AGRONA TEC

BEYOND OXYGEN

OxyBull

User Manual

Table of Contents

1 About this document

This manual contains all instructions and safety information for using and maintaining the Oxybull aeration system.

	Read and understand this manual before installing or using the system. Carefully store this manual for future reference.

1.1 LANGUAGE

This manual is originally written in English (GB). All other language versions are translated from the original English manual.

1.2 USED SYMBOLS

This manual contains safety instructions. Ignoring these instructions may lead to personal injury or damage to the system. Each safety instruction is indicated with a signal word. The signal word corresponds with the level of risk of the described hazardous situation.

DANGER	This symbol indicates a hazard, which, if not avoided, **will** cause death or serious injury.
WARNING	This symbol indicates a hazardous situation which, if not avoided, **could** result in death or serious injury.
CAUTION	This symbol indicates a hazardous situation which, if not avoided, **may** result in minor or moderate personal injury or machine
NOTE	Indicates important information or instructions not related to personal injury.

Other signal words in this manual do not refer to safety.

!	This symbol indicates extra information that might be helpful for some users.

2 About the machine

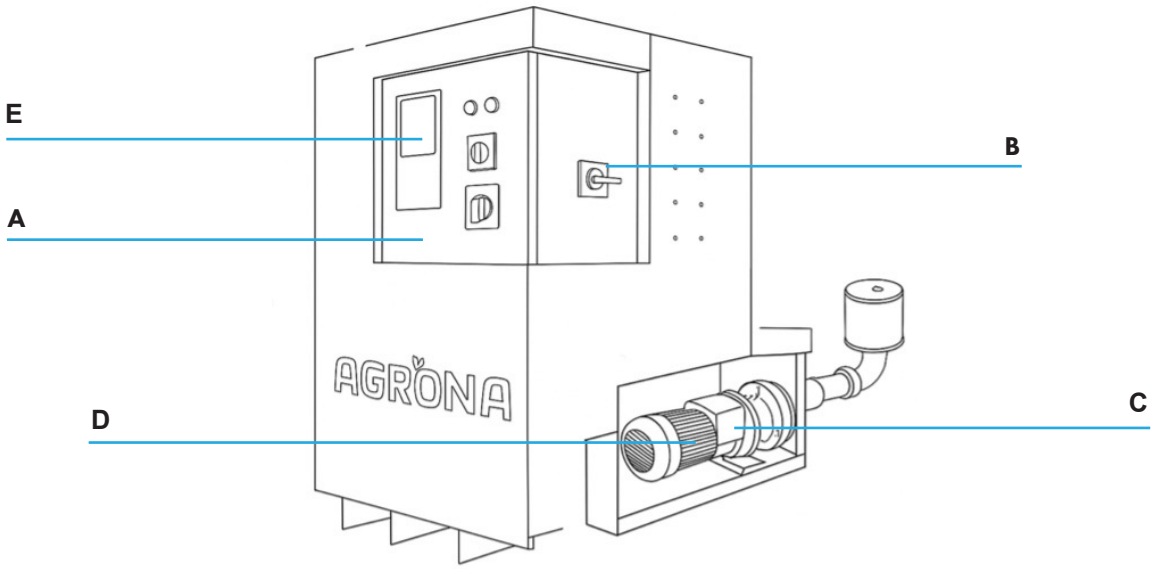
The OxyBull is a plug-and-play aeration system designed to increase dissolved oxygen (DO) levels in water storage tanks and ponds. Using microbubble aeration technology, the system enhances oxygen transfer and maintains continuous water movement, preventing algae growth and reducing organic contamination inside the tank.

The Oxybull consists of a floor-standing blower and control unit that delivers air through HDPE piping to a membrane diffuser positioned at the bottom of the water tank. This configuration ensures uniform air distribution and stable microbubble release.

The aeration process is chemical-free and helps maintain clean water and drip lines, reducing the need for chemical treatments.

The system can be equipped with an optional dissolved oxygen (DO) sensor for real-time monitoring. Component specifications may vary depending on the model type and selected configuration options.

2.1 MAIN PARTS



A. Control Panel
B. Main switch
C. Air Blower
D. Air filter
E. Oxygen Sensor (optional

Your machine may differ from the illustration. Agrona machines are project-specific and may include customized features or optional components.

2.2 TECHNICAL SPECIFICATION

The technical specifications of the Agrona OxyBull system depend on the selected model and configuration. Typical parameters are listed below and should be verified for each installation.

OXYBULL	300 m3	600 m3	900 m3
Flow Rate m3/hour2	60 m3/hour	120 m3/hour	180 m3/hour
Temperature Tolerance °C	0-65	0-65	0-65
Aeration plates	1	2	3
AIR PUMP			
Pump Model	Siemens	Siemens	Siemens
Pump Motor (kw)	3.8 kw	4.6 kw	5.5 kw
Voltage	380/400	380/400	380/400
Hz	50/60	50/60	50/60
CONTROLLER			
Voltage	230 volt	230 volt	230 volt
Timer	Incl.	Incl.	Incl.
Power Light	On/Off	On/Off	On/Off
Dissolved Oxygen (DO) Sensor	Optical, 0 – 20 ppm, 10 Second Response Time		
CONNECTIONS			
Inlet	40 mm	40 mm	40 mm
Outlet	40 mm	40 mm	40 mm
FOOTPRINT DIMENSIONS AERATION SYSTEM			
Length	205 cm	2 x 205 cm	3 x 205 cm
Width	110 cm	2 x 110 cm	3 x 110 cm
Height	18 cm	2 x 18 cm	3 x 18 cm
Weight	1 x 45 kg	2 x 45 kg	3 x 45 kg
FOOTPRINT DIMENSIONS SKID			
Length	75 cm	75 cm	75 cm
Width	75 cm	75 cm	75 cm
Height	110 cm	110 cm	110 cm
Weight	75 kg	85 kg	85 kg
TRANSPORT DIMENSIONS			
Length	100 cm	130 cm	160 cm
Width	115 cm	115 cm	115 cm
Height	220 cm	220 cm	220 cm
Weight	120 kg	170 kg	220 kg
TRANSPORT DETAILS			
Loading meters	0.46	0.60	0.73
Total Pallets	1	1	1

Note: OPTION Integrated Dissolved Oxygen Optical Sensor Probe

Detailed blower performance curves and electrical specifications are provided in Appendix II.

2.3 CONFORMITY

The system is intended for use with water only. It is supplied in accordance with applicable EU directives (Machinery Directive and others). Consult Appendix I for the complete Declaration of Conformity.

3 SAFETY

3.1 INTENDED USE

The OxyBull aeration system is intended to increase dissolved oxygen (DO) levels for water treatment, agriculture, horticulture, aquaculture, cleaning and industrial processes. Typical applications include horticultural irrigation systems, day-supply tanks, water storage reservoirs, and other water-based processes where enhanced oxygenation and water circulation are required to support water quality and biological stability. It is not intended for medical applications, potable drinking water production, or for aerating any fluids outside the specifications defined by the manufacturer. The OxyBull must be installed and operated in controlled environments accessible only to authorized and qualified personnel.

3.2 QUALIFICATION OF PERSONNEL

Personnel working with the OxyBull system can be divided into three categories:

The **installer** is responsible for mounting, connecting, and configuring the system during the initial setup. The installer must:

- Be authorized to perform installation work in accordance with applicable local regulations and standards.
- Have read and understands this manual.

The **operator** is responsible for normal operation of the system and for performing weekly, monthly, or yearly routine maintenance tasks. The operator must:

- Have permission from the owner to operate the machine.
- Have read and understands this manual.

The **qualified technician** is responsible for commissioning, troubleshooting, and annual maintenance. The qualified technician must:

- Be authorized to work on the system in accordance with all applicable local regulations and standards.
- Have read and understands this manual.

The OxyBull is not intended for use by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience or knowledge, unless they are supervised or instructed by a person responsible for their safety.

3.3 SAFETY SYMBOLS ON THE MACHINE

The following symbols are applied to the system.

Symbol	Meaning	Location
	Electrical hazard. Risk of electric shock or electrocution.	Electrical cabinet
	General warning. Read safety instructions.	Front panel and access points
	Sharp edge hazard. Risk of cuts or serious injuries.	PE frame, stainless steel
	Hot surface hazard. Components may become hot during operation.	On the pump

3.4 PERSONAL PROTECTIVE MEASURES (PPM)

The following personal protective measures are needed when working with the machine:

	Indicates that protective gloves must be worn.		Indicates that safety or non-slip footwear must be worn.
	Indicates that a face mask must be worn.		Indicates that splash goggles must be worn.

Technicians performing electrical work must wear electrical rated PPE (Personal Protective Equipment) in accordance with local regulations.

3.5 SAFETY INSTRUCTIONS

WARNING

Improper installation, adjustment, modification, servicing, or use may result in electric shock, fire, or other hazardous conditions. Read and follow all safety instructions on the equipment and in this manual.

- Keep all panels, covers, and protective guards closed during operation.
- Do not modify the machine or bypass any safety devices.

DANGER **Electrical Hazard**

Risk of death or serious injury. The machine contains live electrical components inside an enclosed cabinet.

- Only qualified technicians may access internal electrical parts.
- Power must be isolated before opening the cabinet.

WARNING **Electric Shock Hazard**

Risk of serious injury or death due to electric shock.

- Disconnect the machine from the power supply before opening the electrical cabinet or performing service work.
- Multiple disconnect switches may be present.
- Do not touch the machine with wet hands or tools.
- Ensure all electrical work complies with local regulations and standards.

WARNING **Sharp edge hazard**

Risk of serious injury. Sheet-metal components and fittings may have sharp edges.

- Wear protective gloves and handle components carefully during installation and maintenance.

WARNING **Mechanical and moving-part hazard**

The system contains internal moving components such as the pump and motor.

- Keep all covers closed during operation.
- Do not reach into the machine while it is running.

WARNING **Fall Hazard**

Risk of serious injury or death. Working on or near silos, elevated tanks, or open edges may result in falls.

• Use approved access equipment and fall arrest protection when working at height.
• The facility owner or site management must ensure that access platforms and fall protection systems are installed and compliant with local regulations before elevated work begins.

WARNING **Heavy Lifting**

The unit weighs 120 - 220 kg depending on model.

• Handle the unit carefully, use approved lifting equipment.
• Do not lift the unit alone.

CAUTION **Pressure hazard**

Risk of minor injury or equipment damage. The system operates under water pressure.

• Do not open or loosen pressurized components.
• Depressurize the system before maintenance.

CAUTION **Hot surface hazard**

Risk of minor burns. Certain internal components may become hot during operation.

• Allow components to cool before touching them.

CAUTION **Slip, trip, and fall hazard**

Risk of minor injury. Water or condensation may be present around the installation area.

• Keep the working area dry and free of obstacles.
• In case of water leakage: stop operation, close valves, and inspect seals and connections.

If any unsafe condition occurs

Stop the machine immediately and contact a qualified technician.

Agrona is not responsible for injuries or damage caused by incorrect installation, modification, or unauthorized service.

4 Installation

WARNING

Improper installation may result in electric shock, equipment damage, or unsafe operating conditions.

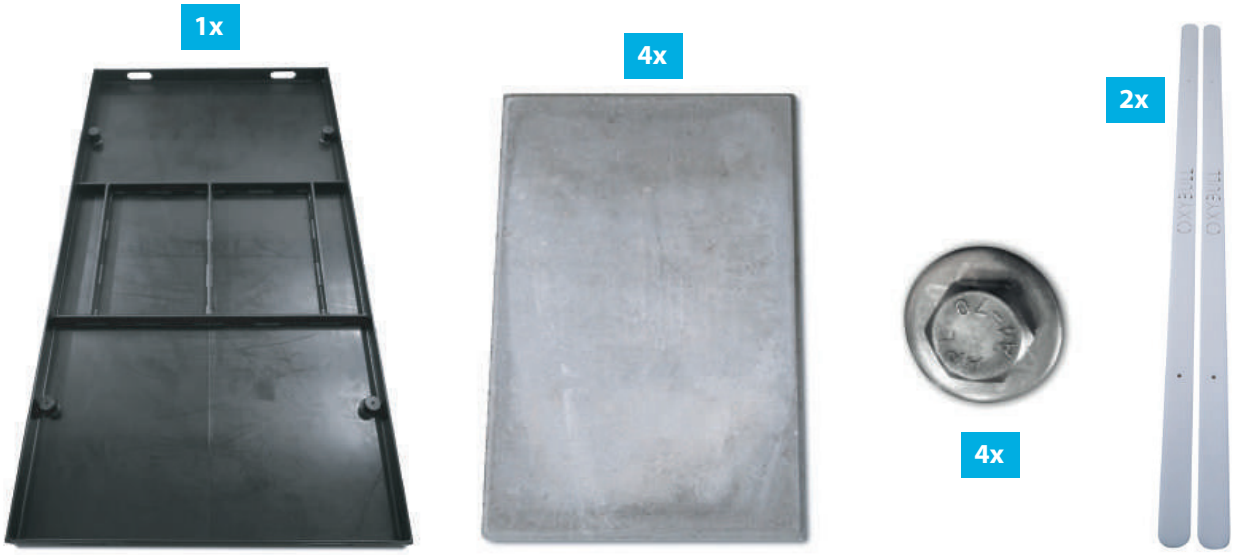
Installation must be carried out only by qualified installers or authorized technicians and must comply with all local regulations, standards, and site specific safety requirements.For detailed model specific information on piping, connection points, electrical ratings, and component layout refer to the technical drawing (available upon request).

NOTE

Agrona is not responsible for injuries or damage resulting from incorrect installation, unauthorized modifications, or work performed by unqualified personnel.

4.1 DELIVERY AND INSPECTION

Upon delivery, inspect all components of the OxyBull system before installation.



Check the following:

- The blower unit and control cabinet are undamaged.
- The PE diffuser frame, membrane panel, and weight tiles are free of cracks or deformation.
- HDPE air piping, couplings, clamps, and fittings are present and undamaged.
- Electrical cables, plugs, and enclosure seals are intact.
- All safety labels are visible and legible.

Report any missing or damaged components to Agrona Tec. immediately.
Retain packaging materials for future transport or service.

WARNING **Heavy Lifting**

Do not lift the system alone. Use two-person lifting techniques or a pallet jack.

WARNING **Sharp edge hazard**

Sheet-metal components and fittings may have sharp edges. Wear protective gloves and handle components carefully during installation and maintenance.

4.2 SITE REQUIREMENTS

Location:

- Install The OxyBull unit as close as possible to the water source.
- The floor must be flat, stable, and dry.
- Keep at least 1 m of space on each side for airflow and service access.
- Ensure the installation area is accessible only to authorized personnel.
- The blower must be installed above the water level to reduce water-ingress risk.

Water Tank / Silo Requirements:

- The diffuser panel must be positioned on the bottom surface of the tank.
- Ensure the tank floor is free of sharp objects or debris that may damage the membrane.

The system may be installed indoors or outdoors.

- Operating temperature: +5 °C to +40 °C
- Relative humidity: < 70%, non-condensing
- The enclosure is corrosion-resistant and suitable for normal outdoor environments.

4.3 INSTALLATION STEPS

STEP 1

Position the OxyBull Unit

- Place the system on a level surface next to the silo if possible.
- Ensure there is sufficient space around the blower for ventilation.

STEP 2.1

Position the PE Frame

- Place the PE frame in the correct position inside the silo or water storage tank.

NOTE

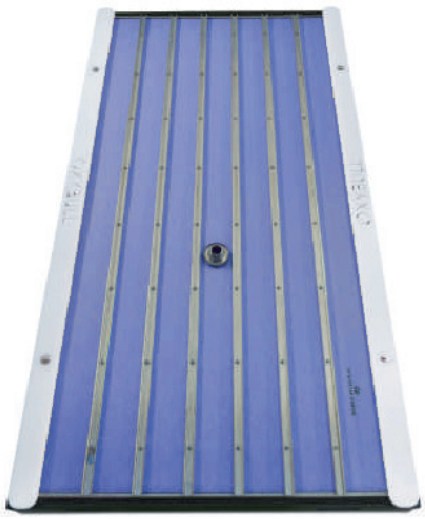
No water may enter the OxyBull through the air inlet during installation.

- Place the 4 tiles on the frame to make the OxyBull heavier.

STEP 2.2

Install the OxyBull on the Frame

- Place the OxyBull membrane on the PE frame



- Fix it with the supplied white side strips.

STEP 2.3

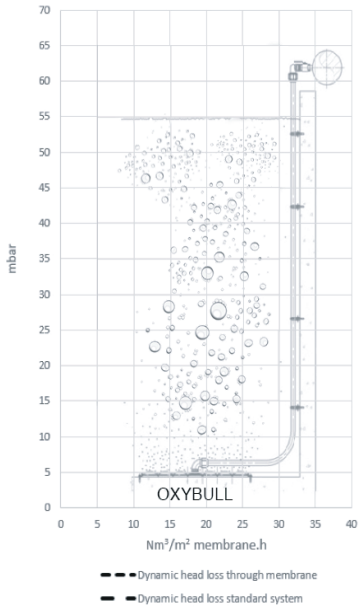
Connect the 90° Compression Coupling

- Connect the 90° compression coupling to the air inlet connection of the OxyBull.

STEP 2.4

OxyBull Fully Installed in the Tank

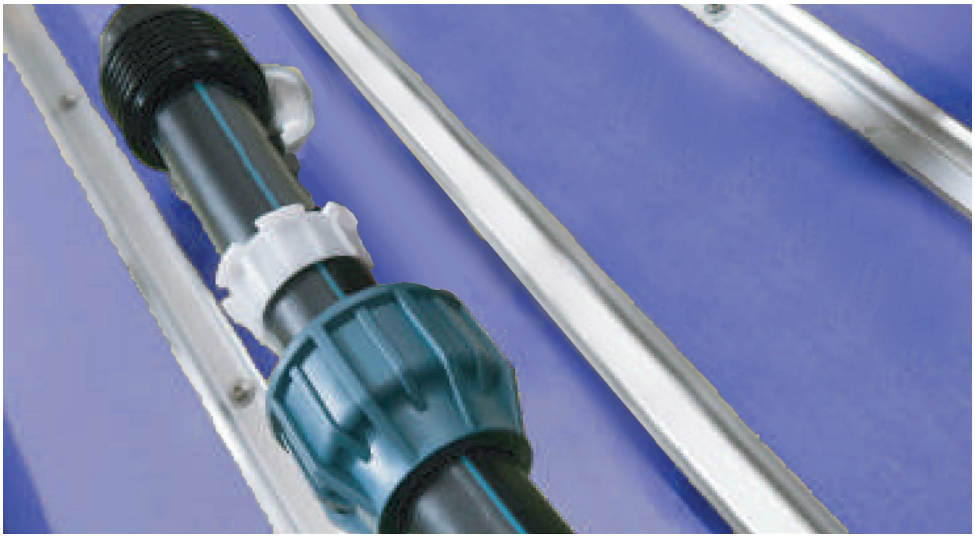
- Verify that the OxyBull is fully assembled and correctly positioned in the water storage tank, silo, or pond.



STEP 3.1

Connect the HDPE Pipe

- Connect the HDPE pipe to the compression coupling on the OxyBull.



NOTE

Ensure the blower is powered OFF and the system depressurized

STEP 3.2

Route the HDPE Pipe

- Guide the HDPE pipe through the supplied couplings outside of the water storage tank

STEP 3.3

Fix the HDPE Pipe to the Silo

- Mount the HDPE pipe to the silo with supplied pipe clamps.

STEP 4.1

Connect the Electrical Cable

- **Connect the electrical cable to the control box and to the blower.**

STEP 4.2

Connect Main Power

- **Connect the main electrical supply cable to the control box**

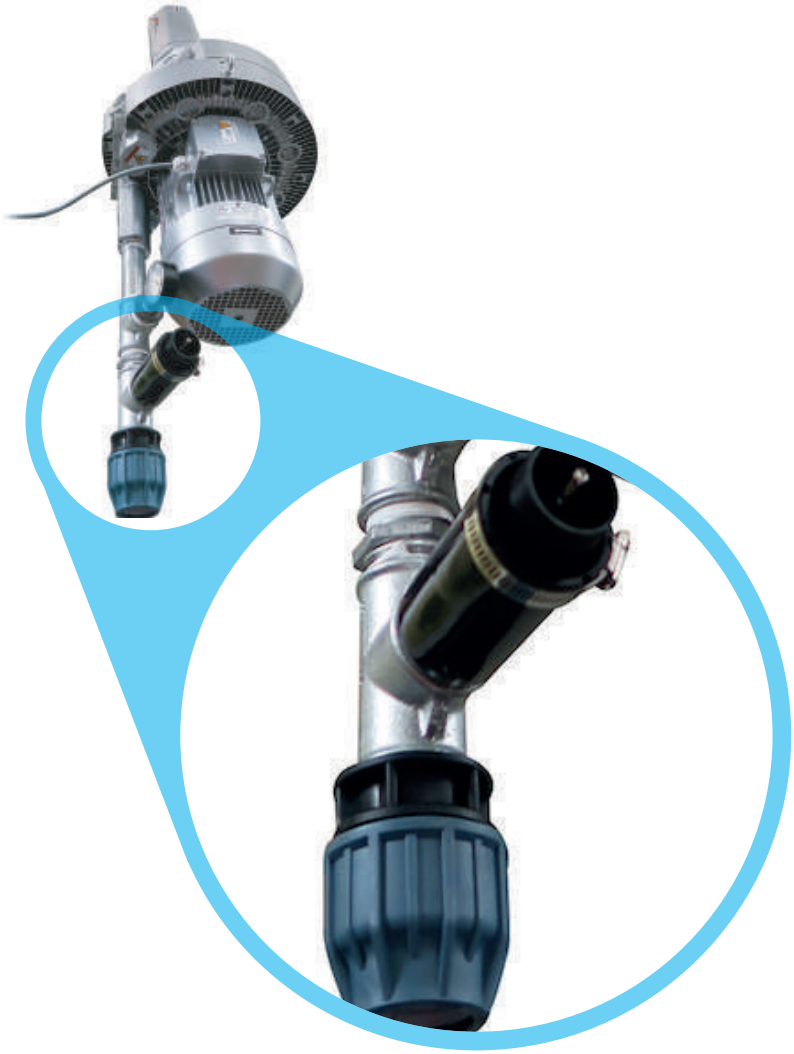
NOTE

Make sure the blower turns in the right direction so that it blows air and does not draw on the exhaust side.

STEP 4.3

Connect the HDPE Pipe to the Blower

- Connect the HDPE pipe to the outlet of the blower. Ensure all clamps and fittings are properly tightened.



4.4 ISTALLATION CHECKIST

Complete this checklist before commissioning the Agrona OxyBull Aeration System.
All points must be reviewed and confirmed by the installer.

Checkpoint	Status ☑ / ☐
PE frame placed on a stable, level surface	☐
PE frame correctly positioned inside the silo/tank	☐
Weight tiles installed on the frame	☐
OxyBull unit mounted on the frame and secured with white side strips	☐
90° compression coupling installed on the air inlet	☐
OxyBull assembly correctly positioned and stable in the tank	☐
HDPE pipe connected to OxyBull	☐
HDPE pipe routed correctly using supplied couplings	☐
HDPE pipe fixed to silo using pipe clamps	☐
Electrical cable connected to the control cabinet and blower	☐
Main electrical connection completed by a qualified electrician	☐
Blower rotation direction verified (air blowing, not drawing)	☐
HDPE pipe connected to blower outlet	☐
All hose connections tightened and leak-free	☐
Diffuser assembly fully submerged before start-up	☐
Area around blower and cabinet dry, clean, and unobstructed	☐
Required PPE used during installation	☐
Warning signs and safety markings installed where needed	☐
Access restricted to authorized personnel	☐
User manual available near the installation	☐

5 Commissioning (Start Up)

Commissioning Start Up Procedure must be performed only by a qualified technician after installation has been completed and verified.

Before operating the machine for the first time, ensure that all safety measures, electrical protections, and water connections have been installed correctly and comply with all applicable local regulations and standards.

WARNING **Electrical and Mechanical Hazard**

Ensure all covers are closed, the area is secure, and the system is correctly installed before energizing the equipment.

5.1 STEP BY STEP STARTUP PROCEDURE

NOTE

Before powering on the system for the first time, ensure all items in the installation checklist (Section 4.4) have been completed.

STEP 1

Switch ON the main power supply to the control cabinet.

- Due to transportation, a coupling can come loose. Make sure that all couplings are tightened securely.

STEP 2

Start the OxyBull blower using the control panel.

STEP 3

Observe airflow through the HDPE pipe and into the diffuser.

STEP 4

Check for a uniform microbubble distribution across the entire membrane surface.

STEP 5

Verify that the blower is operating smoothly without abnormal noise, vibration, or overheating.

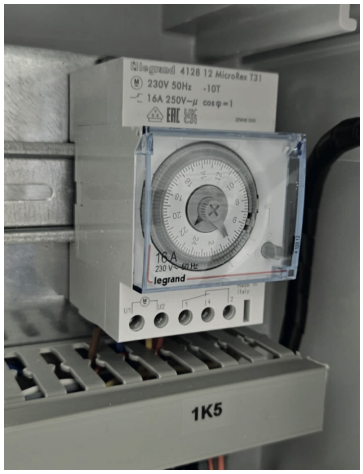
WARNING

If abnormal noise, vibration, leaks, or alarms occur during startup, stop the machine immediately and correct the issue before proceeding.

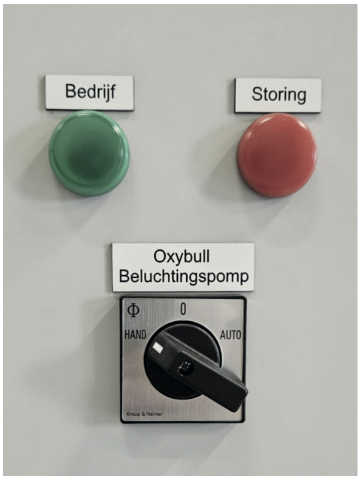
5.2 DAILY AUTOMATIC SHUTDOWN

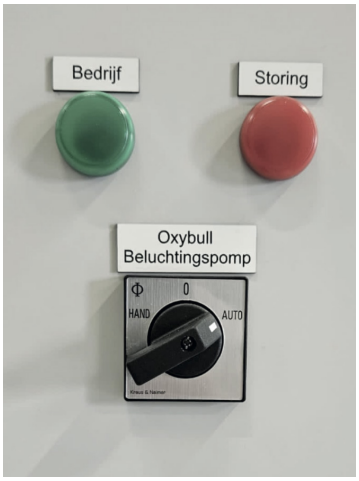
NOTE

The OxyBull must be turned off at least once a day, because of the cleaning mechanism of the membrane. This may be configured via the integrated timer in the control cabinet.



Turn the aeration pump on manual or automatic.





5.3 DISSOLVED OXYGEN (DO) PROBE

5.3.1 Dissolved Oxygen (DO) Sensor Calibration

The Agrona OxyBull continuously monitors and regulates the dissolved oxygen (DO) concentration in process water. Accurate calibration of this system is essential for precise DO measurement and stable operation of the generator.

Purpose of Calibration

To ensure reliable and consistent measurement of dissolved oxygen levels within the Agrona OxyBull system. Proper calibration maintains control accuracy, optimizes oxygen transfer efficiency, and supports the desired oxygenation performance of the process.

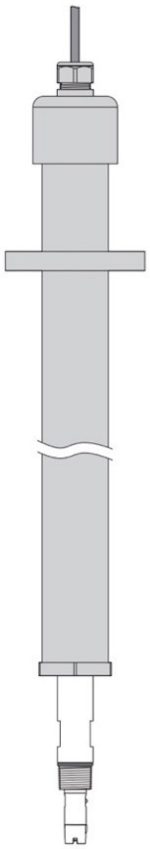
When Calibration Is Required

- **Before installation**
- **Whenever the probe is replaced**
- **When higher accuracy is required**
- **After periodic maintenance**
- **After calibration TimeOut has expired**

Step-by-Step Calibration Procedure

1. Prepare the System

- **Stop the OxyBull.**
- **Ensure there is no water pressure on the sensor.**



2. Check Sensor Installation

- **Verify that the DO sensor is correctly connected to the controller.**
- **Confirm that the pump is OFF before performing any mechanical adjustments or probe maintenance.**

3. Inspect and Clean the Sensor

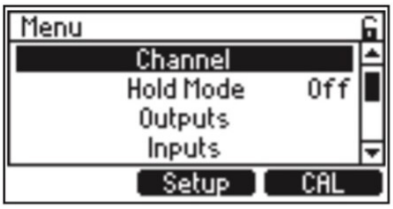
- **Remove the sensor from the water.**
- **Rinse the probe and Smart Cap with clean water to remove debris or buildup, and ensure no air bubbles remain on the optical surface.**
- **Check that the Smart Cap is properly installed, hydrated, and within its service life. Replace it if expired or damaged.**

4. Calibrate the 100% Point (Air Calibration)

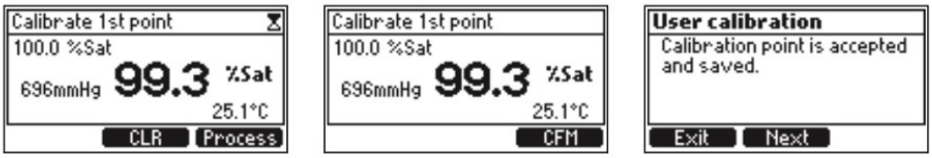
- **Hold the sensor in clean, humid air, away from direct water contact, until the reading stabilizes.**
- **The membrane surface should remain moist but not submerged.**
- **Allow the reading to stabilize.**

On the controller navigate to MENU:

- **Press ≡ from the Measure mode.**
- **Select channel → press CAL, to enter calibration.**
- **Wait until the reading stabilizes near 100% saturation or 10 mg/L.**
- **Confirm measurements either % saturation or mg/L.**



- **On the controller: CAL → 100% (or AIR SAT) → Confirm**
- **Save the calibration point for 100% air saturation.**



Note: A second calibration point (0% saturation) using a zero-oxygen solution is optional but not necessary.

5.3.2 Smart Cap Replacement

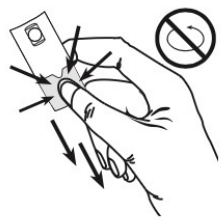
When the cap approaches annual expiration, a warning screen notifies the user of required replacement.

Press ? DIAG key to read days remaining before expiration. When one year is reached the message will change to "Cap Expired".

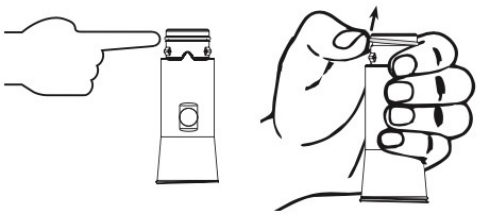
To maintain measurement accuracy, Smart Cap replacement is mandatory.

Ensure all cap-replacement steps are correctly followed.

1. **Clean off probe body and dry off with cloth.**
2. **Remove the expired Smart Cap from the probe by squeezing the cap at the cutout arrow and pulling it off the probe body (do not twist).**



3. **Remove the used O-ring by rolling it off the body.**



4. **Clean the O-ring groove and lens with a soft tissue followed by the lens cleaning wipe.**

5. **Remove the new O-ring from the container and slide on the probe tip (do not roll or twist the O-ring).**

6. **Use a syringe filled with silicone grease and sparingly lubricate the O-ring with a thin film of grease. Avoid getting grease or fingerprints onto the optical window.**

7. **Remove the new optical cap from its container and align the cutout arrow on the Smart Cap with the matching guide on the probe body.**

8. **Slide and press the Smart Cap onto the probe body until the cap snaps in place. Once the cap is installed, it should not be removed unless a new cap is required.**

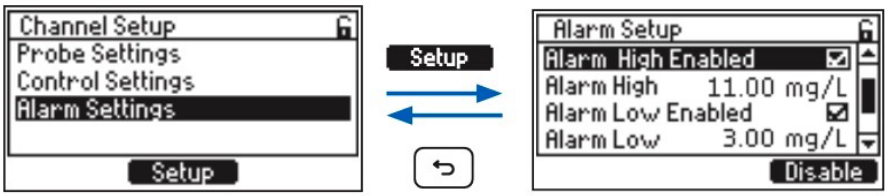
9. **Turn ON the controller or plug in the probe's terminal connector**

10. **Calibrate the probe and controller before reinstalling into the process.**

5.3.3 Alarm Settings

The Alarm Settings menu allows users to define upper and lower settings for dissolved oxygen (DO). When a measured value exceeds or drops below these limits, the controller activates the Alarm Relay and stops generator operation until conditions return to settings.

- Press the ⮌ **Back key** from the Measure mode.
- Select Channel.
- Choose Alarm Settings.
- Press the ▲ ▼ keys to move between options.
- Confirm YES to place the controller in HOLD mode (this pauses control while you make changes).



Note: *Examples shown use pH settings, but apply here to DO measurement with units in mg/L or % saturation.*

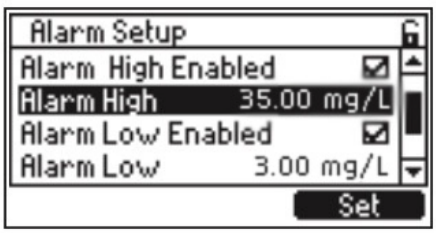
Setting Alarm Parameters

1. Enable Alarm High

- **Navigate to Alarm High Enabled.**
- **Press the corresponding key to toggle between Enable and Disable.**
- **When enabled, a check mark confirms the parameter is active.**
- **Press the ⮌ Back key to save and return to the previous menu.**

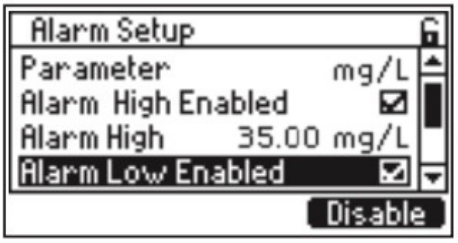
2. Set Alarm High Value

- Select **Alarm High**
- Press **Set**. Press the ▲ ▼ keys, to modify.
- Enter the recommended upper limit: **35.0** mg/L (ppm) or **350 %** corresponding saturation value.
- Press **CFM** to confirm.
- Press the ⮌ **Back key** to save and return to the menu.



3. Enable Alarm Low

- Navigate to **Alarm Low Enabled**.
- Press the corresponding key to toggle between Enable and Disable.
- When enabled, a check mark confirms the parameter is active.
- Press the ⮌ **Back key** to save and return to the menu.



4. Set Alarm Low Value

- **Select Alarm Low**
- **Press Set. Press the ▲ ▼ keys, to modify.**
- **Enter the recommended lower limit: 20.0 mg/L (ppm) or 200 % corresponding saturation value.**
- **Press CFM to confirm.**
- **Press the ⮌ Back key to save and return to the menu.**

5. Save and Exit

- **After setting both alarm limits, press the Back key to return to the Channel Menu.**
- **When prompted, press YES to save changes.**

The controller validates all parameters and returns to Measurement Mode.

5.3.4 Analog Output (4-20 mA) Signal Setup

The Universal Process Controller (UPC) can send a 4-20 mA signal to external devices such as PLCs, monitoring systems, data loggers, or automation controllers. This allows the measured DO value to be transmitted as a proportional electrical signal.

The instructions below explain how to configure the analog output when using an optical dissolved oxygen probe.

Recommended 4–20 mA Scaling for Dissolved Oxygen

For most applications using the optical dissolved oxygen probe, we recommend the following scaling values for the 4–20 mA output:

- **4 mA = 0 ppm DO**
- **20 mA = 50 ppm DO**

This range provides good resolution within the Nanobubble system and ensures accurate monitoring by external devices.

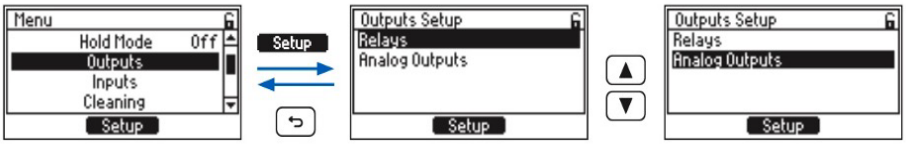
Example Interpretation

If DO = 25 ppm:
• 25 ppm is halfway between 0 and 50 ppm → Output ≈ 12 mA

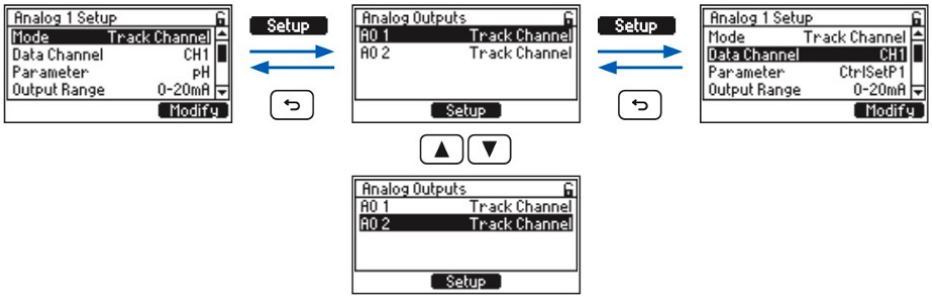
If DO = 45 ppm:

Menu Navigation

- From Main menu, press the ▲ ▼ keys to select Outputs.
- With Outputs selected, Setup virtual key is visible.
- Press Setup to open a submenu structure.
- Press the ▲ ▼ keys to select Analog Output Setup.

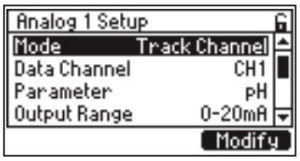


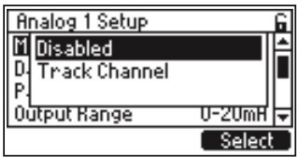
- **From Analog Outputs, press Setup.**
- **Press the ▲ ▼ keys to navigate between parameters.**
- **Choose the analog channel you want to configure (AO 1 or AO 2).**



Mode

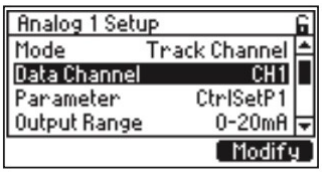
Option: Disabled, Track Channel
With Mode selected, press Modify to toggle options.
Disabled indicates that analog output has not been allocated to any function.
With Track Channel selected the analog output follows a specific parameter.





Data Channel

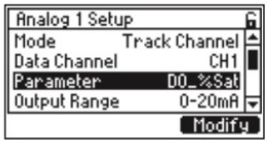
Option: CH1 for one channel
Data channel is always CH1.

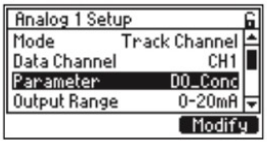


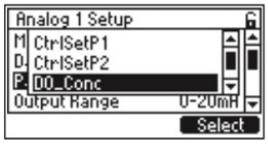
Parameter

With Parameter selected, press Modify and select the DO parameter from the available options. Press Select to save.

DO

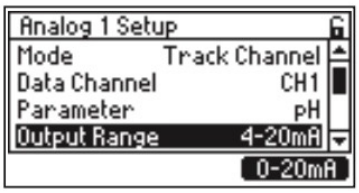






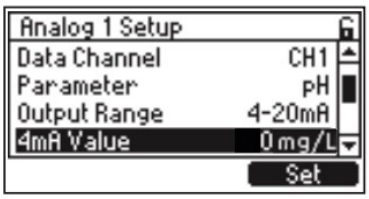
Output Range 4-20 mA

With Output Range selected, press the corresponding virtual key to toggle 0 -20 mA /4 -20 mA output range and choose 4-20



4mA Value - Low Range Value

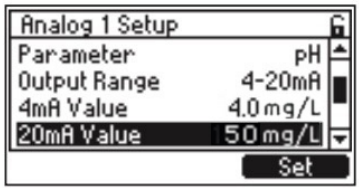
- **With 4mA Value selected, press Set.**
  The value will flash indicating it can be modified.
- **Press the ▲ ▼ keys to increase or decrease the value → enter low range value 0 ppm. This means 4 mA = 0 ppm DO**
- **Press CFM to save.**



Note: Examples shown use pH settings, but apply here to DO measurement with units in mg/L or % saturation.

20 mA Value – High Range Value

- **With 20 mA Value selected, press Set. The flashing value indicates that it can be modified.**
- **Press the ▲ ▼ keys to increase or decrease the value → enter high range value 50 ppm. This means 20 mA = 50 ppm DO**
- **Press CFM to save.**



Note: Examples shown use pH settings, but apply here to DO measurement with units in mg/L or % saturation.

Save Settings

- **Press Back ⮌ to exit the menu.**
- **When prompted, select YES to save changes.**

Verify the Output (Optional but Recommended)

1. Connect a multimeter or loop tester in series with the analog output.

2. Check that the current matches the DO reading on the display.

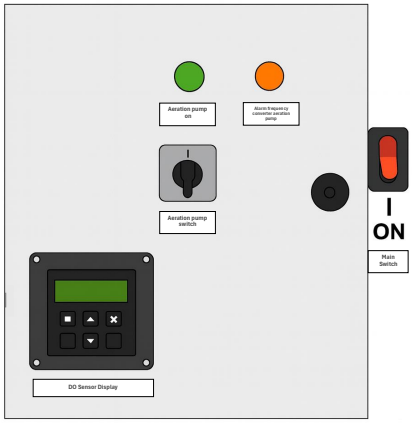
3. Example:
- DO = 25 ppm → Current ~12 mA
- DO = 45 ppm → Current ~18 mA

If values differ, check probe calibration, wiring, or scaling.

6 Use

This chapter describes the correct daily operation of the OxyBull system. Only authorized operators who have read and understood this manual may operate the system.

6.1 CONTROL PANEL OVERVIEW



Depending on the model configuration, the control panel may include:

- Main Power Switch: connects or disconnects power to the system.
- Aeration Pump ON/OFF Switch: manual or automatic
- Indicator lights: power status or error alarm
- Optional dissolved oxygen (DO) sensor display

WARNING

The control cabinet must remain closed during operation and may only be opened by a qualified technician.

6.2 NORMAL OPERATING PROCEDURE

Before Starting the OxyBull:

- **Ensure that installation and commissioning have been completed (see Chapter 5).**
- **Confirm that water is present and the diffuser panel is fully submerged.**
- **Verify that the area is dry, clear, and accessible.**

To start the system:

- **Switch ON the main power supply to the control cabinet.**
- **Activate the blower using the ON/OFF control on the cabinet.**
- **Observe the tank to confirm that uniform microbubbles appear from the diffuser.**
- **Check for abnormal noise, vibration, or air leaks.**

NOTE

If any abnormal condition is detected, switch OFF the system and contact a qualified technician.

NOTE

If oxygen flow becomes unstable, notify a qualified technician.

Daily Shutdown Requirement

NOTE

The OxyBull must be turned off at least once a day because of the cleaning mechanism of the membrane.

Automatic daily shutdown can be configured via the integrated timer in the control cabinet (refer to Chapter 5.2 Daily Automatic Shutdown).

6.3 USE WITH OPTIONAL DO SENSOR (if installed)

If the system is equipped with a dissolved oxygen (DO) sensor:

- DO and temperature values are monitored continuously.
- The operator should routinely check sensor readings for abnormal values.

NOTE

If the sensor shows no data or provides incorrect values, contact a qualified technician.

6.4 OPERATING PARAMETERS AND OBSERVATION

During operation, the operator should check:

- **Correct system indicator lights (no alarms)**
- **Microbubble output: Even, fine bubble distribution across the diffuser.**
- **Blower performance: No abnormal noise, vibration, or overheating.**
- **Air filter: Free of dust buildup. Clean or replace if airflow decreases.**
- **HDPE piping: No leaks, cracks, or loose fittings.**
- **Water level: Diffuser panel fully submerged at all times.**
- **Control cabinet: Closed, dry, and functioning normally.**
- **Area around the unit: Dry, clean, and free of slip hazards.**
- **If installed, DO sensor values within expected range**

If any irregularity is observed, stop the system and contact a qualified technician.

6.5 SHUTDOWN PROCEDURE

Normal Shutdown

- **Switch OFF the blower using the ON/OFF control on the cabinet.**
- **Switch OFF the main power supply if the system will not be used for an extended period.**

Emergency Shutdown

Use emergency shutdown if immediate risk to personnel or equipment is present (e.g., electrical fault, water ingress, abnormal noise, or air leaks).

- **Switch OFF the main power supply immediately.**
- **Prevent access to the system until the fault has been assessed.**

Contact a qualified technician before restarting the system.

6.6 EXTENDED STANDSTILL PROCEDURE

If the system will be out of service for an extended period (e.g., crop rotation):

- **Switch off the machine completely.**
- **Switch OFF the main power supply and disconnect the electrical plug or circuit.**
- **Remove the diffuser panel from the tank if long-term water stagnation is expected.**
- **Clean and dry the diffuser frame, membrane surface, and HDPE piping.**
- **Inspect and clean the blower air filter.**
- **Store the blower and control cabinet in a dry, ventilated environment.**
- **Before recommissioning, perform the full installation and safety inspection (Chapter 4 and Chapter 5).**
- **Keep the unit dry and protected.**

7 Maintenance

Only qualified technicians may perform maintenance or component replacement.
Operators may only carry out basic visual checks and weekly or monthly tasks as assigned by site management.

NOTE

Use only Agrona approved replacement parts.

!	**All maintenance must comply with local safety and technical regulations.**

⚠ WARNING

All maintenance must be performed with the machine fully powered off, isolated from the electrical supply, and depressurized.

7.1 SAFETY BEFORE MAINTENANCE

Before performing any maintenance work:

- **Switch OFF the system and isolate the electrical power. Verify that no residual energy is present.**
- **Depressurize the HDPE air line before disconnecting any fittings.**
- **Allow hot surfaces to cool.**
- **Wear appropriate personal protective equipment (PPE), including gloves, safety glasses, dust mask (when cleaning the filter), and safety footwear.**
- **Follow all site-specific safety procedures and lock-out/tag-out (LOTO) rules.**

⚠ CAUTION

**Sheet-metal components and internal fittings may have sharp edges.
Handle all parts carefully.**

7.2 MAINTENANCE SCHEDULE OVERVIEW

The OxyBull aeration system requires periodic inspections to ensure reliable and safe operation. The table below summarizes the main maintenance items, recommended frequency, and responsible personnel.

Component / Item	Task	Frequency	Performed By
Air Filter	Clean with compressed air; replace if damaged or heavily contaminated	Clean monthly; replace yearly	Technician / Operator (cleaning), Technician (replacement)
Diffuser Panel & Membrane	Inspect for fouling, tears, cracks; rinse gently with water	Monthly	Operator / Technician
HDPE Air Piping & Couplings	Inspect for leaks, cracks, deformation; tighten fittings	Monthly	Operator
Blower Condition	Check for abnormal noise, vibration, or overheating	Weekly	Operator
Blower Ventilation	Ensure ventilation openings are clean and unobstructed	Weekly	Operator
Electrical Components	Inspect cabinet interior, wiring, grounding, and seals	Yearly or after any fault	Qualified technician only
Pressure Relief Valve	Inspect for correct operation	Yearly	Technician
Manometer	Verify correct pressure reading and inspect for damage	Monthly	Operator
Safety Labels	Check visibility and condition	Monthly	Operator
General System Check	Inspect for mechanical damage, water ingress, loose hardware	Monthly	Operator / Technician

7.3 AIR FILTER CLEANING PROCEDURE

- **Switch OFF power and ensure the blower is cool.**
- **Remove the air filter cover.**
- **Blow dust out of the filter using compressed air from the inside outward.**
- **If the filter is damaged or excessively dirty, replace it.**
- **Reinstall the filter and secure the cover.**

NOTE

Cleaning must be done in a ventilated area while wearing a dust mask and eye protection.

7.4 DIFFUSER PANEL MAINTENANCE

- **Keep the membrane submerged when not in active maintenance.**
- **Inspect for tears, cracks, or excessive fouling.**
- **Rinse gently with clean water if visible deposits accumulate.**
- **Do not use chemicals or abrasive brushes on the membrane.**

7.5 BLOWER MAINTENANCE

The blower is largely maintenance free but requires:

- **Clean air intake filter**
- **Clear ventilation and cooling airflow**
- **Closed housing during operation**

If the blower overheats, vibrates, or shuts down unexpectedly, stop the system and have it inspected.

7.6 SPARE PARTS LIST

Below is a recommended spare parts list for the OxyBull system.
Actual part numbers may vary depending on model configuration.

Article Number	Description
OXY-201	Air filter
	Recommendation: clean every month with high pressure air and change at least once a year.
OXY-202	Pressure relive valve
OXY-203	Manometer

8 Troubleshooting

Troubleshooting may only be performed by trained operators or qualified technicians as described in Chapter 3.

WARNING

Always isolate electrical power and depressurize the system before opening any covers or components.

8.1 ERROR SYMPTOMS

Symptom	Description / What the Operator Sees
No airflow	No bubbling visible; blower silent or inactive
Reduced performance	Weak bubbling, reduced circulation, lower DO levels
Overheating	Blower feels hot, auto-shutdown may occur
Strong vibration or noise	Mechanical rattling, humming, grinding, or pulsing sounds
Electrical fault	Cabinet lights off, breaker trips, system will not restart
Water contamination signs	Water visible inside air line or blower intake
Sensor fault	No data, unstable readings, or error notifications on display

When to Stop the System Immediately

Turn the system OFF and contact a qualified technician if any of the following occur:

- Electrical smell, smoke, or sparks
- Blower overheating repeatedly
- Water ingress in blower or control cabinet
- Severe vibration or mechanical impact noises
- Complete loss of bubble output
- Damaged membrane or ruptured air line

8.2 CORRECTIVE ACTIONS

Operators may perform these checks:

- Verify the blower ON/OFF switch and main power are activated.
- Inspect the HDPE pipe and couplings for leaks or disconnection.
- Ensure the diffuser is fully submerged.
- Remove visible debris from around the diffuser frame.
- Check that the blower air filter is not severely clogged.
- Ensure the blower has adequate ventilation.
- Reset the system after eliminating the cause of an electrical overload (operator cannot open cabinet).

IMPORTANT: If the issue involves electrical components or requires opening the blower or control cabinet, only a qualified technician may proceed.

NOTE

If the cause cannot be identified using these steps, isolate the machine and contact Agrona Service.

Issue	Possible Causes	Corrective Actions
No bubbles visible in the tank	• Blower not running	• Check that blower is switched ON
	• Incorrect blower rotation direction	• Verify rotation direction (must blow air, not draw)
	• Loose or disconnected HDPE pipe	• Check all pipe connections and couplings
	• Severely clogged air filter	• Clean or replace air filter
	• Diffuser membrane damaged or folded	• Inspect diffuser; reposition or replace if needed
Weak or uneven bubble output	• Partially clogged air filter	• Clean air filter
	• Air leak in HDPE pipe or couplings	• Tighten/inspect couplings
	• Low water level exposing diffuser	• Ensure diffuser is fully submerged
	• Fouled or biofilm-covered membrane	• Rinse membrane gently with clean water
Blower overheating or shutting down	• Dirty or blocked air filter	• Clean or replace air filter
	• Insufficient ventilation	• Ensure blower ventilation is clear
	• Excessive backpressure	• Inspect air line for blockages
	• High ambient temperature	• Improve cooling/ventilation; allow blower to cool
Unusual noise or vibration	• Loose mounting bolts or fittings	• Tighten mounting hardware
	• Damaged blower impeller	• Inspect piping for leaks
	• Air leak in piping	• Stop system and inspect blower inlet
	• Foreign object in blower inlet	• Contact a qualified technician
Water entering the air line	• Blower installed too low	• Reposition blower above water level
	• Condensation accumulation	• Drain moisture from piping
	• Incorrect rotation/blower orientation	• Verify proper rotation direction
Control cabinet not powering on	• Tripped circuit breaker / blown fuse	• Reset circuit protections
	• Loose or damaged power cable	• Inspect wiring (technician only)
	• Moisture inside cabinet	• Dry cabinet and improve sealing
	• Faulty switch or wiring	• Contact a qualified electrician
DO sensor not showing data (if installed)	• Damaged/disconnected cable	• Check all sensor connections
	• Sensor fouling or end-of-life	• Clean sensor according to instructions
	• Interface or software error	• Replace sensor if expired

WARNING

Water entering the blower can cause severe damage.
Stop the system immediately and contact a qualified technician.

NOTE

Electrical repairs must only be performed by qualified personnel.

8.3 WHEN TO CONTACT AGRONA SERVICE

Stop the machine immediately and contact Agrona or an authorized service partner if:

- Electrical smell, smoke, sparks, or moisture inside the control cabinet are detected.
- The blower repeatedly overheats, shuts down, or vibrates excessively.
- Water has entered the blower or electrical cabinet.
- The diffuser membrane is torn or severely damaged.
- A major air leak or ruptured HDPE pipe is present.
- The system fails repeatedly after basic corrective actions.
- DO sensor readings remain unstable or non-functional after cleaning (if installed).
- Any safety device, fuse, or breaker continues to trip.

Provide the following information when contacting support:

- Model and serial number
- Description of the fault
- Alarm codes or indicator light status (if applicable)
- Recent maintenance actions performed
- Photos of the installation and relevant components

9 Disposal

The OxyBull aeration system and its components must be disposed of in accordance with applicable local, regional, and national regulations.

The system contains electronic parts, metals, plastics, and composite materials that must not be disposed of with household waste.

If local regulations differ from the instructions in this chapter, always follow local disposal rules.

9.1 TRANSFER OR SALE OF THE SYSTEM

If the system is sold or transferred to a new owner:

- Provide this manual with the unit.
- Ensure all safety labels are present and readable.
- Inform the new owner about required maintenance and safe use.

9.2 DISPOSAL OF SYSTEM COMPONENTS

Electrical and Electronic Components (WEEE)
Control cabinet, switches, wiring, terminals, relays, and internal electronics must be disposed of as Waste Electrical and Electronic Equipment (WEEE) at approved recycling facilities.

Blower Unit
The blower consists of: aluminium housing, electric motor, bearings and impeller. These components should be recycled as metal and electronic waste.

Diffuser Panel and PE Frame
The diffuser frame and membrane are made of: polyethylene (PE), EPDM or similar membrane material. Dispose of these materials through approved plastic recycling or technical waste facilities.

HDPE Piping and Fittings
HDPE pipes, compression couplings, and clamps can be recycled as plastic or technical materials.

Packaging Materials
Wood, cardboard, and protective plastics should be recycled through standard recycling streams unless contaminated.

9.3 END OF LIFE HANDLING

At the end of the system's service life the unit should be disassembled by qualified personnel to separate recyclable materials. Components may also be returned to Agrona or an authorized service partner for environmentally responsible disposal.

9.4 MATERIAL RECYCLING CATEGORIES

Component	Recycle Category
Electrical cabinet, PCB boards, wiring	Electronics (WEEE)
Blower unit	Metal / Electro-mechanical
Diffuser membrane	Plastic / Technical waste
PE diffuser frame	Plastic
HDPE pipes and fittings	Plastic
Fasteners (steel/aluminium)	Metal
Packaging (wood, cardboard, film)	Standard recyclable

10 Limited Warranty

Agrona Tec provides a limited warranty that the OxyBull aeration system is free from defects in materials or manufacturing under normal, authorized use, subject to the terms and exclusions below. This Limited Warranty applies exclusively to the original purchaser and begins on the date of delivery. No other warranties, express or implied, are provided.

Warranty Period

- 12 months on electrical, electronic and mechanical components

Consumables are **not covered** beyond their stated period.

Warranty Coverage

Agrona will, at its sole discretion:

- Repair or replace defective parts
- Provide equivalent replacement components

Warranty coverage applies only when:

- Installation follows Agrona instructions
- Maintenance is performed as specified in this manual
- Only genuine Agrona parts are used
- No unauthorized modifications have been made

What This Warranty Does NOT Cover

- Incorrect installation, wiring, or commissioning
- Misuse, negligence, or operation outside specified limits
- Water damage caused by leaks, incorrect drainage, or improper piping
- Electrical damage caused by incorrect voltage, surges, or grounding issues
- Corrosion caused by chemicals or unsuitable environments
- Failures resulting from lack of maintenance
- Labor costs, travel expenses, or on-site service fees
- Consumables and parts, including:
  - Filters
  - Pump seals and bearings
  - O-rings and gaskets
  - DO sensor caps

Agrona is **not responsible** for loss of production, downtime, or consequential damages.

Conditions That Void the Warranty

The warranty becomes void immediately if:

- The unit is modified or repaired by unauthorized persons
- Non-Agrona parts are used
- The system is operated without water (dry operation)
- Safety devices or protective covers are removed or bypassed
- Incorrect electrical voltage or wiring is used
- The serial number or identification labels are altered or removed

11 Appendix I – Declaration of Conformity

EC DECLARATION OF CONFORMITY CONCERNING MACHINERY

Declaration in accordance with Directive 2006/42/EC, as last amended (hereinafter referred to as the Machinery Directive). This language version of the declaration has been verified by the manufacturer (original declaration).

We (manufacturer):

Company name:	Agrona Tec.
Address:	Leeuwenhoekstraat 56, 2652XL Berkel en rodenrijs
Country:	Netherlands

For the product described below:

Generic name:	OxyBull Water Aeration System
Trade name:	OxyBull
Type:	For all types from 10 to 1000000 m3
Serial number:	
Function:	Water aeration for water treatment, agriculture, horticulture, aquaculture, cleaning and industrial processes.

All the relevant provisions of the Machinery Directive are complied with:

The product is in accordance with the provisions of the following European directives:

- Low Voltage Directive 2014/35/EU
- EMC Directive 2014/30/EU
- RoHS Directive 2011/65/EU

Whereas the following harmonized standards have been used:

- EN ISO 12100:2010 | Safety of machinery - Basic concepts for design - Risk assessment and risk reduction
- NEN 5509:2016 + EN-ISO 20607:2019 - User Manuals
- EN 60204-1:2018 | Safety of machinery - Electrical equipment of machinery - Part 1: General requirements

The following natural or legal person established in the Community is authorised to compile the technical file:

Company name:	Agrona Tec
Name and position:	N.Laaguili, Directeur
Adres:	Leeuwenhoekstraat 56, 2652XL Berkel en rodenrijs
Land:	The Netherlands

Issued on, 05 January 2026.

Director, Agrona Tec.

Page 1 of 1

Elmo Rietschle

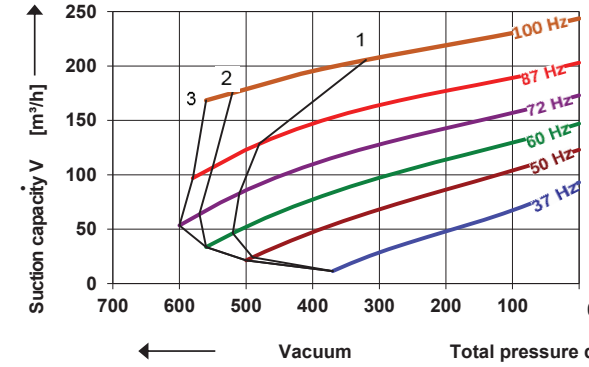
IE3

G-BH7 e
Data sheet 2BH7 520

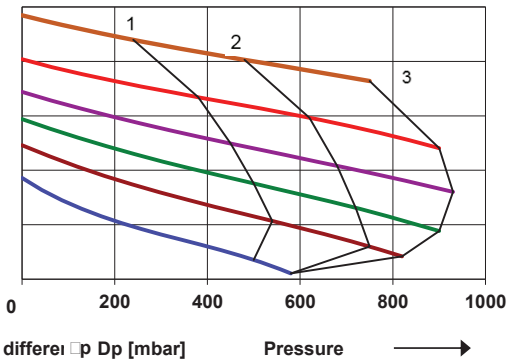
Side channel blower with Frequency Converter

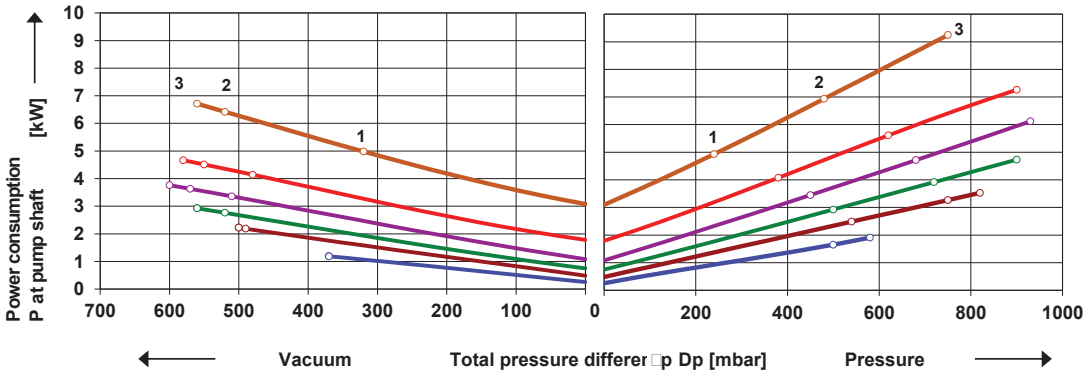
Performance curves

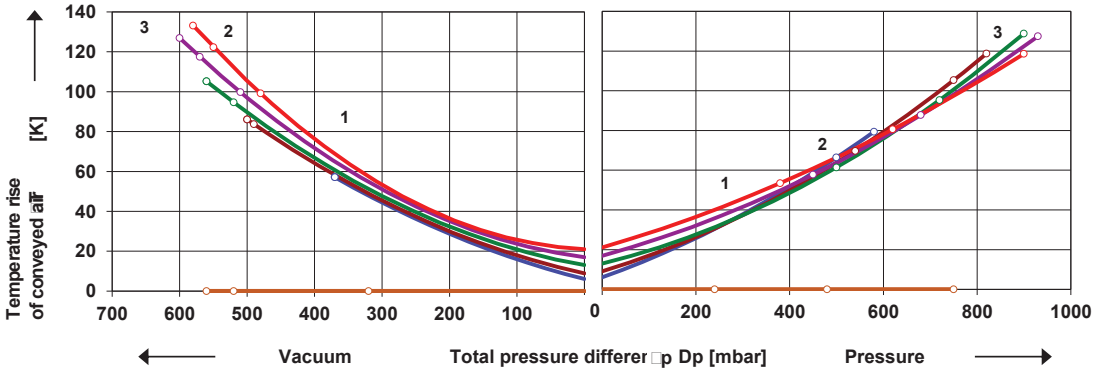
Vacuum operation



Compressor operation







The performancecurves are based on air at a temperatureof 15 °C and an atmosphericpressure of 1013 mbar with a tolerance of ± 10 %. The total pressure differences are valid for suction and ambient temperature up to 25 °C. For other conditions please get in touch with us.

The performancecurves are based on frequencyconverteroperationand a pulsefrequencyof 4 kHz minimum.Rated voltage/frequencyset pointis 345 V / 87 Hz and delta connection of motor. Frequency converters must be connected to a mains voltage of 380 V minimum.

Selection and ordering data

Type 2BH7 520

No.	Frequency	Rated motor			Max. differential pressure [1]		Sound pressure level [2]		Weight Approx.		Order No.	VFD type
		Voltage	Current	Power	Vacuum	Pressure						
	Hz	V	A	kW	mbar		dB(A)		kg			
IE3	Integrated VFD 3~ 400V -15% ... 480V +10%, 50/60 Hz ±6% with thermistor (PTC), IP55, UL 1450											
1	100	400 □	9,8 □	5,0	-320	240	77	72/73	55	57	2BH7520-0A321-1	E
2	100	400 □	12,7 □	6,6	-520	480	81	72/74	#NV	#NV	2BH7520-0A351-1	E
3	100	400 □	16,2 □	8,8	-560	750	81	72/74	69	71	2BH7520-0A371-1	F
		□□	□□	#NV	#NV	#NV	77	72/73	55	57	2BH7520-0A326-1	##
		□□	□□	#NV	#NV	#NV	81	72/74	#NV	#NV	2BH7520-0A356-1	##
		□□	□□	#NV	#NV	#NV	81	72/74	69	71	2BH7520-0A376-1	##
IE3	3~ 50/60 Hz, IP55, Insulation material class F, UL 1004 and CNA/CSA 22.2 No 68-09 (certificate number E225239)											
1	37	-	-	-	-370	500	67	72/73	50	52	2BH7520-0AK26-1 [3]	
	50	-	-	-	-490	540	65					
	60	-	-	-	-520	500	71					
	87	345 □	8,7 □	4,3	-480	380	77					D
2	37	-	-	-	-370	580	69	72/74	54	56	2BH7520-0AK56-1 [3]	
	50	-	-	-	-500	730	65					
	60	-	-	-	-560	680	71					
	87	400 □	11,0 □	5,8	-570	540	81					E
3	37	-	-	-	-370	580	65	72/74	61	63	2BH7520-0AK76-1 [3]	
	50	-	-	-	-500	820	65					
	60	-	-	-	-560	900	71					
	87	400 □	14,4 □	7,5	-580	870	79					F

With seperately driven fan (order option G[4])

1) We recommend differential pressure indicators / switches for limiting differential pressure. Relief valves are only useable at defined frequency.

2) Measuring surface sound pressure level acc. to EN ISO 3744, measured with an equivalent unit at a distance of 1 m. The pump is throttled to an average suction press piping connected, but no relief valves fitted, tolerance ±3 dB (A).

3) PTC recommended for motor overload protection. Ordering example: 2BH7520- □□□□□-□-Z Z=A11

4) Sound pressure level with G17 dependent on voltage (50Hz / 60Hz)

All G-BH match the 2006/42/EC (machinery) and 2014/35/EU (low voltage) directives and the EN 60034 norm "Rotating electrical machines".
The motors comply with EN 60 034 (IEC 60034) and thermal class F.

Frequency converter (IP55) motor integrated / for wall mounting

	Frequency Converter Order No.		Rated mains voltage	Max. motor current	Typical motor power	Rated mains current	Fuse Protection	Weight Approx.	Adaptor for wall mounting Order No.
			V	A	kW	A	A	kg	
A	2FC4152-1 □□ 00		400V (-15%) ... 480V (+10%)	4,0	1,5	3,3	10	3,9	2FX16190ER00
B	2FC4222-1 □□ 00			5,6	2,2	4,6	10	5,0	2FX16490ER00
C	2FC4302-1 □□ 00			7,5	3,0	6,2	16		
D	2FC4402-1 □□ 00			9,5	4,0	7,9	16		
E	2FC4552-1 □□ 00			13,0	5,5	10,8	20	8,7	2FX16690ER00
F	2FC4752-1 □□ 00			17,8	7,5	14,8	25		
G	2FC4113-1 □□ 00			28,0	11,0	23,3	35	21,0	2FX16990ER00
H	2FC4153-1 □□ 00			34,0	15,0	28,3	50		
J	2FC4183-1 □□ 00			40,0	18,5	33,3	50		
K	2FC4223-1 □□ 00			48,0	22,0	39,9	63		

	I/O's and automation	Order option	Example:
ST	2 AIN / 2 AOUT / 4 DIGIN / 1 DIGOUT / 2 RELAYS	STANDARD	2BH7520-0A321-1-Z Z=U51 VFD type 2FC4552-1PB00 to be delivered already installed
PB	2 AIN / 2 AOUT / 4 DIGIN / 1 DIGOUT / 2 RELAYS / ProfiBus interface	Z = U51	
CB	2 AIN / 2 AOUT / 4 DIGIN / 1 DIGOUT / 2 RELAYS / CANopen interface	Z = U52	
PN	2 AIN / 2 AOUT / 4 DIGIN / 1 DIGOUT / 2 RELAYS / ProfiNet interface	Z = U53	
SC	2 AIN / 2 AOUT / 4 DIGIN / 1 DIGOUT / 2 RELAYS / SERCOS3 interface	Z = U54	

VFD accessories

Item	Order No.	Item		Order No.
Manual control		**Differential pressure transmitters**		
MMI handheld	2FX4520-0ER00	Vacuum	-1000 ... 0 mbar	2FX6022-0BD00
USB adaptor cable	2FX4521-0ER00	Pressure	0 ... 600 mbar	2FX6013-0BD00
			0 ... 1000 mbar	2FX6014-0BD00
INVERTERpc Software				
Free download at www.gd-elmorietschle.com >Downloads >frequency-converters >Miscellaneous >Software				

Changes in particular of the quoted performance curve, data and weights may occur without prior notice. The data given does not constitute an obligation from our side to del

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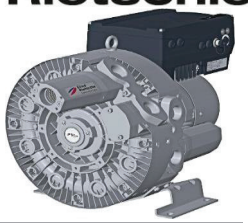
G-BH7 e
Data sheet 2BH7 420

Side channel blower with Frequency Converter

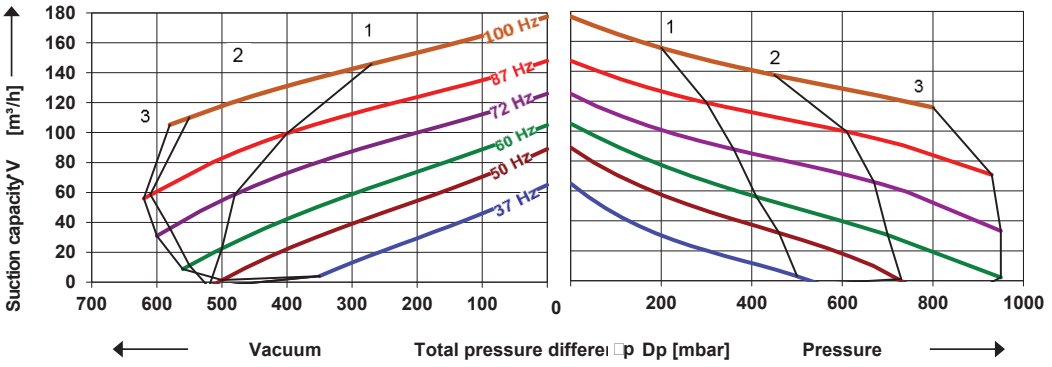
IE3

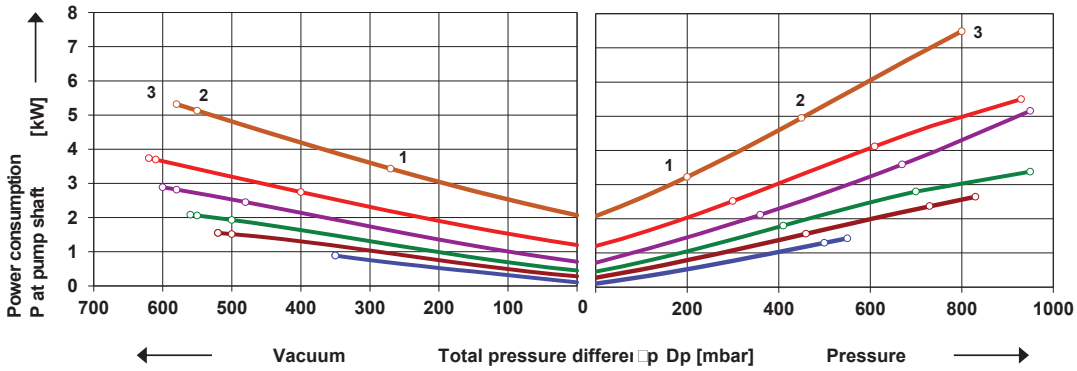


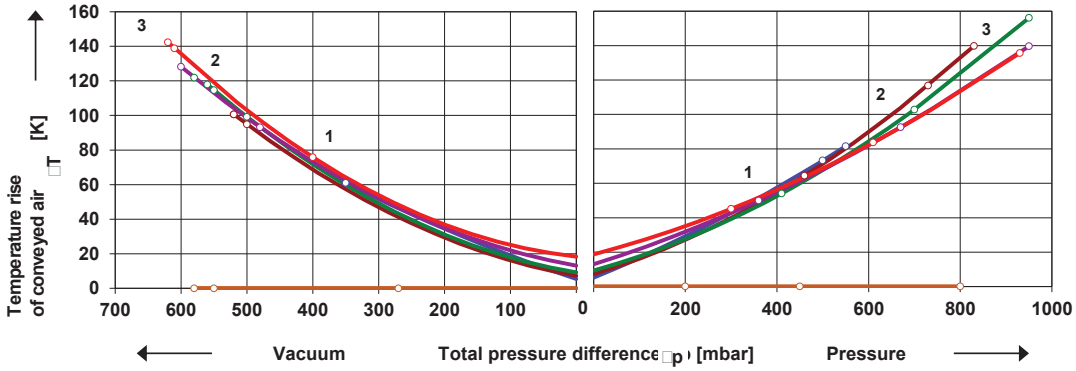
Performance curves

Vacuum operation

Compressor operation







The performancecurves are based on air at a temperatureof 15 °C and an atmosphericpressure of 1013 mbar with a tolerance of ± 10 %. The total pressure differences are valid for suction and ambient temperature up to 25 °C. For other conditions please get in touch with us.

The performancecurves are based on frequencyconverteroperationand a pulsefrequencyof 4 kHz minimum.Rated voltage/frequencyset pointis 345 V / 87 Hz and delta connection of motor. Frequency converters must be connected to a mains voltage of 380 V minimum.

Selection and ordering data

Type 2BH7 420

No.	Frequency	Rated motor			Max. differential pressure [1]		Sound pressure level [2]		Weight Approx.		Order No.	VFD type
		Voltage	Current	Power	Vacuum	Pressure						
	Hz	V	A	kW	mbar		dB(A)		kg			
IE3	Integrated VFD 3~ 400V -15% ... 480V +10%, 50/60 Hz ±6% with thermistor (PTC), IP55, UL 1450											
1	100	400 □	6,5 □	3,5	-270	200	77	70/71	43	45	2BH7420-0A321-1	C
2	100	400 □	9,5	5,0	-550	450	77	70/71	43	50	2BH7420-0A331-1	D
3	100	400 □	12,7 □	6,9	-580	800	80	70/72	55	57	2BH7420-0A361-1	E
3	87	380 □	6,1 □	2,9	-400	300	77	70/71	43	45	2BH7420-0A326-1	C
3	87	380 □	8,8 □	4,3	-610	610	77	70/71	48	50	2BH7420-0A336-1	D
3	87	380 □	11,8 □	5,8	-620	930	80	70/72	55	57	2BH7420-0A366-1	E
IE3	3~ 50/60 Hz, IP55, Insulation material class F, UL 1004 and CNA/CSA 22.2 No 68-09 (certificate number E225239)											
1	37	-	-	-	-350	500	56	70/71	38	40	2BH7420-0AK26-1 [3]	
	50	-	-	-	-500	460	61					
	60	-	-	-	-490	410	66					
	87	400 □	5,8 □	2,9	-400	300	77					C
2	37	-	-	-	-350	550	59	70/71	43	45	2BH7420-0AK36-1 [3]	
	50	-	-	-	-520	730	61					
	60	-	-	-	-550	700	66					
	87	400 □	8,7 □	4,3	-610	610	77					D
3	37	-	-	-	-350	520	66	70/72	47	49	2BH7420-0AK66-1 [3]	
	50	-	-	-	-500	830	61					
	60	-	-	-	-560	950	66					
	87	400 □	11,0 □	5,8	-620	930	80					E

With seperately driven fan (order option G1[4])

1) We recommend differential pressure indicators / switches for limiting differential pressure. Relief valves are only useable at defined frequency.

2) Measuring surface sound pressure level acc. to EN ISO 3744, measured with an equivalent unit at a distance of 1 m. The pump is throttled to an average suction press piping connected, but no relief valves fitted, tolerance ±3 dB (A).

3) PTC recommended for motor overload protection. Ordering example: 2BH7420- □□□□□-□-Z Z=A11

4) Sound pressure level with G17 dependent on voltage (50Hz / 60Hz)

All G-BH match the 2006/42/EC (machinery) and 2014/35/EU (low voltage) directives and the EN 60034 norm "Rotating electrical machines".
The motors comply with EN 60 034 (IEC 60034) and thermal class F.

Frequency converter (IP55) motor integrated / for wall mounting

	Frequency Converter Order No.		Rated mains voltage	Max. motor current	Typical motor power	Rated mains current	Fuse Protection	Weight Approx.	Adaptor for wall mounting Order No.
			V	A	kW	A	A	kg	
A	2FC4152-1 □□ 00		400V (-15%) ... 480V (+10%)	4,0	1,5	3,3	10	3,9	2FX16190ER00
B	2FC4222-1 □□ 00			5,6	2,2	4,6	10	5,0	2FX16490ER00
C	2FC4302-1 □□ 00			7,5	3,0	6,2	16		
D	2FC4402-1 □□ 00			9,5	4,0	7,9	16		
E	2FC4552-1 □□ 00			13,0	5,5	10,8	20	8,7	2FX16690ER00
F	2FC4752-1 □□ 00			17,8	7,5	14,8	25		
G	2FC4113-1 □□ 00			28,0	11,0	23,3	35	21,0	2FX16990ER00
H	2FC4153-1 □□ 00			34,0	15,0	28,3	50		
J	2FC4183-1 □□ 00			40,0	18,5	33,3	50		
K	2FC4223-1 □□ 00			48,0	22,0	39,9	63		

	I/O's and automation	Order option	Example:
ST	2 AIN / 2 AOUT / 4 DIGIN / 1 DIGOUT / 2 RELAYS	STANDARD	2BH7420-0A321-1-Z Z=U51
PB	2 AIN / 2 AOUT / 4 DIGIN / 1 DIGOUT / 2 RELAYS / ProfiBus interface	Z = U51	
CB	2 AIN / 2 AOUT / 4 DIGIN / 1 DIGOUT / 2 RELAYS / CANopen interface	Z = U52	VFD type 2FC4302-1PB00 to be delivered already installed
PN	2 AIN / 2 AOUT / 4 DIGIN / 1 DIGOUT / 2 RELAYS / ProfiNet interface	Z = U53	
SC	2 AIN / 2 AOUT / 4 DIGIN / 1 DIGOUT / 2 RELAYS / SERCOS3 interface	Z = U54	

VFD accessories

Item	Order No.	Item		Order No.
Manual control		**Differential pressure transmitters**		
MMI handheld	2FX4520-0ER00	Vacuum	-1000 ... 0 mbar	2FX6022-0BD00
USB adaptor cable	2FX4521-0ER00	Pressure	0 ... 600 mbar	2FX6013-0BD00
			0 ... 1000 mbar	2FX6014-0BD00
INVERTERpc Software				
Free download at www.gd-elmorietschle.com >Downloads >frequency-converters >Miscellaneous >Software				

Changes in particular of the quoted performance curve, data and weights may occur without prior notice. The data given does not constitute an obligation from our side to del

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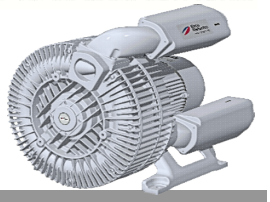
G-BH 2 N

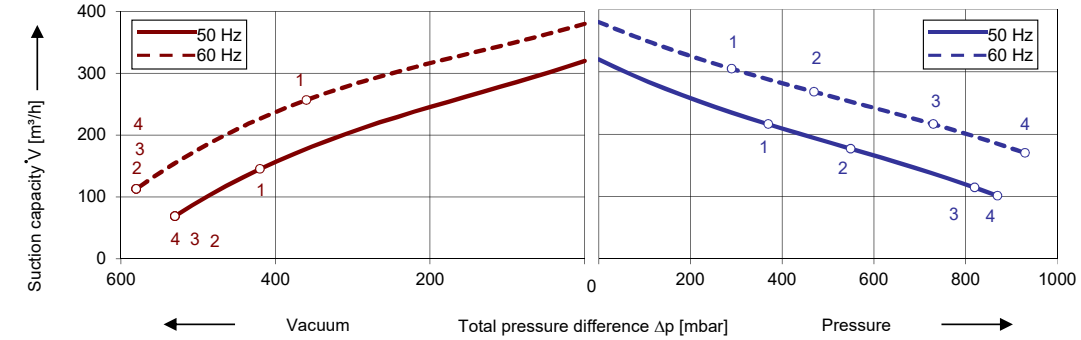
Data sheet 2BH2 0360-2

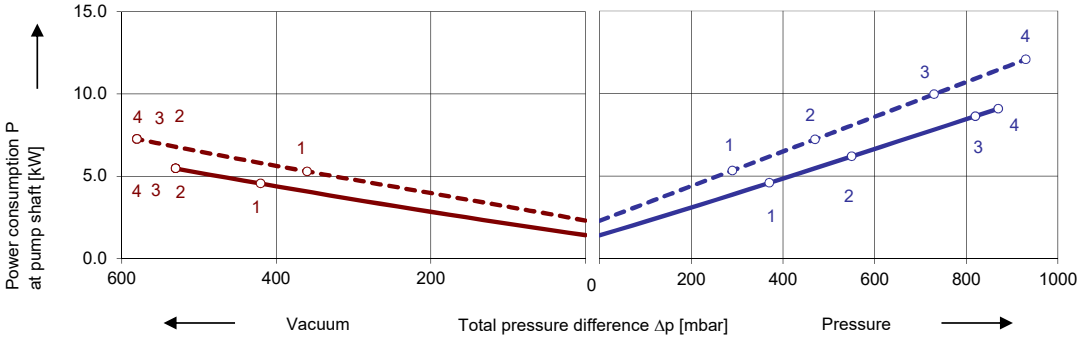
Side channel blower with IE3-motors

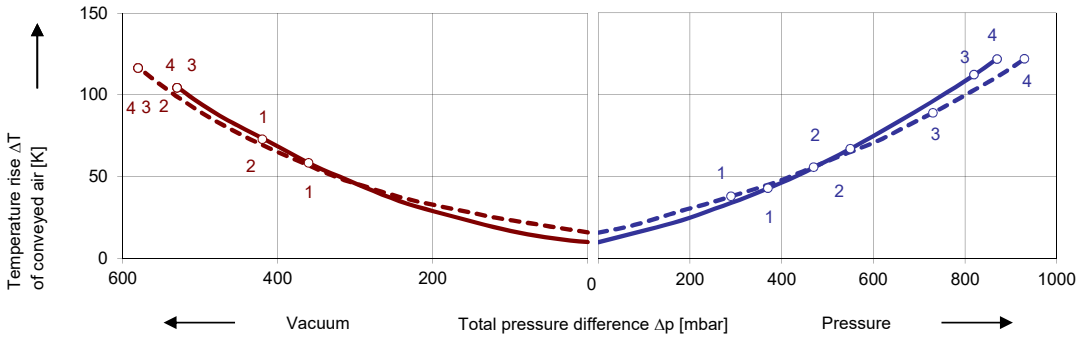


Performance curves

Vacuum operation | **Compressor operation**







The performance curves are based on air at a temperature of 15 °C and an atmospheric pressure of 1013 mbar with a tolerance of ± 10 %. The total pressure differences are valid for suction and ambient temperature up to 25 °C. For other conditions please get in touch with us.

Every G-BH pump can be used both as vacuum pump and compressor in continuous operation over the total performance curve range. The motors are available as standard in protection category IP 55 and insulation class F. The vacuum pumps / compressors are UL and CSA approved.

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Selection and ordering data

Type

No.	Frequency	Rated			Max. differential pressure [2]		Sound pr. level [3]	Efficiency [4]	Weight Approx.	Order No.
		Voltage [1]	Current	Power	Vacuum	Pressure				
	Hz	V	A	kW	mbar		dB(A)		kg	
IE3	**3~ 50/60 Hz, IP55, Insulation material class F, UL 1450 and CAN/CSA C22.2 No. 68-09 (certificate number E225239)**									
1	50	190-210 Δ	17.1 Δ	4.6	-420	370	65	IE3	92	**2BH20360-2AAKL1-BA**
	60	190-210 YY / 380-420 Y	19.6 YY / / 9.8 Y	5.3	-360	290	69	IE3		
	60	200 YY	19.6 YY	5.3	-360	290	69	NP		
2	50	190-210 Δ	23.5 Δ	6.3	-530	550	70	IE3	99	**2BH20360-2AAKM1-BA**
	60	190-210 YY / 380-420 Y	27.6 YY / / 13.8 Y	7.3	-580	470	75	IE3		
	60	200 YY	27.6 YY	7.3	-580	470	75	NP		
3	50	190-210 Δ	30.8 Δ	8.6	-530	820	70	IE3	111	**2BH20360-2AAKN1-BA**
	60	190-210 YY / 380-420 Y	35.2 YY / / 17.6 Y	9.9	-580	730	75	IE3		
	60	200 YY	35.2 YY	9.9	-580	730	75	NP		
4	50	190-210 Δ	46.4 Δ	12.6	-530	870	71	IE3	130	**2BH20360-2AAKP1-BA**
	60	190-210 YY / 380-420 Y	52.8 YY / / 26.4 Y	14.5	-580	930	76	IE3		
	60	200 YY	52.8 YY	14.5	-580	930	76	NP		
IE3	**3~ 50/60 Hz, IP55, Insulation material class F, UL 1450 and CAN/CSA C22.2 No. 68-09 (certificate number E225239)**									
1	50	220-240 Δ / 380-420 Y	14.9 Δ / / 8.6 Y	4.6	-420	370	65	IE3	92	**2BH20360-2AAKL6-BA**
	60	220-240 YY / 440-480 Y	17.0 YY / / 8.5 Y	5.3	-360	290	69	IE3		
	60	230 YY / 460 Y	17.0 YY / / 8.5 Y	5.30	-360	290	69	NP		
2	50	220-240 Δ / 380-420 Y	20.4 Δ / / 11.8 Y	6.3	-530	550	70	IE3	99	**2BH20360-2AAKM6-BA**
	60	220-240 YY / 440-480 Y	24.0 YY / / 12.0 Y	7.3	-580	470	75	IE3		
	60	230 YY / 460 Y	24.0 YY / / 12.0 Y	7.3	-580	470	75	NP		
3	50	220-240 Δ / 380-420 Y	26.8 Δ / / 15.5 Y	8.6	-530	820	70	IE3	111	**2BH20360-2AAKN6-BA**
	60	220-240 YY / 440-480 Y	30.6 YY / / 15.3 Y	9.9	-580	730	75	IE3		
	60	230 YY / 460 Y	30.6 YY / / 15.3 Y	9.9	-580	730	75	NP		
4	50	220-240 Δ / 380-420 Y	40.3 Δ / / 23.3 Y	12.6	-530	870	71	IE3	130	**2BH20360-2AAKP6-BA**
	60	220-240 YY / 440-480 Y	46.0 YY / / 23.0 Y	14.5	-580	930	76	IE3		
	60	230 YY / 460 Y	46.0 YY / / 23.0 Y	14.5	-580	930	76	NP		
IE3	**3~ 50/60 Hz, IP55, Insulation material class F, UL 1450 and CAN/CSA C22.2 No. 68-09 (certificate number E225239)**									
1	50	475-525 Y	6.9 Y	4.6	-420	370	65	IE3	92	**2BH20360-2AAQL3-BA**
	60	550-600 Y	6.8 Y	5.3	-360	290	69	NP		
2	50	475-525 Y	9.5 Y	6.3	-530	550	70	IE3	99	**2BH20360-2AAQM3-BA**
	60	550-600 Y	9.6 Y	7.3	-580	470	75	NP		
3	50	475-525 Y	12.4 Y	8.6	-530	820	70	IE3	111	**2BH20360-2AAQN3-BA**
	60	550-600 Y	12.2 Y	9.9	-580	730	75	NP		
4	50	475-525 Y	18.6 Y	12.6	-530	870	71	IE3	129	**2BH20360-2AAQP3-BA**
	60	550-600 Y	18.4 Y	14.5	-580	930	76	NP		
IE3	**3~ 50/60 Hz, IP55, Insulation material class F, UL 1450 and CAN/CSA C22.2 No. 68-09 (certificate number E225239)**									
1	50	380-420 Δ / 660-725 Y	8.6 Δ / / 5.0 Y	4.6	-420	370	65	IE3	92	**2BH20360-2AAQL7-BA**
	60	440-480 Δ	8.5 Δ	5.3	-360	290	69	IE3		
	60	460 Δ	8.5 Δ	5.30	-360	290	69	NP		
2	50	380-420 Δ / 660-725 Y	11.8 Δ / / 6.8 Y	6.3	-530	550	70	IE3	99	**2BH20360-2AAQM7-BA**
	60	440-480 Δ	12.0 Δ	7.3	-580	470	75	IE3		
	60	460 Δ	12.0 Δ	7.3	-580	470	75	NP		
3	50	380-420 Δ / 660-725 Y	15.5 Δ / / 8.9 Y	8.6	-530	820	70	IE3	111	**2BH20360-2AAQN7-BA**
	60	440-480 Δ	15.3 Δ	9.9	-580	730	75	IE3		
	60	460 Δ	15.3 Δ	9.9	-580	730	75	NP		
4	50	380-420 Δ / 660-725 Y	23.3 Δ / / 13.4 Y	12.6	-530	870	71	IE3	129	**2BH20360-2AAQP7-BA**
	60	440-480 Δ	23.0 Δ	14.5	-580	930	76	IE3		
	60	460 Δ	23.0 Δ	14.5	-580	930	76	NP		

2) Relief valves available for limiting differential pressure.

3) Measuring surface sound pressure level acc. to EN ISO 3744, measured with an equivalent unit at a distance of 1 m. The pump is throttled to an average suction pressure, with piping connected, but no relief valves fitted, tolerance ±3 dB (A).

4) The motors according to NEMA MG1-12. NP=NEMA Premium; NEMA Premium includes IE3.

All G-BH match the 2006/42/EC (machinery) and 2006/95/EC (low voltage) directives and the EN 60034 norm “Rotating electrical machines”.

Service factor (SF) and motor efficiency according NEMA MG1-12.
Voltage tolerances for three phase motors are +/-10%.
The frequency tolerance is +/- 2 % maximum.

Motor for alternate voltages

Voltage range		Efficiency [4]			
50 Hz	**60Hz**		**60 Hz**	**2BH2…-…** □ . □	
3~					
200 VΔ	200 V YY / 230 VΔ / 400 VY	NEMA Premium	•	K	1
190-210 VΔ	190-210 VYY / 220-240 VΔ / 380-420VY	IE3			
200 V YY / 230 VΔ / 400 VY	230 V YY / 460 VY	NEMA Premium	•	K	6
190-210 VYY / 220-240 VΔ / 380-420VY	220-240 VYY / 440-480VY	IE3			
475-525 V Y	550-600 V Y	NEMA Premium	•	Q	3
475-525 VΔ	550-600 VΔ	NEMA Premium	•	Q	5
400 VΔ / 690 V Y	460 VΔ	NEMA Premium	•	Q	7

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