

SHIMGE[®]
----- *for better life*

SERVICE MANUAL

HORIZONTAL CENTRIFUGAL PUMP

Model: BWI



Warning

- Before operation, make sure that electric pump is grounded reliably and leakage protection device is equipped.
- Don't touch electric pump while it is running.
- Don't run electric pump without water.

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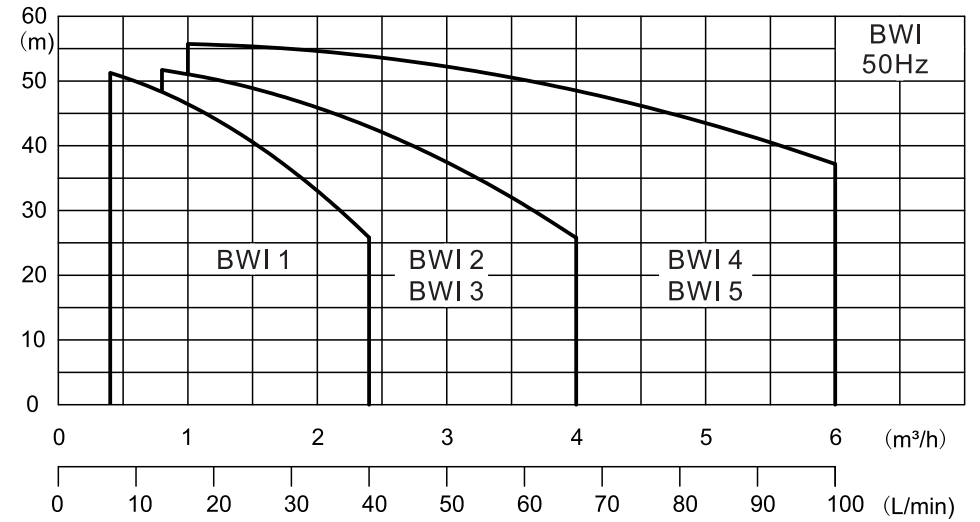
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Contents

I. Product overview	1
II. Working Condition	1
III. Use Occasions	1
IV. Specifications	2
V. Exploded View	2
VI. Technical Data	3
VII. Installation instructions	5
VIII. Maintenance and Maintenance	6
IX. Common Fault(exclude) Table	6
X. Appendix	7

8.Type spectrum



Note: The figures in this manual are all schematic diagrams, and the product performance is also constantly updated. The purchased products (including appearance, color, etc.) shall be subject to the actual products.

5. Maximum inlet pressure

Upper limit of maximum inlet pressure:
Since the pump inlet pressure+pump head \leq 1.6MPa, the upper limit of the pump inlet pressure is the difference between the system pressure value and the shut-off head.

As shown in fig. 5

Model	Curve number
BWI 1/BWI 2/BWI 3/BWI 4/BWI5	1

Figure 5.Said extreme pressure and temperature,pressure and temperature must be within the range shown.

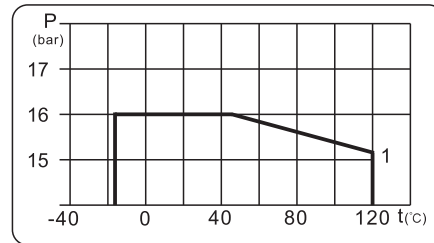


Figure 5

6.Noise level/50Hz

Power (kW)	n (r/min)	3000r/min
	L_{pA} -dB(A)	
0.25	57	
0.37	59	
0.55	62	
0.75	62	
1.0	63	
1.3	64	

7. Model selection of wearing parts

- Corresponding specifications and models of motor bearings

Power (kW)	n (r/min)	3000r/min
	Front bearing/rear bearing	
0.25	6202ZZ/6201ZZ	
0.37	6202ZZ/6201ZZ	
0.55	6203ZZ/6202ZZ	
0.75	6203ZZ/6202ZZ	
1.0	6204ZZ/6203ZZ	
1.3	6204ZZ/6203ZZ	

● Machine seal configuration table

Number	Configuration	Configuration description	Applicable working conditions	Configuration situation
1	FQBV	Springs and structural parts are stainless steel F, moving ring silicon carbide Q, static ring impregnated resin graphite B and fluororubber V.	1.Conventional cold water condition below 0°C~68°C; No particles, can contain oil; 2.Under the normal hot water condition below 68°C~90°C, there is no particle and it can contain oil.	Conventional
2	FQQE	Springs and structural parts are stainless steel F, moving ring silicon carbide Q, static ring silicon carbide Q, and ethylene propylene diene monomer E.	1.90°C~120°C hot water condition, containing a small amount of particles, no oil.	Conventional
3	FQQV	Springs and structural parts are stainless steel F, moving ring silicon carbide Q, static ring silicon carbide Q and fluororubber V.	1.Acidic medium with pH = 5~7; 2.Alkaline medium with pH = 7~9; 3.Under the hot water condition of 68°C~90°C, it contains a small amount of particles and may contain oil.	Custom made
4	FUUE	Springs and structural parts are stainless steel F, moving ring cemented carbide U, static ring cemented carbide U, and EPDM E.	1.Iced water below 0°C; 2.Crystalline alkaline medium; 3.Containing a large amount of granular media; 4.The working condition of pressure exceeding 2MPa; 5.No oil.	Custom made

Thanks for choosing our product, READ our service instructions carefully before installation and using. Make sure this manual in your safekeeping.

⚠ WARNINGS :

⚠ Warnings for Children

1. Any child or any adult who has any physical, sensory or mental defects or lacks of the relevant experience or knowledge, if supervised or given the method on safe use of this product as well as knowing the dangers involved, may use this product.
2. No child shall play with this product as a toy.
3. Without supervision, no child shall be allowed to clean or maintain this product.

⚠ Pressure Warning

1. The system where a pump lies shall be able to withstand the maximum pressure of the pump.

⚠ Electricity Warning

1. The electric power system may be used only when it has the safety protection measures specified by the existing provisions of the country where the product is installed.

⚠ Modification-related Warning

1. Where any electric pump is tampered, modified and/or operates outside the recommended operating scope or goes against any other instruction given in this manual, the manufacturer will not guarantee the correct operation of the electric pump or be responsible for any loss which might be caused by the electric pump.
2. The manufacturer refuses to undertake any responsibility for any error which might appear in this manual due to misprint or misreplication. The manufacturer reserves the right to make any modification to the product, which, in its opinion, is necessary or useful, without affecting basic features of the product.

I. Product overview

BWI light stainless steel horizontal multistage centrifugal pump (hereinafter referred to as pump) shall comply with the enterprise standard of Q/SG 504 light stainless steel multistage centrifugal pump. This series of products conforms to GB/T17219 "Safety Evaluation of Drinking Water Distribution Equipment and Protective Materials". This series of products has the characteristics of high efficiency, low noise and stable operation. The pump is a non-self-priming multi-stage horizontal structure, which is compact, simple to install and convenient to use and maintain.

II. Working Condition

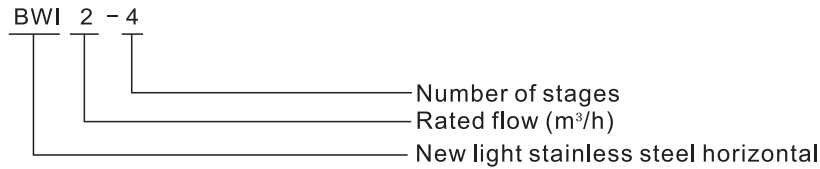
1. Medium temperature: normal type:0°C~68°C, hot water type:0°C~120°C;
2. Ambient temperature:+40°C;
3. Maximum system working pressure:1.0MPa;
4. The maximum inlet pressure is limited by the maximum system operating pressure;
5. When the density of the conveying medium is greater than that of water, it is necessary to consider using a motor with higher power;
6. The power supply frequency is 50Hz AC, the voltage is 220V AC in single phase and 220V/380V AC in three phases, and the voltage fluctuation range is 0.9~1.1 times of the rated value. Please indicate the special frequency and voltage when ordering.

III. Use Occasions

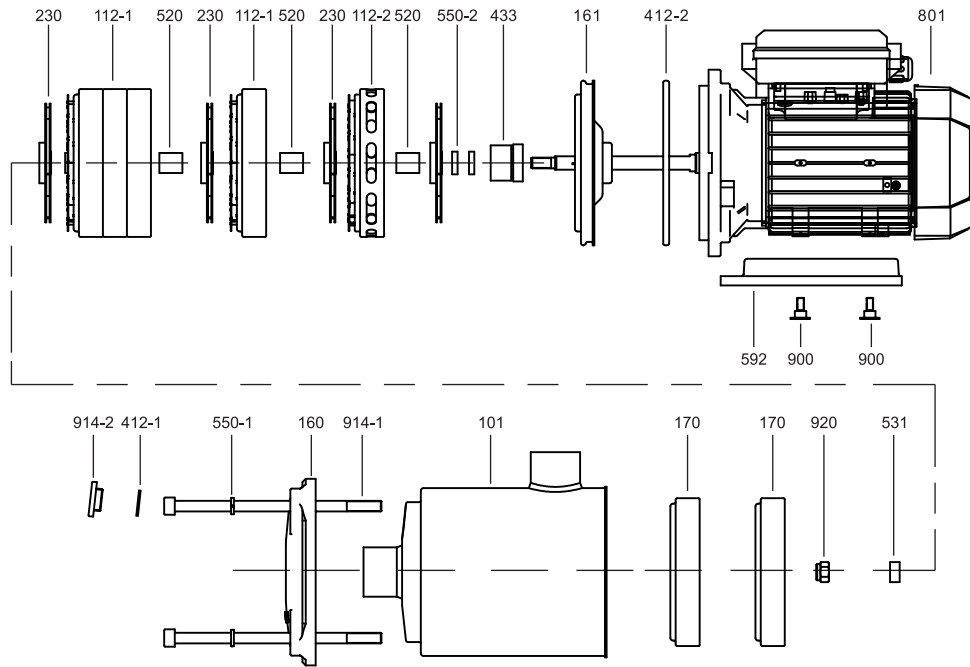
1. Thin, clean, non-flammable and explosive materials without solid particles or fibers;
2. Such as mineral water, softened water, purified water, domestic water supply, clean oil and other substances;

- Suitable for water treatment, filtration and cleaning systems;
- The main material of the pump is stainless steel, which can be used to pump slightly corrosive medium (pH 5 ~ 9).

IV. Specifications



V. Exploded View



- | | |
|---------------------------|--|
| 101、 Pressure cylinder | 520、 Long spacing pipe |
| 112-1、 Chamber | 531、 bush |
| 112-2、 Outlet chamber | 550-1、 Spring washer 8 |
| 160、 Platen | 550-2、 Adjusting washer |
| 161、 Front cover assembly | 592、 Base plate |
| 170、 Inlet chamber | 801、 Motor |
| 230、 Impeller | 900、 Hexagon flange bolt |
| 412-1、 O-ring ∅15×1.8 | 914-1、 Hexagon socket head cap screws |
| 412-2、 O-ring ∅112×3.55 | 914-2、 Hexagonal socket plug |
| 433、 Shaft seal | 920、 I Prevailing torque type hexagon nuts |

X. Appendix

1.pump and Motor parameters

Refer to pump and Motor nameplate: flow rate, lift, power, rotating speed, cavitation allowance, etc.

2. motor start/stop times

Under 1.3kW (inclusive): maximum 100 times/hour.

3. Ambient temperature

The maximum temperature is +40°C, the temperature exceeds +40°C, or the motor is installed at an altitude of more than 1000m, the output power of the motor will decrease, as shown in Figure 3. In this case, the motor with higher output power must be selected.

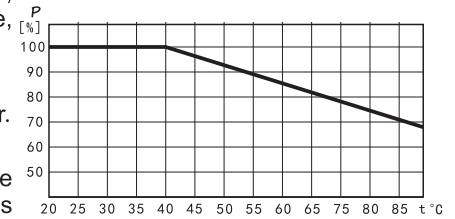


Figure 3

4.Calculation of the Minimum Inlet Pressure

$$H = P_b \times 10.2 - NPSH - H_f - H_v - H_s$$

P_b: Atmospheric Pressure (bar)

H_f: Frictional Resistance in the Inlet Pipe

H_v: Water Vaporization Pressure (Figure 3)

H_s:The safety allowance is usually rated as 0.5m

NPSH: Net Inlet Pressure (Q-NPSH)

If the value of H is positive value, the suction lift is H. If it is negative, the amount of liquid being poured into the pump is H. (Figure4).

Note:The calculation may be more than under normal circumstances,only when using the pump in the following cases H calculation:

- A high media temperature,
- Liquid flow rate exceeds the rating,
- Improted high suction piping,
- System pressure is too small,
- Poor inlet conditions.

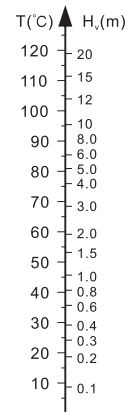
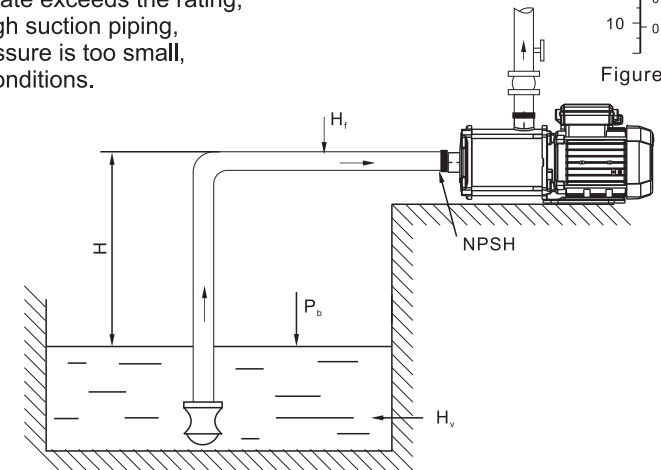


Figure 4



VIII. Maintenance and Maintenance

1. Before maintenance, it must be ensured that the power supply has been disconnected, the pump will not be started accidentally, and the pipeline valve has been closed;
2. After each use, the water pump should be pumped into clear water and run for several minutes to prevent sediment from being stranded in the pump cavity;
3. The pump should be managed and used by special personnel, and the insulation resistance between the winding and the casing should be checked regularly;
4. When the pump is running, the water inlet pipe must be highly sealed. It is forbidden to run the pump under cavitation. Regularly check the current value of the motor during the operation of the pump, and try to make the pump not run under overload conditions;
5. Clean and lubricate the pump regularly.

⚠ When the pump is not applicable during frost, the liquid in the pump must be drained to prevent the pump from being damaged!

IX. Common Fault(exclude) Table

⚠ Before opening the terminal box and pump, please make sure that the power supply has been disconnected and can not be opened accidentally!

Failure phenomenon	Analysis	Solution	Remark
Motor not running	a. Power failure b. Power overload c. Control circuit problem d. The fuse burned	a. Check power supply b. Check the system c. Check control circuit d. Change the fuse	Professional electrician check
Pump operation without water	a. Suction is too high b. Less water in pump cavity c. Inlet pipe or pump cavity with air	a. Lower installation height b. Increase water storage c. Exhaust air	
Pump operation with inadequate flow	a. The pump reversal b. Pipeline or impeller blocked c. Mouth ring wear serious d. Choose the wrong model e. The lower voltage	a. Adjust the motor wiring b. Clean the pipeline and impeller c. Change the impeller d. Re-select model e. Adjust the voltage	c. Professional to replace
Power consumption is too large	a. Not use it at rated conditions b. Motor bearing damaged c. Pump cavity parts wearing	a. Adjust the operation conditions b. Change the motor bearing c. Change the spare parts	c. Professional to replace
Pump running with noise and vibration	a. Installation is not stable b. The liquid with air c. Pump cavitation d. Damaged of the bearing or spare parts e. Motor overload operation	a. Fix the installation b. Adjust the high suction pressure and exhaust air c. Lower vacuum degree d. Change the bearing or spare parts e. Adjust the normal operation	d. Professional to replace
The pump water leakage	a. The mechanical seal damaged b. The O-ring damaged c. Casting with hole or broken	a. Change the mechanical seal b. Change the O-ring c. Change the spare parts	Professional to replace

VI. Technical Data

6.1 BWI parameter table

BWI 1

Model	Power (kW)	Q (m ³ /h)	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	Lift range (m)	V/I (V)/(A)	V/I (V)/(A)
BWI 1-2	0.25	H (m)	19.5	19	18.5	18	17.5	17	16	15	14	13	12	12~19.5	380/0.75	220/1.9
BWI 1-3	0.25		29	28.5	26	25	24.5	23.5	22	21	19	17	16	16~29	380/0.75	220/1.9
BWI 1-4	0.37		37	36	35	33	32	30	28	27	26	22	20	20~37	380/1.2	220/3.0
BWI 1-5	0.37		43	42	41	38	36	34	32	29	27	25	22	22~43	380/1.2	220/3.0
BWI 1-6	0.37		51	50	49	46	44	42	40	36	32	30	26	26~51	380/1.2	220/3.0

BWI 2

Model	Power (kW)	Q (m ³ /h)	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	4.0	Lift range (m)	V/I (V)/(A)	V/I (V)/(A)
BWI 2-2	0.25	H (m)	18.5	17.5	17	16	15	14	12	11	9.5	9.5~18.5	380/0.75	220/1.9
BWI 2-3	0.37		26	25	24	23	22	21	19	16	14	14~26	380/1.2	220/3.0
BWI 2-4	0.55		35	34	33	31	30	28	26	22	19	19~35	380/1.7	220/3.8
BWI 2-5	0.55		43	42	41	39	37	35	32	27.5	23	23~43	380/1.7	220/3.8
BWI 2-6	0.75		52	50.5	47	46	44	40	35	30.5	26	26~52	380/1.9	220/4.8

BWI 3

Model	Power (kW)	Q (m ³ /h)	0.8	1.2	1.6	2.0	2.4	2.8	3.0	3.2	3.6	4.0	Lift range (m)	V/I (V)/(A)	V/I (V)/(A)
BWI 3-2	0.25	H (m)	18.5	17.5	17	16	15	14	13	12	11	9.5	9.5~18.5	380/0.75	220/1.9
BWI 3-3	0.37		26	25	24	23	22	21	20	19	16	14	14~26	380/1.2	220/3.0
BWI 3-4	0.55		35	34	33	31	30	28	27	26	22	19	19~35	380/1.7	220/3.8
BWI 3-5	0.55		43	42	41	39	37	35	33	32	27.5	23	23~43	380/1.7	220/3.8
BWI 3-6	0.75		52	50.5	47	46	44	40	37	35	30.5	26	26~52	380/1.9	220/4.8

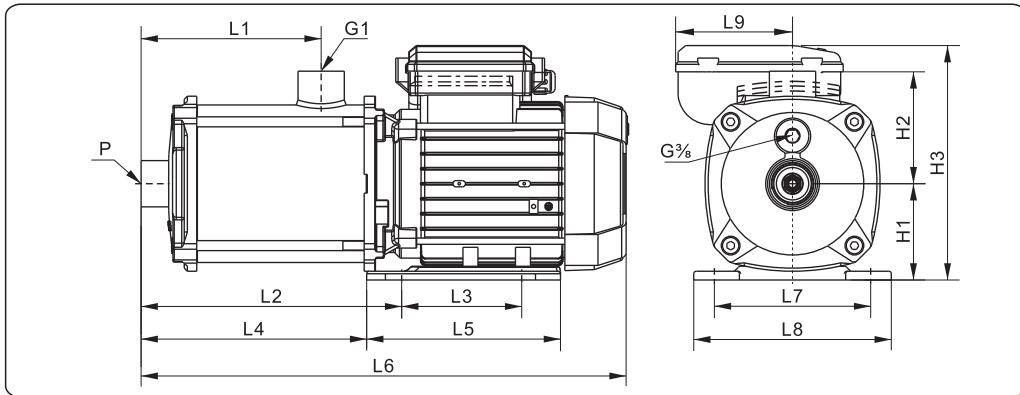
BWI 4

Model	Power (kW)	Q (m ³ /h)	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	Lift range (m)	V/I (V)/(A)	V/I (V)/(A)
BWI 4-2	0.37	H (m)	18.5	18	17.5	17	16	15.5	15	13.5	13	11	10	10~18.5	380/1.2	220/3.0
BWI 4-3	0.55		29	28.5	28	27	26.5	25.5	25	23	22	20	18	18~29	380/1.7	220/3.8
BWI 4-4	0.75		38	37	36	34	33.5	32	30	28	27	24	20	20~38	380/1.9	220/4.8
BWI 4-5	1.0		47	46	45	44	42.5	41	40	36	35	32	27	27~47	380/2.4	220/6.0
BWI 4-6	1.3		56.5	55	54	53	52.5	51	49	45	44	42	36	36~56.5	380/2.9	220/8.0

BWI 5

Model	Power (kW)	Q (m ³ /h)	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	Lift range (m)	V/I (V)/(A)	V/I (V)/(A)
BWI 5-2	0.37	H (m)	18.5	18	17.5	17	16	15.5	15	13.5	13	11	10	10~18.5	380/1.2	220/3.0
BWI 5-3	0.55		29	28.5	28	27	26.5	25.5	25	23	22	20	18	18~29	380/1.7	220/3.8
BWI 5-4	0.75		38	37	36	34	33.5	32	30	28	27	24	20	20~38	380/1.9	220/4.8
BWI 5-5	1.0		47	46	45	44	42.5	41	40	36	35	32	27	27~47	380/2.4	220/6.0
BWI 5-6	1.3		56.5	55	54	53	52.5	51	49	45	44	42	36	36~56.5	380/2.9	220/8.0

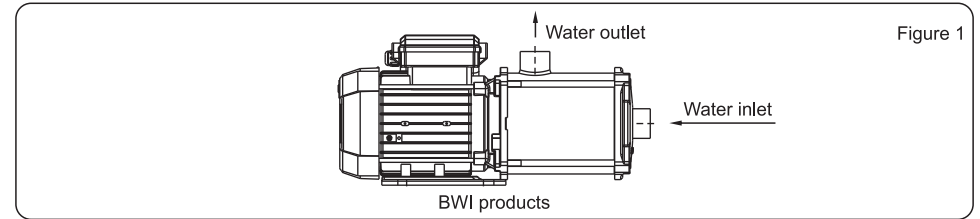
6.1 Installation size and weight



Model	L1 (mm)	L2 (mm)	L3 (mm)	L4 (mm)	L5 (mm)	L6 (mm)	L7 (mm)	L8 (mm)	L9 (mm)	H1 (mm)	H2 (mm)	Three phase	Single phase	P	WT (kg)
												H3 (mm)	H3 (mm)		
BWI 1-2	72	131	96	115	136	305	125	158	93.5	75	90	174	174	G1	7.6
BWI 1-3	72	131	96	115	136	305	125	158	93.5	75	90	174	174	G1	8
BWI 1-4	90	149	96	133	136	323	125	158	93.5	75	90	174	174	G1	8.3
BWI 1-5	108	167	96	151	136	341	125	158	93.5	75	90	174	174	G1	8.6
BWI 1-6	144	203	96	187	136	377	125	158	93.5	75	90	174	174	G1	9
BWI 2-2	72	131	96	115	136	305	125	158	93.5	75	90	174	174	G1	7.4
BWI 2-3	72	131	96	115	136	305	125	158	93.5	75	90	174	174	G1	7.5
BWI 2-4	90	154	96	126	155	334	125	158	93.5	75	90	197	188	G1	10
BWI 2-5	108	172	96	144	155	352	125	158	93.5	75	90	197	188	G1	10.5
BWI 2-6	144	208	96	180	155	388	125	158	93.5	75	90	197	188	G1	12
BWI 3-2	72	131	96	115	136	305	125	158	93.5	75	90	174	174	G1	7.4
BWI 3-3	72	131	96	115	136	305	125	158	93.5	75	90	174	174	G1	7.5
BWI 3-4	90	154	96	126	155	334	125	158	93.5	75	90	197	188	G1	10
BWI 3-5	108	172	96	144	155	352	125	158	93.5	75	90	197	188	G1	10.5
BWI 3-6	144	208	96	180	155	388	125	158	93.5	75	90	197	188	G1	12
BWI 4-2	72	131	96	115	136	305	125	158	93.5	75	90	174	174	G1 ^{1/4}	8
BWI 4-3	72	136	96	108	155	316	125	158	93.5	75	90	197	188	G1 ^{1/4}	10
BWI 4-4	90	154	96	126	155	334	125	158	93.5	75	90	197	188	G1 ^{1/4}	11.5
BWI 4-5	108	207	125	179	175	396	140	178	102	90	90	238	215	G1 ^{1/4}	12.5
BWI 4-6	144	243	125	215	175	432	140	178	102	90	90	238	215	G1 ^{1/4}	15
BWI 5-2	72	131	96	115	136	305	125	158	93.5	75	90	174	174	G1 ^{1/4}	8
BWI 5-3	72	136	96	108	155	316	125	158	93.5	75	90	197	188	G1 ^{1/4}	10
BWI 5-4	90	154	96	126	155	334	125	158	93.5	75	90	197	188	G1 ^{1/4}	11.5
BWI 5-5	108	207	125	179	175	396	140	178	102	90	90	238	215	G1 ^{1/4}	12.5
BWI 5-6	144	243	125	215	175	432	140	178	102	90	90	238	215	G1 ^{1/4}	15

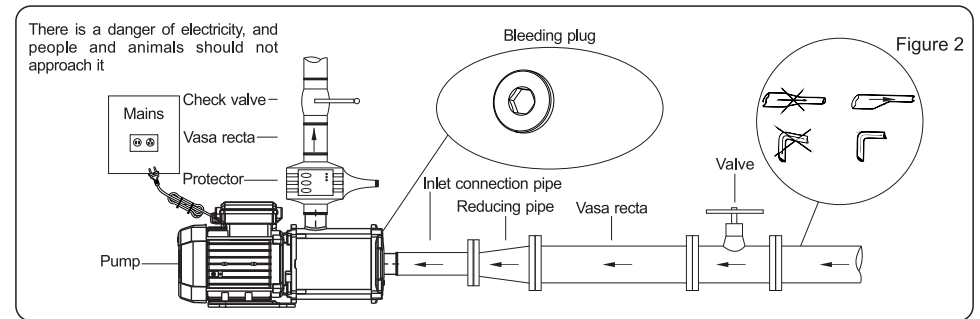
VII. Installation instructions

Before installing and using the water pump, first check whether the product is damaged or missing parts. If found, please contact the service personnel or the manufacturer for replacement in time, and then read the following operation procedures carefully to avoid damaging the water pump.



1. Confirm the water inlet and outlet direction of the pump according to (fig. 1), and then connect relevant accessories such as pipelines and valves. refer to (fig. 2) for specific styles. Customers can provide protectors according to their actual conditions, so that the pump can be safely operated under the set working conditions, and the service life of the pump can be prolonged. A check valve is installed in the water outlet direction of the pump to prevent the water hammer from damaging the pump when it is shut down, and it is also convenient to disassemble and assemble the pump. Install a valve at the water inlet end of the pump. The diameter of the water inlet pipe should be larger than that of the water inlet of the pump, and it should be connected through a reducer to ensure sufficient water intake.

There must be enough space at the installation place of the pump unit to ensure good ventilation and disassembly space. When installing the pipeline, it is forbidden to accumulate air in the pipeline, especially at the suction end of the pump.



2. Electrical connection: This item must be carried out by a professional electrician

Before opening the junction box, you must confirm that the power switch is off! The nameplate is marked with working voltage and frequency, and the motor shall be confirmed to be consistent with the power supply before use. An electrical wiring diagram is attached to the junction box. Please refer to the diagram for wiring.

3. start-up procedure: As shown in Figure 2, please don't start the pump before filling water and exhausting air. The bearing and shaft seal of the pump will be damaged during dry rotation. After the pump runs, check whether the rotation direction of the motor fan is consistent with the rotation sign, otherwise, reconnect the wiring.

When exhausting air, pay attention to water so as not to hurt people or things. Especially when it is used to transport hot water, beware of scalding caused by hot water jet.

4. Working condition adjustment: adjust the corresponding flow rate and lift according to the parameters on the nameplate of the purchased pump. Under this working condition, the pump runs most stably, and the high efficiency area of the pump is generally (0.7 ~ 1.2 times) of the rated point range. If the customer runs away from this interval, it may reduce the efficiency of the pump or seriously damage the water pump directly.

In the working area of the pump, it is necessary to set up "electric danger, people and animals should not approach!" Warning signs, beware of accidents.

5. Shutdown: When stopping the pump, slowly close the valves and pressure gauges on the pipeline, and then cut off the power supply.

Note: If there is no guarantee that there is no particulate matter or fibrous matter in the transported medium, a filter device should be installed before the water inlet, otherwise, the pump impeller may be blocked, stuck, etc., resulting in the pump not working normally and serious direct damage to the pump.

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技术要求

- 1.说明书尺寸:折叠装订后210×142mm,误差2mm;
- 2.材质为:封面157克铜版纸,内页70克双胶纸;
- 3.周边不应有明显飞边;
- 4.文字大小和粗细应整齐醒目,排列匀称,不应断缺和模糊不清;
- 5.封面、封底彩色印刷,绿色为新界绿pantone 3272C;
橙色为C0 M60 Y100 K0;内页黑白印刷。