Hazardous Gas Filtration System

Product User Manual

V19.01

Thanks for buying the Justrite® hazarous gas filtration system.

This manual must be carefully read by all individuals who have the resposibility of installing or using this product.

Please save this manual for future reference.

Contents Page

General Information

Warranty
Thank you for purchasing Justrite hazardous gas filtration system. This manual contains important information for installation, usage and maintenance of the product. To make sure that you know how to use this machine properly and keep it running optimally, read this manual first. This product comes with a one-year warranty. For any warranty issues, please reach out to your local dealer.

Application
The purpose of this appliance is intended to ventilate air from areas where there might be a low risk of explosive gases (ex-zone 2) or from safety areas (non-zone).

The entire hazardous gas filtration system must be installed in a non-hazardous (safe) area. The control box and filtration box are a single, integrated unit and should NOT be separated.

Disclaimer
In addition to the instructions provided in this manual, all applicable local safety and accident preventation regulations - as well as relevant laws and guidelines for storing and handling hazardous maerials - must be followed.

Justrite is not responsible for any personal injury or product damage resulting from failure to follow the instructions in this manual. Please keep all documentation safe. If you have any questions, contact our customer service center or your local dealer.

Product Specifications and Structure

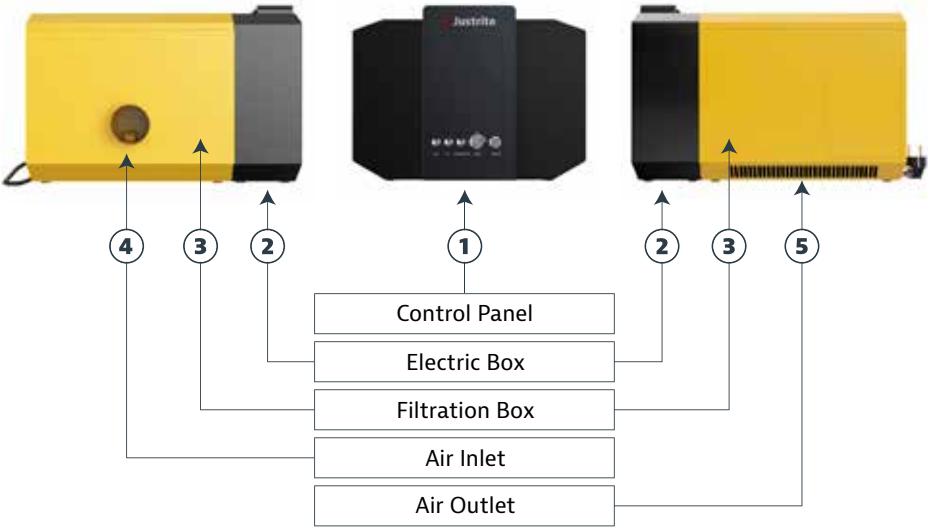
Product Specification

Model	Gxxxxx1 or Gxxxxx1-xx*
External dimensions H x W x D	420×410×280mm
Weight	15kg
Input voltage	100-240V 50/60Hz
Power consumption	≤12W
Flow rate	40m³/h High; 25m³/h Moderate; 10m³/h Low
Sound level	≤40dBA
Indoor or outdoor use	Indoor use
Altitude	Below 1000 m
Relative humidity	40%~70%
Wet location	Not applicable
Pollution degree of intended environment	Pollution degree 2
Ambient temperature	-15°C ~+40°C

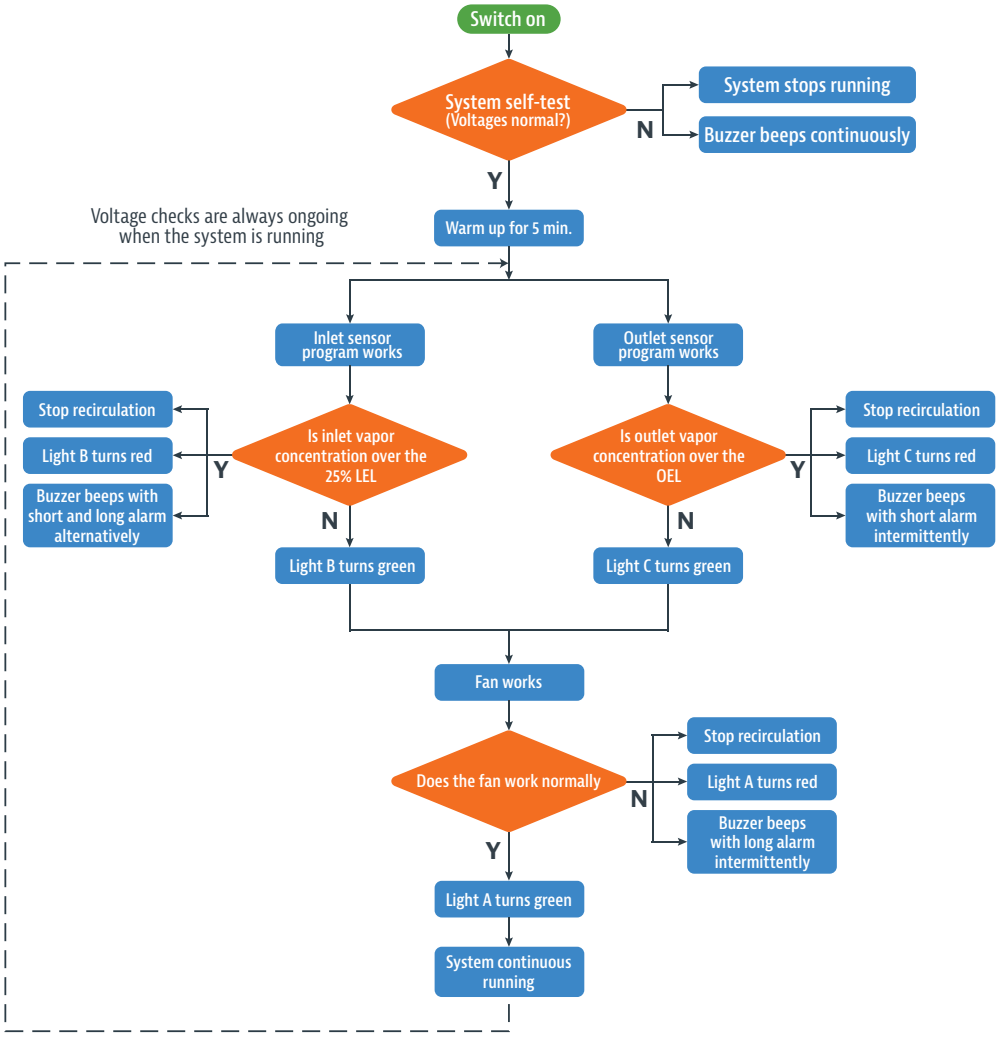
* nomenclature

Serial	Volatile Type	Flow		Paint Colour	Control Pannel	Installed Integrally		Customization	
G	X	X	X	X	X	1	-	X	X

Product structure



System Work Flow Chart



*LEL: Lowest Explosive Limit)

*OEL: Occupational Exposure Limits)

Product Specifications and Structure

Control Panel Introduction

Fan fault indicator
Green for normal, and red for fault.

Air intake indicator
Green for normal, and red for flammable risk in air intake.

Filter saturation
Green for normal, and red for filter saturation.

Flow adjustment knob
L for low flow, M for moderate, and H for high.

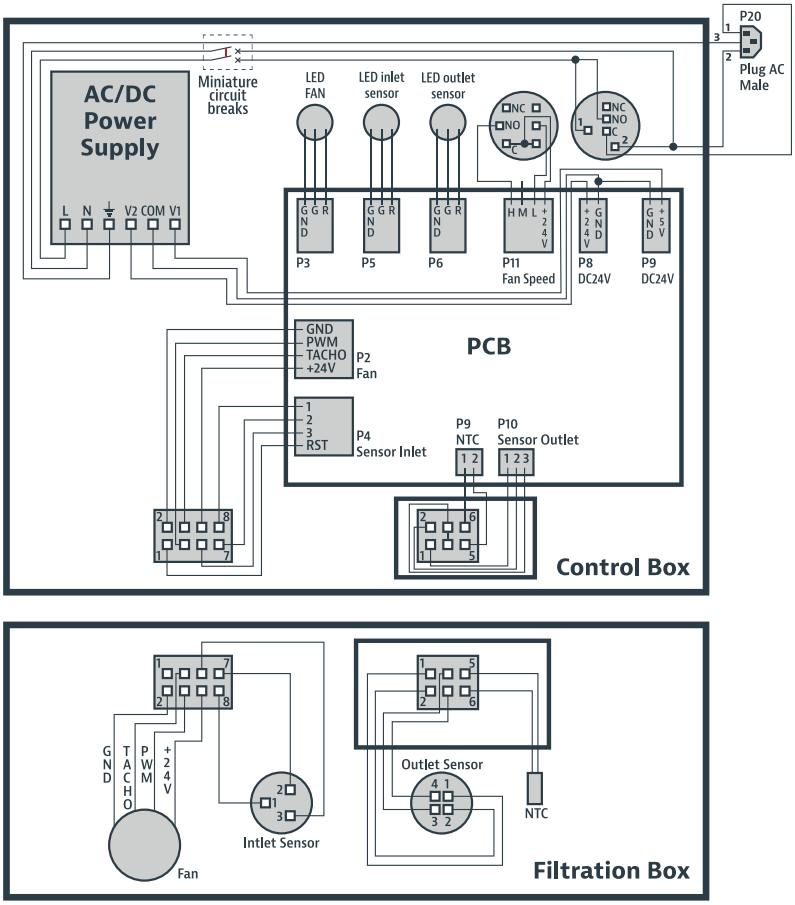
Power switch
On/Off

ATEX Certificate

ATEX approval: TUV 17 ATEX 8056 X Ex Marking: Ex II 3/- G Ex db ic nA IIB T4 Gc

Safety Information for Equipment Used in Hazardous Areas

1. The entire hazardous gas filtration system must be installed in a non-hazardous (safe) area. The control box and filtration box are a single, integrated unit and should NOT be separated.
2. The selected activated carbon filter must be compatible with the substance being filtered (see appendix for details). Regular checks of the activated carbon filters should be carried out by the user, monitored through the input log and time-tracking functions. A performance test report and a certificate of activated carbon efficiency must be provided to the end user along with this manual.
3. End users are not allowed to touch any connections related to instrinsically safe parts. (Wires and connectors for these parts are shown in the diagram below.)
4. The intrinsically safe circuit is used only for the outlet sensor. The equipment related to the outlet sensor is located inside the control box. The control box's main board supplies reliable intrinscially safe (I.S.) power to the outlet sensors, which are installed in the filtration box within the hazardous area.



ATEX Certificate

Energy Output to Simple Apparatus Outlet Sensors:

I.S. Parameters	Outlet Sensor (Semiconductor Sensor TGS2620+NTC)	Outlet Sensor (Semiconductor Sensor TGS2444+NTC)	Outlet Sensor (Electrochemical Sensor HCL-B1+NTC)
Um	27.6V	27.6V	27.6V
Uo	5.2V	5.2V	5.2V
Io	170mA	170mA	170mA
Co	1000μF	1000μF	980μF
Lo	80μH	80μH	80μH

Input Energy of Simple Apparatus Outlet Sensors:

I.S. Parameters	Outlet Sensor (Semiconductor Sensor TGS2620+NTC)	Outlet Sensor (Semiconductor Sensor TGS2444+NTC)	Outlet Sensor (Electrochemical Sensor HCL-B1+NTC)
Ui	5.2V	5.2V	5.2V
Ii	170mA	170mA	170mA
Ci	0	0	0
Li	0	0	0
Lc	67μH (max.Length=30m)	67μH (max.Length=30m)	67μH (max.Length=30m)
Cc	0.24μF (max.Length=30m)	0.24μF (max.Length=30m)	0.24μF (max.Length=30m)

Special Conditions for Safe Use

1. The control box must be used **only in a safe area**. Additionally, to maintain the ATEX protection concept of the built-in fan and intrinsically safe outlet sensor, this control box must be used together with the certified filtration box.
2. Ensure the device is **properly grounded**.
3. The semiconductor sensors (FIGARO types TGS2620 and TGS2444), electrochemical sensor (Alphasense type HCL-B1), and NTC model MF52 have been assessed and tested according to EN 60079-0 and EN 60079-11. End users are **not allowed** to connect or disconnect these intrinsically safe (I.S.) connections at any time. Only gases from Zone 2 or less hazardous areas may be drawn into the filtration box from the safety cabinet. The Zone 2 or less hazardous areas in the safety cabinet are defined in accordance with EN 14470-1 and EN 14175-2/-3. Gas concentrations at the inlet and outlet of the filtration box are monitored by different sensors (see system workflow chart in this manual). The power supply will automatically shut down if the LED indicators turn red. It is the end user's responsibility to ensure that no hazardous gas zones surround the filtration system.
4. The type db inlet sensor is **not a standalone device**. It is the responsibility of the equipment manufacturer or designer to ensure that the sensor is connected to ground with a maximum impedance of 10^9 Ω.
5. The ventilator (built-in fan model RG140-22/14N) has been assessed and tested by ExNB IBExU as Category 3 equipment for gas group IIB and is suitable for use in Zone 2. This ventilator should also be designed and constructed in accordance with EN14986.

Applied Standards

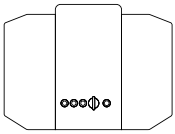
EN 60079-0:2012/A11:2013	EN 60079-15:2010
EN 60079-1:2014	EN 14470-1
EN 60079-11:2012	EN 14175-2/-3

Installation

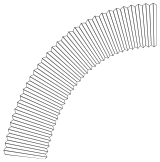
Packing List

When you open the packaging of the system, please make sure all of the following accessories are included.

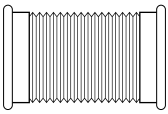
Filtration system (1)



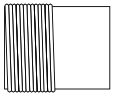
Tubing long (1)



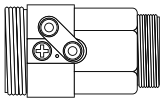
Tubing short (1)



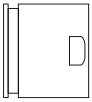
Adapter (1)



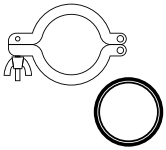
Damper System (2)



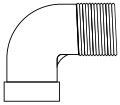
Female adapter (1)



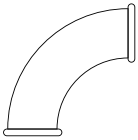
Clamp and fluorine rubber ring (4)



Threaded Elbow (2)



Elbow (1)



Installation Location

The filtration system should be installed on top of the cabinet or in other areas that require ventilation. The installation location must be a non-hazardous (non-zone) area outside the cabinet or ventilated space. Although the system can ventilate air from non-zone or Zone 2 areas, the system itself must only be installed in a non-zone (safe) area.

Non-Zone Area

Installation and Operation

Energy Output to Simple Apparatus Outlet Sensors:
Connect the air intake port of the filter box to the cabinet's vent as shown in the image below. Typically, this connection is made to the cabinet's lower vent.
Secure the connection firmly using a clamp.

Fig. 1

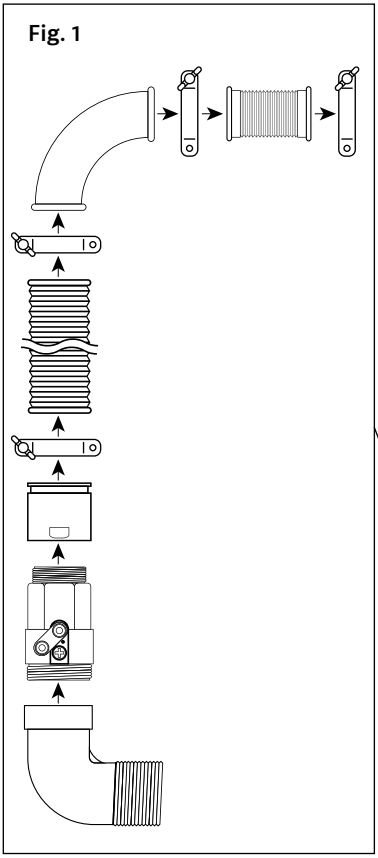
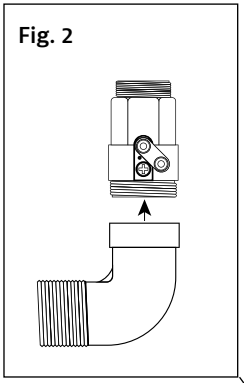


Fig. 2



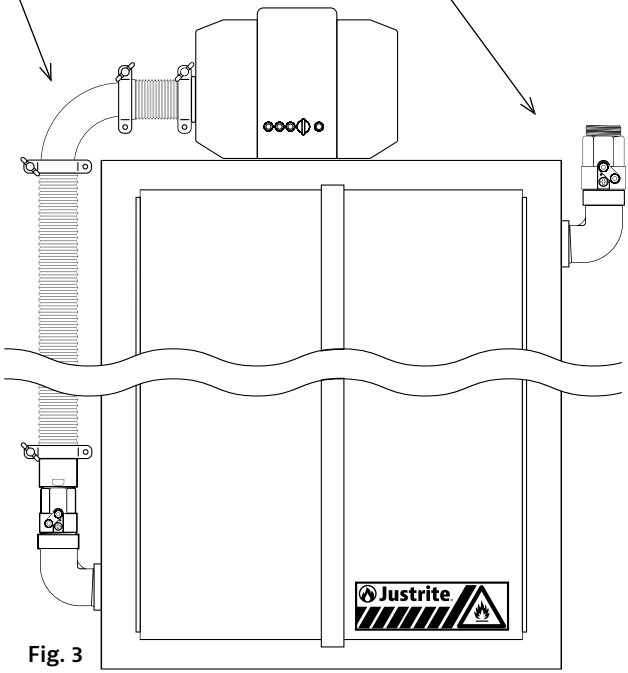


Fig. 3

Electrical Connection

Connect the power plug to the power supply.

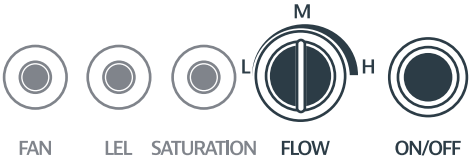
Attention:

- ⚠ **Make sure that the power supply voltage is consistent with the voltage shown on the filtering device's name plate.**
- ⚠ **Use a power supply socket with correct installation and reliable grounding. (The grounding of the socket should be connected to the main grounding of the building with a grounding wire no less than 4 mm².)**

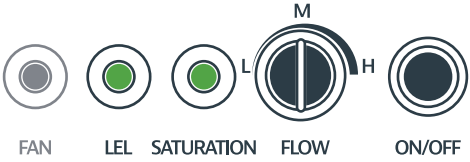
Turn On and Operation:

1. Adjust the air volume with the control box panel knob to the appropriate position according to the air filtering requirement.
   - Below 115 liters use L
   - 170 to 225 liters use M
   - 340 liters use H

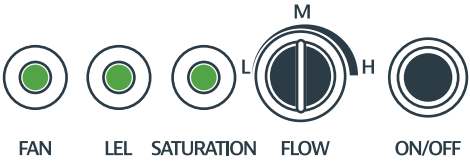
   Press the power switch button, system starts to preheat and self test.



2. After 5 minutes, the system is warmed up and self-checking is complete. If the device is normal, the air inlet concentration alarm and filter saturation alarm indicator light shows green, the fan will begin to run.



3. After the fan is running stably (about 15s), if it is normal, the indicator light of the fan shows green.



4. The device operates normally.

Faults and Alarms

Faults and Alarms

⚠ If any of the circumstances below occur, you must disconnect the power supply immediately, and contact the dealer or manufacturer to investigate and repair if needed.

1. The buzzer beeps continuously:
   - System operating voltage is not normal or there is a circuit failure.

2. Fan indicator light shows red and the buzzer beeps intermittently with long beeps:
   - Fan failure

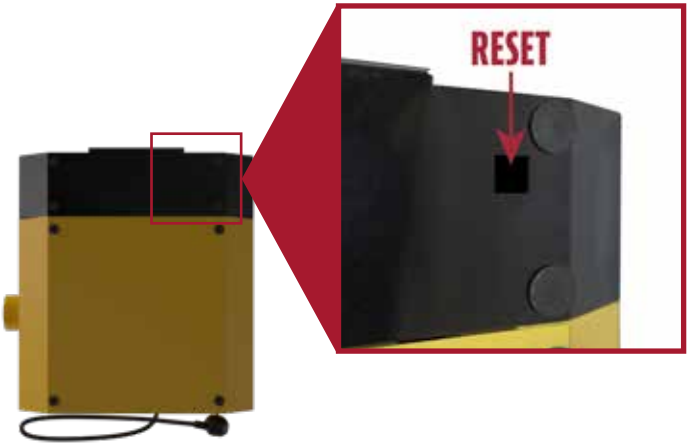
3. Inlet air indicator light shows red and buzzer beeps with alternating long and short beeps:
   - The concentration of flammable volatile gas in the air inlet is too high, safety risk.

4. Outlet air indicator light show red and the buzzer beeps intermittently with short beeps:
   - Filter is close to saturation, the filter should be replaced immediately.

⚠ When circumstance 3 occurs at beginning or during the operation, and the indicator for flammable shows red, turn of the power supply immediately and have an expert check the conditions inside the cabinet.

1. If leakage happens in the cabinet, please deal with the leakage according to the appropriate emergency plan for the chemicals stored.

2. If there has been confirmation that no leakage has occurred, press the button as shown in the image below and hold it for 5 seconds to reset the system.



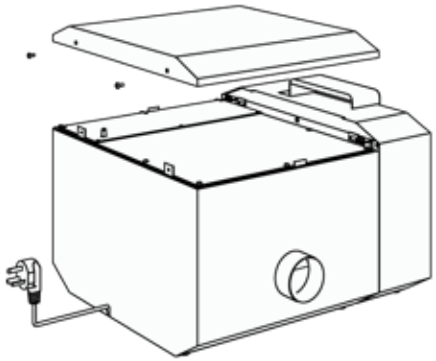
Air Inlet Sensor Maintenance
As the models for VOCs have a combustible gas sensor at the air inlet, it is recommended to replace the sensor every three years. You can contact the dealer or manufacturer to replace it.

Filter Maintenance
Filter Selection

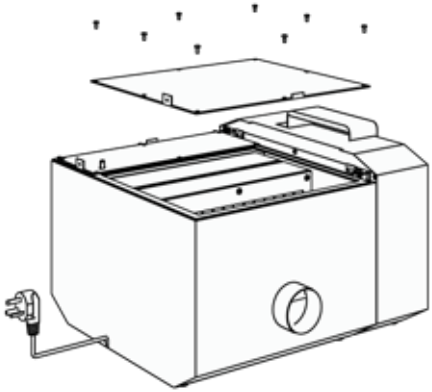
Model	Application Conditions
JCBAP29701	VOCs
JCBAP29702	Volatile acids
JCBAP29703	Alkaline fumes (Ammonia or Amines)

Filter Replacement
Depending on the types of chemicals being stored, the filter replacement cycle will differ. Generally speaking, it is recommended that the filter replacement cycle is no more than one year.

Open the cover of the filter box by unscrewing the six screws on the filter box with a 2.5mm internal hexagonal wrench (allen key).

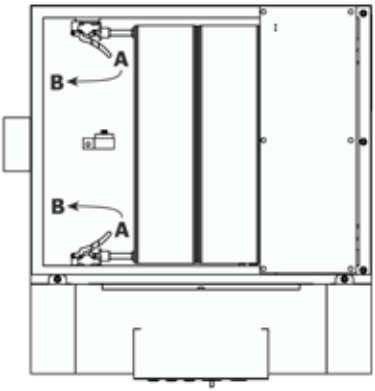


Open the plate at the inlet end with a 2.5mm internal hexagonal wrench (allen key).

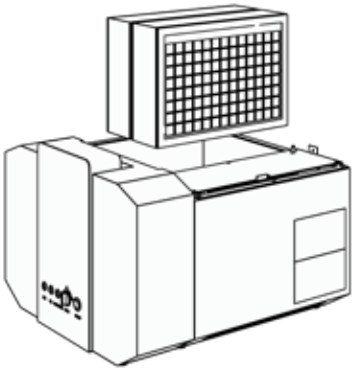


Maintenance and Servicing

Move the handle of the Toggle clamp from position **A** to **B** shown here on the right.



Remove the two old filters vertically.



Install the new filters according to the processes above inversely.

Attention:
The installation direction and sequence of the new filter element should be consistent with the old filter element.

Appendix

Approved Absorbents List

Classify	Chemical Name	LFL (%)	OEL
Solvent of Volatile Substances	nonane		200ppm
	octane	1	300ppm
	pentane	1.5	600ppm
	benzene	1.2	0.5ppm
	methylbenzene	1.2	50ppm
	xylene	0.9	100ppm
	turpentine		100ppm
	dipentene		*
	pine oil		*
	methyl alcohol	6	200ppm
	ethyl alcohol	3.3	1000ppm
	isopropanol	2	400ppm
	butanol	1	*
	glycol	3	*
	diethyl ether	1.9	400ppm
	petroleum ether		*
	acetone	2.6	500ppm
	butanone		*
	cyclohexanone	1	25ppm
	methyl ethyl ketone	1.8	*
	methylisobutylketone		*
	ethyl acetate	2	400ppm
	butyl acetate		*
	dichloromethane	16	50ppm
	trichloromethane		10ppm
	nitromethane	7.3	20ppm
	nitropropane		25ppm
Acids	muriatic acid		5ppm
	vitriol		1mg/m3
	acetic acid		1ppm
Alkaline	ammonium hydroxide		25ppm
	aniline		2ppm
	amine		*

LFL - Low Flammable Limit
OEL - Occupational Exposure Limit; according to GBZ 2-2002 and ACGIH 2002 TLVs.
OLE values of the chemicals marked with * are not found in relative standards, 1000 ppm is used as the control point for these chemicals.

Important: Please consult our technical staff before using the filtration system, in particular, when your target chemicals are not in the list above.

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