



THE
SPRAY NOZZLE
PEOPLE

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IBC CLEANING STATION ORBITOR ECO

Instruction Manual



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NOTE



This set of instructions solely encompasses the operational guidelines for the IBC Cleaning Station. For further information, see System Overview below. For detailed information regarding the individual components, please refer to their respective user manuals. These individual manuals provide in-depth insights, troubleshooting steps, and further operational details specific to each component.

WARNINGS

Power Supply During Failure

Power Failure Protocol: In the event of a power failure, isolate the pump from the power supply immediately. Keep the pump disconnected until ready to initiate start-up procedures again.

SAFETY

- 1.1. Ensure that all power sources are turned off when the pump is not in use and before inspecting, maintaining, servicing, or cleaning the nozzle to help prevent anyone from accidentally turning on power to the pump.
- 1.2. Know how the equipment functions and understand the operating processes.
- 1.3. Wear the appropriate personal protective equipment for the job to be performed, e.g., eye protection, hearing protection, gloves, safety shoes, hard hat.
- 1.4. Check plant voltage with the voltage specified on the pump. Electrical specifications for your pump are printed on the machine serial number tag.
- 1.5. Keep the operating zone free of obstacles that could cause a person to trip or fall toward an operating pump.
- 1.6. Know where the FIRST AID SAFETY STATION is located.
- 1.7. Know where FIRE EXTINGUISHING EQUIPMENT is located.
- 1.8. Use proper lifting and transporting devices for heavy equipment (check the equipment weight before lifting).
- 1.9. Electrical installation of the unit must be performed by a competent electrician and power supply to the unit must have an isolation switch.
- 1.10. All tests are conducted using fresh main water at ambient temperature. For using different fluids as a cleaning agent, it is essential to seek professional advice from health and safety personnel.

TRAINING

It is the responsibility of the customer to ensure that all personnel who will be expected to operate or maintain the equipment, participate in training and instruction sessions, and become trained operators.



This instruction manual is published by The Spray Nozzle People (SNP) Ltd without any warranty.

INTRODUCTION

The IBC Cleaning Station provides numerous advantages, including enhanced efficiency through faster cleaning processes (time savings), a consistent and error-free approach to cleaning, reduced labour costs, and resource optimisation, leading to both cost savings and environmental benefits. These systems promote environmental safety by reducing waste generation, ensuring compliance with industry-specific standards, and enhancing workplace safety. Integrated seamlessly into production workflows, automated systems reduce interruptions and cross-contamination risks while proving to be cost-effective in the long run.

OVERVIEW

The IBC (Intermediate Bulk Container) Cleaning System is a custom designed, simple system for the cleaning of IBC containers. It has been designed for simple operation with minimal components and complexity.

The IBC Cleaning Station comes with a vertical multistage electric pump and the integrated frequency converter (referred to as the E-SPD+), Orbitor ECO nozzle, downpipe, and all the necessary fittings and piping.

System PFD (Process Flow Diagram)

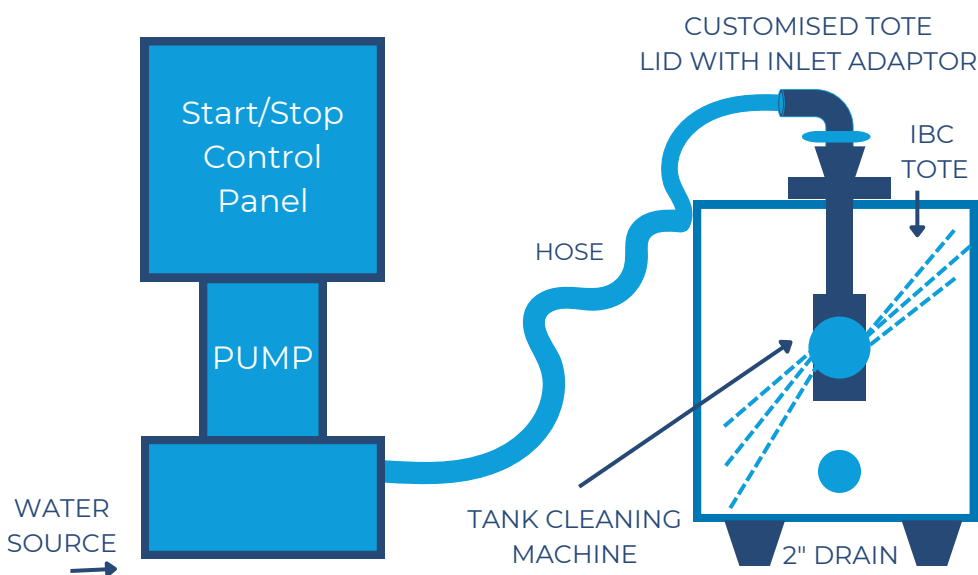


Figure 1:
System PFD

System Overview

The IBC Cleaning Station comprises (see Figure 1):

1. IBC-P-001

- a. 1 of EVMS-K5 10N5 Q1BEG E /2.2KW/400V MOTOR
 - i. Ebara Pump and Motor - single phase vertical multistage electric pump
 - ii. 1 ¼" female inlet and outlet
- b. 1 of E-SPD+ Converter (230v-380v)
 - i. Variable speed drive / controller – for control and protection of pump systems according to the frequency of the pump's power supply
- c. 1 of pressure transducer 0-10 bar

2. IBC-N-001

- a. 1 of 1" Bsp (F) Orbitor ECO Tank Cleaning Machine 360° 4 x 3 mm Nozzles, 316 Stainless Steel
- b. 1 of IBC Tank Cleaning Lance, Part F QR Adapter 316 Stainless Steel
- c. 1 of IBC Lid, to suit 9" thread c/w 2" centre thread with plug, Polypro
- d. 1 of IBC Lid, to suit 6" thread c/w 2" centre thread with plug, Polypro

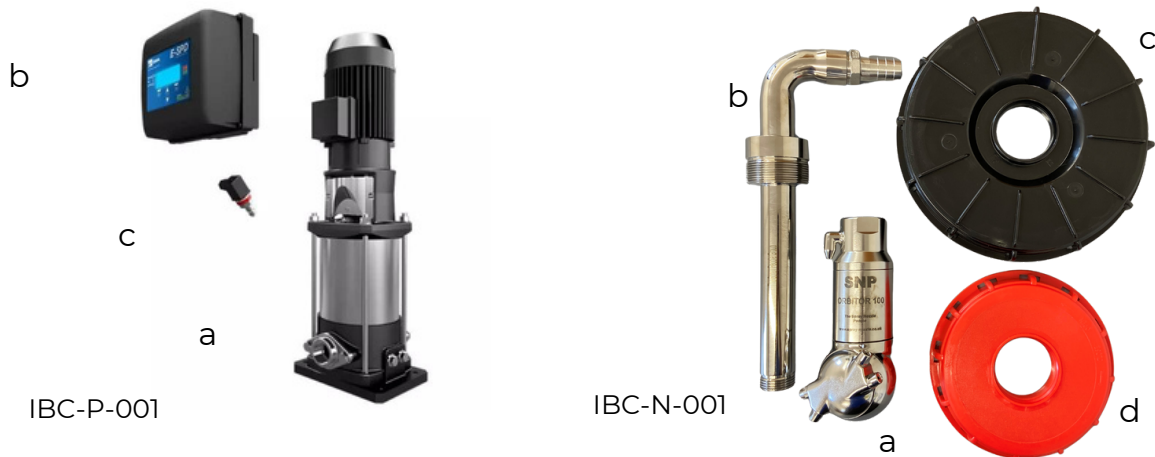
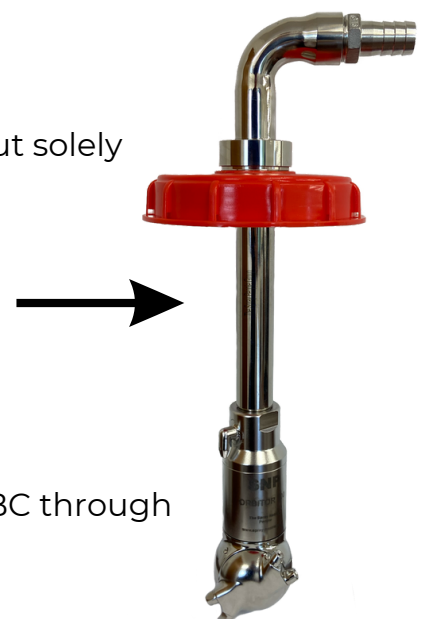


Figure 2: IBC-P-001 and IBC-N-001

INSTALLATION

The installation and maintenance must be carried out solely and exclusively by authorised personnel, who is also responsible for making the electrical connections in accordance with the current safety regulation.

Figure 3: Orbitor ECO Nozzle mounted on downpipe with corresponding lid fitted.



Nozzle Set Up

The Orbitor ECO Nozzle should be mounted in the IBC through the downpipe assembly (as shown in Figure 3).

Nozzle Cycle Times

The pump has been set to run at 5 bar, ensuring a 5 bar delivery at the nozzle.



4x3mm			
BAR	Flow rate L/min	Jet length Mtr	Cycle Time Min
3	45.0	1.0	6
4	51.7	1.5	5.5
5	58.3	2.0	5
6	65.0	2.3	4.4
7	71.7	2.5	4
8	78.3	2.8	3.5
9	85.0	3.0	3.1
10	90.0	3.0	3

← Figure 4: Orbitor ECO Nozzle

Delivery Hose

Delivery Hose Clarification: The delivery hose, which is used for the transfer of fluids, is the smaller hose within the system.

Pump Overview

- Model: Ebara EVMS-K5 10N5 Q1BEG (Ebara Vertical Multi Stage Pump)
- Motor: The motor is a totally enclosed, fan-cooled motor with principal dimensions to IEC and DIN standards.
- Motor standard: Electrical tolerances comply with IEC 60034.
- IE Efficiency class: The motor efficiency is classified as IE3.
- The motor can be connected to a variable speed drive for adjustment of pump performance to any duty point.
- Frequency: 50Hz
- Rated power: P2 2.2 KW
- Ambient temperature: 40°C
- Weight: 15 kg
- Flow rate: 40-130 L/min

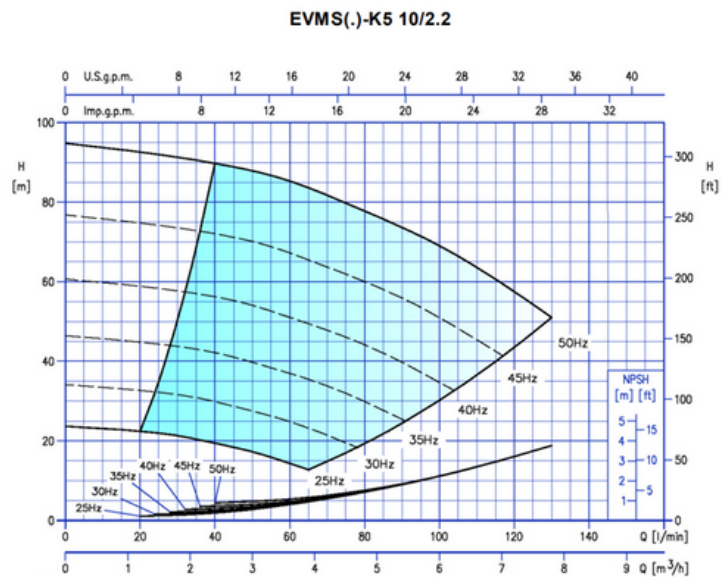
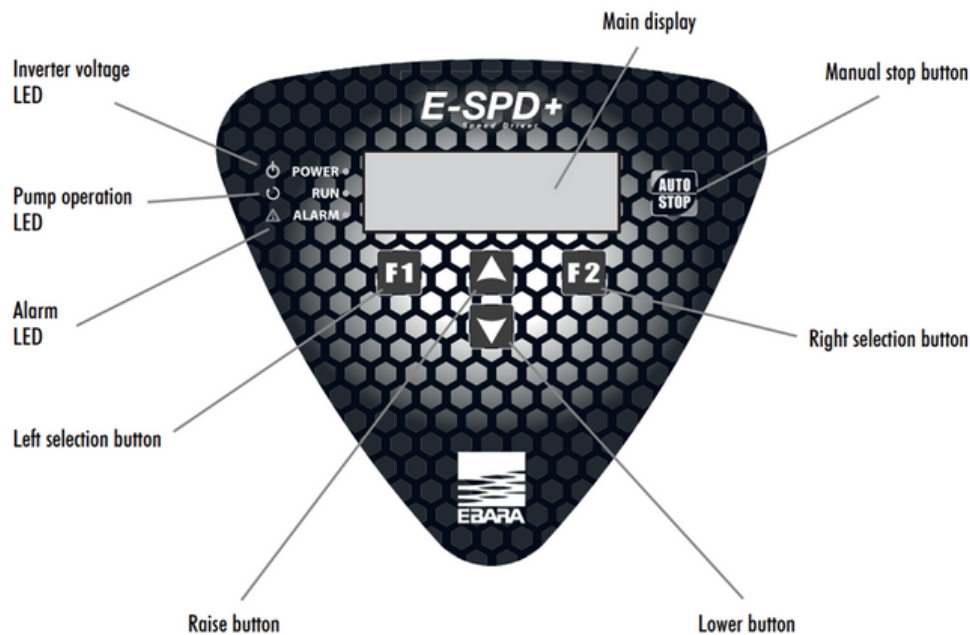


Figure 5: Pump curve

E-SPD+ OVERVIEW



Figure 6: E-SPD+ Control Panel



Safety Instructions

1. Before installing and using the product for the first time, carefully read the whole of this manual and keep it for future reference.
2. Before removing the cover of the Inverter for any maintenance work and electrical connection, ensure you disconnect the mains voltage and wait 5 minutes for the electronic circuit board to discharge any residual voltage inside.
3. Never disconnect the Inverter while the motor is rotating. This action can cause irreparable damage to the Inverter and affect the other electronic systems connected to the same electric grid.
4. Although the pump is not operational (red POWER LED blinking), the electrical supply must still be cut off to the whole Inverter for any maintenance work.
5. Ground cable must be connected properly. If the ground cable is not connected, there is an increased risk of electric shock or fire.

OPERATION

Start-up Procedure: Priming of Pump

See section *What is Priming of a Pump* on page 7 for explanation of priming.



1. Safety Precaution:
 - Ensure the pump is electrically isolated and switched off.
2. Suction Hose Set-up:
 - Use the provided suction hose, ensuring it doesn't restrict flow (avoids cavitation, formation of bubbles in the liquid due to low pressure).
 - Avoid kinks in the hose.
3. Water Supply Connection:
 - Connect to an unpressurised, clean water supply.
 - Check for any airlocks in the system.
4. Priming Process:
 - Keep the supply level higher than the pump casing for effective priming.
 - Vent air through the air bleed port to aid in priming.
5. Discharge Hose Elevation:
 - Ensure the discharge hose end is higher than the supply tank level to prevent syphoning.
6. Power On:
 - Apply power to the unit and allow for the boot-up process, taking note of the warnings about automatic start-up.



*Figure 7:
 Air Bleed Port*

Operation: Initiating IBC Cleaning

1. Nozzle Installation:
 - Install the cleaning nozzle in the target IBC securely.
2. Delivery Hose Connection:
 - Connect the delivery hose using camlocks, ensuring maximum tightness and clamping.
3. Power Connection:
 - If the pump is not yet connected to power, do so, and wait for the boot-up process. Then press the 'auto/Stop' button to commence the cleaning cycle.
4. Allow Cycle:
 - Allow the cleaning cycle to run its course.
5. Cycle Stop for Changeover:
 - Switch the Level Trip switch to 'off' to stop the cycle and facilitate the changeover to the next unit. Note the 5 second delay before the unit stops.
6. Changeover Process:
 - Disconnect delivery piping and unscrew the lid with the nozzle and lance.
 - Install these components on the next unit securely.
 - Reconnect the delivery hose and activate the cycle again using the Level Trip switch.

Shutdown

1. Manual stop button:
 - Press the manual stop button.
2. Wait for Pump to trip:
 - Allow the pump to trip and stop operation.
3. Error Notification:
 - The E-SPD+ will display an Error with the failure light flashing.
4. Error Reset:
 - Press 'Manual stop button' to reset the error on the E-SPD+.
5. Power Isolation:
 - Isolate the pump from the power supply to ensure complete shutdown and safety.

GENERAL INFORMATION

Service & Repair

As special tooling is required for dismantling the nozzle, it is highly recommended to return the nozzle, no matter if it's for inspection, repair or service.

Ordering Spare Parts

Any spare nozzle parts are to be ordered from The Spray Nozzle People Ltd. Kindly indicate type of unit, denominations and ordering number.

What is Priming of a Pump?

Priming a pump involves preparing it to efficiently draw and move fluid by removing any air or gas that might be trapped within the pump or the suction piping. When a pump operates, it needs a continuous flow of liquid to maintain its functionality. However, if there's air in the system, the pump might struggle or fail to move the fluid effectively.

Priming ensures that the pump is filled with the fluid it's meant to move, creating a vacuum and eliminating any air pockets that could hinder its operation. This process is especially crucial for centrifugal pumps that rely on the presence of liquid to generate suction and initiate the pumping action. In practical terms, when you prime a pump, you're essentially filling the pump and suction piping with the fluid it will be handling, ensuring there's no air trapped within the system. This ensures smooth and efficient operation, preventing issues like cavitation (formation of bubbles in the liquid due to low pressure) which can damage the pump and reduce its efficiency.

CONTACT US



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