

# **IMF-B Efficient Fully Mixed Flow Fan**

## **INSTALLATION, OPERATION, AND MAINTENANCE MANUAL**

2021 V1.0



## Preface

Thanks for your honored company choosing our products. When using IMF efficient fully mixed flow fans of belt driving, direct driving, explosion-proof or smoke removal duty, please carefully read this manual prior to any installation or maintenance procedure. This will help you to avoid any destroy due to improper storage, installation, operation or maintenance; and guarantee the fan operated safely and efficiently as well.

### **Attention:**

- 1 Upon receipt of the equipment, carefully inspect the fan and accessories for any damage and shortage, and report it immediately to the supplier;
- 2 The equipment shall be stored at jobsite strictly according to “CANARM Storage Guidelines”, avoid any trampling or striking, otherwise it will damage the equipment and will result in the invalidation of warranty;
- 3 The installation, operation and maintenance shall be operated by professional personnel. Always disconnect power prior to working on fan.

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## 1 Product Storage Guidelines

If a fan is to be stored for a period of time prior to installation, follow the instructions below:

- 1.1 All fans and accessories shall be stored in its original shipping package and indoors;
- 1.2 Store the fans and accessories in dry, clean and without any corrosive air place to keep shaft, bearing and fan housing from dust, debris and corrosion;
- 1.3 If the fan is stored in a temporary place without any drainage facilities, the whole package shall be blocked up at least 10cm high;
- 1.4 Stacking for storage shall not exceed the stack limit label on the outside package;
- 1.5 The outside machined surface of metal spare parts needs periodically checking and greasing to avoid surface rusting;
- 1.6 In normal conditions, rotate the impeller several revolutions every three months to keep the balance of fan impeller and motor rotor. When it is stored in dirt and moisture conditions, rotate the impeller every month;
- 1.7 Grease the bearing periodically and keep a record.

**Damages caused by incorrect storage will result in the invalidation of warranty!**

## 2 Installation Guidelines

### 2.1 Installation type:

There are five installation types of IMF.

Horizontal seat-mounted (See Fig 1)

Vertical seat-mounted (See Fig 2)

Vertical ceiling installation (See Fig 3)

Horizontal ceiling installation (See Fig 4)

Roof installation (See Fig 5)

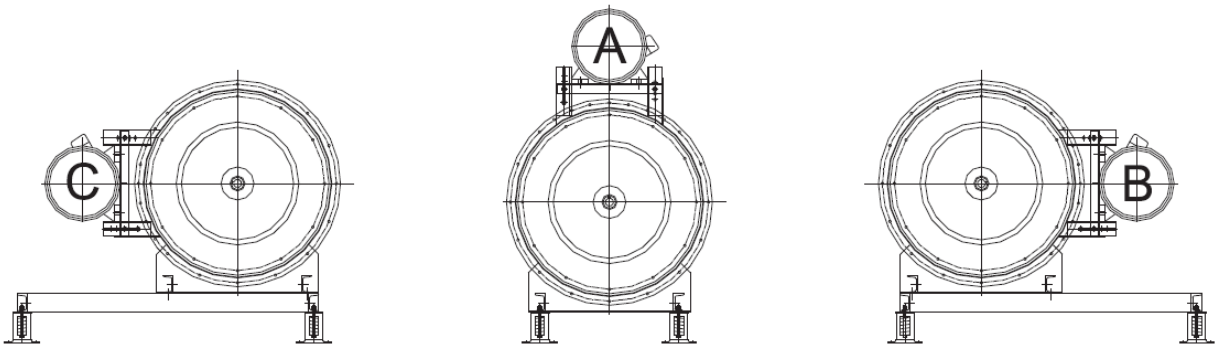


Fig. 1

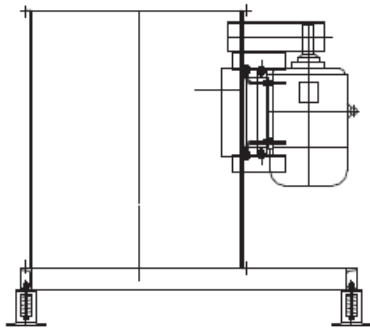


Fig. 2

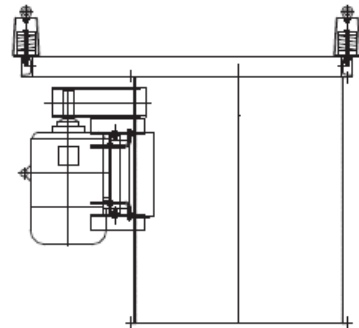


Fig. 3

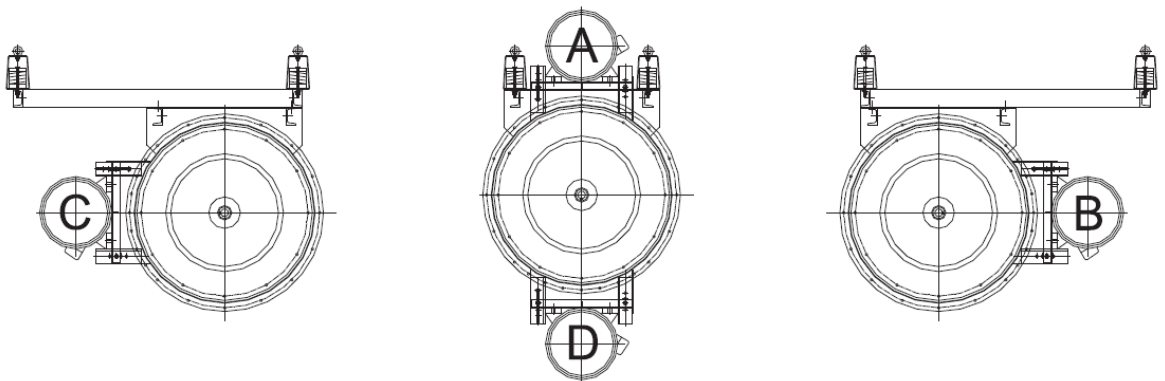


Fig. 4

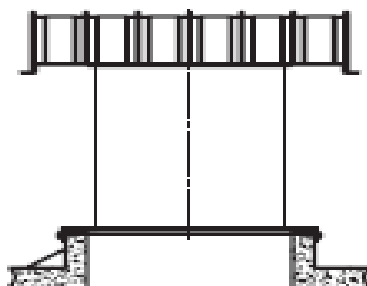


Fig. 5

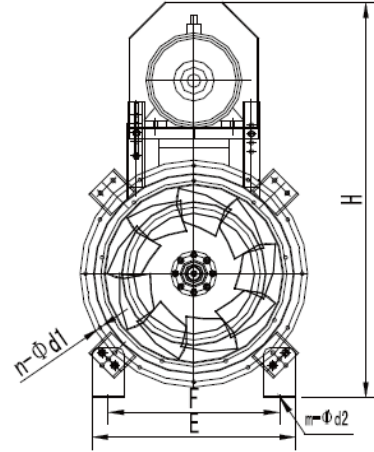
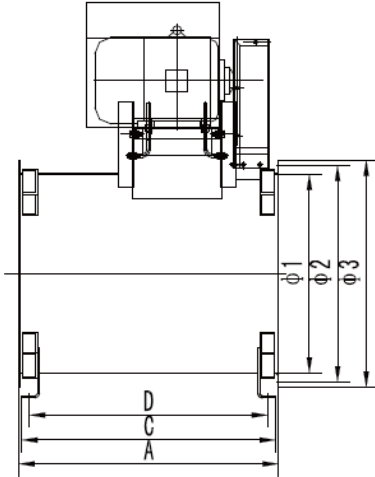
## 2.2 Notes

- 2.2.1 Move the fan to the desired place, lift it by the shipping crate or pallet. Be careful when lifting the fan, it shouldn't have too much impact.
- 2.2.2 Remove outside packing. The fan must be set and mounted level always to avoid damage or vibration.
- 2.2.3 Select different installation ways refer to design, generally choose floor mounting.
- 2.2.4 For floor mounting, fan is connected with foundation through anti-vibrators (or bolts) .
- 2.2.5 A reasonable space shall be left for the open of access door and maintenance of inlet, outlet, and motor.
- 2.2.6 Make sure the straight length of inlet/outlet duct have at least 2.5 times impeller diameter.
- 2.2.7 Make sure the distance from fan inlet to obstructions have at least 1.5 times impeller diameter.
- 2.2.8 No sudden reduction or expansion of the duct , there must be a joint air pipe, with large angle bend , to ensure the fan performance.
- 2.2.9 The inlet/outlet and duct is connected with canvas, silica cloth or metal.
- 2.2.10 Fan outlet direction is adjusted in accordance with customer's requirements.
- 2.2.11 All wiring should be in accordance with national electrical codes.

### 3 Structure Diagram

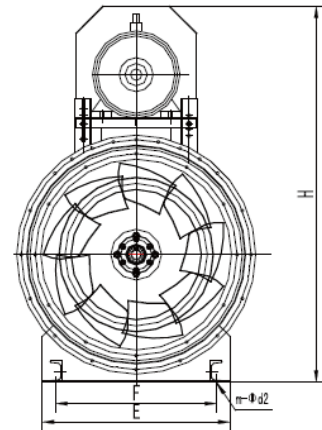
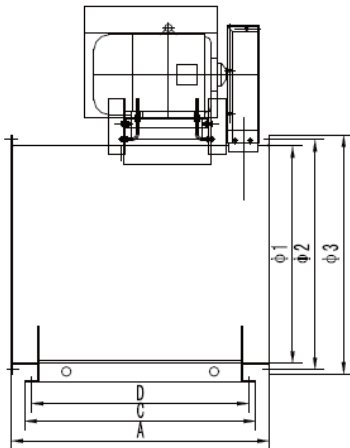
皮带型  
Belt drive type

型号: YFIMF400-500  
Model: YFIMF400-500



型号 Model	φ1	φ2	φ3	A	C	D	E	F	n	φd1	m	φd2	H(Max)	重量weight(kg)
YFIMF-400	450	490	530	610	594	550	486	406	8	12	4	15	980	59
YFIMF-450	510	550	590	707	691	647	546	456	12	12	4	15	1070	71
YFIMF-500	560	610	640	730	714	670	572	482	12	12	4	15	1160	91

型号: YFIMF560-1250  
Model: YFIMF560-1250

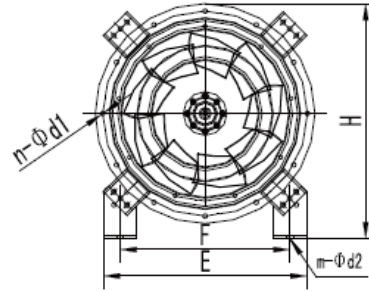
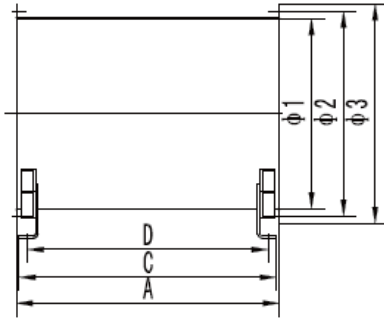


型号 Model	φ1	φ2	φ3	A	C	D	E	F	n	φd1	m	φd2	H(Max)	重量weight(kg)
YFIMF-560	630	670	710	830	730	690	510	410	12	12	4	15	1230	115
YFIMF-630	712	750	792	915	825	775	620	520	12	12	4	15	1400	161
YFIMF-710	809	855	889	960	860	810	700	600	16	12	6	15	1455	183
YFIMF-800	910	955	990	1075	985	936	790	690	16	14	6	20	1590	246
YFIMF-900	1017	1055	1097	1210	1120	1070	890	790	16	14	6	20	1690	292
YFIMF-1000	1130	1180	1230	1320	1190	1140	990	870	20	14	6	20	1825	384
YFIMF-1120	1270	1320	1370	1470	1390	1336	1100	900	20	14	6	20	2045	528
YFIMF-1250	1421	1470	1520	1637	1530	1480	1220	1020	20	14	6	20	2205	678

备注: 尺寸数据单位为毫米 (mm);

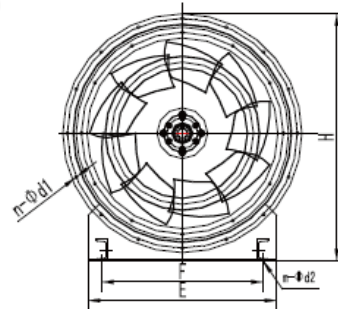
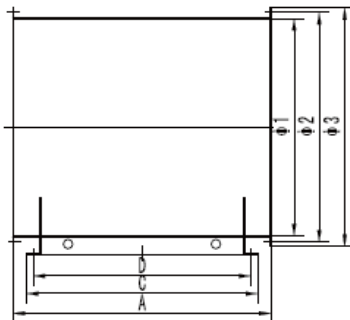
直联型  
Direct drive type

型号: YFIMF400-500  
Model: YFIMF400-500



型号 Model	Φ1	Φ2	Φ3	A	C	D	E	F	n	Φd1	m	Φd2	H(Max)	重量weight(kg)
YFIMF-400	450	490	530	610	594	550	486	406	8	12	4	15	565	52
YFIMF-450	510	550	590	707	691	647	546	456	12	12	4	15	630	65
YFIMF-500	560	610	640	730	714	670	572	482	12	12	4	15	670	83

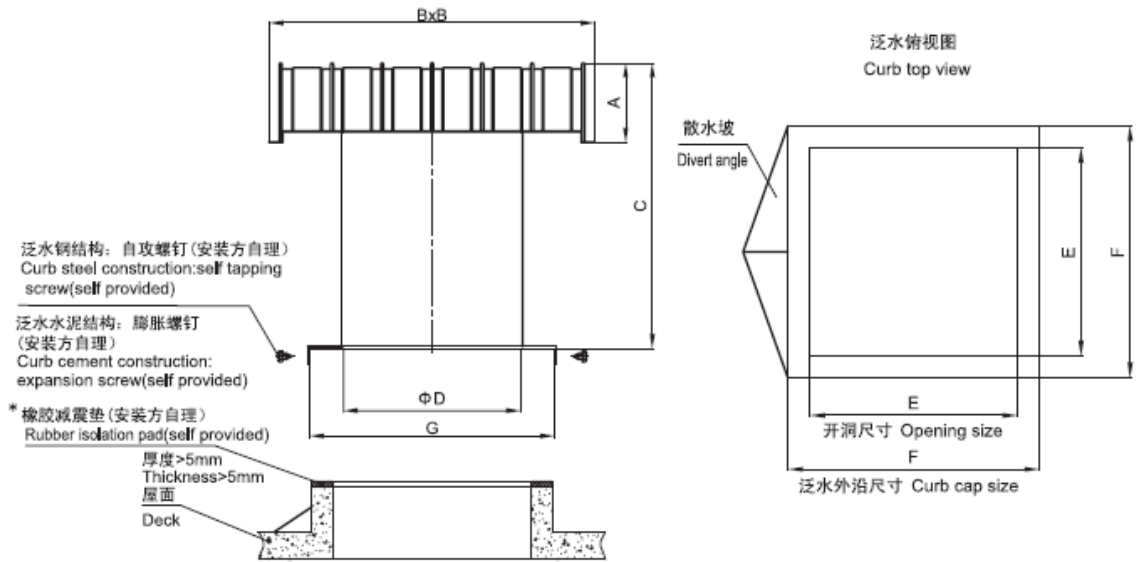
型号: YFIMF560-1250  
Model: YFIMF560-1250



型号 Model	Φ1	Φ2	Φ3	A	C	D	E	F	n	Φd1	m	Φd2	H(Max)	重量weight(kg)
YFIMF-560	630	670	710	830	730	690	510	410	12	12	4	15	750	102
YFIMF-630	712	750	792	915	825	775	620	520	12	12	4	15	846	148
YFIMF-710	809	855	889	960	860	810	700	600	16	12	6	15	920	171
YFIMF-800	910	955	990	1075	985	936	790	690	16	14	6	20	1030	212
YFIMF-900	1017	1055	1097	1210	1120	1070	890	790	16	14	6	20	1149	273
YFIMF-1000	1130	1180	1230	1320	1190	1140	990	870	20	14	6	20	1255	362
YFIMF-1120	1270	1320	1370	1470	1390	1336	1100	900	20	14	6	20	1420	492
YFIMF-1250	1421	1470	1520	1637	1530	1480	1220	1020	20	14	6	20	1575	618

备注: 尺寸数据单位为毫米 (mm);





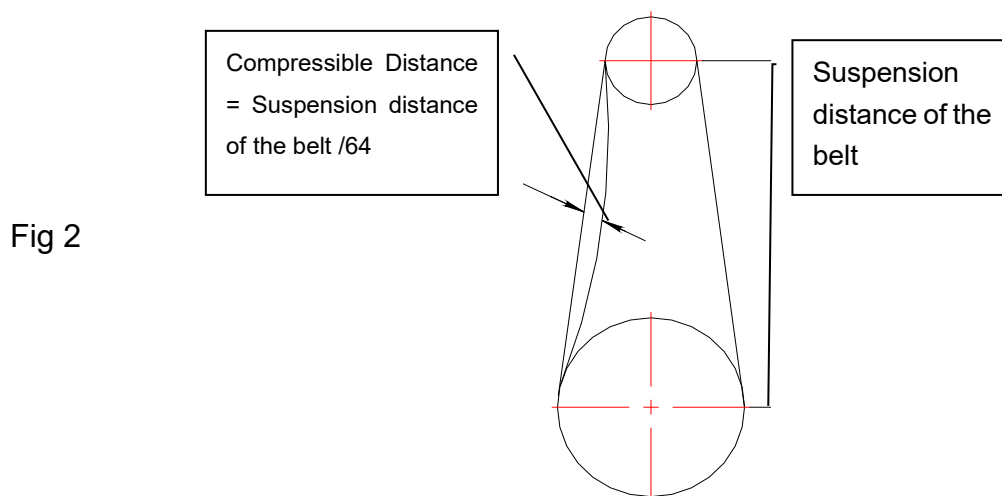
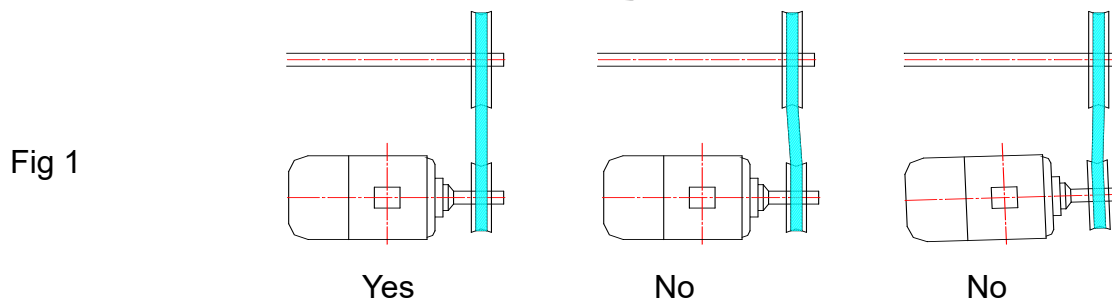
\*注: 消防时用石棉减震垫(安装方自理)  
Note: Smoke removal type needs serpentine isolation pad(self provided)

Model	A	B	C	D	E	F	G
YFIMF-400	250	812	890	455	480	640	650
YFIMF-450	300	992	1037	515	530	690	700
YFIMF-500	300	992	1060	565	580	740	750
YFIMF-560	350	1172	1210	635	680	840	850
YFIMF-630	350	1172	1295	715	730	890	900
YFIMF-710	350	1352	1340	815	830	990	1000
YFIMF-800	400	1532	1525	915	930	1090	1100
YFIMF-900	400	1532	1660	1020	1040	1240	1250
YFIMF-1000	450	1712	1820	1135	1140	1340	1350
YFIMF-1120	500	1892	2020	1275	1240	1440	1450
YFIMF-1250	550	2072	2237	1425	1440	1640	1650

Attention: the weight and size of fan is just for reference! Product is true!

## 4 Pre-start Checks

- 4.1 Lock out all the primary and secondary power sources.
- 4.2 Ensure the fan and ductwork are clean and free of debris.
- 4.3 Inspect and tighten fasteners and setscrews (Movement may occur during shipment, and fastening will be necessary).
- 4.4 Fan and motor should be electricity grounding.
- 4.5 Check the fan manual jigger record.
- 4.6 For Belt drive fan, inspect and ensure the pulley alignment. (See Fig 1)
- 4.7 For Belt drive fan, Inspect the belt tension and adjust it as needed. (See Fig 2)
- 4.8 Inspect the motor wiring refer to the wiring diagram provided with the motor.
- 4.9 Ensure the motor overload protector operating effectively.
- 4.10 The fan should be restored power after the above items 4.2-4.8 is checked by maintenance personnel.
- 4.11 Refer to the attached "Pre-start Check List".



## 5 Start Up

- 5.1 Test the insulated resistance and ensure the motor insulation.
- 5.2 Ensure the voltage supply is in accordance with the motor nameplate.
- 5.3 During the first start up, use “press and stop” method to ensure the rotation of the impeller is the same as indicated by the rotation label.
- 5.4 For 3-phase motors, if the fan is running in the wrong direction, interchange any two leads so that the fan is operating in the correct direction. For single-phase motors, refer to wiring diagram provided with the motor.

### **Reversed rotation will overheat the motor and possible burnout!**

- 5.5 Start again, set the fan to designed speed, run 15 minutes and inspect the following:
  - 5.5.1 Excessive vibration.
  - 5.5.2 Unusual noise.
  - 5.5.3 Improper operation of bearing, pulley and belt. If any problem is discovered, immediately shut the fan off and lock out all electricity power, and check for the cause of the trouble according to items 4.2 to 4.8.
- 5.6 Stop the fan at the first 8 hours, inspect the following:
  - 5.6.1 Inspect bolts, setscrews, and motor mounting bolts. Adjust and tighten as necessary.
  - 5.6.2 Inspect belt tension and pulley alignment. Adjust and tighten as necessary.
  - 5.6.3 Ensure that bearing temperatures do not exceed rise 40°C or max 80°C.  
  
Acceptable vibration level is 6.3mm/s.
  - 5.6.4 Inspect motor temperature. Adjust as necessary.
- 5.7 Stop the fan in the following situation:
  - 5.7.1 Excessive noise;
  - 5.7.2 High bearing temperature;
  - 5.7.3 Excessive vibration.
- 5.8 Stop the fan at the first 24 hours, inspect belt tension.

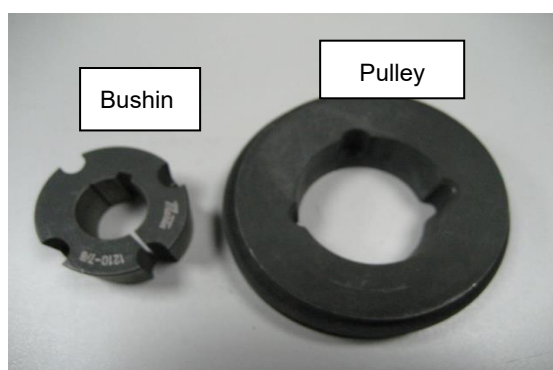
## 6 Maintenance

**Lock off all power sources before maintenance.**

**Establish a maintenance schedule for each unit and keep the record.**

### 6.1 Belt / Pulley

- 6.1.1 Belts tend to stretch after a period of time. They should be checked periodically (every six months) for wear, alignment and tightness. Wheel improperly aligned and belts too loose will result in noise, vibration, energy loss and early scrap.
- 6.1.2 Stop the fan at the first 24 hour, inspect belt tension. Adjust and tighten as necessary refer to Item 4.7.
- 6.1.3 When replace belt, use the same type as supplied with the unit.
- 6.1.4 When replace multi-belts, replace all the belts at the same time.
- 6.1.5 For belt replacement, loosen the motor plate adjustment nuts far enough to allow removal of the belt by hand. Do not force belts on or off. This may cause cords to break, leading to premature belt failure.
- 6.1.6 The drives are equipped with taper lock bushing.
- 6.1.7 When assembling/disassembling and adjusting the pulley alignment, use a metric inner-hexagon spanner to loosen the fastening screws and move into the disassembling holes and tighten, then the pulley can be taken out and the drive can be easily moved.
- 6.1.8 The screw thread of installation hole is on the pulley and the screw thread of disassembling hole is on the bushing. (See Figure below)



### 6.2 Motor

- 6.2.1 Motor maintenance should be cleaned periodically, every six months under normal conditions or every three months in a dust environment. Cleaning should be limited to exterior surfaces only. Removing dust buildup on motor housing ensures proper motor cooling.
- 6.2.2 Greasing of motors is only intended when grease fittings are provided. Greasing should be made periodically and in accordance with manufacturer's recommendations.
- 6.2.3 Motors without grease fitting are permanently lubricated and should not be lubricated further.

### 6.3 Impeller

- 6.3.1 Clean the impeller periodically, every six months under normal conditions or more frequent in a dust environment. Oil and dust may accumulate causing imbalance, result in noise, vibration, energy loss and early scrap.
- 6.3.2 All fasteners should be checked for tightness. Each time maintenance checks are preformed prior to starting unit.

### 6.4 Bearing Lubrication

- 6.4.1 Proper bearing maintenance is most critical for bearing life.
- 6.4.2 Clean surface and lubricate periodically, ensure proper cooling and running.
- 6.4.3 For bearing support
  - 6.4.3.1 Type of lubrication: Grease lubrication
  - 6.4.3.2 Lubricating oil grade:

A high quality lithium based grease conforming to NLGI Grade 3 consistency, such as those listed below, should be used. Exxon polyrex EM, Shell Alvanin RL2, or Great Wall, Sea Lion #3.

Remark: A NLGI grade 3 grease is a light viscosity, low-torque, rust-inhibiting lubricant that is water resistant. Its consistency is 220~250. Its temperature range is -20°C~120°C, grade 3 consistency.
  - 6.4.3.3 Lubricating notes:
    - Note 1: Use a hand-operated grease gun and pump grease in slowly until a slight bead forms around the bearing seals.
    - Note 2: The lubrication should be 1/3 to 1/2 capacity of bearing seat.
    - Note 3: Lubrication frequency should be according to the load, speed, dust and temperature, the following chart is a lubrication schedule recommended under normal conditions. (See table below)
    - Note 4: Units operated in a temperature exceed 70°C or dust environment, the bearings will require frequent lubrication.
    - Note 5: Other types of grease should not be used if one type of grease is already selected, otherwise it will lead to premature bearing scrap.
- 6.4.4 The unit should be in operation while lubricating. Shut down the power sources and slightly move the fan manually for lubricating.
- 6.4.5 Other types of grease should not be used if one type of grease is already selected, otherwise it will lead to premature bearing scrap.

### 6.5 Each time after maintenance, check the fan according to “Pre-start Checks” in Chapter 4.

Shaft Diameter	12--26	27--38	41--49	50--63	68--81	87--100	Unit mm
Fan speed	Greasing Interval (month)						
<500	6	6	6	6	5	4	month
500-750	6	6	6	5	4	3	month
750-1000	6	6	6	5	4	3	month
1000-1250	5	5	5	4	3	2	month
1250-1500	5	5	5	4	3	2	month
1500-1750	5	4	4	3	2	1	month
1750-2000	5	4	4	3	2	1	month
2000-2250	4	4	3	2	1	/	month
2250-2500	4	4	3	2	1	/	month
2500-3000	4	3	2	1	2	/	month

## 7 Troubleshooting

<b>Problem</b>	<b>Cause</b>	<b>Corrective Action</b>
Excessive Noise or Vibration	Impeller scratching fan housing	Adjust the space of impeller and inlet cone
	Belt driving	Tighten pulley and shaft, adjust belt tension, align pulley, and change the worn belt or pulley.
	Bearing	Change damaged bearings, lubricate bearing and fasten screws.
	Impeller unbalance	Clean and remove the dirt off impeller. Check impeller balance.
Low Capacity	Fan	Check impeller for correct rotation and adjust belt tension
	Duct system	Check dampers for proper operation. Check system resistance according to design requirements.
Fan Doesn't Operate	Electrical Supply	Check fuses/circuit breakers. Check for switches off. Check for correct power supply.
	Drive	Check for broken belts. Tighten loose pulleys.
	Motor	Assure motor overload protector is correct and not tripping.
Overheated bearing	Lubrication	Check for excessive or insufficient grease in the bearing.
	Damage	Replace damaged bearing. Relieve excessive belt tension. Align bearings. Check for bent shaft.

## 8 Warranty

### 8.1 Warranty

“**CANARM LTD**®” brand products manufactured by us to be free of defects in material and workmanship for a period of 12 months since the ex-works date. Should any products which prove defective during the warranty period, the parts will be replaced or repaired at our option (exclude belt and filter types of consumable). We are not responsible for any other cost or lost.

### 8.2 Limitations and Exclusions

The warranty provided herein shall be void and of no effect in event that:

- 8.2.1 The product has been operated outside the contract defined condition (including, but not limited to Temperature, corrosive air or media, contaminants, power supply, system resistance).
- 8.2.2 The product has been damaged due to improper operation in violation against Operation and Maintenance Manuals including but not limited to: rough hoisting or installation, parts were removed or improperly replaced, incorrect maintenance, jobsite accident, missing motor thermal protection, or long-term reversed rotation direction.
- 8.2.3 Improper maintenance, on-site accident, none overheating protection, or reverse operation, etc.
- 8.2.4 Unauthorized disassembly or alteration made to the product.
- 8.2.5 The serial number / product numbering information has been altered, removed or is incorrect.



**Attachment:**

## **Pre-start Check List**

After the fan installation, all the following items should be checked by maintenance personnel before the fan could be restored power.

Check and tick the items if yes.

- 1 Ensure the fan and ductwork are clean and no tools or other objects left.  
**Yes**       **No**       **Inspector:**
  
- 2 Inspect and tighten fasteners and setscrews, including motor mounting bolts (4 pcs), wheel fasten bolts (4/6 pcs), installation foundation fasteners connected with vibration insulators, etc.  
**Yes**       **No**       **Inspector:**
  
- 3 Impeller must rotate freely and not rub on the inlet cone.  
**Yes**       **No**       **Inspector:**
  
- 4 Ensure the pulley alignment and the belt tension is consistent with item 4.7.  
**Yes**       **No**       **Inspector:**
  
- 5 The fan and motor should be electricity grounding.  
**Yes**       **No**       **Inspector:**
  
- 6 Ensure the power supply and wiring is in accordance with the motor nameplate.  
**Yes**       **No**       **Inspector:**
  
- 7 The power supply should have motor overload protector. The motor safety factor should conform to the motor rated current.  
**Yes**       **No**       **Inspector:**
  
- 8 Ensure the motor insulation is in accordance with electrifying requirements.  
**Yes**       **No**       **Inspector:**

The fan could be electrified and start-up if all the above items are checked.