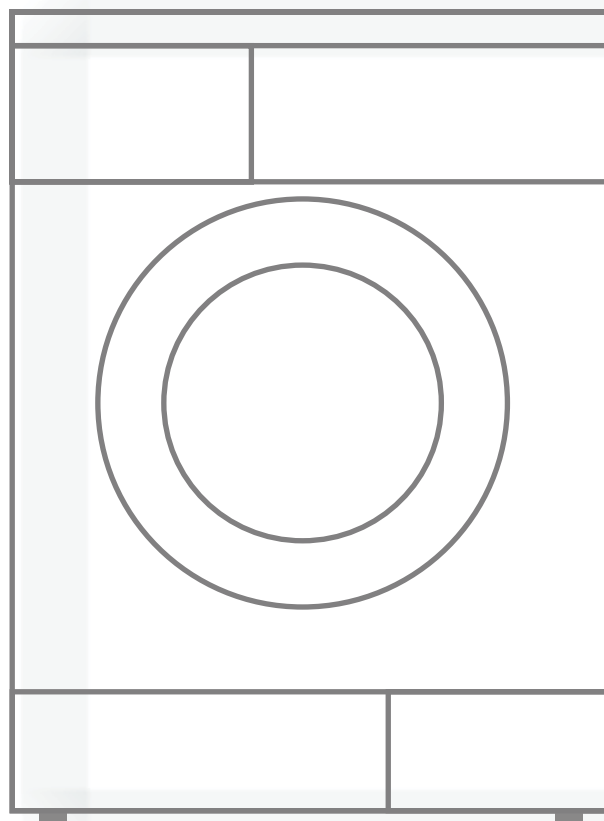




# Midea Drum Washing Machine Service Manual

Sicily Glory (6.0/7.0/8.0kg)



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## 1.SAFETY PRECAUTION

- 1.Do not try to repair the machine by yourself. The machine may be damaged and its life be shortened. What is worse, it will injure yourself.
- 2.Pull out its plug from the power socket before maintenance. Electricity!
- 3.Do not use several power plug with one socket.  
To avoid fire, don't use any socket with its actual current more than rated current.
- 4.Please check the power plug and socket whether damaged or not.  
To avoid an electrical shock and fire, the power plug and socket should be replaced if they are damaged.
- 5.Don't try to clean up the washing machine with water, or else, it's possible to cause an electrical shock or fire and shorten its life.
- 6.Forbid the harness contact with water for avoiding wet and don't extend it during maintenance. Don't twist the harness to avoid it distorted.
- 7.Please clean up the dirt and dust on the surface of the cabinet, harness and connection parts during maintenance.  
Please avoid fire because of the electric leakage of harness.
- 8.Check electrical parts, harness whether they have become moist and replace them if they are wet.
- 9.Check all parts of the machine and make sure to keep them in good condition after maintenance.
- 10.Fasten upon the power plug and pull it out .  
Be careful of a fire and electric shock when power cord is damaged.
- 11.Pull out its power plug when this machine doesn't work.  
Be careful of an electric shock and fire because of levin.
- 12.Don't put tinder or sprayer beside the washing machine.  
Be careful of a fire and explosion because of electric spark.
- 13.Don't put a basin of water or wet clothes on the washing machine.  
It is possible to cause an electric shock or fire if water from wet clothes leaks in to the washing machine.
- 14.Do not place the washing machine in the place where it can be exposed to rain and snow. Or else, it may cause an electric shock or fire, and therefore shorten its life.
- 15.Don't press the button with sharp items such as nail, screw etc. Or else, it may cause an electric shock or other damages.
- 16.This machine should be placed on the horizontal ground and installed correctly.  
The machine is liable to shift on the gradient ground.
- 17.If the harness is damaged, it should be replaced completely.
- 18.It is necessary to put a mat on the floor and recline down the washing machine along its side when repair it.  
It is possible to damage the electrical components if the front of the washing machine is placed at the ground.
- 19.During changing the heater of this machine, please check whether it is fixed on the blanket correctly and whether the screw is fastened tight or not.

### 2.1 Characteristics of product

It is the latest designed machine, which have many advantages such as fashion, large rated washing capacity and large washing range. Specifically, its feature is as following:

- 1.Large washing range from cotton to wool and silk.
- 2.Gentle washing: no twist and little abrasion.
- 3.Electron auto-balance system, that is, the PCB panel controls the speed of spin and ensures uniform distribution of clothes to reduce the wear of textile caused by its vibration.
- 4.The drum of this machine is made of stainless steel of high quality and the cabinet is durable.
- 5.The maximum temperature of washing water could be controlled independently and it is up to 90°C.
- 6.Unique washing methods: rain, soak, throwing-knocking knead and so on, which can wash clothes uniformly and improve washing performance.
- 7.Safety guard: water level control, door lock, child lock etc.
- 8.Anti-crease function: there is an automatic anti-crease and soak function in the synthetic program, that's, it doesn't drain at the end of washing and leave the clean textile in the water of the drum to achieve the function of less crease.
- 9.Function of adjusting spin speed : select different spin speed according to textile.
- 10.Electronic water distribution system: The machine uses PCB to control the inlet valve and distribute water properly at the different stages and dissolve detergent and softener absolutely to improve washing performance.

### 2.2.Working principle

Drum washing machine wash clothes mainly in virtue of mechanical friction, chemical force and temperature force. When the machine works, the motor runs clockwise several seconds and runs anti-clockwise several seconds to drive the drum whose three lifters hold up the clothes pressing against the inside of the drum. When clothes rise close to the top, because the speed of motor is low and the centrifugal force is not enough to overcome the gravity, clothes fall and impinge with washing liquid (like manual throwing-knocking washing). The second force is the extrusion force of clothes (like manual extrusion). The last force is the friction between clothes, clothes and lifters (like manual knead). To improve washing performance, automatic drum washing machine could automatically heat the washing liquid, whose temperature can be adjusted from 30°C to 90°C. The high temperature quickens the movement of the numerator of the washing liquid and speeds up

## 2.INTRODUCTION OF PRODUCTS

the Chemical reaction. In a word, drum washing machine destroys bonding force between dirt and clothes in virtue of intergraded force of water, detergent and mechanical force, to clean away the dust.

### 2.3 Summary model of product

G01



G02

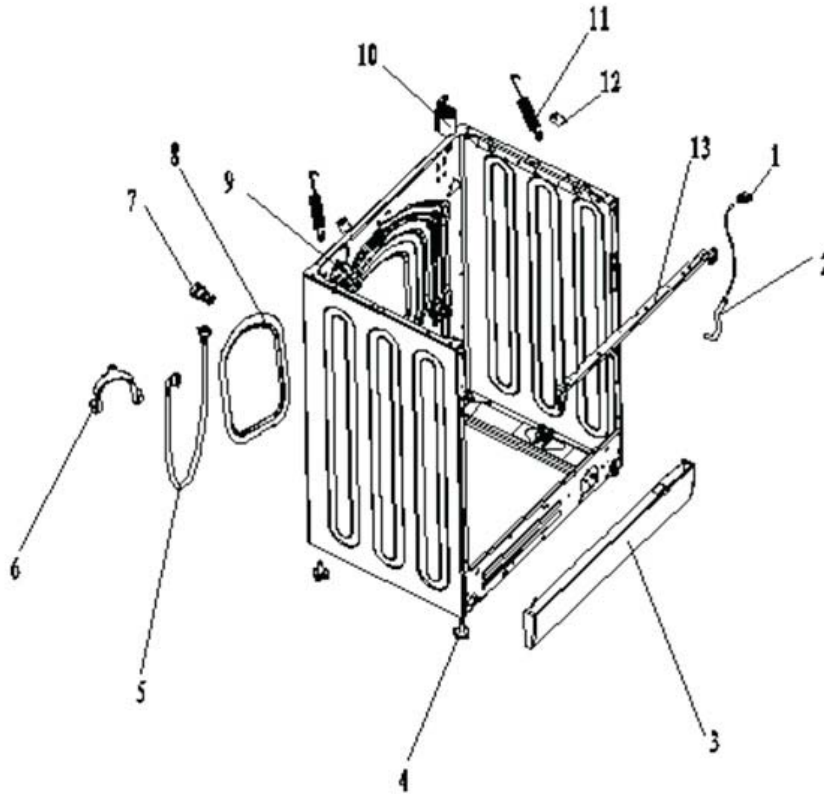


G03



## 2.INTRODUCTION OF PRODUCTS

### 2.4 Explored view & list of parts

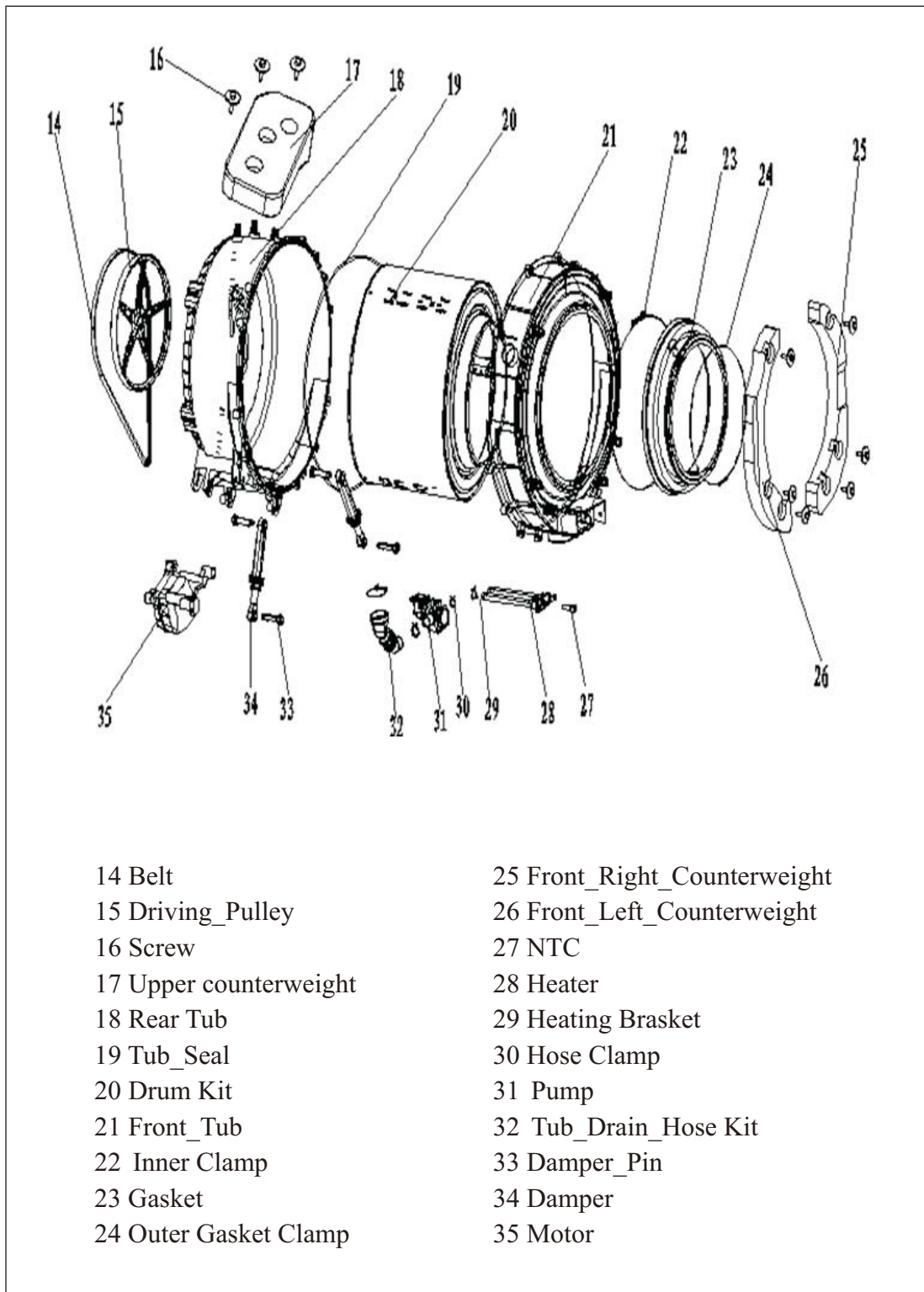


- 01 Pressure Switch
- 02 Pressure Chamber
- 03 Service Panel
- 04 Leg\_Sub
- 05 Water\_Inlet\_Pipe\_Kit
- 06 The Bend Of Drain Hose
- 07 Transport Bolt Kit
- 08 Rear\_Cover
- 09 Water\_Inlet\_Valve
- 10 FILTER
- 11 Suspension Spring
- 12 Spring Hanger
- 13 Top\_Bracket

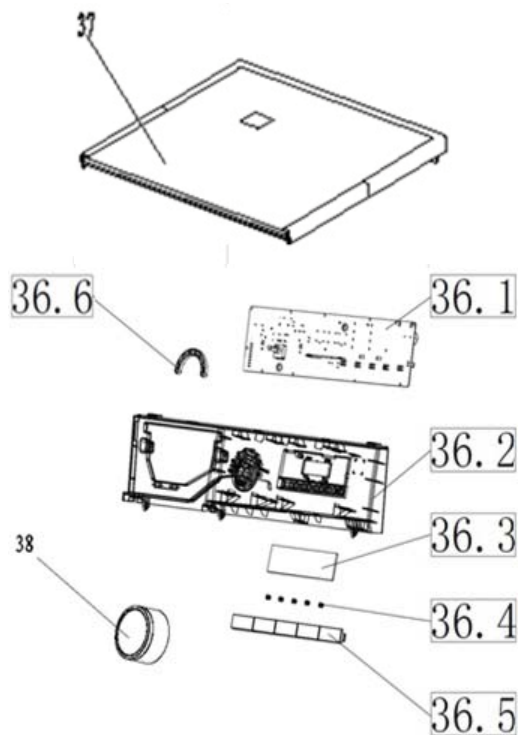


## 2.INTRODUCTION OF PRODUCTS

### 2.4 Explored view & list of parts



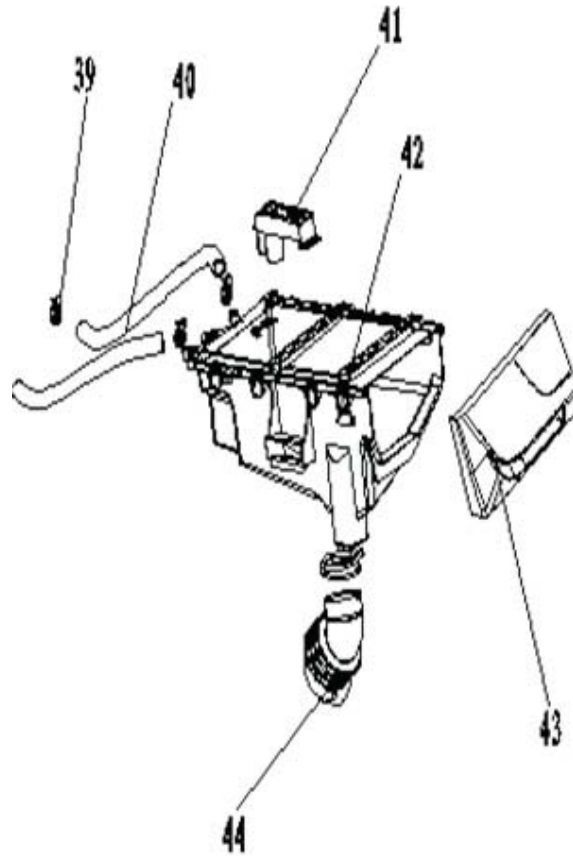
### 2.4 Explored view & list of parts



36	Control Panel Sub
36.1	PCB
36.2	Control_Panel
36.3	dalle
36.4	Start_pause_spring
36.5	Button
36.6	Light_Transferrer
37	Top_Cover_Board
38	Cycle_Select_Knob

## 2.INTRODUCTION OF PRODUCTS

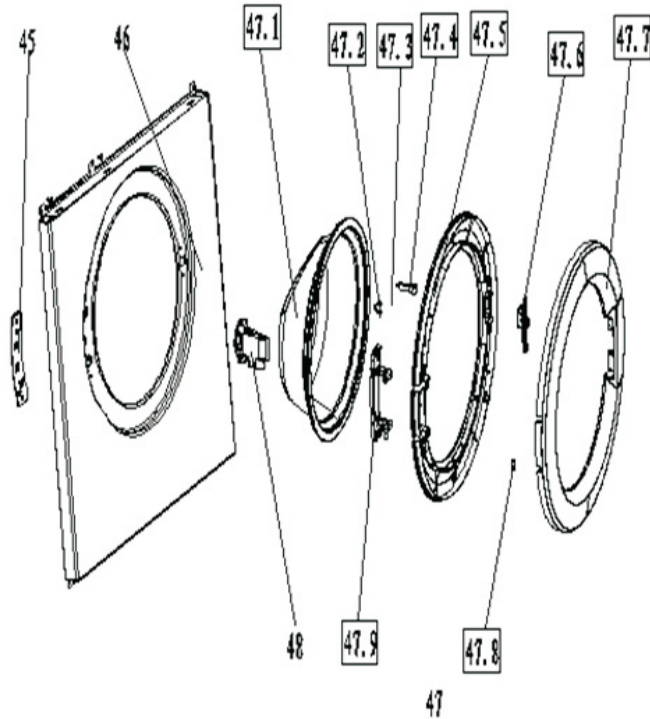
### 2.4 Explored view & list of parts



- 39 Hose Clamp
- 40 Inleft Hose
- 41 Softener Cap
- 42 Detergent Box
- 43 Drawer Panel
- 44 Tub Water Inlet Hose

## 2.INTRODUCTION OF PRODUCTS

### 2.4 Explored view & list of parts

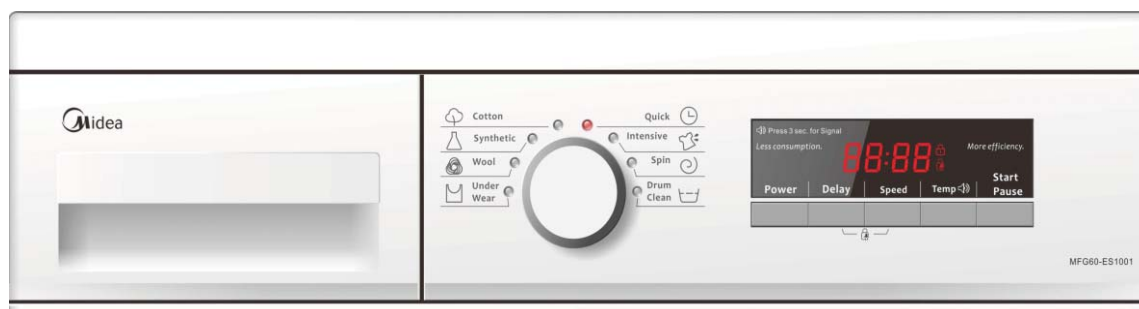


- 45 Door Support Plate
- 46 Front Panel
- 47 Door Sub
- 47.1 Door Glass
- 47.2 Door\_Plunger\_Spring
- 47.3 Hook Pin
- 47.4 Door Plunger
- 47.5 Inner Ring
- 47.6 Door Handle
- 47.7 Outer\_Frame
- 47.8 Door\_Hinge\_Pin\_Cover
- 47.9 Door Hinge
- 48 Door Lock

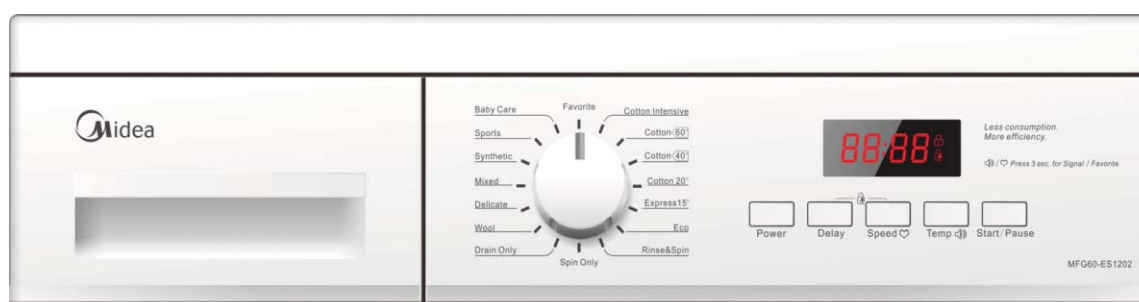
## 2.INTRODUCTION OF PRODUCTS

### 2.5 Introduction of control panel

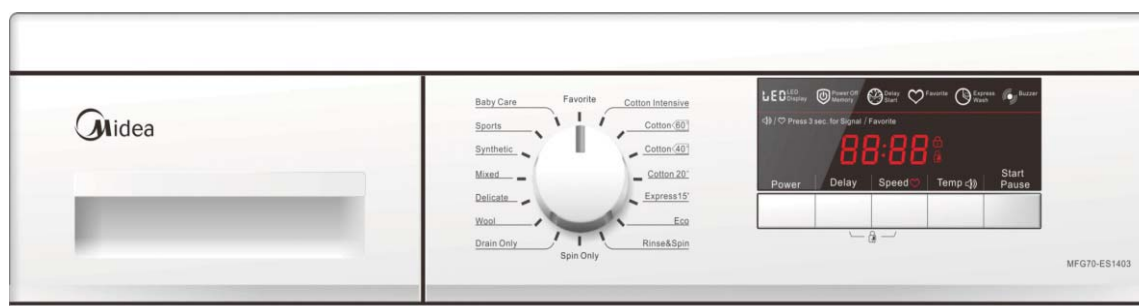
G01



G02



G03



- 1.Drawer Panel: put detergent into detergent box by pulling out Drawer.
- 2.Control Panel: manipulate washing machine with the panel.
- 3.Knob: revolve this knob and select washing program accordingly ( cotton, synthetic, wool) can be selected circularly.
- 4.Function Button: achieve functions of speed selection, temperature selection etc.
- 5.Start/Pause Button: press this button to restart or pause will be done.
6. Display screen: show washing process and relative error information.

## 2.INTRODUCTION OF PRODUCTS

### Programs corresponding with the encoder knob

P00	My Cycle	P08	Spin Only
P01	Cotton Intensive	P09	Drain Only
P02	Cotton 60°	P10	Wool
P03	Cotton 40°	P11	Delicate
P04	Cotton 20°	P12	Mixed
P05	Quick 15'	P13	Synthetic
P06	ECO Wash	P14	Sports
P07	Rinse & Spin	P15	Baby Care

### 2.6 Function of basic

#### - Cotton Intensive

To increase the washing effects, main additional washing time is increased.

It is recommended to wash the clothes for babies or worn by the persons with allergic skin.

#### - Cotton

You can select this procedure to wash the daily washable clothes. The washing period is quite long with quite strong washing intensions. It is recommended to wash the daily cotton articles, for example: bed sheets, quilt covers, pillowcases, gowns, underwear etc.

#### - Quick 15'

This procedure is suitable for washing few and not very dirty clothes quickly.

#### - Eco Wash

As for few light dirty clothes, the maximum temperature of washing is limited to 40 °C , and saving more energy.

#### - Baby care

Baby care procedure with an extra rinse, it can make the baby's wear cleaner and make the rinse performance better to protect the baby skin.

#### - Sports

You can select this procedure to wash the activewear.

#### - Synthetic

You can select this procedure to wash the quite delicate clothes. The procedure is shorter compared with that for cottons and the washing intension is quite gentle. It is recommended to wash synthetic articles, for example: shirts, coats, blending. As for curtains and laced textiles, the procedure "Synthetic" shall be selected. While washing the knitting textiles, detergent quantity shall be reduced due to its loose string construction and easily forming bubbles.

#### - Mixed

You can select this procedure wash the tough clothes, that need much more time and strength .It is used for the daily clothes fo cotton,such as sheets, chained, pillowcases bathrobe and underwear.

#### - Delicate

You can select this procedure to wash your delicate clothes. Its washing intension is gentler and revolution speed is less compared with the procedure "Synthetic". It is recommended for the articles to be washed softly.

#### - Wool

You can select this procedure to wash the wool textiles labeled with "Machine Wash". Please select the proper washing temperature according to the label on the articles to be washed. Furthermore, the proper detergent shall be selected for wool textiles.

### **2.7 Function of safety guard**

#### **2.7.1 Function of avoid overflow**

When the water level is up to the abnormal height in the drum(the set warning level), washing machines will automatically switch on drainage pump to drain by pressure switch, even if the inlet valve failure which can not stop the inflowing water, the washing machine will not be in the overflow. At the same time, the pressure switch will feed back to control panel a signal of fault and the washing machine will alarm.

#### **2.7.2 Function of avoid heating without water**

When there is no water or not enough to submerge the heater, and at the same this machine is in fault, the fuse in the heater will melt to cut off the heater and avoid danger.

#### **2.7.3 Function of bubble checking**

About wiping off bubble: When the water level is lower than level I during draining, the spin function will start. If there is over much bubble in the drum, it will increase the pressure in the drum and switch on the pressure switch , at the same time the PCB panel begin the bubble checking function and clean it away.

### 2.7.4 Function of auto-balance

1. This function will start before spin and after drainage.
2. Drum reverses the speed of 50 rounds per minute in the first six seconds.
3. In the next 10 seconds, the rotational speed from 50r/m to 100r/m slowly.
4. In the following 18 seconds, the washing machine rotates in the speed of 100r/m and estimates the degree of imbalance according to the signal of the motor.
5. If the degree of imbalance is more than the setting value, the auto-balance system will feed back imbalance information of 12 cycles.

### 2.7.5 Function of child lock

To avoid the fault operation by children and then making this wash procedure work abnormally, you can select this function in which other buttons can't be work except knob. As for this machine, press the second button and the first button at the same time for 2.5 seconds from left , the buzzer rings and the pre-wash button, auxiliary function button, start/stop and knob are locked. And then, press them at the same time for another 2.5 seconds, the buzzer rings again and the locked buttons are unlocked. Child lock function is canceled after the whole program is completed when child lock is effective, press the non-child lock button and then buzzer rings to remind that operation is invalid.

### 2.7.6 Program memory

If the running washing machine is powered off, its washing procedure will be stored in chips. When the power is on, washing machine will run from the memorying procedure. If washing machine is powered off during spin, the machine will spin from the start of the procedure again.

### 2.7.7 Function of motor self-protection

When the washing machine works in the poor conditions, the enormous load on the motor will make its temperature increase and its performance decrease even burned motor. When its temperature increases to a set value, the thermal protector of motor will automatically cut off the power supply to achieve self-protection and alarm.



## 3.INSTALLATION

### 3.1 Select the location

1. Washing machine must be placed in the formation, firm, dry and well-ventilated places.
2. Washing machine need a certain space and the shortest distance from the wall is not less than 12cm generally.
3. Don't place the washing machine in the condition of freeze-easy.
4. Washing machine should be placed away from heat, sunlight to prevent pieces of plastic and rubber become aging.
5. Do not put the washing machine in the place where it can be exposed to rain and snow.
6. It is not suitable to use the washing machine on vessels, aeroplanes and vehicles.
7. To avoid walling up the vent, please don't put washing machine on the carpet.

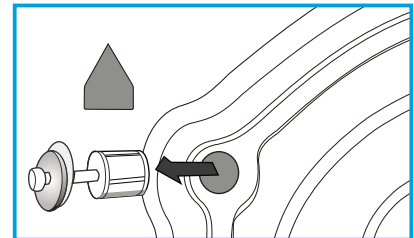
**NOTE:** Washing machine should be put in the room which have enough space, such as its door can be fully opened.

### 3.2 Remove transport bolts

Before using this washing machine, transport bolts must be removed from the backside of this machine.

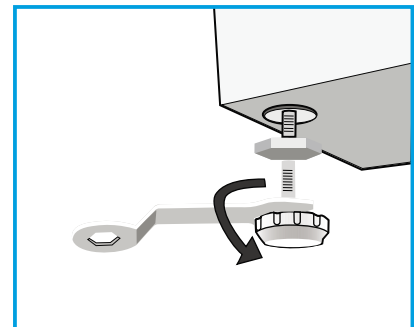
Please take the following steps to remove the bolts:

1. Loosen all bolts with spanner and then remove bolts.
2. Stop the holes with transport holes plugs.
3. Keep the transports bolts properly for future use.



### 3.3 Adjust leg

1. When positioning the washing machine, please first check whether the leg are closely attached to the cabinet. If not, please turn them to the original position with hand or spanner and tighten them with spanner.
2. After position washing machine, press four corners on top cover of this machine in sequence. If the machine is not stable, this leg should be adjusted.
3. To ensure the positioning status of washing machine, loosen the lock nut with spanner and turn the leg with hand until it closely attaches to floor. Press the leg with one hand and fasten the nut closely to the cabinet with the other hand.
4. After being locked properly, press four corners again to make sure that they have been adjusted properly. If it is still unstable, above-mentioned steps shall be repeated by 2 to 3.



**NOTE:** In principle, there is only one loosen leg at most. If this leg is located at back of this machine and it is inconvenient for adjustment, then another leg at its diagonal position can be adjusted to achieve the same effect.

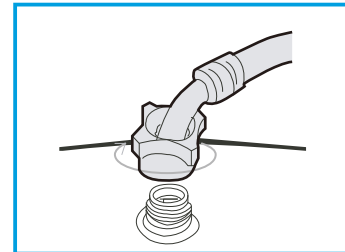
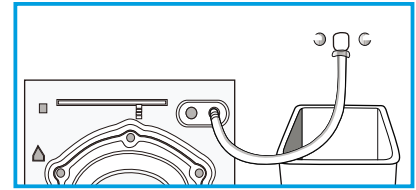
### 3.INSTALLATION

#### 3.4 Connect inlet pipe

Connect the inlet pipe as indicated in the figure.

1. Connect the elbow to tap and fasten it clockwise.
2. Connect the other end of inlet pipe to the inlet valve at the backside of washing machine and fasten the pipe tightly clockwise.

**NOTE:** after connection, if there is any leakage with hose, then repeat the steps to connect inlet pipe. The most common type of tap shall be used to supply water. If tap is square or too big, then standard tap shall be changed.



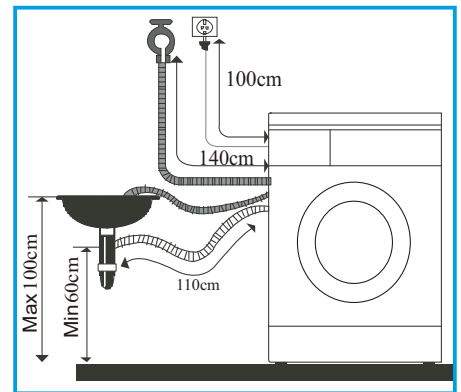
#### 3.5 Place outlet hose

There are two ways to place the end of outlet hose:

1. Put it beside the water trough.
  - 1) Washing machine shall be located nearby the slipway's inlet so that it is convenient for this machine to drain.
  - 2) Take out splint from PE bag and fasten it on the end of the drain hose, and then put it beside the water through or the slipway's inlet.

**NOTE:** clean up the filter of outlet valve, don't fold it, don't clog the inlet/outlet hose to make sure them expedite to inlet or drain.

2. Connect it to the branch drain pipe of the though.



#### 3.6 Electrical connection

1. The maximum current through the unit is 10A when this machine heats the washing liquid, and please make sure that your household power supply system (current, power voltage and wire) can meet the normal loading requirements of the electrical appliances.
2. Please connect the power to a socket which is correctly installed and properly earthed.
3. Please make sure your household power voltage is same as that of the machine's rating label.
4. Power plug must match the socket and cabinet must be properly and effectively earthed.
5. Do not use multi-purpose plug or socket as extension cord.
6. Do not connect and pull out plug with wet hand.
7. When connect and pull out plug, hold the plug tightly and then pull it out. Do not pull power cord forcibly.
8. If power cord is damaged or has any sign of being broken, special power cord must be gotten from its manufacturer or service center for replacement.
9. Has been positioned, the plug of Washing machine should get to socket properly and effectively.

### 3.7 Installing and checking items

1. Check whether remove transport bolts or not.
2. Check whether the socket is installed and properly earthed.
3. Check whether this machine is level or not.
4. Check whether inlet pipe/outlet pipe is wringed or not .
5. Guide user to operate the washing machine and make sure no leakage and no abnormal sound.

**NOTE:** please read instruction manual carefully to ensure the proper operation of this washing machine.

## 4.OVERVIEW OF MAIN COMPONENTS

### 4.1 Top cover kit

#### 1. Parts component

Top cover is made up of hyperbaric plate, top cover-f and top cover-b. Both top cover-f and top cover-b are ABS materials. Front of top cover lock to the panel support of this machine's cabinet, and back of top cover fastnesses to the U-type backside of cabinet with screw.

Two-piece of hyperbaric plate is covered by melamine which is waterproof and fireproofing, and furthermore, the dirt and smudge on its surface could be erased easily.



#### 2. Summary about function

The two screws fixing the top cover screw into the cabinet to avoid loosening.

Change and maintain PCB kit, pressure sensor, filter, inlet valve after unpack top cover kit.

### 4.2 Drawer panel kit

#### 1. Drawer, Drawer panel and Softener cap

Drawer panel kit is consist of drawer, drawer panel and softener cap. Drawer panel is clipped on the face of draw without screw and softener cap in the center of drawer.

According to the need of costumers, different detergent could be placed in three boxes of drawer respectively, and concretely the right one is pre-wash box, the left one is main wash box and the center one is softener box. Certainly user can put decolourant, spicery and softener in the center one to improve washing performance.

After water fill in the drum through drawer, siphon structure of inlet system ensure that drawer have no remanent water or wash liquid.

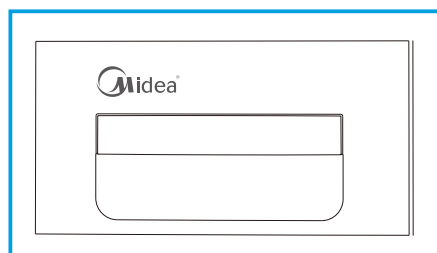
Drawer can be taken out and cleaned up: Unfold the drawer up to 10cm, and then take out the drawer at the same time press the elastic plate to avoid injuring the softener box.

What is noticeable: during cut the softener cap in the detergent box, you have to press the protuberant support of its end.

During the washing machine's in work, it should remind user of closing the drawer, or else, the detergent can't be flowed into the drum completely, and what is worse water may flow out from the outside of the cabinet.

#### 2. Draw panel deck

The material of drawer panel kit is PMMA.



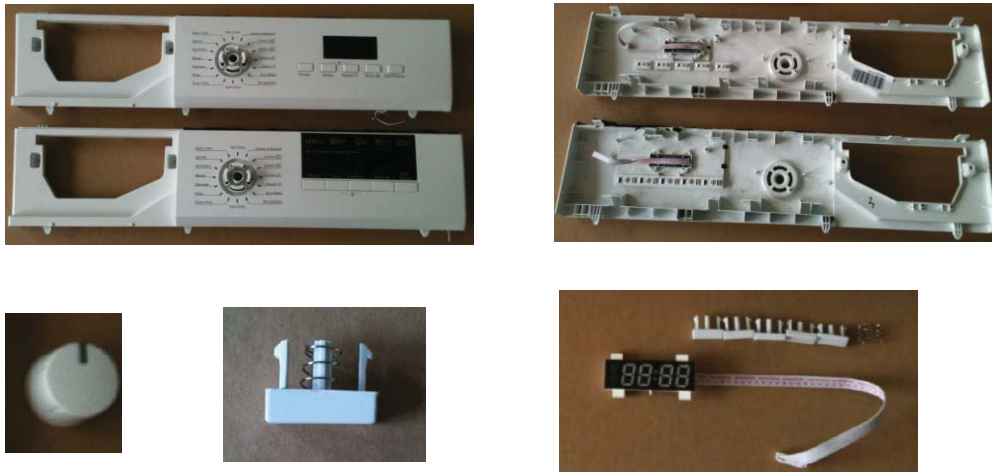
## 4.OVERVIEW OF MAIN COMPONENTS

### 4.3 Control panel kit

Control panel kit consists of control panel, dalle, spring, button, light transferrer etc.

As the key appearance part of washing machine, control panel's appearance and quality have direct influence on costumers. Midea washing machine is known as fashionable and compact appearance.

The material of control panel is the slap-up and splendid ABS material and its mold is specular polished.



### 4.4 Front plate

The material of front plate is PCM and its thickness is 0.8mm. Connection of Front plate and cabinet is pensile structure with screw. Both sides of the back of the front plate have a hole respectively which is to append front plate support. Finally maintainer can fasten front plate on cabinet with five screws. Three holes at the top of the front plate is used to fix the control panel.

Door hole is in the center of front plate, and its left side is hinge and the right side is door lock.



### 4.5 Lower panel

Lower panel is locked to lower reinforce and then fixed with a screw.



## 4.OVERVIEW OF MAIN COMPONENTS

### 4.6 Cabinet kit

The material of the cabinet is PCM colorful metal, and cabinet fold and reinforce are fixed by TOX riveting technique, the panel support is fixed with cabinet with screws.

Fixed in the top of the cabinet through TOX riveting technique, left and right-up reinforce reserve spring hole, pressure switch assembly hole, cable channel hole and screw hole of the PCB board support.

Left and right-down reinforce on top of which it is special fold design of fixing absorber is fixed down of the cabinet through riveting technique.

Down reinforce is riveted down of the cabinet front cover, on top of which the lower panel fixing hole is reserved. The bigger hole is used to fix the pump, down of which is two screw hole used to fasten the lower panel.

The left and right hole on the up-front of the cabinet is panel support hole.

There are inlet valve fixing hole, cable holder-hole, outlet hose hole, and power cord hole from left to right on the up-back of the cabinet.

In the convenience of maintenance, there is a bigger rear panel hole in the middle of the cabinet.

When fixing the rear panel, you should insert the upper part into the hole, then fix two screws in the bottom.

The three holes around the rear panel are transmit bolt holes.

Furthermore there are three outlet hose fixing support holes on the upper and left of the rear cabinet to fix the outlet hose and power cord.

And there is two-leg power plug on the left of the bottom.



### 4.7 Panel support

As the metal slat, Panel support is used to increase the intensity of cabinet and fixed on the control panel.

Panel support is fastened on the cabinet with two screws locating its both sides.





## 4.OVERVIEW OF MAIN COMPONENTS

### 4.8 Absorber

Midea drum washing machine uses the advanced absorber to damp the vibration by drum tub kit when this machine wash and spin. Absorber uses friction damping to achieve its function of damping vibration. Thanks to its similar the piston-type structure, the sponge in the cylindrical plastic inner wall of cylinder and the cavernous metal rod contacts close, the cylinder rod can sliding along the axial and longitudinal, which generate a certain damping force. There is special cavernous damping oil in the sponge, which is the main part to achieve shock absorber. The damping force keeps constant and its direction is opposite toroid running. Absorber pin is used to connect left/right lower reinforce to absorber, the absorber and tub as well.



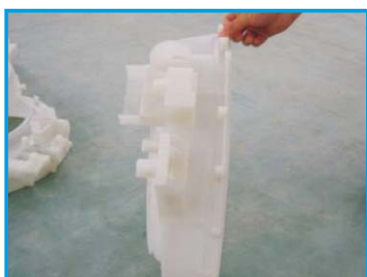
### 4.9 Drum tub assembly

#### 4.9.1 Rear tub kit

As a container for water, the tub capability of this washing machine is not only effects it's rated washing capacity but also decides its rated consumption of water. That is, at the same condition of water level, the radial dimension and the lengthways dimension of its tub have larger, the more its rated consumption of water.

The tub material of Midea washing machine is well property and improved PP which is high intensity, heat-resistant and high rigid. As a good heat guard, PP ensures this machine save power and improves its washing performance in a sense.

This structure, which is divide tub kit into front tub kit and rear tub kit, improves the assembly performance of this machine and enhance its airproof.



## 4.OVERVIEW OF MAIN COMPONENTS

### 4.9.2 Drum kit

Drum kit consist of drum center, drum front, drum back, lifter, spider kit (spider, shaft, shaft bush), and spider bolt etc.

The structure and characteristic of drum:

Drum is made up of drum center using stainless steel, drum front, drum back. As the class BA of AISI 430 BA stainless steel, it is blighting.

After rolling the inside of drum front, the sharp cutting edge rolled up to prevent scratching textiles and arm during removing and adding textile.

The model shape repression of the meet between drum back and spider enlarge the space putting textile. The piercing and drawing reel ensure the textile no injury during washing and spinning, and the compact holes make sure the textile soak fully in the drum.

Drum and drum front/back are connected by advanced spinning curling process.

During the washing, three lifters hold up the clothes pressing against the affixed surface of the drum. When clothes raised close to the top, centrifugal force is not enough to overcome gravity, and therefore clothes fall and impinge washing liquid to improve washing performance.

Spider kit

The spider is the aluminum die-casting. There is a bushing in the axis which is to reduce the wear and tear of V-shaped edge of the oil seal. When installed bushings, the powder-like debris produced by it cut shaft bushings should be removed, or they will wear oil seal. To avoid wear and tear, grease should be applied the corresponding position of the oil seal to ensure that it will play in the role of lubrication in the whole life of washing machine and not dry or off. Spider kit is fastened on the drum with three stainless steel bolts.



### 4.10 Inlet hose

Inlet hose connects household tap and washing machine. The pipe of inlet hose has a high-pressure capacity which nets the high strength polyester fiber lines. Generally, household water pressure is less than 1MPa, and practically the water pipes of Midea washing machine could stand the pressure of 2MPa in one minute not dehiscence, not deformation, and bearing 4MPa pressure not burst.

As for inlet hose, there are many performance requirements such as hot and cold alternate anti-shocking, anti-bending etc.





## 4.OVERVIEW OF MAIN COMPONENTS

### 4.11 Inlet system

#### 4.11.1 Pressure switch

##### Working principle

Mechanical pressure switch have two main components that is balloon and electrical structure. The balloon is fastened sealedly on the pressure switch with hose clamp and the end of balloon is connected on the bottom of tub using press chamber, plastic pipe. During flowing water, the bottom of tub is firstly submerged and its space linking the balloon is closed. With the increase of water level and the pressure of closed air increase gradually until push the needle of rubber membrane.

Another parts is the electrical structure. With the balloon inflating, a needle top spring chip to make it conduction and then change the current direction.

Usually, the fault of pressure switch is leakage and contact barrier. It is easy to check them.

Huff the inlet inflatable with your mouth, and you can clearly hear the clatter sound of spring chip clicks, if it is multi-level control, several clatters sound can be heard.

There is a group of plastic crosser screw in the side nearly line. These screws are used to control the height of water level (to avoid adjust it, there is a certain color lacquer to sign).

Pressure switch is a very important part in the washing machine, which is not only control water level but also influence the safety of washing machine. Once it is invalid, water level can't be controlled.

Low-frequency analog electronic pressure switch: its main principle is a group of LC oscillation circuit, the change of balloon changes the frequency of LC circuit. Pressure switch feedback to the PCB signal, and PCB issued in accordance with the conditions set to decide water level.

The price of low-frequency analog electronic pressure switch is high and as a result its application rares.

In a word, pressure switch employs its closed gas room as the basic condition of normal work. And if the gas room is damaged, the pressure switch will be invalid.

In addition, pressure switch is the key part controlling heating circuit.



## 4.OVERVIEW OF MAIN COMPONENTS

### 4.11.2 Inlet valve

Working principle of inlet valve

Inlet valve has two main components: One is the 220V winding which Set in the injection molding nylon colophony Pa66 outside cylindrical cavity and there is an iron core inside of cavity. And normally, iron core is not in the center of cavity due to the spring force. Once power supplys, the magnetic field produced by winding generate force overcoming the spring force to drive iron core, which open the hole of releasing pressure in the inlet valve.

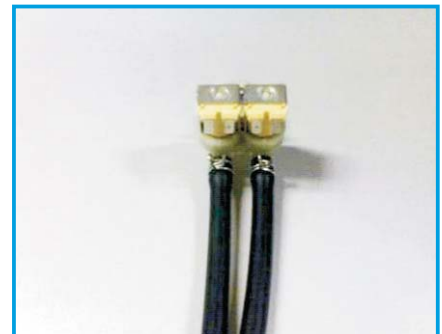
The other is the channel part. There is a hole between inlet and outlet that control flux. The default of the hole is closed and controlled by the hole of releasing pressure in the inlet valve.

As a result, the fluxing hole can be opened on the condition of power supply, iron core moving and the hole of releasing pressure.

In a word, inlet valve works in the condition of power supply and water pressure.

Characteristics of inlet valve:

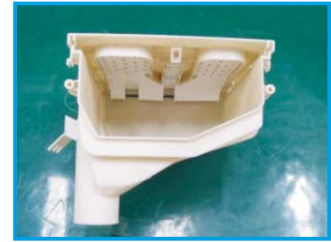
- 1.Flux: the flux of inlet valve is different by different manufacturer produced. And the flux value usual is from 8L/min to 12L/min (the flux value of this machine is 9.5L/min).
2. Modality: the inlet valve is common single-head valve for the atmosphere can be programmed for mechanical models, the direction of water flow when a cam driven by program - controlled link, Plectrum agencies to achieve watershed; The second category is double-head valve, which is used in electronic-type program - controlled washing machine, and usually water influent from the “pre-wash”box, and the other washing box is the main box, and when the two valve boxes at the same time electricity, water influent from the rinse box, its on / off is control by PCB panel.  
The last category is three-head valve, which is used in electronic device programmed with the function of drying washing machine, two of grids have the same functions as well followed. And the third one is used to control condensed water, which has small flow.
- 3.Resistance: the resistance of single-head valve is about  $4000\ \Omega$  .
- 4.Power value: the power value of single-head valve is about 5W.



## 4.OVERVIEW OF MAIN COMPONENTS

### 4.11.3 Detergent box kit

Detergent box kit is made up of detergent box, Detergent box-up and Detergent box-middle. At first, Detergent box-up and Detergent box-middle are pieces of plastic absolute. They are connected and produce many flume as the channel of water flow to weep away the detergent in the box. In order to achieve European standards, an overflow mouth is designed in the detergent box to prevent washing water inflowing the family water system caused pollution.



### 4.11 Drain system

#### 4.12.1 Drainage system

The material of drain hose is Ethylene-Propylene-Diene Monomer (EPDM), whose rigidity is 50sha, default thickness is 2.5mm. The drain hose has anti-loosen structure and it ensure there is no leakage during work.



## 4.OVERVIEW OF MAIN COMPONENTS

### 4.12.2 Drain pump

As for the up-drainage washing machine, the drum washing machine need drain pump to provide the force. The drain pump head is generally 1~1.5m, tonnage is 24L/min.

Drain pump is made up of motor, body, impeller, blower fans. Impeller is derived by the motor to run and drain; the blower fans disperse the heat produced by motor.

In principle, the drain pump has two categories of permanent-magnet pump and cover pole pump.

And drum washing machine usually use the permanent-magnet pump now.

The permanent-magnet pump uses the permanent-magnet motor and its winding resistance DC is about  $170\ \Omega$ . And its resistance usually can be measured by millimeters. If resistance infinite, it can be concluded its opening.

Actually, the common faults of drain pump was mainly that impeller broken flannel or a hard object jammed or the hard object interrupted by the impeller, and this will cause drain pump can not work. the drainage pump will issued swoosh at the end of draining due to the some water can not be completely discharged from the machine, it is a normal phenomenon.

Due to the internal structure of a cavity, filter components upper and lower body by ultrasonic welding.

The filter kit main role is Filtering out clastic produced by washing. If don't clean it timely, it will cause many fault such as pipe plug, Drainage difficulties.

Filters should be washed once a month generally. Remove it before draining water and then put a basin to avoid the remaining water flowing on the floor. Mold cleaning filters carved steps and attention to the matter in the back of the trap door. During installing it again, the filter should be tightened, otherwise easy leakage.



### 4.13 Door kit

Door kit is made up of outer door, inner door, door glass, door handle, door hook, door hook spring, hook pin, hinge, hinge cap and screw.

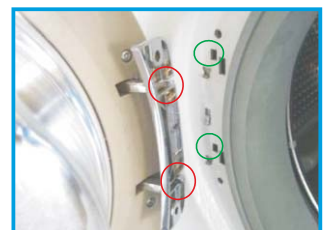
The material of outer door is Acrylonitrile Butadiene Styrene (ABS) which have the good anti-aging and anti- ultraviolet properties, and it is elegant generous.

The material of inner door is the improved PP material.

Door glass is not only good high temperature and impact resistance properties of hot and cold, but also a high intensity.

Door handle is embedded or external.

When open the door without loosening after assembled door handle, door hook, door hook spring, hook pin.



## 4.OVERVIEW OF MAIN COMPONENTS

The material of door hook is zinc alloy. As well hinge, the material of the hinge cap is POM, and the cap set in the pins of hinge ends.

The door lock control the door after installing it correctly, the clasp of door lock enter the mouth of the plate front and then they are fixed with screw to avoid scratch between the door hook and the cabinet. After power supply, door hook will be locked and the door can't be opened.

### 4.14 Gasket

Gasket is injected molding with EPDM which has many properties such as the high temperature, corrosion resistance, anti-aging.

The gasket of Midea washing machine has processed using advanced technique and it has very well performance and beautiful color. What is more, gasket achieves the goal of flexible connectivity between cabinet and tub.



### 4.15 Door lock

Door lock is the device that is self- locking during electricity and feedback signal to the PCB panel.

Delay function: the door can be opened after the unit is off in two minutes.



Harness plug

### 4.16 NTC temperature sensor

NTC can detect the temperature range from  $-5^{\circ}\text{C}$  to  $103^{\circ}\text{C}$ . The heating function stops in the condition of fault (open or short circuit).

Change the NTC before loose the crimping device.



### 4.17 Heater

The body of heater is the heating pipe of stainless steel, and its insulation is magnesium oxide powder and the core is the heating filament. The airproof of heater is EPDM which has many properties such as the high temperature, corrosion resistance, anti-aging.

The stainless steel heating pipe is welded using sub-arc welding and Seamless Detection. And then intercept set length to install the heating filament and fill magnesium oxide powder, and then tamped through vibration. Finally, a diameter of 12mm heating pipe compressed into 8mm with horizontal compression technology, and that is strictly ensure the full magnesium oxide powder tamped and the quality of welds. The heater is fastened on the tub with bolt.

Electrical principle:

Heater uses power of 220V voltage and 50Hz frequency. Due to the rated current is less than 10A, the most power of washing machine is less than 2200 watts. Reducing the other



## 4.OVERVIEW OF MAIN COMPONENTS

power, the most power of heating at 90°C is in the range from 1800 watts to 2000 watts and 1000 watts at 60°C.

The heater can't heat without water, so firstly the heating function will start only user selects the heating procedure, and secondly heating function is in some special procedure to avoid unreasonable heating, and thirdly when water level is up to the set level, its function will operate. In addition, there is the melting device in the heater, and when the temperature is up to set value(usual setting 160°C), Fuse is fused and cut off power supply.

### 4.18 Filter

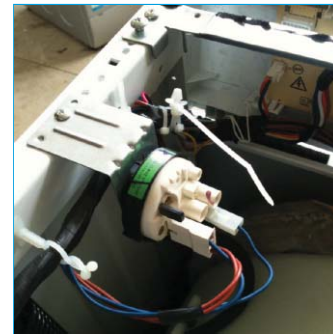
The power change of drum washing machine is in the scope and larger, and in order to prevent its interference on the other household appliance and interfered by the other large appliance, the filter is installed in the washing machine by CCC certification requirements.

Filter is made up of a group of capacitance (usually three), a group of inductance and a resistor. In the power supply circuit, it can inhale the high-order harmonic from washing machine and earth.

The interference is from the high-order harmonic from the power changes of washing machine as well as the disorders and alternating magnetic field according to the continuous changes of the current in the power cord. The frequency and magnitude of change of its power is in the scope and larger that is from zero watts at soak to hundreds of watts at wash, rinse and spin, to nearly 2000 watts at wash with heating. This change more easily aroused the obvious voltage fluctuations in the domestic circuit which effects the normal use of other electrical appliance. These filters can filter out high-order harmonic and earth.

EMC stressed interference and anti-interference, and as for washing machine, it is important to reduce interference to others due to it has good anti-interference. The washing machine use alternating current that can pass capacitor, and in practically, filter will have a very small leakage current (generally less than 2mA). Good grounding is the guarantee of the safe using this machine.

And as a result, we particularly stress the importance of grounding. Sometimes, there is an anesthesia in the working machine, please check their grounding device firstly.



### 4.19 Motor

#### 1. Summary of motor

As the driving components, motor drive the drum during washing and spin. Currently, the motor of drum washing machine usually have two-speed motor and series motor.

##### 1) two-speed motor is the running capacitance of single-phase AC asynchronous motor.

Stator of the three-phase AC motor embedded in the three-phase windings  $120^\circ$ . If it has symmetrical in the three-phase windings, it can produce rotating magnetic field.

Due to using single-phase power, the stator windings of washing machine in the single-phase AC electromagnetic field generate field is a pulsating magnetic field.

And this pulsating magnetic field can be divided into two a rotating magnetic field, and their speed equal to the opposite direction. And therefore, their synthetic torque is zero and motor can't be activated except issuing electromagnetic buzzing sound.

To start motor, washing machine motor normally uses two measures: First, put embedded in the trough of stator two windings, the main windings (running winding) and the vice winding (start winding), and two windings around axes in space in a  $90^\circ$  angle. Secondly, put a capacitor in series on the winding and therefore the same currents have different phase difference on the two winding. As a result, the vice windings has leading  $90^\circ$  current to the main windings, and make the condition of starting motor.

The space between stator and rotor is air gap. Motor has two ways of cooling, natural cooling and fan cooling (air-cool or self-fan cool).

##### 2). Series motor

General speaking, series motor is a DC motor. Its highest speed can be up to 20000r/min.

Performance characteristic: Its electrical characteristic is hard, the size of it output torque is not effect on the change of voltage. Its has large range of regulating speed and has relatively high efficiency which value is up to 0.2 at the speed of 700r/min and 0.63 at the spinning.

Work principle:

There are two series ways between exciter stator windings and the armature windings. The one is that the armature windings series two exciter windings in the figure A; and the other one is that two exciter windings series before they series the armature windings in the figure B. And practically, the first way is used more.

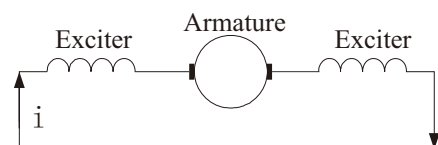
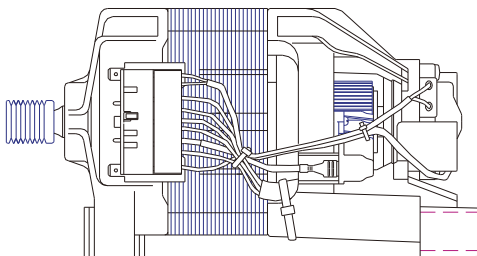


Figure A:armature wires series-wound between two exciter wires

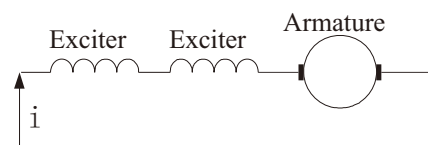


Figure B:armature wires series-wound with two exciter wires

## 4.OVERVIEW OF MAIN COMPONENTS

The structure of single-phase series motor decides it can use not only alternating current but also DC. To predigest its circuit and reduce cost of this machine, it is usually to use AC practically. Between the exciter windings and the armature windings are in series one single-phase power supply. When it is in a positive and negative half-cycle AC, the current passing the exciter windings and the armature windings are shown in the figure C and D separately. In a word, the revolve direction of series motor which is used to AC power supply has nothing to the power supply.

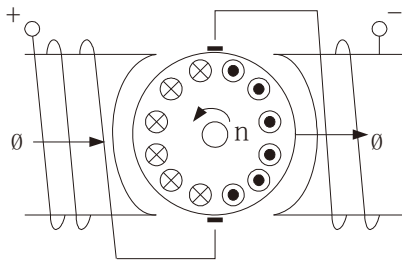


Figure C: rotor revolve direction in a positive half-cycle AC

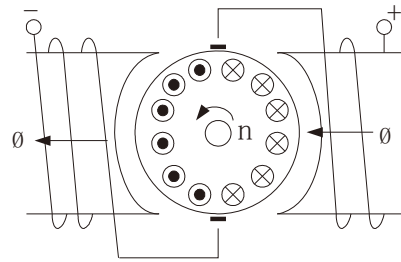


Figure D: rotor revolve direction in a negative half-cycle AC

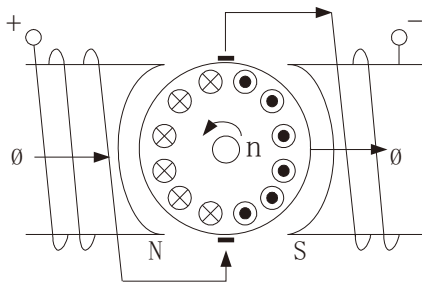


Figure E: rotating direction of motor after change the series polity of the exciter windings and the armature windings

Change the shift of single-phase series motor before change the series polity of the exciter windings and the armature windings, and show in the figure E.

Series motor usually changes voltage to adjust its rotate speed and the calculating formula of its rotate speed is following:

$$n = 60aE / (P\Phi N) \quad (\text{r/min})$$

E-----inductive-voltage of the armature windings

a-----the number of shunt-wound pairs of the armature windings

P-----the number of magnetic polity

Φ----- average flux of magnetic polity

N-----the number of windings of armature windings

From the followed formula, if you change the structure parameter (P, N, a) of single-phase series motor, and you can change its rotate speed. But as for the typed series motor, you can change E and by adjusting the voltage value of the motor to change its rotate speed.

For drum washing machine, modulate the voltage using the electronic actiyator or the PCB panel to adjust its rotate speed.



## 4.OVERVIEW OF MAIN COMPONENTS

### 2. Main parts and structure of motor

#### Stator and rotor

Stator has rotating magnetic field, including stator windings, the core and upper/lower cover for fixing it.

Stator windings is the high strength polyester enameled wire enwinding the core which is sheeted with the silicon steel about 0.5mm thickness by riveting and welding. Both sides of the silicon steel are coated with insulating paint, as well as rotor.

As the rotating parts, rotor output torque from its shaft, including the rotor windings, core and axial. There is a belt pulley of the motor to output torque on the extended-rotor shaft.

#### Gas gap

The unilateral width of the gas gap between stator core and rotor core usually is 0.3mm. Due to the magnetic resistance of air is less than metal's, gas gap is larger, the more is magnetic resistance and the more is Exciting Current to produce the same size rotating magnetic field, as a result, power factor of the motor become lower. To reduce the exciting current, the gas gap should become small, taking into account safety factors of assembly and transport.

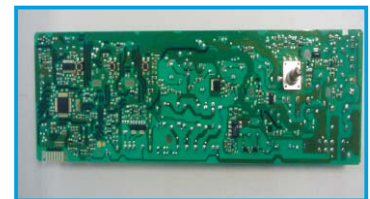
#### Thermal protector

Usually use restorable double foils to cut off the power when the temperature of motor more than the set one, to protect motor, the set temperature of foils is  $115\pm 5^{\circ}\text{C}$ , the contractor will restart the power supply when the temperature is lower than the set one.

### 4.20 PCB panel

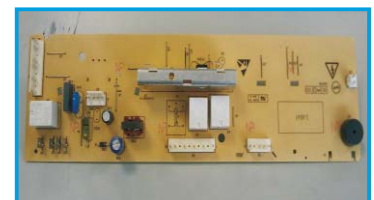
#### General characteristic

- 1)The control panel executes the main functions below:
- 2)Control the spinning(high-speed or low-speed spin and the speed of the last spin)
- 3)Control the temperature of washing liquid
- 4)Control and adjust the unbalanced load during spin



#### The control of spinning speed

The control panel modulates motor's speed by modulating its voltage. By modulating the knob position of speed chooser, the user can set the speed value in the control panel. Then comparing the value of the speed and the impulse value from testing motor, when the control panel makes sure that the motor speed arrive the set speed, it will not modulate the voltage of motor. As a result, the washing machine's drum runs at the set speed.



#### The control of temperature of washing and heating

The user sets the temperature in the control panel by pressing the temperature key; the control panel compares the set temperature and the washing temperature from the

## 4.OVERVIEW OF MAIN COMPONENTS

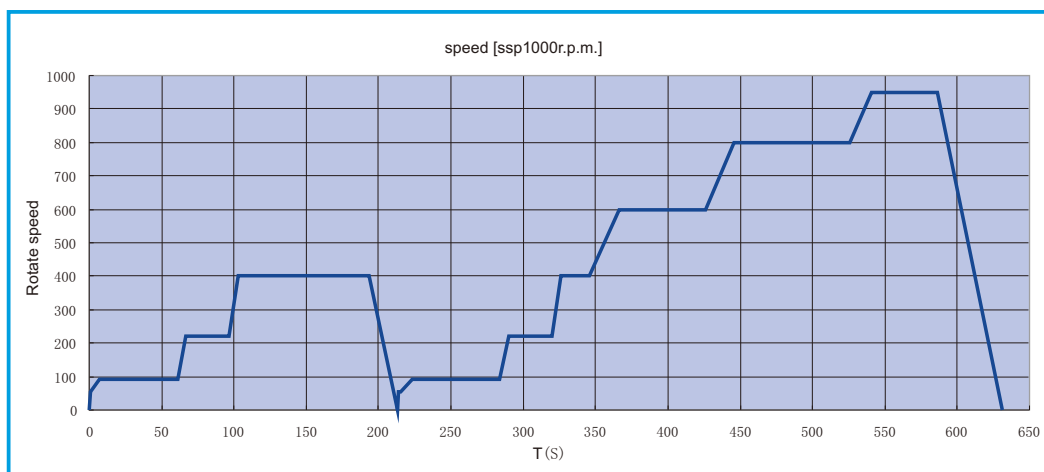
temperature-testing resist value; when the control panel makes sure that the water temperature arrives the set temperature, it cuts off the heater and stop heating.

The control of unbalanced load during spinning

When the washing machine is running the spinning program, if the clothes in the drum are put unbalanced or gravely out of center, the washing machine will vibrate greatly, so the control panel needs to adjust it. The detailed process is as below: when the washing machine is running the spinning, the drum rotating speed will promote from low to high; when it gets to 95r/min ,according to the principal that different eccentric clothes have different rotating speed between ascending and descending, the control panel first checks the testing motor's rotating speed difference at 95rpm, after a special computing, estimates whether the clothes in the drum balanced, such as balanced distribution. If balanced, the washing machine will run at normal spinning speed until the set highest rotating speed. If unbalanced, after the control panel cutting off the controlling motor 5 seconds, the drum runs 30 seconds at washing speed. It shakes the clothes, tests and computes the motor's rotating speed , and estimates whether the distribution balanced. This procedure runs 12 times until the clothes balanced to spin. If the eccentricity is still large after 12 modulations, it will display UE urgent.

Now turn off the machine, open the machine door to replace the clothes or put more clothes to descend the eccentricity, and then choose the spinning program again.

**NOTE:** usually, a towel, jeans and some fabrics have large eccentricity and suggest that consumers should put 2~3 or more to wash.



### 4.21 Main harness assy

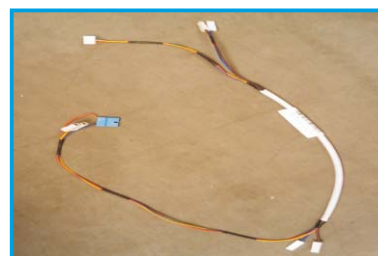
Connecting control panel and peripheral load  
(Detailed in PCB connection)



## 4.OVERVIEW OF MAIN COMPONENTS

### 4.22 Sub-harness assy








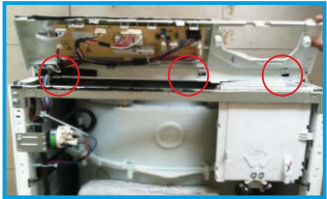

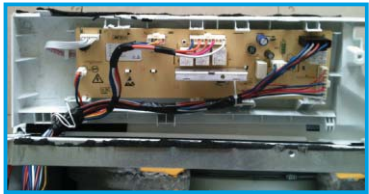
Connecting motor  
(Detailed in PCB connection)







### 4.23 Bill of damageable parts

NO.	Name	Qty	NO.	Name	Qty
1	Inlet hose	1	9	Temperature sensor	1
2	Absorber	2	10	Door lock	1
3	Inlet valve	1	11	Heater	1
4	Tub outlet hose	1	12	Door hook	1
5	Outlet hose	1	13	Filter cover	1
6	Drain pump	1	14	Door glass	1
7	Drive pulley	1	15	Door handle	1
8	PCB panel	1	16		





## 5.UNPACKING WAYS OF MAIN PARTS

Operation step	Picture
<p>1 Undo the back cover</p> <p>Undo two screws fit between back plate and cabinet, and then pull out the back plate .</p>	
<p>2 Undo top cover</p> <p>① Undo 2 screws fit between the top cover and back cabinet .</p> <p>② Push back the top cover 15mm until it leaves away from the control panel, and then take it down.</p>	    
<p>3 Undo the control panel</p> <p>① Departing the top cover (means as above) .</p> <p>② Draw out the detergent drawer .</p> <p>③ Loosen two screws fit on the control panel (facial).</p> <p>④ Loosen two screws fit on the control panel(top) .</p>	 
<p>⑤ Press three clasps between top control panel and panel support.</p> <p>⑥ Take out the control panel inclined from the cabinet .</p>	 

## 5.UNPACKING WAYS OF MAIN PARTS

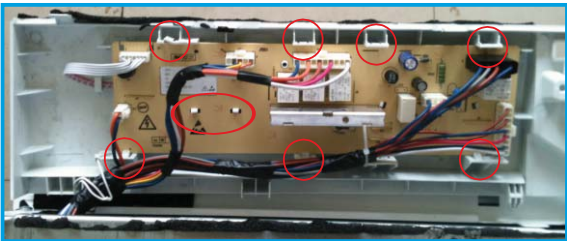
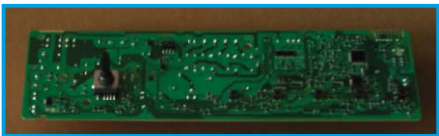


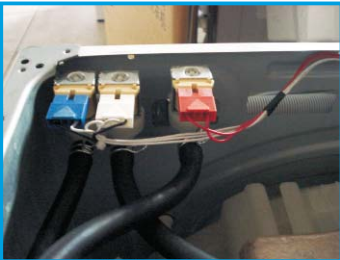

Operation step	Picture
<p>4 Undo the lower panel</p> <p>① Open the filter cover, release the screw on the lower panel.</p> <p>② Turn the washing machine back at an angle, pinch the clasp, and push it out.</p>	
<p>5 Undo the door lock</p> <p>① Open the door of washing machine.</p> <p>② Take the outer gasket clamp to the drum.</p>	
<p>③ Remove two screws on the door lock, and take down the door lock.</p> <p>④ Take out the door lock and draw out the plug; pay attention to the position of the plug so as not to connect a wrong circuit next time.</p>	
<p>6 Undo the front plate</p> <p>① Undo the door lock (methods as followed).</p> <p>② Remove the lower cover (methods as followed).</p>	

## 5.UNPACKING WAYS OF MAIN PARTS


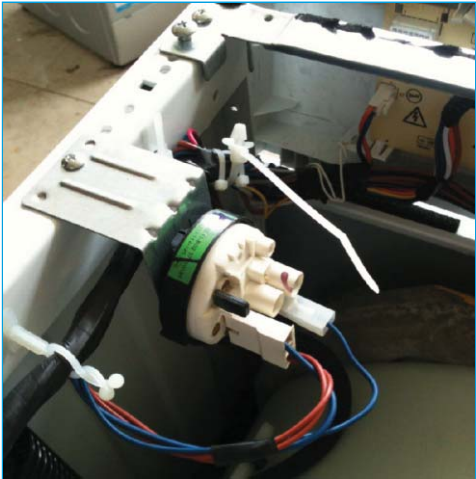

Operation step	Picture
<p>③ Undo five screws in the front plate.</p> <p>④ Put the front plate up to the clasp of the front plate away from the loading holder, and then take off the front plate.</p>	
<p>7Undo the facade counterweight</p> <p>① Undo the front plate (methods as followed).</p> <p>② Remove six screws pull out the facade counterweight.</p>	
<p>8 Undo the gasket</p> <p>① Undo the top cover, control panel, lower cover, machine door and the front plate(methods as followed).</p> <p>② Remove the outer gasket clamp between the door seal and the front plate.</p> <p>③ Loosen the inner gasket clamp between the door seal and the front of the outer tub, and take out the gasket.</p>	 



## 5.UNPACKING WAYS OF MAIN PARTS



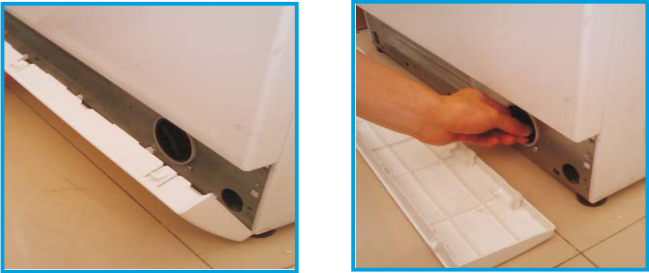

Operation step	Picture
<p>9 Undo the PCB panel</p> <p>Undo the top cover and control panel(methods as followed).</p>	 
<p>10 Undo the detergent box</p> <p>① Undo the top cover and the control panel (methods as followed ).</p>	
<p>② Release the hose clamp and pull out the inlet hose.</p> <p>③ Release the hose clamp and pull out the detergent box hose, and then take out the detergent box.</p>	
<p>11 Undo the inlet valve</p> <p>① Remove the top cover (methods as followed ).</p> <p>② Undo 2 screws between cabinet and inlet valve.</p>	 

## 5.UNPACKING WAYS OF MAIN PARTS




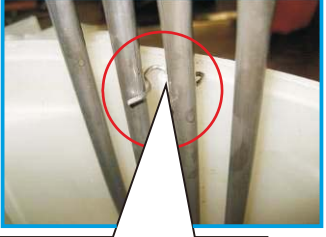

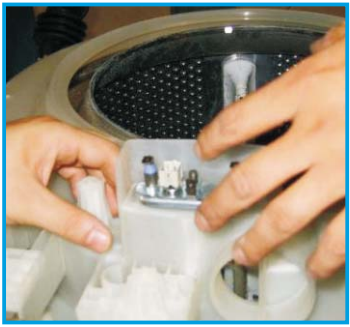

Operation step	Picture
<p>③ Release the clamp fixing the inlet valve and the inlet hose, and then pull out the inlet hose. Take out the inlet valve and plug. Pay attention to the position of the plug so as not to connect a wrong circuit next time</p>	
<p>12 Undo the pressure switch</p> <p>① Undo the top cover (methods as followed).</p> <p>② Pull out the plugs on the pressure switch. Mind the position of the plug to avoid error during the following assembly.</p> <p>③ Loosen the pressure switch hose clamp, and pull out the hose from the pressure switch interface.</p> <p>④ Rotate the pressure switch anticlockwise by 90°, and then pull out the pressure switch.</p>	
<p>13 Undo the pulley</p> <p>① Undo the back cover (methods as followed).</p> <p>② Rotate the pulley and at the same time pull out the belt, and then remove the belt.</p> <p>③ Remove the screw on the pulley and then take down the pulley.</p>	




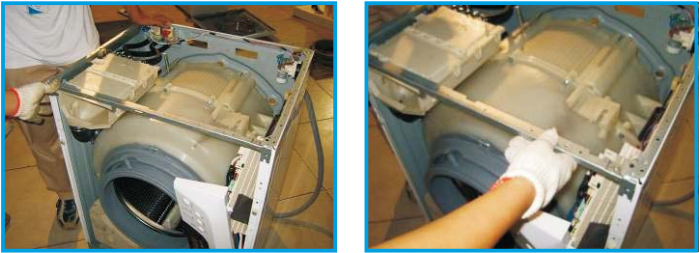


## 5.UNPACKING WAYS OF MAIN PARTS

Operation step	Picture
<p>14 Undo the upper counterweight</p> <p>① Undo the top cover (methods as followed).</p> <p>② Remove three screws fit on the upper counterweight and then pull out the upper counterweight.</p>	
<p>15 Undo the absorber pin</p> <p>① Undo the front plate (methods as followed).</p> <p>② Use pliers to pinch the absorber pin's protuberance, and knock the absorber pin out from back lightly; in the same way, remove the other one.</p>	
<p>16 Undo the filter</p> <p>① Open the filter cover.</p> <p>② Rotate the filter knob anticlockwise, and then pull out the filter.</p>	
<p>17 Undo the drain pump</p> <p>① Undo the top cover, control panel, lower cover and front plate(methods as followed).</p> <p>② Nip out clamp between the drain hose and the drain pump, and then pull out the drain hose.</p>	


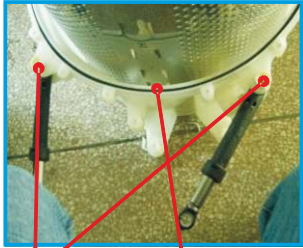




## 5.UNPACKING WAYS OF MAIN PARTS

Operation step	Picture
<p>③ Nip out the clamp between the outlet hose and the drain pump, pull out the outlet hose.</p> <p>④ Loosen the screws fitted on the drain pump, and then pull out the drain pump.</p>	
<p>18 Undo the heater</p> <p>① Undo the top cover, control panel, lower cover and front plate(methods as followed).</p> <p>② Pull out the heater plug. Pay attention to the position of the plug so as to not connect a wrong circuit next time.</p> <p>③ Release the screw fixing the heater.</p> <p>④ Take out the heater.</p>	<div style="display: flex; justify-content: space-around;">   </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;">   </div> <div style="margin-top: 10px;"> <p>In the red circle it is the heater support, clamping the heater.</p> <div style="display: flex; justify-content: space-around;"> <p>Heater</p> <p>NTC</p> </div> </div>
<p>19 Undo the NTC temperature sensor</p> <p>① Undo the top cover, control panel, lower cover and front plate(methods as followed).</p> <p>② Undo the NTC with special tools.</p>	<div style="display: flex; justify-content: space-around;">   </div>

## 5.UNPACKING WAYS OF MAIN PARTS

Operation step	Picture
<p>20 Undo the door glass</p> <p>① Open the door, remove two screws fixing the hinge and front plate, and then remove the door.</p> <p>② Remove six screws on the inner door.</p> <p>③ Remove the outer door and the inner door with special tool.</p> <p>④ Take out the door glass.</p>	
<p>21 Undo the panel support</p> <p>① Undo the top cover (methods as followed).</p> <p>② Undo the control panel.</p> <p>③ Remove two screws fixing the panel support, and then remove it.</p>	
<p>22 Undo the drum tub assembly</p> <p>① Remove the motor in 24(methods as followed).</p> <p>② Pull out the heater.</p> <p>③ Remove the belt.</p>	
<p>④ Remove the screws fixing the pulley, and then take out the pulley.</p>	

## 5.UNPACKING WAYS OF MAIN PARTS

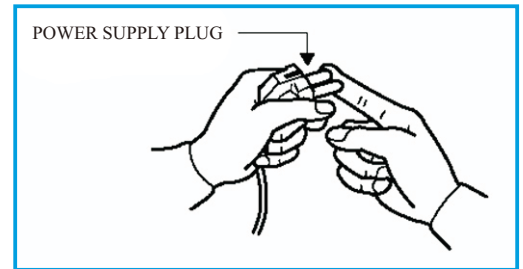
Operation step	Picture
<p>⑤ Remove the screws fixing the front and rear tub, and then remove the tub.</p> <p>⑥ Remove the inner drum kit.</p>	<div data-bbox="694 416 1013 663">  </div> <div data-bbox="1029 416 1332 663">  </div> <div data-bbox="928 674 1134 734"> <p>Pin</p> </div> <div data-bbox="1169 674 1369 734"> <p>Airproof Ring</p> </div>
<p>23 Undo the absorber</p> <p>① Lift out the outer tub kit (means as 21 above).</p> <p>② Undo the absorber pin between absorber and rear tub, remove the absorber.</p>	
<p>24 Undo the motor</p> <p>① First let the machine lie down on the back and then pull out the motor wire and grounding wire. Use spanner to remove the motor screw, and lift up the motor with the other hand in case of falling to the drain pump.</p>	<div data-bbox="708 1346 1035 1576">  </div> <div data-bbox="1048 1346 1350 1576">  </div>
<p>② After two screws are removed, change the motor. First support it to clasp the correct position, then install the screws, and then install the belt.</p>	



## 6.TROUBLESHOOTING

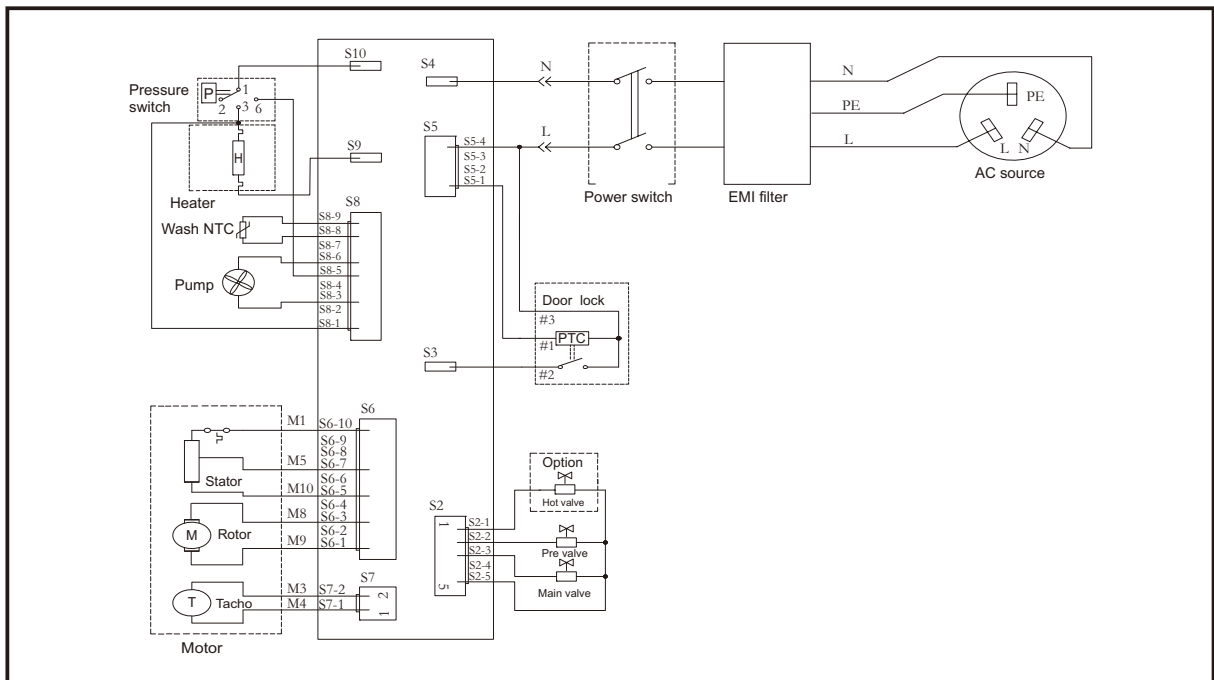
During the failure diagnosing and changing components, please do it as following:

- 1)There is some static harm to the electrical parts from colophony in the washing machine or humans. So it is better to eliminate the potential static by grounding the humans or touching the plugs.
- 2)The rated voltage of the SCR in PCB is 220-240V, so it's possible to be electrical shock. Please take care while strong and weak electricity is alternative.
- 3)The design of PCB is out of failure, so prohibit to change the PCB panel according to its alarm. Please do it according to the failure diagnose program.



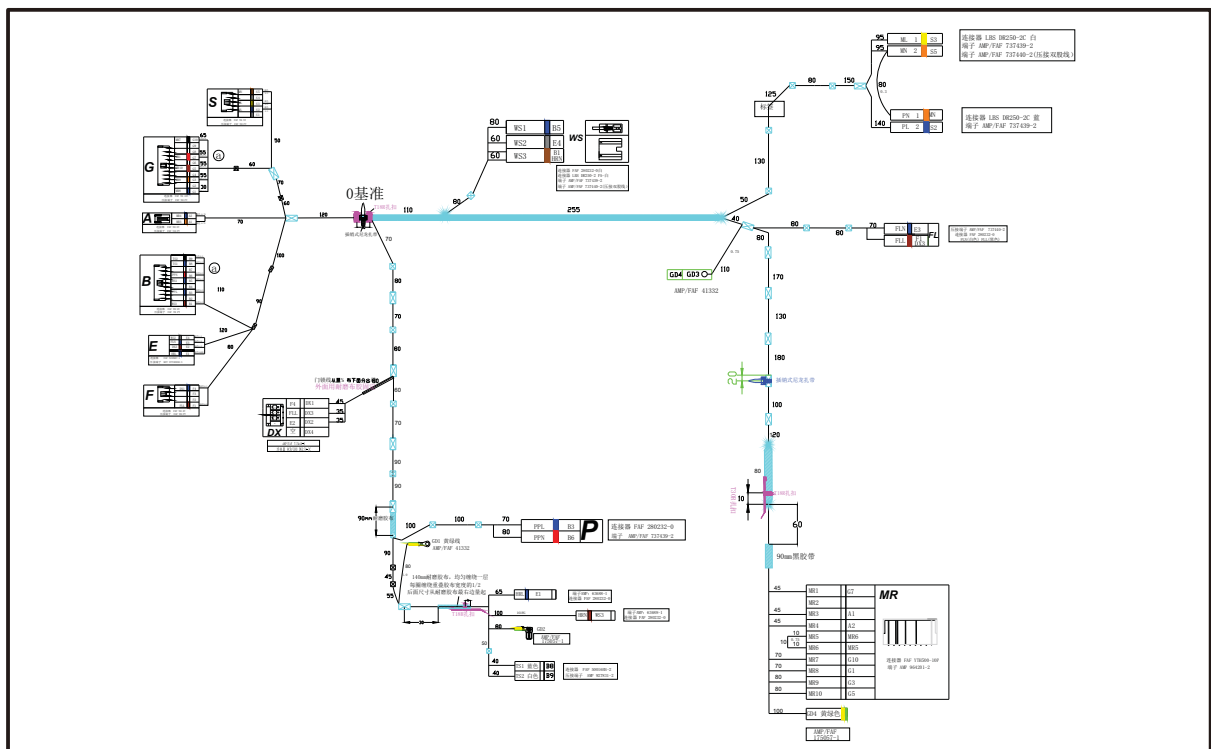
### 6.1 The circuit program & wiring connection figure

SICILY circuit principle



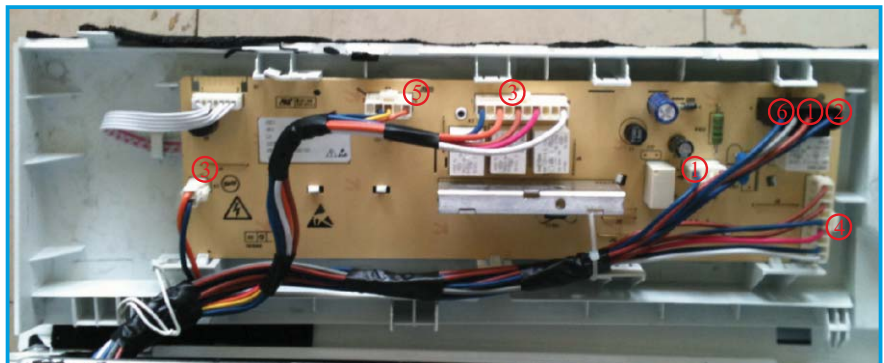
## 6.TROUBLESHOOTING

### SICILY harness connection



### 6.2 PCB wiring figure

- 1 Door lock harness
- 2 Heater harness
- 3 Motor harness
- 4 Drain pump/NTC harness
- 5 Water Value
- 6 Filter harness



## 6.TROUBLESHOOTING

### 6.3 Schedule of failure alarm & its disposal

The alarm display is as below :

Display LED	Description	Reason	Solution
E10	Water injecting problem when washing (water injecting time exceeds 7 minutes)	Tap is not opened or water flows too slowly. Inlet valve filter is blocked. Inlet pipe is twisted. If water is not supplied	Open the tap or wait till the water supply becomes normal. Check inlet valve filter. Straighten the water pipe Check the other taps in the room.
		Please call up service line if there are still troubles.	
E12	Overflow protection : The water level exceed overflow level.	The machine lock the door, close inlet valve, motor stop working, drain water in error status.	1. Re-start machine ; 2. Change inlet valve.
		Please call up service line if there are still troubles.	
E21	Drain problem while washing (drain time exceeds 3 minutes)	Outlet hose is blocked or twisted Drain pump is blocked	Wash and straighten outlet hose. Wash drain pump filter
		Please call up service line if there are still troubles.	
E30	Door lock problem	Door is not closed properly.	Restart after the door is closed
		Please call up service line if there are still troubles.	
E60	Motor stalling warning: Motor try to start working 5 times every 1 min.	The machine lock the door, close inlet valve, motor stop working, drain water in error status.	1、 Check motor wire ; 2、 Change PCB ; 3、 Change motor
		Please call up service line if there are still troubles.	
E61	Speed measuring signature lost warning: PCB cannot detect speed signature during working.	The machine lock the door, close inlet valve, motor stop working, drain water in error status.	1、 Check motor wire ; 2、 Change motor.
		Please call up service line if there are still troubles.	
Please call up the service line if there is any other problem.			



### 6.4 Electrical parts working & testing principle

#### 1. Inlet valve

Working principles:

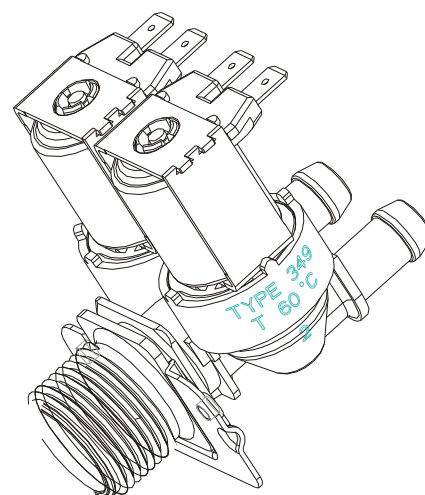
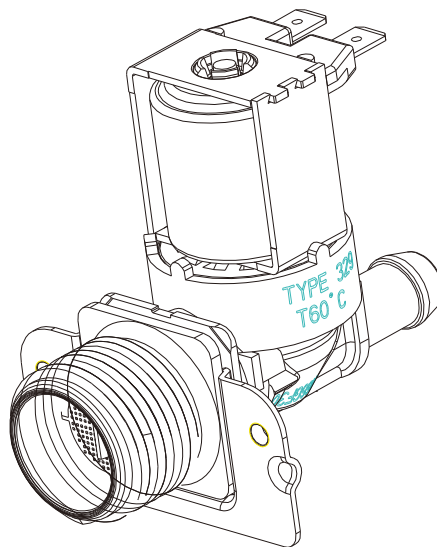
A piece of iron core blocks in the inlet valve, and one side of the iron core is the push exerted by spring. When the power is turned on, the winding in the valve will generate a force to pull the iron core up, and then the inlet passage is smooth and the water flow in the drum under the household water pressure .

Technique datas:

Maximum input voltage:	220-240V
Frequency:	50/60Hz
Resistance:	4.13K $\Omega \pm 10\%$
Flux:	8L/min $\pm 15\%$
Water pressure:	0.2-10bar
Temperature of hot water:	Maximum 25°C

The testing methods of inlet valve is as follows:

- 1) Use the multimeter to test the electromagnetism valve resistance, which should be 4.13k  $\Omega \pm 10\%$ .  
If the value is infinite or approaching to zero, the valve is invalid and can't let water enter.
- 2) Connect the inlet valve and tap, if water flows out of the outlet without power being off, the iron core is invalid and should be replaced.



## 6.TROUBLESHOOTING

### 2. Pressure switch

Pressure switch, which use the water pressure to control its spring, connects different control circuit through contacting different contractor.

Pressure switch has two groups of pressure control point: point 1 connects point 2 in normal state without water, when the water level is up to a certain value, point 3 connects point 1 under the water pressure, providing power to the heater through point 3 and making signal of the water level to the control panel. When the water level is too high, points 1 connects drain pump directly through point 6 and then feedback the signal of overflow to the PCB panel.

Technical parameters:

1) Main touch point subsection capacity:

Point 3: 16(4) A/250V on/off

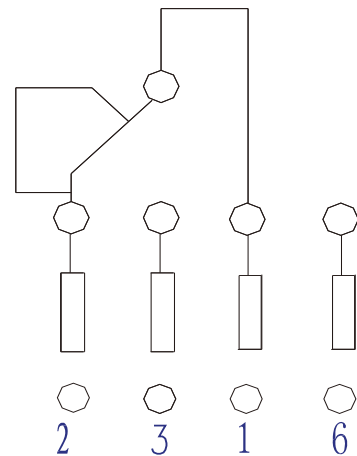
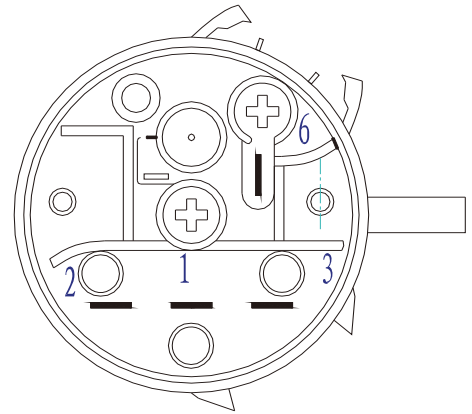
Point 2: 10(2.5)A/250V on/off

2) Overflow protection point subsection capacity:

1A/250V on/off

The test methods of water level switch:

- 1) In normal state without water, points 1 and 2 connect and points 1 and 3 disconnect, if points 1 and 3 connect without water, the water is not in and appear interference malfunction, it should be replaced.
- 2) Huff the switch and if it leaks breath, the inlet will be endless. It should be replaced.
- 3) When the water pressure reach 98mm of water column, points 1 and 3 connect. If not connected, it may appear the malfunction of endless inlet.



### 3. Door switch

#### Function:

There are three connection in the door lock, 1 and 3 provide 220V voltage to the PTC, when the door is close and power is on, PTC will be distortion, then push the middle spring, the points 2 and 3 connect with spring provide power to the peripheral load (motor, pressure switch etc). Meanwhile the plastic bolt in the peripheral spring will insert into the door lock channel outside and self-lock. Only when the power is off about 2 minutes, PTC will get back. At this time the door can be open.

#### Technical rated:

120V/240V, 16A, PTC

Input voltage: 253VAC

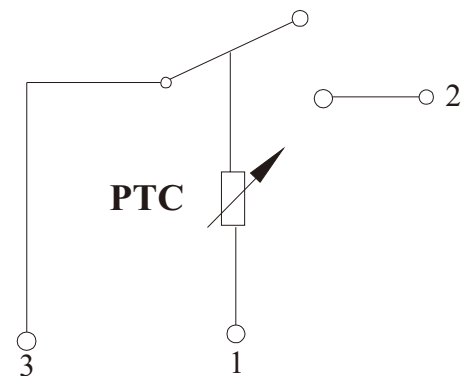
Rated current: 50mA

Start-up current: 2.5A for max.

The testing methods of door lock are as follows:

- 1) The contractor 2 and 3 are disconnection when the door lock is off (if not, the door lock should be replaced). Supply power to the contractor 1 and 3 (220VAC) 10s, and then turn off, the contractor 2 and 3 will be connection in 30 s, if not, the door will not be locked and should be replaced.

Supply power (220VAC) to the contractor 1 and 3 10 s and then turn off, if the contractor 2 and 3 are connection, the door lock should be replaced.



### 4. NTC and heater

The normal working range of NTC is  $-7^{\circ}\text{C}$  to  $105^{\circ}\text{C}$ .

The higher of the temperature, the lower the NTC's resistance value. While the heating temperature will be tested through testing the NTC's resistance value. NTC is inserted in the resistance's flange, which seal ring guarantee the airproof quality. You should loosen the lock facility in order to replace the NTC.

NTC parameters:

R/t speciality: 2003,  $T_n=60^{\circ}\text{C}$ ,

$dR_n=2\%$  and  $dB=1\%$

Resistance speciality:

$R(25) = 4.828 \text{ k}\Omega \pm 3.5\%$ ,

$R(100)= 330 \Omega \pm 3.3\%$

Temperature range:  $-7^{\circ}\text{C}-105^{\circ}\text{C}$

Resolution:  $\leq 1\text{k}$

Tolerance:  $\pm 2.5^{\circ}\text{C}$

Test condition:

Heater parameters

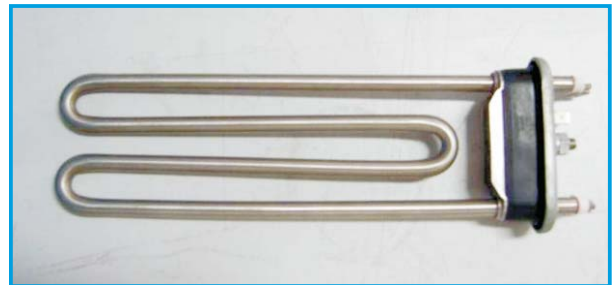
Voltage:  $UN\pm 1\%$

Rating power: 1800W

Rating voltage: 230VAC

Power tolerance:  $+5\% \sim -10\%$

Resistance: About  $300 \Omega$



Resistance is made up of two heat fuses which can't be replaced and integrative (the insurance facility preventing heating without water) .

The testing methods of NTC are as follows: : NTC's resistance value is  $2815 \Omega \pm 3.5\%$  at  $25^{\circ}\text{C}$ , if its value is zero or infinity, the NTC is fault and should be replaced.

The testing method of heater is as follows: the resistance value of heater is about  $27 \Omega$ , if its value is infinity, the heater is fault and should be replaced.

### 5. Drain pump

When the power is on, it will drain water with its impeller.

Technical parameters:

Voltage: 220V

Frequency: 50 Hz

Power:  $< 40 \text{ W}$

Capacity extent: 1 m

Flux: 13L/min

The methods of testing drain pump:

1) It's resistance value is about  $240 \Omega$  tested by multimeter, if the value is zero or infinity, it need to be replaced.

## 6.TROUBLESHOOTING

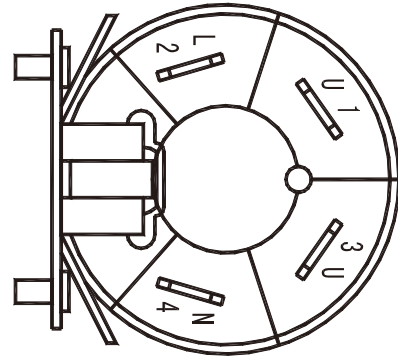
- 2) Take off the filter cover and check whether the impeller is blocked, clean up it and then assemble it.

### 6. Filter

In order to decrease the inter-interference between the washing machine and the power grid, L2 and the power grid's L connector, N4 and the power grid's n connector, U1 and washing machine's L connector, U3 and washing machine's N connector.

Filter parameters as follows:

$$0.68M \Omega + 2 \times 1mH + 0.47\mu F + 2 \times 0.1 \mu F$$



### 7. Series motor

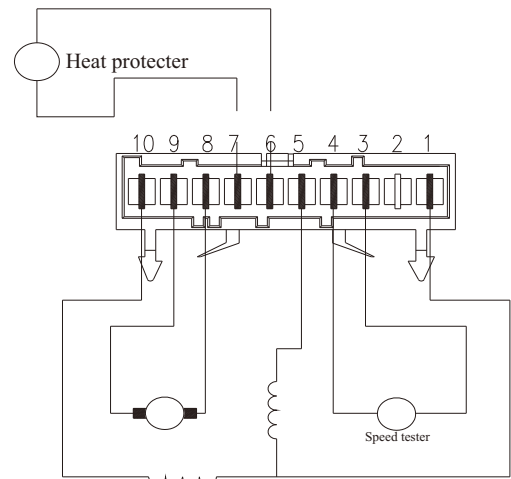
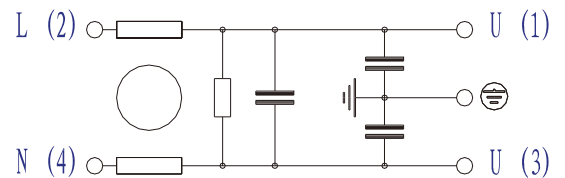
The motor's rotate is controlled by SCR, the bigger of the through angle is the higher of its voltage and motor's speed are, or else, diminishing the through angle can reduce the motor's speed.

The motor's turning is controlled by two relays, when 5 and 8 connector, 9 and 10 supply power, it is clockwise from the shaft direction, when 5 and 9 connect, 8 and 10 supply power, it is anticlockwise then.

The speed-measuring facility in the motor transform the speed into impulse number which was provided to the PCB panel (the higher of the rotate speed, the more of the impulse is), the PCB panel control the motor's speed through SCR.

The methods of testing motor:

- 1) When the resistance between 6 and 7 is infinite, the motor appears heat protection, when 6 and 7 is always cut, the motor should be replaced.
- 2) If the resistance between 5 and 10 or 8 and 9 is infinite, the motor should be replaced.



### 6.5 Service Mode

Before entering into service mode, make sure no water remains in the inner drum, if not, select drain only program to drain them out.

Turn on the machine and press **Delay** and **Temperature** in proper order for 30s to enter into service mode. Press **Delay** or **Speed** to select test program. Press **Start/pause** button to confirm your selection and start the selected test. If you want to go back to test selection interface, press the **Start/pause** button to cancel previous selection.

#### 6.5.1 Version switchover (t01)

- 1) Enter into service mode, LED displays “t01”
- 2) Press **Start/pause** button, LED displays “0xx”.x means
- 3) Press **Delay** to confirm switchover.
- 4) Press **Speed** to change version.
- 5) Press **Delay** button continuously for 3s to confirm your change.
- 6) Press **Start/pause** button to close all output and exit this program. LED displays “t01”.

#### 6.5.2 Error code checking (t02)

- 1) Enter into error code mode, LED displays “ELT”. Press Delay button and LED displays EXX(x=1,2,3....)
- 2) Press **Delay** to show the last code and press Speed to show the next code. The latest 10 error codes can be found in system, and same error code is recorded one time even if it occurs more than one time
- 3) If no error information found, LED shows E00.
- 4) Press **Delay** continuously for 3s, after hearing the beep, all the error codes records deleted, LED displays E00.
- 5) Press **Start/pause** button to exit, LED display t02.

#### 6.5.3 Version information checking (t03)

Version information checking is used to show the current version information stored in nonvolatile memory applications.

- 1) Enter into service mode, LED displays “Sut”.
- 2) Press **Delay** button, LED displays repeatedly “cod” and version number “0xx” repeatedly each for 1s.
- 3) Press Start/pause to go back to version information checking status, LED display “t03”.

#### 6.5.4 UI Checking (t04)

- 1) Press **Start/pause** button to illuminate the whole LED display.
- 2) Press **Delay** button, the whole LED display flashes.
- 3) Press **Start/pause** to stop flash, LED display “t04”

#### 6.5.5 Drain pump checking (t05)

- 1) Enter into service mode, LED displays “PPt”.
- 2) Press **Delay** button to drain out all the remaining water. If all water drained out, LED displays “EP” , and 6 minutes later ,if there is still water remains in it, LED displays “FP”.
- 3) Press **Start/pause** button to exit, LED displays “t05”

#### 6.5.6 Pressure switch checking (t06)

- 1) Enter into service mode, drain out the water, LED displays EPT.
- 2) Press **Delay** button to activate inlet valve. LED displays L1 once water lever get the main wash level.
- 3) Press **Delay** to close inlet valve, LED displays “t06”
- 4) Press **Start/pause** button to exit, LED displays “t06”

#### 6.5.7 Water temperature sensor and heater checking (t07)

- 1) Enter into service mode, drain out the water, LED displays the current temperature of inner drum.
- 2) If water switch works,
- 3) Press **Delay** button to activate the main inlet valve and get the water lever to heating level then turn on the heater and 5 min later turned off automatically.
- 4) After heater turned on, LED displays the current temperature. Detect the real temperature of inner drum and check with the numbers on the display.
- 5) Press **Start/pause** button to exit, LED displays “t07”



### 6.5.8 Inlet valve checking (t08)

- 1 ) Enter into service mode, LED displays “uLt”
- 2 ) Press **Delay** button, LED displays “u2” and switch on the main wash inlet valve for 10 min.
- 3) Press **Delay** button, LED displays “u1” and turn off the main wash inlet valve and switch on prewash valve for 10 min.
- 4) Wait 10 min or press **Delay** button to turn off prewash valve and switch on hot water inlet valve (only for double-inlet models) and LED displays “u3”.
- 5) Press **Delay** button to switch on main wash and prewash valve and get the water level to setting level, if water level can't reach setting level within 5min or exceeds setting level. Drain out the water.
- 6) Press **Start/pause** to exit, LED displays “t08”.

### 6.5.9 Rotating checking (t09)

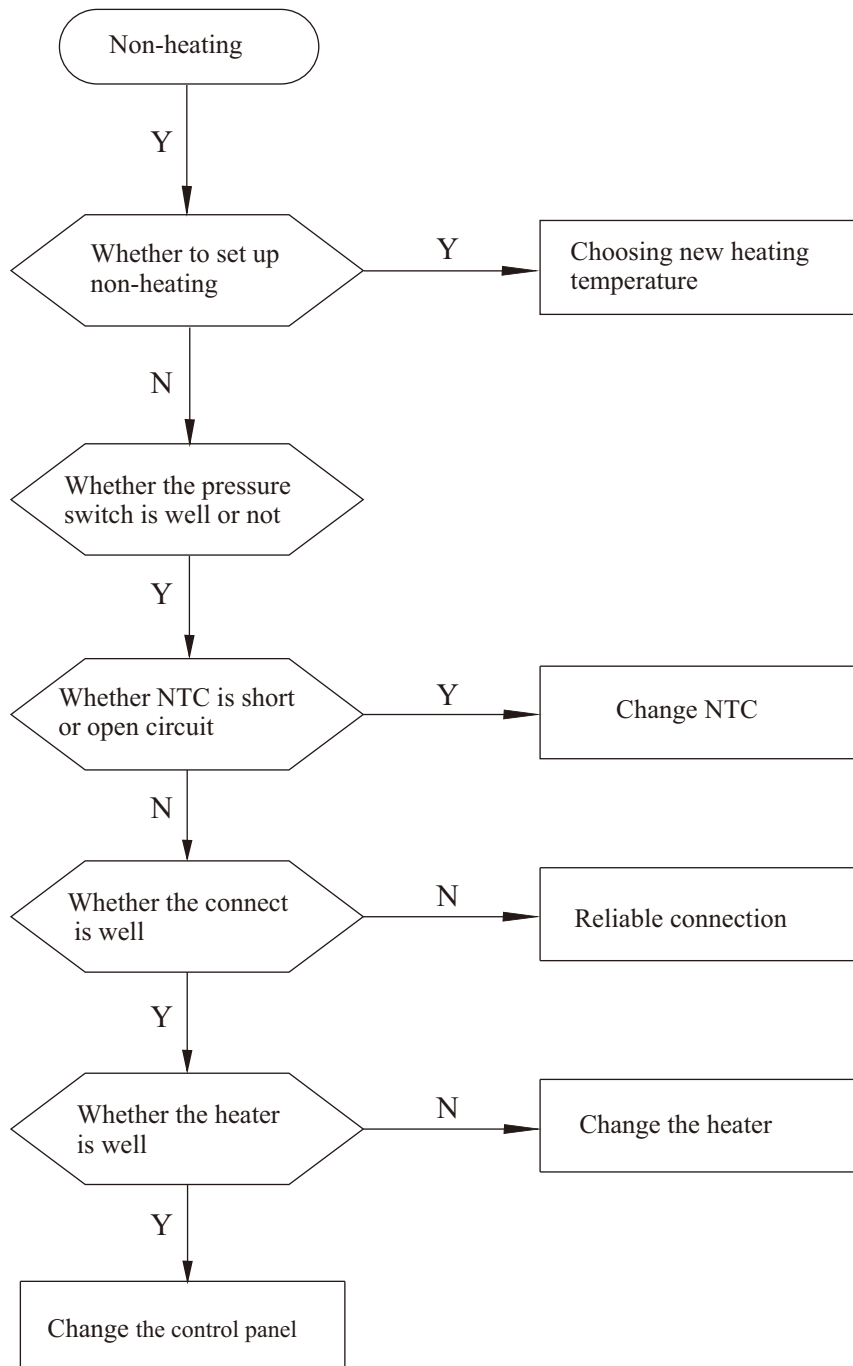
- 1) Enter into service mode, LED displays “tt”
- 2) Press **Delay** button, inner drum rotates in 45r/m clockwise for 15s and stop for 10s then rotates counterclockwise for 15s, over and over again.
- 3) Press **Start/pause** button to turn off the motor and exit, LED displays “t09”.

### 6.5.10 Spin speed checking (t10)

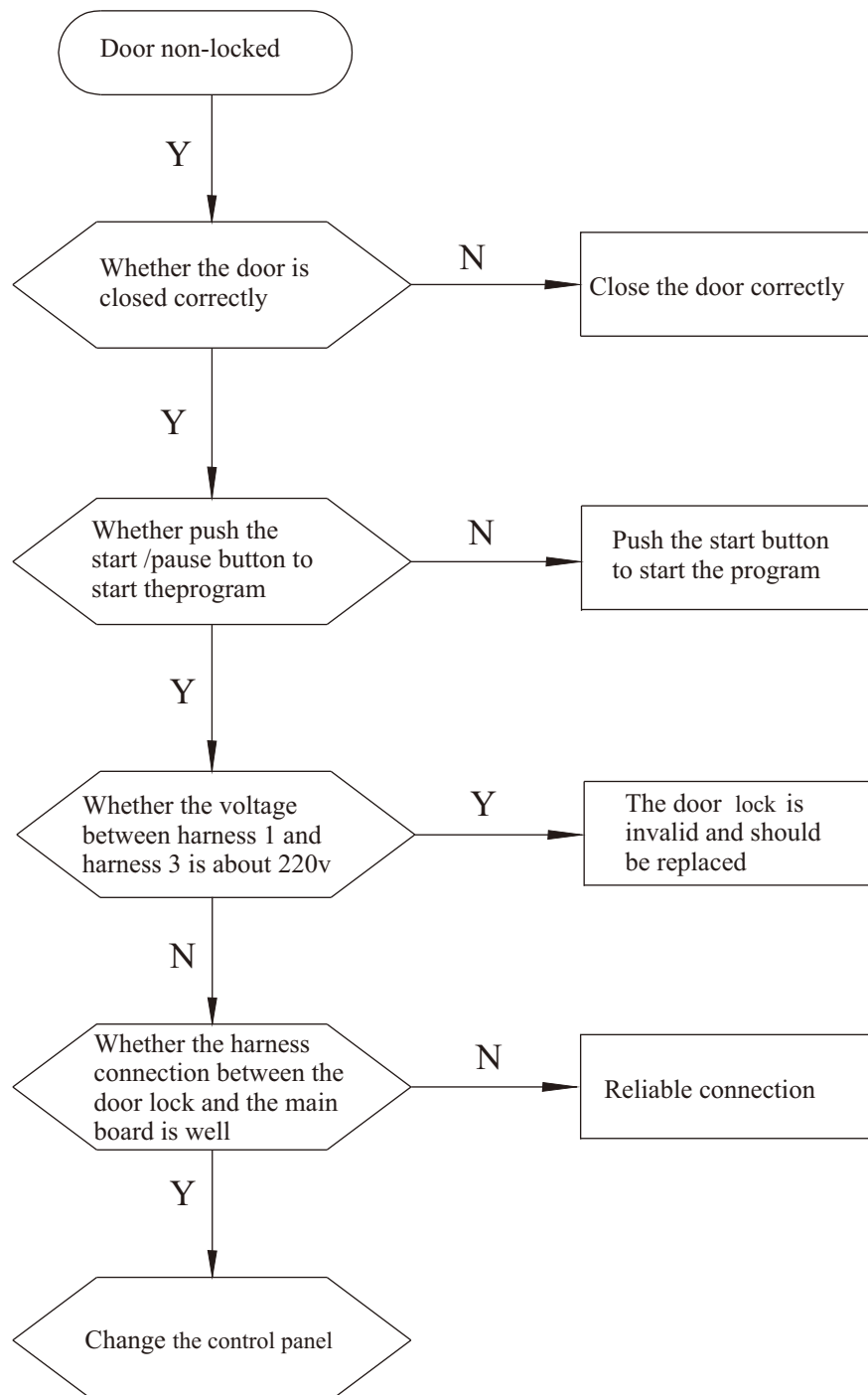
- 1) Press **Start** to enter into service mode, LED displays the current speed. The number on the display goes up in the same pace with the real speed and when it reach 400rpm, you need to press **Delay** button to get the machine to reach its target speed.( if declared speed  $\geq 1000$ rpm, target speed is 1000rpm and if declared speed  $< 1000$ rpm, target speed is its declared speed)
- 2) Press **Start/pause** button to exit and LED displays “t10”.

### 6.6 Fault tree

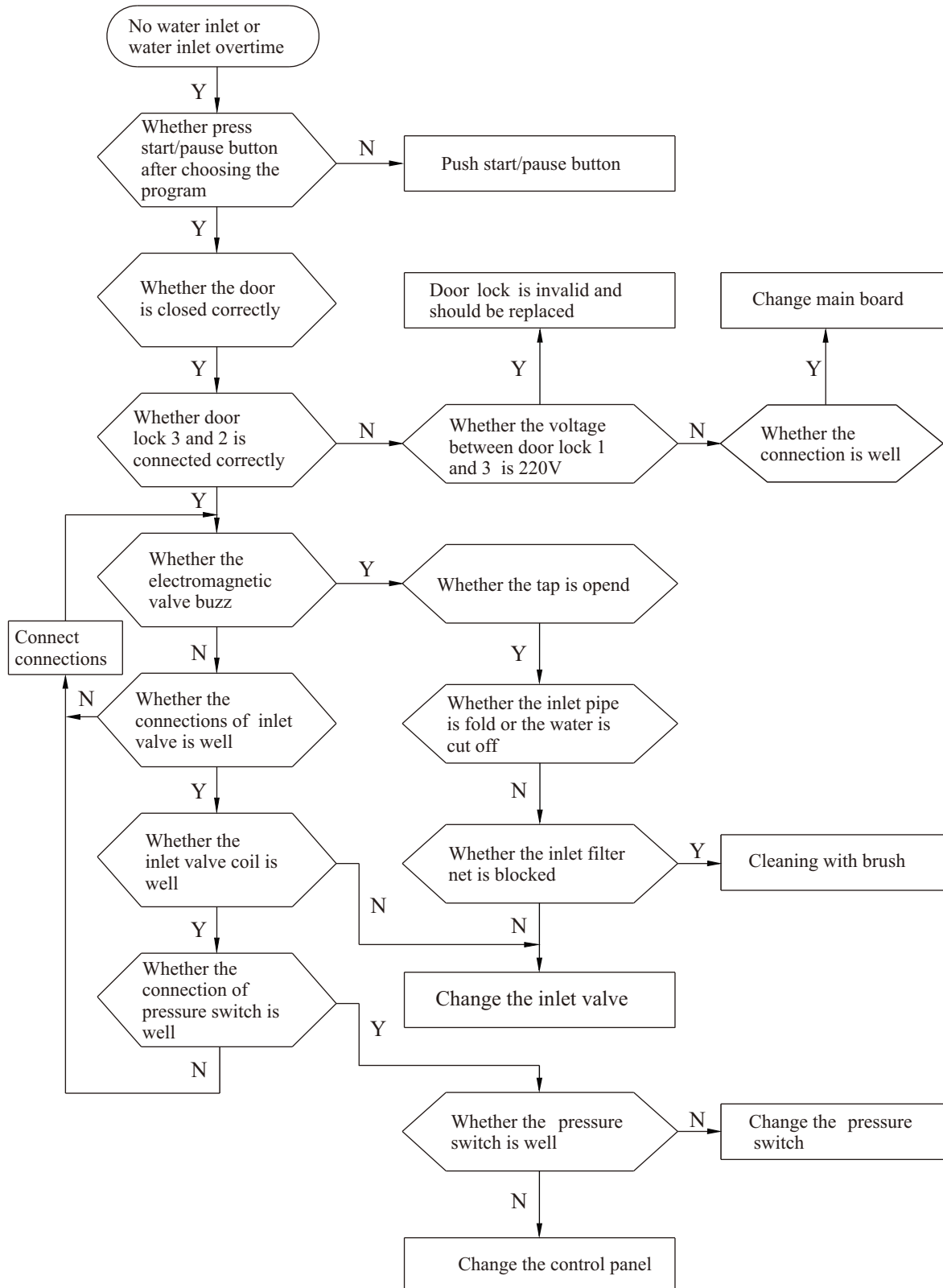
#### 1. Maintenance non-heating malfunction



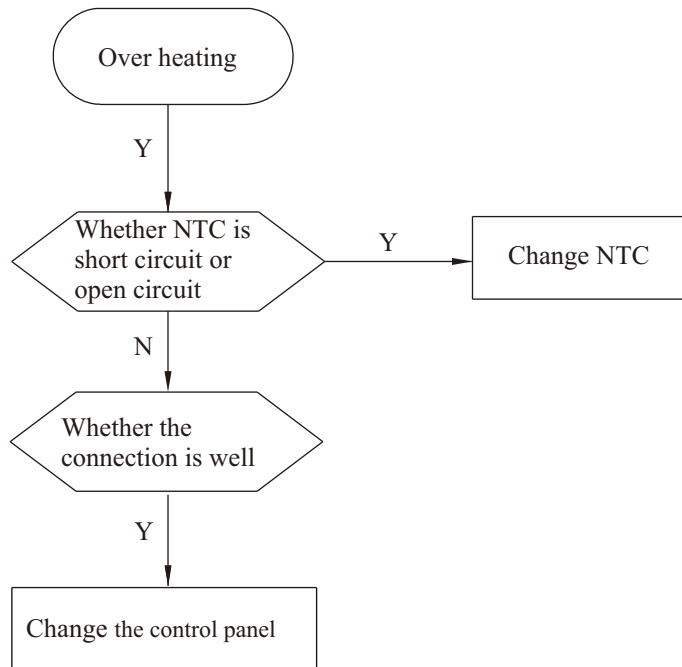
### 2. Door non-locked & its maintenance



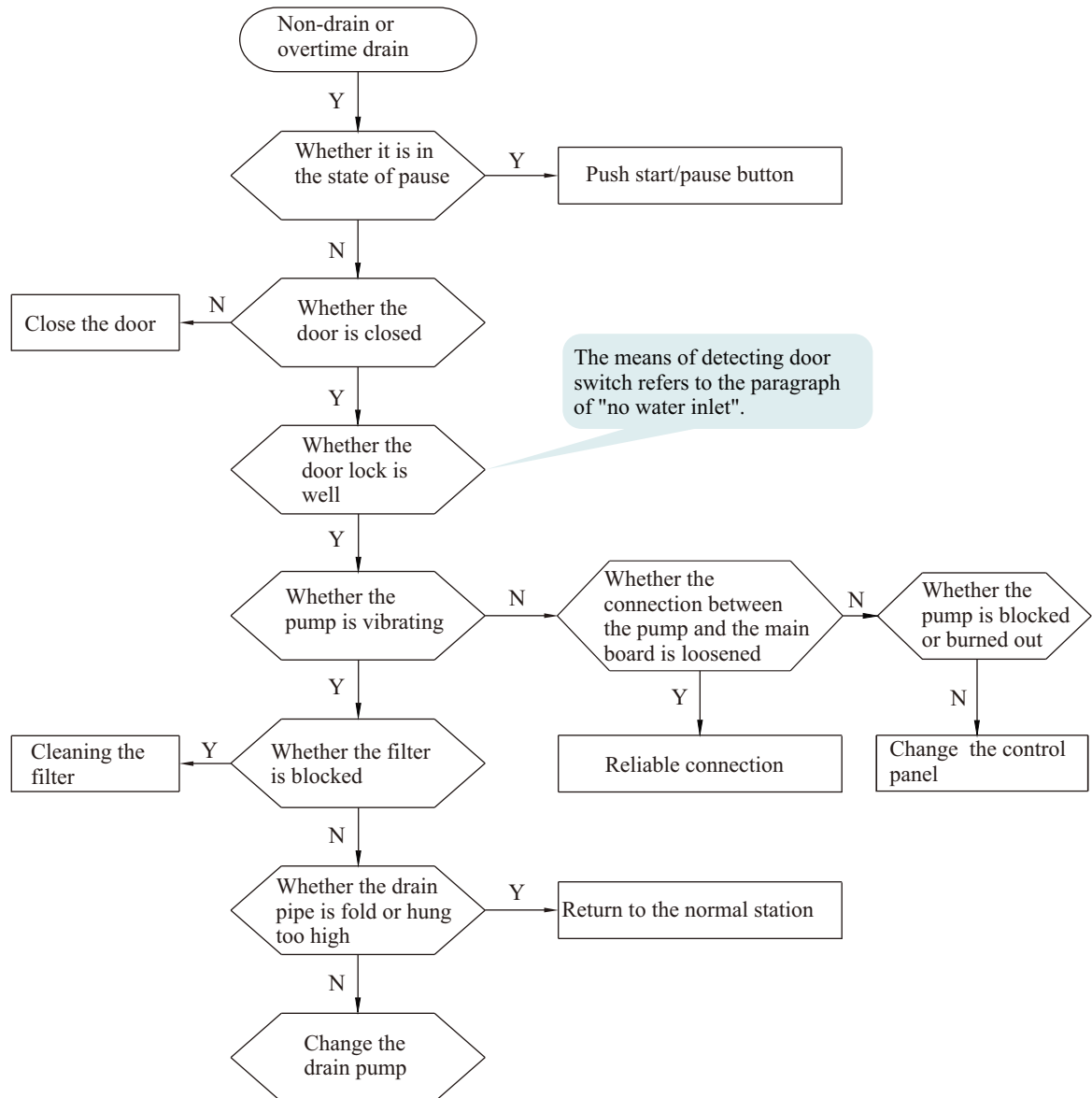
### 3. No water inlet or water inlet overtime



### 4. Heating beyond the setting temperature its maintenance

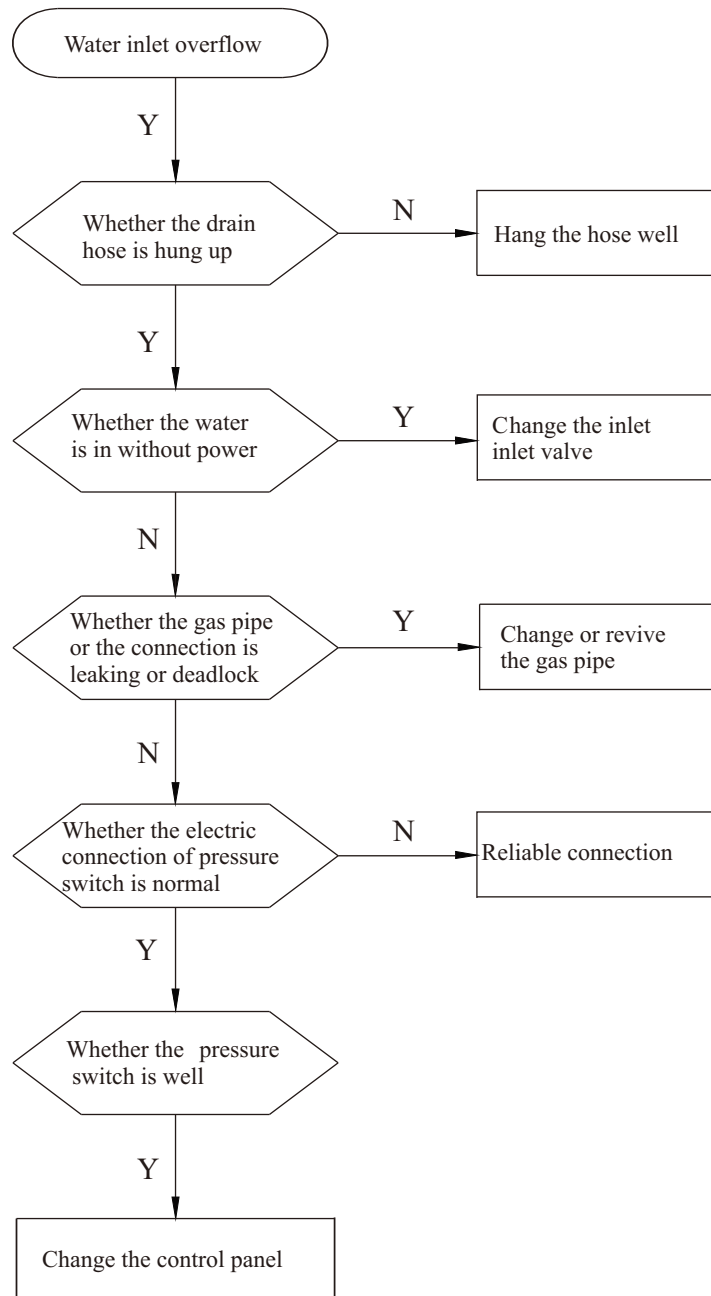


### 5. Maintenance of non-drain or drain exceed the setting time

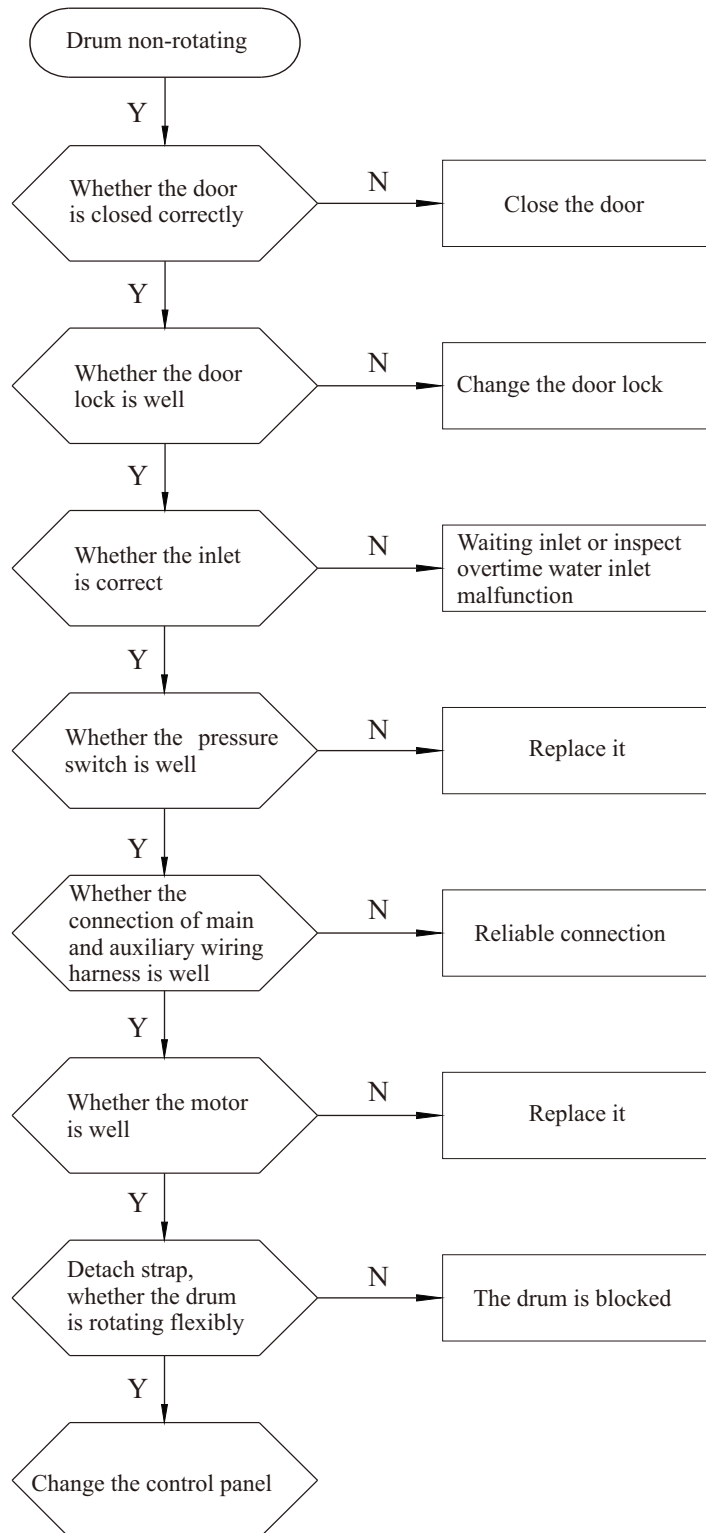




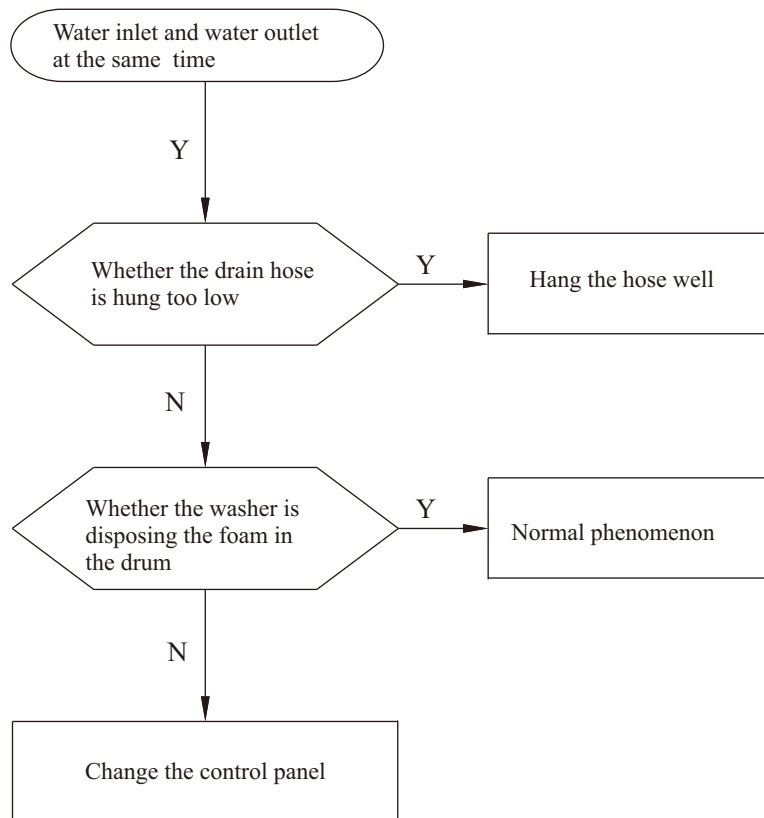
### 6. Water inlet overflow malfunction maintenance



### 7. Drum non-rotating malfunction maintenance



### 8. Maintenance water inlet and water outlet at the same time



## 6.TROUBLESHOOTING

### 6.7 Service tools

Tools for assembly and unpacking



List

Number	Tools	Suitable kit
1	Sleeve spanner	Heater (1)
		Motor (1) , counterweight (5)
		Drum tub assembly
		Strap screw
2	Spanner	Adjust pulley screw leg and undo transport bolts
3	Pliers and pinchers	Assembling or auxiliary function
4	Other tools(screwdriver, pliers and so on)	Common service tools

## 7. TECHNICAL SPECIFICATION

### 7.1 Product technical specification parameter

#### Program list

Procedure Description	Load(kg)		Detergent Box			Default Temp.(°C)	Default Time (Min)		Default Speed (rpm)	
	6.0	7.0	Case I	Case II	Softener Case	6.0/7.0	6.0	7.0	1200	1400
Cotton Intensive	6.0	7.0		●	○	40	118	118	1000	1000
Cotton 60°	6.0	7.0		●	○	60	201	198	1200	1400
Cotton 40°	6.0	7.0		●	○	40	201	198	1200	1400
Cotton 20°	6.0	7.0		●	○	20	81	81	1000	1000
Quick 15'	1.5	2.0		●	○	Cold	15	15	800	800
Eco Wash	6.0	7.0		●	○	30	69	69	800	800
Rinse&Spin	6.0	7.0		×	○	NA	34	34	1000	1000
Baby Care	6.0	7.0		●	○	60	107	107	1000	1000
Sports	6.0	7.0		●	○	40	86	86	800	800
Synthetic	3.0	3.5		●	○	40	73	73	800	800
Mixed	6.0	7.0		●	○	40	78	78	1000	1000
Delicate	6.0	7.0		●	○	30	66	66	600	600
Wool	1.5	2.5		●	○	40	66	66	400	400
Drain Only	6.0	7.0		×	×	NA	1	1	0	0
Spin Only	6.0	7.0		×	×	NA	14	14	1000	1000

## 7. TECHNICAL SPECIFICATION

### 7.2 Table of washing procedure

#### Technical parameters

Parameters \ Model	MFG60-ES1202	MFG70-ES1403
Anti-electricity	Class I	Class I
Waterproof rating	IPX4	IPX4
Rated washing capacity	6.0kg	7.0kg
Rated spinning capacity	6.0kg	7.0kg
Rated voltage	220-240V/50Hz	220-240V/50Hz
Rated input current	10A	10A
Rated dehydration speed	1200rpm	1400 rpm
Heating power	1800W	1800W
Working pressure	0.05~1MPa	0.05~1MPa
Rated consumption of water	45L /cycle	54.5L /cycle
Rated consumption of power	0.89kWh /cycle	1.02kWh /cycle
Wash performance	1.031	1.031
Energy rating	A+	A+
Net weight	50kg	56kg
Figure dimension (mm) ( length×width×high)	595×470×850	595×495×850