Use and Maintenance Manual

Filtering unit BIG-1000

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 **BIG-1000 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 **BIG-1000 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:

– **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 L285 of 31.10.2009*/

– **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 60204-1:2018-12**	– "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)"
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2. Application

BIG-1000 filtering unit is appropriate for cleaning the air contaminated with dust- and gaseous impurities, arising during various manufacturing processes.
It is perfect in removal of dry dust and fumes emitted during welding, gaseous metal cutting and during other processes, in chemical industry, food processing, pharmaceutics, plastic processing.
The appliance is not appropriate for capturing humid dust and aggressive compounds and substances causing explosion risk. The maximum temperature of the conveyed air is +60ºC.

3. Reservations of Producer

- Manufacturer accepts no liability for any consequences following from the operational use that is in contradiction to the purpose of application.
- Installing of any additional elements not belonging to the normal device structure (or accessory set) is not acceptable.
- Any structural changes or modification of the filtering unit, carried out by User on one's own are not permitted.
- Protect the housing from mechanical damage.
- **The appliance is not appropriate for conveying the air that is contaminated with a mixture of flammable substances, in the form of gas, vapour, mist or dust, which would create explosive atmosphere with the air.**
- Do not use the filtering unit for cleaning the air polluted with aggressive substances which could exert destructive effect on the device.
- Manufacturer is not responsible for wounds / body laceration caused in the course of improper operational use.
- **In the course of operational use, pay attention that any sources of ignition i.e. glowing cigarette butts (embers) would not get into the filtration chamber.**

4. Technical Data

Table No.1

Type of the device	Maximum volume flow	Maximum vacuum	Supply voltage	Motor rate	Acoustic pressure level from distance		Consumption of compressed air	Weight	Quantity of connections for ERGO LUX extraction arms
					1m	5m			
	[m³/h]	[Pa]	[V / Hz]	[kW]	[dB(A)]			[kg]	[pcs]
BIG-1000-O	1500	2000	230 / 50	1,1	75	61	0,7	136	1
BIG-1000-R								140	

CAUTION: BIG-1000-O – stationary appliance with the air discharge outside of the building
BIG-1000-R – mobile appliance with the air recirculation

Table No.2 – Replaceable equipment – Cartridge filter

	Type	Weight [kg]	Filtration efficiency [%]	Quantity of filters [pcs]
	PN105032T	4,2	99,9	1

Table No.3 – Additional equipment

Filter of activated carbon impregnated nonwoven (spunbond)			
	**Type**	**Weight** [kg]	**Remarks**
	FCR-BIG-1000	0,6	The complete filter consists of nonwoven (spunbond) along with the protective net, all these elements are placed inside the cartridge filter.
	WFCR-BIG-1000	0,3	Carbon spunbond constitutes replaceable element of the filter.

5. Structure and Function

BIG-1000 filtering unit consists of:

- steel sheet housing,
- radial fan,
- spark catcher,
- high-efficiency cartridge filter – polyester paper – filtration efficiency 99,9%,
- filter of activated carbon impregnated nonwoven (spunbond) – additional equipment
- pneumatic filter regeneration system – set: compressed air tank, electromagnetic valve, dewatering valve to discharge the water from the compressed air system.
- manometer – to measure the pressure inside the compressed air tank
- waste container – to collect the dust (capacity 30 litres),
- control unit – to switch on the system and to control its function,
- a set of four castor wheels for mobile version (the stationary version is placed on four legs that have to be fastened to the floor).

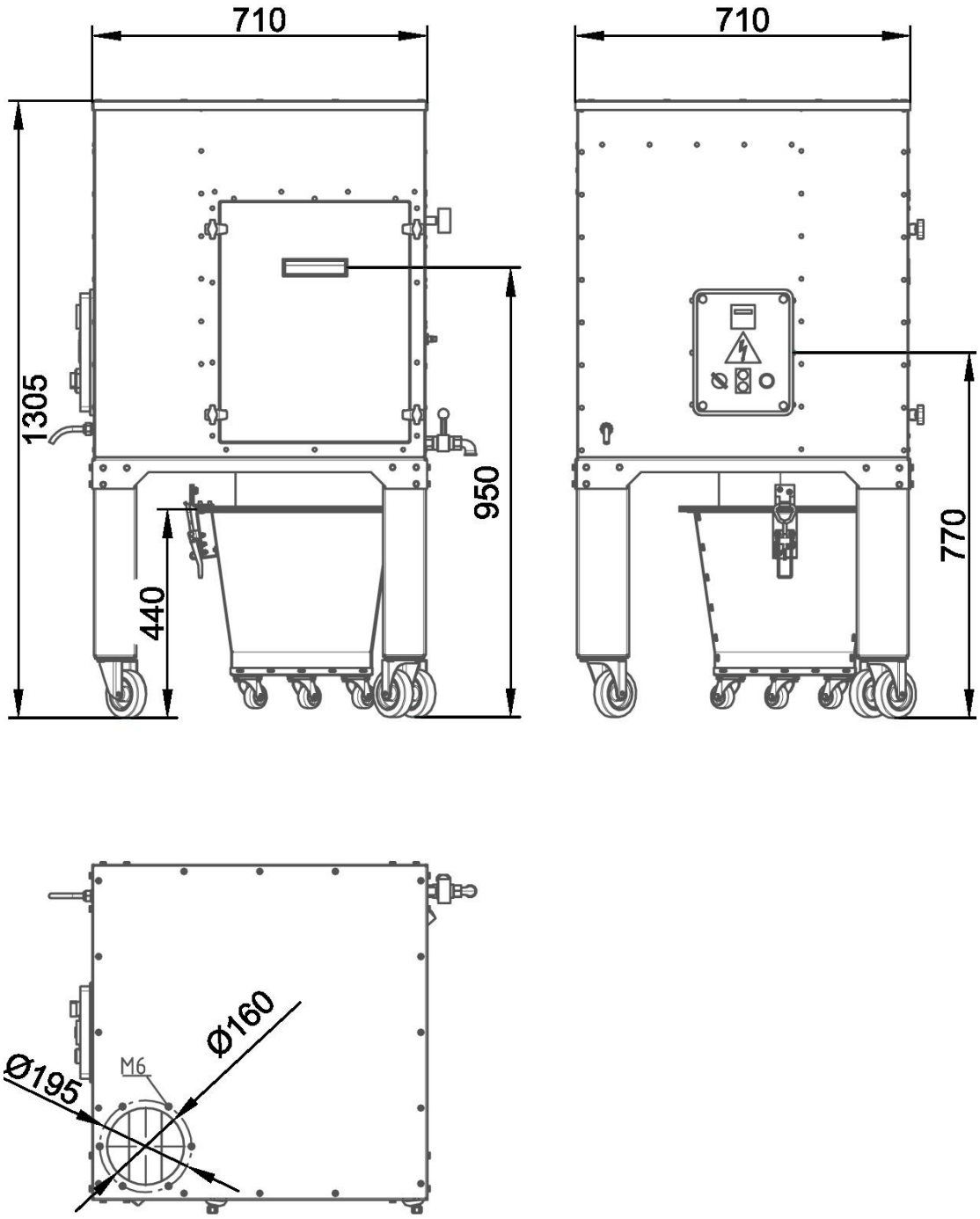

Fig. No.1 – Dimensions of the filtering unit BIG-1000-R

The mobile version of the BIG-1000-R filtering unit is equipped with four castor wheels. There is no outlet connection, whereby the cleaned air is returned into the process room through the holes within the bottom cover of the device.

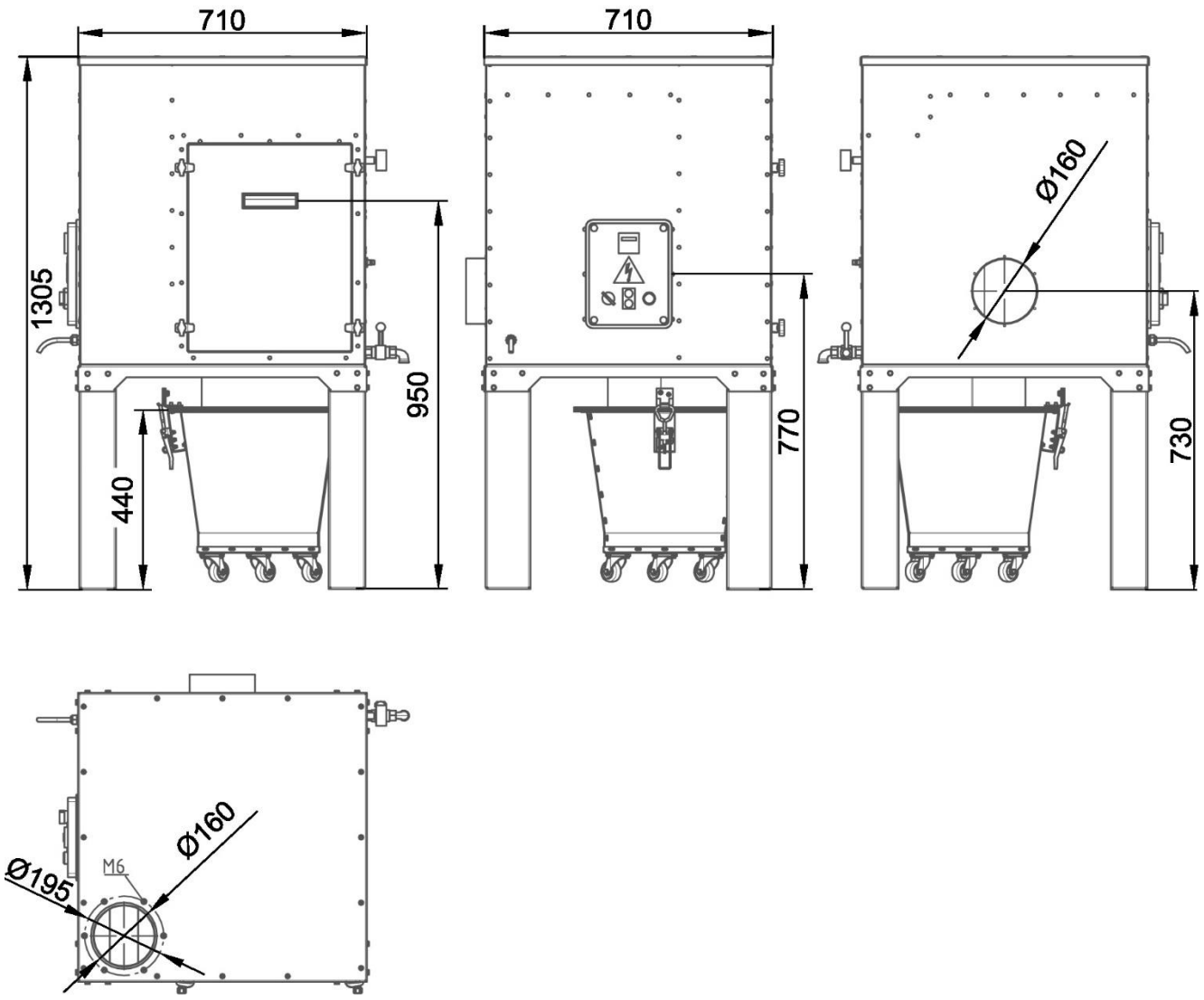

Fig. No.2 – Dimensions of the filtering unit BIG-1000-O

The stationary version of the BIG-1000-O filtering unit is equipped with outlet fitting piece for connection to the extraction system. The cleaned air is removed outside of the building.

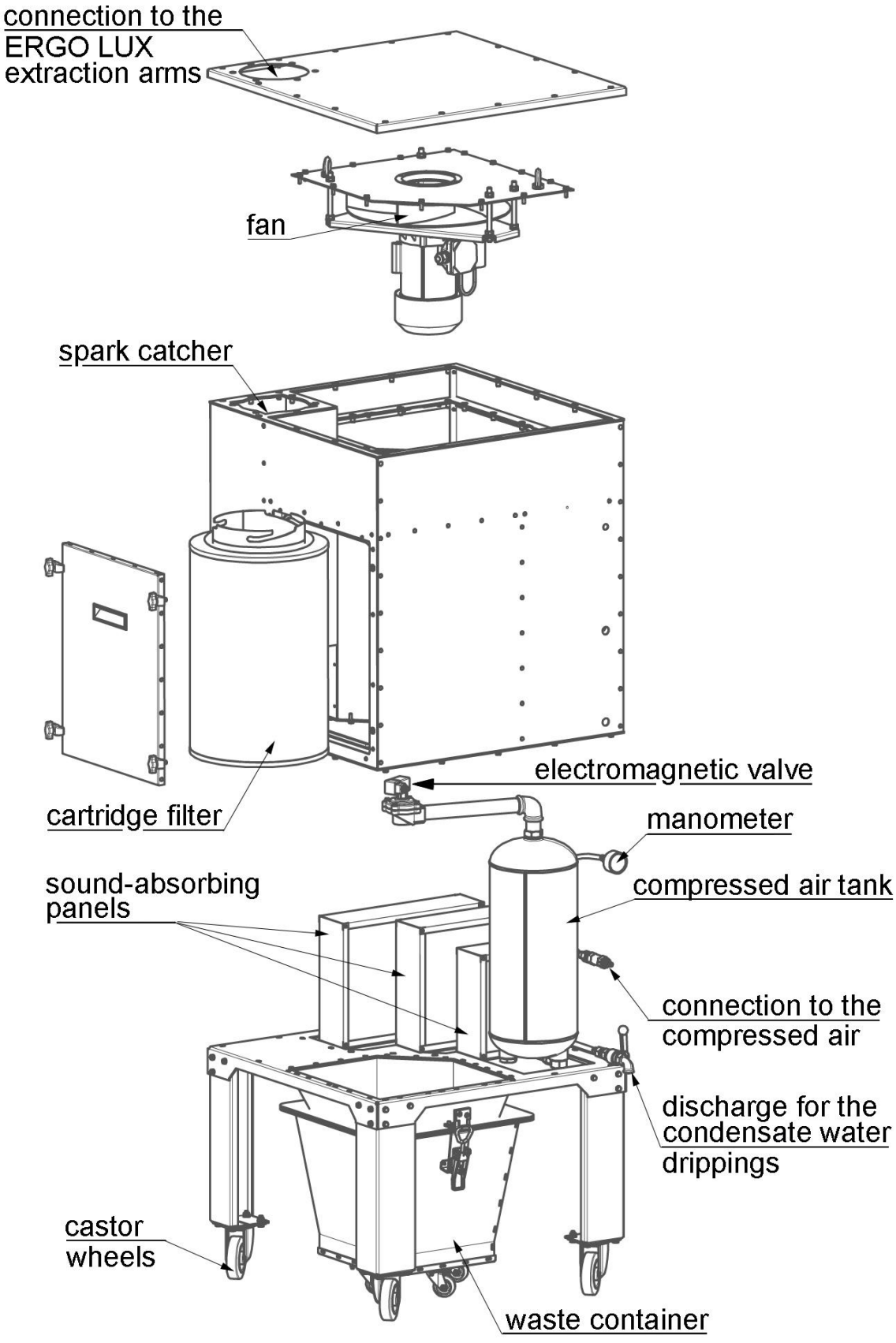

Fig. No.3 – Structure of the filtering unit BIG-1000-R

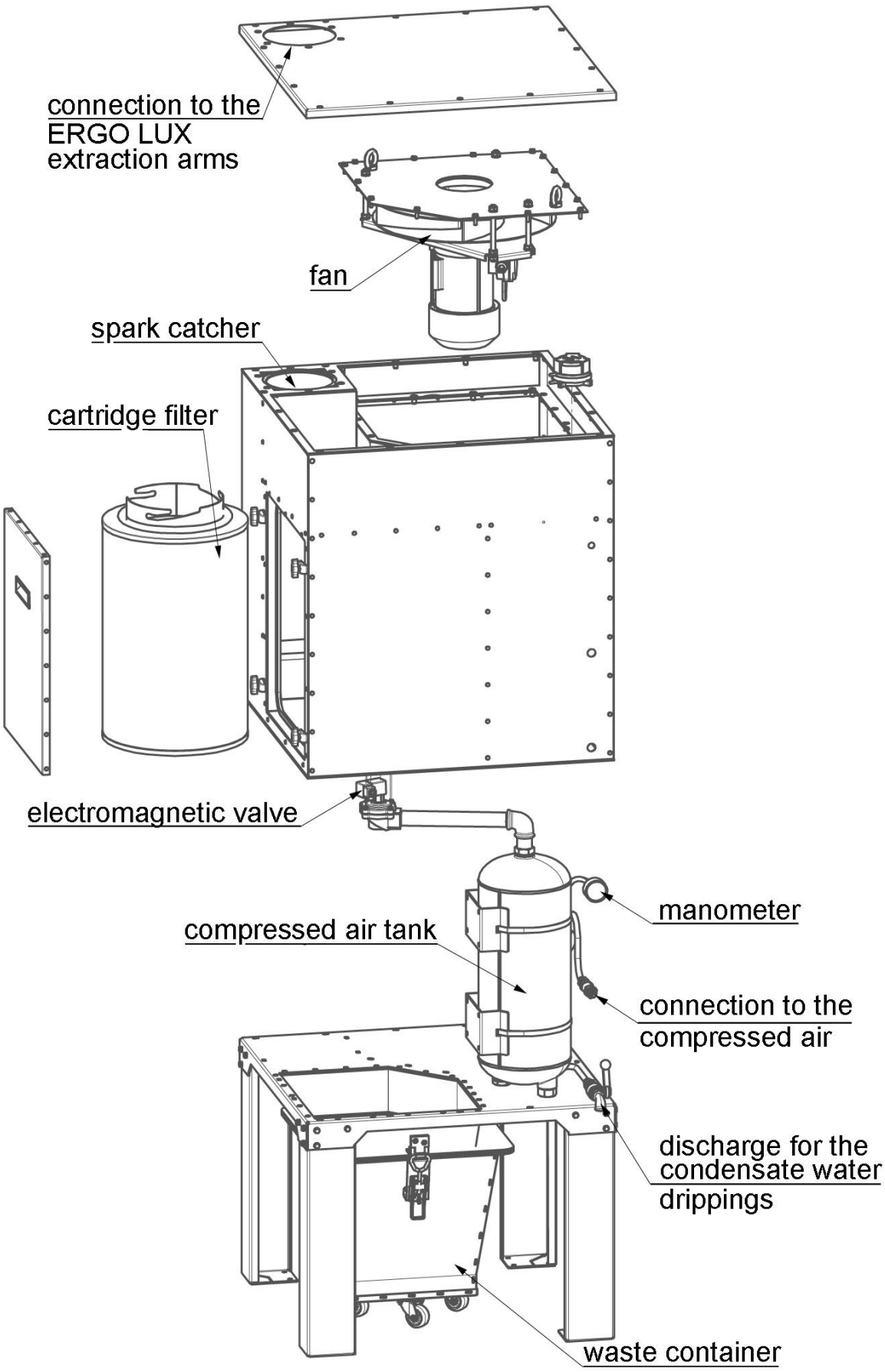

Fig. No.4 – Structure of the filtering unit BIG-1000-O

The filtering unit is equipped with a spark catcher, to avoid entering the welding sparks into the device, in case when the sparks would get sucked into the extraction arm during welding activities.

6. Assembly and Start-up

The mobile version of **BIG-1000-R** requests installing the four castor wheels, whereas the stationary version needs fastening of its legs to the floor.
Both, **BIG-1000-O** and **BIG-1000-R** are adapted for installing of the ERGO LUX extraction arms of workrange 2 or 3 metres and of diameter 160 mm.
For the stationary version, it is admissible to install an extraction arm of workrange 4 metres, but the legs of the device must be necessarily fastened to the floor.
Before the start-up, connect the filtering unit to the external compressed air installation of pressure 6 – 8 bar.
ERGO LUX extraction arms must be mounted, as in the **Fig. No.1** and **Fig. No.2**.

The ERGO LUX extraction arms are additional equipment and are delivered on separate order. Installing, maintenance and operational use of those extraction arms are described in Use and Maintenance Manual of the extraction arms.

Fig. No.5 – Control unit of the filtering unit BIG-1000

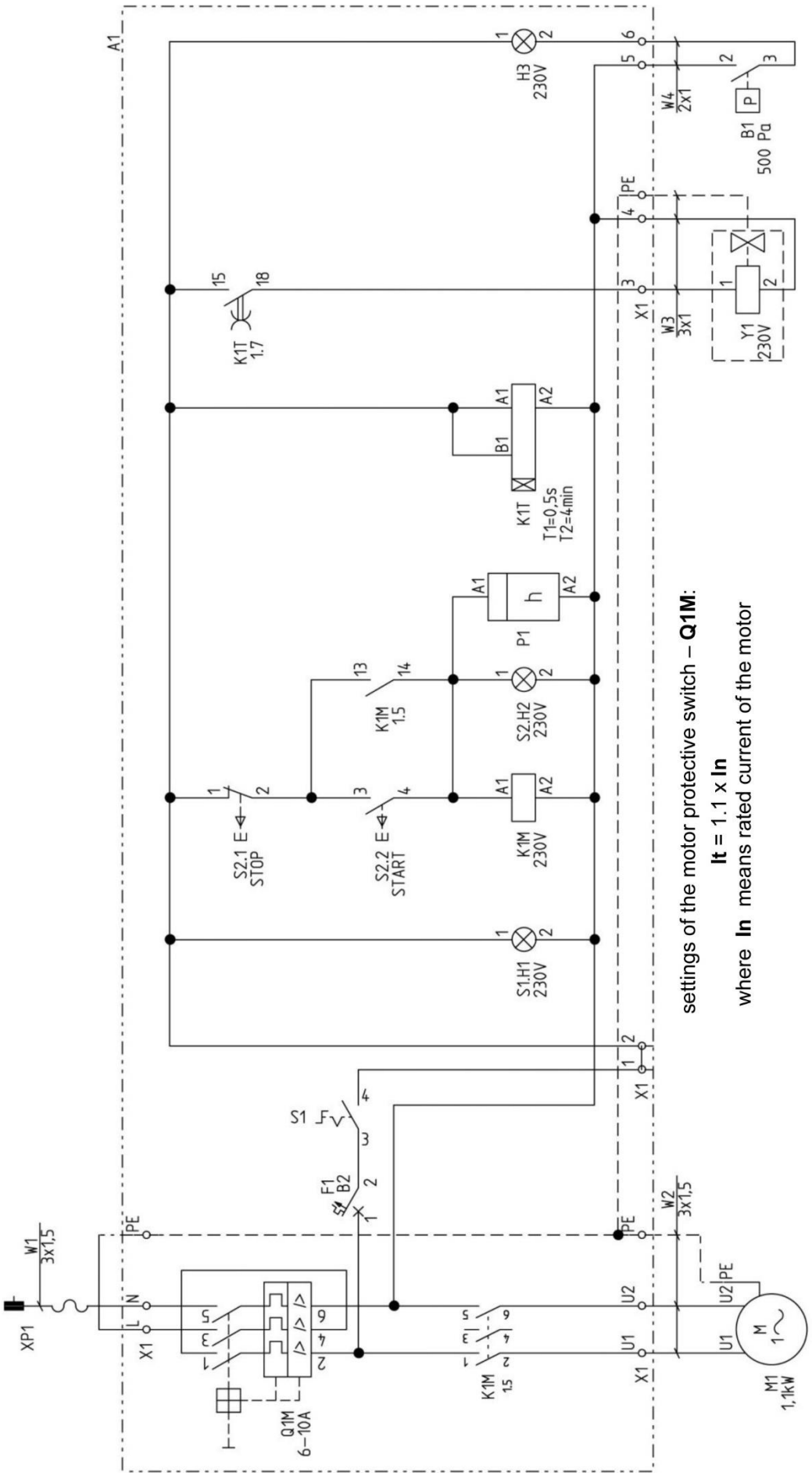

Fig. No.6 – Connection Diagram – BIG-1000

The filtering unit is equipped with a five metres long power supply cable, ended with a plug.
To energise the device, simply insert the plug into the socket.

7. Operational Use

Function of the filtering unit is described in Fig. No.4.

START-UP OF THE DEVICE:

1. Open the compressed air valve.
2. Insert the plug into the socket.
3. Switch on the motor protective switch **Q1M**.
4. Switch on the power supply by setting the **S1** switch into position "**ON**" ; this will be indicated by the white lamp **S1.H1**.
5. The filter cleaning system starts – **K1T** relay controls opening and closing of the electromagnetic valve. Every 4 minutes the valve is opening, the compressed air impulse strikes the filter to clean it.

FUNCTION:

1. Press the **S2.2** "**START**" pushbutton; the fan will switch on – this will be indicated by the green **S2.H2** signalling lamp.
2. The appliance is in operation, the filters are cleaned every 4 minutes.

DISCONNECTION OF THE DEVICE:

1. Press the **S2.1** "**STOP**" pushbutton; the green **S2.H2** signalling lamp goes off; the fan stops.
2. Disconnect the power supply by setting the **S1** switch into position "**OFF**"; The white **S1.H1** lamp will go off.

The control unit is equipped with a **H3** signalling lamp, indicating the excessive filter contamination. The built-in pressure control (pressostat) controls the air flow, and upon excessive pressure resistance activates the yellow **H3** signalling lamp.
The hour-meter (on the control unit door/cover) indicates the summary time of the device operational use.

Parameters of the **K1T** time relay is adjusted into subsequent values:
– impulse time **T1** – 0,5s
– idle time (between the impulses) **T2** – 4min

CAUTION:
Do not change the time settings in the time relay. If necessary, contact KLIMAWENT S.A.

The cartridge filter is made of polyester paper. Activated carbon impregnated nonwoven (spunbond) filter is placed inside the cartridge filter. Its shape is a sleeve of a diameter that matches the inside diameter of the cartridge filter. (The sleeve should be inserted into the cartridge filter). Subsequently, a metal net cylinder should be inserted into the sleeve.
The metal net protects the nonwoven pad from displacement during the filter cleaning by means of compressed air impulses.

Maintenance of the device consists in servicing of the ERGO LUX extraction arm, (which is described in the Use and Maintenance Manual of the extraction arms), and in maintenance of the filters themselves.

Maintenance of the filters: periodically replace the carbon nonwoven (spunbond) – every several months, (depending on the operational conditions) and replace periodically the cartridge filter (replacement – every 1 – 2 years, depending on the intensity of use).
Once a week, it is recommended to remove the filters from the device, clean them with the compressed air stream, to strike off the deposited dust.

Remember to empty the waste container. First, open the clasp locks of the container, draw it out and remove the foil bag with the dust. Put in a new bag, insert the container and close the clasp locks afterwards.
CAUTION: Manufacturer do not deliver the foil bags for waste.

8. Troubleshooting Guide

Table No.4

	Problem	Possible reason	Corrective action
1.	Drop in intake volume flow.	The filter is clogged.	Clean the surface of the filter by striking off the dusts by a “dry” mode” (see Section 7) or replace the filter for a new.
2.	Bad smells are not eliminated.	Active carbon nonwoven (spunbond) is worn out.	Replace the activated carbon impregnated nonwoven (spunbond).
3.	Dust emerges in the chamber of the electromagnetic valve.	The cartridge filter is damaged.	Replace the faulty cartridge filter.
4.	Sudden vibrations of the fan are occurring.	The impeller is damaged.	Replace the impeller for a new.
5.	The ERGO LUX extraction arm is falling.	Incorrectly adjusted friction brake of the joint.	Increase the tension upon the frictional disks of the brake in the joint by tightening the adjustment nuts.
6.	The ERGO LUX extraction arm is automatically setting (turning) always into the same position.	The rotation axis of the swivel is not positioned vertically.	Carry out the positioning of the mounting flange of the extraction arm to set the rotation axis vertically, or put the whole device stably on the levelled even floor.
7.	The device stops – **S1.H1** lamp “**SUPPLY**” is not lighting. The fan does not start.	**Q1M** motor disconnector activated, **S1** switch is faulty, **F1** protection is switched off.	Disconnect the plug of the socket. Check the motor switch and the **S1** switch and the protections. Switch on all these replaced elements.

9. Maintenance

High efficiency of the automatic filter regeneration system (repeated impulses of compressed air) guarantees durability and reliable, long-life function of the cartridge filter and limits the maintenance to the minimum. Filter cleaning proceeds automatically without interruption of the filtration process and therefore not reducing its efficiency.
In general, the device construction provides its operational use without the routing, everyday technical supervision.
In case when any defective function is by noise or visually noticed, undertake technical revision, (see Table No.4).
Within the scope of periodical controls, (every 12 months), check the technical state of the fan, according to the operational rules for the electrical driving devices.
During the maintenance check the mechanical, electrical and pneumatic connections.

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

Periodically, remove the condensate water and impurities from the compressed air tank. Periodically, once a year, control the state of the compressed air tank.
If there are corrosive changes (losses) replace the tank for a new one.

To replace the cartridge filter, follow subsequent steps:
– remove the access cover of the filter,
– turn the filter anti-clockwise, to disconnect the twist coupling between the filter and the housing,
– remove the filter itself,
– install a new cartridge filter, following the above mentioned steps in reverse sequence.

Caution: After the cartridge filter is removed, it is possible to check the state of the nonwoven (spunbond) filter, replace it when necessary.

Maintenance of the ERGO LUX extraction arms ought to be executed strictly according to the directions in the User's Manual of the ERGO LUX extraction arm.

directions in the Use and Maintenance Manual of the ERGO LUX extraction arms.

10. Occupational Health and Safety

Start up and the operation use are only admissible after getting acquainted with the contents of the present manual. In the aspect of safety, BIG-1000 will not cause hazard, when the instructions in the present Use and Maintenance Manual and the general rules of Occupational Health and Safety are observed**.**

WARNING **Any activity associated with repair/technical revision has to be executed exclusively after the device is switched off and disconnected from the power supply system.**
Additionally, cut off the device from the power supply before opening the ZE-BIG-1000 control unit housing.

ERGO LUX extraction arms will not cause hazard to the personnel/people in the vicinity, under the condition that they are correctly and firmly installed to the filtering unit housing.

11. Transport and Storage

The device has to be stored in closed rooms and in dry and well ventilated area, free of aggressive substances. Do not put one device on top of another (no stacking).
During the transport, protect the device from uncontrolled slide / displacement and from overturn. Transport, loading, reloading should be carried out in a way that eliminates scratches, mechanical damages, indentations. Mind that the designations/inscription on the package would not get loose, or obliterated
Caution: ERGO LUX extraction arms are additional accessory and are packed separately. To the ERGO LUX extraction arms are enclosed separate operational 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:

- 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.

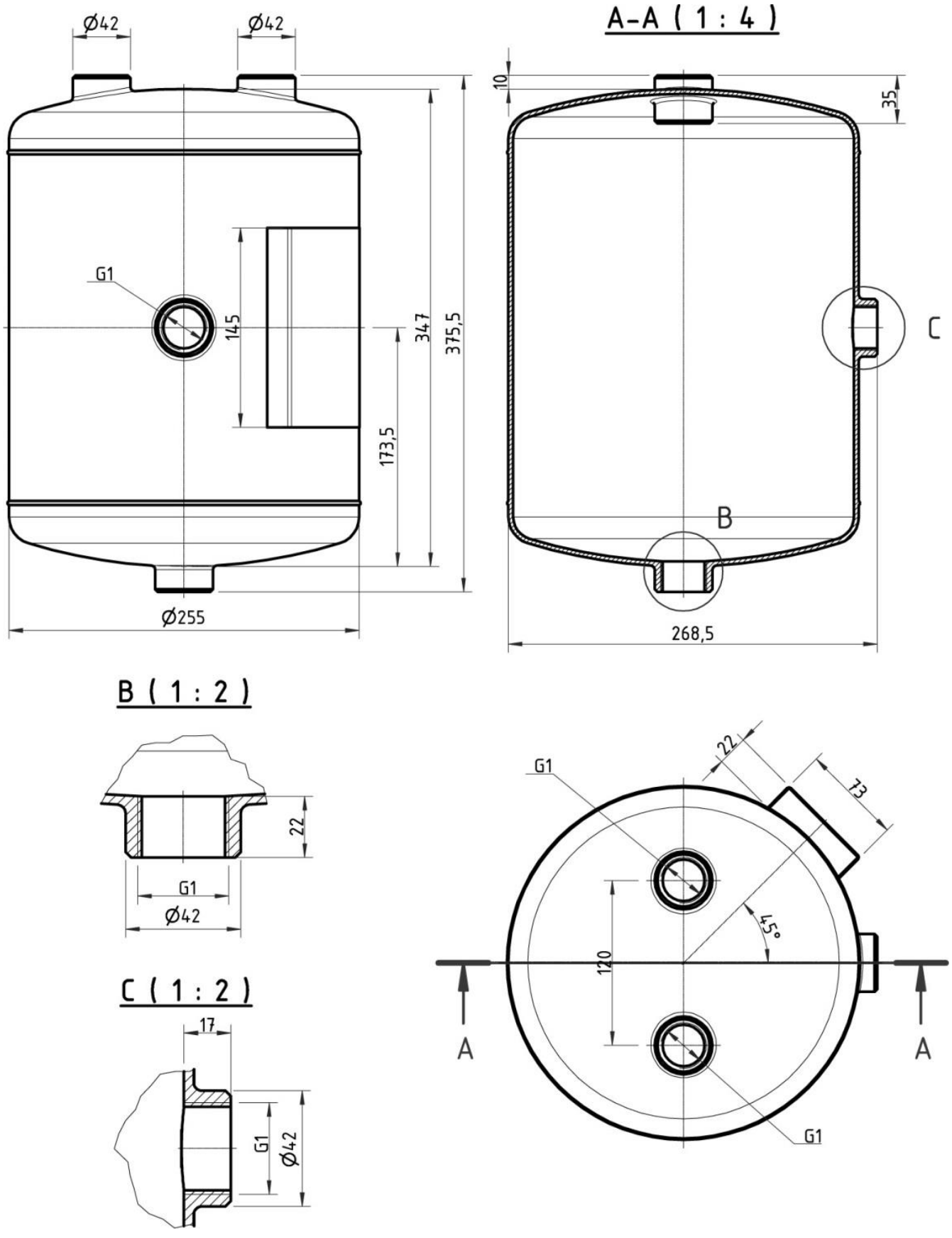

Fig. No.7 – Compressed air tank

Operational Instruction of the Compressed Air Tank

I. Technical data of the compressed air tank

- type of the tank: 35 – 35,
- maximum operational pressure: $\mathbf{P_s}$ = 10,0 bar
- maximum operational temperature: $\mathbf{T_{max}}$ = +100°C
- minimum operational temperature: $\mathbf{T_{min}}$ = -40°C
- capacity of the tank: **V** = 15 litres

II. Range of application

The tank is designed for use in pneumatic installations. The operating medium is the compressed air of operational pressure equal or less then pressure $\mathbf{P_s}$.

III. Conditions of installing and maintenance

1. The compressed air tank can be installed in the pneumatic installations where the operational medium is the compressed air and the highest pressure does not exceed the $\mathbf{P_s}$ operational pressure. **This condition ought to be fulfilled by the company who is installing the tank**.
2. The tank ought to be installed in a way providing its durability, tightness and in such a configuration that the outlet connection is located at the lowest bottom location.
3. The tank has to be fastened to the supporting structure and positioned in such a location where it would not be exposed to outer factors and to direct mechanical destructions and during the operational use it should not be exposed to vibrations that could contribute to a fatigue crack.
4. During any technical revision or repair of the pneumatic installation it is important to check the correctness and state of the tank mounting (screw connections, welds and their technical state).
5. If there is a damage in the wall (crack, indentation, infringement of the mounting stability, etc.) and the tank was relatively exposed to extreme temperatures that could change the structure of the wall material – **immediately the tank ought to be excluded from operational use**.
6. Do not dismantle the tank or its structural parts, while it is under pressure or the supply valve of compressed air is open.
   Any activities related to maintenance or cleaning the tank ought to be executed when the tank is emptied and the control unit is switched off.
7. Do not execute any welding operations close to the tank.
8. During the technical revisions, the tank ought to be emptied from condensate water through the condensate drainage device in the bottom part of the tank.
9. For the compressed air tank is foreseen 40 years of operational use. After this period the tank should be excluded from its operational use. The withdrawn from operation tank must be destroyed and its designations / markings must be wiped out, so the tank would never be returned to operation.

Do not introduce any constructional changes / modifications on the compressed air tank, its application in contradiction with its purpose is forbidden.

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**, **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: **BIG-1000**
serial number: …….. year of production: ……..

meets the requirements of the subsequent European Directives:

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……	……	……
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

NOTES:

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