

Use and Maintenance Manual



Filtering unit

RAK-1000

RAK-2000

Manufacturer:

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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 use of the **RAK 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.

Construction of the **RAK** 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 May 17th, 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 /*

Additionally, the appliance meets following harmonized standard:

- **EN ISO-12100:2012** – “Safety of machinery – Basic concepts, general principles for design. Risk assessment and risk reduction”
- **EN 60204-1:2018-12** – “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 switchgears and controlgears assemblies” Part 1: General resolutions”

2. Application

As a basic appliance RAK filtering unit has been engineered for cleaning the air from welding fumes arising at mobile- or stationary workplaces. The device is designed for intermittent application at welding stations, emitting not high amounts of welding dust. RAK efficiently captures dry dust and viscous dust, that are arising during the welding the oil-laden steel sheet and while using large amounts of the anti-spattering preparations.

Each device features four-step filtration process: pre-filter, filtration pad, compact filter, carbon filter for filtering the gas contamination. After reaching the limit contamination value of the filters, they must be replaced for new, as they are not appropriate for regeneration.

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 that are not belonging to the normal device structure (or accessory set) is not acceptable.
3. Do not undertake any structural changes or constructional modifications on the device on one's own.

4. Protect the flexible elements and pipes of the suction conduit from mechanical damage.
5. Any repair operations or maintenance ought to be performed by an authorised person only.
6. The appliance is not appropriate for conveying the air containing viscous contaminants, as they could damage / glue up the filters.
7. **Do not apply the device for conveying the air that is contaminated with a mixture of flammable substances, in a form of gas, vapour, mist or dust which would create explosive atmosphere with the air.**
8. **In the course of operational use, pay attention that any ignition sources, i.e. glowing cigarette butts / embers would not get drawn into the filtration chamber.**

4. Technical Data

Table No.1

Type of the appliance	Maximum volume flow ¹	Supply voltage	Motor rate	Acoustic pressure level [dB(A)] from distance ²		Weight	Quantity of connection fitting pieces for ERGO extraction arms ³
				1 m	5 m		
	[m ³ /h]	[V]	[kW]			[kg]	
RAK-1000-R	1800	230	1,1	74	60	65	1
RAK-1000-O				69	55	65	
RAK-2000-R	2650	230	1,5	77	63	85	2
RAK-2000-O				73	59	85	

¹ Volume flow has been measured at clean filters.

² Acoustic pressure level values are given in conditions of free area.

³ Complete assortment of the ERGO extraction arms is presented on separate catalogue cards of KLIMAWENT S.A.

Additional Equipment

Table No.2

Designation of the set	Remarks:
a set of castor wheels	the set consists of 4 castor wheels along with wall brackets
a set of hangers	the set consists of 4 wall brackets

REPLACEABLE FILTERS

Filtration pad

Table No.3

Type of the filtration pad	Weight [kg]	Dimensions [mm]	Class	Filtration efficiency [%]	Remarks:
FWR-1000	0,18	490 x 490	G3	88	each device is equipped with one sheet of filtration pad
FWR-2000	0,20	600 x 600			

Compact filter

Table No.4

Type of the compact filter	Weight [kg]	Dimensions [mm]	Class	Filtration efficiency [%]	Remarks:
FKR-1000	2,5	490 x 490	F9	95,6	1 piece
FKR-2000	4,0	600 x 600			

Activated carbon impregnated nonwoven (spunbond)

Table No.5

Type of the nonwoven	Weight [kg]	Dimensions [mm]	Remarks:
FCR-1000	0,30	450 x 450	each device is equipped with one sheet of nonwoven (spunbond); dimension of FCR-2000 is given after development / unscrolling
FCR-2000	0,32	570 x 700	

5. Structure and Function

RAK filtering unit consists of subsequent elements:

- steel sheet housing,
- radial fan,
- pre-filter (a grid of holes 0,8 x 0,25 mm),
- filtration pad – class G-3,
- compact filter – F-9,
- activated carbon impregnated nonwoven (spunbond) filter,
- control unit,
- hour-meter – measuring the time of use,
- pressure control (pressostat),
- castor wheels for the mobile version, or wall hangers for stationary version (additional equipment),
- power lead cable with a plug – 5 metre length.

Structure of the RAK filtering unit is illustrated in Fig. No.1 and Fig. No.2. The contaminated air is drawn in by the ERGO LUX extraction arm (extraction arms). While penetrating the filters, the air is being cleaned and expelled outside the building.

The air outlet is carried out in two ways:

- RAK-R – the air is returned back to the process room through the outlet located underneath the housing (recirculation);
- RAK-O – is equipped with the outlet fitting piece – suitable for connection to the discharge ductwork – to expel the air flow outside the building.

It is possible to install the connection fitting piece on the left or on the right side wall of the device, according to the request of Customer.

RAK-type filtering unit is adapted for installing the castor wheels (mobile version) or wall hangers (stationary version). Castor wheels and hangers are to be chosen by Customer as additional equipment.

All filtering units type RAK are adapted for operation with ERGO extraction arms of workrange 2 or 3 metres. They have been designed in two options:

- **RAK-1000** – suitable for connection of one extraction arm,
- **RAK-2000** – suitable for connection of two extraction arms.

The filtering unit is operated by means of a control unit. Each device is equipped with a hour-meter to measure the operational time and pressure control (pressostat), that indicates the necessity of replacement of the compact filter by activation of the signalling lamp.

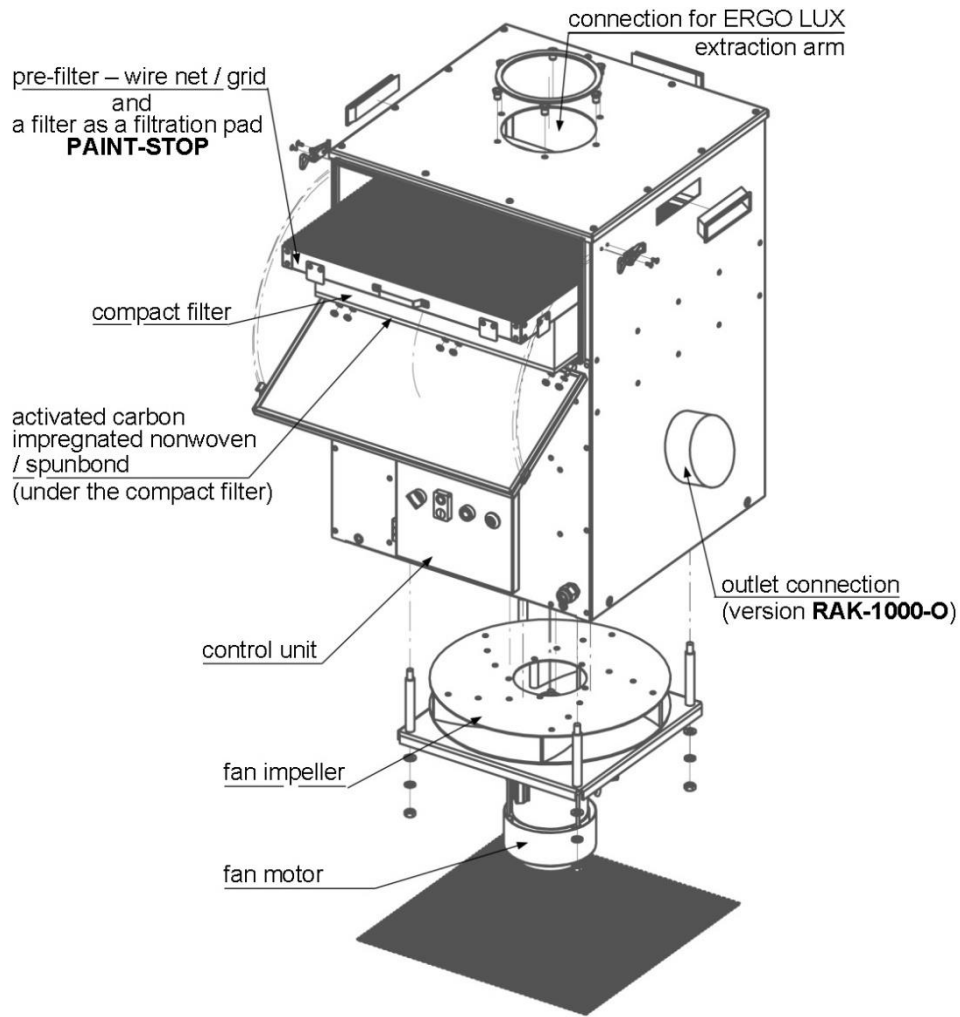


Fig. No.1 – RAK-1000 – Structure

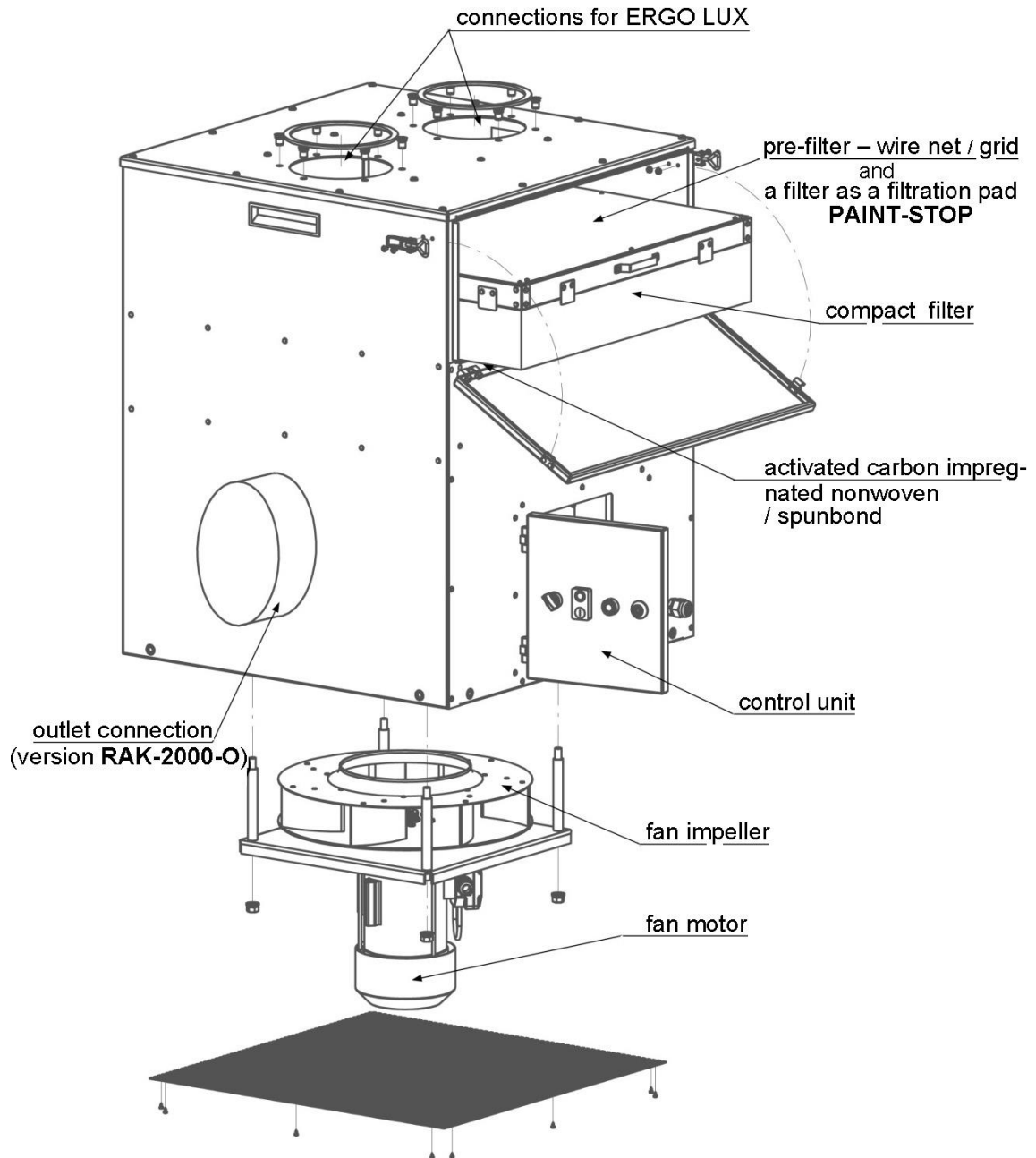


Fig. No.2 – RAK-2000 – Structure

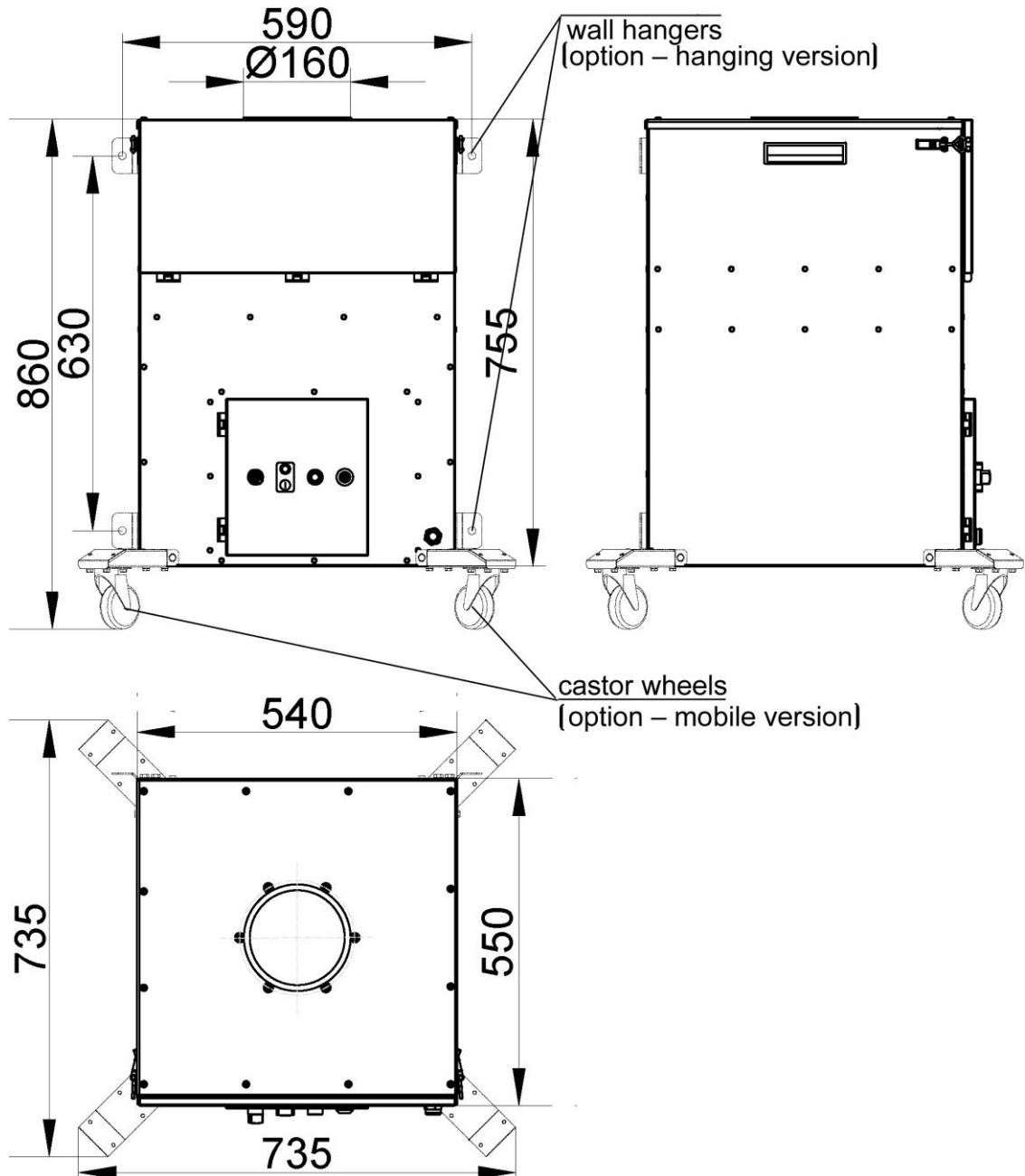


Fig. No.3 – RAK-1000 – Dimensions

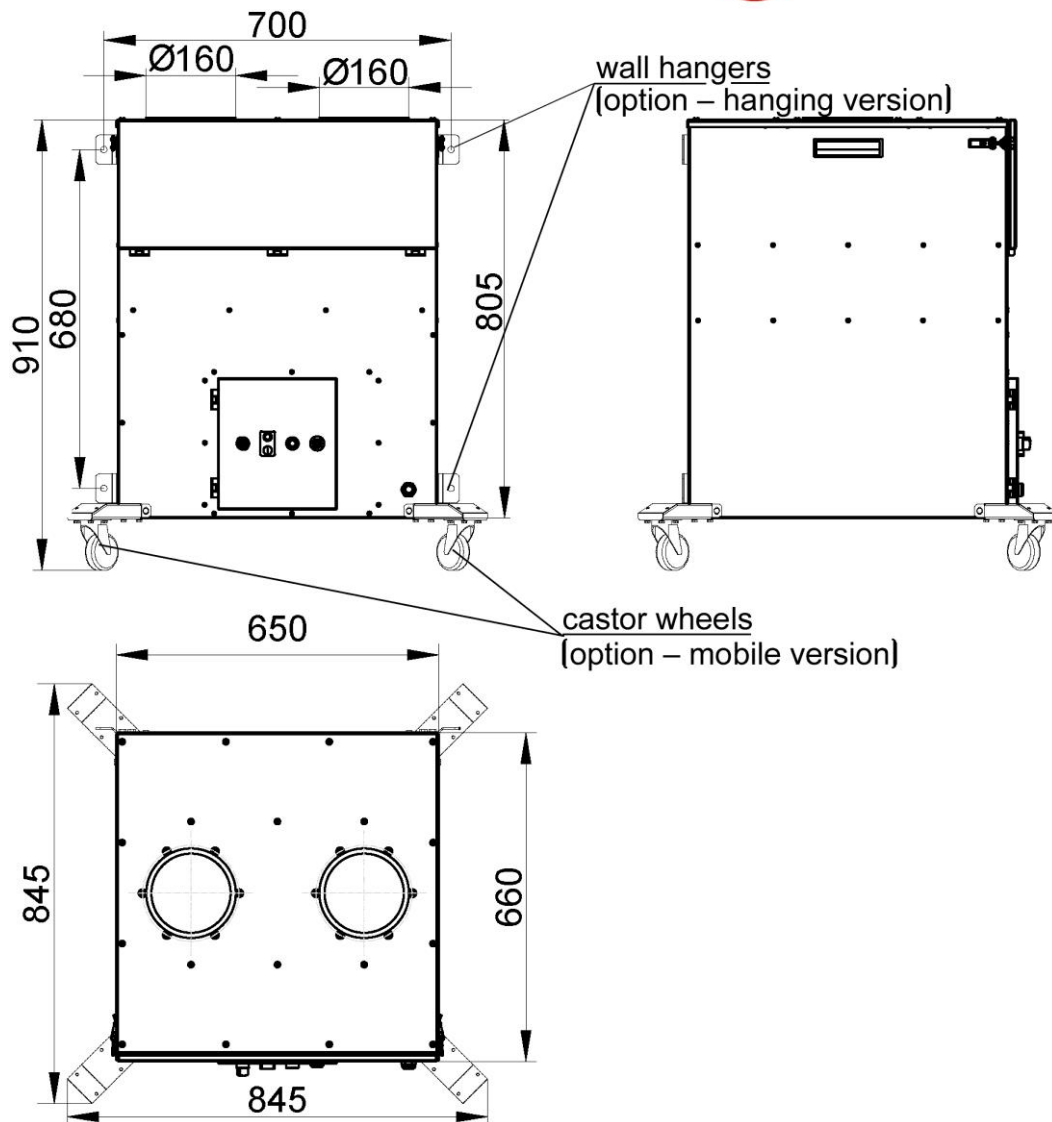


Fig. No.4 – RAK-2000 – Dimensions

6. Assembly and Start-up

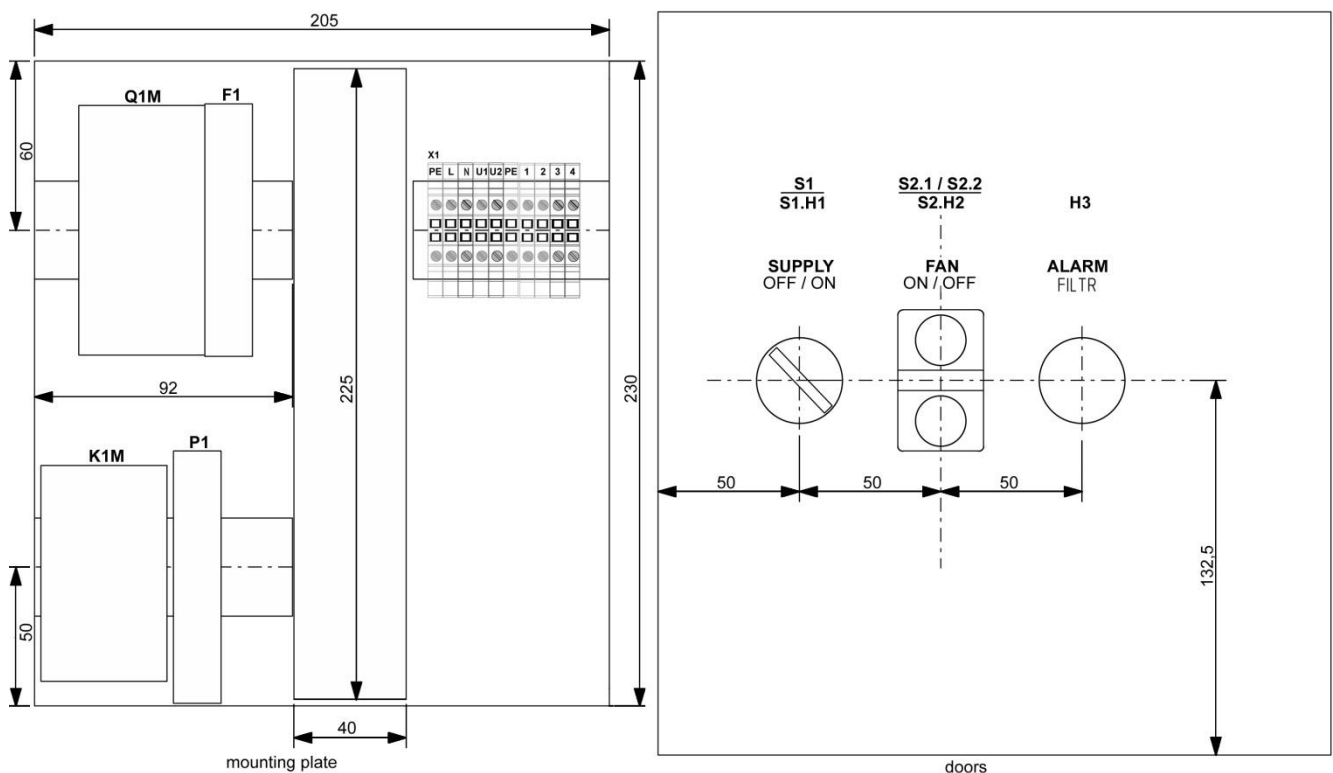
Both versions, mobile and stationary – feature hole pattern the same for castor wheels set as well as for the set of wall hangers.

In order to prepare the device for use, install the 4 wheel sets to the lower part of the housing or 4 wall hangers in the corners of the back housing wall.

Prior to installing of the stationary device version, pay attention that the load carrying capacity of the wall is sufficient. The device must be installed exactly vertically, as the installed ERGO LUX extraction arms require vertical positioning and strictly horizontal position of the device cover. Both versions of the device are equipped with a 5 metres length supply cable (ended with a plug). Connection diagram is illustrated in Fig. No.6.

Implemented functions:

- **Q1M** – protection of the fan motor, from short-circuit-, overload- and non complete phase work
- **F1** – protection of the control circuit
- **S1.H1** – signalling of the applied supply voltage – white lamp
- **S2.H2** – signalling that the fan is in operation – “**RUN**”
- **H3** – signalling of the filter contamination – yellow lamp
- **S2.2 / S2.1** – double button – fan “**ON / OFF**”
- **K1M** – start-up of the fan
- **P1** – hour-meter – measuring the work time of the device


Fig. No.5 – RAK – Control unit

7. Operational Use

In the course of operational use, follow subsequent steps:

- periodically clean the pre-filter of net,
- periodically replace filtration pad and the carbon nonwoven (spunbond) – depending on the intensity of operational use,
- periodically replace the compact filter – pressure control (pressostat) indicates the necessity of replacing of the compact filter; Manufacturer’s setting of the pressure control is 500 Pa.
- examine the indications of the hour-meter, as this helps to determine the replacement frequency of the filtration pad and of the carbon spunbond.

Maintenance of the ERGO LUX extraction arms is described in their User’s manual. There is also some more information regarding the installing, use and maintenance of those devices.

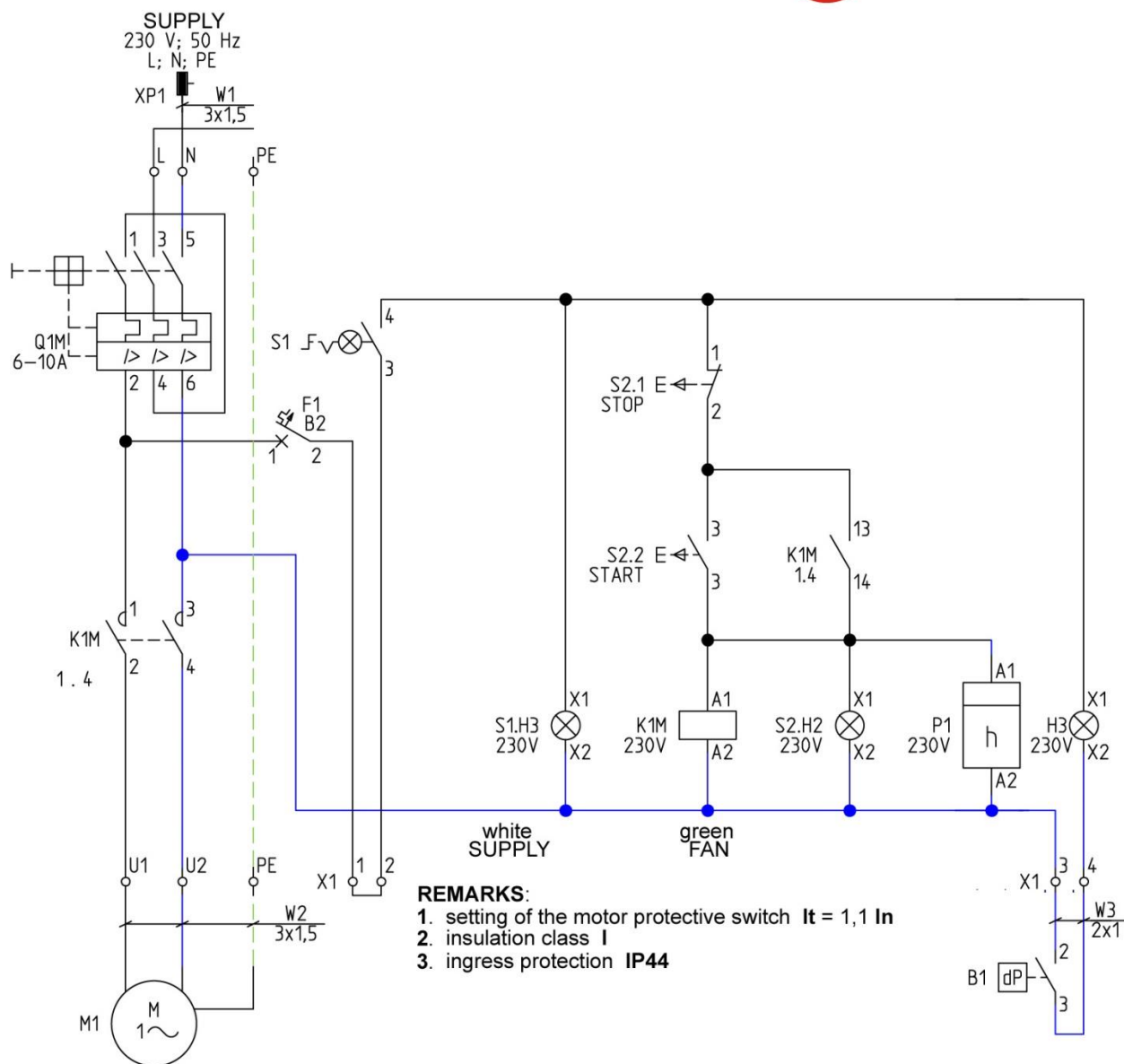


Fig. No.6 – RAK – Connection diagram

8. Troubleshooting Guide

Table No.6

Problem	Possible reason	Corrective action
1. Drop in the suction volume flow.	Filters are clogged.	Replace the filter set.
	The inlet net of the hood is polluted (clogged holes of the net).	Clean the inlet net or replace it for a new one.
	The shut-off damper at the hood (of the ERGO LUX extraction arm) is closed.	Open the shut-off damper.
2. Sudden vibrations of the fan are occurring.	The impeller has lost its balance	Carry out the impeller balancing.

9. Maintenance

Maintenance of the RAK filtering unit is limited, first of all, to conservation of ERGO LUX extraction arms and of the extraction fan. Maintenance steps of the ERGO LUX arms are described in the User's manual of the extraction arms.

Once a year, check the technical state of the extraction fan, according to the rules of operational use of electrical driving devices.

10. Occupational Health and Safety

Before the start and use of the RAK filtering unit, it is important to get acquainted with the contents of the Use and Maintenance Manual. All activities within the range of connection to the power supply, ought to be performed strictly according to the enclosed Connection Diagram and in conformity with the safety regulations.

WARNING

Any activities pertaining to connection to the power supply system have to be performed exclusively by an authorised person with testified qualifications and in compliance with the being in force valid safety regulations.

The appliance meets the safety requirements included in the 2006/42/EC Directive and do not require additional protection measures for safe operational use. Any activity on the device should be carried after the disconnection from the power supply system.

11. Transport and Storage

The unit ought to be stored in dry rooms and in areas of efficient ventilation and in zones free of aggressive substances. Do not put one device on top of another.

For the transport time, the device should be protected from an uncontrolled overturn and displacement (slide). Transport and reloading must be carried out with care, eliminating scratches, indents, package damage and obliteration (wiping out) of markings on the package surface.

CAUTION: Castor wheels sets, wall hanger sets, and additionally ERGO LUX extraction arms are additional equipment and are packed separately. For ERGO LUX extraction arms are enclosed special User's Manuals.

12. Terms of warranty

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

- device failures caused during the use which is in contradiction with the purpose of application and with the present Use and Maintenance Manual,
- mechanical damage and malfunctions caused by User,
- technical changes, adaptations of the device, introduced by User on one's own.
malfunction resulting from the improper transport, storage or incorrect maintenance.
- inefficiency following from the normal operational exhaustion / wear.

Infringement of the Section 3 "Reservations of Producer" of the present Use and Maintenance Manual and especially modifications undertaken by User on one's own or use in contradiction with the purpose of application – shall result in 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: **RAK**

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 May 17th, 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/*

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The appliance meets following harmonized standard:

- | | |
|-----------------------------------|---|
| ● EN ISO-12100:2012 | – “Safety of machinery – Basic concepts, general principles for design. Risk assessment and risk reduction” |
| ● EN 60204-1:2018-12 | – “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” |

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place, date

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signature of authorised person

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

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name, surname, function

of the signatory
NIP: 958 159 21 35
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56 1500 1025 1210 2007 8845 0000