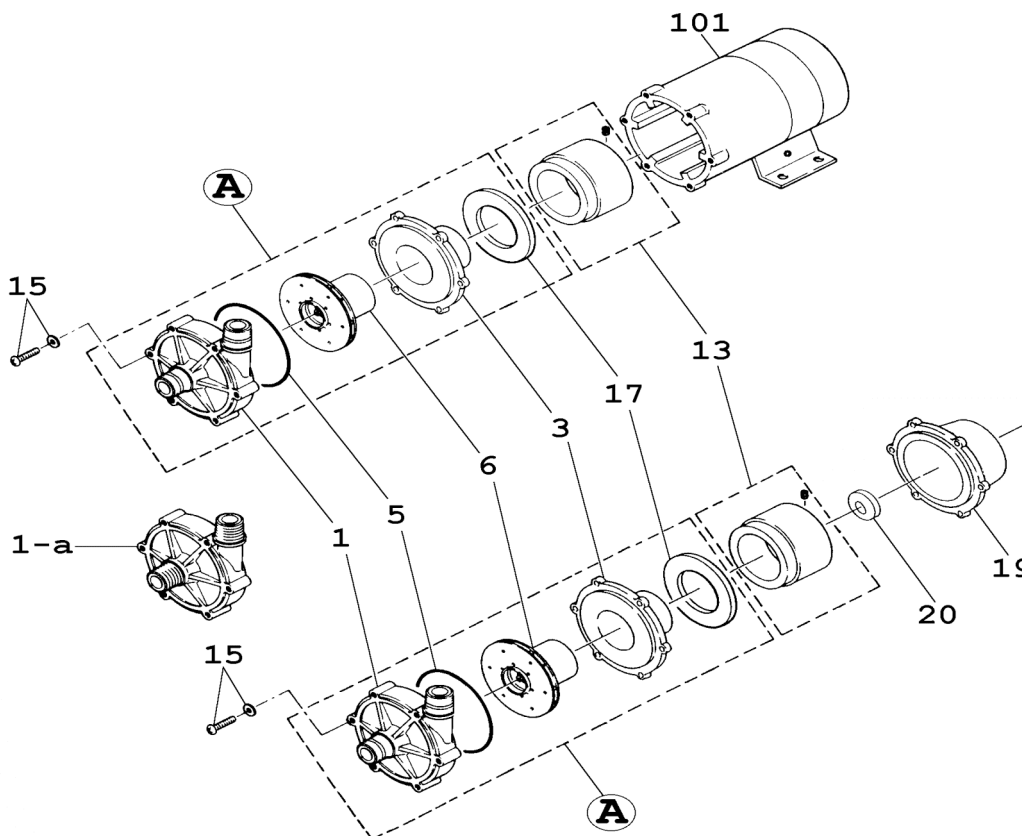


# MD-100R • 100R-5

No. 51-041  
Mar. 01, 2006



Item	Description	Q'ty	Material	MD-100R	MD-100R-5
				Part No.	Part No.
1	Front Casing (+Bearing) Unit	1	GFRPP+PTFE+	MD0143	ï
1-a	" 'M' "	1	Alumina Ceramic	MD0144	ï
3	Rear Casing (+Bearing) Unit	1	GFRPP+PTFE	MD0149	ï
5	O-Ring	AS568-244	FKM	MD0145	ï
			EPDM	MD0514	ï
6	Impeller Unit	Ø 84 mm	CFRPP+PTFE+	MD0147	
		Ø 100 mm	Al.Ceramic+Ferrite		MD0631
13	Drive Magnet Unit (Ø14mm)	1	Aluminium+Ferrite	MD0150	ï
*13	" for IEC Motor (Ø14mm)	1		MD0707	ï
15	Bolt+S.W.+P.W.	M6x50	SUS304 equivalent	MD0378	ï
17	Retainer Ring	1	SUS304	MD0155	ï
101	Motor [AC220/240V] 1-Phase	1		MD0332	ï
	Motor [AC400/440V] 3-Phase	1		MD0334	ï
*19	Bracket for IEC Motor	1	FC200	MD0336	ï
*20	Spacer for IEC Motor	1	Aluminium	MD0411	ï
A	Wet End Set	1	with FKM	MD0158	MD0160
		1	with EPDM		
A	Wet End Set, 'M' Type	1	with FKM	MD0159	MD0161
		1	with EPDM		

Note: Items marked with \* are required to fit an IEC Motor.

⚠ Subject to change without prior notice! ⚠ Actual pump may differ from the exploded view!

## 6 HANDLING INSTRUCTIONS

---

### 1. Handle the pump carefully

Strong impact to the pump assembly may result in damage or reduced performance.

### 2. Starting

Before priming the pump be sure the power is turned off then proceed with filling the pump end with water. Note, the pump must be fully primed before starting.

Next close the valve on the outlet or discharge side of pump. Turn on power to the pump, when full speed is reached gradually open the discharge valve until specified flow rate is achieved.



#### Caution

**Operating the pump dry (without liquid) may cause severe damage.**

### 3. Stopping

When stopping the pump, first close the discharge valve gradually. When it is completely closed, turn off the power switch so that the pump stops. Never stop the pump suddenly by quickly closing a valve (i.e., solenoid or hydraulic valves).



#### Caution

**Quick valve closure may cause water hammer that can cause severe damage to the pump.**

### 4. Temperature

The pump itself may not suffer a change in performance due to temperature fluctuation. However, the liquid may change in terms of viscosity, vapor pressure, and corrosive properties. Pay special attention to changes in liquid characteristics as a result of temperature fluctuation.

Liquid temperature range: 32 – 176°F (0 – 80°C)

Ambient temperature range: 32 – 104°F (0 – 40°C)

### 5. As there is a powerful magnet inside the pump unit, do not use any liquid that contains metallic substances such as iron, nickel, etc.

### 6. Do not operate the pump in the following places:

- Places exposed to rain and/or wind.
- Places where the temperature falls below 32°F (0°C).
- Places where corrosive gas (such as chlorine) is present.
- Places exposed to splashing of water or fluid being pumped.
- Places where the ambient temperature is 104°F (40°C) or above.
- Places where explosive or combustible materials/gases are present.

### 7. Do not operate the pump with the following liquids:

- For the compatibility to chemical liquid or any special liquid, contact an Iwaki America sales representative.
  - Liquids that significantly swell polypropylene.
  - Paraffinic hydrocarbons such as gasoline and kerosene.
  - Halogenated hydrocarbons such as trichloroethylene and carbon tetrachloride.
  - Ether and low-grade ester
  - Slurry
- (For a chemical compatibility to guide contact Iwaki America customer service.)
8. To prevent fire and explosions, do not place dangerous or flammable substances near the pump.
  9. Be sure unit is properly ground.
  10. If a pumped is damaged, it can be dangerous to operate. Contact factory for assistance.
  11. Avoid direct physical contact with the motor or pump during operation, as surface temperatures may be extremely high due to operating conditions.

## **7 INSTALLATION, WIRING AND CONNECTIONS**

---

### **7.1 Installation**

1. **Installation site**  
Installation site must have an ambient temperature of 32-104°F (0-40°C) and a relative humidity lower than 90%. Install the pump where maintenance and inspection work can be done easily.
2. **Pump installation method**  
This pump is not self-priming. It is recommended that the pump shall be installed in a position lower than the liquid level of the suction tank by at least 12 inches (30 cm). If this distance is too short, air may enter the pump, causing damage.
3. **Direction of pump discharge port**  
The discharge port can be directed as desired. However, for efficient elimination of air in the pump end, it is recommended that the discharge port be positioned in the horizontal direction.
4. **Anchoring of base**  
The base of the pump must be anchored firmly. The pump must not be mounted in a vertical position.

## 7.2 Piping instructions

1. To minimize frictional resistance, the shortest piping possible with a minimum number of bends should be utilized on the inlet or suction side of the pump.
2. Use a corrosion-resistant vinyl hose that is rated at or above the pressure rating of the pump (see specification table).
3. Hose size (for hose-barb style pumps)  
Select hose size in accordance with the diameter of the pump connections. As the hose tends to be crushed under the force, the use of a braided reinforced hose is recommended. Note, if the connection on the suction side is loose air may be mixed in with pumped fluid.

**(In the case of high temperature liquids, special attention must be paid to the selection of a hose.)**

4. Hose connection  
Be sure to cut the ends of the hose straight. Press the hose end firmly against the discharge or suction port until it reaches the bottom of the port. Use a fastener (such as a hose clamp) to make the connection tight and leak free.



### **Caution**

**Do not over tighten the connection ports (suction and discharge) excessively as they are made of plastic resin and are could be damaged.**

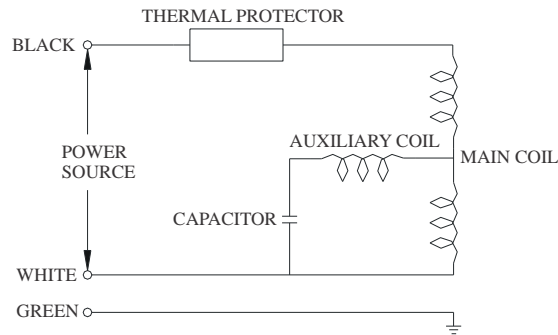
5. Valve installation  
Install valves close to the suction and discharge ports.
  - Suction side valve:  
For easy liquid removal and pump maintenance
  - Discharge side valve:  
For adjustment of the discharge rate or head and for easy removal and pump maintenance.

## 7.3 Wiring

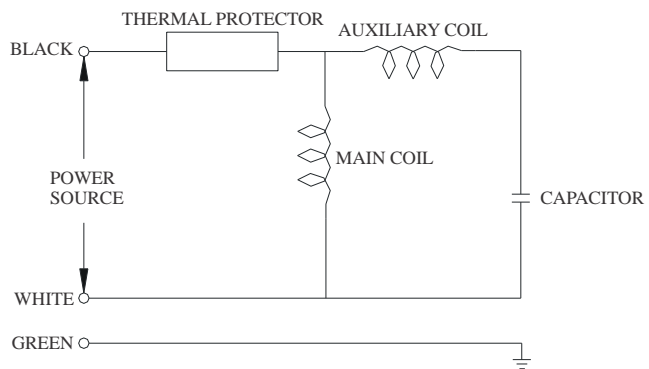
1. Prior to wiring the pump, confirm the voltage indicated on the nameplate is correct for your installation. (Observe all local and national regulations regarding electrical work.) The connection diagram is presented on the next page.
2. The pump does not have an external switch. It starts when power is supplied to the pump wires.

## Wiring diagrams

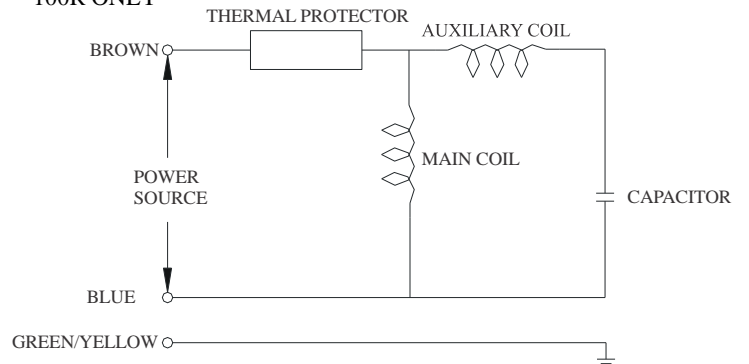
- (W)MD-15R, 20R, 20RX, 20RZ, 30R, 30RX and 30RZ (Single-phase capacitor run motor with thermal protector)



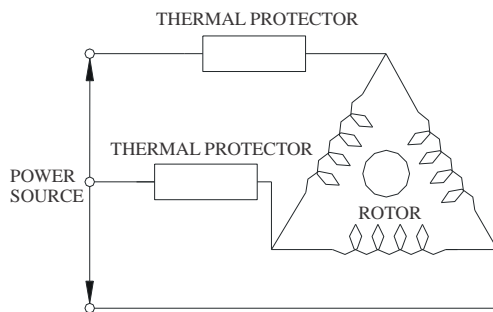
- (W)MD-40R, 40RX, 40RZ, 55R, 70R, 70RZ, and 100R (Single-phase capacitor run motor with thermal protector)



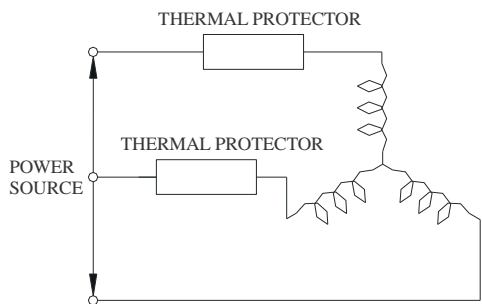
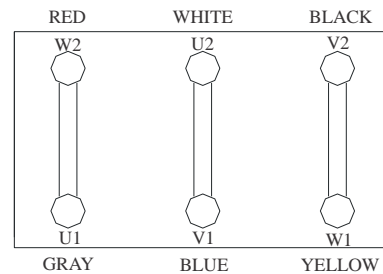
100R ONLY



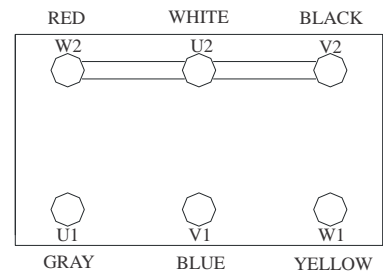
- MD-70R, 70RZ, and 100R models (3-phase motor, 220/380V)



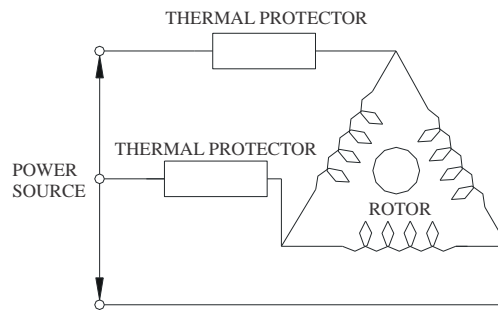
220V



380V



- (W)MD-70R, 70RZ, and 100R models (3-phase motor,400/440V)



## 8 ASSEMBLY

---

1. Place the motor on end vertically so that the shaft is pointed upward.
2. Install the drive magnet on the motor shaft and position the shaft flush with the inside of the magnet. Note: On WMD models, screw the bracket to the motor first.
3. Insert the rear casing into the magnet/motor bracket.
4. Install the impeller and O-ring into the rear casing.
5. Place the front casing over the pump, making sure that the volute casing is aligned.
6. Using a hex head driver, fasten the liquid end to the bracket using six screws. Tighten in a star pattern.

## 9 OPERATION



### Caution

- Before operating the pump, confirm that connections to the discharge and suction ports are secure.
- Dry run operation (operation without liquid in the pump) damages the pump. Be sure to fill the pump with liquid prior to startup.
- Do not operate the pump with closed, or almost entirely closed, suction and/or discharge side valve(s). A closed suction valve will cause dry-run operation.
- Do not open or close the suction or discharge side valve suddenly, this may result in decoupling and damage to the pump end. (Under such circumstances, turn off the power supply immediately. When the motor stops rotating, the magnetic coupling will be reconnect automatically.)

No.	Operation Step	Note
1	Check piping, wiring and voltage.	Check connections to confirm they are secure and leak-free. Check the power supply voltage by referring to the information on the nameplate.
2	Open and close valves.	Fully open suction side valve. Fully close discharge side valve.
3	Check that pump chamber is filled with liquid.	Fill pump chamber with priming liquid. Be sure suction line is completely filled, this is especially important if pump is above liquid level.
4	Supply power to pump	After steps 1 to 3 above, connect power supply to start pump.
5	Adjust discharge capacity & head to desired values.	Adjust discharge side valve gradually till desired discharge capacity and head are obtained. Do not open or close valves suddenly. <b>Note: Do not keep discharge side valve closed for more than 1 minute.</b> <b>Note: Check that pump is operating normally. If not, turn off power immediately and eliminate cause referring to 'Causes of Trouble and Troubleshooting' section (p.27).</b>
6	Checkpoints during operation	Be careful to prevent solids from entering the pump. Solids in the pump may cause impeller to be locked stopping liquid circulation. The motor continues to rotate even if impeller is locked. In such a case, turn off power supply at once.

## Pump Stopping Procedure

No.	Stopping Step	Description
1	Close discharge side valve.	Close discharge side valve gradually. Do not use electromagnetic valve for quick closing.
2	Switch power off.	Check that motor stops smoothly after power supply is disconnected. If not, pump should be inspected. (For details, contact Iwaki or your dealer.)

## How to store pump when it is out of use for a long time

Remove the liquid from the pump if it is to be stored for a long period of time. In addition, run it with water for about 5 minutes every 3 months to prevent rust on the motor bearing.

### Warning

- Before draining the pump, turn off the power supply.
- Be sure to wear proper safety gear (gloves, protective shoes, etc.) when handling pump end for draining purposes, especially when a hazardous chemical is being pumped.



### Caution

Note that residual liquid may run from the discharge and suction ports when the housing is removed. Do not allow any electric parts to come in contact with the liquid.

Never discharge hazardous or chemical liquid over the ground or floor in the plant. Instead, use a draining pan (or container). Observe each applicable local law or regulation for the handling or disposal of hazardous liquids.

## Draining procedure

1. Turn off the power supply. (Make sure no other operator will turn the power supply on accidentally.)
2. Close the discharge and suction sides valves fully.
3. Remove the hoses piping attached to the pump.
4. Remove the screws on the pump base to detach the pump from its mounting location.
5. Rotate the pump.
6. Discharge hazardous liquids appropriately.



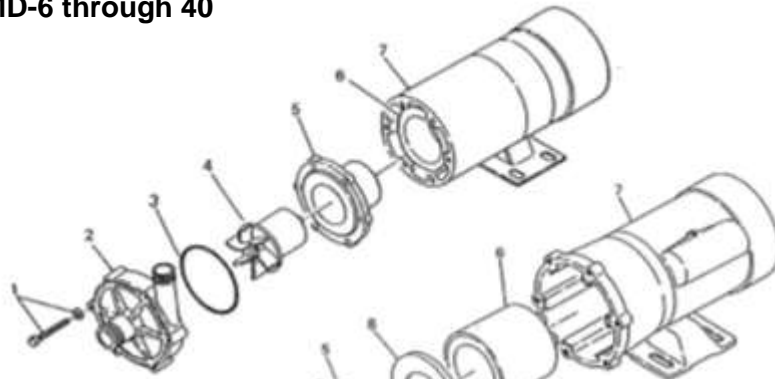
## 10 MAINTENANCE/INSPECTION

### Maintenance and inspection

- When the pump has been used for a long time, the front casing screws attaching the pump head to the motor bracket may loosen. Tighten screws periodically taking care not to deform the plastic parts. Also, after pump has been stored for a long time, tighten screws before pump is used again.
- Daily inspection  
Check operating conditions (vibration, noise) as well as electric current value and pump discharge capacity. As soon as you find any abnormality, turn off power and refer to “Troubleshooting” on page 27.

## 11 PARTS DESCRIPTION AND EXPLODED VIEW

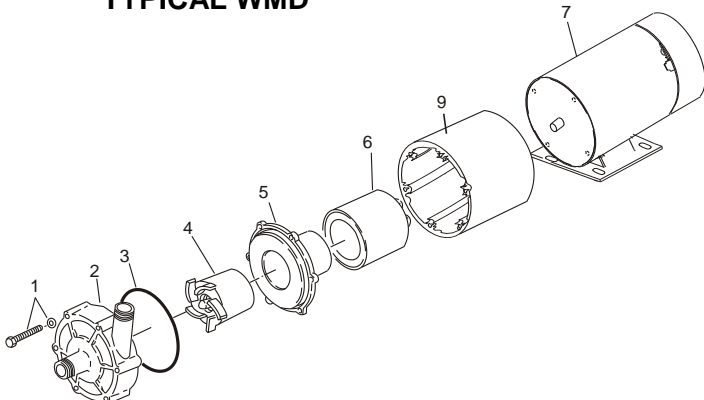
### TYPICAL MD-6 through 40



### TYPICAL MD-55/70/100



### TYPICAL WMD



Item No.	Description	Item No.	Description
1	Screw	5	Rear Casing
2	Front Casing	6	Drive Magnet
3	O-Ring	7	Motor Assembly
4	Impeller	8	Retainer (MD-100R,100F,55F only)
		9	Bracket

## 13 TROUBLESHOOTING

	Pump does not start.	Pump is not pumping or flow is insufficient.	Electric current is high.	Excessive noise or vibration.	Liquid leaks.	
Power is not supplied or wiring is faulty.	<input type="radio"/>		<input type="radio"/>			Check power connections or contact your dealer.
Motor is out of order (short coil or capacitor failure).	<input type="radio"/>		<input type="radio"/>			Contact your dealer.
There is residual air in the pump.		<input type="radio"/>		<input type="radio"/>		Eliminate air from pump end completely.
Air is sucked in via suction port.		<input type="radio"/>		<input type="radio"/>		Check suction connection.
Pump is running dry.		<input type="radio"/>		<input type="radio"/>		Supply priming water to pump.
Specific gravity/viscosity of liquid is too high.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>			Confirm application with pump specifications.
Periphery of impeller magnet is in contact with rear casing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		Contact your dealer.
Impeller is damaged.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		Contact your dealer.
Foreign matter is stuck to impeller.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		Contact your dealer.
O-ring is damaged.					<input type="radio"/>	Contact your dealer.
Loose front casing bolts.		<input type="radio"/>			<input type="radio"/>	Tighten bolts.



**[www.PumpAgents.com](http://www.PumpAgents.com) - click here for pricing and ordering**