

GABA

High Performance Heat & Wet Type
Gas Abatement System
AWE 050 AE

Instruction Manual



Table of Contents

1	About this manual	3
2	Before Use	4
2.1	Product	4
2.2	User Manual	4
2.3	Copyright	4
2.4	Authentication	5
2.5	Terms	5
2.6	Product Description	6
3	Related to Safety	8
3.1	Safety Equipment	8
3.2	Risk Factors	9
3.3	Safety Label	10
3.4	Precautions	11
3.5	Interlock	13
3.6	Emergency Stop	14
4	Facility Requirements	16
4.1	Installation Environment	16
4.2	Installation Space	16
4.3	Utility	17
4.4	LOTO Location and Measures Time	18
5	Installation	19
5.1	Product Transport	19
5.2	Utility Installation	20
5.3	Installation Inspection	21
6	Operation	23
6.1	Start	23
6.2	Set Up Mode	24
6.3	Manual Mode	25
6.4	Auto Mode	25
6.5	Other Modes	26
6.6	Setting mode (other than PLC)	27
7	Trouble Shooting	28
7.1	Tower Lamp	28
7.2	Trouble Solving Method	28
8	Maintenance	34
8.1	Preparation Materials	34
8.2	Equipment Stop	35
8.3	Module Replacement	35
8.4	Module Cleaning	35
8.5	Preventive Maintenance	36
9	EU Declaration of Conformity	37

1 About this manual

This document contains the company's technology and intellectual data. unauthorized use such as copying and transfer without permission from the company is strictly prohibited.

GABA AWE 050 AE User Manual

Amendment Date	July 11, 2023
Standard Model Item Name	GABA AWE 050 AE
Standard Model Item Code	505W-A001-01
Manufacturer	MAT Plus Co., Ltd.
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Homepage	www.buschvacuum.com

2 Before Use

2.1 Product

- The product GABA AWE 050 AE is an abatement technology by MAT PLUS Co., Ltd. The original designation of this product is MAT505W.
- The product is applied with the latest technology to achieve users' safety, high process efficiency, and energy efficiency.
- This product, as a product for industrial use, is an air pollution controlling device for reducing harmful gases and particles from industrial exhausts.
- The front part of this product is designed to be connected to the exhaust pipe of the source of harmful gases.
- The rear end of this product is connected to the vacuum system and it is designed for the internal product to be operated with negative pressure.
- Users must be fully acquainted with operation and management before using the product.
- This product must be operated only by trained personnel.
- A password must be set on the product system so that only designated personnel can access the system.
- If the product is not operating normally, refer to this user manual and solve the problem. When the problem cannot be resolved, please contact the manufacturer or the seller.
- If abnormal situations or problems occur during product operation, immediately stop operation and contact the manufacturer or the seller.

2.2 User Manual

- Read this user manual before use and use the product safely and appropriately.
- Users must be well acquainted with and observe the risk factors and safety matters entered in this user manual.
- This user manual explains the safety, installation, operation, problem solving, maintenance methods, option items, and technical data of the product in detail.
- This user manual includes advanced operation procedures authorized only to trained personnel.
- This user manual explains based on the basic set values of the product.
- This user manual may not correspond to the users' product environment.
- Some items, device, and software from the content of this user manual may not be provided or may be changed by derivative products according to the manufacture's policy.
- The contents of this user manual may be partially changed without notice to the user. For the latest version of the use manual, contact the manufacturer or the seller.
- Do not operate the product in any way other than the method specified in this user manual.
- MAT PLUS Co., Ltd. or the seller is not responsible for the accidents or malfunctions occurred resulting from not observing the instructions in this user manual.

2.3 Copyright

- Copyright © MAT PLUS Co., Ltd.
- This user manual is a copyright protect in accordance with the copy right law.
- You may not copy, transmit, translate or change part or all of the user manual into an electronically readable form without prior consent of MATPLUS Co., Ltd.

2.4 Authentication

- This product is a product that corresponds to the following standards, guidelines, and regulations.

Items	Report NO.	Issued Date	Authentication Test Institution
CE			SZU KOREA CO., LTD.
EMC			

Table 1.1 Authentication Status

2.5 Terms

The terms used in this user manual include "Warning", "Caution", and "Notice".



WARNING

It is used when indicating warning matters that can cause severe damages if not paid attention to.



CAUTION

It is used when indicating matters to be attended to use properly.

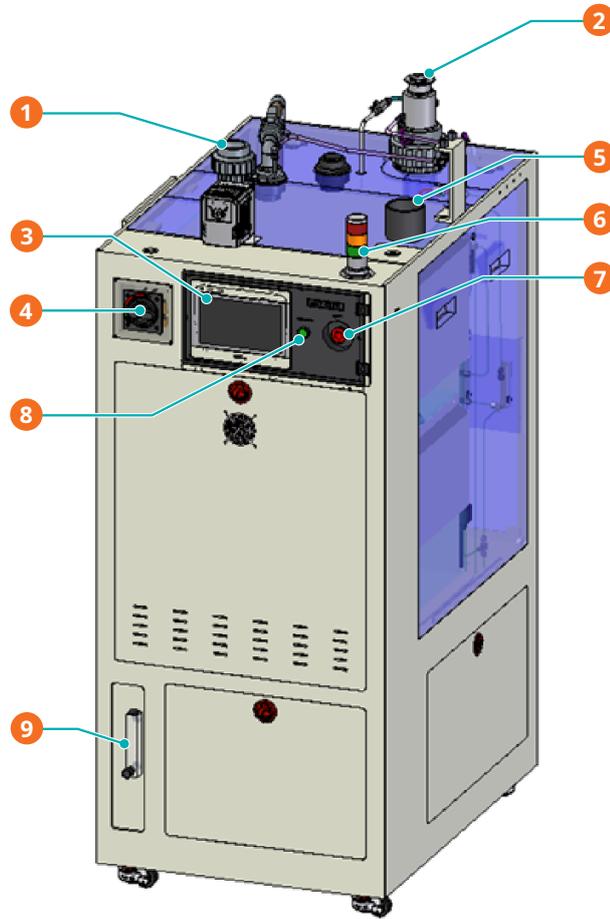


NOTICE

It is used when providing additional information such as reference matters that are good to know and useful functions.

2.6 Product Description

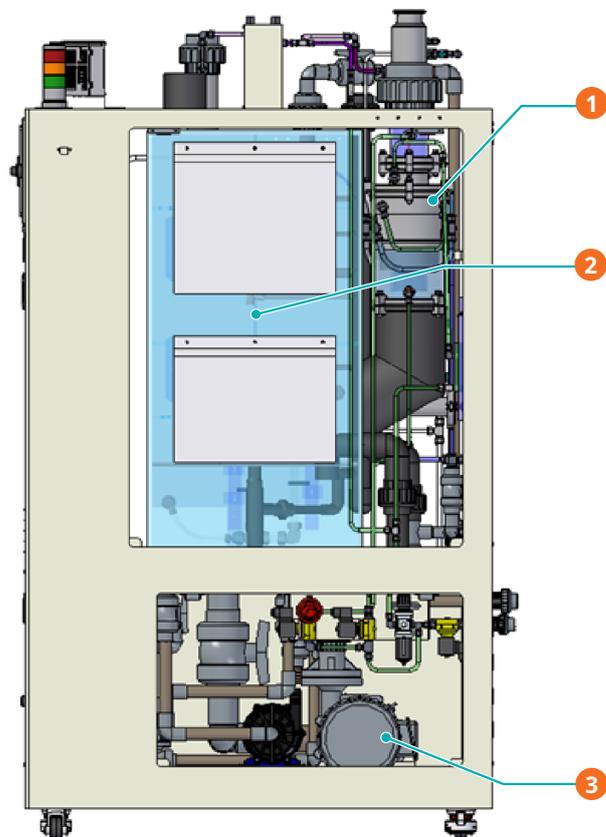
Product Front



Description			
1	Gas Outlets	2	Gas Inlets
3	Touch Screen	4	Main Power Breaker
5	Cabinet Exhaust	6	Tower Lamp
7	Emergency Switch	8	Start Switch
9	Flowmeters		

Fig 1.1 Name of Product Front

Internal Product



Description			
1	Inlet Preventer	2	Wet Tank
3	Pump		

Fig 1.2 Name of the Internal Product

3 Related to Safety

3.1 Safety Equipment



WARNING

Wearing inappropriate safety equipment or not wearing any may cause fatal damages to the body.

Symbol	Meaning of the Symbol
 Safety Gloves	You must wear safety gloves in areas indicated with this symbol. Wear safety gloves appropriate to the work.
 Safety Helmet	You must wear a safety helmet in areas indicated with this symbol. A safety helmet must be able to protect the whole head. Wear a safety helmet appropriate to the work.
 Facial Protection	You must wear a facial protection in areas indicated with this symbol. It must be compatible with other protection equipment worn. Wear a facial protection appropriate to the work.
 Safety Glasses	You must wear safety glasses in areas indicated with this symbol. Safety glasses must be able to protect the side of the eyes. Wear safety glasses appropriate to the work.
 Gas Mask	You must wear a gas mask in areas indicated with this symbol. Wear a certified gas mask to protect the respiratory system. Wear a gas mask appropriate to the work.
 Safety Clothing	You must wear a safety clothing in areas indicated with this symbol. It must be able to protect the entire skin. Wear a safety clothing appropriate to the work.
 Safety Shoes	You must wear safety shoes in areas indicated with this symbol. The ankles must not be exposed when wearing together with the safety clothing. Wear safety shoes appropriate to the work.

Table 2.1 Safety Equipment

3.2 Risk Factors

WARNING

Be sure to work after wearing appropriate protective equipment when implementing any work attached with a hazard label. If it is not observed, it may cause fatal damages to the body.

Risk Label	Meaning of the Symbol	
 <p data-bbox="384 730 558 790">Danger Electric Shock</p>	<ul style="list-style-type: none"> - You may be electrocuted when contacted or approached. - There may be fire and additional damages due to electric leakage, short circuit, etc. 	<p data-bbox="612 663 807 723">Protective Equipment</p> <div style="display: flex; justify-content: space-around; align-items: center;">    </div> <p data-bbox="847 819 1409 880">Wear safety glasses, insulating gloves, and safety shoes.</p>
 <p data-bbox="357 1081 584 1142">Warning Hazardous Substance</p>	<ul style="list-style-type: none"> - Fire may occur due to combustible substances. - It is used when there is combustible substance or spontaneous combustion substance inside. - There may be additional damages such as burn and generation of noxious gases due to fire. 	<p data-bbox="612 1088 807 1149">Protective Equipment</p> <div style="display: flex; flex-wrap: wrap; justify-content: space-around; align-items: center;">       </div> <p data-bbox="847 1404 1453 1487">Wear safety glasses, heat-resistant gloves, safety shoes, facial protection, gas mask, and heat resistant clothing.</p>
 <p data-bbox="363 1691 579 1751">Warning Corrosive Substance</p>	<ul style="list-style-type: none"> - There is danger of corrosion due to corrosive substances. - Even a low level of corrosive substance may irritate the eyes and the respiratory system. - In case of high level of concentration, there is risk of injury or death. 	<p data-bbox="612 1671 807 1731">Protective Equipment</p> <div style="display: flex; flex-wrap: wrap; justify-content: space-around; align-items: center;">       </div> <p data-bbox="847 1986 1461 2069">Wear safety glasses, chemical-resistant gloves, safety shoes, facial protection, gas mask, and chemical resistant clothing.</p>

Risk Label	Meaning of the Symbol	
 <p>Noxious Gas Exposure</p>	<p>- Substances such as harmful dust, vapor, and gas may occur and damage the respiratory system.</p> <p>Protective Equipment</p>	 <p>Wear safety glasses, safety gloves, safety shoes, and gas mask.</p>

Table 2.2 Risk Label and Protective Equipment

3.3 Safety Label

- Safety labels are attached as follows.
- Additional labels or other labels may be attached according to the area.

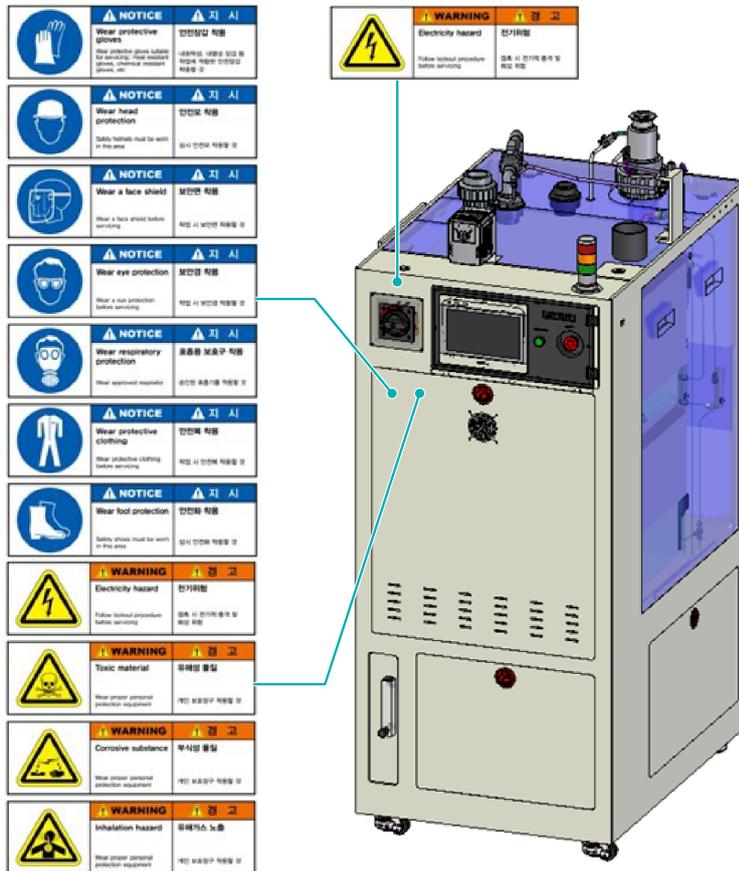


Fig 2.1 Safety Label Location

3.4 Precautions

Pressure - during normal operation



WARNING

This product uses the utilities such as water, nitrogen gas, and compressed dry air with high pressure. When inappropriate operation method is used, the user's body may be exposed to high pressured gas.

- The utilities used in this product are flown with high pressure at the supply part, exhaust part, pipes, and component connection part.
- Do not arbitrarily disassemble the parts flowing with utilities during normal operation.
- This product must be used in negative pressure condition.

Pressure - during Maintenance



CAUTION

If inspection, maintenance, and repair work are necessary, please observe the following directions to prevent danger.

- The utility lines may retain remnant pressure even after the valve is closed or after the suspension of operation.
- When disassembling the utility pipes and parts, open the connection part very slowly before complete disassembly and gradually remove the remnant pressure.
- Disassemble completely after the remnant pressure is all relieved.
- Work after wearing appropriate protective equipment.

Electricity - during Normal Operation



WARNING

This product uses 200-240VAC power according to the facility equipment. It may cause electric shock and burn to the user's body.

- Do not touch the power part when the product is in normal operation.
- Do not arbitrarily disassembly the power part when the product is in normal operation.

Electricity - during Maintenance



CAUTION

If inspection, maintenance, and repair work are necessary, please observe the following directions to prevent danger.

- Do not implement inspection, maintenance, and repair without shutting down the power.
- Work after wearing appropriate protective equipment.

Gas – during Normal Operation



WARNING

This product may flow harmful gases according to the installed environment. Users may be exposed to harmful gases.

- Before suspending the operation, inform the person interested such as product users and facility managers of operation suspension and the reasons for operation suspension.
- Do not arbitrarily disassemble the pipes flowing with gases during normal operation.
- Do not disassemble parts in the area existing with gases during normal operation.

Gas – during Maintenance



CAUTION

If inspection, maintenance, and repair work are necessary, please observe the following directions to prevent danger.

- Before suspending operation, stop the process facility connected to the front end of this product.
- Before suspending operation, shutdown the supply of harmful gases.
- Do not operate the front-end process facility or supply harmful gases during inspection, maintenance, and repair work.
- Work after wearing appropriate protective equipment.



NOTICE

When the product is in normal operation, users are not exposed to harmful gases.

- This product is designed so that the internal product is operated under negative pressure as it is connected together to a vacuum system.
- It is not exposed to harmful gases during normal operation.
- During abnormal situation, interlock is operated and it protects the users from risk factors.

Contaminant – during Normal Operation



WARNING

This product is designed so that the internal product is operated under negative pressure as it is connected together to a vacuum system.

It is not exposed to harmful gases during normal operation.

During abnormal situation, interlock is operated and it protects the users from risk factors.

- Do not arbitrarily disassemble the parts during normal operation.
- Leakage of gases and waste water may cause fatal damages to the body.

Contaminant – during Maintenance



CAUTION

If inspection, maintenance, and repair work are necessary, please observe the following directions to prevent danger.

- The facility manager of the facility installed with this product must process and discharge contaminants produced by this product in accordance with laws and regulations.
- Discharge of contaminants generated during inspection, maintenance, and repair work must be handled in accordance with the regulations of the installed facility.
- Work after wearing appropriate protective equipment.

Noise, Vibration



NOTICE

This product does not generate noise over 70dB. This product is designed to satisfy the vibration standards of each device.

3.5 Interlock



NOTICE

This product operates the interlock if abnormal operation is detected. It protects the user's safety through operation of interlock.

- It explains only EMO, Water Leak related to Emergency.
 - EMO
 - If you press the Emergency Off button, the Main MC connected to the Safety relay unit is opened and all the power is shut off.
 - Circulation Pump, Drain Pump, Venturi Pump etc. are connected to the power of the driving part. When cancelling EMO, the operation mode is forcibly converted to main mode to prevent automatic operation.
 - Water leak
 - If a leak is detected, an alarm will set off.
- If the product detects abnormal status during normal operation, the following interlocks are operated.

System Error / Output	Supply Water	Circulation Pump	Drain Pump	3-Way Valve (Option)
Supply Water Flow Error				By-pass
Circulation Flow Low Error		Off		By-pass
Circulation Flow High Error		Off		By-pass
Circulation Pump Trip		Off		By-pass
Water Leak	Off	Off	Off	By-pass
Inlet Pressure Alarm	Off	Off		By-pass
Exhaust Pressure Alarm	Off	Off	Off	By-pass
Main Tank level Low		Off	Off	By-pass
Main Tank level High	Off			By-pass
Main Tank level H-High	Off			By-pass
H2 Leak	Off	Off	Off	By-pass
Level Sensor Error	Off			By-pass

Fig 2.2 Interlock Operation Method

3.6 Emergency Stop

- This product includes an emergency stop mode.
- When abnormal operation status is detected when all the parts are normal, interlock and alarm are generated.
- Although it is in abnormal operation status, if interlock and alarm are not generated, activate the emergency stop mode.
- If variables occur at the installed environment of the product such as fire, flooding, and gas leakage, activate the emergency stop mode.
- If the emergency stop mode is activated, it immediately stops the product.

System during Abnormal Stop



This product is retained at high temperature for a certain time after the abnormal stop. It may cause burn to the user's body.

- If Abnormal stop mode is activated, power provision to all circuits is cut off.
- Power is continuously supplied to the main circuit breaker, the main electronic contactor, and emergency stop circuit.

System Recovery



WARNING

Do not insert process gases to the product until the product or the surrounding environment of the product become a normal status. Gas leakage may cause fatal damages to the user's body.

- If recovering to a normal state from emergency stop state, follow the following procedure.
 1. Check whether there isn't any problem in the environment where the product is installed.
 2. Check whether the product is in normal state.
 3. Turn the emergency stop button clockwise and check the button protrude toward the user's body.
 4. Press the START switch of the front part of the product for more than 1 seconds.
 5. If there are additional requirements or inspection matters, start manual mode operation.
 6. If there aren't additional requirements or inspection matters, or if confirmation is completed, start operation with automatic operation mode.

4 Facility Requirements

4.1 Installation Environment



CAUTION

This product is designed to be installed indoors where there is no risk of explosion. Install at an appropriate installation environment for normal operation and maintenance.

Table 3.1 Required Environment for Installation

Classification	Required Environment
Temperature	5°C ~ 40°C
Relative Humidity	30% ~ 75%
Elevation	1,000 m (3,280 ft) below the sea level (Consult with MAT PLUS Co., Ltd. if it exceeds)

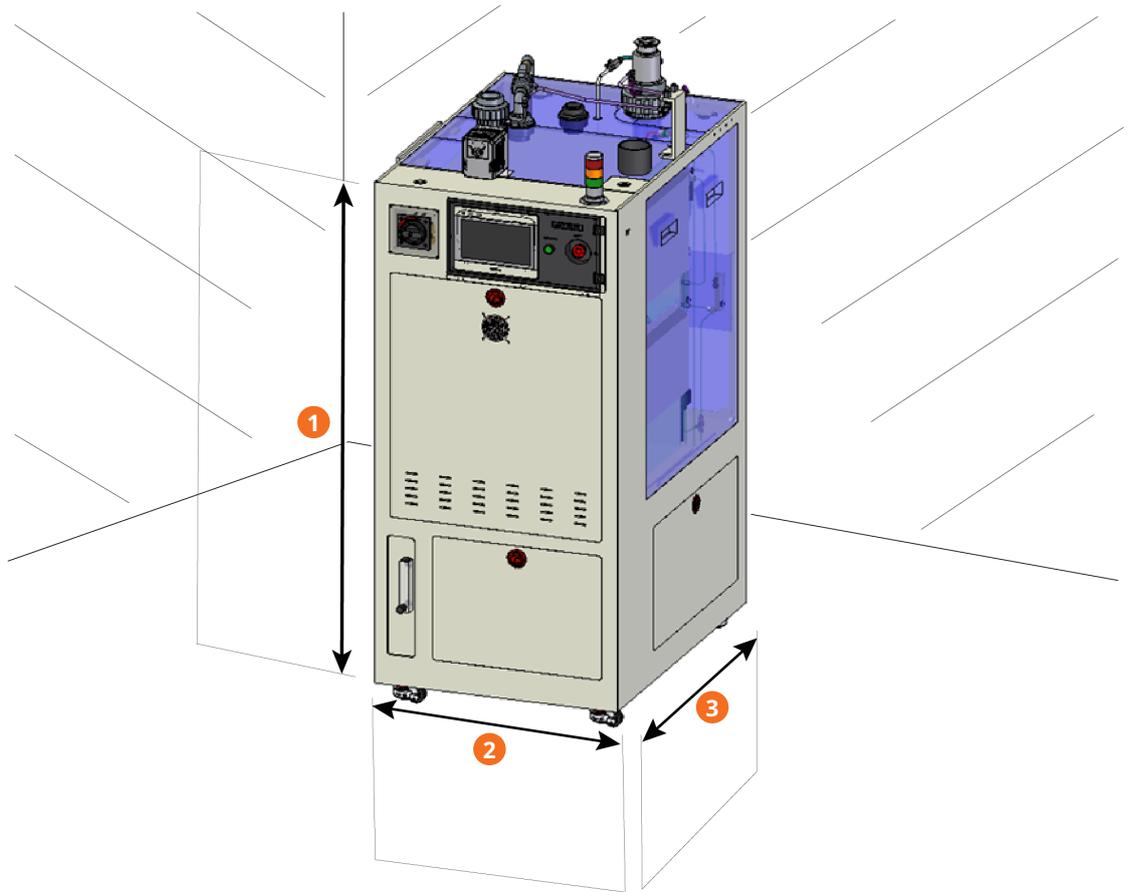
- When installing the product, the temperature for the installed area is recommended to be 5°C ~ 40°C.
 - If temperature of the installed area is not appropriate, dew condensation at the internal and external exhaust pipe may occur.
- Do not put any objects within the radius of opening and closing the cabinet door.
 - There may be restrictions on the maintenance work of the product.
- When installing the product, install at a flat floor.
 - If it is not a flat floor, parts may fall off due to vibration.

4.2 Installation Space

Table 3.2 Required Spaces for Installation

Classification	Size
External Size	780mm (W) × 1,100mm (D) × 1,729mm (H)
Weight	200kg (Dry), 270kg (Wet)
Inspection and Maintenance Space	1,000mm (Front), 500mm (Sides), 500mm (Rear)
Utility Connection Space	Top 500mm

Fig 3.1 Required Spaces for Installation



Description			
1	1,729	2	780
3	1,100		

4.3 Utility

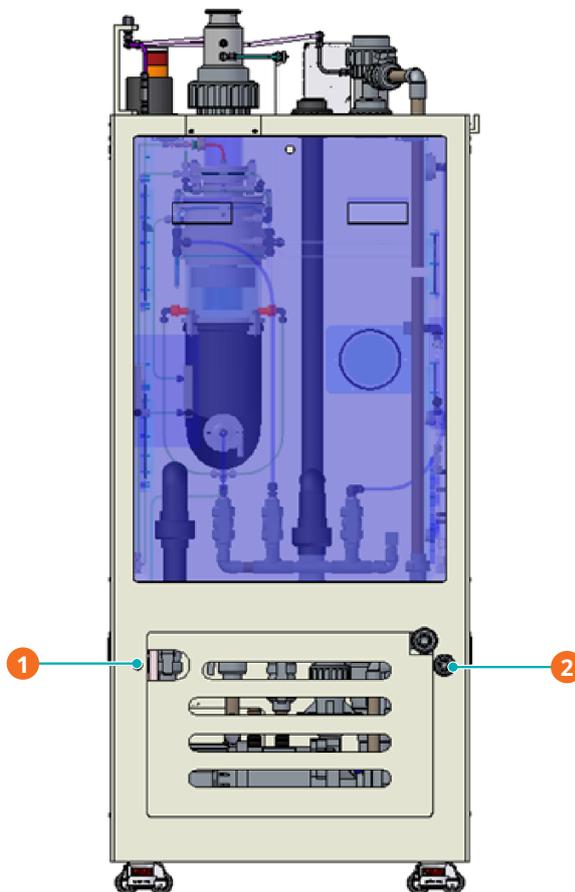
Table 3.3 Utility

Classification		Specifications
Power	Main Power	220V, 50Hz, 20KA Power Consumption 4,5KW MAX @PF 0.98 SCCR: 1.5KA
	Cir. Pump	1500W
	Drain Pump	260W
N2 Gas		4 ~ 7 kg • f/cm ² (Max 200 SLM), 1/4" Tube
CW (City Water)		3 ~ 5 kg • f/cm ² (Max 18 SLM), 15A (1/2") PVC Union
Gas inlet		NW50 Flange, Maximum of 1 Port
By-pass inlet		NW50 Flange, Maximum of 1 Port
Gas exhaust		-100 ~ -50 mm H ₂ O, 0.5 m ³ /min, 50A (2") PVC Union
Cabinet exhaust		-30 ~ -10 mm H ₂ O, 1,5 m ³ /min, 75A (3") PVC Union

Classification	Specifications
Drain	<ul style="list-style-type: none"> - Natural drain: 40A (1-1/2") PVC Union, Acid drain - Natural drain: 20A (3/4") PVC Union, Acid drain (Option)

4.4 LOTO Location and Measures Time

Fig 3.2 LOTO Location



Description			
1	N ₂ IN	2	Water IN

- LOTO is applied to this facility so that it can be used in the following cases.
 - During PM, improvement work, facility relocation, emergency situations (Leak etc.).

5 Installation

5.1 Product Transport

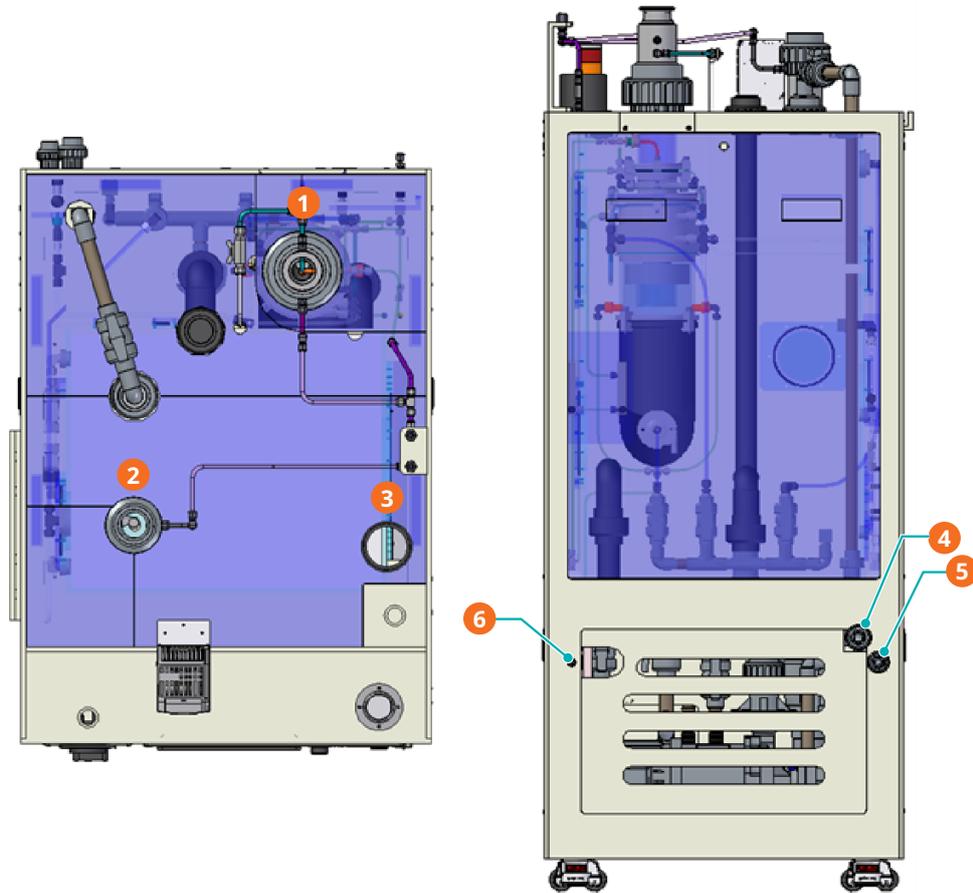


Description	
1	Label Left

- For facility transport, turn the wheels attached to the facility to float it from the ground and move it to the right position.
- When transporting, it should be floated less than 1cm to prevent damage of the top part of the facility.
- Since this equipment is a heavy object, more than 3 people are necessary when transporting.

5.2 Utility Installation

Fig 4.2 Connection Parts of the Product Utility



Description			
1	Gas Inlet : Gas Inlet	2	Gas Exhaust: Final Gas Exhaust
3	Cabinet Exhaust: Cabinet Temperature Increase Prevention	4	Drain Pipe: Waste Water Exhaust within the Product
5	Water Supply Pipe: Supply Water within the Product	6	N2 Supply Pipe: Supply N2 within the Product

Table 4.1 Product Connection Pipe Type

Gas exhaust pipe, Cabinet exhaust pipe connection

- Connect the exhaust pipe to the product.
- Connect using 50A, 75A size pipe.
- Connect using an appropriate gasket and clamp.

Air supply pipe, Water supply pipe, N2 supply pipe connection

- Connect the water supply pipe, water supply pipe, and N2 supply pipe to the product.
- Connect using 15A, 1/4" pipe respectively.

Drain pipe connection

- Connect the Drain pipe to the product.
- Connect using a 20A Size pipe.

Bypass pipe connection (when adding Bypass option)

- Connect the Bypass pipe to the product.
- Connect using a NW50 Size pipe.
- Connect using an appropriate Gasket and Clamp.

Gas inlet pipe connection

- Connect the bypass pipe to the product.
- Connect using a NW50 Size pipe.
- Connect using an appropriate gasket and clamp.



WARNING

When inappropriate Union, Gasket and Clamp are used, it may be the cause of gas and liquid leak. If leak occurs, it may cause fatal damages to the user's body.

5.3 Installation Inspection

Product Fixation Inspection

- Check the installation location and fixation of the product.
- Check whether the product shakes or not.
- Inspect whether there is problem opening the front, sides, and rear door of the product.

I-marking Inspection

- Check the union, bolt type I-marking of the connection part of the internal product pipe.
There may be connection parts without an I-marking.
[It may vary according to the role of the parts. ex.) parts with no connection direction]
- When it is hard to determine the I-marking, please contact the person in charge.

Utility Inspection



WARNING

When checking the utility, make sure to proceed according to the manual. Work after wearing appropriate protective equipment. There may be exposure of electric shock and harmful chemicals to the body.

Pipe Connection Inspection

Pipe Type	Size	Pressure	Flow Rate
Gas exhaust	50A	-100 ~ -50 mm H ₂ O	
Cabinet exhaust	75A	-30 ~ -10 mm H ₂ O	
Water (CW)	1/4 inch	3 ~ 5 kg ·f/cm ²	Max 18 LPM
N ₂	1/4 inch	4 ~ 7 kg ·f/cm ²	Max 200 SLM
Natural Drain	40A		
Power Drain	20A		
Gas Inlet	NW50		

Table 4.2 Inspection Items for the Product Connection Pipe

- Check the connection state of each pipe.
- Check the pressure and flow rate supplied to each pipe.
 - Pressure may vary according to the subject of supply (installation environment). Flow rate may be checked by adjusting the Flowmeter.

Power Line Inspection



WARNING

Be sure to work after turning OFF the main power. There may be risk of electric shock.

- The main power of this product is 200~240VAC, and it is based on three-phase, interrupting capacity of 20A.
- Make sure to use the power suitable to the specification.
- Connect the power line to the connection part so that it is not loose.
- Check whether the connection part of the grounding line is not loose. If it is loose, reconnect.
- Connect the grounding line to the O-type terminal at the Bus bar within the equipment.

6 Operation

6.1 Start



WARNING

Inappropriate system operation during normal operation may cause fatal damages not only to this product but also to other connected products. If it is not appropriate to normal operation, do not operate until it becomes an appropriate environment. Make sure to work after checking the manual when operating.

- Make sure to operate after being well acquainted with the operation method of the corresponding system.
- Check whether all the utilities are in normal operation before operating the product. (Refer to the installation)
- Press the power (start) button for more than 1 second.
- The initial screen is as follows.

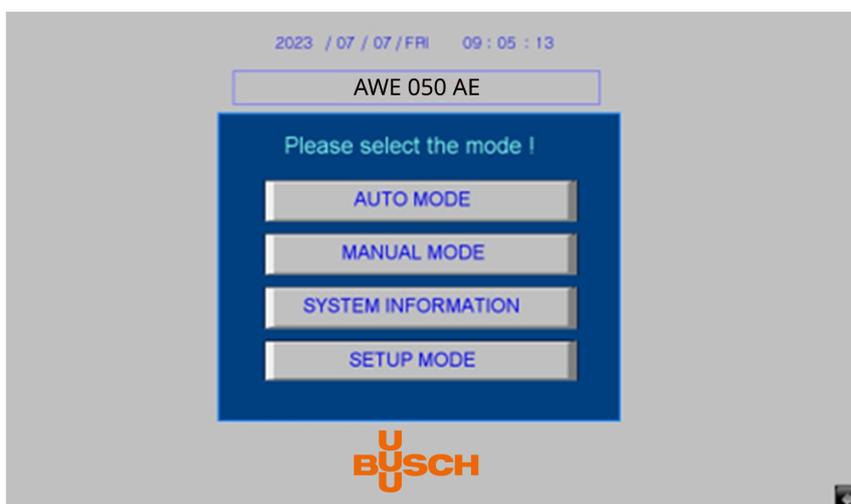


Fig 5.1 PLC Initial Screen

6.2 Set Up Mode

- After set up or when changing the setting during operation, you can change the set values related to the alarm or the boundary values of the warning, and other operation in the Set Up Mode.

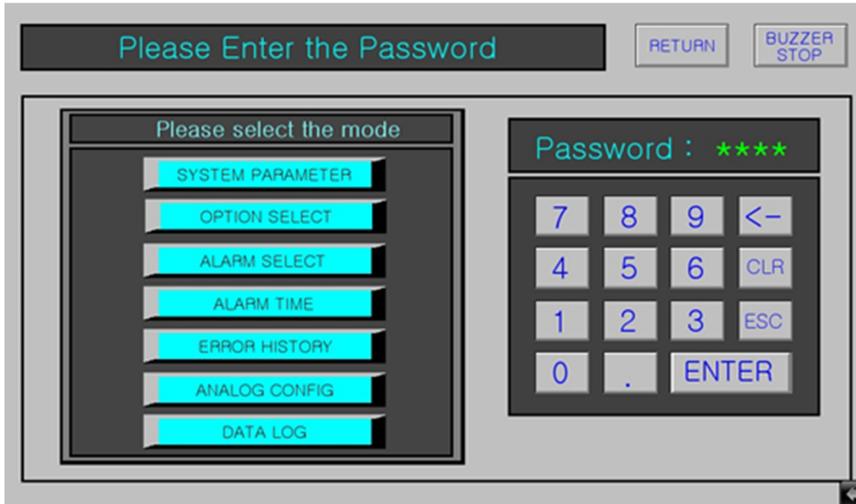


Fig 5.2 Set Up Mode Screen

ERROR HISTORY

- Errors that occurred during operation of this facility are saved on the touch screen. If you select "DATA LOG" on the menu, you can check the alarm history.
- If you select the Error History screen, you can check the type and time of the generated errors.



Fig 5.3 Error History Screen

6.3 Manual Mode

MANUAL MODE

- Select the MANUAL MODE at the menu of the main screen or if you select MODE CHANGE at AUTO MODE, Manual operation is possible.
- In Manual Mode, all devices and utilities can be selected and controlled independently on the Touch Screen.
- All devices and utilities activated in Manual Mode can be controlled through Icons and the level of the Wet Chamber can be confirmed from the schematic diagram on the Touch Screen.
- Even if the operation state is in Manual Mode, if the level of the Wet Chamber reaches High Level, the Drain Pump is automatically operated and after the water is drained down to the Middle Level, it stops again.
- At a natural discharge type without a Drain Pump, the device stops when the SUPPLY WATER Valve is locked, which means that there is a problem at the downstream.
- If the process Chamber is turned on, it is not recommended to operate in Manual Mode.

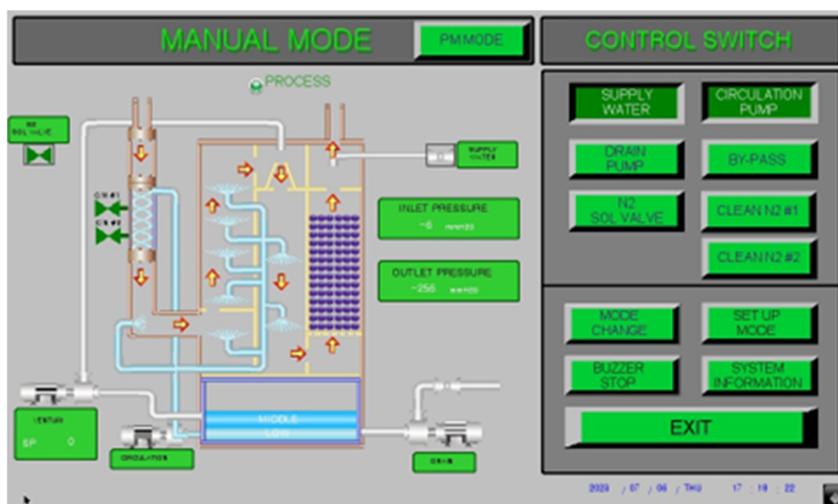


Fig 5.4 Manual Mode Screen

6.4 Auto Mode

AUTO MODE

- Automatic operation starts when AUTO MODE is selected from the menu on the main screen.
- If City Water is supplied and the water level condition is fulfilled, the circulation pump is operated and the water level retained between the Middle Level and High Level through operation and suspension of the drain pump.
- If 3-way valve option is installed, if you press the "P" button on the touch screen, all devices and utilities activated on the touch screen are indicated with new icons.
- If an alarm is generated, the corresponding alarm information is displayed on the touchscreen. At this time, the valves and the pumps are stopped according to the interlock and if 3-way valve is installed, the 3-way valve returns to the By-Pass location.

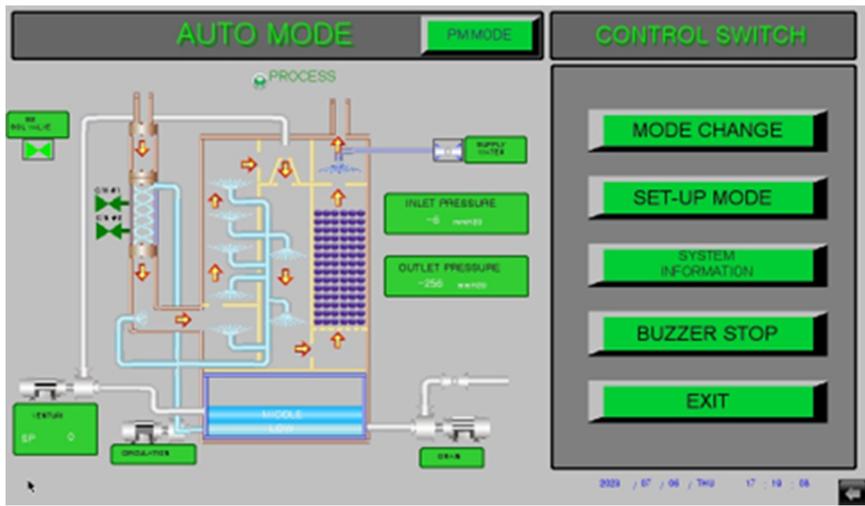


Fig 5.5 AUTO MODE Screen

6.5 Other Modes

POWER SAVING MODE

- If there is no touch entry for 10 minutes, the backlight power of the touchscreen is shut off.
- If the backlight power is shut off, the screen turns on if you touch the screen.

DATA LOG

- It collects and stores data displayed on the product.
- USB use is not possible for customer's security.

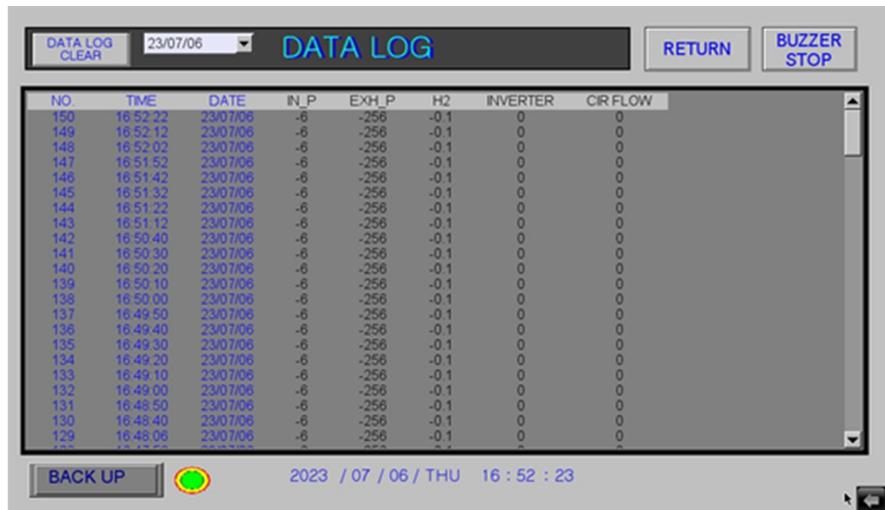


Fig 5.6 DATA LOG Screen

6.6 Setting mode (other than PLC)

Digital Pressure Gauge (PSQ)

- May be set according to the fluid pressure of Water and Air.

Alarm Value Setting

1. **PV Indicator (Green, Red, Orange Color):**
Operation Mode: PV (Current Value).
2. **SV Indicator (Green):**
Operation Mode: SV (Set Value), unit, etc. indication.
3. **[M] Key:**
Parameter group entry, item selection and operation automatic return.
4. **[▼], [▲] Key:**
Preset setting of output operation mode, mode execution and parameter change.

Fig 5.7 Pressure Controller



Description			
1	PV Indicator (Green, Red, Orange Color)	2	SV Indicator (Green)
3	[M] Key	4	[▼], [▲] Key
5	OUT1 or OUT2		

- If you press the [▲] button one time, "P-1" will be displayed on the SV indication part and the alarm setting screen will flicker.
- After entering the alarm value by pressing the [▲, ▼] button, if you press the [M] button for a long time, alarm values will be set.
- If an alarm occurs, words on the PV indication part will change to red color and "OUT1" will be indicated on the output lighting.

Zero Point Adjustment

- If you press the [▲, ▼] button simultaneously for more than 1 second, automatic zero point adjustment will be implemented.

7 Trouble Shooting

7.1 Tower Lamp

- It flashes in different colors so that it is easy for users to understand according to the operation state of the product.

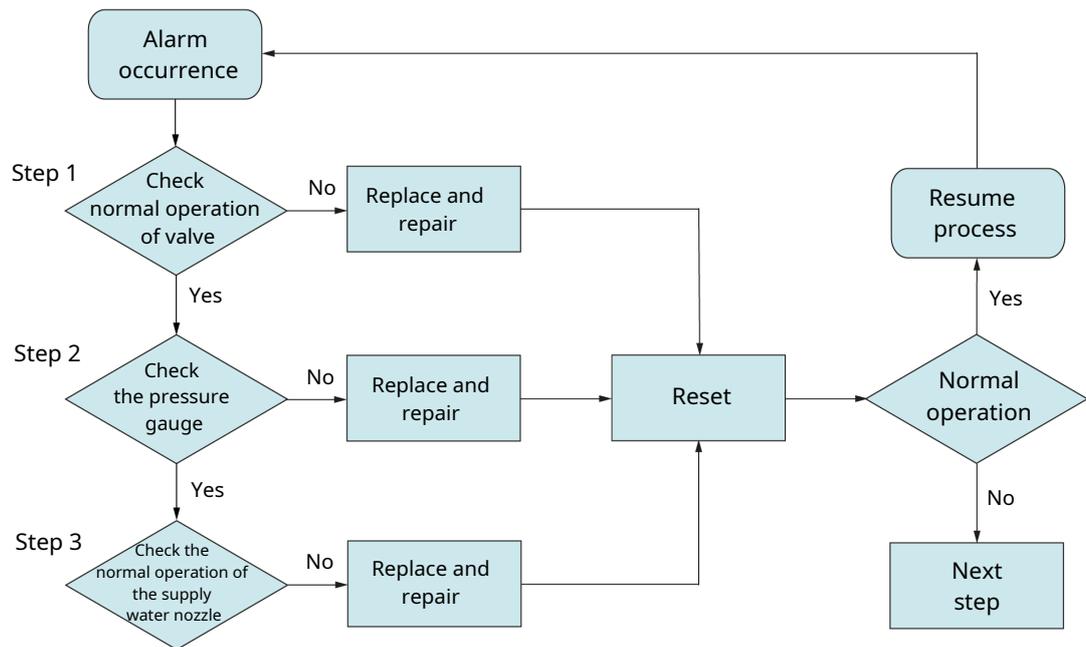
Lamp	System Condition
Green Steady 	When the system is normal in the automatic & manual mode.
Yellow Steady 	When the system is in the initial screen. When the system is in normal operation bypass state in automatic & manual mode state. When system is in Warning state.
Red Steady 	When an alarm occurs.

Table 6.1 Tower Lamp Flash State Items

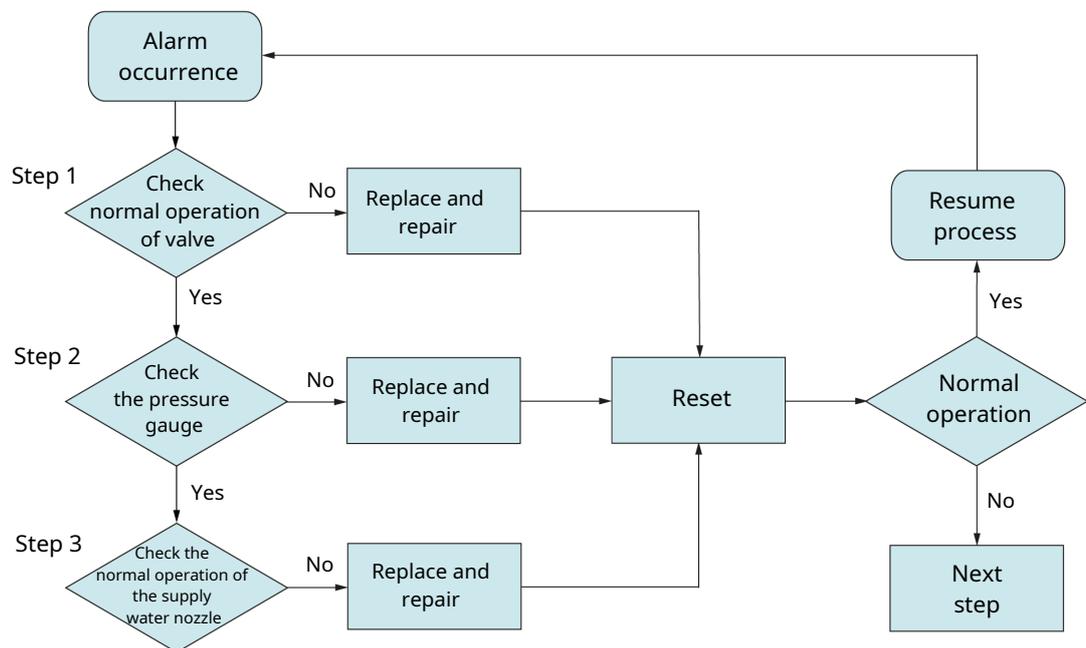
7.2 Trouble Solving Method

- If normal operation is not possible even after implementing all the steps presented in each problem-solving method, contact the manufacturer or the seller.
- Reset work is a work that presses the START button for more than 1 second.

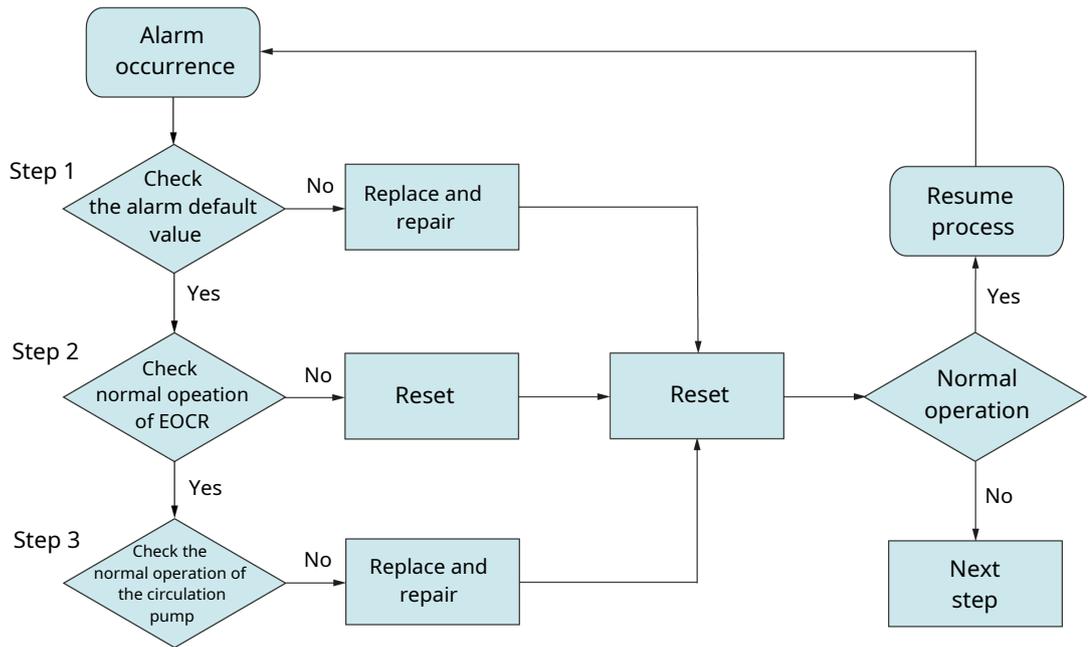
Supply Water Flow Error



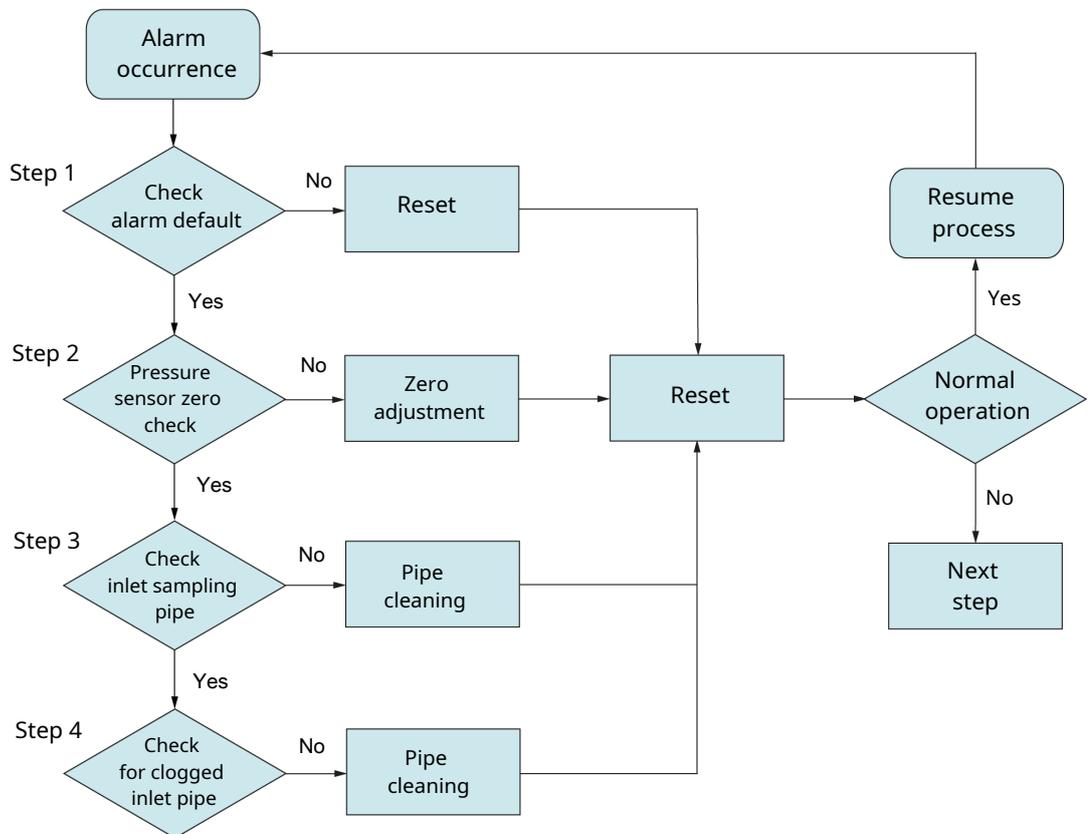
Circulation Flow Error (Low, High)



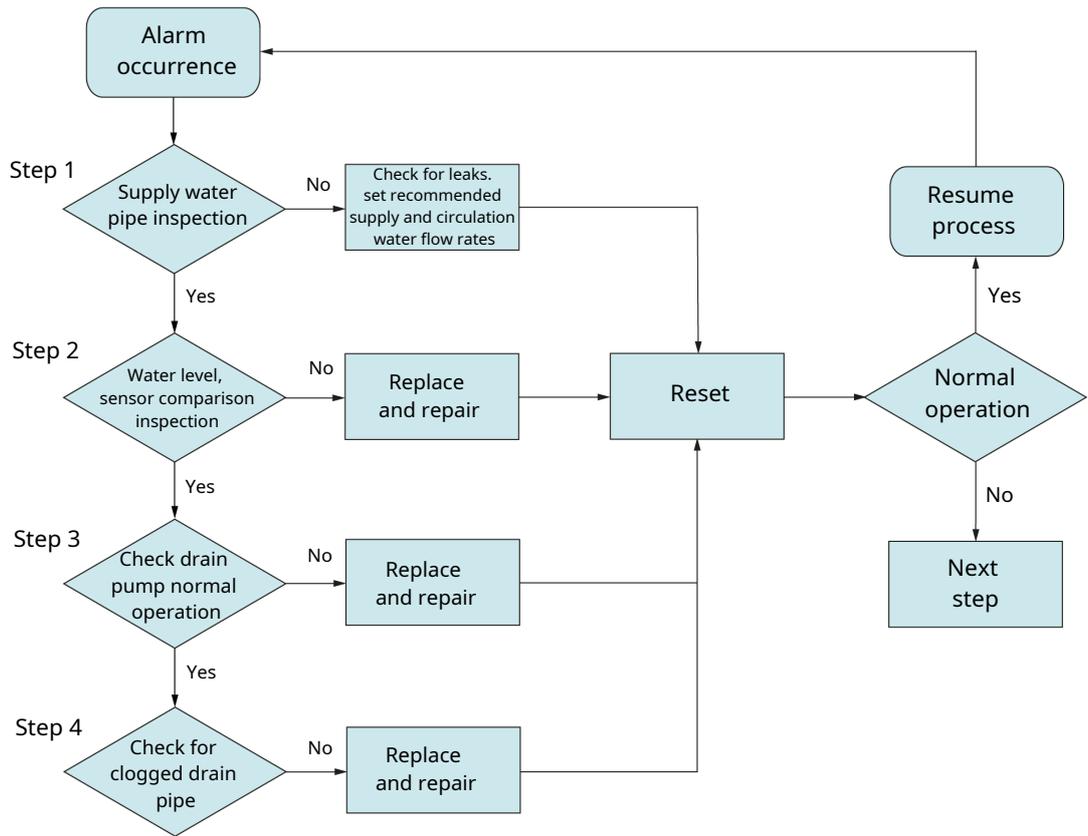
Circulation Pump Trip Error



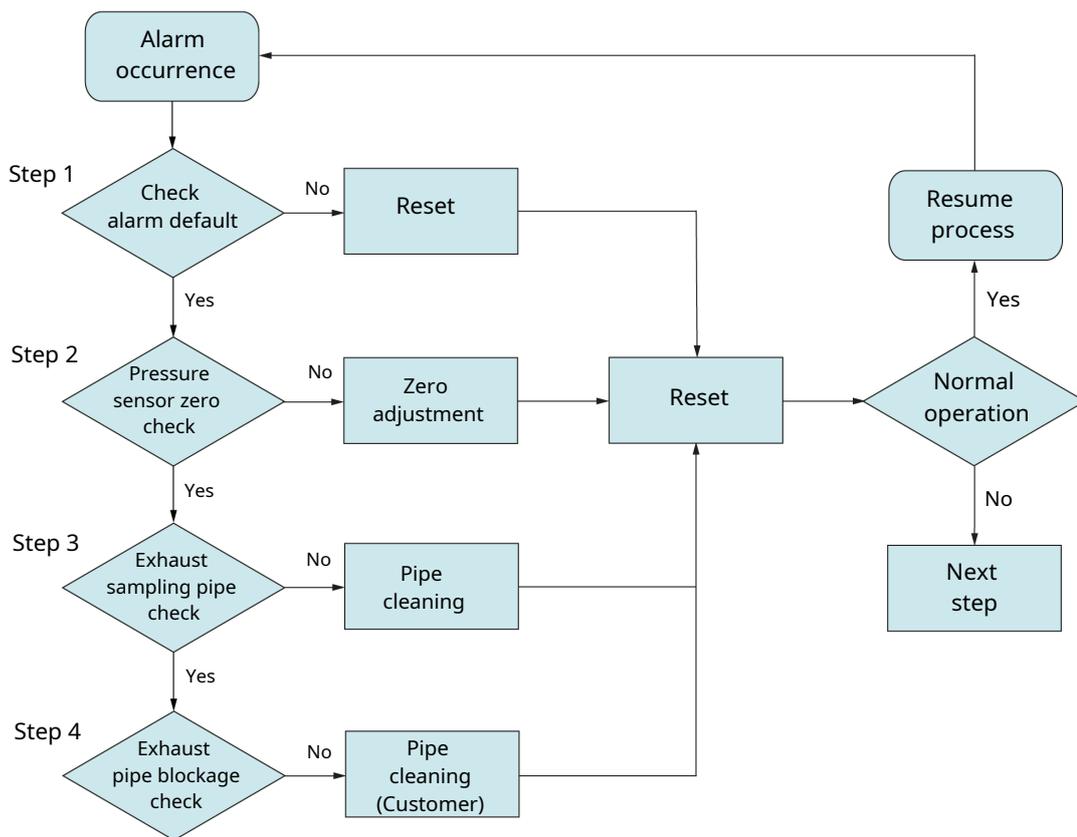
Inlet Pressure Error



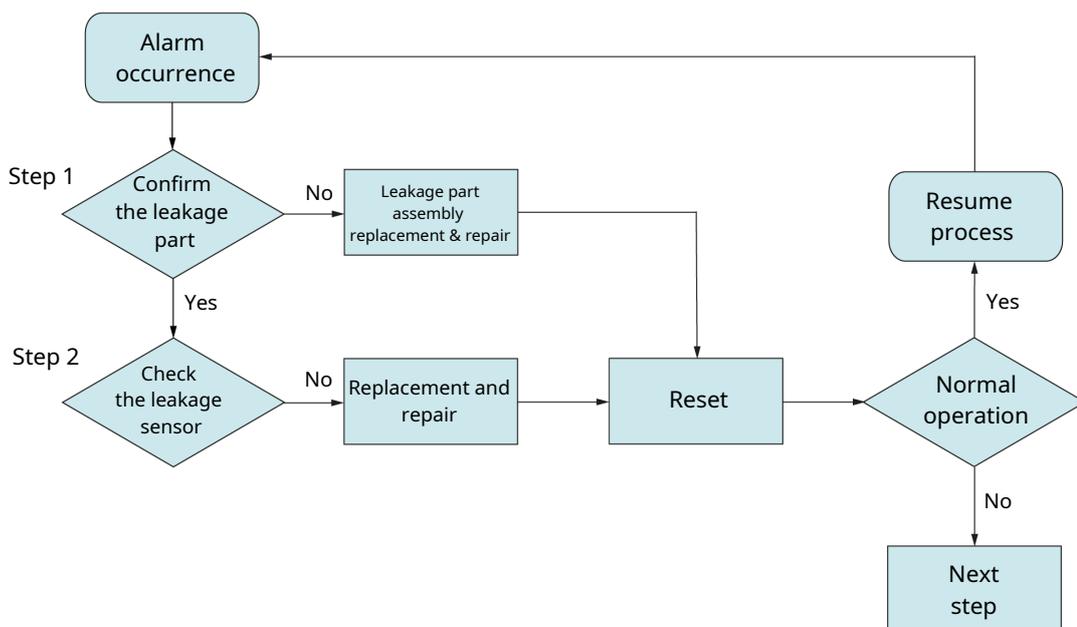
Main Tank Level Error (Low, High, H-High)



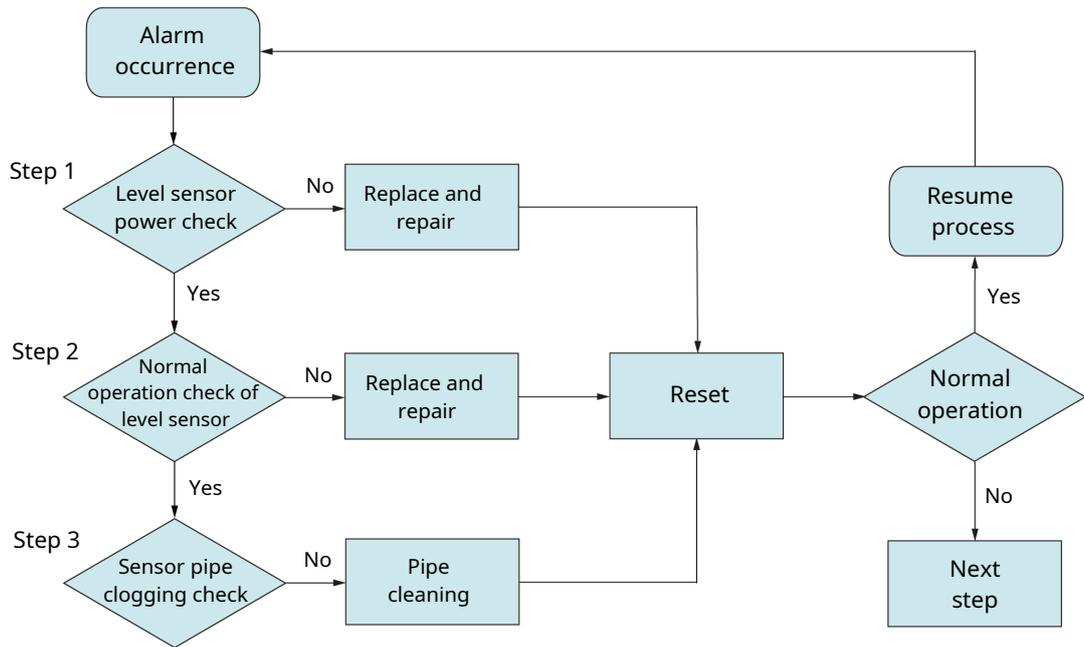
Exhaust Pressure Error



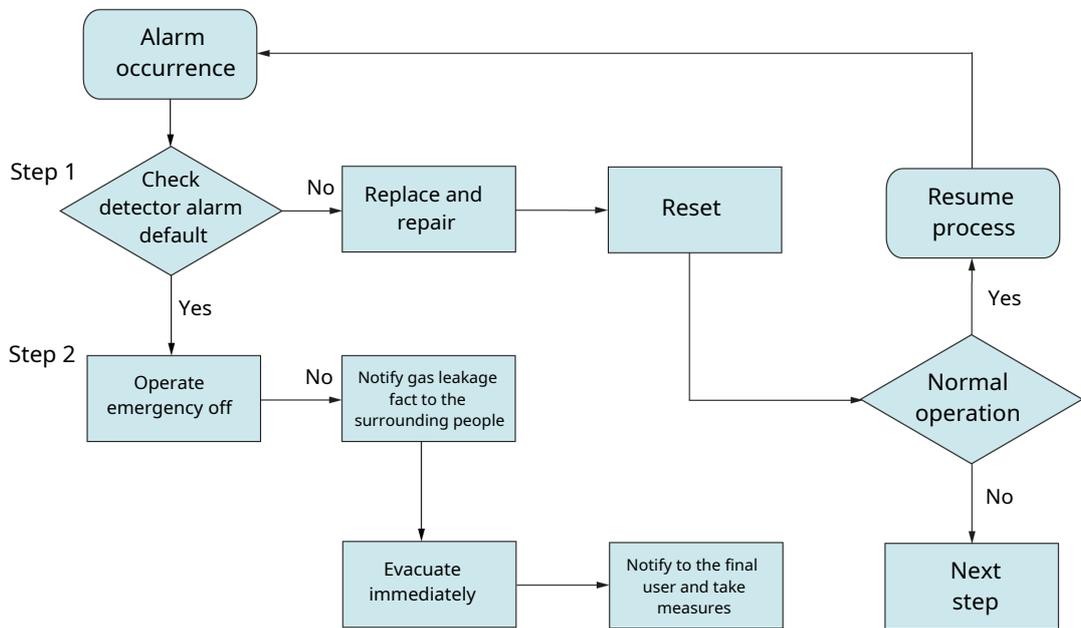
Water Leak Error



Level Sensor Error



H2 Detected Error



8 Maintenance

8.1 Preparation Materials

Protective Equipment

- Refer to Chapter 2.1 Protective Equipment

Working Tools

Name	Role
 <p>Spanner</p>	<ul style="list-style-type: none"> • Tighten and loosen bolt. • Required Size: 1/4", 3/8", 13 mm. • Required Quantity: each more than 1 for each.
 <p>Allen Wrench</p>	<ul style="list-style-type: none"> • Tighten and loosen bolt • Required size: 3mm, 4 mm, 5 mm, 6 mm • Required quantity: more than 1 for each.
 <p>Industrial Wiper</p>	<ul style="list-style-type: none"> • Remove contamination sources generated during work.
 <p>Wet Vacuum Cleaner</p>	<ul style="list-style-type: none"> • Remove contamination sources generated during work.
 <p>Plug</p>	<ul style="list-style-type: none"> • Block pipes and valves that are open during work. • Required Size: 1/4", 3/8", 10 mm, NW50, NW160. • Note: Certain size plugs are not ready-made goods.
 <p>Litmus Paper</p>	<ul style="list-style-type: none"> • For measuring acidity of wastewater generated during work.

Table 7.1 Working Tools

Replacement Parts

- Provided separately.

8.2 Equipement Stop



WARNING

Before stopping the equipment, shut off the flow of process gases. If not shutoff, process gases may be leaked and they may cause fatal injuries to the users.

- 5.5 Safely stop the equipment according to the method specified in the cooling methods.

8.3 Module Replacement

Inlet

- This product supports a service type in the form of module replacement to minimize the process stop time.
- To replace the module, prepare safety equipment specified in chapter 2.1 and wear appropriate protective equipment.
- Prepare the working tools specified in chapter 7.1.
- The inlet module replacement sequence is as follows.
- Check whether the supply of N₂, Water supplied to the inlet is blocked.
- Disconnect the Spin N₂, Curtain N₂, Spin water, Circulation water line connected to the inlet.
- Disconnect the Inlet pressure, Cleaning water line connected to the top part of the inlet.
- Disconnect the bracket fixing the inlet at the top part of the inlet, separate the frame and the Top cover, and after wearing safety gloves, disconnect the inlet.
- After transporting the inlet to a safe place, assemble the new inlet in the reverse order.

8.4 Module Cleaning

Inlet

- To clean the module, prepare safety equipment specified in chapter 2.1 and wear appropriate protective equipment.
- Prepare the working tools specified in chapter 7.1.
- The cleaning sequence of the inlet is as follows.
- Check whether the supply of N₂, Water supplied to the inlet is blocked.
- Disconnect the Spin N₂, Curtain N₂, Spin water, Circulation water line connected to the inlet.
- Disconnect the Inlet pressure, Cleaning water line connected to the top part of the inlet.
- Disconnect the bracket fixing the inlet at the top part of the inlet, separate the frame and the Top cover, and after wearing safety gloves, disconnect the inlet.
- Fill the cleaning device with water and after adding 10% of hydrogen fluoride, insert to the inlet and implement primary wash.
- If the inlet becomes clean, implement secondary cleaning with water.
- Dry the inlet using compressed air and store at a designated location.

Nozzle

- To clean the module, prepare safety equipment specified in chapter 2.1 and wear appropriate protective equipment.
- Prepare the working tools specified in chapter 7.1.
- The cleaning sequence of nozzles is as follows.
- Separate the view cover attached to the chamber.
- After separating the nozzle in counter-clockwise direction, remove foreign substances and clean with water.
- Reassemble in the reverse order of disassembly.

8.5 Preventive Maintenance

- For the safety and maintenance of this product, periodic item inspection is required.

Inspection Items	Cycle	Inspection Method
Check the gas inlet/outlet pressure	Daily	Visual check.
Check the use amount of the utility	Daily	Visual check whether appropriate range of flow is retained.
Check water leak	Daily	Visual check inside and outside of the equipment.
Check water line pressure	Daily	Visual check whether appropriate range of pressure is retained.
Organize equipment	Weekly	Work manual.
Inspect and replace electric parts	At the time of PM	Work manual.
Check the connection parts and implement leak test	At the time of PM	Visual check.
Pressure gauge calibration	At the time of AM	Work manual.

Table 7.2 Preventive Maintenance

9 EU Declaration of Conformity

This Declaration of Conformity and the CE-markings affixed to the nameplate are valid for the machine within the Busch scope of delivery. This Declaration of Conformity is issued under the sole responsibility of the manufacturer.

When this machine is integrated into a superordinate machinery the manufacturer of the superordinate machinery (this can be the operating company, too) must conduct the conformity assessment process for the superordinate machine or plant, issue the Declaration of Conformity for it and affix the CE-marking.

The manufacturer

MAT PLUS Co., Ltd.
31-22 Mansudong-Gil, Gongdo-Eup,
Ansung-Si, Gyeonggi-Do, 456-823
Republic of Korea

declares that the machine: GAS ABATEMENT SYSTEM, Type designation(s): MAT505W

fulfill(s) all the relevant provisions from EU directives:

- 'Machinery' 2006/42/EC
- 'Electromagnetic Compatibility' (EMC) 2014/30/EU
- 'RoHS' 2011/65/EU Restriction of the use of certain hazardous substances in electrical and electronic equipment (incl. all related applicable amendments)

and comply(-ies) with the following harmonized standards that have been used to fulfill those provisions:

Standard	Title of the Standard
EN ISO 12100 : 2010	Safety of machinery - Basic concepts, general principles of design
EN 60204-1 : 2018	Safety of machinery - Electrical equipment of machines - Part 1: General requirements
EN ISO 4414 : 2010	Pneumatic fluid power – General rules and safety requirements for systems and their components.
EN IEC 61000-6-2 : 2005	Electromagnetic compatibility (EMC) Part 6-2 : Generic standards. Immunity for industrial environments
EN IEC 61000-6-4 : 2007 / A1 : 2011	Electromagnetic compatibility (EMC) Part 6-4 : Generic standards. Immunity for industrial environments + A1 : 2011

Legal person authorized to compile the technical file and authorized representative in the EU (if the manufacturer is not located in the EU):

Busch Dienste GmbH
Schauinslandstr. 1
DE-79689 Maulburg

Notified Body: **SZU KOREA**

Manufacturer:



CH Kim / VP

Gyeonggi-Do, Korea / 07.2023

Notes

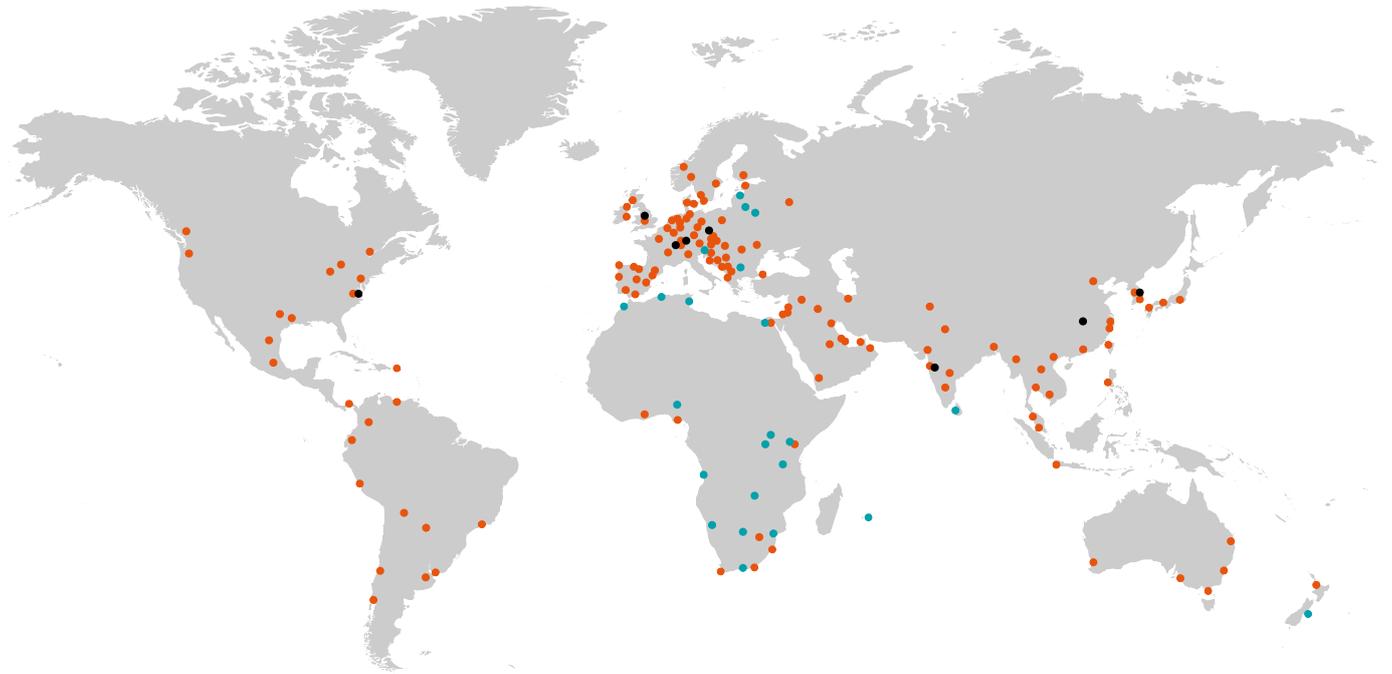
A large grid of small dots, arranged in approximately 30 rows and 60 columns, covering the majority of the page. This grid is intended for users to write their notes on.

A large grid of small dots for taking notes, consisting of approximately 30 columns and 40 rows of dots.

Busch

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