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Air Conditional Service Manual

Model:
AC-W17CL

CONTENTS

TECHNICAL SPECIFICATIONS....4

FEAURE OF PRODUCT....5

PRINCIPLE OF OPERATION....6

SYSTEM DIAGRAM....7

EXPLODED VIEW....8

PART LIST....9

OPERATION STEP....12

TROUBLE SHOOTING....18

CIRCUIT DIAGRAM....27

TECHNICAL SPECIFICATION

ITEM			MODEL
FUNCTION			COOLING
Power supply			Single phase, 50Hz, 230V
Capacity (W)			5000
Rated input power (W)			2200
Rated current A			10.5
Refrigerant			R22
Refrigerant charge (kg)			1.38
Recirculated air flow (m^3/h)			780
Fan motor speed r/min (220V)			935 15
Fan motor output power (W)			115~130
Fan motor capacitor (F)			8
Indoor side	Fan diameter & length		223.5 104
	Heat exchanger		Aluminum foil and copper tubes
	No. of rows and fin spacing		4 2.0mm
	Louver motor		3.5W
	Control mode		Manual control
	Noise level dB(A)		60
Outdoor side	Control of cooling medium		Restriction by capillary
	Compressor	Type	Totally-enclosed and rotary
		Model	SHX33SC4-U
		Power (W)	1875
		Operating current (A)	8.7
		Type of protector	Internal installed
		Starting mode	Capacitor-run
		Actuating temperature of protector ()	100 5
	Heat exchanger		Aluminum foil and copper tubes
	No. of rows and fin spacing		3, 1.8mm
	Fan diameter & height (mm)		392 85
	Noise level dB(A)		65
Outline	Width (mm)		660
	Depth (mm)		756
	Height (mm)		436
Net weight (kg)			72
Controlled temperature range & accuracy ( )			15~30 1.5
Service ambient temperature ( )			18~43

FEATURES OF PRODUCT

Models AC-W17CL has their indices remarkably improved as a whole and gained the lead among the products of the same kind in the market. A brief account of their features is given below.

(1) Fine Appearance.
The design of appearance has changed from the dull design style of traditional window type air conditioners. An internationally prevailing streamline design is employed for the panels. Air outlet vents are provided in conjunction with the automatically swinging vertical louvers.

(2) Low Noise. Low-speed, low-noise and large-diameter impeller fans are used.
The indoor and outdoor fans are driven by the same motor. The noise generated indoors and outdoors is notably reduced by optimized parameters of the fans and air ducts in addition to other silencing and damping measures. Which live up to the national loading standard.

(3) High Efficiency and Energy Saving. Bridge-type finned heat exchangers ribbed copper tubes and hydrophilic aluminum foil and other advanced technology are employed for the novel window type air conditioners so that their heat exchange efficiency is significantly raised while their volume reduced.

(4) High Safety.
The novel window type air conditioners are design strictly in compliance with the requirements of the new National Standard GB4706.32 and the CE Certification Standard for room air conditioners and appropriate measures such as earthing of the compressors and improving the tensile strength of the power cords are taken with a view to better ensuring safety and reliability.

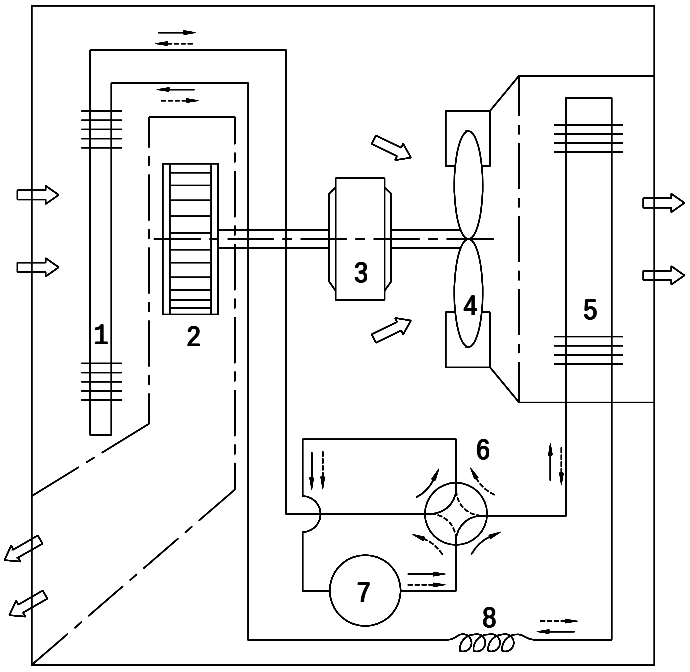
Moreover, the performance of the novel window type air conditioners has been improved and their service life extended by use of superior-quality and high-precision technology and assembly.

PRINCIPLE OF OPERATION

After the power supply is switched on and the machine is set to COOL mode, with the compressor being operating, the low-temperature and low-pressure refrigerant vapor is sucked into it and then compressed into high-temperature, high-pressure gas. The gas is cooled into liquid by the air through the outdoor heat-exchanger. The liquid comes into the indoor unit after being throttled by the capillary. The refrigerant in the indoor heat-exchanger evaporates, absorbing heat and reducing the room temperature. The evaporated refrigerant vapor then returns to the outdoor unit where it is sucked into the compressor again and discharged from the same after being compressed. By cycling in this manner, the purpose of reducing the room temperature is fulfilled.

After the power supply is switched on and the machine is set to HEAT mode, the coil of the reversing valve is energized. With the compressor being operating, the high-temperature, high-pressure refrigerant vapor discharged from it first comes to the heat exchanger of the indoor unit where it is cooled, releasing heat and making the room temperature rise. The cooled high-pressure refrigerant is throttled in the outdoor unit and returns to the compressor after evaporation. By cycling in this manner, the purpose of increasing the room temperature is fulfilled.

SYSTEM DIAGRAM

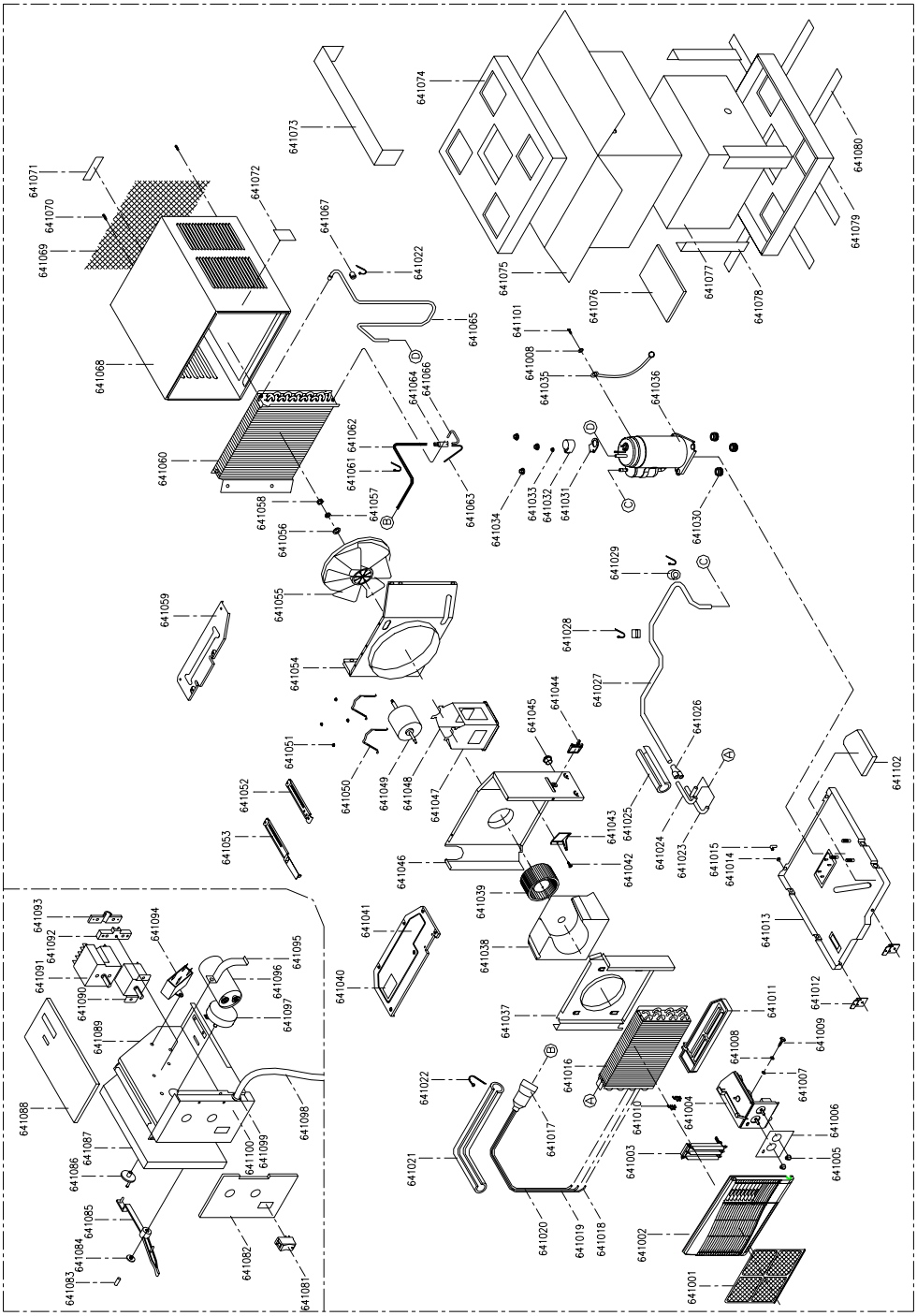


1. Indoor heat exchanger
2. Fan
3. Fan motor
4. Fan
5. Outdoor heat exchanger
6. Compressor
7. Capillary

The direction of refrigerant flow

The direction of air flow

EXPLODED VIEW



PART LIST

Code	Description	Code	Description
641001	Filter net	641052	Bracing ( )
641002	Panel assembly	641053	Bracing ( )
641003	Vertical louvers	641054	Back partition plate
641004	Electrical unit	641055	Propeller fan
641005	Knob	641056	Plain washer
641006	Control panel	641057	Spring washer
641007	Washer	641058	Nut
641008	Plain washer	641059	Back cover plate
641009	Bolt	641060	Condenser assembly
641010	Clamp of fix temperature tube	641061	Strapping
641011	Water collecting plate	641062	Capillary tube
641012	Connecting clamp	641063	Liquid filling pipe
641013	Base plate assembly	641064	Filter
641014	Rubber ring	641065	Gas exhaust pipe
641015	Drain mouth	641066	Liquid outlet pipe
641016	Evaporator assembly	641067	Pipe sleeve
641017	Distributing implement	641068	Frame assembl0y
641018	Liquid inlet pipe(1)	641069	Fence net
641019	Liquid inlet pipe(2)	641070	Screw
641020	Liquid inlet pipe(3)	641071	Factory name scutcheon
641021	Sheath	641072	Nameplate
641022	Strapping	641073	Sheer adhesive tape
641023	Three direction connecting pipe	641074	Damping foam
641024	Curving pipe	641075	Top box
641025	Sheath	641076	Operation manual
641026	Fork pipe	641077	Film cover
641027	Gas inlet pipe	641078	Corner support
641028	Strapping	641079	Bottom box
641029	Sheath	641080	Packing tape
641030	Compressor damping ring	641081	Boat switch
641031	Rubber washer	641082	Foam block
641032	Terminal box cover	641083	Fixing pin
641033	Nut	641084	Fixing clamp
641034	Nut	641085	Wind-door lever

Code	Description	Code	Description
641035	Earthing lead	641086	Eccentricity wheel
641036	Compressor	641087	Foam block
641037	Wind-path partition plate	641088	Foam block
641038	Volute	641089	Foam block
641039	Centrifugal fan	641090	Temperature controller
641040	Wiring scutcheon	641091	Selector Switch
641041	Front cover plate	641092	Fixing lead block (bottom)
641042	Screw	641093	Fixing lead block (top)
641043	Wind-door	641094	Fan motor capacitor
641044	Saddle lead clamp	641095	Capacitor clamp
641045	Wiring ring	641096	Compressor capacitor
641046	Front partition plate	641097	Louver motor
641047	Motor stand (1)	641098	Power supply lead
641048	Motor stand (2)	641099	Wiring ring
641049	Motor	641100	Electrical box
641050	Motor fixing clamp	641101	Screw
641051	Screw	641102	Waterproof foam block

No.	Description	Code	Model	Specification	
1	Temperature controller	641090	WK30A-LA		15~30
2	Selector	641091	XK30/5-04		
3	Boat switch	641081			
4	Louver motor	641097	TY-50C		5r/min
5	Panel assembly	641002			
6	Fan motor capacitor	641094	CBB611A	8	F/450VAC
7	Compressor capacitor	641096	CBB65A-1K	50	F/450VAC
8	Centrifugal fan	641039			
9	Propeller fan	641055			
10	Eccentricity wheel	641086			
11	Knob	641005			

OPERATING STEP

(1) Removal of panel assembly Take out the filter, and unscrew two screw left side & right side of the groove. Then release the detent between the panel and the frame. Now the panel can be removed.	
(2) Removal of frame Unscrew the two screws at the lower back of the frame and remove the frame by holding it while grabbing the handle of the bottom plate and pulling the latter out by force.	

(3) Remove Vertical louvers.	
(4) Removal of electrical box unit Unscrew the three screws at the electrical box unit remove it. Disconnect the wires and earthing conductor.	
(5) Removal of front cover plate Unscrew the eight screws at the front cover plate and remove it.	

(6) Removal of back cover plate Unscrew the four screws at the back cover plate and remove it.	
(7) Remove the bracing	
(8) Removal of evaporator assembly Unscrew the two screws at the wind-path partition plate and remove it, then take out the evaporator assembly from the wind-path partition plate.	

(9) Removal of wind-path partition plate The wind-path partition plate can be taken out by removing the screw connecting the win-path partition plate and base plate.	
(10) Removal of centrifugal fan Unscrew the bolt at the centrifugal fan and remove it.	
(11) Remove volute and water collecting plate.	

(12) Removal of front partition plate The front partition plate can be dismantled by unscrewing the three screws fixing it.	
(13) Removal of condenser The condenser can be dismantled by unscrewing the six screws fixing it.	
(14) Removal of propeller fan Unscrew the nut that fastens the propeller fan to the motor shaft and dismantle the fan.	

(15) Removal of the back partition plate. Unscrew the screws holding the back partition plate and the base plate together and remove the back partition plate.	
(16)Removal of fan motor assembly The fan motor assembly can be taken out by removing the four nuts connecting the motor to the base plate.	
(17) Disconnect the piping and the compressor.	

THROUBLE SHOOTING

(1) Air conditioner doesn’t work

Symptom	Possible cause		Remedy
Air conditioner doesn’t work	Power interruption		Restore power supply
	Fuse break	Line-to-line short-circuit	Check wiring according to the electric diagram, eliminate short-circuit and replace the fuse.
	Power plug improperly connected or poor connected		Correct poor connected and plug the power plug properly into the socket
	Erroneous wiring		Check wiring according to the electric diagram and rewire correctly

(2) Both fan and compressor or either of them doesn't work when operation mode is set to "cooling" or "heating" or "ventilation"

Symptom	Possible cause	Remedy
The compressor does not work	Power failure	Check the circuit in order
	A too high set temperature (For cooling operating) or too low set temperature (For heating operating)	Lower the set temperature (For cooling operating); Higher the set temperature (For heating operating)
	Thermostat fault	Replace thermostat
	Air conditioner in ventilation mode	No problem
	Loose connector	Reconnect the connector
	Compressor capacitor damaged	Replace the capacitor
	Compressor seized or winding open or short-circuited. HV or LV side broken down	Replace the compressor
	A too low or too high voltage	Turn off the machine and turn it on again when normal voltage is available
	Compressor overload protector actuated	Turn off the machine and turn it on again when the compressor is cooled down. Provide unit with protection against sunlight such as an awning
	Fault selector switch	Replace the selector switch
The fan motor does not work	Power failure	Check the circuit in order
	Loose connector	Reconnect the connector
	Motor capacitor damaged	Replace the capacitor
	Motor winding open or short-circuited.	Replace the motor
	Fault selector switch	Replace the selector switch

3) Poor Cooling or no cool during Cooling Operation

Symptom	Possible cause	Remedy
Poor cooling or total failure in cooling during cooling operation	Temperature controller damaged or malfunctioning	Replace temperature controller
	Circulating air flow decreased, heat exchanger effect of evaporator reduced and hence cooling effect also reduced when dust accumulates on the air filter of air conditioner through extended operation	Wash off dust on the filter and replace it after it is dried
	Dust accumulated on fins of the air conditioner, resulting in insufficient cool air flow or poor heat removal and hence reduced cooling effect.	Remove dust with a long-hair brush or compressed air
	Capillary in the cooling circulation system clogged, causing malfunctioning of the system or reduction in cooling effect.	Re-evacuate and fill refrigerant or replace the capillary (and filter, etc.)
	Piping in the system improperly welded or copper tubes damaged, resulting in leakage of refrigerant	Do patch welding after leak test and replenish refrigerant.
	Damaged capacitor of the fan or its poor contact, or damaged motor of the fan or failure of power line to the fan, resulting in failure to operate or reduced speed of the fan and hence unavailability of cool air or poor cooling effect.	Inspect the power line, switches, temperature controller and terminal block, etc. and replace the capacitor or motor.
	Failure of compressor due to too high (or too low) voltage or incorrect wiring of power line or discontinuity of the circuit or any fault in compressor itself (e.g. motor burned or seized or valve plate damaged)	Furnish a voltage regulator or replace any damaged part.
	A too high cooling load	Check for the expected cooling load
	A too high set temperature	Adjust the set temperature

(4) Poor Heating or no heat during Cooling Operation

Symptom	Possible cause	Remedy
Poor heating or total failure in heating during heating operation	Temperature controller damaged or malfunctioning	Replace temperature controller
	Circulating air flow decreased, dust accumulates on the air filter of air conditioner through extended operation	Wash off dust on the filter and replace it after it is dried
	Dust accumulated on fins of the air conditioner, resulting in insufficient air flow	Remove dust with a long-hair brush or compressed air
	Capillary in the heating circulation system clogged, causing malfunctioning of the system or reduction in heating effect	Re-evacuate and fill refrigerant or replace the capillary (and filter, etc.)
	Piping in the system improperly welded or copper tubes damaged, resulting in leakage of refrigerant	Do patch welding after leak test and replenish refrigerant.
	Damaged capacitor of the fan or its poor contact, or damaged motor of the fan or failure of power line to the fan, resulting in failure to operate or reduced speed of the fan and hence unavailability of cool air or poor cooling effect.	Inspect the power line, switches, temperature controller and terminal block, etc. and replace the capacitor or motor.
	Failure of compressor due to too high (or too low) voltage or incorrect wiring of power line or discontinuity of the circuit or any fault in compressor itself (e.g. motor burned or seized or valve plate damaged)	Furnish a voltage regulator or replace any damaged part.
	A too high heating load	Check for the expected heating load
	A too low set temperature	Adjust the set temperature
	4- way valve fault	Replace the 4-way valve

(5) Compressor Stops Immediately after its Starting.

Symptom	Possible cause	Remedy
Compressor stops right after starting	Precluded ventilation of the outdoor unit, leading to a rise in condensing pressure and actuation of the compressor overload protector and shutdown of the compressor in particularly serious case.	Remove the obstacles
	A too low supply voltage or a too high supply voltage which exceeds the rated voltage by 10% causing an increase in current, hence actuation of the overload protector and shutdown of the compressor.	Furnish a voltage regulator
	Compressor fault	Replace compressor

(6) Water Leakage

Symptom		Possible cause	Remedy
Water leakage	Water leakage at the indoor side	The outdoor side higher than or at the same height as the indoor side	Reinstall the air conditioner and ensure a correct mounting angle

(7) Abnormal Noise and Vibration

Symptom	Possible cause	Remedy
Abnormal noise and vibration generated during operation of the air conditioner	A too small clearance between the top of the propeller fan impeller and its case, leading to a louder operation noise of the fan	Adjust the clearance
	Foreign matter entrapped in the fan	Stop the machine and remove the foreign matter
	The capillary and High Pressure and Low Pressure piping not well secured, causing bumping and rubbing noise	Secure any loose components
	Internal parts of the compressor damaged and metal bumping noise generated	Replace the compressor

Trouble shooting for A Single-Phase Asynchronous Motor

No.	Symptom	Cause	Remedy
1.	Failure of motor to start after power on in spite of normal supply voltage	1. Lead broken 2. Primary winding or secondary winding broken 3. Contacts of starting switch failing to be closed or poor contact 4. Capacitor open-circuited 5. Bearing blocked • Bearing damaged • Bearing improperly fitted • Setting of grease • Foreign matter entrapped in the bearing 6. Rubbing between the stator and the rotor • Bearing worn • Shaft bent 7. Overloaded	1. Locate the broken point with a multi-meter and repair. 2. Determine the fault with a multi-meter and replace the winding. 3. Inspect the starting switch and make adjustment. 4. Replace the capacitor. 5. Replace the bearing • Refit the bearing • Renew grease • Clean the bearing 6. File away the abnormally projecting area of lamination; Adjust the concentricity. 7. Reduce the load or select a motor with greater capacity for proper matching.
2	Difficulty in starting in spite of capability of being started at no load or with an external force	1. Secondary winding broken or circuit discontinued 2. Poor contact of starting switch 3. Capacitor open-circuited	1. Inspect and determine the fault with a multi-meter. Repair or replace the winding. 2. Inspect and determine the fault with a multi-meter. Make adjustment. 3. Replace the capacitor.

No.	Symptom	Cause	Remedy
3	Failure of motor to run to the normal speed	1. A too low supply voltage 2. Primary winding short-circuited or incorrectly wired. 3. Bearing damaged or inadequately lubricated. 4. Shaft bent. 5. Starting switch remaining closed. 6. A too high load.	1. Adjust the supply voltage to the rated value. 2. Correct the end wiring or replace the winding. 3. Replace the bearing or clean it and renew or replenish grease. 4. Straighten it. 5. Adjust or repair the switch. 6. Use a motor with greater capacity.
4	Quick heating of motor after being started and even winding burned	1. Primary winding short-circuited or earthed. 2. Secondary winding short-circuited or earthed. 3. Primary and secondary windings displaced each other by mistake. 4. Contacts of starting switch failing to open after starting. 5. A too high or too low load of motor. 6. Incorrect voltage.	1. Inspect and determine the fault with a multi-meter. Repair or replace the winding. 2. Inspect and determine the fault with a multi-meter. Repair or replace the winding. 3. Measure the resistance or check the code at the connections and correct wiring. 4. Measure the total current or secondary circuit current. Service or replace the starting switch. 5. Attain proper matching as per properties of motors. 6. Measure the voltage with voltmeter and make calibration.

No.	Symptom	Cause	Remedy
5	Serious heating of motor after starting and a too great input power	1. Motor overloaded 2. Winding short-circuit earthed 3. Rubbing between the stator and the rotor. 4. Damaged or defective bearing	1. Adjust the load of motor. 2. Inspect and determine the fault with a multi-meter and service the faulted part. 3. Check the shaft is not bent and the stop groove of the end cover is not loose. Ensure the concentricity. 4. Service or replace the bearing.
6	Fuse blown after power on, unable to start the motor	1. Winding short-circuited or earthed. 2. Outgoing lead earthed. 3. Capacitor short-circuited.	1. Measure the resistance and eliminate the fault. 2. Correctly connect the lead-out. 3. Replace the capacitor.
7	A too load noise generated during running of motor	1. Winding short-circuited or earthed. 2. Starting switch damaged. 3. Bearing damaged or inadequately lubricated. 4. A too large axial clearance 5. Foreign matter entrapped in motor. 6. A bent shaft. 7. Rotating part rubbing against the stator.	1. Measure the resistance and eliminate the fault. 2. Repair or replace the switch. 3. Repair or replace the bearing. 4. Set proper clearance. 5. Disassemble the motor and remove the foreign matter. 6. Straighten or replace the shaft. 7. Inspect and determine the fault and then service the related part.
8	Abnormal vibration of motor	1. Rotor being out of balance. 2. Pulley being out of balance 3. A Bent shaft extension.	1. Calibrate it for dynamic balance. 2. Calibrate it for static balance. 3. Straighten or replace the shaft

No.	Symptom	Cause	Remedy
9	Overheating of bearing	1. Bearing damaged 2. Improper mating between inner and outer rings. 3. Too much or too little or too dirty grease.	1. Replace the bearing. 2. Make the inner and outer rings well mated and ensure their mating areas do not slip relatively. 3. Replenish or renew the grease and ensure the packing amount makes up no more than seventy percent of the bearing volume.

The above table shows that the common troubles of a single-phase asynchronous motor are caused either electrically or mechanically. The electrical problems are related to its winding, capacitor, starting switch and internal wiring, etc. While the mechanical ones related to its bearings, shaft, lubrication and fitting, etc. Before servicing, inspect the equipment and find out the cause of any trouble and determine the solution so that the problem can be solved properly.

Nevertheless, some faults are due to more than one factor and this necessitates further study and improvement and summing up of experience in practice. Besides, certain technical procedures and key points for operation should be followed and necessary repair tools and testing instruments furnished at the maintenance points in order to effectively service motors of domestic electric appliances like the single-phase asynchronous motor.

CIRCUIT DIAGRAM

SA1 : SELECTOR
SA 2 : BOAT SWITCH
KT : THERMOSTAT
MF : FAN MOTOR
ML : LOUVER MOTOR
MC : COMPRESSOR
C_1, C : CAPACITOR
XP : PLUG