COMPRESSOR

SB4/C-50.LB40
SB4/C-100.LB40
SB4/C-200.LB40
SB4/C-100.LB40V

MANUAL

ISO 9001:2008

1. General data

The present manual is a document, containing the specification of the compressors (hereinafter referred to as compressor) SB4/C-50.LB40, SB4/C-100.LB40, SB4/C-200.LB40, SB4/C-100.LB40V, (air compressors, piston-type compressors), as well as the maintenance guidelines and technical characteristics, the adequacy of which is ensured by the manufacturer.

The manufacturer has the right to make some minor constructive changes, which may be not stated in this document.

2. Purpose

2.1. The compressor is a complex electromechanical production, which serves the purpose of compressed air supply to the pneumatic systems, devices and instruments, used in industry, automobile service centers and for other consumers' purposes, after its rectification with the auxiliary air treatment system, and adjustment to the standards, peculiar to each branch. The compressor helps to save electric energy, to mechanize labor and to improve the quality of production.

It is not allowed to use the compressor in the areas of high risk of explosion or fire according, in the places, exposed to rain, and for household purposes.

2.2. The power supply of the compressor is provided by means of an alternate current power supply source with the voltage 400 V and the frequency (50 ± 1.25) Hz.

2.3. The climatic construction – NF 3.1, by the ambient temperature 274 – 313 K (from +1 up to +40 ºC).

2.4. The compressor's operating mode – intermittent.

2.5. Pressure regulation in the receiver – automatic.

2.6. The compressor has a thermal protection against the equipment overload, short circuit or fault of one of the phases of the electricity supply network.

2.7. The compressor can be additionally equipped with a water and oil segregator.

2.8. The general view of the compressor is presented on pictures 1, 2 and the principal electric scheme – on picture 3.

3. Performance specifications

3.1. The general safety requirements, concerning the compressor's design and electric equipment comply with EN 1012-1; EN 60204-1.

3.2. The compressor's receiver is designed and manufactured in compliance with the Directive of EEU Council "Certification of vessels under pressure 87/404/EEU".

3.3. The main technical characteristics of the compressor are listed in table 1.

3.4. The compressor's electrical equipment is made with protection level not less than IP41.

Table 1

Name of the parameter	Parameter's value			
	SB4/C-50.LB40	SB4/C-100. LB40	SB4/C-200. LB40	SB4/C-100. LB40V
Number of compressor stages	1			
Number of the compressor's cylinders	3			
Capacity (in-draft), l/min, (m^3/h)	530 (31,8)			
Maximum compressed air pressure, MPa, ($kg/sm^{2)}$	1,0 (10)			
Nominal capacity, kW	3,0			
Supply voltage, V	400			
Receiver volume, l, no less than	50	100	200	100
Dimensions, mm, no more than:				
length	900	1150	1460	630
width	450	500	560	560
height	800	1000	1150	1300
Weight, kg, not more than	92	100	140	110

3.5. The characteristics of wedge-type belt are listed in table 2.

Table 2

Name and marking	Quantity	Notes
Belt A 1400	1	

3.6. Characteristics of the electrical equipment are listed in table 3.

Table 3

Nameandmarking	Technical characteristics	Quantity	Notes
Engine AIR90L2 У3	50 Hz, 400 V, 3 kW, 6,0 A	1	
Pressostate with built-in protection MDR3	P_{max}1,2 MPa , $I_т$ – 6…10A	1	Manufactured by "CONDOR" (Germany)

3.7. Characteristics of greasing substance.

Nominal filling volume for the oil amounts to 1,2 l.

For compressor's module greasing it is recommended to use the following types of compressor oils for piston-type air compressors, avoiding their mixing (or the oils, having the similar quality and requirements).

SHELL Corena P 100
CASTROL Aircol PD 100
ESSO Kompressoroel 30 (VCL 100)

4. Complete set

4.1. The list of delivered components is given in table 4.

Table 4

Name	Quantity	Notes
Compressor	1	
Manual	1	
Wheels and shock absorbers	1	
Shippingcontainer	1	

Notes: Complete set of wheels and shock absorbers (pos. 15, see pic. 1, 2, 3, 4) as well as the details for their fastening are packed separately.

5. System and the operation principal

5.1. The compressor (pic. 1, 2, 3, 4) consists of the following main assembly units and components: compressor module LB40, receiver 1, bay 2, electric engine 3 with pulley 4, wedge-type belts 5, protection enclosure 6, pressostate 7, manometer 8, air-outlet unloading pipe 9, force air pipe 10, discharge cock 11, safety valve 12, check valve 13, overflow valve 14, wheels and shock absorbers 15.

Compressor module – piston-type, single-stage, double-cylinder with air-cooling – is made for compressed air production.

Greasing of rubbing surfaces of the compressor module's components is made by means of oil spraying. Oil pouring into the crater is accomplished through the carter's port, oil drain is accomplished through an aperture in the crater's bottom, which is blanked with the cap.

Receiver 1 serves for collecting of compressed air, avoidance of pressure pulsation, condensate and oil segregation. Receiver is also a body, on the base of which other modules and compressor's components are mounted.

Receiver has connecting pipes for telepressostate orpressostate 7, check valve 13, overflow valve 14, safety valve 12 and holders for mounting of the bay.

Bay 2 is meant for assembling of the compressor's module, engine, wedge-belt transmission and protection enclosure.

Electric engine 3 is meant for the compressor's drive.

Telepressostate or pressostate 7 provides the operation of the compressor in automatic mode and maintains the pressure in the receiver.

Unloading air-channel 9 serves for unload of the compressed air out of the force air-pipe 10 after the compressor's shutdown, in order to make its subsequent start easier

Spigot 11 with the pressure regulator serves for air supply.

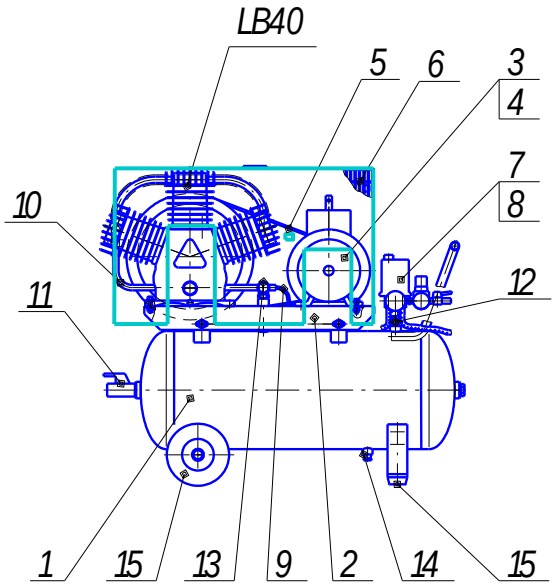
Safety valve 12 serves for limiting of the maximum pressure in receiver and is set for the pressure of the emergency response – $(1{,}05^{+0{,}05})$ MPa.

Check valve 13 ensures the compressed air supply in the direction from the compressor's module to receiver only.

Discharge cock 14 serves for discharge of condensate from receiver.

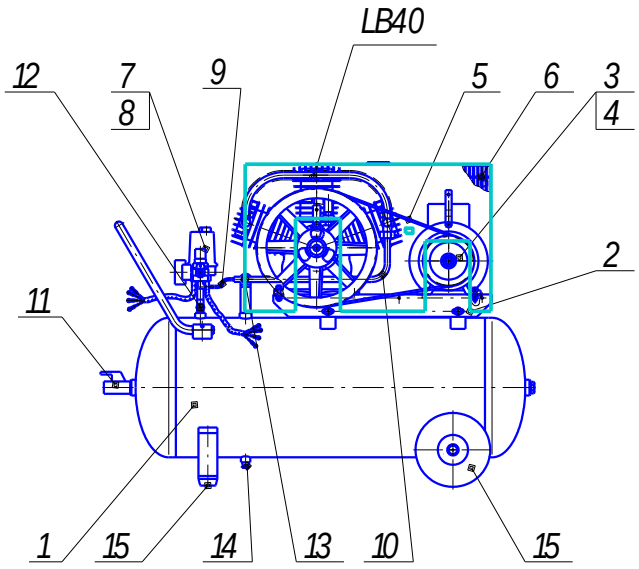
Manometer 8 serves for pressure control in receiver.

General view of the compressor SB4/C-50.LB40



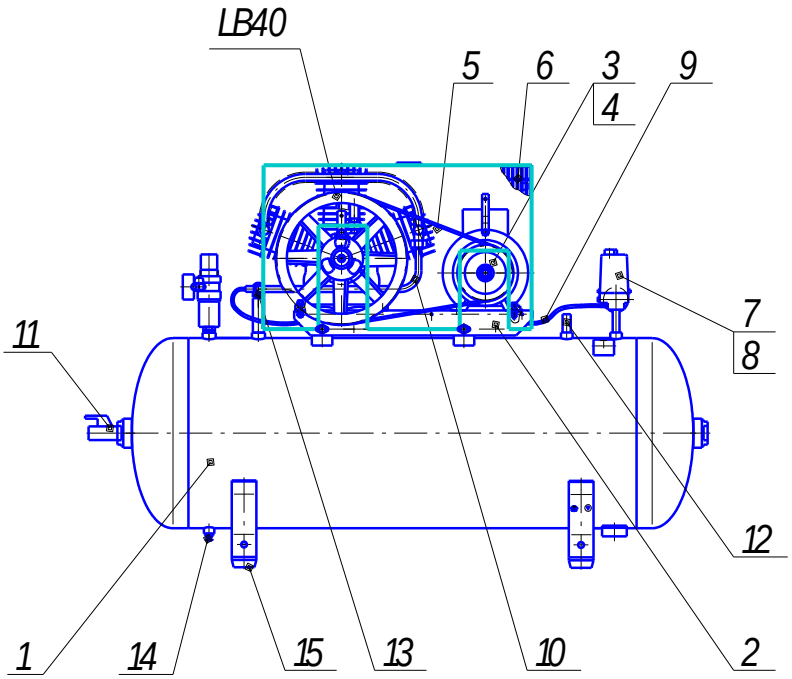
Pic. 1

General view of the compressor SB4/C-100.LB40



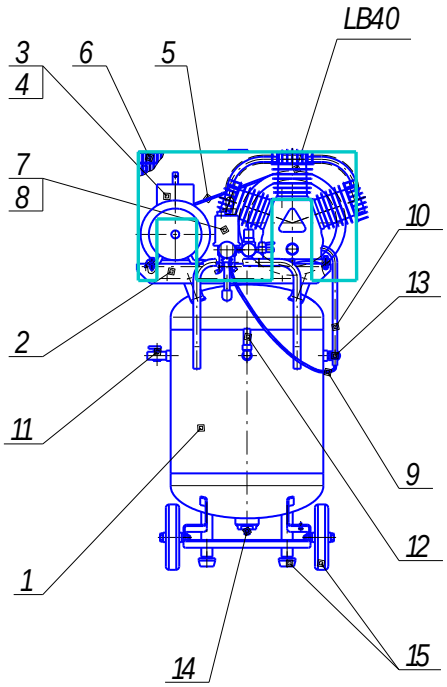
Pic. 2

General view of compressor SB4/C-200.LB40



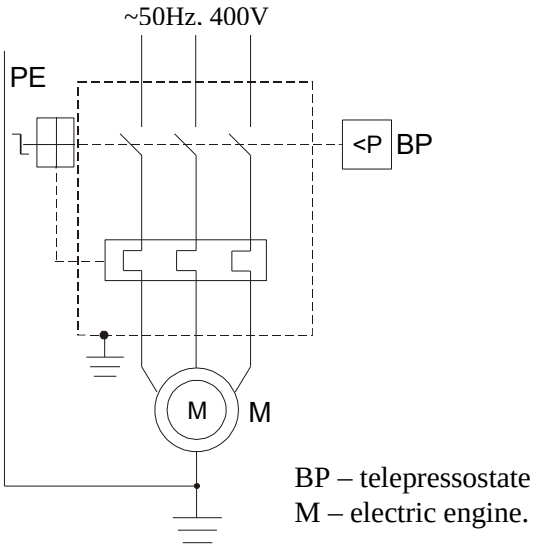
Pic. 3

General view of compressor SB4/C-100.LB40V



Pic. 4

Principal electric circuit



Pic.5

6. Safety regulations

6.1. For the compressor's control are allowed only those persons, who were previously instructed about its system and maintenance regulations, and who were instructed on the safety and first-aid measures.

6.2. In the process of running the compressor, the operator should use protective glasses in order to protect eyes against the foreign particles, brought by the flow of air.

6.3. Compressor should be placed on the horizontal floor surface, in a stable position.

6.4. Do not expose the compressor to the influence of precipitation.

6.5. In the room, where the compressor is situated, it is necessary to ensure good ventilation (aeration), checkingthe ambient temperature, which should be between +5 and +40 ºC.

6.6. The air sucked in by the compressor should not contain any dust, fumes of any kind, dangerously explosive or flammable gases, solvent or dye spray, toxic smoke of any type.

6.7. In case the compressor is situated in a room of critical condition (presence of dust particle of different types) it is necessary to change filters more often. If the filters loose their carrying capacity significantly, than it can lead to crash of the suction, force or check valve.

6.8. The usage of the compressor is limited to the air compression, that is why it can not be used with other gases.

6.9. Utilization of compressed air for other stipulated purposes (supercharge, pneumatic instrument, coloring, washing with the water-base means* etc.) is conditioned by the knowledge and observance of the standards, provided for each occasion.

6.10. When the compressor is plugged to the connection line, or to the operation unit, it is recommended to use pneumoapparatus and flexible lines of the same size and having the same characteristics (pressure and temperature).

6.11. Compressed air is a flow of energy, and for this reason it is associated with a potential danger. Pipelines, containing the compressed air, should be in working condition and plugged correspondingly. Before increasing pressure in the flexible lines, one should make sure, that their rags are well fixed.

6.12. Do not use the flexible lines for the instruments' shift.

6.13. To move the compressor (switched off) the handle located on the receiver should be used.

6.14. Before starting the device one should check up the following:

- accuracy of connection to the power supply source and to earth.
- integrity and reliability of the protection enclosure of the wedge-type drive fastening.
- reliability of the compressor's supports fastening.
- integrity and good order of the safety valves and operating controls.

6.15. For technical testing one should use the present manual, as well as "Regulations on the electric installations" and " Regulations on the safe exploitation of the vessels under pressure".

6.16. After completing the rehabilitation the operator should place the protective enclosure and all other details, by this one should observe the same safety measures, as by the first start.

6.17. Safety measures by operating of the receiver.

- Properly use the receiver within the limits of pressure and temperature, stated on the shield with technical data of the manufacturer.
- Constantly control the serviceability and efficacy of the protective and controlling devices (pressostate, safety valve, manometers).
- Do not place receiver in premises with poor ventilation facilities, and in zones, exposed to heat and flammable materials.
- Do not expose the receiver to vibrations, which can lead to breakage of the welds, because of the metal's fatigue strength.
- Every day one should discharge condensate, which is generated in receiver.

When operating the receiver, one should observe the requirements of "Regulations on the system and safe exploitation of the vessels under pressure".

6.18. The equivalent of the sound level in the operator's working zone within 1,0 m from the compressor, provided the coefficient of usage is 0,6, should not exceed 80 decibel.

6.19. When the noise level exceeds normal level, than it is necessary to use the means of individual protection.

6.20. The cargo handling procedures should be carried out according to transport marks on the container.

6.21. Recycling of the used oils and condensates should be carried out with observance of the appropriate specifications, because these products pollute the environment.

6.22.While operating the compressor one should observe " General fire prevention rules for the industrial enterprises … ".

It is forbidden:

- To operate the compressor with the faulty or switched - off protection against currents of short circuit and thermal protection;

- To bring in any changes to electrical or pneumatic circuits of the compressor or their settings. In particular to change the value of the maximal pressure of compressed air and settings of the safety valve;

-To turn on the compressor with removed protection of wedge-belt transmission;

-While operating the compressor to touch heated details (head and block of cylinders, heat pump, details of the force air-pump, electric motor's cooling fans);

-To carry out machining or welding of the receiver. In case of defects or corrosion it is necessary to replace it completely, as it falls under the special norms of safety;

-to touch the compressor with wet hands or to work in wet footwear;

-To direct a jet of compressed air at oneself or other people around;

-To let children and animals into the working area;

-To carry out coloring in a non-aired premises or near open flame;

-To store kerosene, petrol and other inflammable liquids at the site of thecompressor's installation;

-To leave the compressor, which is plugged to the mains, without supervision;

-To carry out repair works of the compressor, which is plugged to the mains, and when the pressure in the receiver is not releived;

-To transport the compressor, which is under pressure.

7. Pre-starting and operating procedures

7.1. Study the instructions of the present passport attentively and follow them.

7.2. It is important, that the first start of the compressor should be made by the trained personnel, which carries out various kinds of the control according to the instructions.

7.3. Accurately open the package, check up completeness, make sure of the absence of damages.

7.4. Mount wheels and shock-absorbers onto the receiver, mount the compressor on an even horizontal platform, ensuring in this way an easy approach to the switch and spigot of air supply to the consumer. For good ventilation and effective cooling it is necessary that the protections of belt transfer were at a minimum distance of 1 meter from a wall. The floor of the premises at an installation site of the compressor should be made from a fireproof and oil proof material.

7.5. Check up the conformity of the instructions shields on the unit of the compressor, receiver, electric motor and data of the present passport.

7.6. Check up on the oil indicator the level of oil in crank case of the compressor's module - it should be within the limits of a red mark on a watching glass. If necessary, add some oil up to the average level, choose oil according recommendations in the present instruction. Do not allow outflow of oil from junctures and onto the outside surfaces of the compressor.

7.7. Check up conformity of the voltage of a power-supply mains with the requirements of the paragraph 2.2 of the present operation manual.

In the case of electrical connection the sequence of phases is of importance, as it determines the direction of rotation, which should correspond to the direction, applied both on the compressor's pulley and on the protective enclosure. The air flow should be directed from the fan pulley to the piston group.

It is necessary to underline, that even the rotation of the engine in the opposite direction during very short period of time can cause the compressor breakdown.

7.8. Reliably connect the compressor to the consumers of compressed air, using the appropriate pneumoapparatus and pipelines.

7.9. By the first start, and also after the long period of inactivity, it is recommended to add some drops of compressor oil to the air filter.

7.10. Start-up and stop of the compressor should be carried out only by means of the switch on pressostate. After starting-up the compressor, while air is used by the consumer, the relay of pressure of the pressostate automatically switches off and on, maintaining the pressure of compressed air in the receiver. At the first start-up, and also at each repeated switching check the conformity of the direction of rotation specified on a protective enclosure of wedge-belt transmission and the pulley of the compressor's unit.

7.11. The relay of pressure (pressostate) is adjusted by the manufacturer, and should not be readjusted by the user.

The adjustment of pressure of compressed air at the output is carried out by a regulator of pressure as follows:

- with the spigot being open it is necessary to pull the handle of a regulator of pressure upwards and to rotate it clockwise in order to increase the pressure or counter-clockwise to reduce pressure;

- After checking the given value of pressure according to manometer, it is necessary to press the handle, thus having fixed the chosen value;

The amount of processed air depends on pressure in receiver and on its consumption - at a superfluous consumption the manometer displays low values.

7.12. The compressor is equipped with the device of thermal protection against overloads. During long periods of operation and overconsumption of compressed air automatic switching-off of the compressor due to its overheating is possible.

After the engine cools down to a tolerable temperature, turn off the switch located on the pressostate's case, the device of thermal protection is then switched on.

In order to prevent failure of the engine, the intervention in system of thermal protection is intolerable.

7.13. For correct usage and normal work of the compressor it is necessary to take into account, that the nominal operation mode is as follows: intermittent with duration of switched-on periods (SP 60 %) and number of swithched-on periods within one hour – not more than 60.

7.14. After the complete switching-off let out the air from the receiver.

8. Maintenance servicing

For durable and reliable work of the compressor carry out the following operations on its maintenance servicing:

- After the first 50 working hours check up and if necessary tighten the bolts of cylinders' heads of the compressor's unit for indemnification of the temperature shrinkage, the moment of tightening - 25 Nm;

- check monthly the density of connection of the air pipe-lines, level of oil in the casing, clear the compressor of a dust and dirt. As a cleaning material one can apply only cotton or linen cloth. The application of the ends and woolen cloths is not allowed;

- change the oil after the first 100 working hours and further through every 500 working hours. It is not recommended to mix different types of oil. If the oil changes its color (turns white - presence of water, turns dark - strong overheating) is recommended to replace oil immediately;

- Depending on conditions of operation, but no more than once per month, clear the soaking up air filter, blowing the spout and the filtering element with compressed air. It is recommended to replace the spout of the air filter or the filtering element at least once a year, if the compressor works in a clean premises, and even more often if the premises are dusty. Reduction of the capacity of the air filter reduces service life of the compressor, increases the consumption of the electric power and can result in breakup;

- Merge condensate from the receiver, using the overflow valve, once per week;

- After the first 48 hours of operation and further it is necessary to check periodically and to adjust the tension of belts and to clear them of dirtying, as at an insufficient tension belt slips, overheating and decreasing of EFFICIENCY of the compressor's unit may occur. When the belts are drawn, there is an excessive loading on bearings, which leads to their deterioration, overheating of the electric motor and the compressor's unit. At a correct tension the deflection of a belt at its middle under the influence of 20 H should be within the limits of (5-6) mm. The tension can be adjusted by means of displacement of the electric motor, having previously released the bolts, which fasten it to a platform. A pulley of the electric motor and pulley of unit of the compressor should be at one plane;

- Periodically check the reliability of fastening of the compressor's unit and engine to a platform, and of the platform to the receiver;

- Periodically check integrity and reliability of engine controls, control devices, cables, airchannels;

Periodically clear all outside surfaces of the compressor and electric motor forimprovement of the cooling-function.

9. Possible malfunctions and the ways of their elimination

The list of possible malfunctions and the ways of their elimination are given in table 5.

Table 5

Name of faultiness	**Possible reason**	**Method of elimination**
Compressor's productivity slowdown	Distortion of the junctions' density or air channels	Spot the leak, squeeze the junctures, change the air channels.
	Air filter loading	Clean the filter element
	Belt slip, due to insufficient tension or fouling	Strain the belt, cleanse it.
Air leak from the pressostate's valve – constant "hissing", when the compressor is still stopped.	Air leak because of wearing or blocking of the check valve.	Unscrew the hexahedral valve's head, clean the saddle or the seal disk, or change them.
Motor overheating and engine shutdown in the process of operation.	Malfunction of the engine's ventilator	Check the ventilator, change it if necessary.
	Insufficient level of oil in the compressor's casing	Check the quality and the level of oil, add some oil, if necessary.
	Continuous compressors operation with maximal pressure and air consumption , which triggers heat protection	Bring down the loading, air consumption and pressure, restart the compressor.
Compressor's shutdown in the process of operation	Feed network distortion	Check the feed network.
The compressor vibrates in the process of operation, it drones, after restart the compressor's engine doesn't start, the engine drones.	No tension in one of the feed circuit's phases.	Check and ensure the feed ing of the circuit.
Oil excess in compressed air and receiver	Oil level in the casing is above normal	Adjust it to the middle level.

In case of detection of other malfunctions it is necessary to consult the manufacturer.

10. Manufacturer's Warranty

10.1. The manufacturer guarantees conformity of the compressor with the parameters specified in the present passport, under the condition of observance by the consumer of the service, storage and transportation regulations.

10.2. Warranty period of operation is 12 months from the date of sale of the compressor with a mark in the passport, but no more than 18 months from the date of manufacture.

10.3. As far as warranty service, purchasing of replaceable and spare parts are concerned, please consult the dealer of the manufacturer.

10.4. When purchasing the compressor demand accurate and exact filling in of the columns of the unit 12 of the present passport:

- Date of sale;
- The seller's data;
- Seal of the vendor.

10.5. The buyer loses the right of warranty service in case of:

- loss of the passport;
- completely blank unit 12 of the present passport;
- presence of mechanical and other damages due to infringement of the conditions of operation, rules of transportation and storage.

11. Transportation and storage

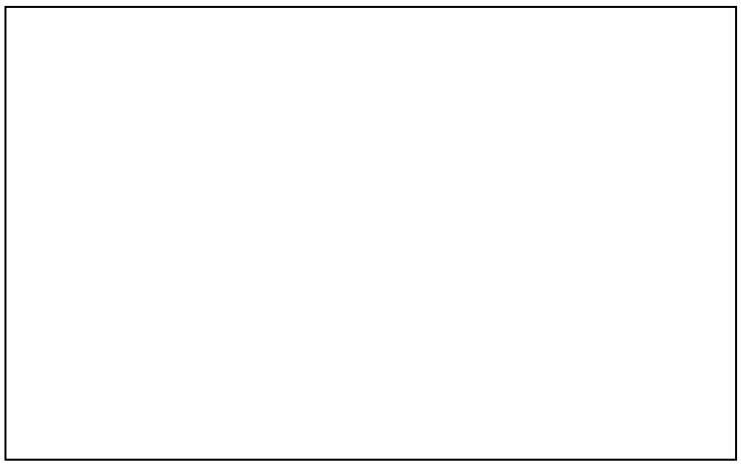
11.1. The transportation of the compressor should be carried out only in the closed transport. The compressor should be stacked in a packing box.

11.2. The compressor should be stored in closed premises at a temperature from minus 25 up to plus 55 ºC and relative humidity of no more than 80 %.

The content of dust, fumes of acids and alkalis, aggressive gases and other harmful impurity in premises, where the compressor is stored, is prohibited.

12 Acceptance and packaging certificate

The compressor unit



is completed with a receiver _____ l. Serial № _____,

electric motor _____ Serial № _____,

upon shipment the compressor is filled at the enterprise-manufacturer with the oil of the following mark: _____,

the compressor unit found ready for service.

Packaging was done by _____

Manufacture date "_____"_____ 20 y.

QCD mark _____ Seal

REMCOMP

Republic of Belarus, 247672, Rogatschev, ul. Pushkina, b. 62,

Tel: (+375-2339) – 39474, 34394, fax (+375-2339) – 34320.

Pre-purchase preparation was done:

Date of sale "____"_____ 20 y.

Seller's requisites _____

_____ Seal

Warranty Certificate

This certificate is the commitment to carry out guarantee repair of the compressor

The certificate entitles to free-of-charge repair and replacement of details and units failed due to the fault of the manufacturer during the warranty period.

Dear buyer! Make sure, that all sections of the guarantee coupon are filled in plain and without corrections.

Item
Model
Factory number
Date of sale
Name and signature of the seller
Seal of the seller

Warranty period is _____months from the date of sale.
The article was tested in the following operation modes_____
in my presence_____ (buyer's signature)

The article was not tested because:_____
_____(seal and signature of the seller)

Upon the execution of the act of purchase the general conditions and requirements of "Regulations on goods' acceptance according to their quality and quantity" should be observed.

For warranty repair the following documents should be submitted:

1. Warranty coupon.
2. Documents, confirming the fact of purchase.
3. Passport of the product.

At absence of one of the specified documents manufacturer can refuse to carry out guarantee repair.

The warranty service is denied in the following cases:

1. Absence of the completely filled guarantee coupon or its loss;
2. Presence of mechanical and other damages, due to infringement of the requirements to the conditions of operation, rules of transportation and storage;
3. Spontaneous change of a design or internal system of the device;
4. Infringement of safety of factory guarantee seals on the device and non-authorized access to the device's settings;
5. Application of spare parts and materials which have been not stipulated by the operational documentation;
6. Infringement of modes of operations established by the operational documentation (the passport etc.).

The warranty does not cover:

1. Consumed materials, which should be replaced during the warranty period as stipulated by the rules of maintenance service (filtering elements and materials, oil etc.);
2. Products failed owing to force-majeure events (disaster, acts of nature etc.).

The warranty does not provide for:

1. Preventive maintenance or cleaning of the product or on-site connection, adjustment,repair or advice by an expert. These works are made under the separate contract.
2. The transport charges are not included into warranty services.