

The data, images and performances specified in this booklet are purely indicative.

The manufacturer reserves the right to make any change or modification, without providing any notice to users.

GENERAL INFORMATION

HOW TO USE THIS MANUAL

The inclusion of a general table of contents on page two enables the reader to locate the relevant topic immediately, making it easier to consult the manual.

The chapters are organised sequentially based on topic, making it easier for the reader to find the desired information.

PURPOSE OF THE MANUAL

This manual was compiled by the manufacturer to provide the necessary information to all parties authorised to safely carry out transport, handling, installation, maintenance, repair, dismantling, disposal or storage operations relating to the machine or parts thereof.

Information relating to the electric motor can be found in the Use and Maintenance Booklet for the motor, issued by the manufacturer.

Failure to comply with the information provided may pose a risk to the health and safety of persons and may also cause economic damage. The manual must be stored carefully to ensure that it can always be located and consulted in perfect condition.

In the event of loss or damage, a replacement copy must be requested directly from DODA COSTRUZIONE MACCHINE AGRICOLE di Doda Aldo & c. s.n.c.

DODA COSTRUZIONE MACCHINE AGRICOLE di Doda Aldo & c. s.n.c. reserves the right to change, supplement or improve the manual; such changes shall not, however, constitute a reason to consider this copy inadequate.

WARRANTY GUIDELINES

Doda provides a 12 month warranty on its products, valid from the moment of commissioning but limited to an 18 month period from the date of shipping.

The warranty shall not apply if the problem or fault in question results from the incorrect or unsuitable use of the product, or if the aforementioned use does not correspond to that for which it was commissioned.

The warranty is limited to the repair or replacement of the product and/or the parts found to be defective, at the absolute discretion of the manufacturer, and subject to inspection by the latter.

DODA will not pay additional costs for transport or labour associated with the replacement of the defective parts.

The machines to which the manual relates must be used in environments and for uses that correspond to those provided for during the design phase.

Any improper use of the product is prohibited.

Any modification to or replacement of machine parts, without prior authorisation by the manufacturer, may constitute a risk factor for accidents and, in this case, the manufacturer shall be absolved of all civil and criminal liability, and the warranty shall be deemed void.

MANUFACTURER DETAILS

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SYMBOLS USED IN THE MANUAL

MEANING	NOTE	SYMBOL
PROHIBITION	It is PROHIBITED to perform certain manoeuvres and operations that could compromise the safety of the operator, the machine or adjacent parts/structures	\oslash
DANGER	Important DANGER messages relating to the safety of the operator and the machine.	
ELECTRICAL DANGER	DANGER of an electrical nature.	<u>k</u>
EX WARNING	Particularly important warning relating to potentially explosive atmospheres	EX
WARNING	This symbol draws attention to a particularly important warning	

DODA thanks you for purchasing a product in its range and invites you to read this booklet.

Inside you will find the necessary information for correct use of the machine you have purchased. Please, therefore, follow the instructions contained herein and read all sections of the booklet.

Please also store the booklet in a safe place and do not alter it. The content of this manual may be changed without notice, in order to include changes and improvement to the units already provided.

Any reproduction or translation of any part of this booklet is prohibited without prior authorisation.

GENERAL INDEX

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1. INTRODUCTION

The machine described in the following "USE AND MAINTENANCE" booklet is a screw separator. It is of simple and efficient construction for the treatment of any agricultural or industrial waste that requires separation of the liquid part from the solid part.

The mechanical system that has been found to be most effective is based on the compression and filtration of sewage with subsequent deviation of the liquid product and dry substance. The separator is driven by a SUPER series chopper pump and is available with a 4-5 or 9Kw electric motor, depending on the service required. The entire structure is in stainless steel.

Technologically, this machine was also built in accordance with the concept applied to all DODA products:

"Highest quality to obtain the maximum reliability and durability."



- 1) Separate liquid discharge
- 2) Solid discharge
- 3) Overflow pipe
- 4) Inspection cover

- 5) Gear motor unit
- 6) Compensation tower
- 7) Support foot
- 8) Fill pipe

2. MACHINE LOADING AND UNLOADING





For transport, position a pallet at the base and lift it all with a forklift truck. If there is no pallet, the forklift truck must have forks that are at least 1.2 m long and must take care to ensure that they rest on the points shown in **fig. 2**. Under no circumstances must the machine structure be permanently welded to the base.



Never leave a suspended load unsupervised!



Do not make sudden manoeuvres, or knock the steel parts with the forks of the lift truck.



Never stand under the suspended load when lifting, transporting or unloading the machine!



Before lifting, ensure that the structure is balanced!





3. GENERAL WARNINGS



WARNING!

- 1) Check that no component has been damaged during transportation. If damage has occurred, contact your dealer immediately.
- 2) Connection to the power supply must be performed, according to the DODA instructions, by specialised personnel.
 DODA is in no way responsible for the electrical connections (please follow the instructions on the motor plate and the sticker which indicates the direction of rotation)
- 3) Before starting the machine, check that the rotating parts of the transmission are adequately protected as required by their manufacturer.
- 4) The protection of the rotating parts not supplied with the machine must be performed by the operator based upon existing provisions of law.
- 5) DODA accepts no responsibility for changes that alter the characteristics of the purchased machine.
- 6) DODA machines may not be installed on structures that do not comply with EC safety requirements.
- 7) Before operating the machine, it is essential to read the instructions contained in the **Use and Maintenance Booklet**. In particular, ensure that you have fully understood how the machine operates.
- 8) The machine was designed and constructed to treat water and sewage, but not chemical products. Treating the latter substances may cause permanent damage.

The Doda separator can process any type of waste, including that originating from industrial or agricultural-food processes.

In addition to the dangers deriving from movement or pressurised parts of the machine, treatment of sewage can constitute a danger due to the gases that can form. These gases (CO2 carbon dioxide, NH3 ammonia, H2S hydrogen sulphide, CH4 methane) can cause intoxications and explosions. When operating with mixers, shakers, transfer systems between tanks and sewage ventilation systems, make sure that the gas does not flow into the stalls (envisage siphons or shutters). When moving sewage within stalls, make sure that there is good ventilation.

4. PRELIMINARY CHECKS



The DODA separator separates out the pumpable sewage (which must be free from foreign bodies such as metal parts, stones, pieces of wood or cloth) into a solid part and a liquid fraction. The DODA separator has been designed for use outside, in temperatures ranging between 0 °C and 40 °C. For more information, please contact the manufacturer.

- The gear unit is in an oil bath and contains **SHELL OMALA S4 WE 320** synthetic oil, pre-filled by the manufacturer in the correct quantity (1.31L for EX302, 3.5L for EX1003-EX1503). During first start-up, make sure that the oil is at the correct level and inform DODA of any anomalies.

- Before testing, activate the automatic lubricator, rotating the specific ring (see fig. 5). Adjustment of this setting determines the distribution time, which ranges between a nominal 1 and 12 months.

Based on fairly intensive use of the machine, the release time should be set to between a minimum of 3 and a maximum of 6 months.

Type of grease: LGWA 2 grease (multi-purpose EP type)

SKF *LGWA 2* is a premium quality mineral oil based, lithium complex *grease* with extreme pressure (*EP*) performance:

- Excellent lubrication at peak temperatures up to 220 °C (430 °F) for short periods
- Protection of wheel bearings operating under severe conditions
- Effective lubrication in wet conditions
- Good water and corrosion resistance. Excellent lubrication under high loads and low speeds.



5. DESCRIPTION OF OPERATION

The DODA separator is used to separate the solid fraction from the liquid fraction in any waste. The machine is a compact unit comprising a filter, a screw, a product collection tank, a door with counterweights, a gear unit with electric motor and a support structure.



Operating principle:

The fluid to be processed enters through a pipe into the separate collection tank and from there, to the filter. The liquid fraction drained from the filter, flows out by gravity. The discharge door exercises a contrast action that varies depending on the position of the counterweights, and which generates the "cap". Once a certain pressure has been reached inside the filter, the discharge doors opens, releasing the solid fraction.

The pressure level and, consequently, the level of compaction of the solid fraction, can be managed by means of the mobile counterweights applied to the discharge door. The operating capacity of the separator changes according to the different variables:

filter light, type of product to be processed, degree of residual humidity admitted in the separated dry matter.

In order to function correctly, the separator must be powered in such a way as to have constant pressure in the loading tank.

This condition is maintained, installing the pressure compensation towers or modulating the loading pump speed.

6. POSITIONING AND TRANSPORTATION

Before positioning the Separator, prepare the structure by fixing it properly to the sides of the tank.

Please remember that the machine must operate in a horizontal position. The surface for the



machine must be at a height suitable for the load pump head, bearing in mind the pressure drop in the feed pipe. A suitable height avoids the excessive accumulation of solid material close to the machine and guarantees a better management of the separated **1**) Open the electrical panel **fig. 7** and connect the electrical supply cables in the correct terminal board

W fig. 8.

Check that the power voltage is suitable to that indicated by the terminal board of the electric motor **fig. 6**.

2) To check the electric motor is rotating in the correct direction, keep the black "Manual- Automatic" handle O turned to the manual position.

3) Turn the main switch handle U from the zero position to the one position fig. 7 for just one second, then turn it straight back to the zero position (during this phase, check that the electric motor is rotating in the correct direction: see sticker on the back).

In order to preserve the operation of the machine, avoid that the motor rotates in the wrong direction for more than two seconds.



- O) "Manual Automatic" Selector.
- P) Separator operating.
- Q) Separator alarm.
- **R**) Thermal circuit breaker alarm light.
- S) Emergency.
- U) Main switch.
- V) Module.
- **Z**) Thermal circuit breaker regulator.
- W) Supply terminal board.

7. INSTALLATION OF THE SEPARATOR

Installation diagram



Equipment necessary

Suitable lifting systems must be used, compliant with current safety regulations, to position the separator. No special tools are required for assembly.





WARNING!

The separator must be installed in such a way that the solid material can be freely expelled; it must be at a suitable height to allow for the discharge of the solid substance onto the plateau or into a trailer. If discharging directly onto the plateau, the installation height will also determine the storage capacity of the separated solid fraction. Also make sure that there is a specific tank available that can receive, by gravity, the separated liquid fraction.

pg. 7



Assembly of the separator with pressure sensor. Connect the input line "A" and the liquid discharge line "B" (**fig. 12**).



Assembly with the compensation tower and the overflow line.





Connect the input line "A", the separated liquid discharge line "B" and the overflow line "C" (fig. 14).



The overflow line and the separated liquid discharge line must have separate connections in the storage tank. The overflow pipe and liquid discharge pipe must be at a slope and must not create "siphons".



For any electrical connection inside or outside of the separator control panel, please contact specialised personnel or the manufacturer directly.

DODA accepts no responsibility for the electrical connections unless carried out by the company itself. Under no circumstances should you open the protection carters of the transmission parts if the machine is functioning.

The *feed pipe* (diameter 150) must be connected to inlet A fig. 15.

The *overflow pipe* (diameter 150), on the part opposite the inlet, is connected to connections **B fig. 14**.

The *liquid discharge pipe* (diameter 150) is found in the bottom part of the machine in point C fig. 14.





WARNING: the connections for the pipes are not load-bearing: do not rest the weight of the pipes on the machine.

The filter drum can be inspected through the structure: release and lift the cover using the specific handles (see **fig. 17-17A**). From this opening, the external part of the filter and the internal of the liquid collection tank, can be washed.



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8. OPERATION



NOTE: prior to starting the machine, read the "GENERAL WARNINGS" chapter. After preparing everything necessary to normal operation and ensuring the entire stability of the machine, it may be used.

For all electric motor versions, after checking the correct direction of rotation, connect to the power supply.

Turn the main switch **U fig. 7** to the **One** position and the handle **O** to the "automatic" direction. At this point, *if there is a level sensor giving consent*, the pump that feeds the separator starts.

Should you wish to interrupt the cycle at any time, simply turn the handle **O fig. 7** to the manual direction:

- The feed pump will stop

IMPORTANT: never start the machine up when empty.



Make sure that no foreign bodies, such as metal parts, stones, pieces of wood or cloth, chalk enter the separator. Please also consider that abrasive substances (such as sand) will speed up wear and tear of the machine.

If the system does not have a level sensor on the feed pump, which allows the machine to turn on and off automatically, proceed as follows:

- turn the main switch U fig. 7 to the One position
- position the handle O to the "automatic" direction
- start up the feed pump
- to stop the system, turn the handle O fig. 7 to the central position
- stop the pump
- turn the handle **O** to the manual direction again.

Creation of the "cap"



To start the separator empty:

Move the weights to the end of the arm (see figure 19). Start the feed pump.

When the separator is loaded, increase the weight on the arms until forming a "cap".



Make sure that the solid part exits the separator regularly, lighten the load and proceed to adjust the weights (the closer they are to the arm rotation fulcrum, the damper the resulting separated solid product will be).

The speed of cap formation depends on the quantity of fibre contained in the product to be processed.

To be sure of not losing the "cap", there must be at least 20 cm of solid substance in the end part of the filter.

As a general rule, in order to obtain a cap with the correct consistency, observe the following:

the cap is too wet when the solid materials are pasty, do not crumble and slip (instead of rolling) for a surface with a slope of 45 $^{\circ}$;

the cap is too dry if the solid materials crumble into very small pieces and when the product is squeezed (by hand), there is no trace of liquid matter.

The position of the bar with the weights during operation must be horizontal. Please adjust if necessary:

unscrewing the bolt
"A" (see fig 19A)
changing the hole position "B" (see fig 19B)
tight the bolt "A" (see fig 19A).



PRODUCT QUALITY

In order to obtain a separated product that is more or less solid, you need to act on the weights and balances: if I wish to obtain a drier product, I need to move the weight further from the rotation fulcrum "A" (see **fig. 20**).





It takes a few minutes before the results are seen after a change in separator settings. Re-visit after some weeks again to re-adjust of change in material structure

The cap is too dry

Move the weights of the levers near the rotation fulcrum or even remove them completely.

If the cap is excessively "dry", it can cause the separator to stop.

To unload the cap from the filter more easily, push the weights symmetrically forwards.

The cap is too wet

If the cap is too wet, it make break repeatedly, causing the product to be discharged as-is.

The adjustment of the weights is essential and necessary during the first start-up and until stable separation conditions are achieved.

9. WORKING AND SAFETY GUIDELINES



Before carrying out any maintenance operations, stop the machine and disconnect it from the power supply.

- 1) When working and carrying out inspections on the machine, wear appropriate clothing (overalls, gloves, helmet, safety shoes, fastened clothes, etc.), which have been previously checked and approved by the site's safety manager.
- 2) The machine should be used in appropriately lit areas.
- 3) Only suitably trained staff can use the machine and access the operating areas.
- 4) Do not perform repairs or adjustment operations when the machine is in operation or when it is connected to the power supply.
- 5) The machine should only be used when all protective equipment is in place, following the instructions identified in the above paragraphs in order to avoid contact with moving parts. Do not damage or remove the protective equipment.
- 6) Prior to beginning work, ensure that the entire working unit is stable.
- 7) During maintenance, ensure that the machine is completely at a standstill and disconnected from the power supply.
- 8) Ensure that the motors are rotating in the direction indicated by the arrow positioned on the motors.
- 9) If the outlet is connected to pipes or hoses, check that the fixing joints are in perfect condition; do not stand close to them.
- 10) Store the machine in a dry place, protected from rainfall, when not being used for prolonged periods.
- 11) Ensure that the machines are perfectly level.

10. MAINTENANCE



Before carrying out any maintenance operations, stop the machine and disconnect it from the power supply.

1) Replace the grease cartridge when it is empty. Activate the cartridge as described in paragraph 4 on page 4.



2) After using the separator, wash the internal parts to prevent the product treated from solidifying on the walls of the filter and liquid collection tank.



Contact Doda for replacement parts

- 3) Once every 3 months, grease the rotating parts (joints, crowns, etc.), see figure 22A.
- 4) If installing the compensation tower, refer to the correct position in figure 22.



If the machine's performance should decline, check the filter as follows:

Dismantle the filter and wash in high-pressure water.

Check for wear and tear.

Make sure that the guide plastic profile has an even contact surface with the filter.				
If the second se	he guides are found to be worn or damaged during this control, replace them to avoid sing greater damages. Dismantle the filter and screw as follows:			
1.	Turn off the separator load pump.			
2.	Dismantle the weights from the discharge door and raise the levers to open the discharge door.			
3.	Leave the separator turning for as long as solid fraction, or much of it, comes out.			
4.	Turn the separator off and the main switch on the control panel.			
5.	Remove the discharge flange screws.			
	fig. 23			

6. Remove the filter. If the filter is blocked by solid product and incrustations, wash with plenty of water, using levers as required (see figure 24-25).





Do not strike the filter and screw with blunt objects to attempt to separate them. They are high-precision elements that must be treated with care. <u>Never open the machine dividing the loading tank from the rest of the components</u> (see figure 26).



The plastic guide profiles are used to absorb the thrust during start-up and reduce friction. The filter "floats" in the guides, depending on the resistance exerted by the cap.

During maintenance, also clean the guides thoroughly, removing any solid parts that may have deposited there.

Gear unit and electric motor

The gear unit and motor are supplied ready for use. The gear unit gearing is lubricated by synthetic oil (SHELL **OMALA S4 WE** 320 or equivalent), pre-filled by the manufacturer (1.3lL for EX302, 3.5L for EX1003-EX1503). The oil should not be topped up.

Check the oil level regularly: any discrepancies may indicate an anomaly (contact the manufacturer).

Any leaking out of oil from the points indicated in figure 27 is an indicator of anomaly (contact the manufacturer).



Filter inspection and re-assembly

The area of the filter that wears most is the end part, towards the discharge of the solid product.

If there is a cavity area inside the filter, which develops in a circular fashion, this means that the filter has not been re-assembled correctly after cleaning (the filter remains blocked and cannot move within the guides) see figure 28.

When assembling the filter, check that it can move freely both in an axial and radial direction. When re-assembling the discharge flange, after having tightened the screws, there must be a few tenths of space between the filter and the flange. Check the space using a feeler gauge.

The frequent breakage of the cap, even after cleaning the screw and filter, may indicate the need to replace the filter or regenerate the screw (wear and tear).

If the filter is worn there are 4 possibilities to re- assambly the filters again. Rotate and change from front to back etc. (See pg 21).

The construction characteristics of DODA screws mean that they can be perennially regenerated at limited cost.





LOAD SIDE

DISCHARGE SIDE

pg. 21



LOAD SIDE

DISCHARGE SIDE



LOAD SIDE

DISCHARGE SIDE



Screw control and assembly

The screw is in AISI 316 stainless steel. The ridges are treated with a hardening coating processed using special procedures and equipment.

During maintenance, check that the screw has not been damaged. The axial contact surface and the centring sites must be clean and not show any evidence of damage or wear and tear.

The tie-rods "A" (fig.28A-28B) must be handly screwed up to the gear box hub.

After this, it is necessary to tight nut to locknut on the opposite thread (fig.28C).

Use the torque wrench to tighten with 20.3 Nm value the tie-rod.

Before to insert the auger it is necessary to control that the tie-rods are parallel through them.

To check this the threads must enter without interference in the front hub cap holes (fig.28D).



Before inserting the screw, check the correct torque of the 3 tie-rods on the gear unit hub (to avoid the grip of the threads, use a specific copper-based anti-seize lubricant for stain-less steel material (use LOCTITE LB 8008 or equivalent)).

If the screw hub and tie-rods with the related closure cap are not perfectly joined, the screw does not rotate correctly and can damage the filter.

Tighten the M10 nuts with fastening torque of 20.3 Nm. Check that the filter can in any case move radially. It is important to guarantee approximately 1 mm (5/128") space in the lower part of the filter.

Run the screw empty for a few seconds, checking that the filter does not move radially.

Use a 0.15mm feeler gauge to re-check the distance between screw and filter.



11. STICKERS

The machine is equipped with the following stickers, which must be checked and, if damaged or less legible, replaced.

ATTENZIONE Prima di posizionare la macchina verificare che il motore sia collegato nel senso di rotazione indicato dalla freccia. **WARNING** Before placing the pump control the turning direction of the motor it must run as pointed out by the arrow. **DODO** THIS STICKER REMINDS YOU TO CHECK THE DIRECTION OF ROTATION OF THE ELECTRIC MOTOR BEFORE STARTING THE MACHINE.



POSITION: NEAR THE GEAR UNIT

NOTE: KEEP THE DRAINAGE HOLE POSI-TIONED IN THE LOWER PART OF THE GEAR UNIT SUPPORT BELL, CLEAN

THIS STICKER IS NOT PRESENT IN "HD" VERSION



POSITION: ON THE INSPECTION STRUCTURE. GENERIC DANGER. INSTRUCTIONS FOR USE. READ AND COMPLY FULLY WITH THE INDICATIONS GIVEN IN THE USE AND MAINTENANCE MANUAL SUPPLIED BY THE MANUFACTURER AND SCRUPULOUSLY APPLY THE MAINTENANCE PROGRAMMES.



Sticker indicating compliance with EEC regulations.

MANUFACTURER NAME
 MONTH AND YEAR OF MANUFACTURE
 MACHINE REGISTRATION NUMBER
 MACHINE TYPE

12. PERFORMANCE AND TECHNICAL DATA

The DODA screw separator is built entirely from AISI 304 and AISI 316 stainless steel.

The separation performance depends on the type of filter, the calibration of the weights and the type of product processed.

Operating capacity (data is approximate and for information only):

Very liquid product	500	l/min
Medium-density product	350	l/min
Very dense product	200	l/min



IMPORTANT: the loading pressure at the separator intake must never exceed 0.3 bars

WARNING! THE MAXIMUM OPERATING TEMPERATURE OF THE GEAR UNITS IS 70-80 °C (risk of burns).

13. PROBLEMS AND SOLUTIONS

Before carrying out any maintenance, adjustment or repair operations, stop the machine (main switch U fig. 7 in position 0). Make sure that it is completely disconnected from the main power line.

PROBLEMS	CAUSES	SOLUTIONS
No liquid comes out of the over- flow and/or liquid drainage No solid product comes out of the machine.	 The feed pump is not loading the substance. The substance to be separated is too dense. The feed line from the pump to the separator is blocked. The product processed is too liquid 	 Check that the feed pump is correctly connected and operating. Dilute the substance cor- rectly. Change the feed pipe or free it from the blockage. Mix the product as-is.
Product is not dry eventhough the weights are at the end of the bar	- Filter is torn	- Extensive wear on the screw

EC DECLARATION OF CONFORMITY DIRECTIVE 2006/42/EEC AS AMENDED

WE

DODA di Doda Aldo & C. S.n.c.

Via Contrargine Sud, 3/5 40010 Canicossa (Mantua)

DECLARE, UNDER OUR EXCLUSIVE RESPONSIBILITY, THAT THE PRODUCT,

SCREW SEPARATOR

TO WHICH THIS DECLARATION REFERS, MEETS THE REQUIREMENTS SET OUT IN DIRECTIVE 2006/42/EEC AS AMENDED.

CANICOSSA (MANTUA)

(Name, signature, corresponding stamp of an authorised party)



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