



# INSTALLATION, OPERATION & MAINTENANCE MANUAL

Series: A2, G2, H2, V2, A4, & V4

**DS-C01-006**

Electric Submersible Pumps

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

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A2, G2, H2, V2, A4, & V4  
February 2024

**INDUSTRIAL FLOW SOLUTIONS** would like to thank you for purchasing our products.

This instruction manual provides you with the information required to safely own and operate your product. This manual also contains information to optimize performance and longevity of your BJM Pumps® submersible pump. Please read this manual carefully and store it in a safe place while you are still using the pump, making sure that you record all the maintenance operations carried out. Retain these instructions for future reference.

The product you have purchased is of the highest quality workmanship and material and has been engineered to give you long and reliable service. This product has been carefully tested, inspected, and packaged to ensure safe delivery and operation. Please examine your item(s) carefully to ensure that no damage occurred during shipment. If damage has occurred, please contact the place of purchase. They will assist you in replacement or repair, if required.

**INDUSTRIAL FLOW SOLUTIONS, LLC** rejects all responsibility for any issues caused by improper use of the product, as well as any direct and indirect damage. Before using the product, you must carefully read this manual and make sure that you familiarize yourself with all the warnings.

If you have any questions regarding the inspection, disassembly, assembly or testing please contact your BJM Pumps® distributor, or Industrial Flow Solutions Operating, LLC.

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**WARNING:** Read these instructions carefully before attempting to install, operate, or service your product. Know the product's application, limitations, and potential hazards. Protect yourself and others by observing all safety information. Failure to comply with these instructions could result in personal injury and/or property damage!

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## 1 Applications

The BJM submersible pumps from the V2 - V4 - A2 - A4 - G - H series are utilized in both commercial and industrial settings. They are commonly employed for tasks such as draining untreated wastewater, water mixtures, and both light and heavy-duty sewage water. Whether it is removing water from construction sites, industrial facilities, or sewage treatment plants, BJM submersible pumps are trusted for their robust construction and reliable operation, making them indispensable tools in demanding applications across different industries.

**Pumped liquid temperature range:** 32 - 104°F (0 - 40°C)

**Maximum immersion depth:** 65 ft (20 m)

**Minimum liquid level:** 18 – 28 in (457 – 711 mm)

Please refer to section 5 for the minimum liquid level requirement specific to each pump model.

**PH of the pumped liquid:** 6 - 10 pH

Chemical compatibility may vary depending on the material used in the pumps. For detailed information on specific chemical compatibility, please consult with our factory.

**Protection degree:** IP 68

**Maximum liquid density:** < 1.1 SG (1100 kg/m<sup>3</sup>)

**Maximum allowable solids:** 0.5 - 3.5 in (12 – 90 mm)

The allowable size of solids in the pumped liquid varies depending on the specific pump model.

Please refer to the Technical Specifications section 4 for details.

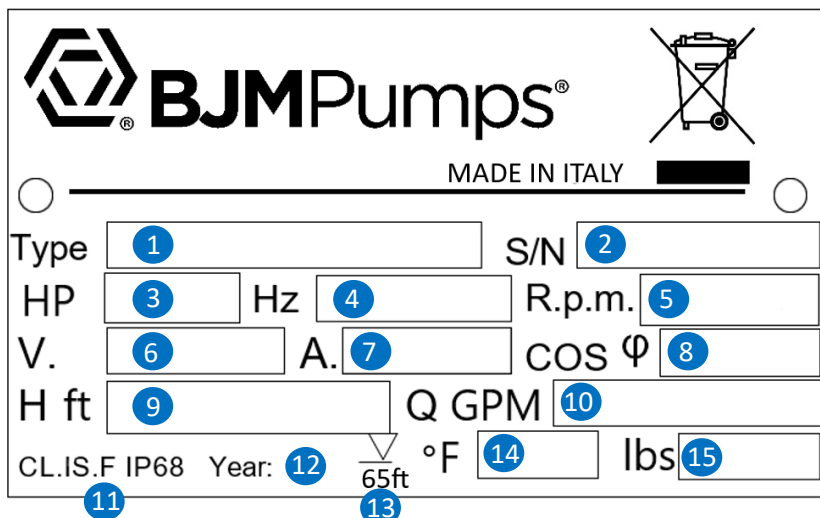
**Maximum noise level:** ≤ 70 dB



**WARNING:** Do not pump flammable or volatile liquids. Death or severe injury will result.

## 2 Identification plate

North American Version



The identification plate features the BJMPumps logo, a crossed-out trash can icon, and the text "MADE IN ITALY". It includes fields for various specifications, each marked with a blue circle and a number from 1 to 15. The fields are: Type (1), S/N (2), HP (3), Hz (4), R.p.m. (5), V. (6), A. (7), COS φ (8), H ft (9), Q GPM (10), CL.IS.F IP68 (11), Year (12), °F (14), lbs (15), and a specific value of 65ft (13) indicated by a downward arrow.

1	Pump Model
2	Serial number
3	Rated horsepower P2
4	Frequency
5	Revolutions per minute
6	Voltage
7	Full Load Amperage
8	Power Factor
9	Head (feet)
10	Flow rate (gallons per minute)
11	Insulation class
12	Year of production
13	Maximum submersion (ft)
14	Maximum operating temperature (°F)
15	Weight (lbs)

### 3 General characteristics

#### 3.1 Materials

##### 3.1.1 Mechanical seals

The V2 - V4 - A2 - A4 - G - H series electric pumps are equipped with two mechanical seals for enhanced performance and reliability. The first seal, located in the oil well (motor side), is lubricated and composed of Carbon Ceramic. The second seal, which comes into direct contact with the pumped liquid, is made of Silicon Carbide and FKM, offering high wear resistance to ensure durability and efficient operation.

##### 3.1.2 Impellers

The impellers installed in the V2 - V4 - A2 - A4 - G - H series pumps are crafted from G25 cast iron. Each impeller undergoes a dynamic balancing process to optimize performance, minimize noise and vibrations, and ensure efficient operation.

##### 3.1.3 Additional Components

Components	Material	Components	Material
Motor casing, oil chamber, bearing holder, volute	GG25 cast iron	Hardware	AISI 304 stainless
		Motor Shaft	AISI 420 stainless
		O-Rings	BUNA rubber
Grinder (G-Series only)	Hardened steel	Cable grommet	Neoprene 50SH

#### 3.2 Electric cable

The pumps are all fitted with a 33' SOOW electric cable. Other cables lengths are available upon request. Pumps are supplied without plugs.

#### 3.3 Bearings

The pumps are fitted with two radial ball bearings, pre-lubricated for extended durability. In case of wear, these bearings should only be replaced by qualified professionals.

#### 3.4 Electric motor and temperature sensors

The electric motors are asynchronous type, 2 or 4 poles, with squirrel cage rotors. The operating voltages are 460 V three-phase or 230V single-phase, they offer power options ranging from 1.5 to 12 horsepower (HP).

These motors are engineered to deliver maximum rated power, with a permissible voltage variation of up to 10% of the rated voltage. All stators are constructed with class F 311°F (155°C) insulation and feature an IP 68 protection degree, ensuring robust performance. They are suitable for use with liquid temperatures ranging from 32 to 104°F (0 to 40°C).

There are safety bimetallic micro-thermocouples integrated into the windings. These safety mechanisms are normally closed but will open if the temperature exceeds 266°F(130°C), interrupting the power supply to the electric pump. Once these protections have cooled down to 167°F(75°C), the power supply to the electric pump is automatically reinstated. The electric motor is cooled by the same pumped liquid in which the pump is submerged. Note that a maximum of 15 regularly spaced start-ups per hour are permitted.

## 4 Technical Specifications

Series	Model	Discharge Size	Max. Solid (in)	Motor Speed (rpm)	Power (hp)	Full Load Amps		Cable	Weight (lbs)	Oil Quantity (fl. Oz.)
						3-ph 460V	1-ph 230V			
V2	V2-1500	DN65-PN10	1.6	3450	2	-	12	(1)	90.5	16
	V2-15	DN65-PN10	1.6	3450	2	3.4	-	(1)	90.5	16
	V2-22	DN65-PN10	1.6	3450	3	4.8	-	(1)	91.5	16
	V2-41	DN80-PN16	1.75	3450	5.5	8.3	-	(1)	132.5	24
	V2-56	DN80-PN16	2.4	3450	7.5	11	-	(2)	154.5	40
	V2-75	DN80-PN16	2.4	3450	10	14	-	(2)	154.5	40
	V2-89	DN80-PN16	2.6	3450	12	16.8	-	(3)	154.5	40
V4	V4-1100	DN80-PN16	2	1750	1.5	-	10	(1)	101.5	16
	V4-11	DN80-PN16	2	1750	1.5	3	-	(1)	101.5	16
	V4-1500	DN80-PN16	2	1750	2	-	12	(1)	103.5	16
	V4-15	DN80-PN16	2	1750	2	3.4	-	(1)	103.5	16
	V4-22	DN80-PN16	2.25	1750	3	4.8	-	(1)	125.5	16
	V4-30	DN80-PN16	2.25	1750	4	6.2	-	(1)	150	24
	V4-41	DN100-PN16	3.5	1750	5.5	8.3	-	(1)	209.5	24
	V4-56	DN100-PN16	3.5	1750	7.5	11	-	(2)	218.5	40
	V4-75	DN100-PN16	3.5	1750	10	14	-	(2)	275.5	40
A2	A2-1900	DN65-PN10	1.5	3450	2.5	-	14.5	(2)	90.5	16
	A2-19	DN65-PN10	1.5	3450	2.5	4.1	-	(1)	90.5	16
	A2-22	DN65-PN10	1.5	3450	3	4.8	-	(1)	91.5	16
	A2-41	DN80-PN16	1.75	3450	5.5	8.3	-	(1)	132.5	24
	A2-56	DN80-PN16	2.25	3450	7.5	11	-	(2)	185	40
	A2-75	DN80-PN16	2.25	3450	10	14	-	(2)	193	40
	A2-97	DN80-PN16	2.5	3450	13	18.2	-	(3)	198.5	40
A4	A4-1500	DN80-PN16	2	1750	2	-	12	(1)	101.5	16
	A4-15	DN80-PN16	2	1750	2	3.4	-	(1)	101.5	16
	A4-22	DN80-PN16	2.25	1750	3	4.8	-	(1)	125.5	16
	A4-30	DN80-PN16	2.25	1750	4	6.2	-	(1)	150	24
	A4-41	DN100-PN16	3.5	1750	5.5	8.3	-	(1)	209.5	24
	A4-56	DN100-PN16	3.5	1750	7.5	11	-	(2)	218.5	40
	A4-75	DN150-PN16	3.5	1750	10	14	-	(2)	275.5	40
G2	G2-1900	2" NPS-F DN32-PN6	-	3450	2.5	-	14.5	(2)	82.5	16
	G2-19	2" NPS-F DN32-PN6	-	3450	2.5	4.1	-	(1)	82.5	16
	G2-2200	2" NPS-F DN32-PN6	-	3450	3	-	17	(2)	88	16
	G2-22	2" NPS-F DN32-PN6	-	3450	3	4.8	-	(1)	88	16
	G2-41	2" NPS-F DN50-PN10	-	3450	5.5	8.3	-	(1)	136.5	24
	G2-63	2" NPS-F DN50-PN10	-	3450	8.5	12.2	-	(2)	187.5	40
	G2-78	2" NPS-F DN50-PN10	-	3450	10.5	14.7	-	(2)	189.5	40
	G2-97	2" NPS-F DN50-PN10	-	3450	13	18.2	-	(3)	198.5	40
H2	H2-1500	2" NPS-F DN50	0.75	3450	2	-	12	(1)	77	16
	H2-15	2" NPS-F DN50	0.75	3450	2	3.4	-	(1)	77	16
	H2-2200	2" NPS-F DN50	0.75	3450	3	-	17	(2)	79.5	16
	H2-22	2" NPS-F DN50	0.75	3450	3	4.8	-	(1)	79.5	16
	H2-41	DN65-PN6	0.5	3450	5.5	8.3	-	(1)	120	24
	H2-56	DN65-PN6	0.5	3450	7.5	11	-	(2)	176.5	40
	H2-75	DN65-PN6	0.5	3450	10	14	-	(2)	176.5	40
	H2-98	DN65-PN6	0.5	3450	13	18.2	-	(3)	176.5	40

(1) 16/7 SOOW Ø??mm

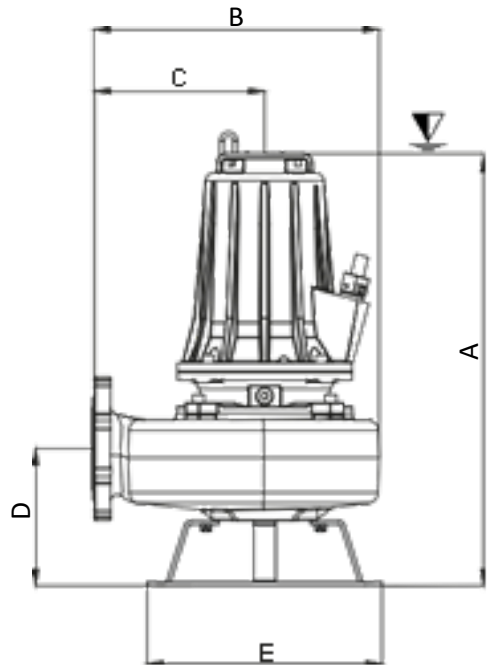
(2) 14/4 + 16/3 SOOW Ø??mm


(3) 12/4 + 16/3 SOOW Ø??mm

## 5 Dimensions

All dimensions in inches

Series	Models	DN	A	B	C	D	E
V2	V2-1500, V2-15, V2-22	DN65-PN10	21.1	11.6	8.3	5	10.2
	V2-41	DN80-PN16	21.9	13.4	7.8	7.1	10.2
	V2-56, V2-75, V2-89	DN80-PN16	24	14.5	7.8	7.1	12.6
V4	V4-1100, V4-11, V4-1500, V4-15	DN80-PN16	18	12.8	13.2	3.9	10.2
	V4-22, V4-30	DN80-PN16	24.1	15.2	14.6	7.3	12.6
	V4-41, V4-56, V4-75	DN100-PN16	28	18.5	19.8	8.3	14.6
A2	A2-1900, A2-19, A2-22	DN65-PN10	21.1	11.6	8.3	5	10.2
	A2-41	DN80-PN16	21.9	13.4	7.8	7.1	10.2
	A2-56, A2-75, A2-97	DN80-PN16	24	14.5	7.8	7.1	12.6
A4	A4-1500, A4-15	DN80-PN16	20.5	15.7	9.6	7	12.6
	A4-22, A4-30	DN80-PN16	22.1	16.1	9.6	7	12.6
	A4-41, A4-56	DN100-PN16	25.6	17.7	10.5	8.3	14.6
	A4-75	DN100-PN16	28.3	20.8	12.2	10.5	16.5
G2	G2-1900, G2-19, G2-22, G2-2200	2" NPS-F DN32-PN6	15.9	10.2	6	3.8	8.1
	G2-41	2" NPS-F DN50-PN10	19.8	13	7.5	3.8	10.2
	G2-63, G2-78, G2-97	2" NPS-F DN50-PN10	22.2	14	8.5	4.8	10.8
H2	H2-1500, H2-15, H2-22, H2-2200	2" NPS-F DN50	17.2	11.4	6.6	4.2	10.2
	H4-41	DN65-PN6	19.7	13	7.4	5.1	10.2
	H4-56, H4-75	DN65-PN6	20.2	13.9	7.8	5.1	10.2



 Minimum submersion

## 6 Safety standards

To ensure your safety during pump maintenance or installation, please observe the following guidelines:

1. Installation, inspection, and maintenance should be conducted exclusively by qualified technicians. Individuals with reduced physical, sensory, or mental capabilities, or lacking experience or knowledge, should not operate the pump unless under supervision or proper instruction.
2. Always be mindful of health hazards and adhere to sanitary measures.
3. Personnel working in facilities handling wastewater should be vaccinated against potential illnesses transmitted through wounds, contact, or inhalation.
4. Wear appropriate clothing, footwear, safety glasses, and other personal protective equipment (PPE) to prevent contact with hazardous liquids.
5. Recognize the risk of drowning and avoid working alone. Ensure another worker is present outside the tank.
6. Clearly mark the work area with barriers and other appropriate signals, especially in crossing areas.
7. Before commencing work, check oxygen levels and test for the presence of dangerous gases in the tank.
8. Ensure electrical cables within the tank are switched off and undamaged before any intervention in the pumping station.
9. Verify there is no risk of explosion before soldering or conducting any operation that may produce flames or sparks.
10. These installation and operation instructions do not override standard safety regulations. Always follow all safety protocols and best practices.

## 7 Installation


Pump installations are seldom identical. Each installation and application can vary due to many different factors. It is the owner/service mechanics responsibility to repair, service, and test to ensure that the pump integrity is not compromised according to this manual.

Begin by checking the cleanliness and level of oil in the oil chamber. Any impurities or insufficient oil levels must be addressed promptly to avoid potential damage to the system, (see section 13.1).


With the power disconnected, manually rotate the impeller to verify smooth operation. Any resistance or obstruction should be investigated further before proceeding. Take the time to verify the functionality of any monitoring equipment integrated into the control system, (if applicable). This includes sensors, floats, gauges, or any other components designed to provide crucial data regarding the pump's operation.




Ensure that the supply voltage and frequency align with the specifications outlined on the pump data plate. Any discrepancies could lead to inefficiencies or potential damage to the pump motor. For installations with extended cables, consider the voltage drop in the cable, when confirming proper supply voltage. Make sure that the fuses or circuit breakers are of the properly sized for the pump amperage, including the inrush starting amperage.

	<p><b>WARNING:</b> The starting surge with the direct-on line start can be up to six times higher than the rated current.</p>
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Install the electrical connections as illustrated in the proper wiring diagram for your pump (see section 8.1). Check for proper rotation direction of impeller (see section 8.4).

	<p><b>WARNING:</b> Do not attempt to alter the length or repair any power cable with a splice. The pump motor and pump motor and cable must be completely waterproof.</p>
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Attach proper lifting equipment to the lifting handle (or lifting rings) fitted to the pump.

	<p><b>WARNING:</b> Do not lift the pump by the power cable, piping, or discharge hose. This may compromise its integrity and functionality of the system.</p>
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Position the suction inlet of the pump at the lowest point of the tank. Take care to prevent the pump from sinking into soft or loose ground; it should be placed on a base or suspended from the bottom. Remove stand from pump when using slide rail system. Keep stand and reattach when transporting or handling the pump. After the pump has been installed, make sure that the pump and all piping are secure before operation.

	<p><b>WARNING:</b> Do not run pump dry or below minimum operating level. See section 5 for pump specific minimum operating levels.</p>
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**Example of fixed installation with slide rails**



## 8 ELECTRICAL CONNECTIONS



**WARNING:** Prior to opening the electric pump for maintenance or inspection, always disconnect the electric power supply to prevent the risk of electric shock or injury.

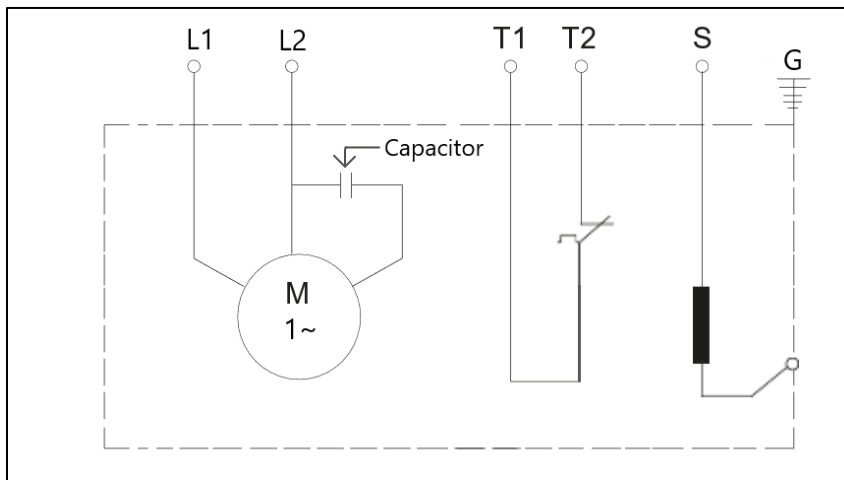
All the electrical connections must be executed by a qualified electrician.

- Ensure that the supply frequency and voltage match those specified on the pump plate.
- Look at the wiring diagrams for the proper electrical connections.
- In the 3-phase motors, check the rotation direction of the impeller (see the rotation direction section 8.4).
- Avoid operating the pump without first identifying and rectifying the cause of any malfunction.
- When reassembling the cable, always use a new gasket (cable gland) to prevent water infiltration into the pump. Ensure that the cable entry gland is securely closed.

All the electrical connections must be protected against humidity and all joints must be watertight.

### 8.1 Wiring Diagrams

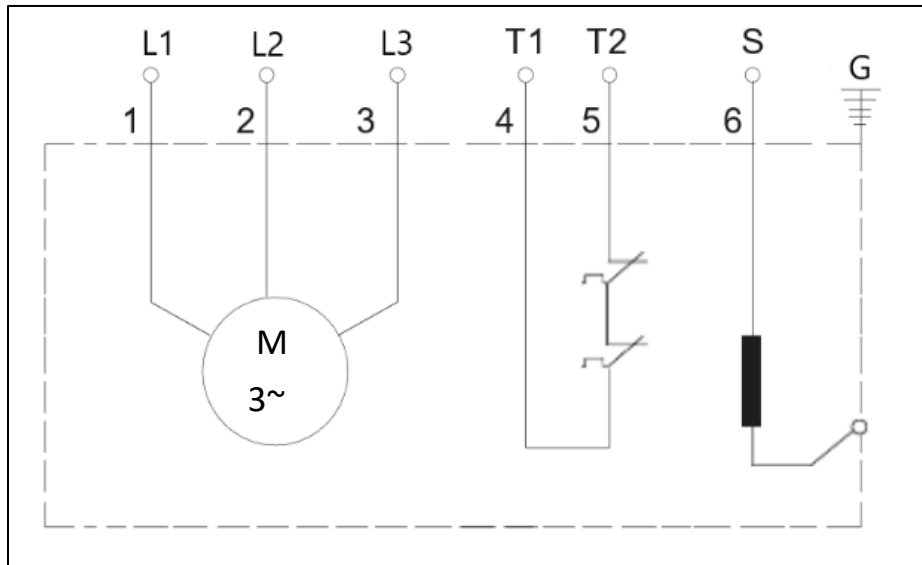
#### Single Phase 230V



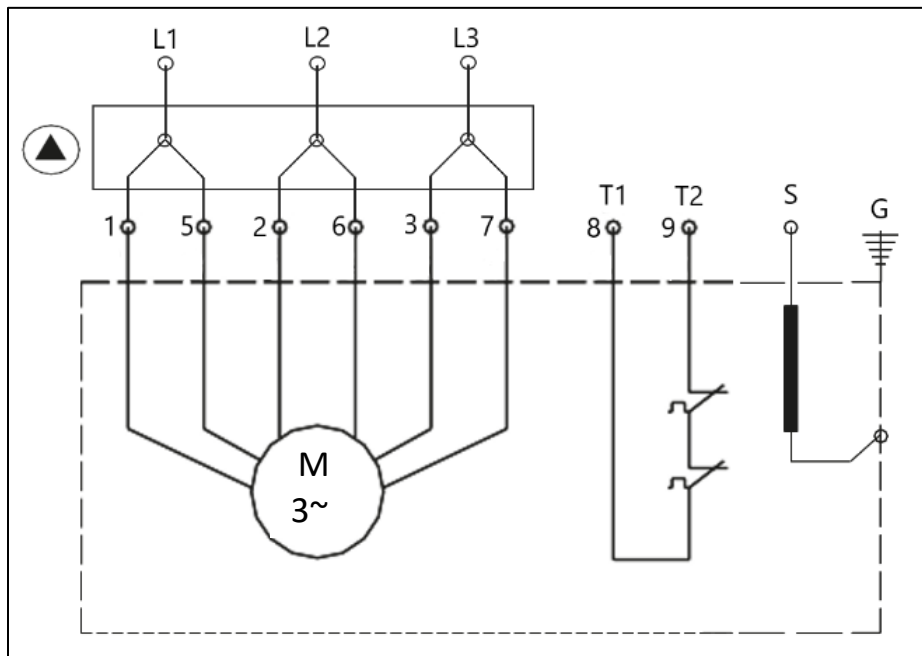
Connection	Color
L1	Black
L2	White
T1, T2	Orange
S	Blue
G	Green

### Three Phase 460V

Less than 7.5HP



7.5HP and greater



Connection	Color
L1, L2, L3	Red, White, Black
T1, T2	Orange
S	Blue
G	Green

### 8.2 Motor Protection T1-T2

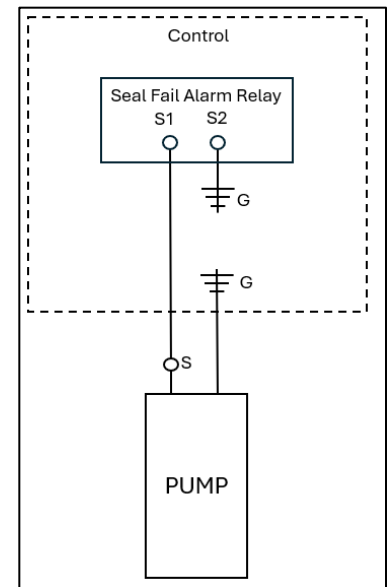
The V2 - V4 - A2 - A4 - G - H models are furnished with T1-T2 thermal sensors in the winding, designed to be linked to a control panel equipped with suitable protection modules. These sensors promptly detect any motor overheating, automatically halting pump operation.

This protective mechanism is typically in the closed position, and it opens when the temperature reaches 266°F (130°C), interrupting the power supply. Once the temperature decreases to 167°F (75°C), the sensor closes again, allowing the pump to resume operation (refer to diagrams for more details).

### 8.3 Seal Minder®

The Seal Minder®, also known as a seal fail circuitry or moisture detection circuit, alerts the pump operator if there is moisture in the oil chamber. This early warning helps schedule repairs and inspections. The Seal Minder® includes a sensor probe inside the oil chamber, where mechanical seals are cooled and lubricated by oil.

To use the Seal Minder®, connect it to a control panel. It helps indicate seal failure and requires a seal fail circuitry in the control panel for warning signals. Connect the open end of the Seal Minder® circuit cord to a seal failure alarm relay circuit or use a standalone Seal Minder Panel. Connect the ground terminal in the seal failure alarm relay to the ground of the control panel. Seal Minder Relay available as an optional accessory, contact IFS for pricing.



Seal Minder® wiring diagram

### 8.4 Rotation direction (only for three phase pumps)

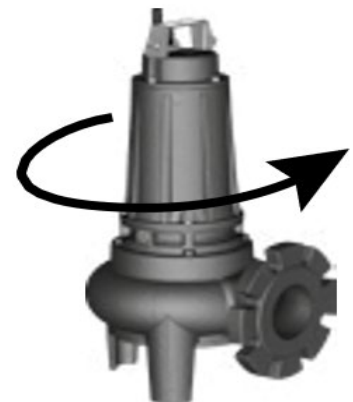
After every new connection, loss of phase, or voltage fluctuation, it is possible that the phases become inverted. Therefore, it is crucial to check the rotation direction. Incorrect rotation can lead to motor overheating, intense vibrations, and a significant reduction in pump capacity.

To verify the correct impeller rotation direction, slightly tilt the pump and start it.



**CAUTION:** Keep a safe distance from the impeller during pump startup and be cautious of any potential kickback, which could be harmful.

### Starting Kickback



If the pump exhibits a counterclockwise kickback (viewed from above) upon starting, the connection is correct. Otherwise, stop the power supply and invert the two phases.

When viewed from the suction inlet, the correct impeller rotation is counterclockwise.

## 9 Care and handling

### 9.1 Transportation

Do not lift the pump by the electric cable; use only the handle provided for this purpose.



**WARNING:** When moving the pump from one location to another always disconnect the power supply for risk of electrical shock.

### 9.2 Operation



**WARNING:** Running the pump dry or without a load may result in an explosion.



**WARNING:** Operating the pump with flammable liquids, such as petrol, poses a significant risk of fire or explosion. Please ensure that only compatible liquids are used to prevent potential hazards

While operating or submerged in liquid, the pump is not susceptible to freezing. However, if the pump is removed from the water and exposed to below-zero temperatures, the impeller may become blocked by ice. If the impeller is obstructed by ice, submerge the pump in water and allow the ice to melt before starting it again. Avoid quick methods of defrosting to prevent damage to the pump.

### 9.3 Cleaning

If the pump has been used with liquid containing solid particles, allow it to run for a few minutes in clean water. This helps to remove impurities (such as mud and stones) and prevents them from drying, which could block the impeller and mechanical seal, causing the pump to malfunction.

### 9.4 Pump Bleeding

When submerging the pump in a water-filled well, air bubbles may form inside the pump body, potentially affecting pumping performance. If this occurs, remove the pump from the liquid and then submerge it again, repeating the process several times if necessary to ensure optimal performance.

### 9.5 Storage


When storing the pump:


- Store in locations protected from humidity and extreme temperatures. Acceptable temperature range 32-104°F (0-40°C).
- Place it in a vertical position, ensuring its stability to prevent rolling or falling.


During storage, it is advisable to manually rotate the impeller or blades periodically (at least every two months), using safety gloves, to prevent the seals from seizing. Before reusing the pump, always ensure that the impeller shaft rotates freely.

## 10 Inspection and maintenance

### 10.1 Inspection Safety

	<b>WARNING:</b> Before working on the pump, check the power supply is disconnected and the pump cannot energize.
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	<b>WARNING:</b> Prior to use, ensure thorough cleaning of the pump using water or specified cleaning products. Failure to do so may result in biological contamination, posing a serious risk of infection.
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	<b>CAUTION:</b> When handling the pump and its parts, always wear work gloves to minimize the risk of injury
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### 10.2 Recommendations for inspection


Periodical checks and maintenance are suggested to guarantee safer operation. For newly installed or recently repaired pumps, it is recommended to conduct an inspection after the first week of operation.

The pump should undergo inspection after every two thousand hours of operation or at least once annually. For more demanding applications or intermittent use, inspections should be performed more frequently.

	<b>WARNING:</b> If abnormal noise is detected during pump operation, cease use immediately and contact Industrial Flow Solutions technical support. Continuing operation may lead to severe damage to the pump.
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<b>Regular Inspection:</b>	Monthly	Bi-monthly	Semi-annually	Annually
Measure insulation resistance. Reference insulation resistance = 1MΩ or greater. <sup>1</sup>	•			
Measure operating current. Compare with rated current	•			
Measure supply voltage. Compare with allowable range (within ±10% of rated voltage).	•			
Pump inspection. A noticeable drop in performance may indicate wear in the impeller, etc., or clogging of the strainer, etc. Remove the clogged debris and replace any worn parts.	•			
Seal inspection. Check seals every 2 months or every month depending on liquid pumped.		•		
Oil inspection. Check the oil every six months or after 2,000 hours of use, whichever comes first.			•	
Change oil. Change the oil every 12 months or after 4,000 hours of use, whichever comes first.				•

<sup>1</sup> If the insulation resistance has become noticeably lower than the previous inspection, an inspection of the motor will be necessary

	<p><b>WARNING:</b> If detecting a higher-than-normal temperature during pump operation, cease use immediately and contact Industrial Flow Solutions technical support. Continuing operation may lead to severe damage to the pump</p>
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A general check must be done on the following points:

- Ensure there are no infiltrations originating from the cable. If detected, replace the cable gland, ensuring screws and bushings are tightly closed.
- If the supply cord is damaged, it must be replaced by the manufacturer, authorized distributor, or qualified personnel to prevent hazards.
- Inspect the oil level and quantity. The oil chamber is adequately filled when the oil level, with the pump laid on one side, is 1-1.5 cm below the oil cap hole.

### 10.3 Motor insulation control

Annually, or after four thousand hours of operation, it is essential to inspect the motor insulation. Utilize a megohmmeter to conduct measurements at the cable ends (ensuring disconnection from the panel). The test voltage should not exceed 1000V continuously.

The winding resistance to ground should exceed 5 MΩ. If it falls below this threshold, perform two measurements: one for the cable and another for the motor. Disconnect the cable from the motor and measure the winding resistance to ground by connecting all winding ends.

- A cable insulation resistance below 5 MΩ indicates cable damage.
- Low insulation values in the motor signify winding damage.

## 11 Spare parts list

The spare parts lists are available on-line through our web site [www.flowsolutions.com](http://www.flowsolutions.com) or contact IFS at [sales@flowsolutions.com](mailto:sales@flowsolutions.com) 860-631-3618

## 12 Replacing the impeller



**WARNING:** Before working on the pump, check the power supply is disconnected and the pump cannot energize.



**WARNING:** Prior to use, ensure thorough cleaning of the pump using water or specified cleaning products. Failure to do so may result in biological contamination, posing a serious risk of infection.



**CAUTION:** When handling the pump and its parts, always wear proper PPE to minimize the risk of injury

### 12.1 Series A2-A4-H-V2-V4

1. Unscrew the four socket screws securing the volute to the oil chamber, and carefully remove the volute from the main pump body.
2. Ensure the impeller is securely held, then proceed to unscrew the socket screw connecting it to the motor shaft.
3. If necessary, utilize prybars to safely remove the impeller from its position.
4. Prior to mounting a new impeller, inspect the terminal part of the shaft to ensure it is clean and free from imperfections.
5. Align the key on the shaft with the impeller keyhole, then carefully slide the impeller into its designated position. Use a soft mallet to gently tap the impeller into place, ensuring it is fully seated.
6. Once the impeller is securely positioned, fasten it by screwing the socket screw and spacer back into place.
7. Return the volute to its original position, ensuring proper alignment, and secure it firmly with the four socket screws.

### 12.2 Series G

1. Unscrew the socket screw securing the cutter head in place. Carefully remove the cutter head from the cutting kit, taking care to note the alignment pins used to maintain alignment with the impeller. Use pliers to remove these pins.
2. Unscrew the four socket screws securing the closing plate to the volute, and cautiously remove the plate from the main pump body using pry bars.
3. If necessary, utilize pry bars to safely remove the impeller from its position.
4. Before mounting a new impeller, inspect the terminal part of the shaft to ensure it is clean and free from imperfections.
5. Align the key on the shaft with the impeller keyhole, then carefully slide the impeller into its designated position. Use a soft mallet to gently tap the impeller into place, ensuring it is fully seated.



6. Return the closing plate to its original position, ensuring proper alignment, and secure it firmly with the four socket screws.
7. Using pliers, insert the alignment pins into their corresponding holes in the impeller hub.
8. Align the cutter head with the pins and push it into place. Once securely positioned, fasten the cutter head by screwing the socket screw and spacer back into place.

## **13 Replacing the oil**

The oil used to refill the chamber of our pumps is ecological, non-toxic, tasteless, and colorless. (Marcol 82 ESSO, Pharma 19, Q8 WF15 or equivalent product)

The lubrication oil level check should only be performed outside the pump's operational environment. The oil level should be maintained below the access hole by 1 to 1.5 cm.

### **13.1 Oil inspection:**

- During normal maintenance if oil is cloudy or milky in appearance
- At overhaul
- After two thousand hours of operation or in any case once a year.

Oil replacement or top up should only be conducted by qualified individuals. To top up or replace the oil, ensure the pump is positioned level.

Ensure oil replacement activities do not pose risks to people or the environment, especially if the pump has been used with hazardous liquids.

### **13.2 Replacing the oil**

1. Position the pump horizontally with the oil plug facing up.
2. Remove the oil plug.
3. Slowly rotate the pump to allow all oil to drain from the tank for a few minutes.
4. Clean the inside of the tank using washing oil.
5. When refilling the oil tank, ensure the pump is positioned with the cap facing upward.
6. Fill the tank with proper oil replacement.
7. Refill until the oil level is 20 mm below the thread of the oil cap. Refer to section 5 for exact oil quantity.
8. Before screwing the cap back on, inspect its seal and replace if necessary.
9. Lower the pump into the well.


Comply with the current regulations on the disposal of used oils.

## 14 Mechanical seal replacement

The pumps in these series are equipped with two mechanical seals:

- Motor-side mechanical seal
- Impeller-side mechanical seal

Both seals consist of two parts: a rotating section and a fixed ring. Before fitting new seals, ensure that the faces in contact are undamaged.


	<p><b>WARNING:</b> It is advised to refrain from applying excessive force during the installation of the seal to mitigate the risk of damaging the components.</p>
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### 14.1 Replacing the Lower Mechanical Seal

1. Empty the seal lubrication oil tank as described in section 13.
2. Uncouple the impeller as indicated in section 12 before replacing the mechanical seal.
3. Using two slot-head screwdrivers, remove the old seal, first working on the rotating part, then on the fixed ring. Position the pump to prevent oil leakage from the tank.
4. Before fitting the new seal, ensure that the housings are clean, without burrs or scores that could damage it or compromise the seal to the shaft.
5. Replace the impeller and pump body as described in section 12.
6. Refill the oil tank with the quantity indicated in section 13.

### 14.2 Replacing the Upper Mechanical Seal

1. Empty the seal lubrication oil tank as described in section 13.
2. Remove the impeller as described in section 12.
3. Remove the lower mechanical seal as described above.
4. Unscrew the four socket screws securing the oil chamber/volute to the motor housing.
5. Remove the oil chamber/volute.
6. Remove the Seeger ring and the AVP ring on the shaft in front of the mechanical seal using Seeger pliers.
7. Remove the mechanical seal from the shaft.
8. Fit the new mechanical seal.
9. Replace the Seeger ring and the AVP ring on the shaft.
10. Check condition of the O-Ring between the oil chamber/volute and motor housing. Replace if necessary. Reinsert the oil chamber/volute.
11. Tighten the four screws securing the oil chamber/volute to the motor housing.
12. Reinstall or replace the lower mechanical seal as described above.
13. Replace the impeller and pump body as described in section 12.
14. Refill the oil tank with the quantity indicated in section 13.

	<p><b>WARNING:</b> These procedures should only be executed by qualified personnel. Mishandling may result in damage to the seal or the pump.</p>
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## 15 Troubleshooting

### The pump does not start:

- Check for loss of electric power supply (inspect blown fuses or tripped protection relays).
- Ensure the selection switch is turned ON (if turned OFF, switch it ON).
- Investigate loss of phase by checking the connection.
- Verify if the impeller is blocked.
- Check for seized mechanical seals or ball bearings.

### The pump does not stop:

- Failure to the stop regulator (clean or replace the stop regulator).
- The pump is not able to empty the tank till the stop level. It may be necessary to replace the pump with another one of larger flow capacity.

### The pump runs at reduced performance/capacity:

- Check if the pump's rotation direction is incorrect (only applicable to three-phase motors).
- Inspect the hydraulic section for wear.
- If the pump is operating in an air pocket, switch it off and back on after bleeding the system.
- If the pump operates intermittently, consider these factors:
  - Check if the liquid temperature is too high (above 104°F/40°C) or too low (below 32°F/0°C).
  - Verify if the pump experiences excessive start-ups per hour.
  - Ensure that the fluid level in the tank is sufficient for pump operation.
  - Check if the power supply voltage is within the required limits ( $\pm 10\%$ ).
  - Inspect for obstructions obstructing the impeller or blades, causing incorrect rotation.
- If the issue persists, contact IFS.

### The pump stops unexpectedly:

- Check for a broken bearing.
- Investigate burning or loss of charge in the winding, indicating a faulty winding.
- Look for signs of excessive power supply overload.
- If the cause is excessive power supply overload, the installer can correct the power supply. Otherwise, contact IFS.

**To service or repair your pump, please contact your local BJM Pumps distributor. Service should only be performed by qualified electricians. Additionally, you can reach out directly to our technical support team at 860-631-3618 or via email at [applications@flowsolutions.com](mailto:applications@flowsolutions.com)**

## 16 Tools

The tools necessary for a normal maintenance of the pumps are the following:

- Low profile hex keys and sockets of 6, 8 and 10 mm.
- Circlip and slip joint pliers.
- Phillips and slot-head screwdrivers.
- Mallet and pry bars.

## 17 Warranty

The warranty and related terms and conditions can be found on our website:

<https://flowsolutions.com/terms-and-conditions/> or contact us at [sales@flowsolutions.com](mailto:sales@flowsolutions.com)

## 18 Supporting documents

	Pump Model	Performance Curve	Technical Datasheet	Series	Dimensional Drawings	Parts List
A2	A2-19	DS-C42-010	DS-C42-014	A2	DS-C42-002	DS-C42-004
	A2-22	DS-C42-005	DS-C42-006	G2	DS-C56-002	DS-C56-004
	A2-41	DS-C42-009	DS-C42-011	H2	DS-C59-002	DS-C59-003
	A2-56	DS-C42-012	DS-C42-013	V2	DS-C61-002	DS-C61-005
	A2-75	DS-C42-007	DS-C42-008			
	A2-97	DS-C42-003	DS-C42-015			
V2	V2-15	DS-C61-010	DS-C61-011			
	V2-22	DS-C61-003	DS-C61-007			
	V2-41	DS-C61-004	DS-C61-012			
	V2-56	DS-C61-009	DS-C61-013			
	V2-75	DS-C61-006	DS-C61-014			
	V2-89	DS-C61-008	DS-C61-015			
G2	G2-19	DS-C56-006	DS-C56-008			
	G2-22	DS-C56-005	DS-C56-009			
	G2-41	DS-C56-012	DS-C56-015			
	G2-63	DS-C56-007	DS-C56-010			
	G2-78	DS-C56-013	DS-C56-014			
	G2-97	DS-C56-003	DS-C56-011			
H2	H2-15	DS-C59-006	DS-C59-008			
	H2-22	DS-C59-004	DS-C59-005			
	H2-41	DS-C59-007	DS-C59-009			
	H2-56	DS-C59-014	DS-C59-015			
	H2-75	DS-C59-010	DS-C59-013			
	H2-97	DS-C59-011	DS-C59-012			

## 19 Start-up report

PUMP INFORMATION			
Pump Owner's Name:			
Location of Installation:			
Person in Charge:		Phone: ( )	
Purchased From:			
Model:		Serial No:	
Voltage:	Phase:	Frequency:	HP:

INITIAL INSPECTION			
Does impeller turn freely by hand?		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Condition of Equipment		<input type="checkbox"/> New <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor	
Condition of Cable Jacket		<input type="checkbox"/> New <input type="checkbox"/> Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor	
Direction of Impeller Rotation (Use C/W for clockwise, CC/W for counterclockwise):			
Resistance of cable and pump motor (ohms)			
Red to White _____ White to ground _____ Black to ground _____			
MEG OHM CHECK OF INSULATION			
Red to ground _____ White to ground _____ Black to ground _____			
Condition of location at start-up:		<input type="checkbox"/> Dry <input type="checkbox"/> Wet <input type="checkbox"/> Muddy	
Was equipment stored?	<input type="checkbox"/> Yes <input type="checkbox"/> No.	Length of storage:	
Fluid being pump:		pH of fluid:	
Debris in bottom of station?		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Was debris removed in your presence?		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Are guide rails exactly vertical?		<input type="checkbox"/> Yes <input type="checkbox"/> No	
Is base elbow installed level?		<input type="checkbox"/> Yes <input type="checkbox"/> No	

<b>CONTROL CHECK</b>	
Tip lowest float (stop float), all pumps should remain off. Tip second float (and stop float), one pump comes on. Tip third float (and stop float), both pumps on (alarm on simplex). Tip fourth float (and stop float), high level alarm on (omit on simplex).	
If not float controls, describe type of controls:	
Does liquid level ever drop below volute top?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Control Panel MFG & model:	
Number of pumps operated by control panel:	
Short Circuit protection:	Type:
Number and size of short circuit device(s)	Amp rating:
Overload type:	Size:      Amp rating:
Do protective devices comply with pump motor amp rating?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Are all pump connections tight?	<input type="checkbox"/> Yes <input type="checkbox"/> No
Is the interior of the panel dry?	<input type="checkbox"/> Yes <input type="checkbox"/> No If No, correct moisture problem.

<b>ELECTRICAL READINGS</b>			
<b>Single Phase</b>	Voltage supply at panel connection, pump off	L1	L2
	Voltage supply at panel connection, pump on	L1	L2
	Amperage load connection, pump on	L1	L2
<b>Three Phase</b>	Voltage supply at panel connection, pump off	L1-L2	L2-L3      L3-L1
	Voltage supply at panel connection, pump on	L1-L2	L2-L3      L3-L1
	Amperage load connection, pump on	L1-L2	L2-L3      L3-L1

FINAL CHECK		
Is pump secured properly?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Was pump checked for leaks?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Do check valves operate properly?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Does station operate at proper flow rate?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Noise level:	Acceptable <input type="checkbox"/>	Unacceptable <input type="checkbox"/>
Comments:		
Describe and equipment difficulties during start-up:		
Installed by: Company: _____ Person: _____ Date: _____		
Maintained by: Company: _____ Person: _____		
Date and time of start-up _____ Present at start-up: ( ) Engineer's name _____ ( ) Contractor's name _____ ( ) Operator's name _____ ( ) others _____		