Use and Maintenance Manual

Filtering unit SMOG Filter-800

Contents:

1. Introductory Remarks

The purpose of the present User's Manual is to supply User with directions within the range of application, installation, start-up and the operational use of the **SMOG Filter-800 filtering unit**.

Installing, start up and operational use are exclusively admissible after getting acquainted with the contents of the Use and Maintenance Manual.
With regard to continuity of work carried on improvement of our products, we reserve for ourselves the revision possibility of the draft and technological changes improving their functional features and safety.

The construction of the **SMOG Filter-800 filtering unit** meets the requirements of the current state of technology as well as the safety and health assurances included in:

– **2006/42/EC Machinery Directive** of the European Parliament and of the Council of 17 May, 2006 on machinery – amending the 95/16/EC (recast) /*Journal of Laws EC L157 of 09.06.2006, page 24*/

– **2014/35/EC Directive** of the European Parliament and of the Council of 26 February, 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits.
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The appliance meets the requirements included in:

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– **327/2011** (**EU**) **Commission Regulation** of March 30th, 2011 on implementing the **2009/125 /EC Directive** of the European Parliament and of the Council with regard to ecodesign requirements for fans driven by motors with an electric input power between 125W and 500 kW /*Journal of Laws L90 of 06.04.2011*/

The device has been constructed and produced on the basis of following harmonized standards:

• **EN ISO-12100:2012**	– "Safety of machinery – Basic concepts, general principles for design. Risk assessment and risk reduction".
• **EN 60204-1:2010**	– "Safety of machinery – Electrical equipment of machines. Part 1: General requirements".
• **EN ISO 13857:2010**	– "Safety of machinery – Safe distances to prevent hazard zones being reached by upper and lower limbs".
• **EN 60529:2003/A2:2014-07**	– "Degrees of protection provided by enclosures (IP Code)"
• **EN 61439:2011**	– "Low-voltage switchgear and controlgear assemblies – Part 1: General resolutions".

2. Application

In general, SMOG Filter-800 filtering unit is a solution for cleaning the air from vapours, gases and dust particles, in chemical laboratories, biological- and analytic labs, as well as during the grinding or laser cutting of rubber, plywood, acryl, plexiglas and other plastics.
The device is especially useful in application for processes, accompanied by unpleasant smells, e.g. during gluing or using various types of aerosols.
SMOG Filter-800 absorbers capture with efficiency both, tobacco smoke and contaminants contained in smog, which infiltrated from outdoors into the room.
The device cannot be applied in rooms of explosion hazard, where an explosive atmosphere is likely to occur.

3. Reservations of Producer

1. Manufacturer accepts no liability for any consequences following from the operational use that is in contradiction to the purpose of application.
2. Installing of any additional elements not belonging to the normal device structure (or accessory set) is not acceptable.
3. Any structural changes or modification of the filtering unit, carried out by User on one's own are not permitted.
4. Protect the housing and the flexible suction ducting elements from mechanical damage.
5. Maintenance and any repair activities can exclusively be carried out by an authorized person.
6. Do not use the appliance for conveying the air containing aggressive impurities that would damage the filters, as well as for dusts creating explosion hazard.
7. **In the course of operational use, pay attention that any ignition sources, i.e. glowing cigarette butts must not get into the filtering chamber.**

4. Technical Data

Table No.1

Type	Maximum volume flow [m³/h]	Maximum vacuum [Pa]	Motor rate [kW]	Supply voltage [V/Hz]	Acoustic pressure level [dB(A)]*	Weight [kg]
SMOG Filter-800	800	940	0,25	230/50	57	182

***** Acoustic pressure level has been measured from distance of 1m from the device.

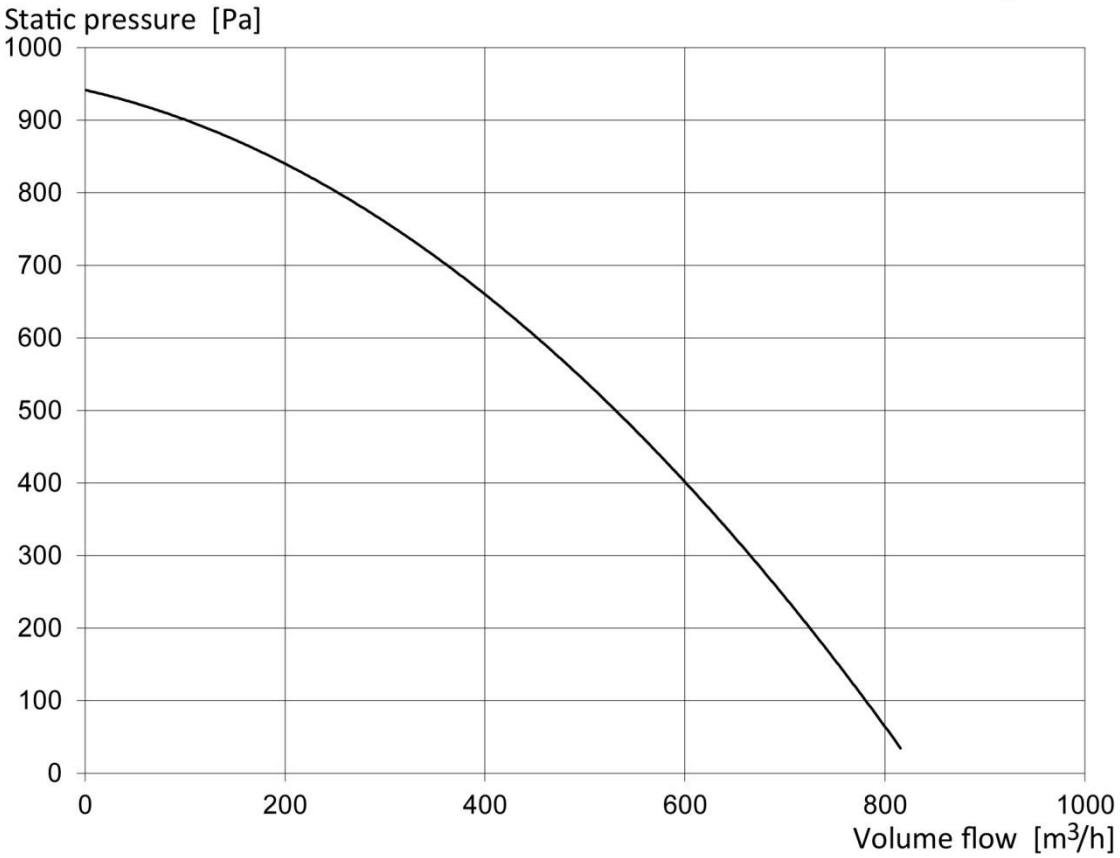


Fig. No. 1 – Flow chart SMOG Filter-800

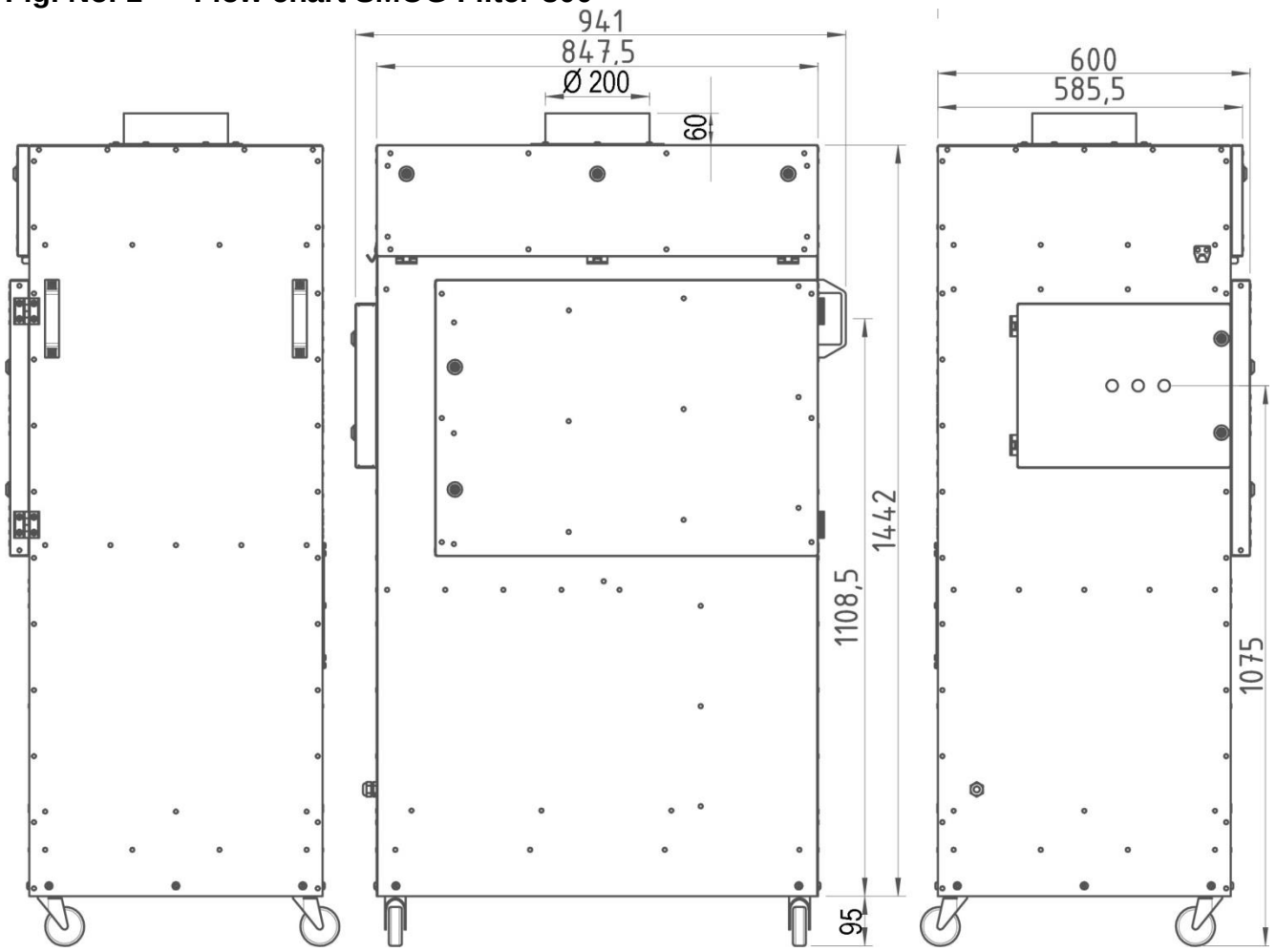


Fig. No. 2 – Dimensions of the absorber type SMOG Filter-800

5. Structure and Function

SMOG Filter-800 absorber consists of following elements:

- steel sheet housing,
- fan – located in the bottom part of the device, at the side of clean air,
- PAINT STOP filter,
- high-efficiency HEPA filter – class H13,
- cassettes with granulated activated carbon,
- differential pressure control (pressostat) – to signalise the excessive flow resistance of the HEPA filter,
- control unit,
- suction head (on demand).

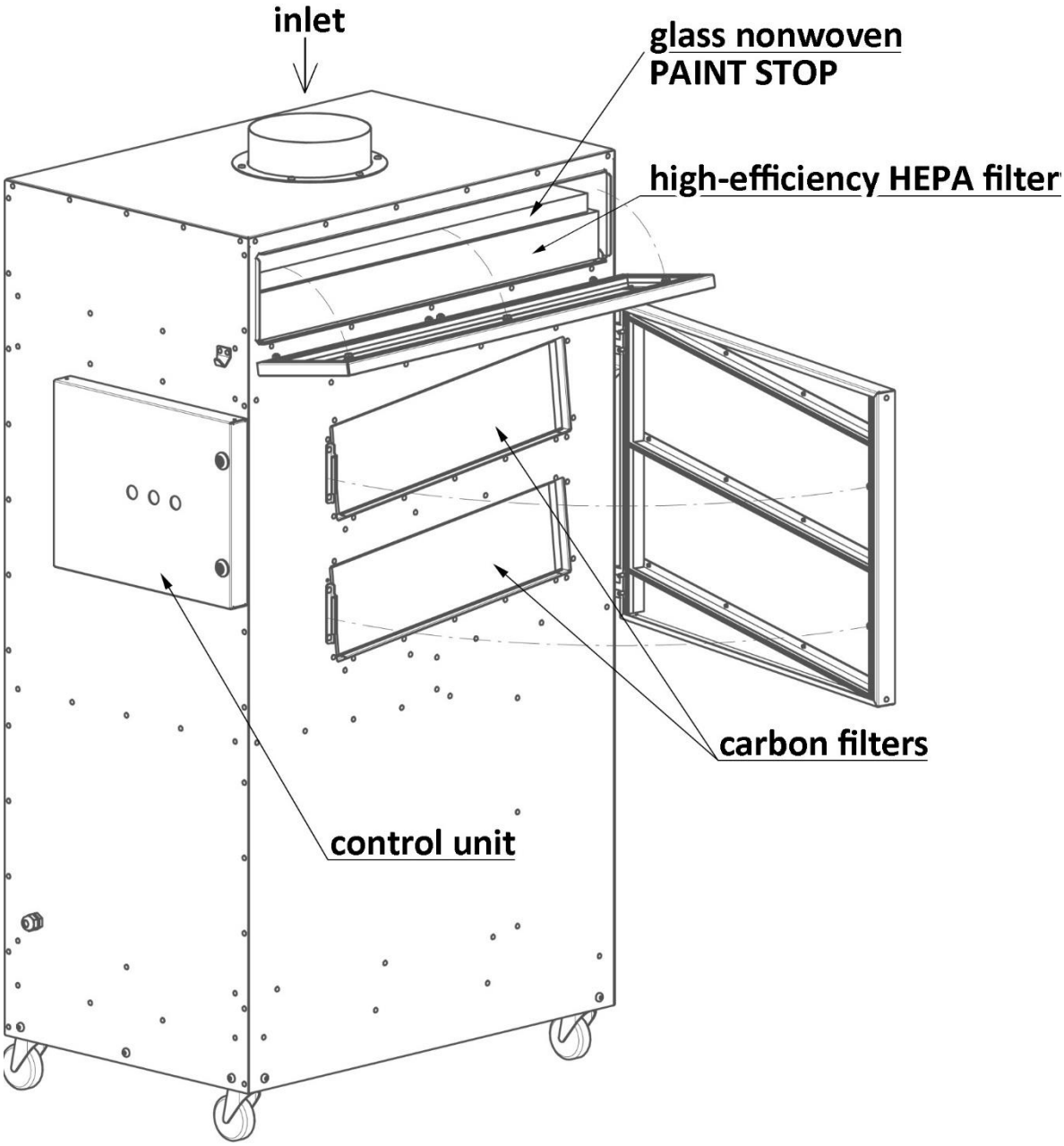


Fig. No. 3 – Structure of the device type SMOG Filter-800

The polluted air is drawn into the filtering unit, through the top surface (see Fig. No.3) and after having passed through all the filters, the cleaned air is expelled outside, from underneath the device.

6. Assembly and Start-up

The appliance is mobile and it can be placed in a chosen convenient place. The device inlet can be connected with a local exhaust, ducting of general ventilation or equipped with a suction head (additional equipment). In all configurations, the drawn in air is returned back to the process room (through the perforated steel sheet placed underneath the device) after the filtration.
In order to energise the device, simply put the plug into the 230V, 50Hz supply socket.

Connection diagram is illustrated in Fig. No.4.

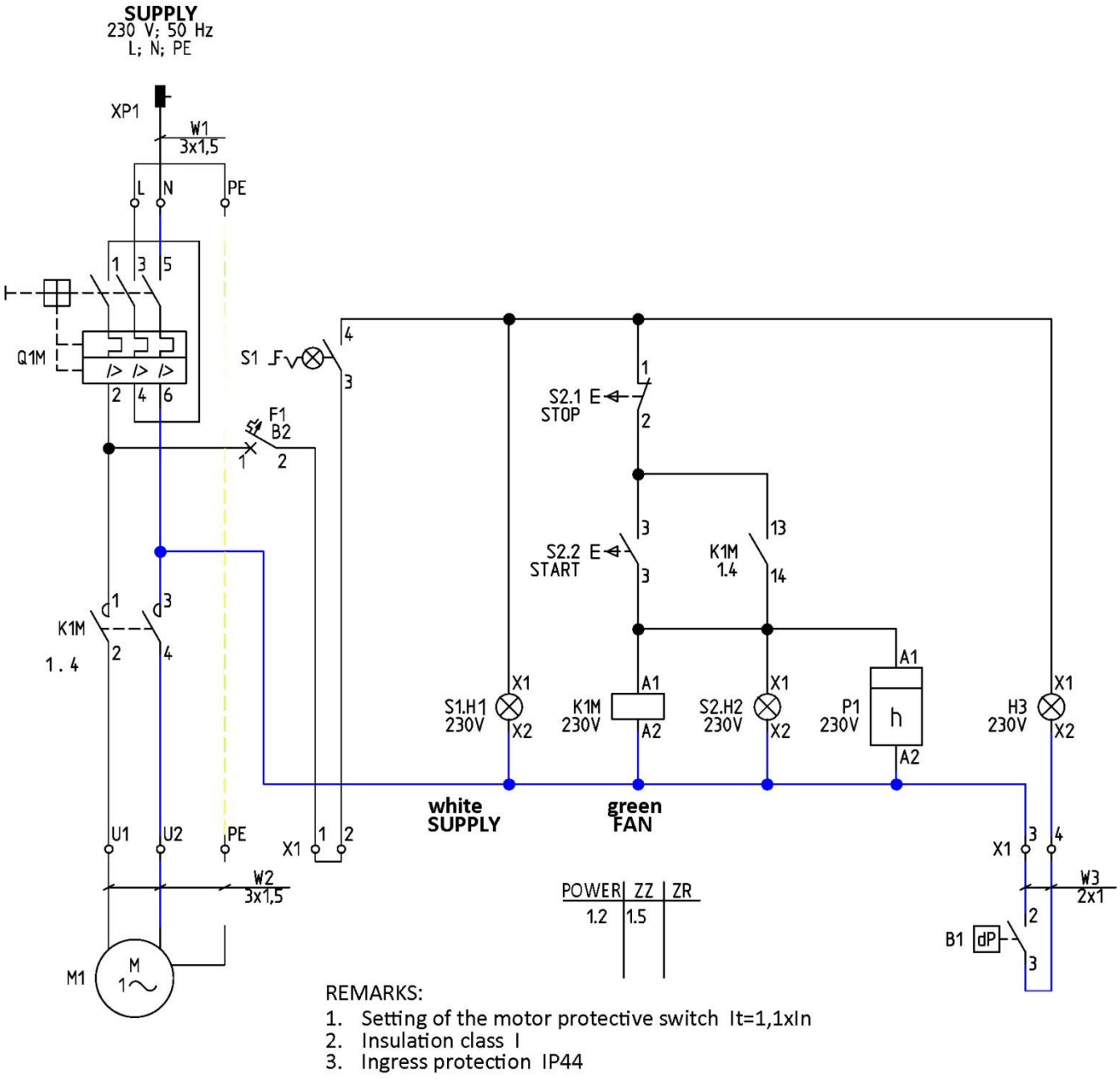


Fig. No.4 – Connection diagram of the SMOG Filter-800 absorber

The fulfilled functions

- **Q1M** – protection of the motor from damage caused by the blocked start up, overload and short-circuit,
- **F1** – protection of the control circuit,
- **S1.H1** white lamp – signal of the applied voltage,
- **S1.H2** green lamp – signal of the fan function,
- **H3** yellow lamp – signal of the polluted high-efficiency filter,
- **S2** double button – fan ON/OF,
- **K1M** contactor – start up of the fan,
- **P1** counter – counts the work time of the device (hour-meter),
- **B1** differential pressure control (pressostat) – control of pollution degree of the filter – compares the pressure before the filter and behind the high-efficiency filter – in case when the pressure difference rises above 500Pa, the contact is getting closed.

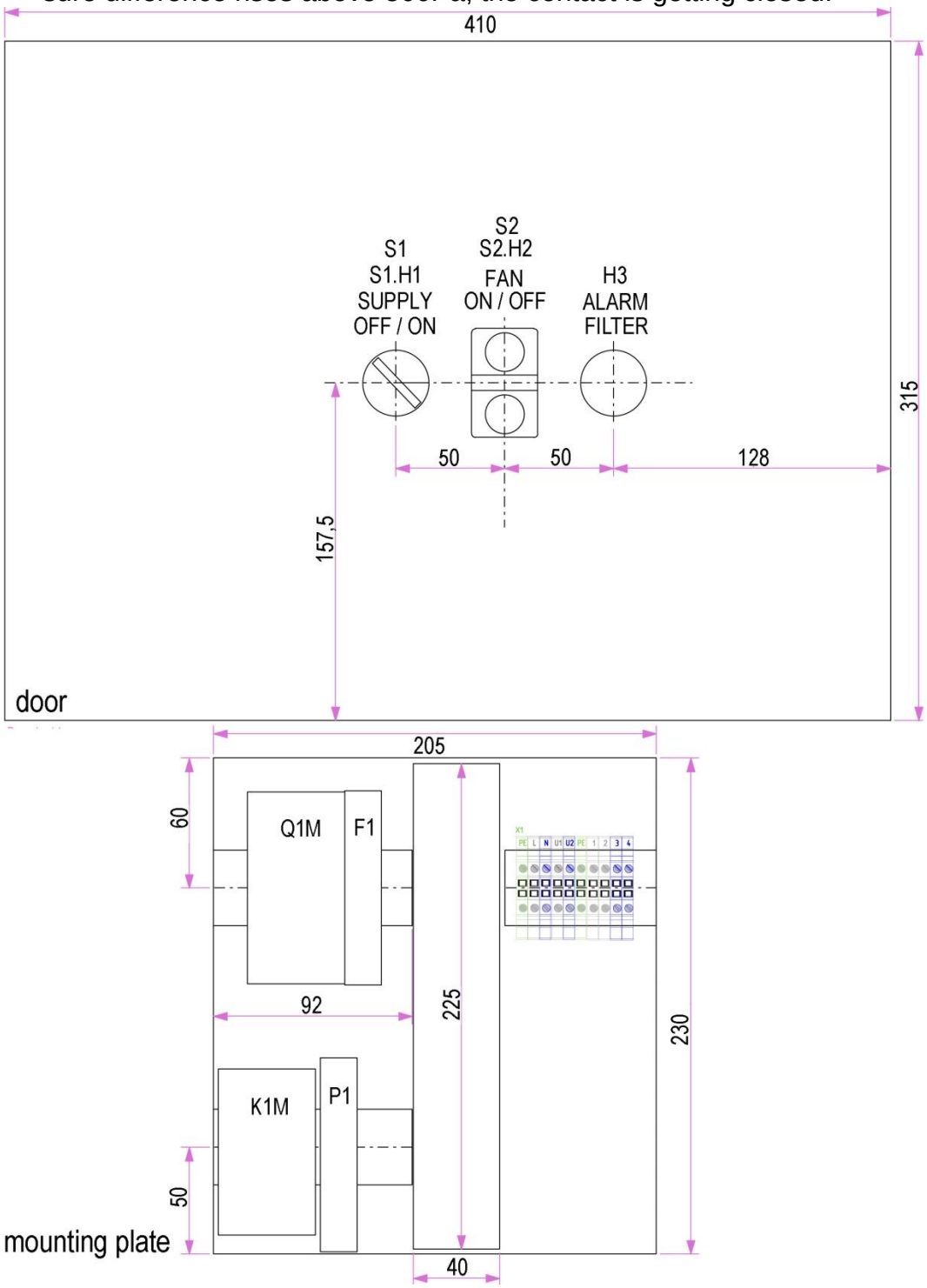
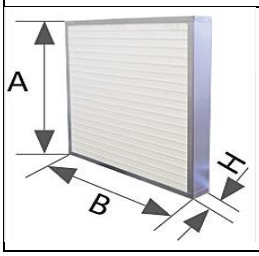


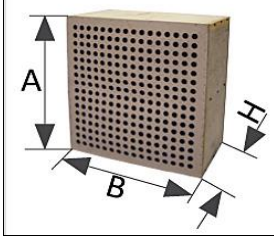
Fig. No. 5 – Control unit of the device SMOG Filter

7. Operational Use

SMOG Filter-800 absorbers guarantee full re-circulation of the extracted air. The cassettes with granulate activated carbon, absorb efficiently the majority of the noxious chemical compounds, such as styrene, toluene, alcohols, phenol, and numerous others.
The dust pollutants are captured within the HEPA high-efficiency filter. At the moment when this filter reaches the limit pollution degree, a signal appears about the necessity of the filter replacement.
Absorptivity of the activated carbon, for various vapours and gases, is given in **Table No. 5**.

Table No.2 Replaceable parts

High-efficiency filter HEPA						
	**Type**	**Weight** [kg]	**Dimensions AxBxH** [mm]	**Class**	**Quantity of filters** [pcs]	**Filtration material**
	FW-SF	3,2	800x535x80	H13	1	Hydrophobic glass paper 99,95%

Cassette with activated carbon					
	**Type**	**Weight** [kg]	**Dimensions AxBxH** [mm]	**Quantity of filters** [pcs]	**Filtration material**
	WA-ECO-20	24*	534x534x155	2	Cassette made of cardboard and plywood

* weight of the activated carbon – 20 kg

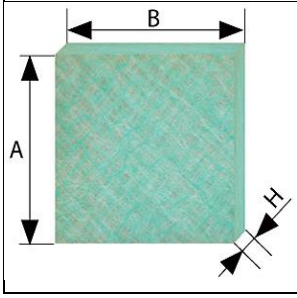
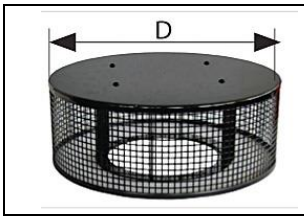
Pre-filter						
	**Type**	**Weight** [kg]	**Dimensions AxBxH** [mm]	**Class**	**Quantity of filters** [pcs]	**Filtration material**
	PS-SF	0,5	800x535x50	G3	1	Glass nonwoven with progressively increasing density

Table No.3 – Suction head (Additional equipment)

	Type	**Weight** [kg]	**Diameter D** [mm]
	K-SF	0,7	400

Maintenance of the device consists in several operations:

- periodical replacement of the HEPA filter – the replacement necessity is indicated by the signalling lamp (**H3**),
- periodical replacement of the cassettes with activated carbon – the necessity of replacement depends on the organoleptic evaluation of User (depending on the intensity of pollution and its sort),
- periodical replacement of the paint-stop filter – (when the fan capacity decrease is noticed).

CAUTION:
The worn out cassettes with activated carbon should be submitted to utilisation, according to the regulations, being valid in the whole country. Activated carbon is disposed by specialised companies.

8. Troubleshooting Guide

Table No.4

	Problem	Possible reason	Corrective action
1.	The flow capacity of the fan decreases – whereby the signal lamps are not activated	The “paint-stop” nonwoven (spunbond) is polluted excessively	Replace the “paint-stop” spunbond for a new
2.	The flow capacity of the fan decreases – whereby the **H3** signal lamp is lit	The high-efficiency filter is excessively polluted	Replace the high-efficiency filter for a new
3.	Unpleasant smell is emerging outside the device	The activated carbon layer is saturated	Replace the worn out activated carbon bed in the cassette
4.	Sudden vibrations of the device	The impeller is faulty	Replace the impeller for a new

9. Maintenance

In the course of operational use, every 12 months check the technical state of the fan, according to the detailed rules of operational use for the electrical driving devices. Within the range of maintenance check the mechanical and electrical connections.

WARNING **Technical revisions ought to be carried out exclusively at the device disconnected (unplugged) from the power supply system**.

10. Occupational Health and Safety

Start-up and maintenance are exclusively possible after getting acquainted with the contents of the present Use and Maintenance Manual.
Circuits of plugs ought to be equipped with short-circuit- and current-differential protection (see enclosed Connection diagram).

The appliance meets the safety requirements of the 2006/42/EC Directive and do not require any additional protection for a safe use.

Any revisions ought to be carried out exclusively after the fan is switched off and the appliance disconnected from the power supply system.

11. Transport and Storage

SMOG Filter-800 filtering unit ought to be transported on a pallet, protected with foil against weather conditions. During the transport the appliance has to be placed in vertical position, and protected from displacement (slide) and from being knocked down.
The device has to be stored in a dry room and well ventilated area.

12. Terms of warranty

The period of warranty for the purchased device is indicated in the “Card of Warranty”.
The warranty does not comprise:

- mechanical damage and dysfunctions caused by User,
- device failures caused during use which was in contradiction with the purpose of operational use and the present Use and Maintenance Manual,
- damages being effected during improper transport, storage or incorrect maintenance.

Infringement of the Section 3 “Reservations of Producer” of the Use and Maintenance Manual and especially modifications undertaken by User on one’s own shall cause the loss of warranty validity.

13. Performances of carbon absorptivity for various vapours and gases

Table No.5

Highly absorbed gases	Medium absorbed gases	Slightly absorbed gases
ethyl acrylate – $C_5H_8O_2$ methyl acrylate – $C_4H_6O_2$ acrylonitrile – $C_3H_{13}N$ valeric aldehyde – $C_5H_{10}O$ amyl alcohol (pentanol) – $C_5H_{12}O$ butyl alcohol – $C_4H_{10}O$ propyl alcohol – C_3H_7OH aniline (aminbenzene) – $C_6H_5NH_2$ heavy petrol (naphtha) of petroleum heavy petrol (naphtha) of coal tar bromine – Br_2 Butoxyethanol - - butyl cellosolve – $C_6H_{14}O_2$ - cellosolve – $C_4H_{10}O_2$ - cellosolve acetate – $C_6H_{10}O_2$ butyl chloride – C_4H_9Cl propyl chloride – C_3H_7Cl chlorobenzene – C_6H_5Cl chloroethanol – C_2H_5ClO chloroform – $CHCl_3$ chloronitropropane – $C_3H_6ClNO_2$ chloropicrin (nitro-chloroform) – CCl_3NO_2 chloroprene – C_4H_5Cl cyclo-hexanol – $C_6H_{12}O$ cyclo-xenon – $C_6H_{10}O$ acetylene tetrachloride – $C_2H_2Cl_4$ ethylene tetrachloride – C_2Cl_4 czterochlore węgla – CCl_4 decane – $C_{10}H_{22}$ dioxan – $C_4H_8O_2$ di-bromomethane – CH_2Br_2	acetone - C_3H_6O acetylene – C_2H_2 acrolein - C_3H_4O butyric aldehyde – C_4H_8O ethyl alcohol – C_2H_5OH methyl alcohol – CH_3OH benzene – C_6H_6 bromoethane – CH_3Br bromomethane – CH_3Br butadiene – C_4H_6 chlorine – Cl_2 ethyl chloride – C_4H_5Cl vinyl chloride – C_2H_3Cl cyclo-hexen – C_6H_{10} dichloro-difluoromethane – CCl_2F_2 di-ethylamine – $C_4H_{11}N$ carbon disulphide – CS_2 ethyl ether – $C_4H_{10}O$ ethylamine – C_2H_7N fluoro-trichloro-methane – CCl_3F phosgene – $COCl_2$ anaesthetic gas hexane – C_6H_{14} hexylene – C_6H_{12} hexyne – C_6H_{10} isoprene – C_5H_8 hydrogen iodide – HI xylene – C_8H_{10} formic acid – HCOOH methyl mercaptan – CH_3SH ethyl formate – $C_3H_6O_2$ nitromethane – CH_3NO_2 methyl acetate – $C_3H_6O_2$ pentane – C_5H_{12} pentylene – C_5H_8 pentyne – C_5H_8 propanol – C_3H_6O	acetic aldehyde – C_2H_4O ammonia – NH_3 hydrogen bromide – HBr butane – C_4H_{10} butanone – C_4H_8O butylene – C_4H_8 butyne – C_4H_6 chloromethane – CH_3Cl hydrogen chloride – HCl hydrogen cyanide – HCN nitrogen dioxide – NO_2 sulphur dioxide – SO_2 hydrogen fluoride – HF formaldehyde – CH_2O propane – C_3H_8 propylene – C_3H_6 propyne – C_3H_4 hydrogen selenide – H_2Se hydrogen sulphide – H_2S sulphur trioxide – SO_3

Highly absorbed gases	Medium absorbed gases	Slightly absorbed gases
ethylene di-chloride – $C_2H_4Cl_2$ di-chlorobenzene – $C_6H_4Cl_2$ di-chloroethane – $C_2H_4Cl_2$ di-chloroethylene – $C_2H_2Cl_2$ di-chloronitro-ethane –$CH_3CCl_2No_2$ di-chloropropane – $C_3H_6Cl_2$ di-methylaniline – $C_8H_{11}N$ amyl ether – $C_{10}H_{22}O$ di-butyl ether – $C_8H_{18}O$ di-chloroethyl ether – $C_4H_8Cl_2O$ di-isopropyl ether – $C_6H_{14}O$ propyl ether – $C_6H_{14}O$ ethylbenzene – C_8H_{10} phenol – C_6H_6O heptane – C_7H_{16} heptylene – C_7H_{14} indole – C_8H_7N isophorone – $C_9H_{14}O$ iodine – I iodoform – CHI_3 camphor – $C_{10}H_{16}O$ di-ethyl ketone – $C_5H_{10}O$ di-propyl ketone – $C_7H_{14}O$ methyl-butyl ketone – $C_6H_{12}O$ methyl-iso-butyl ketone – $C_6H_{12}O$ methyl-ethyl ketone – C_4H_8O creosol – $C_8H_{10}O_2$ cresol – C_7H_8O croton-aldehyde – C_4H_6O ethyl silicate – $C_8H_{20}O_4Si$ acrylic acid – $C_3H_4O_2$ caprylic acid – $C_8H_{16}O_2$ butyric acid – $C_4H_8O_2$ lactic acid – $C_3H_6O_3$ uric acid – $C_5H_4N_4O_3$ acetic acid – CH_3COOH propanoic acid – $C_3H_6O_2$ valeric acid – $C_5H_{10}O_2$	ethylene monoxide – C_2H_4O carbon monoxide - CO	

Highly absorbed gases	Medium absorbed gases	Slightly absorbed gases
mentol – $C_{10}H_{20}O$ merkaptan etylu – C_2H_6S merkaptan propylowy – C_3H_8S methyl cellosolve – $C_3H_8O_2$ methyl cellosolve acetate – $C_5H_{10}O_3$ methyl-cyclo-hexane – C_7H_{14} methyl-cyclo-hexanol – $C_7H_{14}O$ urea, (carbamide) – CH_4N_2O kerosene (kerosine) nicotine – $C_{10}H_{14}N_2$ nitrobenzene – $C_6H_5NO_2$ nitroethane – $C_2H_5NO_2$ nitroglycerin –$C_3H_5N_3O_9$ nitropropane – $C_3H_7NO_2$ nitrotoluene – $C_7H_7NO_2$ nonane – C_9H_{20} amyl acetate – $C_7H_{14}O_2$ butyl acetate – $C_6H_{12}O_2$ ethyl acetate – $C_4H_8O_2$ iso-propyl acetate – $C_5H_{10}O_2$ propyl acetate – $C_5H_{10}O_2$ octalene – $C_{12}H_8Cl_6$ octane – C_8H_{18} decay (decomposition) vapours – $C_4H_{12}N_2$ ozone – O_3 para-di-chlorbenzene – $C_6H_4Cl_2$ penthanone – $C_5H_{10}O$ perchloroethylene – C_2Cl_4 pyridine – C_5H_5N dimethyle sulphate – $C_2H_6O_4S$ skatole – C_9H_9N styrene – C_8H_8 turpentine – $C_{10}H_{16}$ mesityl oxide – $C_6H_{10}O$ toluene – C_7H_8 toluidine – C_7H_9N tri-chloroethylene – C_2HCl_3		

14. Sample of Declaration of Conformity

Declaration of Conformity EC No. ……..

Manufacturer (eventually the authorized representative / importer):
name: **KLIMAWENT S.A.**
address: **81-571 Gdynia**, **ul. Chwaszczyńska 194**

A person, authorized for issuing the technical documentation: Teodor Świrbutowicz, KLIMAWENT S.A.

hereby declares that the appliance:
name: **Filtering unit**

type/model: **SMOG Filter-800**
serial number: …….. year of production: ……..

meets the requirements of the subsequent European Directives:

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• **EN 61439:2011**	– "Low-voltage switchgear and controlgear assemblies – Part 1: General resolutions".

……	……	……
place, date	signature of authorised person	name, surname, function of the signatory

KLIMAWENT S.A.
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District Court Gdańsk-Północ
in Gdańsk, VII Wydział Gospodarczy
of the National Register of Court
KRS 0000308902 company stock
13.779.200 zł paid in total

NIP: 958 159 21 35
REGON: 220631262
Bank Account: **Santander Bank Polska S.A.**
56 1500 1025 1210 2007 8845 0000

Producer:
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