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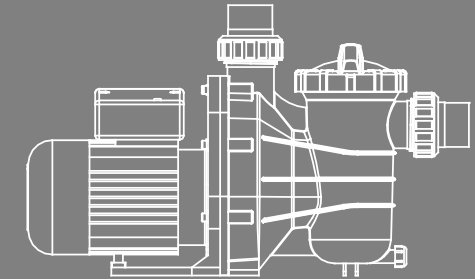
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# SS, SS-T SERIES CENTRIFUGAL PUMP

Installation and Operation Manual



EMAUX WATER TECHNOLOGY CO., LTD

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## USER MANUAL

💧 STRIVE FOR CLEAR WATER

[www.emauxgroup.com](http://www.emauxgroup.com)



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This Limited Warranty extends only to products purchased from Emaux authorized reseller. This Limited Warranty does not extend to any product that has been damaged or rendered defective (a) as a result of accident, misuse or abuse;  
(b) as a result of an act of God;  
(c) by operation outside the usage parameters stated herein;  
(d) by the use of parts not manufactured or sold by Emaux;  
(e) by modification of the product;  
(f) as a result of war or terrorist attack; or  
(g) as a result of service by anyone other than Emaux authorized reseller or authorized agent.

EXCEPT AS EXPRESSLY SET FORTH IN THIS WARRANTY, EMAUX MAKES NO OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. EMAUX EXPRESSLY DISCLAIMS ALL WARRANTIES NOT STATED IN THIS LIMITED WARRANTY. ANY IMPLIED WARRANTIES THAT MAY BE IMPOSED BY LAW ARE LIMITED TO THE TERMS OF THIS EXPRESS LIMITED WARRANTY.

Key No.	Part No.	Description	QTY
18	106241439	Capacitor for SS020T Pump (220V/50Hz)	1
18	106241443	Capacitor for SS033T Pump (220V/50Hz)	1
18	106241444	Capacitor for SS050T Pump (220V/50Hz)	1
18	106241421	Capacitor for SS075T Pump (220V/50Hz)	1
18	106241424	Capacitor for SS100T/120T Pump (220V/50Hz)	1
19	1062570102	PCB	1
21	4202870076	Wire box top cover	1
21	4202770076	Wire box bottom cover	1
22	01031027	Cooling Fan for SS020T/033T Pump	1
22	01031026	Cooling Fan for SS050T-120T Pump	1
23	01031011	Fan Cover for SS020T/033T Pump	1
23	01031010	Fan Cover for SS050T-120T Pump	1
24	02011104	O-Ring for 1.5" Union	2

## 9. TERMS OF THE WARRANTY

As original purchaser of this equipment have purchased from Emaux Water Technology Co Ltd, through Authorized International Distributor or Dealer, warrants its products free from defects in materials and workmanship under normal use during warranty period. The warranty period begins on the day of purchase and extends only to the original purchaser. It is not transferable to anyone who subsequently purchases the product from you. It excludes all expendable parts. During the warranty period, Emaux authorized reseller will repair or replace defective parts with new parts or, at the option of Emaux, serviceable used parts that are equivalent or superior to new parts in performance.

## WARNINGS AND SAFETY INSTRUCTIONS

### GENERAL WARNING

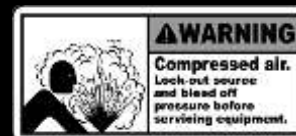
This instruction contain general caution information for use in Pool and SPA pump installation application. Specified Pump model function should be refer to particular manual. Components such as the filtration system, pumps and heater must be positioned so as to prevent their being used as means of access to the pool by young children.



### RISK OF ELECTRICAL SHOCK

This appliance should be installed by qualified electrical personnel in accordance with National Electrical Code and all applicable local codes and ordinances. Hazardous voltage can shock, burn, and cause death or serious property damage. DO NOT use an extension cord to connect unit to electric supply to reduce the risk of electric shock.

1. The pump should be permanently connected to an individual circuit breaker.
2. Pump must be connected to a residual current device (RCD) having a rated residual operating current not exceeding 30 mA or receptacle with ground fault circuit interrupt (GCFI).
3. Electrical grounding must be connected before connecting to electrical power. Failure to ground all electrical equipment can cause serious or fatal electrical shock hazard.
4. Bonding: Use at least #8 AWG (#6 AWG for Canada) a solid copper conductor, run a continuous wire from external bonding lug (if available) to the pressure wire connector provided on the electrical equipment and to all metal parts of swimming pool, spa, or hot tub, and metal piping (except gas piping), and conduit within 1.5 m (5 ft) of inside walls of swimming pool, spa, or hot tub.
5. Never open the inside of the drive motor enclosure. There is a capacitor bank that holds a mains supply voltage charge even when there is no power to the unit. The voltage should be referred to the individual pump operation voltage.
6. The pump is capable of high flow rates; use caution when installing and programming to limit pumps performance only.
7. Switch OFF pump power before servicing and disconnecting the main circuit to the pump.
8. Never change the filter control valve position while the pump is running.



### COMPRESS AIR HAZARDOUS

This system enclosed pre-filter / filter and become pressurized. Pressurized air can cause the Lid to separate which can result in serious injury or death.

### STAND CLEAR OF PUMP DURING START-UP

Pool and spa circulation systems operate under high pressure. When any part of the circulating system (i.e. lock ring, pump, filter, valves, etc.) is serviced, air can enter the system and become pressurized. Filter tank Lid and pre-filter cover must be properly secured to prevent violent separation. Place pre-filter / filter air relief valve in the open position and wait for all pressure in the system to be relieved before remove the lib to access the basket for cleaning.



### HYPERTHERMIA

SPA water temperature excess 38°C (104°F) may be injurious to health. Measure water temperature before entering SPA. Hyperthermia occurs when the internal temperature of the body reaches a level several degrees above the normal body temperature of 98.6°F (37°C). The symptoms of hyperthermia include drowsiness, lethargy, and an increase in the internal temperature of the body.



## SUCTION ENTRAPMENT HAZARD

This pump produces high levels of suction and creates a strong vacuum at the main drain at the bottom of your pool and spa. This suction is so strong that it can trap adults or children under water if they come in close proximity to a pool or spa drain or a loose or broken drain cover or grate.

The Virginia Graeme Baker (VGB) Pool and Spa Safety Act creates new requirements for owners and operators of commercial swimming Pools and spas.

Commercial pools or spas constructed on or after December 19, 2008, shall utilize:

1. A multiple main drain system without isolation capability with suction outlet covers that meet ASME/ANSI A112.19.8a Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs and either:
  - 1.1 A safety vacuum release system (SVRS) meeting ASME/ANSI A112.19.17 Manufactured Safety Vacuum Release systems (SVRS)  
For Residential and Commercial Swimming Pool, Spa, Hot Tub, and Wading Pool Suction Systems and/or ASTM F2387 Standard  
Specification for Manufactured Safety Vacuum Release Systems (SVRS) for Swimming pools, Spas and Hot Tubs or
  - 1.2 A properly designed and tested suction-limiting vent system or
  - 1.3 An automatic pump shut-off system.

Commercial pools and spas constructed prior to December 19, 2008, with a single submerged suction outlet shall use a suction outlet cover that meets ASME/ANSI A112.19.8a and either:

1. A SVRS meeting ASME/ANSI A112.19.17 and/or ASTM F2387, or
2. A properly designed and tested suction-limiting vent system, or
3. An automatic pump shut-off system, or
4. Disabled submerged outlets, or
5. Suction outlets shall be reconfigured into return inlets.

There are five types of suction entrapment according to The Virginia Graeme Baker (VGB) Pool and Spa Safety Act

1. Body Entrapment a section of the torso becomes entrapped
2. Limb Entrapment an arm or leg is caught by or pulled into an open drainpipe
3. Hair Entrapment or entanglement hair is pulled into and/or wrapped around the grate of the drain cover
4. Mechanical Entrapment the bather's jewelry or clothing gets caught in the drain or the grate
5. Evisceration the victim's buttocks come into contact with the pool suction outlet and he or she is disemboweled



### TO REDUCE ENTRAPMENT HAZARD RISK

Two function suction outlets per pump must be installed to prevent entrapment. The minimum separate of suction on the same plate must be at least point to point measurement 1 meter (3ft) apart. It is used to avoid "dual blockage" by bather.

**WARNING:** If suction is found damage, broken, cracked, missing or not securely attached during regular checking, shunt down the pool and replace it immediately.

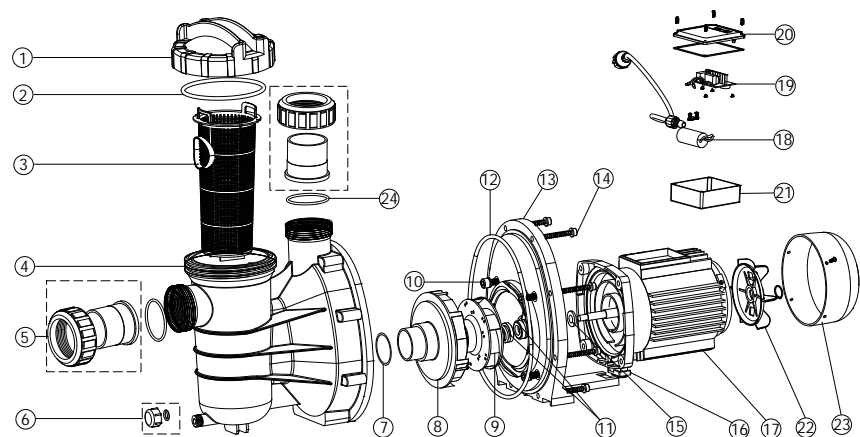
A vacuum release or vent system is recommended to install for suction entrapment release.

Key No.	Part No.	Description	QTY
1	01201031	Transparent Lid	1
2	02010247	O-Ring for Lid	1
3	01112051	Basket	1
4	01021064	SS Pump Pre-Filter	1
5	89280105	1.5" Union	2
6	89022402	Drain Plug With O'Ring	1
7	02011004	O-Ring for Diffuser	1
8	01111014	Diffuser	1
9	01311015	Impeller SS020(220V/50Hz)	1
9	01311016	Impeller SS033(220V/50Hz)	1
9	01311017	Impeller SS050(220V/50Hz)	1
9	01311018	Impeller SS075(220V/50Hz)	1
9	01311019	Impeller SS100(220V/50Hz)	1
9	01311014	Impeller SS120(220V/50Hz)	1
10	89022403	M8 x 16 Screw with Washer	4
11	04015033	1/2" Mechanical Seal	1
12	02011090	O-Ring for Flange	1
13	01021065	SS Pump Flange	1
14	03011035	M6 x 30 Screw	8
15	02011156	Motor Slinger	1
16	89022404	Motor Support	1
17	104007375	Motor SS020T(220V/50Hz)	1
17	104007374	Motor SS033T(220V/50Hz)	1
17	104001151	Motor SS050T(220V/50Hz)	1
17	104001154	Motor SS075T(220V/50Hz)	1
17	104001158	Motor SS100T/120T(220V/50Hz)	1

Key No.	Part No.	Description	QTY
18	04016030	Capacitor for SS/SD/SQ/ST020 AMU020P/TP(50/60Hz)	1
18	04016031	Capacitor for SS/SD/SQ/ST033 Pump	1
19	89022112	Cable Box for SD,SQ,SP,ST050-120 Pump	1
20	89022111	Cable Box for SQ/ST/SD020-033, SS020-SS030 Pump	1
21	89021505	Cable Box for SA/ ST/ SD 110V	1
22	01031027	Cooling Fan for SS/SD/SQ/ST050-SS/SD/SQ/ST120 Pump	1
22	01031026	Cooling Fan for SS/SD/SQ/ST020-SS/SD/SQ/ST030 Pump	1
23	01031011	Fan Cover for SS/SD/SQ/ST020-SS/SD/SQ/ST030 Pump	1
23	01031010	Fan Cover for SQ/SP/SS/SD/ST050-SQ/SP/SS/SD/ST120	1
24	02011104	O-Ring for 1.5" Union	2

Notes: 5\* 89280105B is 1.5" Union in Black Colour  
5\* 89280105W is 1.5" Union in White Colour

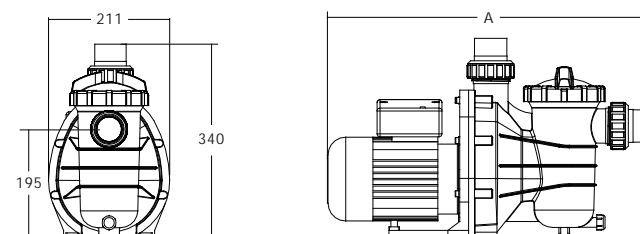
## SS SERIES WITH TIMER



## 1. PRODUCT INFORMATION

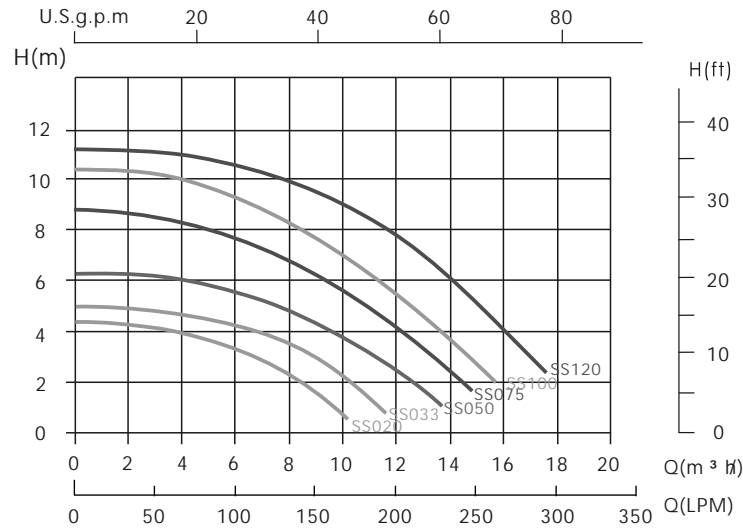
Model 50Hz	Input (kW)	Current (AMP)	Noise (dB)	Head(m)			
				2	4	6	8
				FlowRate(m <sup>3</sup> /h)			
SS020 / SS020T	0.28	1.5	55	8.4	4	-	-
SS033 / SS033T	0.43	2	55	10.4	7	-	-
SS050 / SS050T	0.55	2.5	60	12.4	10	4	-
SS075 / SS075T	0.75	3.5	60	14.4	12.2	9.4	5
SS100 / SS100T	0.90	4.7	65	15.2	13.8	11.4	8.4
SS120 / SS120T	0.97	5.8	65	18	16	14	12

## DIMENSIONS



Code 220V/50Hz	Code 110V/60Hz	Model	Connection Size	Horsepower	Weight (kg)	Capacitance 220V	Capacitance 110V	A mm
88022401	88022601	SS020	1.5" / 50mm	0.2hp	6.20	5μF	20μF	507
88022402	88022602	SS033	1.5" / 50mm	0.33hp	6.50	6μF	24μF	507
88022403	88022603	SS050	1.5" / 50mm	0.5hp	8.03	8μF	30μF	552
88022404	88022604	SS075	1.5" / 50mm	0.75hp	9.01	14μF	40μF	552
88022405	88022605	SS100	1.5" / 50mm	1.0hp	9.09	20μF	60μF	552
88022406	88022606	SS120	1.5" / 50mm	1.2hp	11.00	20μF	60μF	552
9020329	/	SS020T	1.5" / 50mm	0.2hp	6.20	5μF	/	507
9020330	/	SS033T	1.5" / 50mm	0.33hp	6.50	6μF	/	507
9020331	/	SS050T	1.5" / 50mm	0.5hp	8.03	8μF	/	552
9020332	/	SS075T	1.5" / 50mm	0.75hp	9.01	14μF	/	552
9020333	/	SS100T	1.5" / 50mm	1.0hp	9.09	20μF	/	552
9020334	/	SS120T	1.5" / 50mm	1.2hp	11.00	20μF	/	552

## PERFORMANCE CURVE



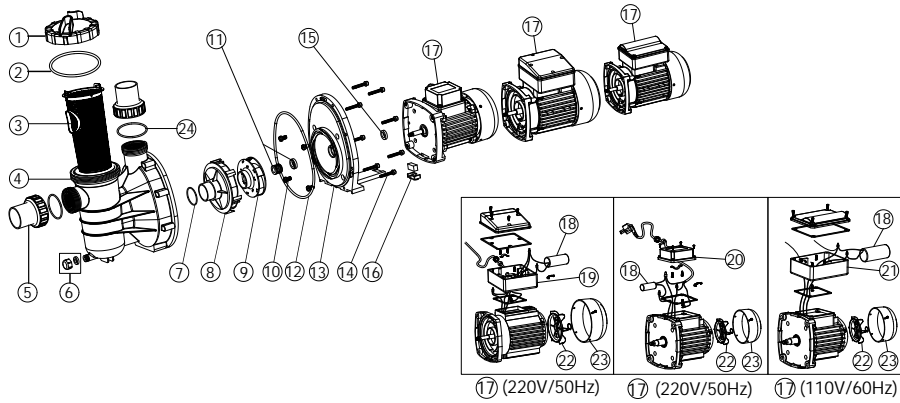
## 2. INSTALLATION

### 2. 1 PIPING

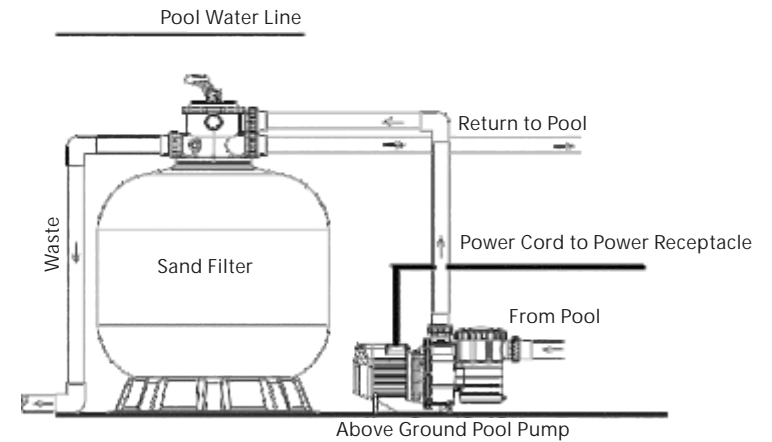
1. Locate the system below the pool water line, for best pump performance.
2. Install the pump as close to the pool as possible, preferably in a dry, well ventilated area away from direct sunlight. Protect the pump from excessive moisture.
3. Before installing the pump, make sure that the surface is solid, elevated, rigid and vibration free.
4. Secure the pump to the base with screws or bolts to limit the vibration and the stress on the pipe or the joints.
5. Leave enough space for gate valves in suction and discharge piping, if required.
6. Ensure there is enough clearance for pre-filter basket & Lid open and motor ventilation.
7. Connect the suction and discharge pipe to the outlet and inlet of the swimming pool.
8. Make sure that floor drainage is adequate to prevent flooding.
9. Make sure that the pump and piping are accessible for servicing.

Key No.	Part No.	Description	QTY
13	01021065	SS Pump Flange	1
14	03011035	M6 x 30 Screw	8
15	02011156	Motor Slinger	1
16	89022404	Motor Support	1
17	89022109	Motor SD020/SQ020/SS020/ST020(220V/50Hz)	1
17	89022110	Motor SD033 (220V/50Hz)	1
17	89022105	Motor SD050/SQ050/SS050/ST050(220V/50Hz)	1
17	89022106	Motor SD075/SQ075/SS075/ST075(220V/50Hz)	1
17	89022107	Motor SD100/SQ100/SS100/ST100(220V/50Hz)	1
17	89022108	Motor SD120/SQ120/SS120/ST120(220V/50Hz)	1
17	89022201	Motor SD/SQ/SS/ST020(220V/60Hz)	1
17	89022202	Motor SD/SQ/SS/ST033(220V/60Hz)	1
17	89022203	Motor SD/SQ/SS/ST050(220V/60Hz)	1
17	89022204	Motor SD/SQ/SS/ST075(220V/60Hz)	1
17	89022205	Motor SD/SQ/SS/ST100(220V/60Hz)	1
17	89022206	Motor SD/SQ/SS/ST120(220V/60Hz)	1
17	89022305	Motor SD/SQ/SS/ST020(110V/60Hz)	1
17	89022306	Motor SD/SQ/SS/ST033(110V/60Hz)	1
17	89022301	Motor SD/SQ/SS/ST050(110V/60Hz)	1
17	89022302	Motor SD/SQ/SS/ST075(110V/60Hz)	1
17	89022303	Motor SD/SQ/SS/ST100(110V/60Hz)	1
17	89022304	Motor SD/SQ/SS/ST120(110V/60Hz)	1
18	04016028	Capacitor for SS/SD/SQ/ST050 Pump 110V	1
18	04016019	Capacitor for SC050 & SS/SD/SQ/ST075 Pump 110V	1
18	04016021	Capacitor for SC075 & SS/SD/SQ/ST100-124 Pump 110V	1
18	04016009	Capacitor for SS/SD/SQ/SP/ST050 Pump	1
18	04016010	Capacitor for SS/SD/SQ/SP/ST075 & SC050 Pump	1
18	04016012	Capacitor for SS/SD/SQ/SP/ST100-120	1
18	04016032	Capacitor for SS/SD/SQ/ST020 Pump 110V	1
18	04016033	Capacitor for SS/SD/SQ/ST033 Pump 110V	1

## 8. REPLACEMENT PARTS



Key No.	Part No.	Description	QTY
1	01201031	Transparent Lid	1
2	02010247	O-Ring for Lid	1
3	01112051	Basket for SS Pump	1
4	01021064	SS Pump Pre-Filter	1
5*	89280105	1.5" Union (Black/ White Colour)	2
6	89022402	Drain Plug With O'Ring	1
7	02011004	O-Ring for Diffuser	1
8	01111014	Diffuser	1
9	01311014	Impeller SS120(220V/50Hz)	1
9	01311015	Impeller SD020/SD50/SQ20/SQ50/SS20/SS50/ST20/ST50	1
9	01311016	Impeller SD33/SD75/SQ33/SQ75/SS33/SS75/ST33/ST75	1
9	01311017	Impeller SD050/SD100/SQ050/SQ100/SS050/SS100/ST050	1
9	01311018	Impeller SD075/SD120/SQ075/SQ120/SS075/SS120/ST075	1
9	01311019	Impeller SD100/SQ100/SS100/ST100(220V/50Hz)	1
9	01311023	Impeller SD020/SQ020/SS020/ST020(220V,110V/60Hz)	1
9	01311024	Impeller SD033/SQ033/SS033/ST033(220V,110V/60Hz)	1
10	89022403	M8 x 16 Screw with Washer	4
11	04015033	1/2" Mechanical Seal	1
12	02011090	O-Ring for Flange	1



## 2.2 ELECTRICAL WIRING



This power pump demand licensed or certified electrician or qualified pool installer to ensure there is adequate protection between the pump motor and mains power supply according to individual countries safety code.

The pump has power cord with plug attached on the plug, plug it to a power socket with circuit breaker to isolate the motor from the mains power for over load protection. The circuit breaker rating should refer to the electrical specification of individual pump working voltage and power.

The power has to be with a Residual Current Device (RCD) or Ground Fault Circuit Interrupt (GFCI) having a rated residual operating current not exceeding 30 mA.



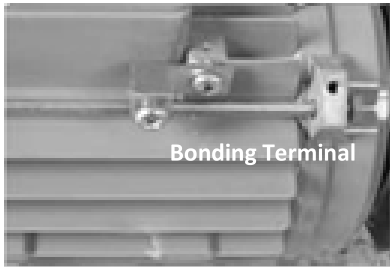
If the RCD/GFCI device trips, it means there is fault on the power line or motor. Do not use this pump. Disconnect the pump and have the problem corrected by a qualified service representative before using.

Press the reset button to reset the RDC/GFCI devices after fixed. It will keeps the circuit shut off and will not reset if the power line problem is not fixed. It is recommend to test the RCD/GFCI at least once a month.

Pumps should be shipped with Power cord with plug for corresponding countries



Bonding Instructions – Permanently wired units will need to include instructions for connecting the solid copper, equipotential bonding conductor. For SS020, SS033, SS050, SS07 and SS120 110V/60Hz version, the size of the bonding conductor should be No. 8 AWG. For Canada the size of the bonding conductor should be No. 6 AWG. Bonding Nut location is as photo.



### 3. START UP



- WARNING:**
1. Verify the pump shaft turn freely.
  2. Check the mains voltage, current and frequency are accordingly to the name plate.
  3. Never run pump dry! Running pump dry may cause damage to the mechanical seal causing leakage and flooding. Fill the pre-filter with water before starting motor.
  4. Before removing the pre-filter Lid, STOP PUMP, CLOSE GATE VALVES in suction and discharge pipes.
  5. Always STOP THE PUMP before when RELEASE ALL PRESSURE from the pump and the piping system before proceeding.
  6. Never tighten or loosen screw while the pump is in operation.
  7. The suction pipe and the suction inlet in the pool must be free from obstruction.

**WARNING:** Tighten / untighten the pump Lid by hand only.

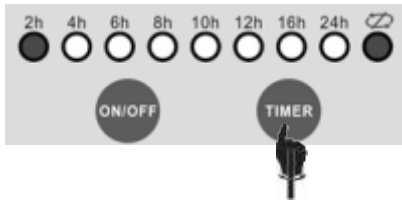
## 7. TROUBLE SHOOTING

Problem description	Possible causes
Motor does not start	<ol style="list-style-type: none"> <li>1 .Disconnect switch or circuit breaker in off position</li> <li>2 Fuses blown or thermal overload open</li> <li>3 Locked motor shaft</li> <li>4 Motor windings burned out</li> <li>5 .Defective starting switch inside single phase motor</li> <li>6. Disconnected or defective wiring</li> <li>7 Low voltage</li> </ol>
Pump does not reach full speed	<ol style="list-style-type: none"> <li>1. Low voltage</li> <li>2. Pump connected to the wrong voltage</li> </ol>
Motor overheats (protector trips)	<ol style="list-style-type: none"> <li>1. Low voltage</li> <li>2. Motor windings connected to the wrong voltage on dual voltage model</li> <li>3. Inadequate ventilation</li> </ol>
Pump delivers no water	<ol style="list-style-type: none"> <li>1 .Pump is not primed</li> <li>2 .Closed valve in suction or discharge line</li> <li>3 Leakage or air into suction system</li> <li>4 Impeller clogged</li> </ol>
Leakage of water at the shaft	<ol style="list-style-type: none"> <li>1 Shaft seal requires replacement</li> </ol>
Low pump capacity	<ol style="list-style-type: none"> <li>1. Valve in the suction or discharge line partly closed</li> <li>2. Suction or discharge line partly plugged</li> <li>3. Suction or discharge line too small</li> <li>4. Plugged basket in skimmer or hair and lint pre-filter</li> <li>5. Dirty filter</li> <li>6. Impeller clogged</li> </ol>
High pump pressure	<ol style="list-style-type: none"> <li>1. Discharge vale or inlet fittings closed too much</li> <li>2. Return lines too small</li> <li>3. Dirty filters</li> </ol>
Noisy pump and motor	<ol style="list-style-type: none"> <li>1 Plugged basket in skinner or hair in lint pre-filter</li> <li>2 Worn motor bearings</li> <li>3 .Valve in suction line partly closed</li> <li>4 Suction line partly plugged</li> <li>5 .Vacuum hose plugged or too small</li> <li>6 Pump not supported properly</li> </ol>
Air bubbles at inlet fittings	<ol style="list-style-type: none"> <li>1 Leakage of air into the suction line in connections or valve stem</li> <li>2 .Cover gasket of hair and lint pre-filter needs cleaning</li> <li>3 Low water level in the pool</li> </ol>

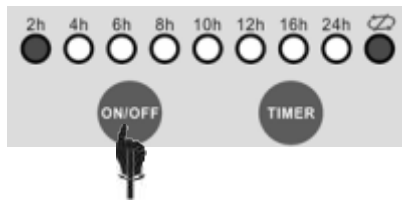
**Note:** If the above recommendations of this manual do not solve your particular problem(s), please contact your local service agent for further assistance.



### 6.3 Single Cycle Mode



To switch to Single Cycle Mode, press [timer] for about 3 seconds (the Single Cycle Indicator will come on). To change cycle time, press the [timer] button again. It works in a sequence and will change from 2h 4h 6h 8h 10h 12h 16h 24h 2h.



When the timer is set to 2h, the pump will operate and stop after 2 hours until the pump is switched on again.



Unscrew the 4 screws on the lid of the terminal box and remove the lid.



Remove the battery.



Remove the rubber film on the surface of the battery.



Replace the battery.



Replace the lid of the terminal box and tighten the 4 screws with a screwdriver.



**WARNING:**

Before start-up, the alignment of the pump should be checked. The tubing should be inspected to ensure that they are properly fitted and tightened and that they do not exert pressure or tension on the pump's suction or discharge connection. The pump should never be operated.

1. Clear all piping of construction debris and verify that the piping has passed a proper pressure test.
2. Check the filter and other equipment for proper installation, verifying all clamps and connections are properly installed as per the manufacturer's instructions.
3. Open any shut off valves on the suction and discharge lines.
4. Open the filter pressure relief valve and release all pressure from the system.
5. If the pump is located below the water level of the pool, opening the pressure relief valve will fill the pump with water.
6. If the pump is located above the pool water level, remove the Lid from the pre-filter and fill with water before starting the pump.
7. Check to see that the Lid O-ring and seat areas are clean and lubricated. Debris in the sealing area can cause air to leak into the system and make it difficult to prime the pump.
8. Close/tighten the Lid to make an airtight seal.
9. Turn on the pump.
10. If the pump does not prime within 15 minutes. Ensure all instructions to this point have been followed. Stop the pump! Check for suction leaks and repeat steps (I) through (VIII).

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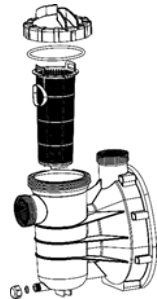
## 4. ROUTINE MAINTENANCE

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The pump mechanical seal requires no lubrication and service.

The only routine maintenance needed is the inspection and cleaning of the pre-filter basket. Debris or trash collected in the basket will choke off the water flow through the pump. Follow the instructions below in order to clean the pre-filter basket:

1. Turn off the pump, close the gate valve in suction and discharge, and release all pressure from the system before proceeding.
2. Turn the transparent Lid cover follow the arrow on the Lid cover to release and lock the Lid ring.
3. Remove the pre-filter basket and cleaning. Make sure all the holes in the basket are clear, flush the basket with water and replace it in the trap with large opening at the pipe connection port (between ribs provided). If the basket is replaced backwards, the cover will not fit on the trap body.
4. Clean and inspect the Lid's O-ring ring; reinstall on the Lid cover.
5. Clean the ring groove on the pre-filter body and replace the Lid. To help keep the Lid from sticking, tighten it by hand only.
6. Put back the basket with opening face to suction inlet directly.
7. Fill up the filter body with water and Prime the pump.



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## 5. WINTERIZING

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If the air temperature drops below 0°C (35°F), the water in the system can freeze and cause damage. Freezing damage is not warrantable.

To prevent freezing damage follow the procedures listed below:

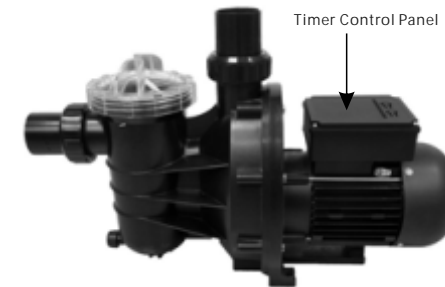
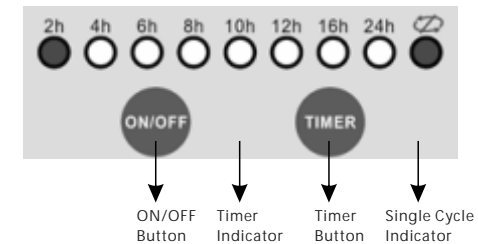
1. Shut off electrical power for the pump at the house circuit breaker.
2. Drain the water out of the pump case by removing the two drain plugs from the case.
3. Store the plugs in the pump basket.
4. Cover the motor to protect it from severe rain, snow and ice.
5. If it is possible, store the pump in a dry location during this time.
6. Do not wrap the motor in plastic. It will cause condensation and rust on the inside of the motor.

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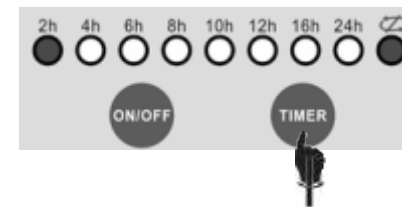
## 6. TIMER SETTING(FOR TIMER VERSION)

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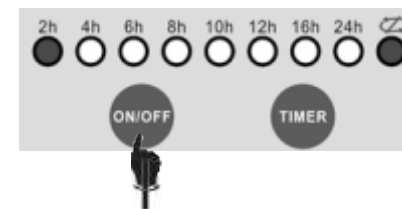
### 6. 1 CONTROL PANEL



### 6. 2 Continuous Mode



After turn on the pump, the default setting is 24 hours continuous operation. To set the desired operation period, this can be done by pressing the timer button (2h 4h 6h 8h 12h 16h 24h 2h).



For example, if you set the timer to 2h and press [on] at 08:00, the pump will operate for 2 hours within the 24 hours period zone (indicated by the 2h light flashing; the light will stop flashing when the pump stops). The pump will start again for 2 hours at 08:00 the following day.