

User manual

Concrete Spraying Machine

SSB 14 STANDARD

SSB 14 DUO

SSB 14 COM – F



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I. Preface

This user manual is necessary to get basic information about safety use of guniting machine SSB 14 (further only machine), made by producer FILAMOS, s.r.o., Hate 546, 261 01 Píbram, Czech Republic. Other information, recommendations and technical parameters are mentioned in the Operating and maintenance instructions made by producer. The user manual is obligatory for all users that use this machine.

II. Use

The machine is designed for spraying concrete, lining mine workings, water structures and engineering structures, for carrying out repair work of minor extent in the building industry. If used to spray refractory concrete mixtures, it is designed to line furnaces, boilers, coke-oven batteries, etc., for cold and hot spraying, as well as in power engineering and metallurgy.

The machine can also be used to convey bulk materials which do not develop flammable /explosive/ dust during transport. The dosing of the transported materials is smooth and continual.

The machine is designed for the operation in the places free of a danger from the methane (SNM-0) explosion and other inflammable gasses as stated in CSN EN 1127-2.

To guarantee smooth operation of the machine it is necessary to keep to the recommended aggregate composition according to the granularity chart, per standards CSN EN 12620, CSN EN 13055-1.

The machine may be used in media with temperatures ranging from + 5 to +40°C.

III. Machine operating

Start operating – opening and adjusting compressed air, then turning on the electric motor.

Presence of the machine operator is not necessary unless during refilling of the dry composition and its application.

Finish operating – it is necessary to empty the feeding hopper and blow compressed air distribution system by air. After that to switch off the electric motor and then close compressed air cock.

Workmen have to be introduced with:

- User manual,
- Operating and maintenance instructions,
- Operating rules applied to the construction place

Workmen are obliged to use personal protective equipment stated in Operating and maintenance instructions (crash helmet, ocular protection and respirator against cement dust, convenient work clothes and shoes, work gloves). Workmen are obliged to do daily notes into the operating diary.

Safety instruction concerning:

- Assembly and the installation – Assembly of the machine is carried out at the producer and the transport to the client is performed in already assembled form of the machine. The check of the machine integrity, complexity of the equipment of the machine is performed in the place of operation. Machine is switch to the electrical supply and to the compressed air supply after setting to the place of application.
- Setting to the operation – Machine and its accessories must be appropriately assembled before setting to the operation. All necessary assembly and following checking operation steps must be carried out according to the Operation and Maintenance Manual provided by the producer.
- Operation of the machine – Machine must be used only in accordance with the Operation and the Maintenance manual provided by the machine producer. Machine is operated by one operator who is responsible for the faultless conditions of the machine at the same time.
- Manipulation – machine can be transported by the suitable transport means defined by the site manager. Total weight of the machine is 300 kg ($\pm 5\%$). Each machine is equipped with catching loops for the connection to lifting machine. Manipulation must be careful without any dynamic crashes
- Assembly and disassembly – Disassembly of the hoses is done in case of each transfer to the other operation place Transfer of the machine in assembled mode is done by mechanical transport means (crane truck, truck). It is necessary so that there is no pressure of the compressed air in the machine as well as the switch off the electric supply is done before any disassembly of the machine
- Adjustment – It means setting up according to the Operation and the Maintenance Manual. Simple steps without any influence to the safety of the equipment must be done by the operators according to the local conditions. Other procedures must be left to the specialised service according to the Operation and the Maintenance Manual.
- Maintenance – small and operational steps are done by the operators according to the time order in the Operational Manual. Procedures requiring higher specific knowledge are done by the authorised service agencies for those machines.
- Disposal – Disposal of the machine is comprised of decomposition of the parts to:

- Steel material polluted by the dangerous substances
- Colour metals,
- Plastics, rubber and the parts polluted by the dangerous substances must be disposed off in accordance to the Act about the liquidation of the dangerous substances.

Training instructions

There are only mentally and physical competent workmen older than 18 years with theoretical and practical skills qualified to operate the machine.

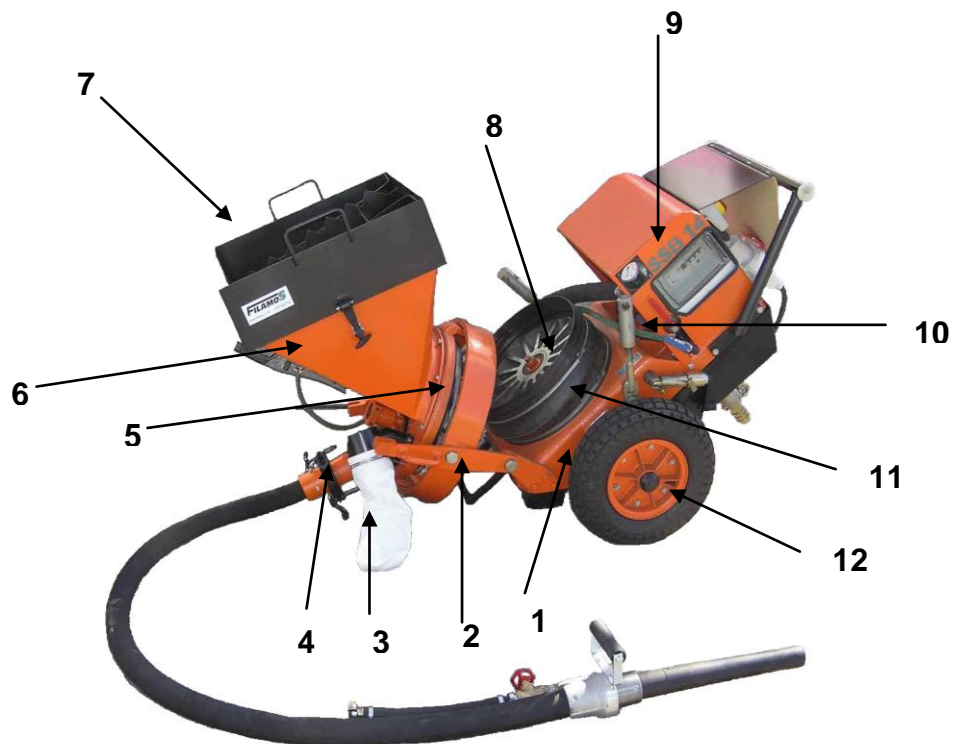
Other ways of use

There are only concrete, refractory and similar mixtures that could be delivered through the machine. There is no warranty in case other materials are delivered through.

IV. Description

The machine consists of the following main parts:

- machine drive (electric motor and slide-on gearbox)
- base frame with bearing part [1]
- dosing drums I and II [8]
- machine head with sealing plate [5] and blower [4]
- loading hopper [6] with vibrator and adapter fitted with a screen and saw to cut the sacks [7]
- rippling
- hinged frame [2] with clamping bolts [10]
- sealing cuff [11]
- dust absorber [3]
- compressed air distribution system,
- el. switch box [9]
- bantam-tyre wheels /rail undercarriage/ [12]
- accessories DN 25, 32, 40.



The electric motor is fitted with a stepped pulley and connected by one V-belt with the slide-on gearbox

The bearing part of the dosing drum, the machine drive and the air distribution system are fitted to the rear self-supporting frame. The bantam wheels are screwed to the sides of the base frame.

The dosing drum is fitted to the upper side of the bearing part shaft by a square-end and clamping nut. There are two dosing drums which can be exchanged depending on the performance of the machine required and DN (inner diameter) of the transport hoses.

The machine head is fixed to the hinged frame, and the sealing plate, its bottom sealing surface bearing on the dosing drum, is fixed to its bottom side. The blower, air inlet, feeder and exhaust of residual air from the dosing drum pockets are fitted to the upper side of the machine head.

The loading hopper is equipped with the vibrator and the adapter fitted with a screen and saw to cut the sacks

There is a rippling in the loading hopper that is used to fulfil the dosing drum pockets. The rippling can be used only with the dosing drum I.

The hinged frame, in which the machine head is fixed, is fitted at the sides to two levers which are pivoted on one side in the suspension of the machine frame and on the other side clamped by two clamping bolts. Clamping bolts are used to control the pressure of the sealing plate on the dosing drum. The levers have holders for lifting the machine with a crane.

The sealing cuff is used to seal the space between the base frame and the machine head. The sealing cuff is fixed with the tightening strip.

The dust absorber with the filter bag is fitted on the machine head. It is used to catch the residual dust materials from the dosing drum pockets.

The air distribution system consists of the main air inlet and two or three cocks. The main air inlet is fitted with a cock and quick coupler for the connection with pressure hose DN 40. The other cocks are used to control the compressed air into the blower (there is also a pressure gauge), pneumatic vibrator and for the machine cleaning. The air distribution system is fitted on the lateral side of the cover.

The machine controls are concentrated on the lateral side of the cover of the electric motor. Electric power is supplied via a cable to the switch. (For dimension chart refer to Appendix no.1).

The machine is placed on the bantam-tyre wheels or rail undercarriage.

The accessories consist of the delivery hose, end hose with the nozzle, water hose, sealing plates and nozzle endings.

Working principle

The mixture to be sprayed or conveyed is poured into the loading hopper to fill the pockets of the dosing drum. The dosing drum is filled continually. From the pockets of the dosing drum is blown by compressed air to the blower and from there into the transport hoses, at the end of which a spraying gun is mounted. Mixing water is fed into the spraying gun simultaneously to moisten the spraying mixture. The volume of mixing water is controlled by a tap.

Machine drive

There are three types of machine drive:

I. Electric motor with variable speed pulley (STANDARD)

The electric motor is fitted with a stepped pulley and connected by one V-belt with the slide-on gearbox, which is keyed by a hollow output shaft to the shaft of the bearing part of the dosing drum. By mechanical rotating the gearbox the drive rpms are controlled in a range of 1:1,5. The gearbox may be rotated only in time the machine is stopped. The machine is turned on and the dosing drum is rotating by the central switch.

II. Two speed electric motor (DUO)

The electric motor is fitted with a stepped pulley and connected by one V-belt with the slide-on gearbox, which is keyed by a hollow output shaft to the shaft of the bearing part of the dosing drum. The output is adjusted by the switch. There are two standings – 4 or 6 poles (1450/960 rpms)

III. Electric motor with frequency convertor (COM-F)

The electric motor with the frequency changer is fitted with a stepped pulley and connected by one V-belt with the slide-on gearbox, which is keyed by a hollow output shaft to the shaft of the bearing part of the dosing drum. The output is electronically controlled by four (4) buttons on the related control box. The machine is turned on by the central switch (dosing drum is not rotating). The drum is rotating when the green button is pressed. The output is changing by black button “+” and black button “-“. The drum stops rotating when the red button is pressed. The machine is turned off when the central stop is turned. The rpms are controlled in a range of 1:4.

V. Technical parameters

SSB 14 STANDARD: 6 poles electric motor with variable pulley 1,5 kW
(11 – 16 rpms/min.)

Dosing drum	I	I	II	II
Drum volume /dm ³ /	3	3	1,2	1,2
Drum rpm	11	16	11	16
Theoretical performance m ³ x h ⁻¹	2	3,0	0,8	1,2

SSB 14 DUO: 4/6 poles electric motor 1,87/1,35 kW (11/16 rpms/min.)

Dosing drum	I	I	II	II
Drum volume /dm ³ /	3	3	1,2	1,2
Drum rpm	11	16	11	16
Theoretical performance m ³ x h ⁻¹	2	3,0	0,8	1,2

SSB 14 COM-F: 6 poles electric motor 1,5 kW with the frequency convertor
(5 – 16 rpms/min)

Dosing drum	I	I	II	II
Drum volume /dm ³ /	3	3	1,2	1,2
Drum rpm /min ⁻¹ /	5	16	5	16
Theoretical performance m ³ x h ⁻¹	0,9	3,0	0,4	1,2

The drum should be selected with a view to the performance required.

The technical performance depends on the type and composition of the transported mixture, the transporting distance, the volume and pressure of compressed air and the manner of filling the machine feeder.

Technical parameters

Air consumption (transport distance 40 m)	2 – 5 m ³ x min ⁻¹
Air pressure	0,5 – 0,6 MPa
Performance of electric motor	1,5; 1,35/1,87 kW
Voltage system	3 NPE ~ 50 Hz, 3 x 400/230 V / TN-S
Max. deviation of voltage system	± 10 %
Coverage	IP 55
Inner diameter of transport hoses	DN 25, DN 32 for dosing drum II DN 40 for dosing drum I
Inner diameter of water hose	DN 20
Max. granularity of conveyed material	8 mm for DN 25, DN 32 16 mm for DN 40
Max. horizontal transporting distance	300 m (DN 25, DN 32 150 m)
Max. vertical transporting distance	100 m

The transporting distance and height are directly affected by:

- The composition and water content of the conveyed mixture (with mixtures consisting mostly of fine fractions – optimum transporting distance is 80 m for DN 40 hoses and 40 m for DN 32 hoses). Should be tested individually.
- Sufficient amount of compressed air,
- Transport hoses or piping (for larger distances these must be straight with no bends).

The compressed air must be always dry!

Principal dimensions

Length	1000 mm
Width	780 mm
Height	980 mm
Weight (without accessories)	300 kg

VI. Standard accessories

- extension hose – 20 m
- end hose with spraying gun – 20 m
- water hose – 20 m
- sealing plates – 3 pcs.
- nozzle ending – 2 pcs.

This is a standard mix of spare parts supplied. Each customer is entitled to change required spare parts and its quantity.

VII. Material

The material used in manufacturing the machine conforms to the valid manufacturing documentation as regards chemical composition and mechanical properties.

Aggregate properties for sprayed concrete conform to standards ČSN EN 12620 a ČSN EN 13055-1.

VIII. Executions

All parts have been manufactured according to production blue-prints. Intolerance dimensions conform to standards CSN ISO 2768-1.

The electric wiring conforms to standards CSN EN 60204-1. Protection against the dangerous touch voltage is secured by an automatic switch off the source.

Metal-coating of parts performed in accordance with manufacturing documentation and standards CSN EN 12 329. Before assembly, the coreless parts were treated with primer on contact surfaces.

Welds were performed in accordance with blue-prints and standards CSN EN ISO 9692-1.

The product has the surface treatment of 3rd degree of rust aggressive surroundings protection and the paint complies with CSN ISO 3864.

IX. Markings

The machine has a rating plate with the following data:

- Name and residence of manufacturer,
- CE mark – declaration of conformity,
- manufacturer's number and year of production,
- rated air pressure,
- rated water pressure,
- input,
- rated voltage,
- weight of machine.

Electric motor and gearbox have their own rating plates.

X. Testing

The properties of the machine are checked in the manufacturing plant by means of a functional test: running empty and under pressure of 0.3 MPa with sealing in operation mode. Each machine has been tested.

The test consists of the following checks:

- functionality and tightness of the dosing drum and sealing plate (with exhaust sealed, tightened clamping bolts and machine at the rest),
- loading of the electric motor at idle run with tightened clamping bolts,
- direction of dosing drum rotation (against the direction of clock hands).
The direction is marked by the arrow-head on the machine head.
- functionality and tightness of the air distribution system,
- functionality of the vibrator and the rippling (dosing drum I)

The execution of the tests is recorded in the „CERTIFICATE OF QUALITY AND COMPLETENESS“.

XI. Delivery

Each product is delivered assembled with the following documentation:

- User manual
- Operating and maintenance instructions
- Report of initial control of electric equipment
- Certificate of quality and completeness – Warranty certificate
- Spare parts catalogue

XII. Warranty

The warranty period is 12 months from the date of the machine delivery. Otherwise according to conditions in purchase contract.

The manufacturer provides no warranty:

- If the product is used for purposes or in a manner other than specified in the User manual and Operating and Maintenance Instructions,
- If the product is not being given proper care (poor storage, assembly, incorrect operating),
- If the product has been changed, modified or repaired without the manufacturer's previous consent,
- If the machine has been damaged by incorrect electrical connection,
- If the product has been damaged by a third person or vis major,
- If warranty is being claimed without Warranty Certificate,
- On the sealing plate, dosing drum, blower, transport hoses and the nozzle since their lifetime depends on the abrasiveness of the transported material.

XIII. Packaging

The machine is supplied on standard pallets, covered with plastic foil. If different packaging is requested, this must be included in the purchase contract. The standard accessories are placed on the pallet with the machine, or placed in the machine loading hopper. All casings are disposable and charged to the customer.

XIV. Transport

The machine is transported by usual transportation means. When being transported, the machine should be fixed to avoid spontaneous movement and damage. For additional information – binding plan, Appendix No. 1.

XV. Storing

The machine and accessories must be stored in spaces protected against the elements, excessive dampness, acid vapours, oils and fungi.

XVI. Servicing

Servicing is carried out in accordance with the servicing conditions given in the Operating and Maintenance Instructions.

XVII. List of standards

Used standards: European directive No. 98/37/ES according to Appendix No. 1 to NV 24/2003 Sb., CSN EN ISO 12100-2, CSN EN 294, CSN EN 418, CSN EN 811, CSN EN 953, CSN EN 983, CSN EN 1037, NV 178/2001 Sb., NV 502/2000 Sb., CSN EN 1127-2, CSN EN 12620, CSN EN 13055-1, CSN ISO 2768-1, CSN EN 60204-1, CSN EN 12329, CSN EN ISO 9692-1, CSN ISO 3864.

XVIII. Supplements

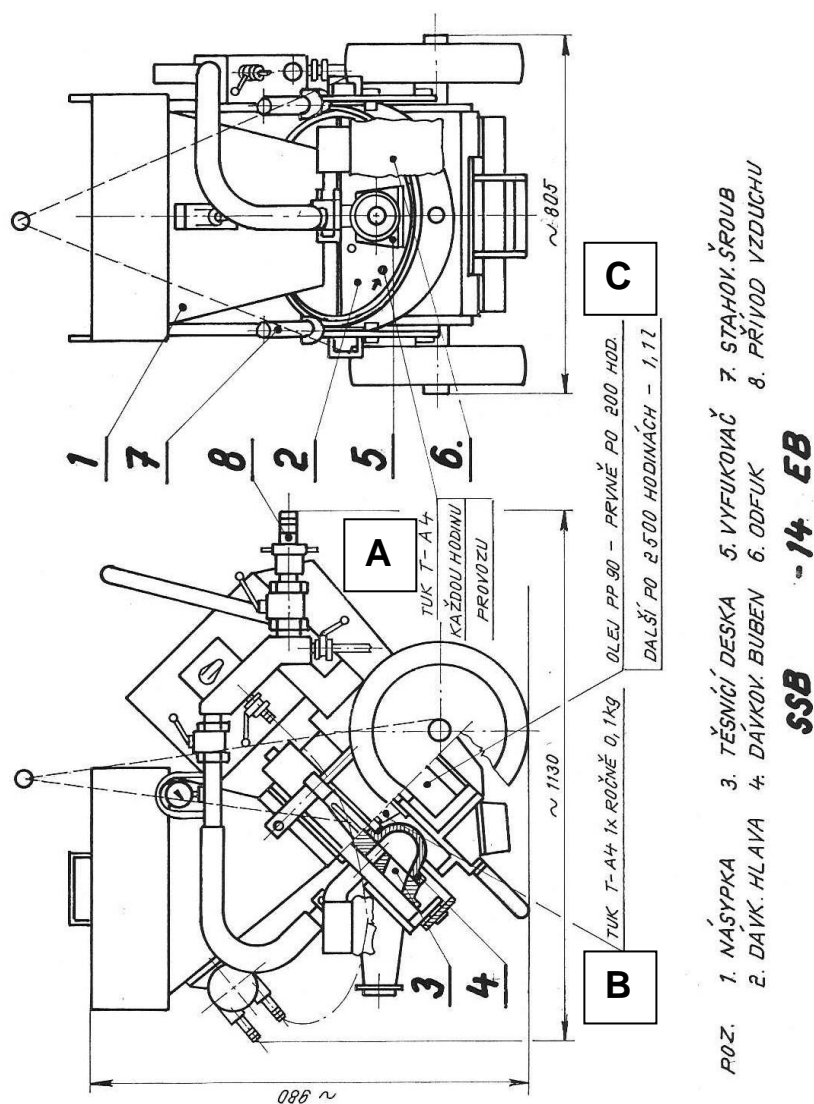
Appendix No. 1: Machine assembly + binding plan + lubricating plan

The End

Pribram, Czech Republic - April 2004

Made by: Jiri Labuda

Producer : FILAMOS, s.r.o., Hate 546, 261 01 Pribram, Czech Republic

Appendix No. 1: Machine assembly + binding plan

A: T-A4 grease: every operating hour

B: T-A4 grease: 0,1 kg yearly

C: PP 90 oil - firstly after 200 operating hours, then after 2500 operating hours – 1,1 l

1. loading hopper
2. machine head
3. sealing plate
4. dosing drum
5. blower
6. dust absorber
7. tightening clamp
8. air inlet