DEL-AIR
ISO 9001 CERTIFIED
SYSTEMS

DEL-AIR Fan and HRV Electric Motors

TEST INSTRUCTIONS

Before replacing a motor or sending a motor back for warranty, check the motor thoroughly to determine if it is actually faulty and try to determine what might have caused the fault. Follow the procedure(s) below:

Physical Examination:

1. SHAFT WON'T TURN - if the shaft won't turn or is very stiff to turn, the bearings need to be replaced. Before replacing the bearings, check the winding resistance (see below) to determine if the motor should still run after the bearings are replaced.

2. BROKEN OR CORRODED WIRES - cut off the corroded wire, re-strip and reconnect if possible. If the break or corrosion is irreparable, there may be no other choice but to discard the motor.

3. CAPACITOR BURNED OR DAMAGED - if there is obvious physical damage to the capacitor, it must be replaced.

4. MOTOR CASE DAMAGED OR CORRODED - if the motor case (body) is corroded through or otherwise damaged there may be no other choice but to discard the entire motor and replace with a new unit.

Electrical Examination:

A digital multimeter capable of reading OHMS (Ω) is essential in testing the electrical condition of a motor. See Figure 1 (below) for an illustration of how the meter should be used to measure the resistance of the wires. If shopping for a new meter, we recommend one which can also test capacitor's. Look for a "μF" or just "F" setting somewhere on the meter's selection dial or ask a meter salesperson for assistance in selecting a good quality meter.

Follow the steps below to verify the electrical integrity of the motor.

1. CAPACITOR - all DEL-AIR motors require a capacitor in order to run. Usually, the capacitor should be replaced whenever a motor is brought in for repair but if you have access to a meter which can test for capacitance (μF), check the capacitor first. If the reading is more than 20% lower than the rating shown on the capacitor or motor nameplate, replace the capacitor.

2. SHORT CIRCUIT in Motor Wires - Using an Ohm meter, if you find that a pair of wires (see tables on back page) reads 0 ohms (or a number very close to zero ohms) it is likely that there is a short in the windings of the motor. If the motor has not been in service long, it is likely that the motor has been wired incorrectly. If a cord is still attached it should be possible to verify the wiring by comparing it to the wiring diagram shown on the side of the motor. If the wiring has been undone prior to inspection it may be difficult to prove mis-wiring. A short circuit is usually irreparable but some motor winding shops may be able to repair it at a cost approaching the cost of a new motor.

3. OPEN CIRCUIT in Motor Wires - Using an Ohm meter, if you find that a pair of wires does not give you a reading it is likely that there is a break in the circuit somewhere. Usually this is caused either by incorrect wiring or in the case of a motor that is very old it can happen due to corrosion or vibration within the motor. Sometimes a motor winding shop can repair the open circuit but in most cases the motor needs to be discarded and replaced with a new unit.

4. WINDING RESISTANCE OUT OF RANGE - Refer to Tables 1—3 on Page 2 for the proper resistance for the corresponding motor model you are testing. For best accuracy, resistance readings should be taken with the motor at room temperature. Winding resistance is affected by temperature and corrosion. The ranges listed in the tables is that suggested by the manufacturer. It is possible for a reading to be 10-20% out of range and the motor will still run. Normally, the resistance test will reveal short circuits or open circuits but in the case of a motor which appears OK otherwise but is running abnormally, an out of range resistance value may help to determine if the motor should be replaced or not.

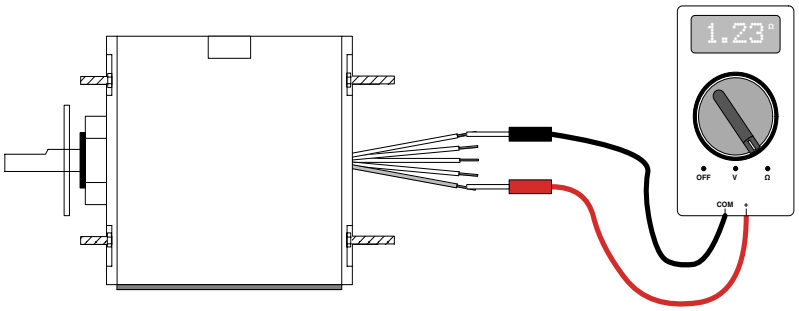

Figure 1 - Using a Digital Multimeter to measure winding resistances

Table 1 - Winding Resistance of some FASCO motors.

Wire 1	Wire 2	High Limit (Ohms)	Low Limit (Ohms)
7128-0348 (NW6K, NW10K)			
Black	Brown	8.98 Ω	7.81 Ω
Black	White	16.20 Ω	14.10 Ω
Black	Red	1.49 Ω	1.29 Ω
7162-1668 (EA150, EA350)			
White	Red	65.60 Ω	55.88 Ω
White	Black	84.64 Ω	72.10 Ω
7162-2846 (V500, NW750)			
Black	Red	14.87 Ω	12.67 Ω
Black	White	14.57 Ω	12.41 Ω
7162-2516 (RA350, V500, NW750)			
Black	Blue	14.80 Ω	12.60 Ω
Black	Red	15.44 Ω	13.16 Ω
7162-2517 (RA150)			
Black	Red	38.42 Ω	32.72 Ω
Black	White	37.44 Ω	31.90 Ω
7128-0468 (HO10K)			
Black	Brown	13.5 Ω	11.0 Ω
Black	White	13.0 Ω	11.0 Ω
Black	Red	1.4 Ω	1.1 Ω

SHORT CIRCUIT in Motor Wires - Using an Ohm meter, if you find that a pair of wires (see tables on back page) reads 0 ohms (or a number very close to zero ohms) it is likely that there is a short in the windings of the motor. If the motor has not been in service long, it is likely that the motor has been wired incorrectly. If a cord is still attached it should be possible to verify the wiring by comparing it to the wiring diagram shown on the side of the motor. If the wiring has been undone prior to inspection it may be difficult to prove miswiring. A short circuit is usually irreparable but some motor winding shops may be able to repair it at a cost approaching the cost of a new motor.

OPEN CIRCUIT in Motor Wires - Using an Ohm meter, if you find that a pair of wires does not give you a reading it is likely that there is a break in the circuit somewhere. Usually this is caused either by incorrect wiring or in the case of a motor that is very old it can happen due to corrosion or vibration within the motor. Sometimes a motor winding shop can repair the open circuit but in most cases the motor needs to be discarded and replaced with a new unit.

WINDING RESISTANCE OUT OF RANGE - Refer to Tables 1—3 on Page 2 for the proper resistance for the corresponding motor model you are testing. For best accuracy, resistance readings should be taken with the motor at room temperature. Winding resistance is affected by temperature and corrosion. The ranges listed in the tables is that suggested by the manufacturer. It is possible for a reading to be 10-20% out of range and the motor will still run. Normally, the resistance test will reveal short circuits or open circuits but in the case of a motor which appears OK otherwise but is running abnormally, an out of range resistance value may help to determine if the motor should be replaced or not.

Table 2 - Winding Resistance of some FASCO motors.

Wire 1	Wire 2	High Limit (Ohms)	Low Limit (Ohms)
7124-0431 (RA800)			
Black	Blue	5.89 Ω	5.12 Ω
Black	Red	5.62 Ω	4.88 Ω
Red	Blue	11.51 Ω	10.00 Ω
7124-0550 (EA800)			
Black	Blue	45.70 Ω	39.70 Ω
Black	Red	43.30 Ω	37.60 Ω
Red	Blue	88.97 Ω	77.33 Ω
7124-0776 (Old J & P Fans)			
Orange	Black	5.20 Ω	4.52 Ω
Red	Blue	5.20 Ω	4.52 Ω
White	Orange	0.00 Ω	
Brown 1	Black	38.90 Ω	33.80 Ω
Brown 2	Orange	0.00 Ω	
7124-1596 (NW2K)			
Black	Brown	38.60 Ω	33.50 Ω
Black	White	34.10 Ω	29.60 Ω
Black	Red	2.86 Ω	2.48 Ω
7126-3292 (NW4K)			
Black	Brown	27.80 Ω	24.20 Ω
Black	White	11.30 Ω	9.78 Ω
Black	Red	1.20 Ω	1.04 Ω

Table 3 - Winding Resistance of some Hurricane Series motors.

Wire 1	Wire 2	High Limit (Ohms)	Low Limit (Ohms)
Leeson M099700* (H18/H20)			
P2	T4	6.86 Ω	5.62 Ω
T5	T8	29.26 Ω	23.94 Ω
Leeson M099800 (H18/H20)			
P2	T4	7.30 Ω	5.98 Ω
T5	T8	19.83 Ω	16.23 Ω
Leeson M099846* (H24)			
P2	T4	6.42 Ω	5.26 Ω
T5	T8	3.67 Ω	3.01 Ω
Leeson M099946 (H24)			
P2	T4	6.84 Ω	5.60 Ω
T5	T8	4.77 Ω	3.91 Ω
Leeson M099836 (H36)			
P2	T4	9.11 Ω	7.45 Ω
T5	T8	11.94 Ω	9.77 Ω
Century C594 (H48)			
Yellow	Orange	0.96 Ω	1.44 Ω
White	Blue	3.58 Ω	5.38 Ω

* This motor has been discontinued but was used on the initial production run of fans.