

Use and Maintenance Manual



Filtering unit **HARD-1000-S**

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1. Introductory Remarks

The purpose of the present Use and Maintenance Manual is to supply User with directions within the range of application, installation, start-up and the operational use of the **HARD-1000-S 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 **HARD-1000-S 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. /*Journal of Laws EC L96 of 29.03.2014*/

The appliance meets the requirements included in:

- **2009/125/EC (ErP) Directive** of the European Parliament and of the Council of October 21th, 2009 establishing a framework for the setting of ecodesign requirements for energy-related products / *Journal of Laws L 285 of 31.10.2009* /
- **327/2011 (EU) 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 L No. 90 of 06.04.2011* /

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

- **PN-EN ISO 12100:2012** – “Safety of machinery. Basic concepts, general principles for design. Risk assessment and risk reduction”.
- **PN-EN 60204-1:2018-12** – “Safety of machinery. – Electrical equipment of machines. Part 1: General requirements”.
- **PN-EN ISO 13857:2010** – “Safety of machinery. Safe distances to prevent hazard zones being reached by upper and lower limbs”.
- **PN-EN 60529:2003/A2:2014** – “Degrees of protection provided by enclosures (IP Code)”
- **PN-EN 61439:2011** – “Low-voltage switchgear and controlgear assemblies – Part 1: General resolutions”.

2. Application

HARD- 1000-S filtering unit is a solution for cleaning the air from viscous dusts and gas contamination. It is a perfect solution for subsequent purposes:

- filtration the aerosols arising during spray painting of not large elements,
- filtration the air contaminated with dust particles and gases arising during laser cutting of rubber, plywood, plexi, acrylic and other plastics as well as grinding of the above mentioned materials,
- for dust and gas contaminants emitted during polishing of various materials,
- for oil-laden welding fumes, accompanied by gases emitted during the welding process,
- filtration the air contaminated with grease particles at kitchen extraction hoods,
- for elimination of unpleasant smells in chemical laboratories,
- for vapours arising during upholstery activities, such as cutting, gluing.

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 from mechanical damage.
5. Maintenance and any repair activities can exclusively be carried out by an authorized person.
6. Do not use the device 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	Maximum vacuum	Motor rate	Supply voltage	Noise level [dB(A)]		Weight [kg]
	[m ³ /h]	[Pa]	[kW]	[V]	1m	5m	
HARD-1000-S	1250	1700	0,75	230	70	67	180

CAUTION: Volume flow has been measured at clean filters
Filtration efficiency 99,95%

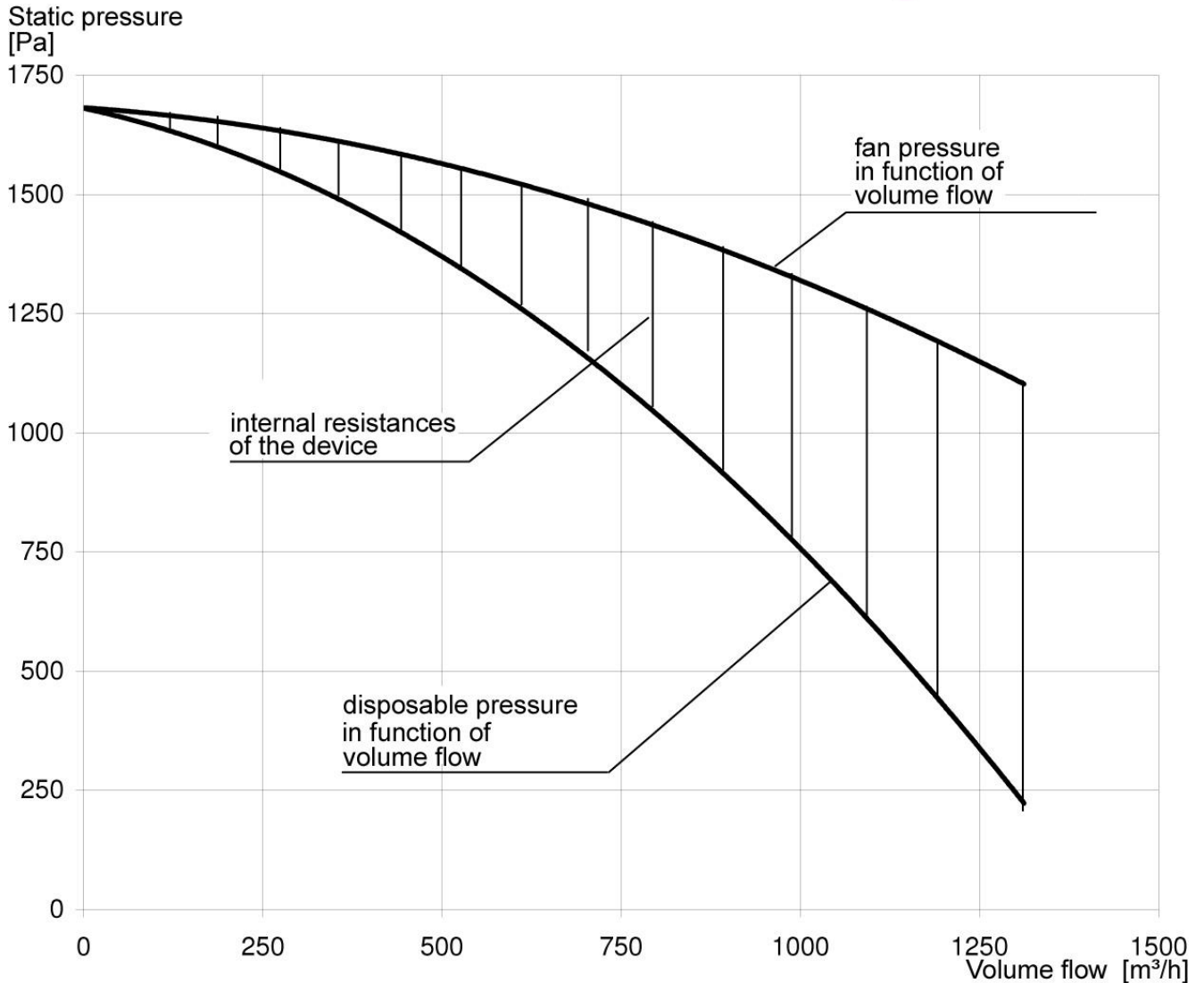


Fig. No.1 – Flow chart of the filtering unit HARD-1000-S

5. Structure and Function

HARD-1000-S consists of subsequent components:

- steel housing,
- radial fan – housing of cast aluminium,
- pre-filter “paint-stop” – class **G3** (hardly flammable)
- pocket filter – class **F8**,
- high-efficiency filter – class **H13**,
- gas absorber – a cassette with granulated activated carbon, weight 20 kg (activated carbon is delivered in bulk)
- two pressure controls – activating the signalling lamp upon excessive flow resistance of the pocket filter and the high-efficiency filter,
- suction connection pieces – to install the extraction arms or ventilation conduits,
- silencer – at the fan outlet,
- hour-meter (for work time measuring),
- control unit.

The air is drawn in, through suction connection pieces and subsequently streams through the following filters, where it is cleaned and finally returned outside.

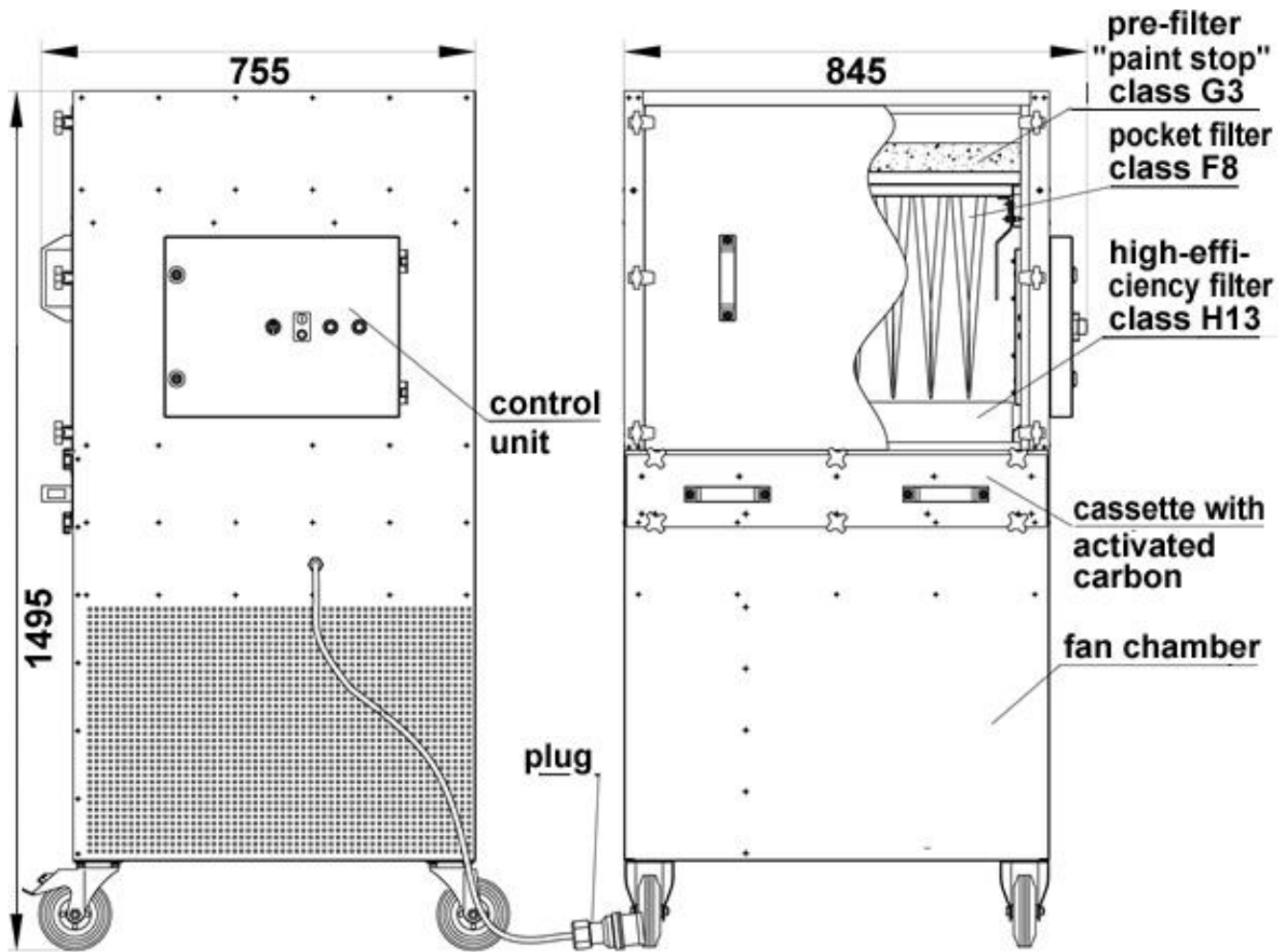


Fig. No.2 – Structure of the filtering unit HARD-1000-S

6. Assembly and Start-up

Prior to operational use, equip the HARD-1000-S device with an ERGO extraction arm or with a flexible hose. For installing the ERGO arm are implemented two swivels $\varnothing 125$ mm or one swivel $\varnothing 160$ mm (see Fig. No.3). After installing of suitable connection fitting pieces, it is possible to fasten flexible hoses.

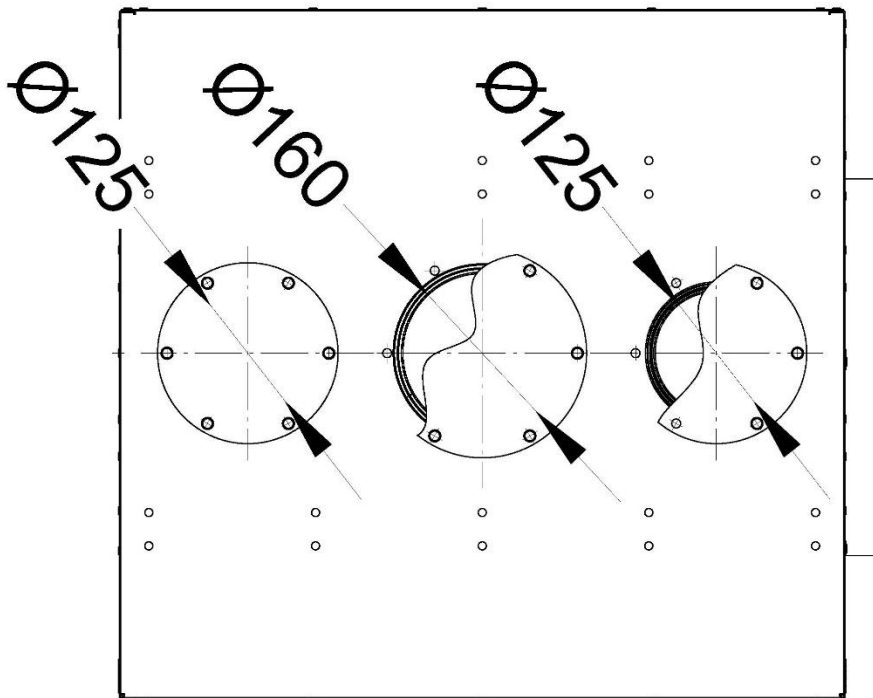


Fig. No.3 – Connections

The hose has to be fastened on the device by means of a DC connector.

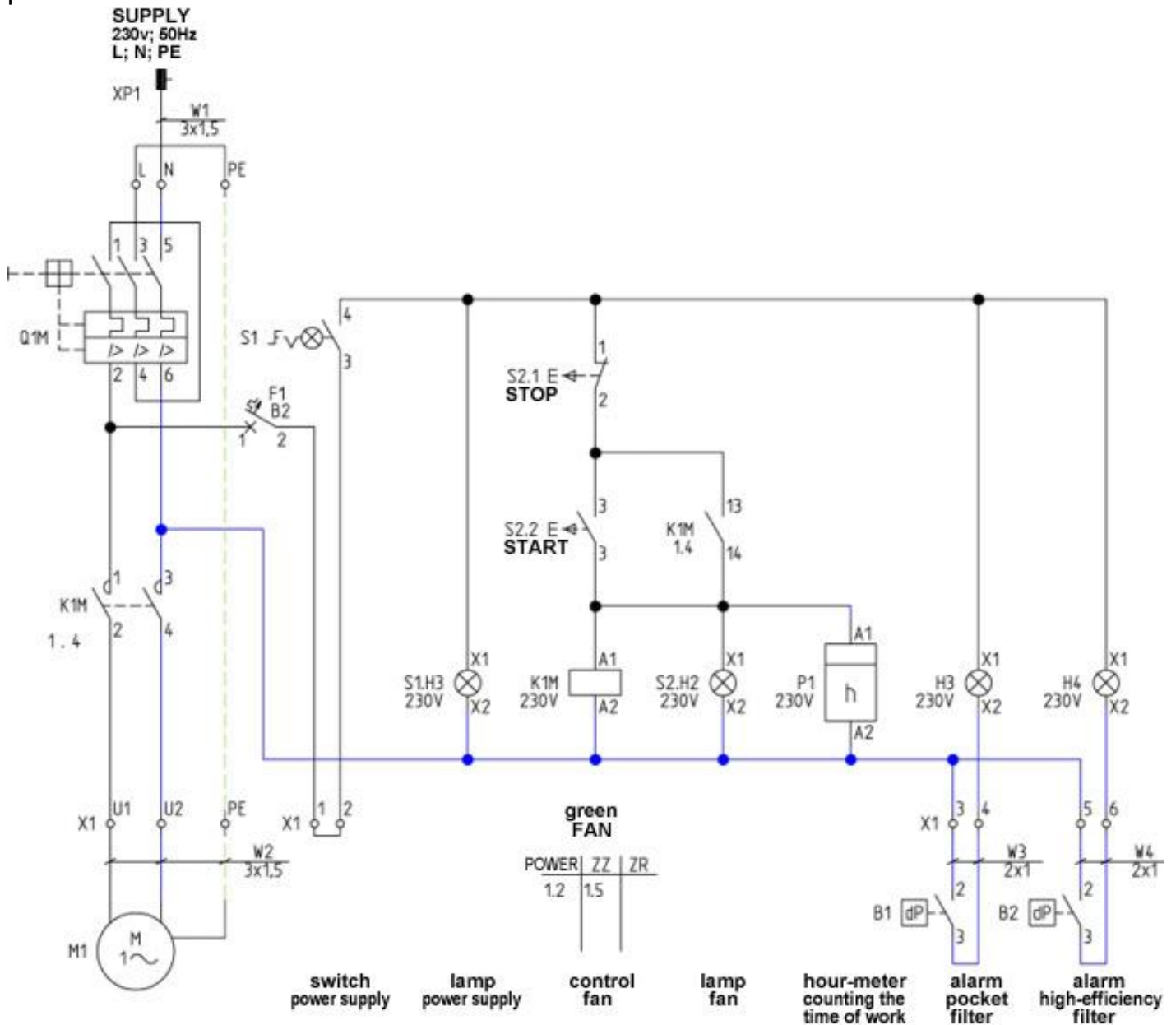
Brackets and ERGO extraction arms do not constitute equipment of the device, they are additional accessories.

Prior to the first start-up go through subsequent steps:

1. Take off the two covers from the device.
2. Slide out the HEPA high-efficiency filter and the pocket filter.
3. From inside, screw out bolts blocking the cassettes with activated carbon (the wrench is enclosed to the delivery).
4. Slide out the cassettes with activated carbon.
5. Fill out the cassettes with activated carbon (delivered along with the device), up to 10 mm below the upper edge of the cassette. Important is that the active carbon is distributed evenly along the side walls of the cassettes and gently pressed down to make it more dense.
6. Insert the cassettes back into the device. Handle with care, as the sealings would not get damaged while sliding the cassettes in. Mind that the carbon would not get displaced aside, showing empty places within the cassettes.
7. Put back the high-efficiency HEPA filter and the pocket filter.
8. Close the covers.

At that point the appliance is ready for use.

For energizing, plug the device to **230V/50Hz** power supply socket and switch on the motor protective switch.



CAUTION:

1. Setting of the overload protection $I_t = 1,1 \times I_n$
2. Insulation class I
3. Ingress protection **IP44**

Fig. No.4 – Connection diagram – HARD-1000-S

Implemented functions of the control unit:

- **Q1M** – Motor protective switch – protects the motor from failure due to the blocked start-up, overload and short-circuit.
- **P1** – hour-meter – to indicate the work hours of the device.
- **F1** – over-current protection – to safeguard the control circuit.
- **K1M** – contactor – start-up of the fan
- **B1** – pressure control (pressostat) – compares the pressure in front of the filter and behind the filter. When the difference reaches 500 Pa, the contact is getting closed.
- **B2** – pressure control (pressostat) – compares the pressure in front of the filter and behind the filter. When the difference reaches 500 Pa, the contact is getting closed.
- **S1.H2** – white lamp – indicates the applied voltage onto the control circuit
- **S2.H2** – green lamp – indicates work of the device – state “**RUN**”
- **H3** – modular yellow lamp – indicates pollution state of the filter
- **H4** – modular yellow lamp – indicates pollution state of the filter
- **S.1** – fan work – **STOP**.
- **S.2** – fan work – **START**.

7. Operational Use

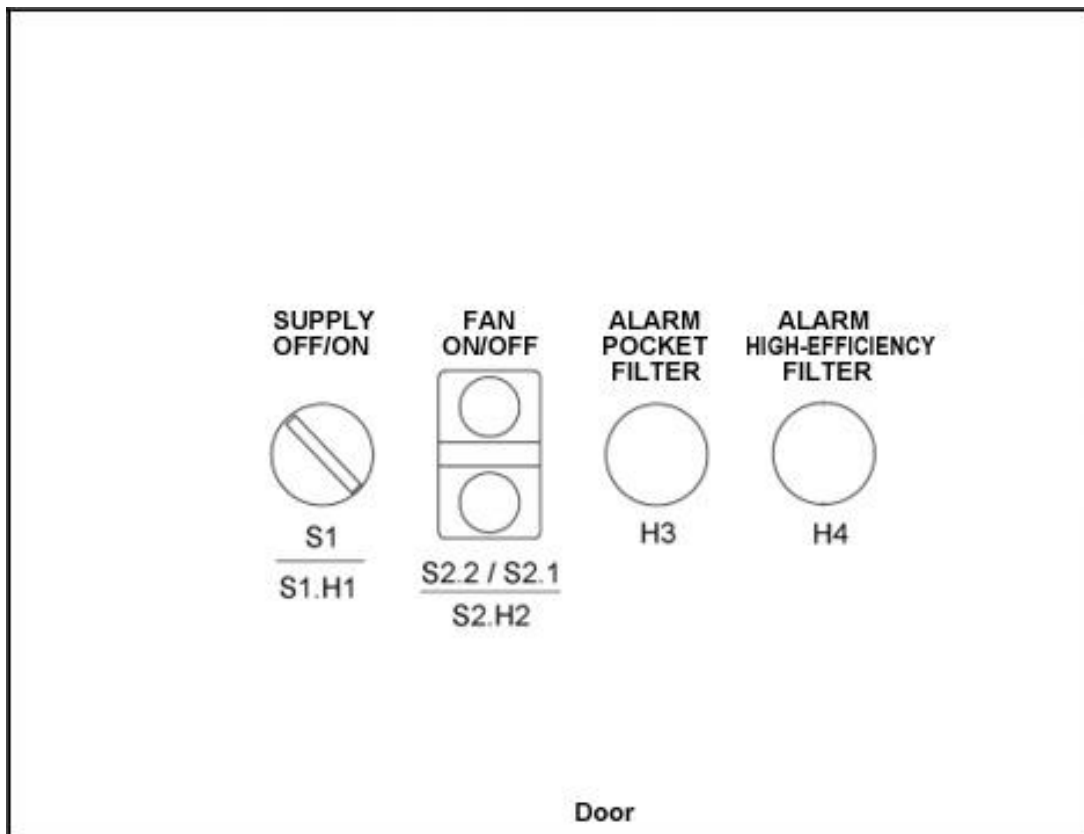
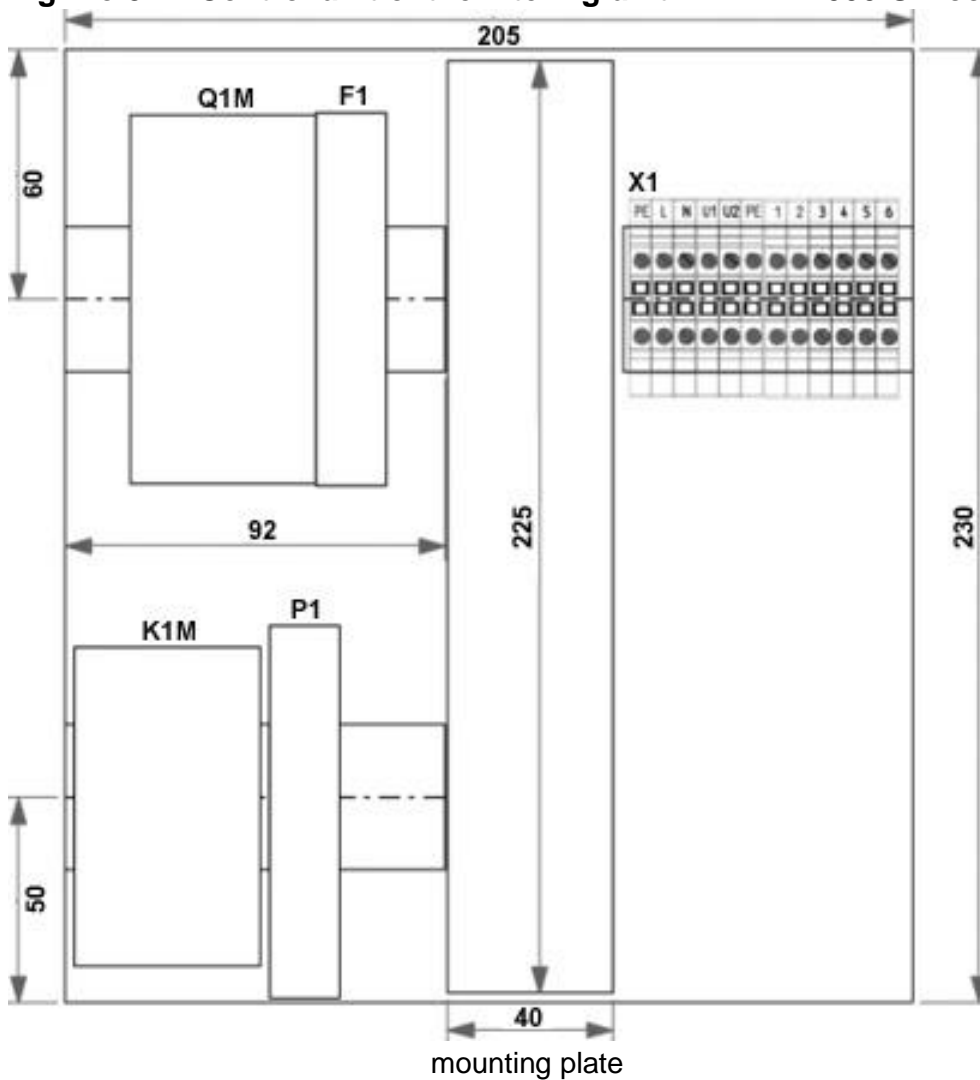
In the course of operational use, observe the replacement periods of filters by monitoring the signal lamps activated through the pressure controls (pressostats). The lighting signal lamps indicate the replacement necessity of the subsequent filters.

- **H3** yellow lamp – signalizes the replacement necessity of the **pocket filter** – which takes place at limit resistance of the filter – 500 Pa.
- **H4** yellow lamp – indicates replacement necessity of the **high-efficiency filter**, at the filter limit resistance 500 Pa.

H3 lamp is coordinated with the **B1** pressure control (pressostat) – pocket filter;

H4 lamp is coordinated with the **B2** pressure control (pressostat) – high-efficiency filter.

Prior to pocket filter replacement, release the filter clamps and slide the filter gently out of the guide profiles. In order to replace the high-efficiency filter, first pull out the pocket filter, then (gripping the front handle and rear handle of the high-efficiency filter) lift and remove it from the HARD-1000-S filtering unit.


Fig. No.5 – Control unit of the filtering unit – HARD-1000-S – cover

Fig. No.6 – Mounting plate of the control unit of the filtering unit – HARD-1000-S

Do not slide the high-efficiency filter directly on the guide profiles (while pulling out), as this could damage the sealing and cause filter dysfunction as a result afterwards.

The same rule applies while inserting and removing the filter

Replace the spunbond (nonwoven) “Paint-stop” filter, after you observe the fan efficiency decrease. User should on one’s own estimate the replacement time of the filter, depending on the specified technological process.

Active carbon filter ought to be replaced when it stops absorbing the unpleasant smells/odours. Observe the indications of the hour-meter (measuring the work time). The activated carbon layer should be replaced after approx. 200 hours of operation. Nevertheless, this depends on the intensity of contaminates accumulation.

Taking into account the activated carbon weight (in the filter) and its absorptivity, operator can assume roughly, that the carbon ought to be replaced after absorbing approx. 5 kg of gases.

To replace the activated carbon unscrew the bolts pressing the cassettes against the guide profiles. Subsequently, draw out the cassette and remove the worn out carbon.


Then distribute evenly the new activated carbon mass within the whole cassette.

CAUTION:

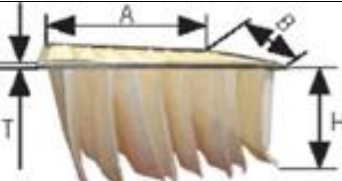
Activated carbon ought to be disposed in accordance with the local regulations.

REPLACEABLE FILTERS

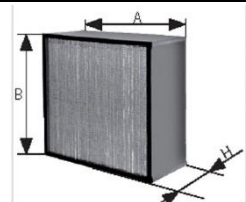
Pre-filter „paint stop”

	Type	Weight	Dimensions	Class	Efficiency
		[kg]	[mm]		[%]
	PS-HARD-2000-S	0.5	700x740x50	G3	90-95

Pocket filter

	Type	Weight	Dimensions	Class	Efficiency
		[kg]	AxBxHxT [mm]		[%]
	FK-HARD-2000-S	2,3	610x610x360x20	F8	90

High-efficiency filter HEPA

	Type	Weight	Dimensions	Class	Efficiency
		[kg]	AxBxH [mm]		[%]
	FK-HARD-1000-S	6,5	610x610x80	H13	99,95

Granulated activated carbon

	Type	Weight	Remarks
		[kg]	
	ORGANOSORB 10CO 4x8	20	The cassette contains a total volume of the activated carbon: 20 kg. Activated carbon is delivered in bulk along with the device

8. Troubleshooting Guide

Table No.2

	Problem	Possible reason	Corrective action
1.	The flow capacity of the fan fan decreases – whereby the signal lamps are not activated	the “paint-stop” spunbond (nonwoven) is polluted excessively	replace the “paint-stop” spunbond for a new
2.	The flow capacity of the fan fan decreases – whereby the H1 signal lamp is lit	the pocket filter is excessively polluted	replace the pocket filter for a new one
3.	The flow capacity of the fan fan decreases – whereby the H3 signal lamp is lit	the high-efficiency filter is excessively polluted	replace the high-efficiency filter
4.	Unpleasant smell (odour) is perceptible/sensible outside the device	the activated carbon bed is saturated	replace the active carbon layer in both cassettes
5.	Sudden vibrations are occurring	the fan 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

Any activity associated with repair / technical revision has to be carried out exclusively after the device is disconnected 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 User’s Manual.

The circuits of the interface sockets ought to be equipped with appropriate current-differential protections (see Connection Diagram).

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

WARNING

Any activity connected with repair/technical revision has to be executed exclusively after the fan is switched off and the device disconnected from the power supply system.

11. Transport and Storage

HARD-1000-S is transported on a pallet, protected with foil against atmospheric factors. During the transport, the appliance must be in vertical position and protected from overturn, knocking down and uncontrolled displacement/slide.

The appliance has to be stored in a dry and well ventilated room.

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. Sample of the Declaration of Conformity

Declaration of conformity EC No.

Manufacturer (eventually the authorized representative / importer):

name: **KLIMAWENT S.A.**

address: **81-571 Gdynia, 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: **HARD-1000-S**

serial number: year of production:

meets the requirements of the subsequent European Directives:

- **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*/
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- **PN-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
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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: **Bank Zachodni WBK S.A.**
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