Use and Maintenance Manual

Filtering unit RAK-1000-RC
RAK-2000-RC

Manufacturer:
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800O48 RAK-1000-RC 25.10.2019/EN
800O49 RAK-2000-RC 25.10.2019/EN

Contents:

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-RC 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-RC** 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-RC filtering units have been constructed for general ventilation and filtration. They can be applied everywhere there, where it is not possible to use local exhausts or their flow efficiency is not sufficient.

The appliances can be used in not large rooms as well as in premises of larger cubature – but under the condition that they are applied with a larger quantity of devices adapted to the sort of of emission of contamination.

Each device features a four-step system of the air filtration: a pre-filter, filtration pad, compact compact filter and a carbon filter absorbing the part of gaseous contamination.

The filters cannot be submitted to regeneration, thus after they reach the limit pollution degree, they should be replaced for new ones.

3. Reservations of Producer

A. Manufacturer accepts no liability for any consequences following from the operational use that is in contradiction to the purpose of application.

B. Installing of any additional elements that are not belonging to the normal device structure (or accessory set) is not acceptable.

C. Do not undertake any structural changes or constructional modifications on the device on one's own.

D. Protect the device housing from mechanical damage.

E. **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**.

F. The device cannot be used for conveying the air containing aggressive contaminants as they would have destructive effect on the device structure.

G. Manufacturer is not responsible for wounds / body laceration experienced by User during the of improper operational use.

H. **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 device	Maximum volume flow[1] [m^3/h]	Supply voltage [V]	Motor rate [W]	Acoustic pressure level [dB(A)] from distance[2]		Weight [kg]
				1 m	5 m	
RAK-1000-RC	1260	230	160	59	40	65
RAK-2000-RC	2320		2 x 160	62	63	85

[1] Volume flow has been measured at clean filters.

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

Fig. No.1 – RAK-1000-RC – Dimensions

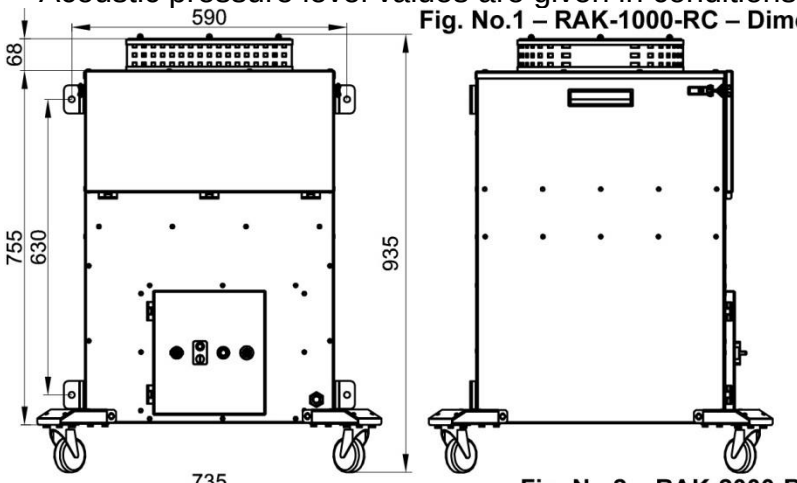
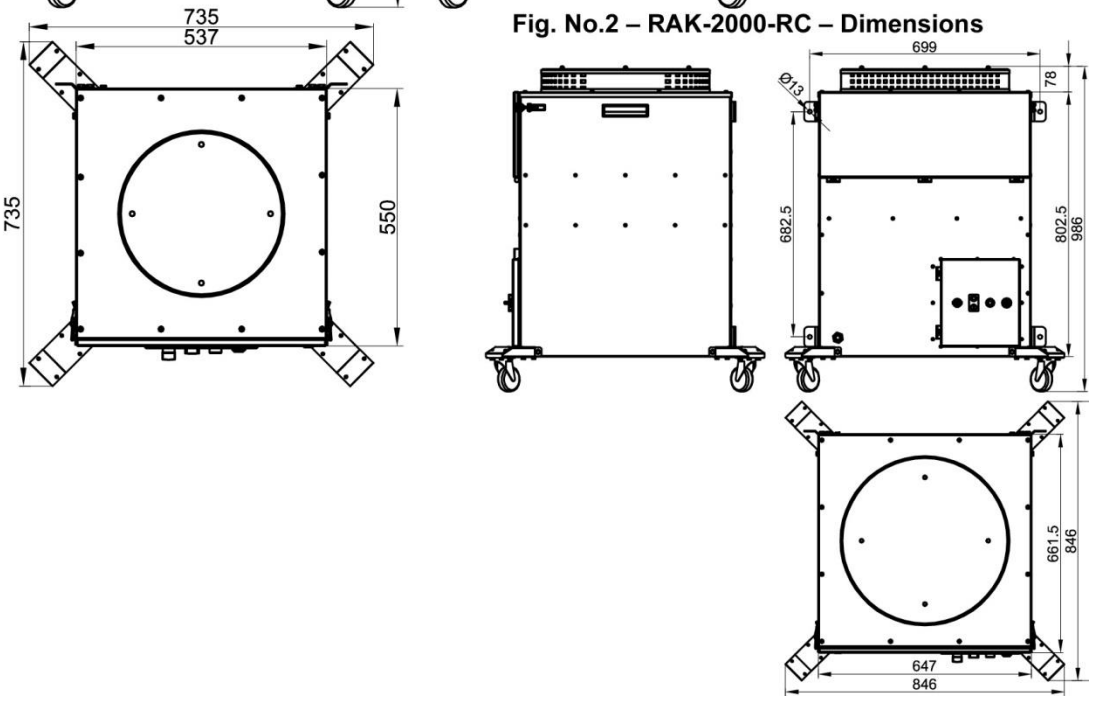


Fig. No.2 – RAK-2000-RC – Dimensions



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

The RAK-RC appliance consists of subsequent elements:

- steel sheet housing,
- duct fan WP-9-N (RAK-RC-2000 – 2 pieces),
- pre-filter (a grid of holes 0,8 x 0,25 mm),
- filtration pad PAINT STOP,
- compact filter – class **F-9**,
- activated carbon impregnated nonwoven filter (spunbond),
- 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),
- suction head.

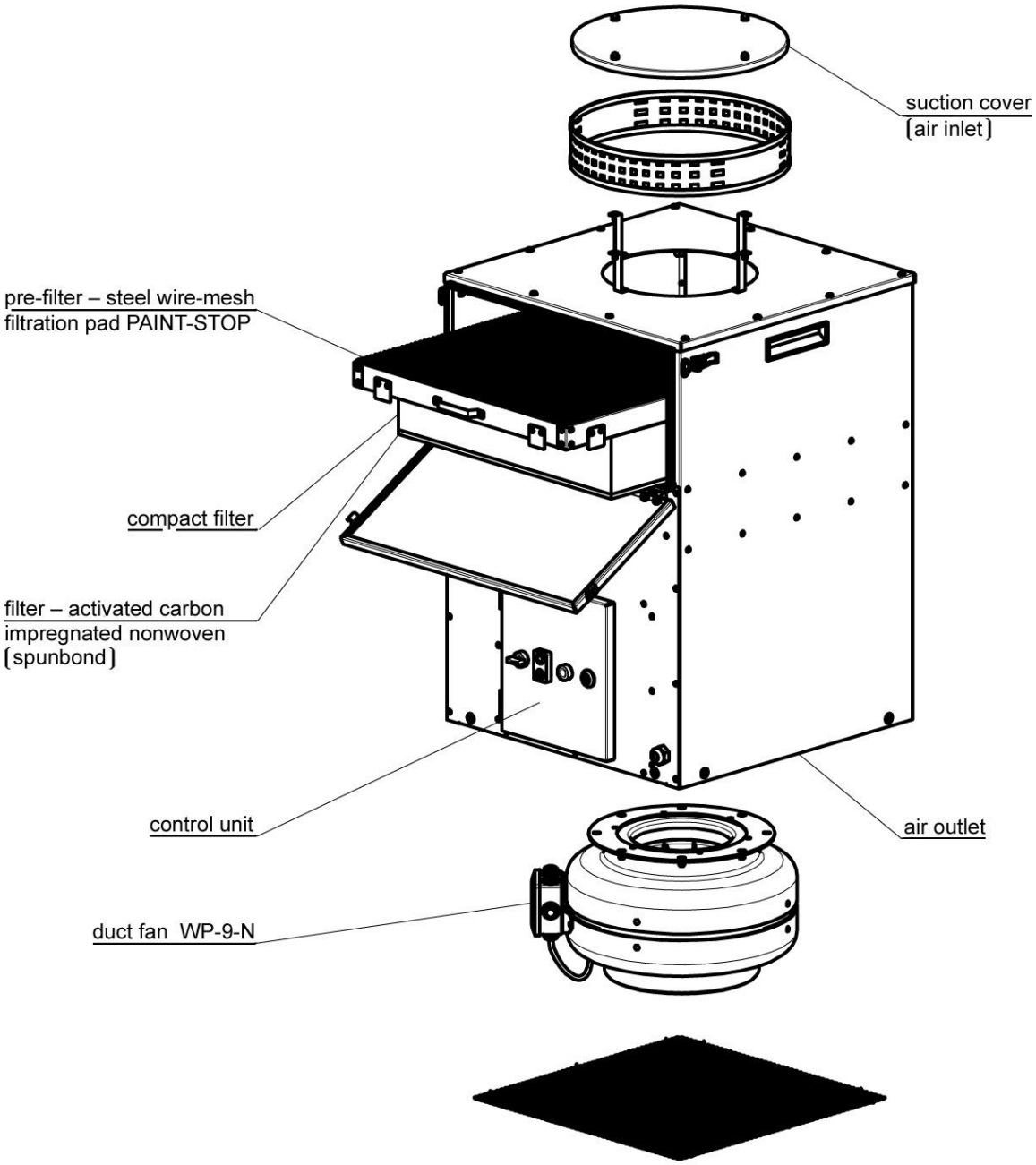


Fig. No.3 – RAK-1000-RC – Structure

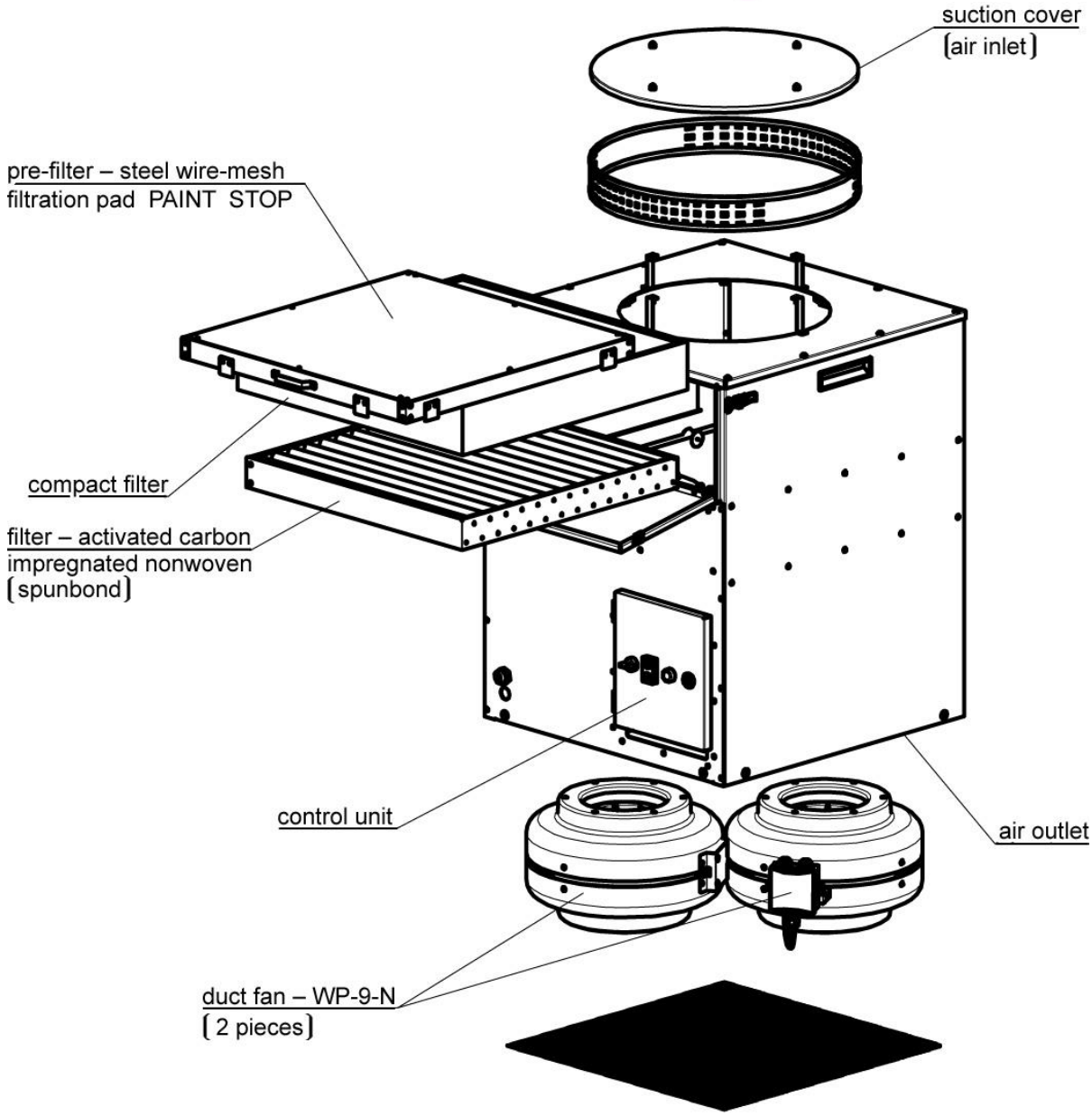


Fig. No.4 – RAK-2000-RC – Structure

Structure of the RAK-RC filtering unit is illustrated in Fig. No.3 and No.4. The contaminated air is drawn in (from above), through the suction head. While penetrating the subsequent filters, the air is being cleaned and discharged.
The outlet is located underneath the device housing. The air is entirely recirculated (returned back to the process room).
RAK-RC is installed by means of wall hangers (stationary version) or is displacing on castor wheels (mobile version). The air inlet is covered with a suction head and protected with a grill. The appliance is operated by means of a control unit. Each device version is equipped with a hour-meter and a differential pressure control (pressostat) indicating the replacement necessity of the compact filter (signalling lamp).

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 appliance must be installed exactly vertically. Both versions of the device are equipped with a 5 metres length supply cable (ended with a plug). The connection diagram is illustrated in Fig. No.6 and Fig. No.7.

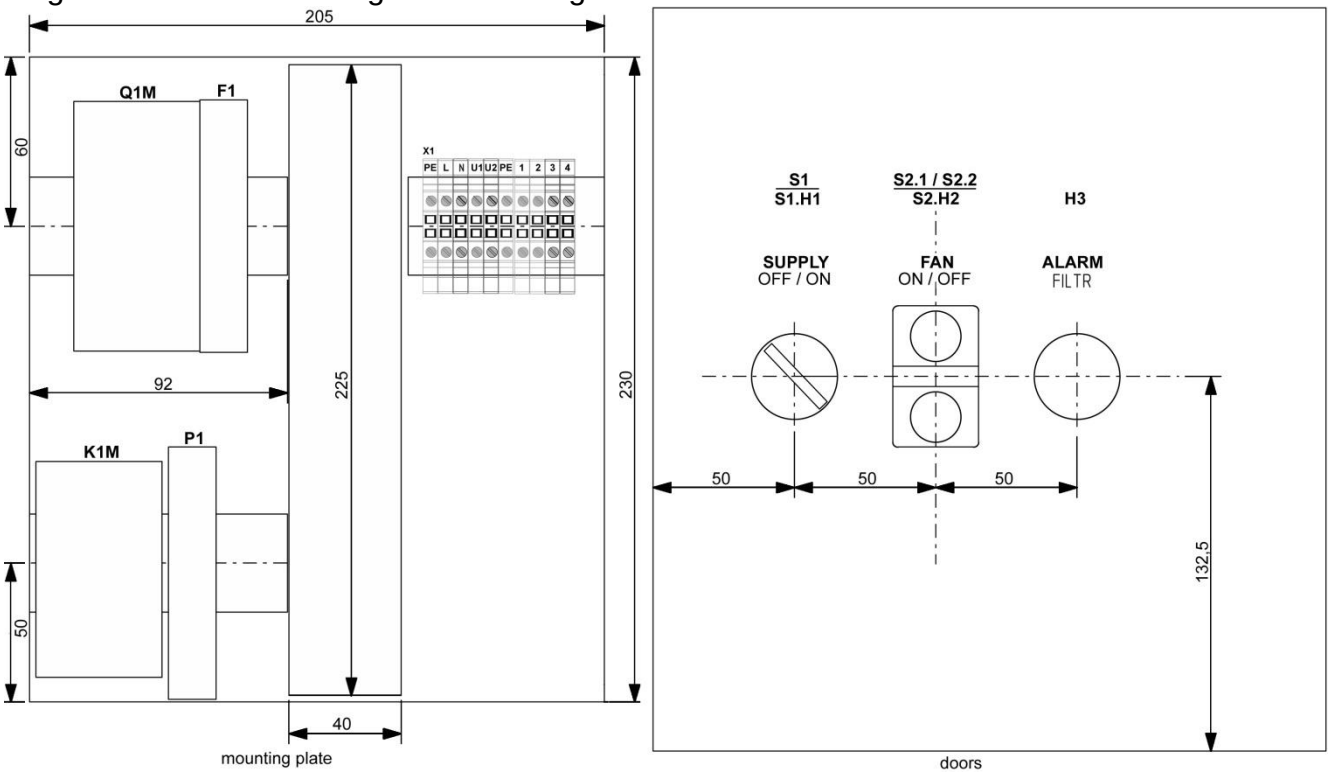


Fig. No.5 – RAK-RC – Control unit

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
- **B1** – pressure control (pressostat) – indication of the filter pollution

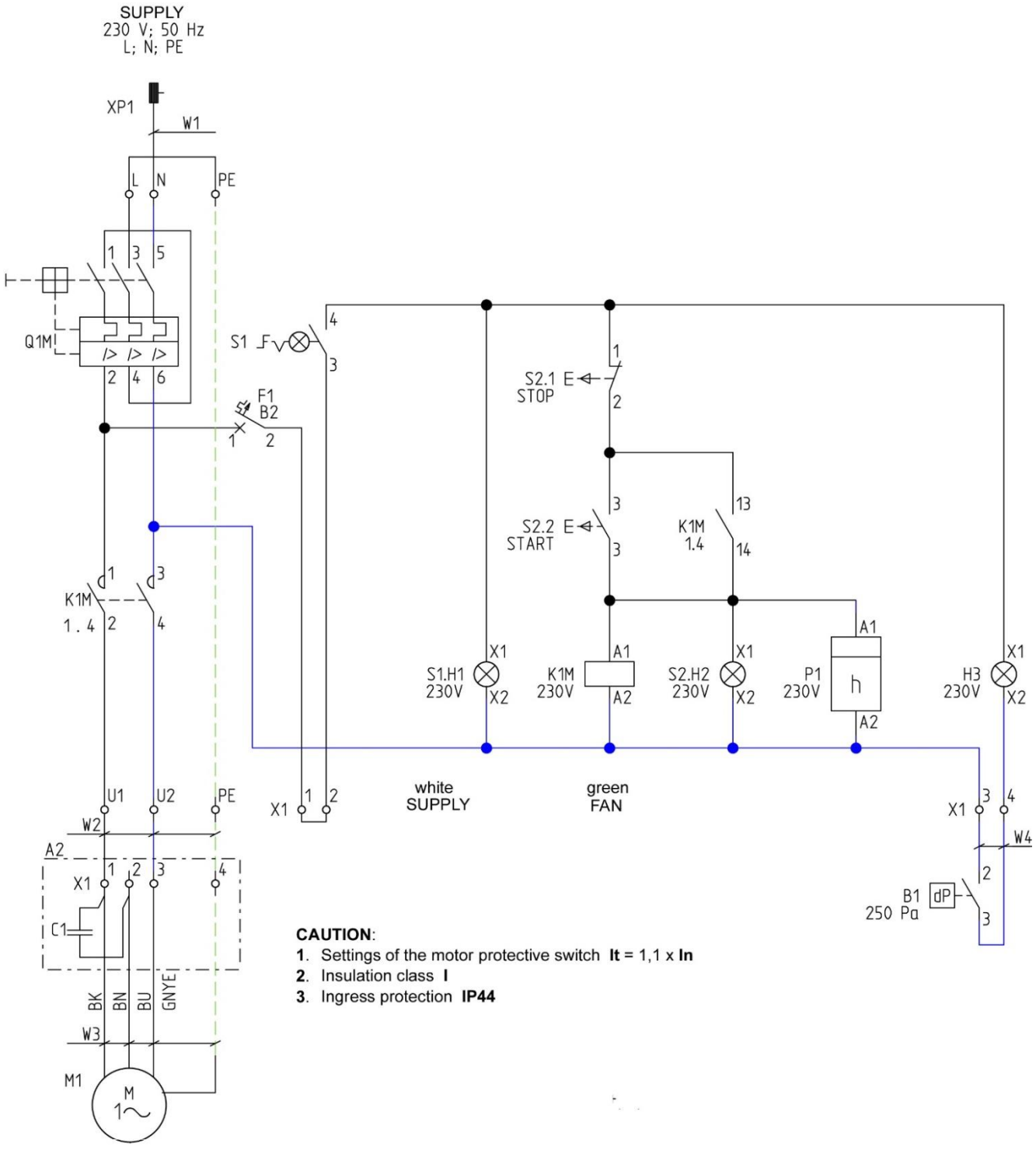


Fig. No.6 – RAK-1000-RC – Connection Diagram

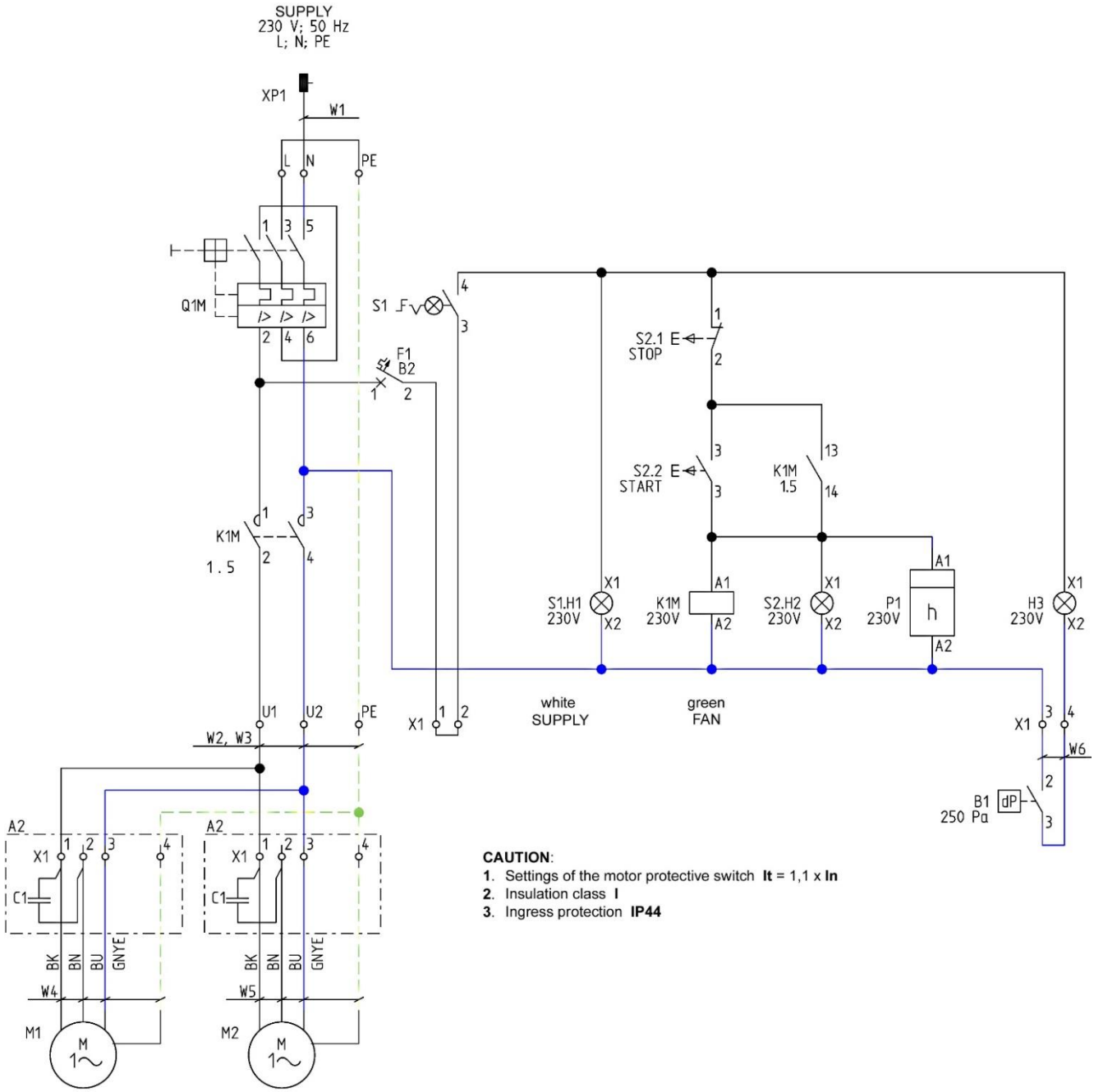


Fig. No.7 – RAK-2000-RC – Connection Diagram

7. Operational Use

In the course of operational use, follow subsequent steps:

- periodically clean the net pre-filter,
- periodically replace the filtration pad and the carbon nonwoven (spunbond) – every several months, depending on the intensity of operational use,
- periodically replace the compact filter – pressure control (pressostat) indicates the replacement necessity of the compact filter; Producer's setting of the pressure control is 250 Pa.
- observe the indications of the hour-meter, as this helps to determine the replacement frequency of the filtration pad and of the carbon nonwoven.

Typical malfunctions of the function of the RAK-RC filtering unit, their causes and corrective actions are listed in Clause 8 (Table No.6).

8. Troubleshooting Guide

Table No.6

	Problem	Possible reason	Corrective action
1.	Decrease in the suction volume flow.	Filters are polluted.	Replace the set of filters.
		The inlet net of the suction head is polluted (the holes of the inlet net are clogged).	Clean the inlet net or replace it for a new one.
2.	Sudden vibrations of the fan are occurring.	The impeller has lost its balance.	Undertake the impeller balancing.

9. Maintenance

First of all, maintenance of the RAK-RC filtering unit consists in conservation of the extraction fan. To provide reliable function of the extraction fan and to observe the rules of Occupational Health and Safety, it is recommended to undertake the technical revisions of the fan in regular periods (for example once a year).

WARNING **All technical revisions and maintenance have to be executed after the device is disconnected from the power supply system.**

In the course of technical inspections especially examine the state and function of the extraction fan, as well as the state of mechanical- and electrical connections (among them the connection to the PE protective cable).

10. Occupational Health and Safety

Prior to start and use of the filtering unit, it is important to get acquainted with the contents of the present Use and Maintenance Manual.

For the sake of safety, connect the device to the power supply system, strictly according to the enclosed Connection Diagram and in compliance with instructions included in the Section 6 of the present Use and Maintenance Manual.

WARNING **All the activities pertaining to the connection to the power supply system ought to be performed exclusively by an authorized person with testified electrical qualifications and in compliance with the enclosed Connection Diagram.**

The appliance is in compliance with the safety requirements included in the 2006/42/EC Directive and does not require any additional protection measures for safe operational use. Any activities on the device should be carried after its 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.

For the transport time, the device should be protected from an uncontrolled overturn and displacement (slide). Do not put one device on top of another.

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 and wall hanger sets are additional equipment and are placed in separate packages.

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-1000-RC**; **RAK-2000-RC**
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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• **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	signature of authorised person	name, surname, function of the signatory
KLIMAWENT S.A. **Supported Employment Enterprise** 81-571 Gdynia, ul. Chwaszczyńska 194 phone: +49 58 829 64 80 email: klimawent@klimawent.com.pl www.klimawent.com.pl	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