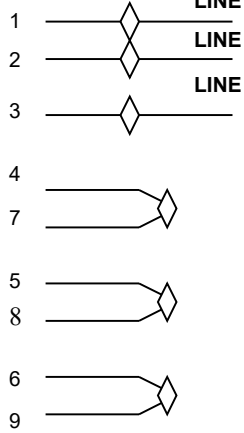
INTERCHANGE LEADWIRES 5 & 8 to REVERSE ROTATION

K. 3Ø, 9 WIRE

230 VAC

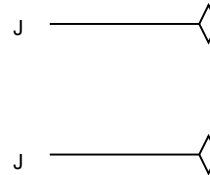


460 VAC



INTERCHANGE ANY TWO LEAD LINES TO REVERSE ROTATION

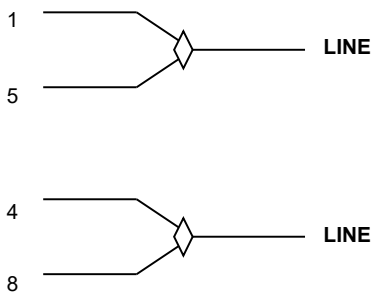
L. PILOT DUTY THERMAL OVERLOADS



HOOK J LEADS TO CONTROL CIRCUITRY

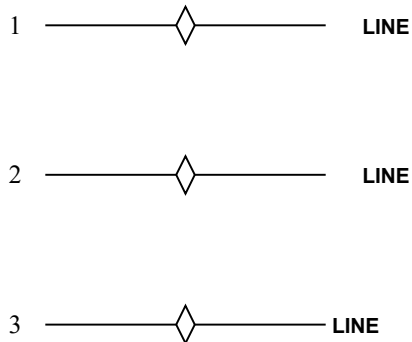
M. 1Ø 230 VAC

SINGLE VOLTAGE



INTERCHANGE LEADWIRES 5 & 8 TO REVERSE ROTATION

N. 3Ø 575 VAC

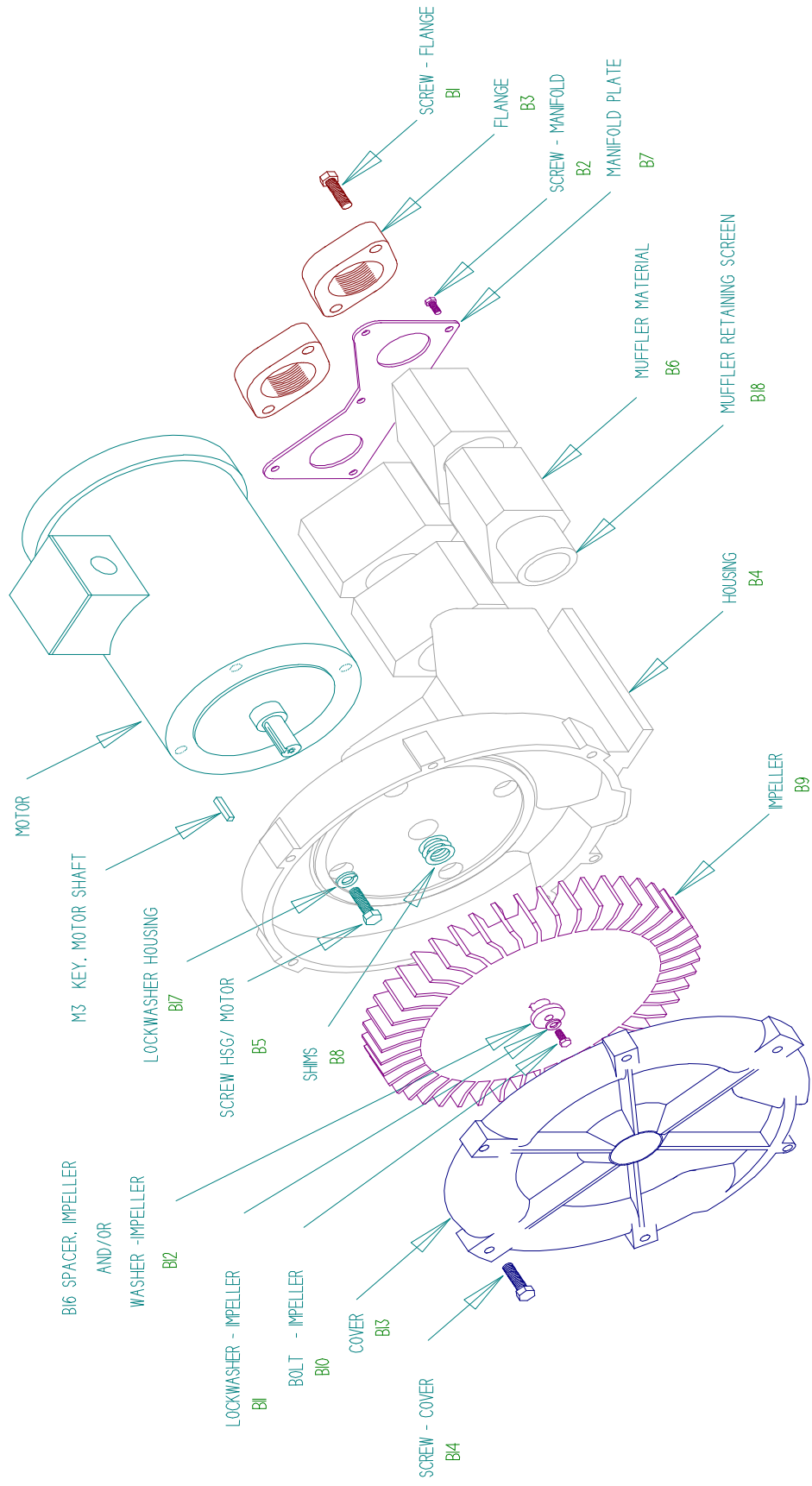


INTERCHANGE ANY TWO LEAD LINES TO REVERSE ROTATION

ASSEMBLY DIAGRAM

CP454 CP513 CP523 CP555 CP606 CP656

DIRECT DRIVE BLOWERS



CP 454/513/523/505/555/606/656
Service and Parts Manual

Model:
Part No.:

Parts Breakdown

CP454	CP454	CP523	CP505	CP555	CP606
038234	080490	038241	038236	038244	038246
038235	080491	038240	038237	038245	038247
038960	080494	038966	038238	038970	038972
038961	080495	038967	038239	038971	038973
			038962		
			038963		
			038965		

Item No.	Qty.	Req'd Description	See Next Page	155003	See Next Page	See Next Page	See Next Page	See Next Page	See Next Page
M3	1	Key Motor Shaft	155317	155317	140042	140042	155317	140042	See Next Page
B1	4	Screw, Flange	155496	155496 (10 pcs)	160556	160556	155170	155496	121837
B2	6	Screw, Manifold	551337	551337	551337	551337	551337	155496	155496
B3	2	Flange	551318	551092	551320	529429	529134	551337	551336
B4	1	Housing	155327	155327	155327	155327	251777	155327	529813
B5	4	Screw, Hsg/Motor	515743	515743	516560	516560 (6 pcs)	515743	515743	155327
B6	4	Muffler Material	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	529781
B7	4	Muffler Insert	551328	551328	529875	529875	551329	529317	Not Used
B8	1	Manifold Plate	510356	510356	510356	500664	510356	510356	551330
B8	*	Shim .002"	510357	510357	510357	500665	510357	510357	510356
B8	*	Shim .005"	510358	510358	510358	500666	510358	510358	510357
B8	*	Shim .010"	510359	510359	510359	500667	510359	510359	510358
B8	*	Shim .020"	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	510359
B8	*	Shim .030"	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used
B9	1	Impeller	551201	551095	529301	(2 pc) 529931	529300	529302	Not Used
B10	1	Bolt, Impeller	160556	160556	160556	160556	160556	160556	551202
B11	1	Lockwasher, Impeller	251308	251308	251308	251308	251308	251308	160556
B12	1	Washer, Impeller	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	251308
B13	1	Cover	528672	551094	528717	528717	517468	551257	Not Used
B14	6	Screw, Cover	155236	155129 (8 pcs)	121837 (8 pcs)	155328	155236 (7 pcs)	155236	Not Used
B16	1	Spacer, Impeller Bolt	515055	515055	515055	515055	515055	515055	515040
B17	1	Lockwasher, Housing	Not Used	Not Used	Not Used	Not Used	Not Used	Not Used	155236
B18	1	Screen, Muffler Retaining, Right (**)	551309	551089	551309	551309	529989	551309	Not Used
B18	1	Insert-Muffler	Not Used,2)	551006	Not Used	Not Used	Not Used	Not Used	Not Used
B18	1	Screen, Muffler Retaining, Left (**)	551309	551089	551309	551309	529989	551309	529818
B18	1	Insert-Muffler	Not Used	551006	Not Used	Not Used	Not Used	Not Used	Not Used
B19	1	Bolt, Muffler Hsg/Hsg	516587	516587	516587	516587	516587	516587	Not Used
B19	1	Lip Seal	516587	516587	516587	516587	516587	516587	Not Used

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

Model	Part No.	Motor	Wiring Diagram	Specific Parts	Bearing, Rear (M1)	Bea Impeller
CP454W72LR	038234	515746	K + L	M3 155123		
CP454EZ72LR	038235	529238	C	M3 155322		
C454FR72LR	038960	550471	K + L	M3 155003		
CP454R72LR	038961	510317	C	M3 510629		
CP454W72MLR	080490	515746	K + L			
CP454EZ72MLR	080491	529238	C			
CP454FR72MLR	080494	550471	K + L			
CP454R72MLR	080495	550317	C			
CP505AX72LR	038236	510325	K + L	M3 155123		
CP505CT72LR	038237	517341	C	M3 155322		
CP505M72LR	038238	516687	K + L	M3 155123		
CP505FE72MLR	038239	551359	C	M3 155322		
CP505AS72MLR	038963	510318	C	M3 510629		
CP505FS72MLR	038962	550467	K + L	M3 155003		
CP505CD72MLR	038965	510763	C	M3 510629		
CP513EZ72LR	038241	529238	C	M3 155322		
CP513W72LR	038240	515746	K + L	M3 155123		
CP513R72LR	038967	510317	C	M3 510629		
CP513FR72LR	038966	550471	K + L	M3 155003	510449	510
CP523M72LR	038242	517675	K + L	B13A 529190		
CP523CS72LR	038243	551367	C	M3 155320		
CP523K72LR	038969	516571	C	M3 155099		
CP523FU72LR	038968	550468	K + L	B13A 529190		
CP555M72LR	038244	516687	K + L	M3 155320		
CP555CS72LR	038245	517342	C	B13A 529190		
CP555FU72LR	038970	550469	K + L	M3 155123		
CP555K72LR	038971	511306	C	M3 155322		
CP606M72MLR	038246	516687	K + L	M3 155003		
CP606CR72MLR	038247	517343	C	M3 510629		
CP606FU72MLR	038972	550469	K + L	M3 155123		
CP606CK72LR	038973	510895	C	M3 155322		
CP656FF72XLR	080054	550759	C	M3 510629		
CP656M72XLR	080064	516687	K + L	M3 155003		
CP656CR72XLR	080065	517343	C	M3 155123		
CP656FU72XLR	080142	550469	K + L	M3 155003		
CP656CK72XLR	080143	510895	C	M3 510629		

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

CP656
080054
080064
080065
080142
080143

155123
121837
155170
551336
550754
155327
(10 pcs) 551585
550691
551976
510356
510357
510358
510359
Not Used
550756
160556
251308
Not Used
550757
(8) 156236
515055
Not Used
529989
not used
529989
Not used
Not Used
516587

<u>ring, End (M2)</u>
1217