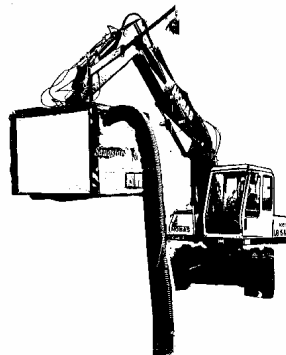




Tube Cube TC-1



Operating Instructions

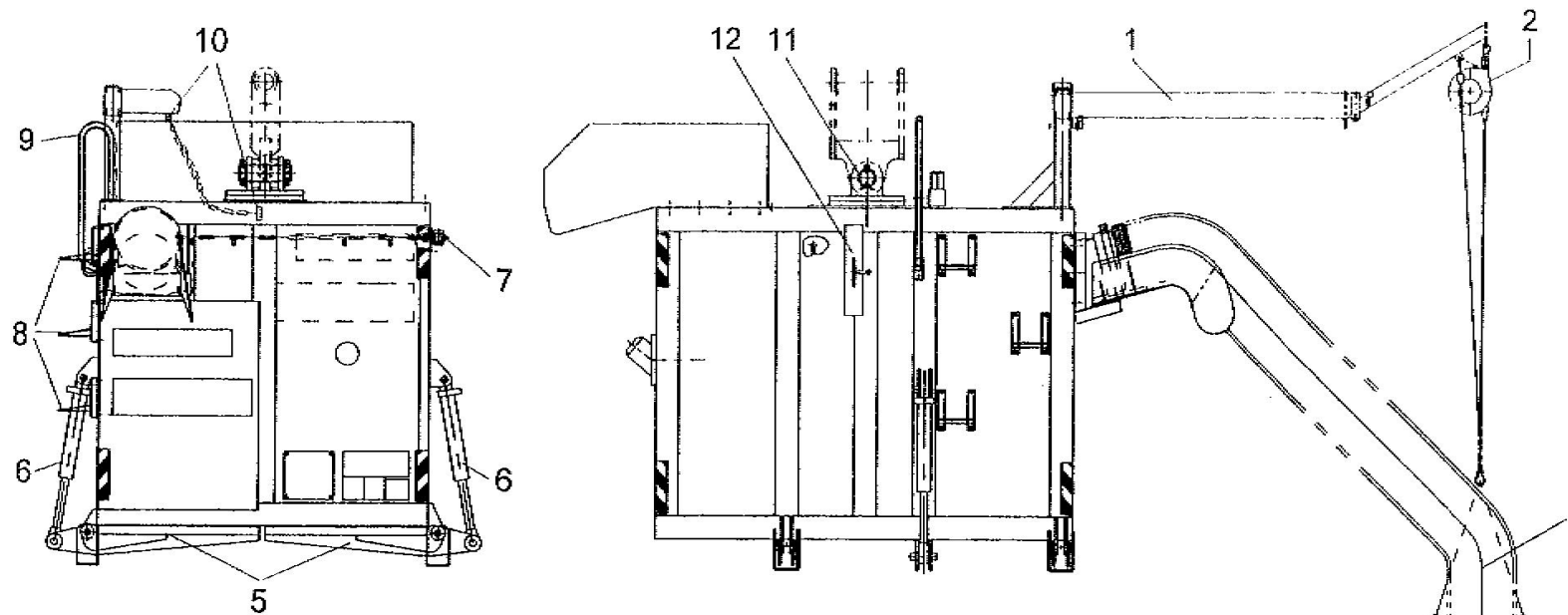
BSB Saugbagger und Zweiwegetechnik GmbH & CoKG

Vulkanstraße 13, D- 10367 Berlin / GERMANY

Phone: ++49 30 – 526 955 44

Fax: ++49 30 – 526 955 46

BSB - Tubecube TC 1 - Layout



Assembly of the tube cube

- 1 Swinging Arm
- 2 Stroke Construct
- 3 Suction Hose
- 4 Suction Tube
- 5 Flaps
- 6 Cylinder
- 7 Irrigation Works
- 8 Folding Steps
- 9 Strap
- 10 Eyes
- 11 Pivot Link
- 12 Riddle

Operating Instructions

Tubecube TC-1

1. Brief Description of the Operating Principle

The add-on unit "Tubecube" is a versatile tool for transporting various types of earthy soils by means of suction power. Materials are transported through air depression. The material is conveyed in a separate storage vessel by means of a moveable suction hose with suction crown and support.

Rough precipitation of the conveyed material takes place in this initial vessel chamber. The finer material components are precipitated through air deflection, filtering (if required) and additional air expansion in a second vessel chamber.

A nozzle system is installed in the second chamber as a standard for very dry materials. The dust particles are bound through finely sprayed water. The air quantity thus cleaned is drawn in by the powerful radial fan.

The radial fan is driven by means of a hydraulic motor.

The air escapes "Tubecube" via the fan chamber equipped with noise protection lining.

2. General Notes on Assembly

The add-on unit is designed for excavators with an operating weight of approximately 12 tons and a motor output of more than 48kW.

The excavator must be equipped for the operation of lifting gear (national laws and regulations have to adhere to !)

The transport and operating weights indicated in the data sheet must be complied with (operation with stabiliser depending on the support frame).

Please note :

The weight of the Tubecube during work is various !

The Tare Weight is 1060 kg ! The dead weight, which belongs to

The dead weight belongs to the specific gravity of the conveyed material.

A filled storage vessel (capacity max 1,0 m³) could rise the weight up to nearly 3tons !

The basic model excavator requires the built-in optional connection for the grab swivel device and a separate leakage point for the oil engine directly on the tank.

The following hydraulic parameters are required:

- Oil flow supply for Axko motor radial fan

Maximum oil flow	110 l/min
Operating pressure	320 bar
Minimum hydraulic performance	36 kW
Separate leakage port	max. back pressure 2.5 bar

Oil flow for tilt cylinders or – if available – hammer connection.

- Oil flow supply for clamshell cylinder

Oil flow approximately	30 – 40 l/min
Maximum operating pressure	Max. 50 bar

The generally available connection for a grab swivel device can be used. As a standard "Tubecube" features pressure relief values set to 50 bar which prevent overloading of the flap unit independent of the excavator type (clamshell cylinder on both sides with pilot controlled check valve).

The add-on unit "Tuibecube" is mounted onto the dipper arm instead of the bucket.

Suspension on "Tubecube" is dimensioned in such a way that the most common excavator types can be adapted by means of bushes and intermediate rings.

When placing orders for the "Saugster please indicate the type of excavator which is to be used. The conversion kit will then be prepared for you at the manufacturer's works.

Hydraulic coupling to the basic machine is effected by means of hoses with quick change couplers.

3. Notes on Operation

The "Tubecube" is intended for complicated excavation work, e.g. for creating top holes when repairing municipal utility systems (water, electricity, etc.). The soil can thus be carefully removed. When it comes to supply lines particular care should nevertheless be employed when using the suction crown.

The add-on device "Tubecube" must be brought into the required position and spotted where possible prior to commencing work.

IMPORTANT

Standing under suspended loads is prohibited. "Tubecube" has a highly mobile suction hose. In any case work should be performed in the direction away from the suction vessel in order to prevent the risk of accidents.

The device is ready for operation once the suction fan has been switched on. The soil is drawn and deposited in storage vessels via the suction crown provided with grab handles.

"Tubecube" is switched on by means of the bucket ram.

IMPORTANT

NOTE: The built-in water sprinkling system must be put into operation for dry materials. For this purpose a hydrant, for example, must be connected by using the supplied water hose.

Water sprinkling is no longer required in the case of earth-moist materials. The water supply can be stopped at the stopcock.

In order to facilitate work with the suction hose a spring is coupled to the suction crown by means of a double mobile swivel arm.

Extended suction crowns can be attached in order to facilitate work at greater depths. However, the suction diameter must be reduced as a function of the working depth.

IMPORTANT

NOTE: Particular care should be taken when working on defective gas, electricity and water lines.

Although the radial fan is equipped with an increased flash guard, health protection guidelines, national laws and regulations must be complied with.

The suction capacity will be extremely reduced if the filling level of the vessel is exceeded. In this case suctioning work must be stopped.

"Tubecube" must then be directed to the evacuation site.

The flaps on the underside of the vessel can be used for controlled discharging. The suction material is then deposited.

The seal area should be inspected for cleanliness before closing the flap.

The suction operation can be resumed if required.

4. "Tubecube" Application Limits

Light, sandy or gravelly soils present no problem at all.

"Caking" may occur in the case of soils with a high marl and/or clay content.

"Caking" can be easily eliminated with, for example, an air lance.

The physical limits of the "Tubecube" are reached with "compact" loamy soil.

Very compacted soils must be loosened through suitable tools, such as air lances or pneumatic hammers.

Metaphorically speaking, "Tubecube" is easily able to accommodate chunks that are the size of bricks.

However, a check should always be made for the compatibility of the material to be transported as well as the appearance of wear on the suction hose.

Pits and ditches filled with water can be suctioned out. However, it should be noted that the vessel is only able to hold the respective fluid when the suction fan is switched on.

A screen plate is attached between the two separating chambers. If the suctioning capacity is diminished, then the screen plate should be removed from "Tubecube" by using the handle and then cleaned by tapping it. Freezing temperatures may cause the flap seals to freeze together after water has been suctioned. In this case suitable measures, e.g. insertion of thin wooden discs, should be taken in order to prevent the machine from being shut down.

5. Maintenance

"Tubecube" is a low-maintenance design. The valve hinges, swivel arm joint and the ball-and-socket joint of the flap cylinder simply have to be lubricated once a month. Use for example Shell Alvanie EP 2 or an equal type.

The fan chamber can be cleaned by opening the cover located under the Axko motor.

The maintenance guidelines of the balancer must be taken into consideration.

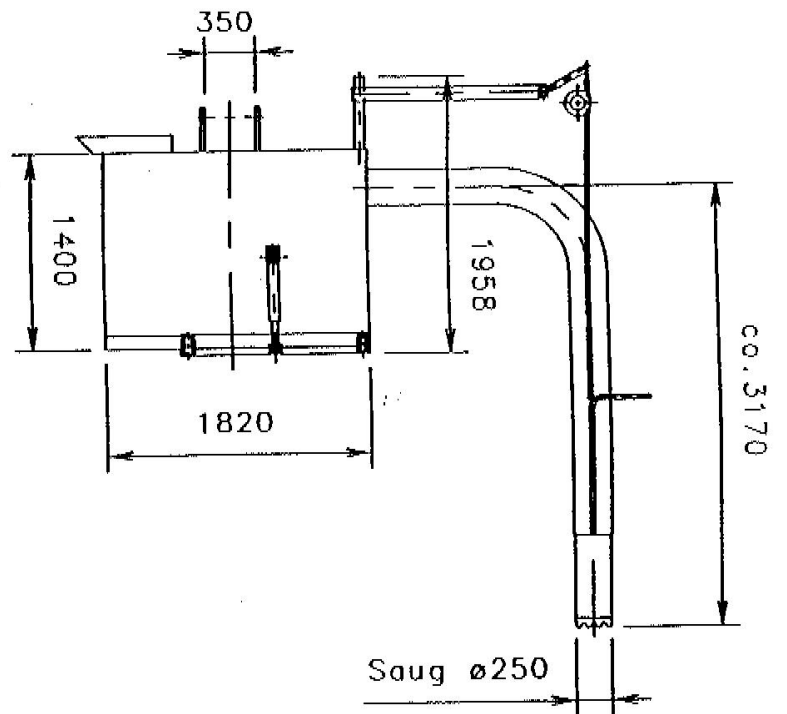
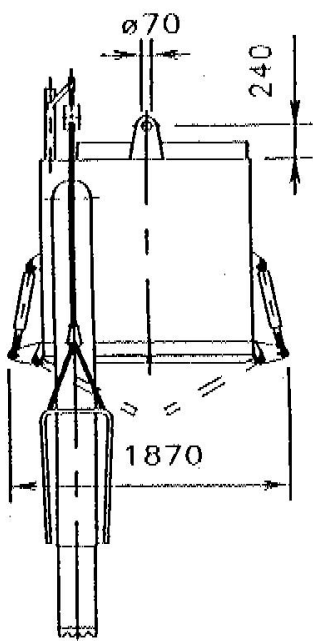
6. Notes on Occupational Safety:

1. Use support frames with sufficient structural stability and lift gear operation
National laws and regulations have to adhere to !.
2. Do not stand under suspended loads.
3. Suction work with the suction hose should always be carried out in the direction away from the add-on unit. Take adequate measures in order to prevent foot injuries.
4. Maintenance visual contact with the operator of the excavator. Agree on hand signals.
5. Caution should be exercised when suctioning materials on leaky gas lines. Consult the gas supply company for an assessment of the situation. Specify safety measures.
6. It is recommended that ear protection be worn for suction work.
7. Travelling on public roads with "Tubecube" installed is prohibited (visual field, external dimensions).
8. To climb the Tubecube without any danger (couple the hydraulic system or bolt the supporting device), please use the folding steps (8) and the strap (9). Do use the folding steps (8) and the strap (9) also the way down.
9. For transport of the tube cube is to fold the swinging arm (1) and the stroke construct (2) and both parts are to fasten to the intended eyes (10) through a chain to avoid any danger and damages.



Tubecube

Technical parameters



- Operating weight of the support frame: > 12 t
- Support frame pump flow: > 100 l/min
- Required motor output of the support frame: > 48 kW
- Suction power: approx. 17,000 m³/h air
- Suction pressure: approx. 800-900 mm WS
- Fan driving power: > 36 kW
- Storage vessel capacity: max. 1.0 m³ suction material
- Tare weight: 1,060 kg
- Suction depth without extension: 1,500 mm



Tube cube

Hydraulic facility / Circuit diagram

