

USE AND MAINTENANCE MANUAL



Rail Extraction System KOS-L/SSAK

Contents:

- 1. INTRODUCTION2
- 2. PURPOSE2
- 3. RESERVATIONS OF MANUFACTURER2
- 4. TECHNICAL DATA2
- 5. STRUCTURE AND FUNCTION2
- 6. ASSEMBLY AND STARTUP5
- 7. OPERATIONAL USE5
- 8. TROUBLESHOOTING GUIDE12
- 9. MAINTENANCE AND REPAIR12
- 10. OCCUPATIONAL HEALTH AND SAFETY12
- 11. TRANSPORT AND STORAGE12
- 12. TERMS OF WARRANTY12
- 13. DECLARATION OF CONFORMITY14

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1. INTRODUCTION

The purpose of the present Use and Maintenance Manual is to supply User with directions within the range of application, assembly, start-up and operational use of the **KOS-L/SSAK** Rail Extraction System.



Prior to assembly at the place of operation and use, it is important to get thoroughly acquainted with the contents of the present instruction.



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 **KOS-L/SSAK** meets the requirements of the current state of technology as well as the safety and health assurances included in:

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

Additionally, it is in accordance with the subsequent harmonised standards:

EN ISO-12100:2012 Safety of machinery – General principles of design – Assessment and reduction of hazard

EN 60204-1:2010 Safety of machinery – Electrical equipment of machines – Part 1: General requirements

2. PURPOSE

KOS-L/SSAK rail extraction system has been engineered for effective removal of the exhaust volume emitted by vehicle from the garage. The system is especially constructed for vehicles of permanent stationing place i.e. fire department depots, medical emergency units and other rescue units, where absolute readiness for emergency action departure is required. It can be applied for vehicles with a side- or back exhaust pipe. If the exhaust pipe is ended under the carbody, apply appropriate extension.

3. RESERVATIONS OF MANUFACTURER


- Maintenance and any repair can be executed exclusively by an authorised person.
- During the operational use, proceed the rule – the served vehicle engine is allowed to run at maximum rotations for 60 seconds only.
- Prior to installing – check the load carrying capacity of the ceiling / wall, in a place where the unit shall be installed; unsure setting of mounting bolts could result in uncontrolled device detachment, its damage and risk to the operator / people in the vicinity.
- 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 that are not belonging to the normal device structure (or accessory set) is not acceptable.
- Do not introduce any structural or constructional modifications of the system on one's own.
- While the served vehicle leaves the depot garage, its velocity must not exceed 10 km/h.

4. TECHNICAL DATA

Table No.1

Type	Recommended volume flow in the funnel [m ³ /h]	Flow resistances [Pa]	Exhaust hose			Inlet diameter of the funnel [mm]
			internal diameter [mm]	length [m]	thermal resistance [°C]	
KOS-L/SSAK	1200 – 1500	1000 – 1300	150	5	200	170

Table No.2

	Type	Length of the segment	Cross-sectional dimension	Cross-sectional area	Unit weight	weight of the segment
		[m]	[mm]	[cm ²]	[kg/m]	[m]
	KOS-L	1,25	160 x 240	384	14,2	17,75
		2,5				35,5

5. STRUCTURE AND FUNCTION

KOS-L/SSAK system consists of following elements:

- self-tightening suction duct **KOS-L** – constructed of steel segments of length **2,5 or 1,25 m** – joined together to the required length, depending on the needs
- trolley – extractor L
- control unit
- duct suction fitting piece – extractor L
- ventilation hose
- electromagnet assembly – supply 24V
- suction funnel

Along the suction duct displaces the trolley of the extractor. The suction fitting piece (attached at the trolley) displaces under the rubber apron. The rubber apron covers the perforated side wall of the duct. Vacuum created by the extraction fan seals up and tightens the rubber apron to the side wall. Rubber bumpers (installed at the duct ends) slow down the trolley movement at limit positions. For description of the KOS-L/SSAK rail extraction system see Fig No.1.

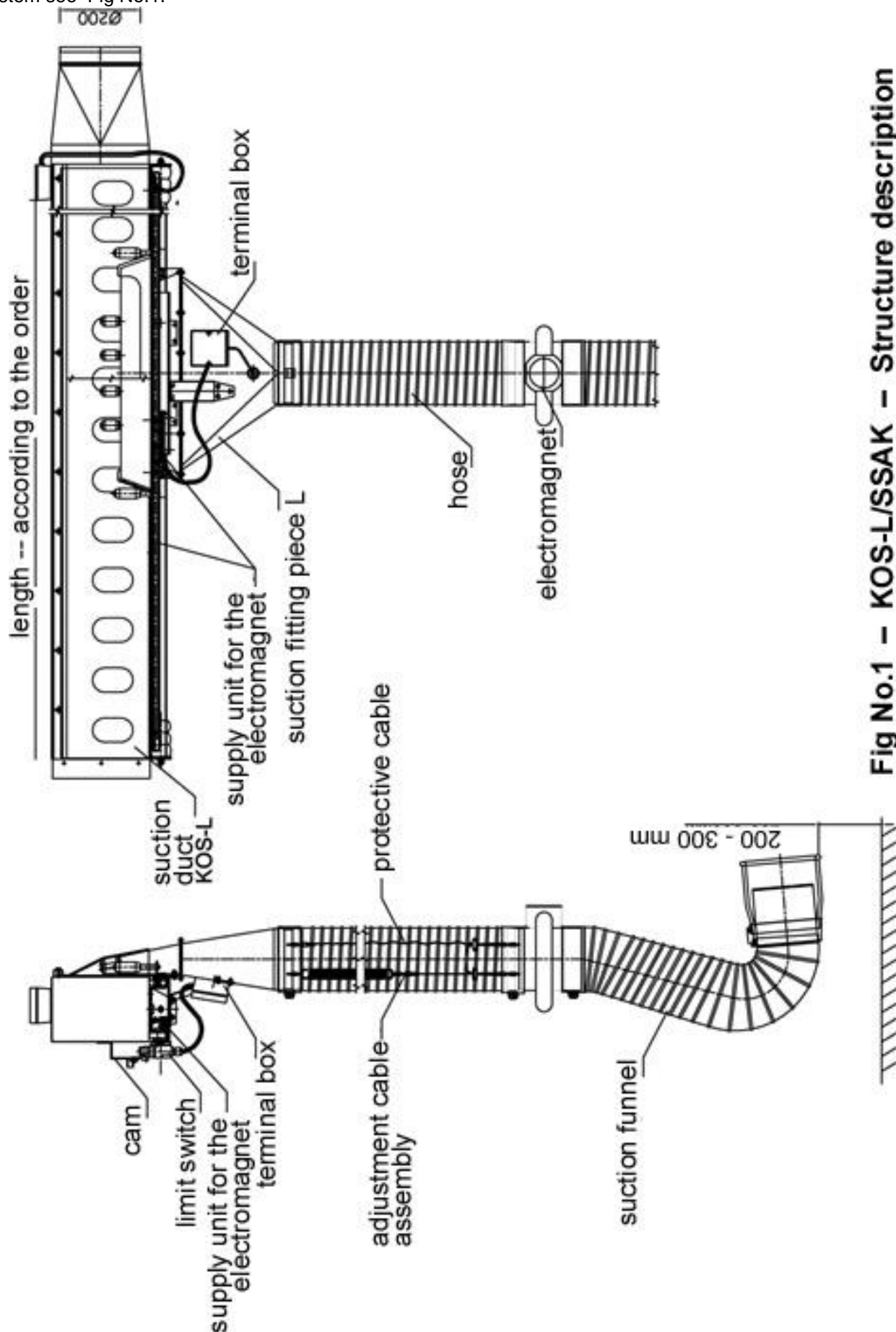


Fig No.1 – KOS-L/SSAK – Structure description

The discharge ductwork can be connected to each end of the suction duct, as well as at its side wall. The recommended installing height of the suction duct is 3,5 up to 4 metres.

On the vertical hose section is located a handle with an electromagnet anchor which serves for hose fastening on the carbody (to the gripper plate crewed on the side wall or back wall of the carbody). Inside the exhaust hose there is an electrical cable to supply the electromagnet. User can manually disconnect the power supply from the electromagnet by pressing the pushbutton **B2**.

At the end of the exhaust hose is fastened adequately shaped suction funnel, which should be engaged at the exhaust pipe of the served vehicle. The electromagnet is supplied (24V DC) through the current strip (which is fastened on the guide supporting strip and the duct body). The supply voltage is received by sliding on the reception gliding elements (fastened on the block on the trolley).

Controlling proceeds by means of a cam fastened on the suction duct. The cam activates the limit switch that is fixed at the trolley. For description see Fig. No.2, No.3, No.4.

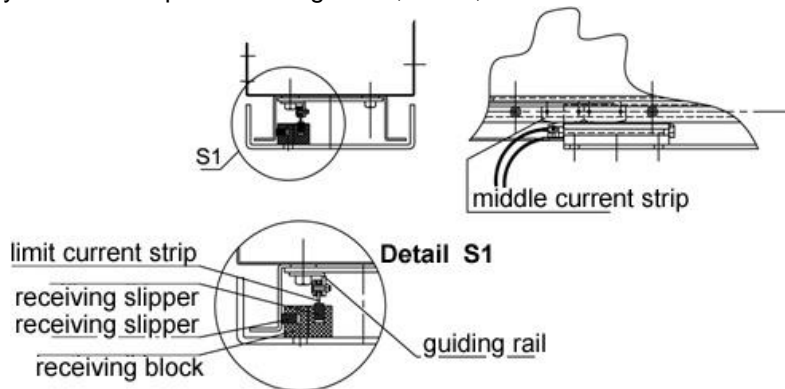


Fig. No.2 – KOS-L/SSAK – Supply, current strips

When the vehicle enters the garage, the exhaust hose should be fastened through the electromagnet to the gripper plate (on the sidewall or at the back of the carbody). The funnel inlet should be positioned right opposite the vehicle exhaust pipe with a small distance. The “funnel-exhaust pipe” distance must allow safe funnel disconnection upon departure.

Upon vehicle departure from the garage, the trolley is being pulled on the guide track, along with the vehicle and the limit disconnecter (at the end of the duct) automatically disengages the funnel (and hose), right at the moment when vehicle leaves the garage. After departure, the spring inside the exhaust hose lifts the hose to home position.

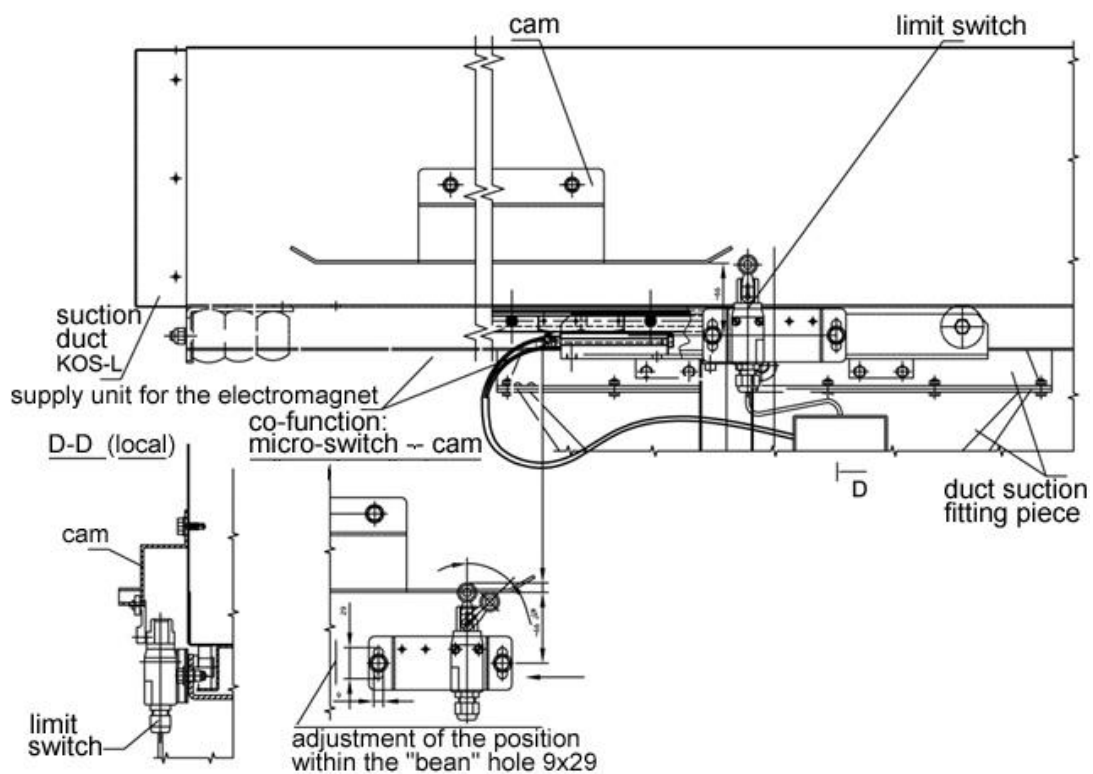


Fig. No.3 – KOS-L/SSAK – Supply, description

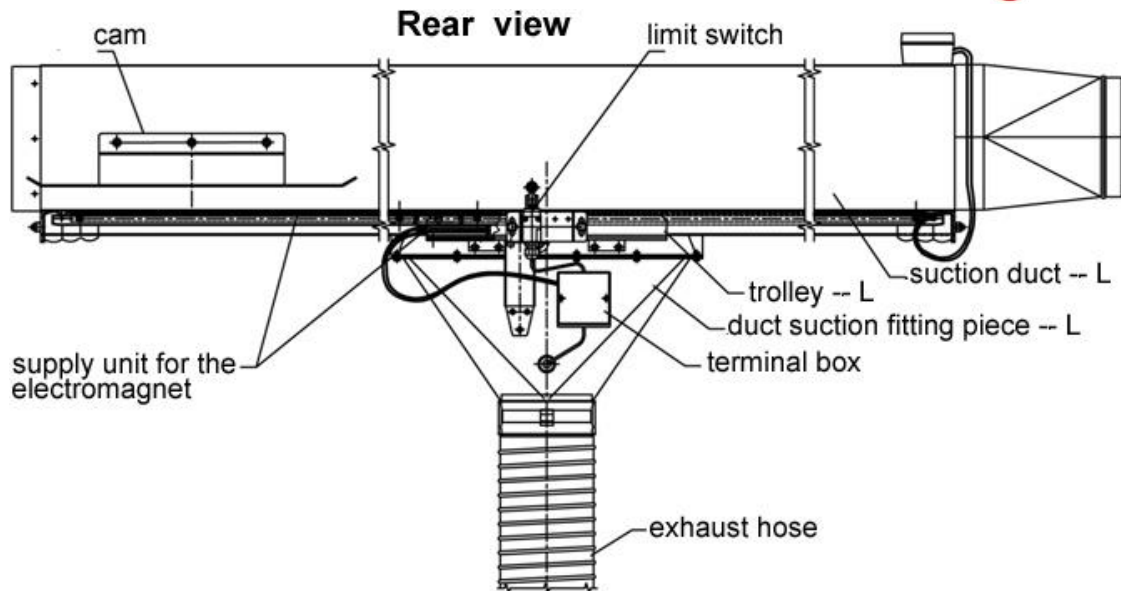


Fig. No.4 – KOS-L/SSAK – Rear view

Electrical system (delivered on separate order) consists of following elements:

- control unit **ZE-SSAK** (supply 3x400V),
- limit disconnecter **B1** (supply 24V DC)

On demand, the electrical system can be additionally equipped with elements of remote control for the extraction fan, for example:

- a) supporting control unit **ZP-1/24V**, **ZP-2/24V** – for a remote control by cable for the fan (control cassette)
- b) radio transmitter **NR-1Ap** (remote control) – installed in the vehicle and radio receiver **OR-1** installed close to the control unit ZE-SSAK.

These devices constitute the system of remote control for the extraction fan via radio waves.

6. ASSEMBLY AND STARTUP

The device, suction duct, has to be installed under the ceiling or wall of the process room. On the side wall and back wall of the carbody must be fastened the gripping plate of the electromagnet, at the height providing efficient exhaust gas capture (through the suction funnel inlet). The outlet of the vehicle exhaust pipe must be even with the carbody outer surface and at the distance of at least 25 cm from the wheel of the vehicle.

Connection of the **ZE-SSAK control unit** ought to be carried out by User on one's own, according to the local conditions and requirements, it is also important to select the appropriate type and section of the supply cable as well as adequate short-circuit- and overload protection – in conformity with the valid standards and regulations and with reference to the local conditions.

Additionally, make sure if the parameters of the hitherto existing electrical installation is in accordance with the data on the nominal data plate (supply voltage, frequency). In case of inconsistency, it is not allowed to carry out the connections. **Any activity related the power supply connection, must be executed by a person with qualifications and in accordance with the valid regulations of the country where the appliance shall be installed.**

To operate the extraction system use the ZE-SSAK control unit.

7. OPERATIONAL USE

Switching ON and OFF:

1. Set the **S1** switch into position "ON". This will be indicated by the white signalling lamp **S1.H1** integrated in switch **S1**.
2. By means of the **S3** switch – select the mode of control:
 - a) "L" – local – from the ZE-SSAK control unit
 - b) "Z" – remote – by means of the supporting controllers or via radio;
3. To disconnect the system – set the **S1** switch into position "OFF".

Local control:

1. To start the fan press the green field in the double button **S4 (S4.2 "START")** – see Connection Diagram. The fan function will be indicated by the green **S2.H2** lamp in the double button **S4**.
2. To stop the fan – press the red field in the double switch **S4 (S4.1 "STOP"** – see Connection Diagram) When the fan is switched off – the green **S4.H2** goes off (or the lamp in the supporting controller goes off. The fan will stop after the delay time – as adjusted in the time relay **KT1** (manufacturers setting 2 minutes).



Fig. No.5 – ZE-SSAK control unit

The control unit, depending on the size of the extraction fan, is equipped with adequately selected motor protective switch and a contactor. The unit serves as a short-circuit- and thermal protection and is equipped with a time relay delaying the moment when the fan switches off. Manufacturers setting for the time delay is 2 minutes.

Table No.3 – Specification of the control units – applied in dependence of the size of the fan

Type	Part No.	Supply voltage [V]; 50 Hz	Current range [A]	Motor rate [kW]	Cooperating fans
ZE-SSAK-4-3	511Z50	3x400	2,5-4	1,5	WPA-8-E-3-N; WPA-8-D-3-N
ZE-SSAK-6,3-3	511Z51	3x400	4-6,3	2,2	WPA-9-E-3-N; WPA-9-D-3-N
ZE-SSAK-10-3	511Z52	3x400	6-10	3	WPA-10-E-3-N; WPA-10-D-3-N
ZE-SSAK-14-3	511Z53	3x400	9-13	5	WPA-11-E-3-N; WPA-11-D-3-N
ZE-SSAK-16-3	511Z54	3x400	13-18	7,5	WPA-13-E-3-N; WPA-13-D-3-N

The use of supporting controllers



Fig. No.6 ZP-2/24V



Fig. No.7 ZP-1/24V

1. Press the green field in the double button (of the **ZP-1/24V** supporting control unit) to start the fan. This will be indicated by the green lamp in the button;
2. Press the red field in the double button (of the **ZP-1/24V** supporting control unit) to stop the fan. The green lamp in the button goes off;
3. Set the switch in the double button (of the **ZP-2/24V** supporting control unit) into position **ON** to start the fan. This will be indicated by the green lamp in the button;
4. Set the switch in the double button (of the **ZP-2/24V** supporting control unit) into position **OFF** to stop the fan. The green lamp in the button goes off.

Automatic control – via radio (remote control):

1. The extraction fan will be automatically operated when the switch (in the **S3**) of work mode is set into position “**Z**” – remote. When the driver turns the key in the engine ignition starter – the **NR-1Ap** transmitter sends signal to the **OR-1** radio receiver and the fan will be switched on. This is indicated by the green lamp **S4.H2**.
2. The fan disconnects automatically – when the vehicle leaves the garage / depot (at the moment when the vehicles exceeds the reach of the radio transmitter – approx. 200 metres and after the time delay).

Remote control – via radio:



Fig. No.8 NR-1Ap radio transmitter



Fig. No.9 OR-1 radio receiver

1. The fan is switched on at the moment when the vehicle engine is started or when driver turns the ignition starter key. NR-1Ap radio transmitter sends a signal to the OR-1 radio receiver and the fan is automatically operated.
2. The fan will be automatically be switched off – after the vehicle leaves the garage / depot – and the radio contact between the transmitter and receiver is interrupted (approx. 200 metres – depending on the local conditions). After the signal is lost, the fan will switch off after the adjusted time delay.

CAUTION:

1. The fan will automatically start again, when the vehicle returns near the garage door.
2. If there is need for the vehicle to wait near the garage door for a longer time – it is possible to switch off the working fan by pressing the button in the transmitter.

How to switch off the whole system:

1. Set the **S1** switch (in the ZE-SSAK control unit) into position **OFF**. The built-in white lamp **S1.H1** goes off.

The suction funnel must be adjusted right opposite the vehicle exhaust pipe and the electromagnet anchor should be engaged with the gripper plate on the carbody (while its engine is not running). Subsequently switch on the extraction fan.

Placement of the elements of the control system is illustrated in Fig No.10, whereas connection of the radio transmitter is shown in Fig No.11; connection of the receiver and the supporting control units in Fig. No.14.

Distribution of elements

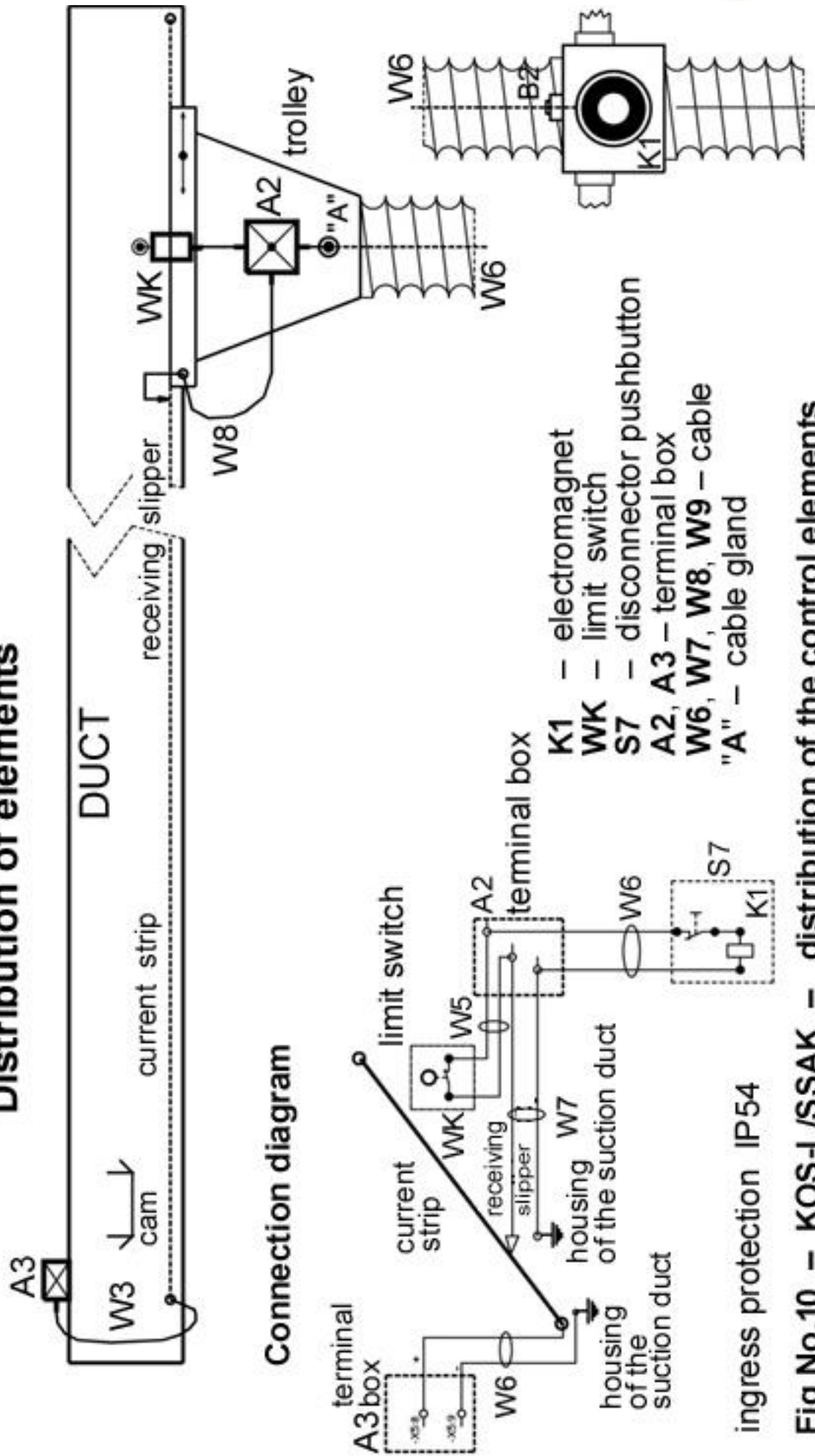


Fig No.10 – KOS-L/SSAK – distribution of the control elements

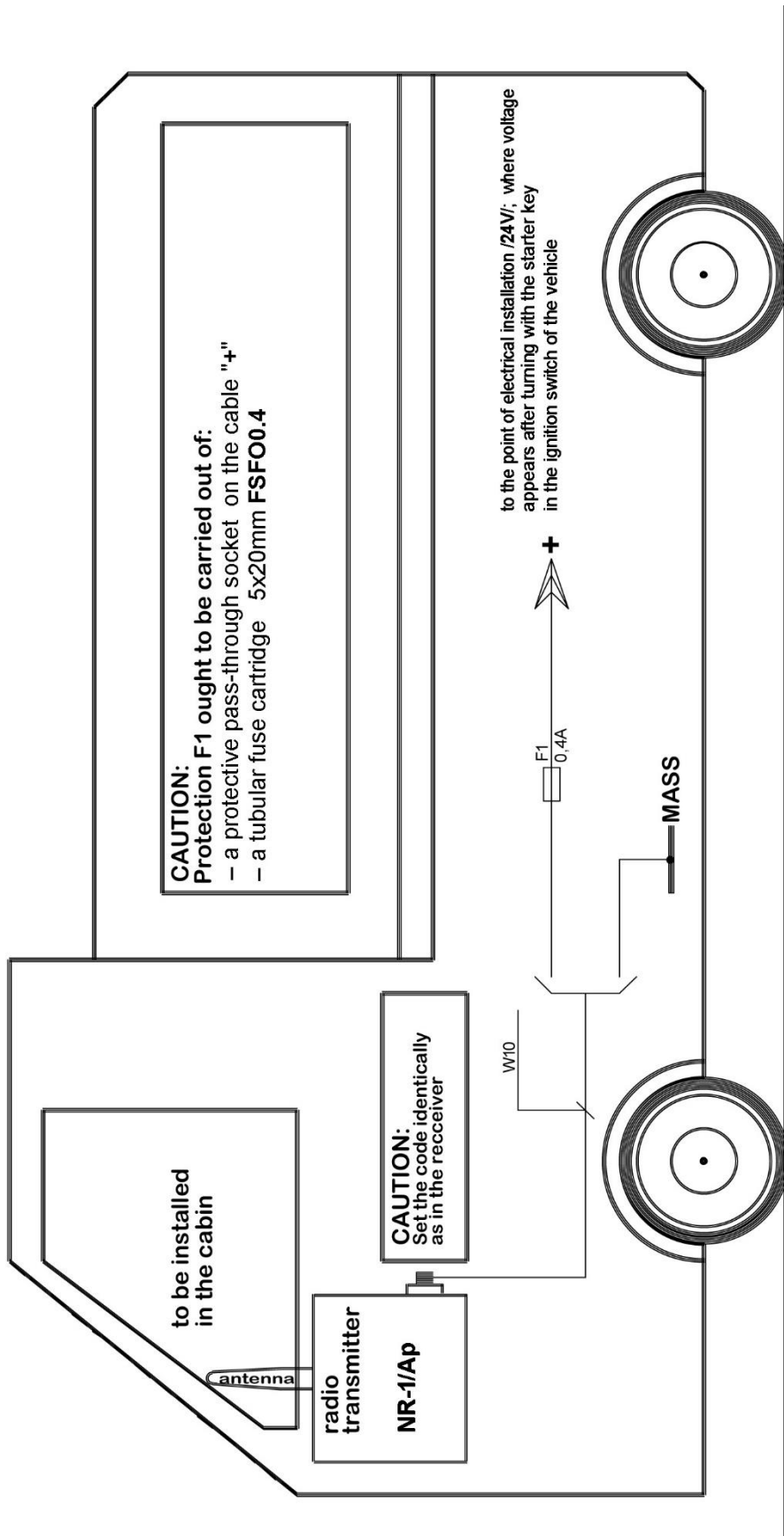


Fig. No.11 – KOS-L/SSAK – connection of the transmitter

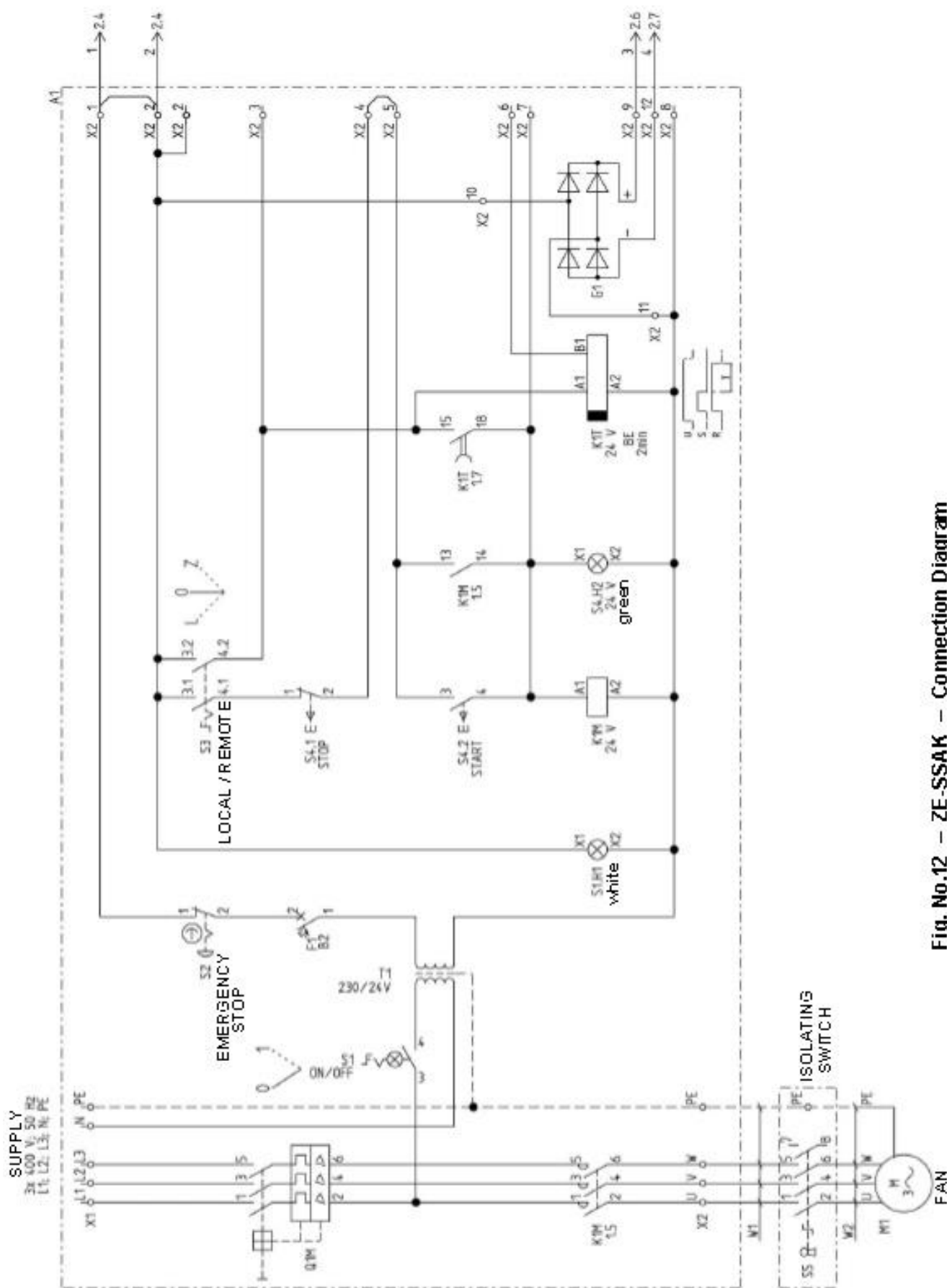


Fig. No.12 – ZE-SSAK – Connection Diagram

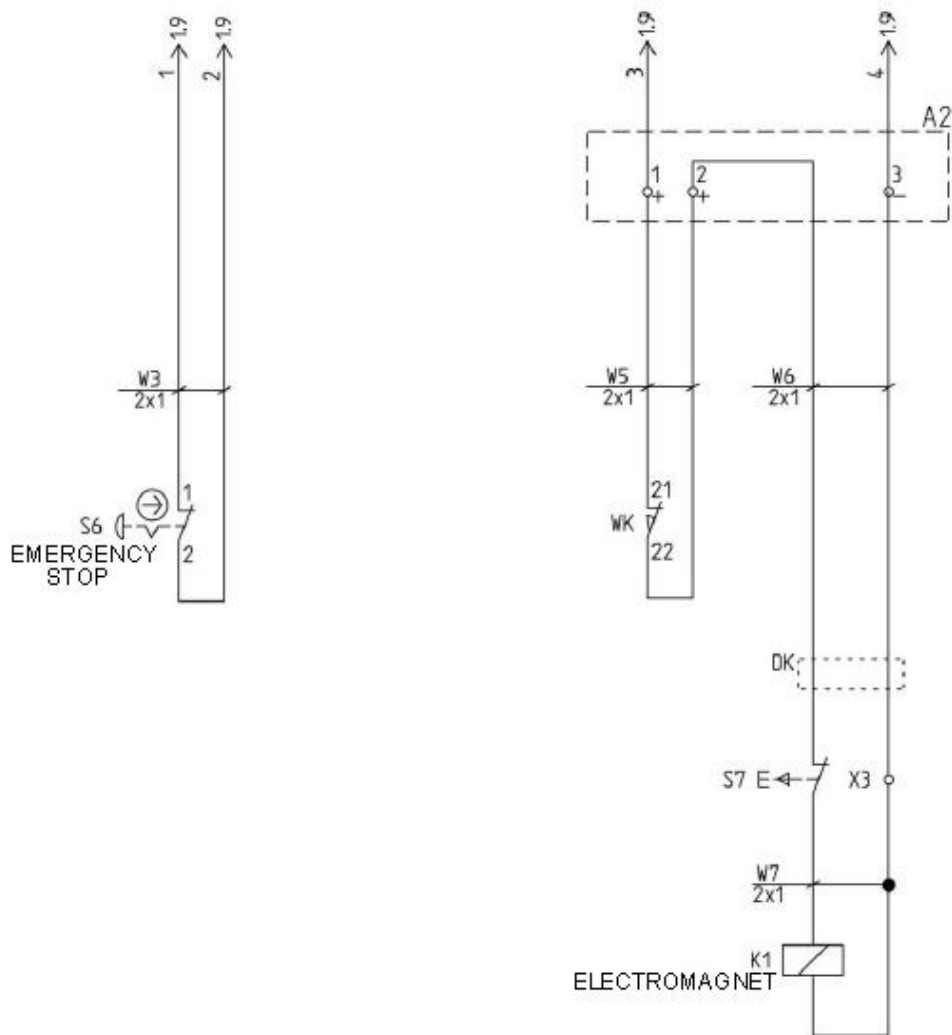


Fig. No.13 – Connection diagram for the electromagnet

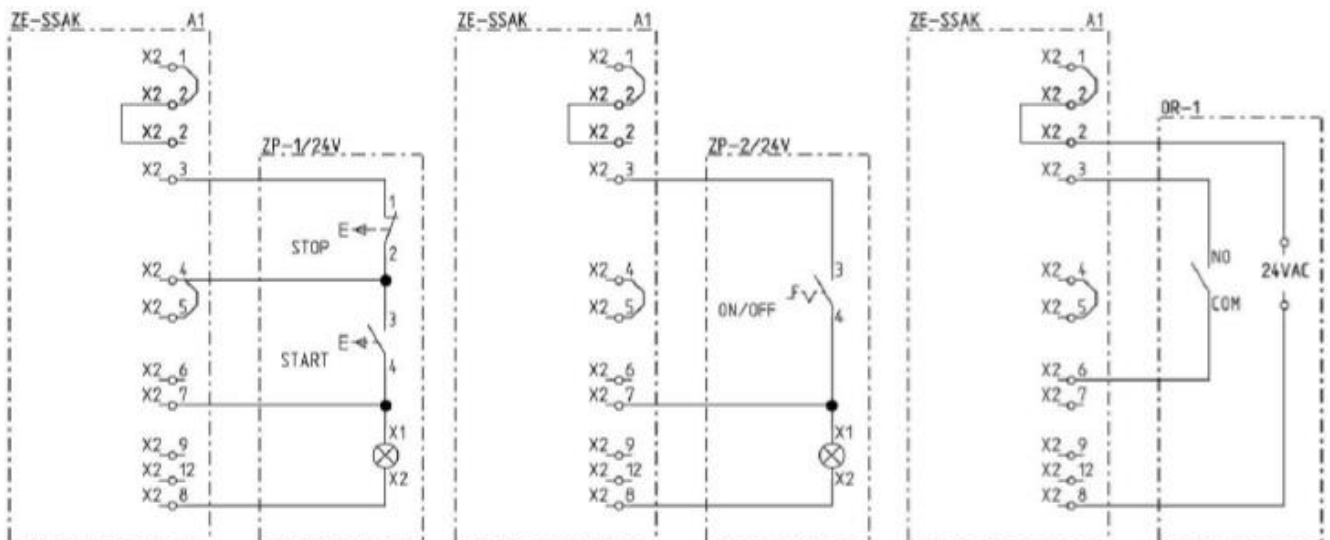


Fig. No.14 – Connection diagrams for the supporting controllers and the receiver with the control unit

8. TROUBLESHOOTING GUIDE

Table No.4

	Problem	Possible reason	Corrective action
1.	decrease of the intake air volume along with the increased noise	incorrect impeller rotation sense	change the phase connection sense
		solid element, barrier object being obstacle for the air flow got stuck (clogged) in the suction funnel or in the installation	unclog the suction funnel or the exhaust hose
2.	electromagnet failure	the contact surface of the electromagnet anchor and the electromagnet gripper are polluted	clean the contact surfaces
		electromagnet coil is burnt through; interruption in the electrical circuit; Transformer or rectifier system are faulty	localise the failure reason and fix it

9. MAINTENANCE AND REPAIR

Start up and the operational use are only admissible after getting acquainted with the contents of the present Use and Maintenance Manual. In case when defective function is by noise or visually spotted, undertake technical revision of the appliance.

Within the scope of periodical revisions check: the technical state of the extraction fan, according to the detailed regulations of operational use of electrical driving devices. To improve the contacting efficiency of the electromagnetic gripper, clean the contact surface (if necessary). Carry out technical revisions exclusively after device disconnection from the power supply.

10. OCCUPATIONAL HEALTH AND SAFETY

Start up and the operational use are only admissible after getting acquainted with the contents of the present Use and Maintenance Manual. For safety reasons, the fan ought to be connected to the electrical power system according to the valid regulations in range of personal protection from electrical shock and protection from short-circuit- and overload effects.

Any activities related to connection of the fan with the power system ought to be carried out only by a qualified person – according to the instructions in Section 6 of the present Use and Maintenance Manual Important is the correct impeller rotation sense of the fan with reference to the arrow on the fan housing. **Any maintenance / repair should be carried out after the device is disconnected from the power supply.**

Manufacturer is not responsible for the results when the system is used in contradiction with the purpose of application and when some changes were introduced by User, without written commitment with Manufacturer.

CAUTION:

While the exhaust extractor is suddenly leaving the garage, be careful, and take into account if within the operational area of the hose are no people especially at the moment of suction funnel disconnection. Protect the exhaust hose from squeezing. **Admissible vehicle departure velocity (while leaving the depot) is 10 km/h.**

11. TRANSPORT AND STORAGE

The extraction system ought to be stored in a dry room and areas of efficient ventilation. For the time of transport the device ought to be protected from damages, indents and also protected from an uncontrolled displacement / slide or overturn.

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 malfunctions caused by User,
- device failures caused during the use which is in contradiction with the purpose of application and with the present Use and Maintenance Manual,
- malfunctions resulting from the improper transport, storage or incorrect maintenance,
- functional inefficiencies of the system being caused by normal operational wear / exhaustion.

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.

Stand Assembly instruction Rail Exhaust Extraction System KOS-L/SSAK

1. Energize the system – set the **S1** switch into position **ON**, this will be indicated by the white **S1.H1** lamp. Select the operational mode of control by **S3** switch:
2. Setting **L** – means local control
 - 2.1 To start the fan – press the green field in the double button **S4**. This will be indicated by the green lamp **S4.H2** in the double button **S4**.
 - 2.2 To stop the fan – press the red field in the double button **S4**. The green lamp **S4.H2** goes off.
3. Setting **Z** – means remote control – by means of supporting control units or via radio.
 - 3.1 To switch on fan by means of the supporting control unit **ZP-1/24V** – press the green field in the double button. The fan function is indicated by the green lamp integrated in the button.
 - 3.2 Switch off the fan by means of the supporting control unit **ZP-1/24V** – press the red field in the double button. The fan is disconnected - the green lamp integrated in the button goes off.
 - 3.3 To switch on fan by means of the supporting control unit **ZP-2/24V** – set the switch into position **ON**. The fan function is indicated by the green lamp integrated in the button.
 - 3.4 To switch on fan by means of the supporting control unit **ZP-2/24V** – set the switch into position **OFF**. The green lamp integrated in the button goes off.
 - 3.5 Fan start via radio – at the moment when driver operates the engine of the vehicle or when turns the ignition starter key in the vehicle. A signal is being sent by the **NR-1Ap** radio transmitter to the **OR-1** radio receiver – and the fan is switched on.
 - 3.6 The fan will be switched off automatically – after the vehicle leaves the garage and the radio wave is interrupted (between the radio transmitter and radio receiver (approx. 200 metres – depending on the local conditions). After the signal is interrupted – the fan will switch off after time delay.
4. Connect the suction hose by means of the electromagnet to the gripper plate crewed on the carbody wall or at the back of the vehicle.
5. The suction funnel must be hanging right opposite the exhaust pipe of the served vehicle – when the engine of the vehicle is not started.
6. Switch on the whole system – set the **S1** into position **OFF**. The built-in lamp **S1.H1** goes off.
7. In case of a sudden vehicle departure from the garage, precautions have to be taken. Pay attention that no one of the personnel is standing in the work range of the hose/funnel at the moment of funnel disconnection. **Mind that the vehicle departure velocity is not exceeding 10 km/h.**
8. **Protect the exhaust hose and suction funnel from mechanical damage.**

CAUTION:

Supporting control units, radio control and the safety button are additional equipment and are delivered on separate order. The safety button disconnects the system in case of emergency.

13. DECLARATION OF CONFORMITY**DECLARATION OF CONFORMITY EC No. _____**

Manufacturer (eventually also the authorised representative / importer):

name: **KLIMAWENT S.A.**

address: **81-571 GDYNIA, ul. Chwaszczyńska 194**

A person, authorised for issuing the technical documentation:

name and address: **Teodor Świrbutowicz, KLIMAWENT S.A.**

hereby declares that the product: **Rail Extraction System**

type / model: **KOS-L/SSAK**

serial number: _____

year of production: _____

Meets the requirements of the subsequent European Directives:

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

is in accordance with the requirements of the following harmonised standards:

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EN 60204-1:2010 Safety of machinery – Electrical equipment of machines – Part 1: General requirements

place, date

*signature of the
authorised person*

*name, surname,
function of the signatory*

NOTES:

NOTES: