

User manual

Dosing pump

DC 50 / DC 200



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I. USE

Dosing pump, series DC, is used for dosing liquid additives to a concrete flow at realisation of dry-sprayed or wet-sprayed concrete technology.

The additive is used for increasing speed of the concrete hardening process, increasing the resistance at low temperatures, etc.

The pump may be used in the environment with outside temperatures of $+5 \div +35$ °C.

The source of electric power from the network 3 x 400V / 50Hz must be available.

The source carrying the minimum pressure of 0.3 MPa shall be used as the pressured water intake.

The equipment is designated for the environment free of any danger of a methane explosion (SNM-0) and flammable gases according to the Czech National Standard (ČSN) EN 1127-2.

II. PRINCIPLE OF FUNCTION; DESCRIPTION

The basic unit of the pump is a hose pump providing for accurate dosage, easy maintenance, dry-operation, long service life, etc.

The pump is driven by the electric motor equipped with the ballast resistor permitting the dosed quantity be mechanically controlled.

The pressure switch situated within the circuit provides for the pump automatic switch-off and switch-on according to a rise or drop of the pressure caused by closing and opening the closure on the spraying nozzle of the concrete spraying machine.

The system of a reverse valve avoids any leak of chemical liquid additive into the water distribution branch.

The control (regulation) of the dosed quantity is carried out by change of rotations of the pump rotor. The rotations are controlled at the driving shaft and the number of them is transferred to a display on the converter showing the quantity of supplied liquid additives in litres. The operating staff may operatively adjust the optimum dosage at various and changing conditions of spraying, e.g. output of water at the place of spraying.

Distributions water section:

- closing valve (1) at the input with a quick coupler (2) for connection of the pressured water
- reduction valve (3) for setting the input pressure – set at 0.55 MPa
- reverse valve (4) avoiding the access of a liquid mix to the distribution water section
- safety valve (5) set at 0.6 MPa
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The mixing section (6) is connected to the water supply and rising branch from the hose pump (7).

It is also provided with the controlling manometer (8) and pressure switch (9) controlling the water and additives mix supply switch-on and switch-off. The pressure switch is set in the following range 0.3 ÷ 0.55 MPa. Electric power to the pump motor is switched on at the bottom and switched off at the top.

The sucking part of the distributions comprises a suction hose with basket. Such part is connected to the closing valve (11) by the quick coupler (10) avoiding any leak of the liquid additive back to the tank from which it is sucked.

The rising branch is provided with the closing valve (12) and quick coupler behind the mixer for connection of the hose leading to the Machine nozzle for a concrete spraying. In order to depressurise the hose, such connection is amended with a corner valve permitting to loose the pressure in the rising branch at the pump stopping.

The electrical part comprises five-pin connector 16A/400V (13), motor starter (14) with a stop button and box with the thermal and under-voltage trip (15).

The electric motor (16) with capacity of 550 W is in the set with a mechanical ballast resistor (17) and worm gearbox (18) connected to the hose pump by the flexible connection coupling (19).

III. SAFETY

The pump may be connected only to the approved media complying with the standards (electric power, pressured water)

The operating staff must be older than 18 years of age and familiar with the User Manual, observe any and all operating rules of a structure and the technological regulations and measures set forth in the project documentation for the work subject to realisation.

They also must observe the safety regulations set forth by the liquid mix producer.

IV. TECHNICAL DATA

Type of the pump	DC 50	DC 200
Output (l/hod)	13-50	48-240
Max. pressure (MPa)	0,75	
Input (W)	550	
Feeding system	3 NPE ~ 50 Hz	
Weight (kg)	148	
Length	80 cm	
Width	70 cm	
Height	65 cm	

The DC 50 type is fitted for the shotcreting machine SSB 14 or SSB 05, DC 200 type for the machines SSB 24 and SSB 02.

The whole equipment is situated in a protective frame and covered with metal sheets and one rubber wall.

The connecting and controlling elements are accessible from the equipment face side, a display showing the supplied quantity is covered up with a lifting rubber cap.

The protection from any dangerous touch is provided by a self-activating disconnection from the source and different progressive connections. The bolt for the interconnection with the earthing network at a worksite is placed on the frame face side.

The equipment is made from materials of regular qualities.

The manufacturer tests the pump using clean water instead of the liquid additive, and all elements are set and their sealing tested.

The equipment is marked with a type label of the manufacturer and supplied together with the release inspection and the certificate of conformity.

The warranty is honoured for 12 months from the date of delivery. The warranty is not honoured for a replaceable working hose of the pump itself.

The equipment is supplied on a pallet and the transport is carried out by usual transport means.

V. OPERATION AND MAINTENANCE INSTRUCTIONS

Main principles for the equipment operation:

- the servicing and operating staff must be very careful and equipped with working protective aids according to the additive producer instructions
- any and all repairs and adjustments may be done only if the equipment is disconnected from the electric power source
- at realisation of the pump and distributions repair, the pressure must be lowered in such areas and the pump rinsed with clean water
- the suction hose handling must always be done with an increased diligence
- any repairs on electric installation may be executed only by a worker certified to perform such electrical installations

Preparation of operation:

- the equipment gets connected to the electric power and pressured water sources; earthing is a must
- the tank containing the liquid additive is placed in a sufficient distance and then hose-connected to the pump
- the rising hose is connected and check of all connection points and function of closing valves is performed
- the sufficient space for the operating staff and its contact with the spraying nozzle operator is provided

Operation:**A) Dry-spraying**

- upon agreement with the nozzle operator, the pressured water is released into the distribution
- after the hose is filled, the pump is switched on to suck in the liquid additive to be mixed with water in the mixer

B) Wet-spraying

- is done without any pressured water intake, only the hose pump is lowered

Operation interruption:

- caused either due to a closure of the cock at the spraying nozzle, increase of the pressure or the pressure switch having been turned off
- the operation is executed by switching off the motor starter (stop-button)

In order to prevent any leak of pressure, it is good to close the suction cock and delivery cock

Operation termination:

- to clean the additive sucking part with clean water and rinse out the entire pump distribution and pump as well
- by checking the manometer to verify that no pressure exists in the distribution and to disconnect the hoses thereafter

The equipment works in a semi-automatic regime – despite, the permanent presence of operating staff is required. The equipment operation must be monitored, primarily the additive mix tank level.

At the time of maintenance, connection points must be checked according to the User Manual one-by-one as well as the hose clips and hose pump BREDEL (supplied), the lubricant level must be checked.

Also the dosing hose replacement is to be done following the User Manual.

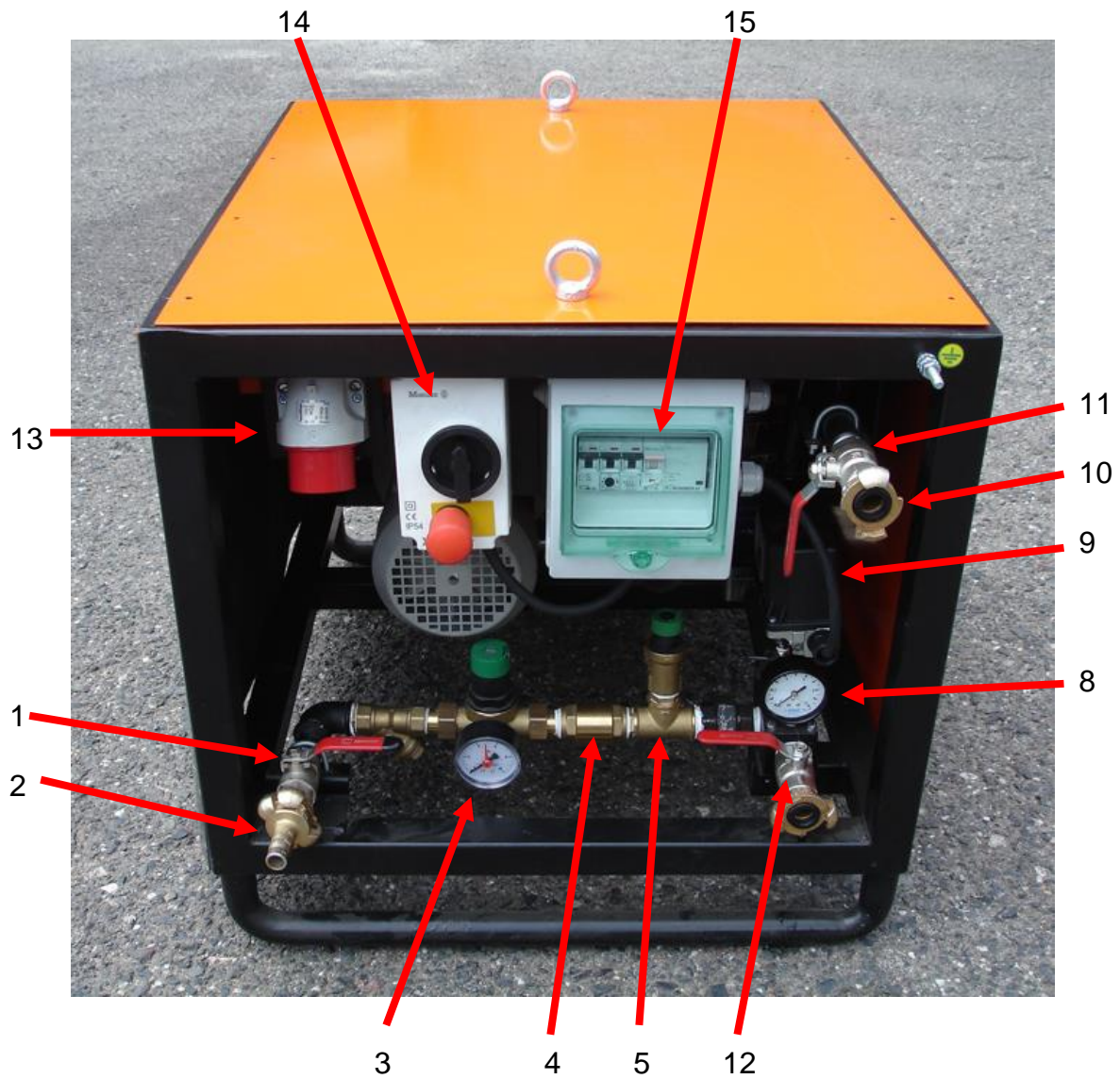
The oil in the ballast resistor must be replaced after 3,000 hours in maximum – 0.5 litre of SHELL OIL DONAX TA.

The warm gearbox filling stays at all times over the entire service life of the pump – only needs to be checked whether the oil level is not dropping due to a leak at the shaft sealing – use SHELL OIL TIVELA SC 320 for refill, if any.

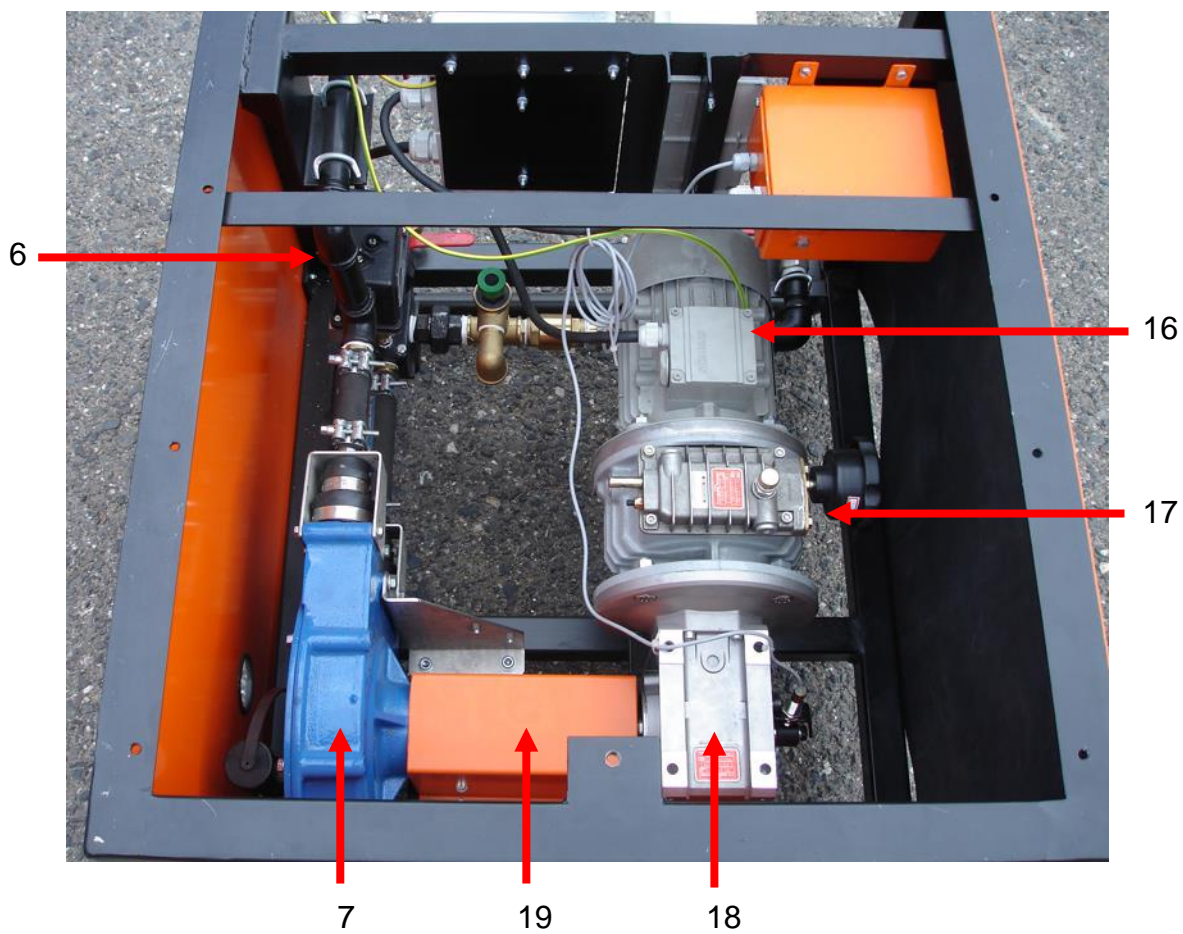
VI. APPENDICES

1. a 2. Description of the Dosing Pump Type DC
3. List of Spare Parts (for purchase, if needed)

ANNEX 1. DESCRIPTION OF THE DOSING PUMP (chapter 2)



ANNEX 2. DESCRIPTION OF THE DOSING PUMP (chapter 2)



ANNEX 3. List of Spare Parts

1, 11, 12	Ball cock 3/4"
2, 10	Quick coupler 3/4"
3	Reduction valve D06F 3/4 B
4	Reverse valve PN 16 – 3/4"
5	Safety valve PV KB 1/2" x 3/4" KB 15
7	Hose pump
8	Manometer G1/4", 0 – 1 MPa
9	Pressure limiter N 61216 0041
16, 17, 18	Electric motor, ballast variator, worm gearbox – BONFIGLIOLI
19	Shaft coupling GE-T-24A-32B