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SD SLUDGE SCREW PRESS



DESIGN 2022

MODELLO	SD – Design 2022
EDIZIONE	1°
REVISIONE	13/06/2022 – 01/07/2022



FLUITECO reserves the right at any time to make any changes it deems necessary.
This manual cannot be granted and / or sold to third parties for viewing without the written permission of FLUITECO.

This manual is an integral part of the supply of machinery, if it becomes damaged or illegible in any part, they require a copy of FLUITECO.

FLUITECO assumes no responsibility for improper use of the machine and for damage caused as a result of operation not covered or described in this manual.

The machine must be used only to satisfy the needs for which it was expressly designed, and any other use is to be considered dangerous.

Any action that changes the structure and operating cycle of the machine must be explicitly authorized only by FLUITECO technicians.

Use only original parts; FLUITECO is not responsible for damage after the use of non-original spare parts.

FLUITECO reserves the right to modify the design and make merchant improvements without notifying customers already have similar models.

FLUITECO is responsible only for the descriptions in Italian and in case of difficulty in understanding to contact our office for clarification.



Attention!

This manual contains important information regarding safety procedures to be adopted for the use and maintenance of the machine: it is necessary for each operator to carefully read this information before carrying out any work in relation to the machine.



INDICE

1 GENERAL INFORMATIONS	4
1.1 HOW TO READ THE MANUAL	4
.....	4
.....	4
.....	4
1.2 IDENTIFICATION OF THE MACHINERY	5
1.3 DECLARATION OF CONFORMITY	5
1.4 TECHNICAL SERVICE	5
1.6 POSITION OF SAFETY LABELS	6
2 LIFTING	6
2.1 CHECKS AFTER RECEIPT	6
2.2 LIFTING AND POSITION	6
2.3 SAFETY NOTICES	6
3 INSTALLATION	7
3.1 INSTALLATION AREA	7
4 CONNECTION	8
4.1 ELECTRICAL CONNECTION	8
4.2 WASHING CONNECTION	11
.....	11
.....	12
4.3 COMPRESSED AIR CONNECTION	12
5 AIR EXTRACTION CONNECTION	12
6 SAFETY	12
6.1 SAFETY DEVICES	12
6.2 SAFE USE RULES	13
6.3 RESIDUAL RISKS	13
7 DESCRIPTION AND SPECIFICATION	15
7.1 CORRECT USE	15
7.2 TECHNICAL FEATURES	16
8 USE OF THE MACHINE	17
8.1 CHECKS AND START-UP	17
8.2 WASHING SYSTEM	18
8.3 PERIODIC MAINTENANCE	20
8.3.1 GREASING	20
8.3.2 Cable tensioning	21
9 MAINTENANCE	22
9.1 PRELIMINARY SAFETY OPERATIONS	22
9.2 PERIODIC CHECKS	22
9.2.1 CHECKS TO BE PERFORMED EVERY 10 WORKING HOURS	22
9.2.2 PERIODIC CHECKS	22
9.3 HOW TO ORDER REPLACEMENT PARTS	23
9.4 HOW TO REMOVE THE SCREW	25
9.5 HOW TO REPLACE THE SCREW	26
9.6 REPLACEMENT OF RUBBERIZED SECTORS or BRUSHES	26
10 LONG-TERM STORAGE	27
10.1 DEMOLITION OF THE MACHINE	27
11 TROUBLESHOOTING	27



12 PROBLEMS IN TERMS OF PERFORMANCE AND POSSIBLE SOLUTIONS	28
13 Analysis of the risks highlighted in the design phase of the SD Fluiteco machine and countermeasures adopted	29
13.1 Analysis of the risks highlighted in the design phase of the machine and countermeasures adopted	29
13.2 Analysis of residual risks in the operating phases of the machine	30

1 GENERAL INFORMATIONS

INTRODUCTION

Before starting any operation, it is necessary to carefully read the manual to avoid any problem and / or dangerous use of the machine.




Use and instruction manual is part of the technical data sheets supplied with the machine and the purpose is to give all the information necessary for a correct and safe use of the machine.

Manual is aimed at people in charge of installing the machine and people in charge of use and maintenance who must read this manual very carefully.

1.1 HOW TO READ THE MANUAL

While consulting the manual it is possible that you will encounter some symbols.

The meanings of the symbols are listed below:

GENERAL WARNING	This type of warning advises personnel about the dangers of operating the machine. If this warning is not followed, the machine could cause damage with danger to personnel.	
ELECTRIC VOLTAGE DANGER SIGNS	This type of warning advises about the presence of voltage. Before starting any maintenance operation, it is necessary to cut off the electricity supply by turning off the main switch. After that you need to make sure that the voltage is no longer present on the machine.	
WARNING	This type of warning advises about the need to pay special attention.	



1.2 IDENTIFICATION OF THE MACHINERY

The machine can be identified by the descriptions punched on the metal plate represented and explained below. The plate is easily recognizable on the metal frame of the appliance.

 FLUITECO® <small>Strada del Lavoro, 119 - 47014 Cesenatico - Repubblica di San Marino Web: www.fluiteco.com - E-Mail: fluiteco@fluiteco.com</small>		 M.D. (2006/42/CE)
MODELLO / MODEL		
NUMERO SERIALE / SERIAL NUMBER		
ANNO DI PRODUZIONE / PRODUCTION YEAR		
WEIGHT / PESO	Kg	
POTENZA MOTORE / MOTOR POWER	Kw	
TENSIONE MOTORE / MOTOR VOLTAGE	V	

The following details can be read on the nameplate:

- Name and address of the manufacturer
- Year of manufacture
- Type of machinery
- Power
- Badge number
- Weight

The nameplate cannot be modified.

In case of need, contact our after-sales service (fluiteco@fluiteco.com or sales@fluiteco.com), communicating the information on the plate.

1.3 DECLARATION OF CONFORMITY

The machine is built according to the directive 2006/42 / EC. The machine is intended to be part of a plant that will be run by the installation program.

The declaration of conformity required by directive 2006/42 / EC is attached to this manual.

1.4 TECHNICAL SERVICE

To obtain the best performance from the machine and to avoid any possible problem that could cause the termination of the warranty, it is necessary to follow all the instructions in this use and maintenance manual.

This use and maintenance manual is part of the machine and must be easily accessible by all the personnel in charge. In case of need to contact FLUITECO, even after reading the instructions, it is necessary to have this manual at hand, in order to have a better understanding of all the explanations. Please always remember to inform our service about the serial number of the machine. The serial number is always shown on the nameplate.

1.5 SAFETY

This machine has been designed and built according to the regulations in force for the prevention of accidents with reference to both the mechanical and electrical parts. The safety systems it is equipped with serve to protect the operator and the machine itself during the processing phases.

Where potentially hazardous situations could not be eliminated, these have been reported by appropriate labels applied around the hazardous area. Periodically check that they are present and in good condition.



1.6 POSITION OF SAFETY LABELS

Some labels are attached to the machine to indicate where the user is a residual risk or important points on the machine. You need to make sure these don't deteriorate or peel off over time.



2 LIFTING

2.1 CHECKS AFTER RECEIPT

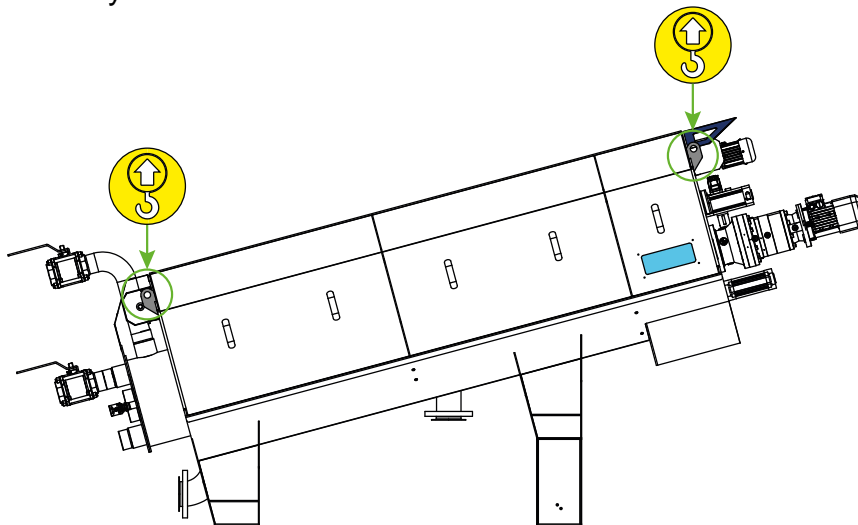
Upon receipt of the machine, it is necessary to check whether the machine reflects the order and the approval drawing. It is also necessary to check that the machine is complete in all parts as per the transport document.

Before unloading the goods, check that it has not been damaged during transport. In case of damage, it is necessary to make a brief description on the transport document.

2.2 LIFTING AND POSITION

Lifting and positioning of the machine must be carried out with machinery and lifting means suitable for the weight (see machine plate) and size of the machine.

Lifting must always and only be carried out using the lifting eyes fixed to the machine, with lifting hooks equipped with safety locks.



2.3 SAFETY NOTICES

- Lifting and positioning of the machine must imperatively be carried out by qualified personnel.
- No one should stand under the machine once it is lifted.
- Wear suitable protective equipment. Clothing must be close to the body. Avoid wearing ties, necklaces or belts that can catch or slip between moving parts.
- Do not remove the safety devices, protections and adhesives.
- Do not use or discontinue control equipment or tools attached to the machine without a license or without knowledge of its function.





- All technical modifications that affect the operation or safety of the machine must only be carried out by the manufacturer's technical personnel or technicians formally authorized by him.
- During installation there is a combined action of different operators, it is therefore necessary to act with the utmost caution.



IMPORTANT!

IL FLUITECO DECLINES ANY LIABILITY ARISING FROM THE BANKRUPTCY OF THE PREVIOUS ONE.

3 INSTALLATION

3.1 INSTALLATION AREA

The area designated for positioning the machine must be provided by the user with all connections (electricity, technical water, compressed air, etc.) for the operation of the machine, in accordance with the information in this manual, and in compliance with the characteristics of the electrical and / or electronic components. It is the user's responsibility that the placement area complies with local laws and safety rules: ventilation, grounding, adequate lighting, etc.

In particular places with the risk of freezing during the winter period, the machines without insulation / insulation (optional that can be requested), can only be used inside a suitable building. Ice can cause damage.

It is the user's responsibility to prepare the positioning area with safety devices according to this manual.

During installation, it is necessary to provide an adequate area of movement around the machine in order to facilitate assembly first of all but above all to ensure future due maintenance (ordinary and extraordinary)

The area designated for positioning the machine must be level (0 °) and able to support the weight and dimensions of the machine.

The fixings must be suitable for the surface and positioned in correspondence with the feet of the machine.

Each machine support has two holes which must be well anchored / anchored to the ground.



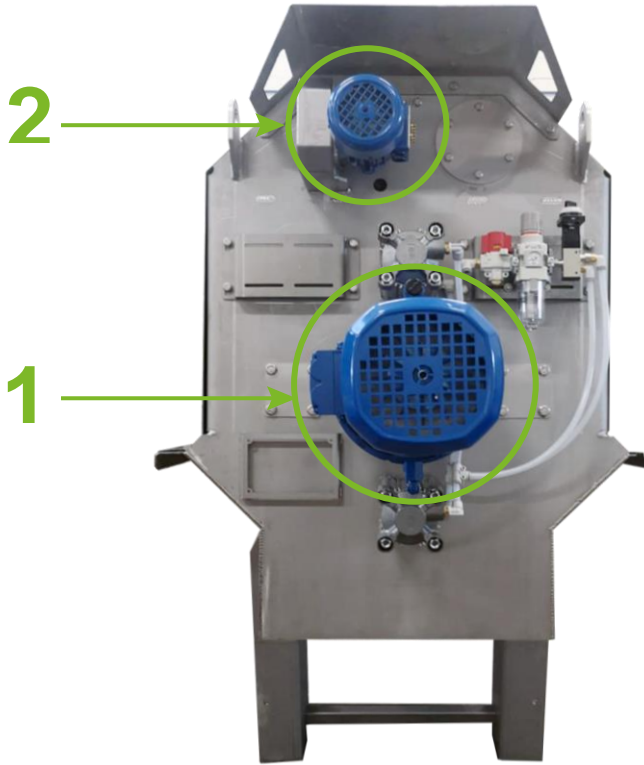


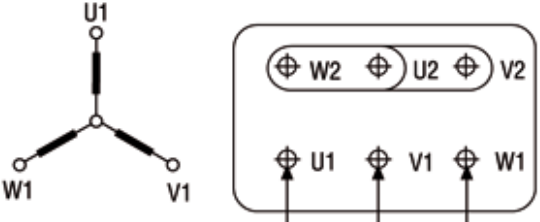
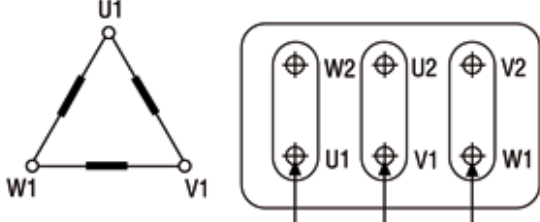
4 CONNECTION

4.1 ELECTRICAL CONNECTION

The machine is equipped with electrical devices for normal operation:

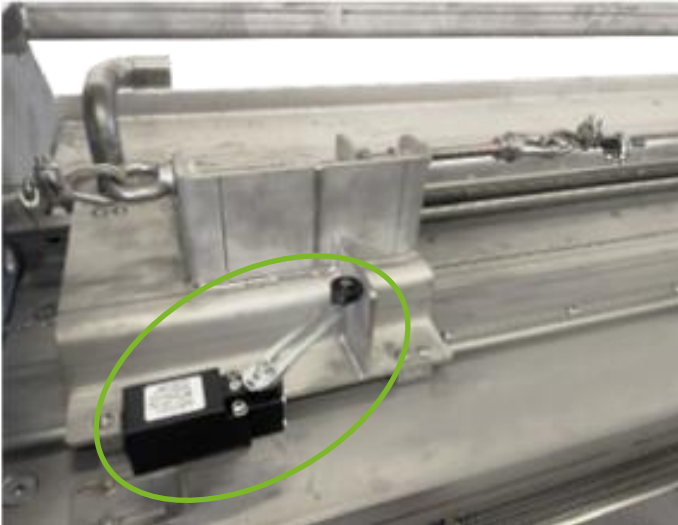
- Electric motor of the screw 1
- Electric motor for washing 2



Star Connection	Triangle Connection
<p data-bbox="131 1077 386 1108">Collegamento Stella</p>  <p data-bbox="164 1369 318 1400">Collegamento Y</p>	<p data-bbox="824 1077 1122 1108">Collegamento Triangolo</p>  <p data-bbox="938 1365 1101 1396">Collegamento Δ</p>



- Limit switch for automated washing operation (N ° 2)



* Remove bolted covers to access

- Solenoid valves for washing (OPTIONAL)



* Remove bolted covers to access

WARNINGS:



The electrical connections and the control panel must be carried out by competent personnel.

It is the responsibility of the end user to build the electrical panel according to the regulations and laws in force in the installation area.



We recommend providing appropriate protections against excessive electrical absorption of the gear reducer. It is also mandatory to provide for the possibility of not automatically restarting the machine in the event of a power failure and restoration.

Check that the voltage is in accordance with the motor nameplate values.

Electrical wiring must be of the correct size and safety as required by the electric motor.

4.2 WASHING CONNECTION

The SD-Sludge Screw Press is equipped with a 3/4 " flush valve for the 200 and 400 models, while the 700,900 and 1200 have 1".

The washing can be supplied with a solenoid valve on request (OPTIONAL).



* Remove bolted covers to access

The washing must be supplied with technical water with a minimum pressure of 5 / 6Bar.

SD Model	SD200	SD400	SD700	SD900	SD1200
Section	3/4"		1"		
Washing /h	540	600	780	990	

* Instant consumption

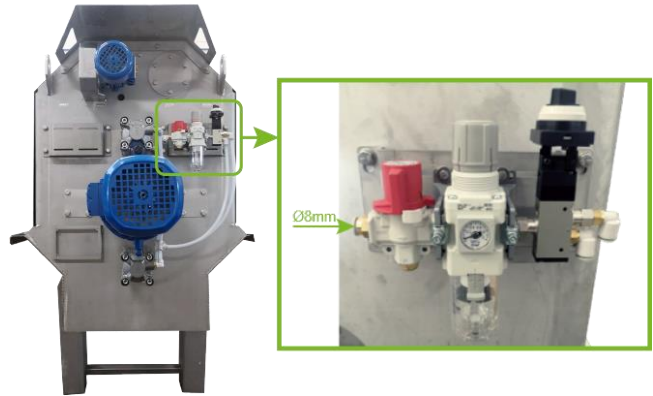


4.3 COMPRESSED AIR CONNECTION

The compressed air system is located in the rear part of the machine, above the dehydrated sludge outlet.

It consists of a main valve, an adjustable pressure gauge and an exchange valve for opening and closing the counterpressor cone.

The connection is very simple, just connect the piping (8mm Rilsan) to the main valve (in red in the image on the side).



5 AIR EXTRACTION CONNECTION

Each SD unit has included the connection for odor extraction.

Located in the rear part of the machine, above the compressed air control system, there is a flanged disk which will be enough to remove to connect the piping.



6 SAFETY

6.1 SAFETY DEVICES

Each system must be equipped, by the installer, with an emergency button (red) to stop the system in an emergency.

By pressing this button in particular dangerous conditions, the system can be blocked / stopped instantaneously. The emergency button must be positioned near the machine and must be easily accessible.

The machine is equipped with all the necessary protections, however, it is recommended to install rapid machine stop devices. It is also recommended to place warning symbols near danger points such as the dewatered sludge discharge mouth. Being a completely closed machine except for the dewatered sludge outlet) to access it, remove the bolted covers (see arrows below).



It is the task of the end user to ensure the presence of these protections and report their absence.



6.2 SAFE USE RULES

To avoid any accident, you need to carefully read the following information:

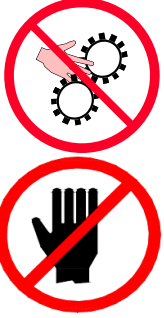


- The machine can only be used by qualified and expert personnel, after having read the instructions and having consulted with Fluiteco;
- All connections must be made by qualified and experienced personnel.
- Carry out a correct fixing to the floor
- Before starting, all safety devices must be properly connected.
- Before the machine is put into operation, it must be made safe and all personnel must remain at a safe distance.
- In case of defects, in particular on the safety devices, the operator must immediately inform his superiors and not intervene.
- If the defect prevents safe use, the machine must be stopped immediately.
- Any modification regarding the use or the safety conditions can only be carried out by FLUITECO SRL personnel, and subsequently, FLUITECO SRL refuses all responsibility for unauthorized modifications or damage caused by these modifications.
- It is forbidden to remove the safety devices and signs present on the machine.
- All actions on the machine must only be carried out by qualified and experienced personnel.
- Personnel must use suitable work clothing.
- Disconnect the power supply, compressed air and technical water before any operation and / or maintenance on the machine.
- To avoid any accidental starting of the machine during inspection, cleaning and maintenance, it is necessary to turn the main switch to the OFF position and press the emergency button to lock the machine.
- Before starting it is necessary to make sure that all safety devices are active.
- FLUITECO SRL refuses all responsibility for damage to persons and property caused by the absence and / or tampering of the safety devices.
- It is necessary to inspect the system, or once every work shift to check for any damage or defects that can be seen from the outside.
- In the event of an anomaly, stop the system immediately, particularly if there are risks to the safety or safety of the system.
- Make sure that the safety devices, safety warnings and the system identification plate are always clearly legible.
- The ground connection of the external metal part of the machine is mandatory.
- Touching the rotating part of the machine can cause serious injury.

6.3 RESIDUAL RISKS

FLUITECO has produced and built the machine in question, trying to reduce the risks as much as possible. However, there are still some risks deriving from any lack of maintenance or tampering that cannot be eliminated during the design and construction of the machine. Other sources of risk are represented by behaviors that do not correspond to what this manual reports and also to failure to comply with the laws and regulations relating to the prevention of accidents and safety in the workplace.



The table below summarizes the risks and the behaviors to reduce them.

IMAGES	Description	Measurment
	The machine also consists of moving parts, which can cause serious injury	It is forbidden to carry out maintenance operations when the machine is in motion. Prevent access to moving parts of the machine is in operation (with railings, fences, interlocking openings).
	The machine must be equipped with its own electrical system: the electrical parts can be accessed by removing the motor terminal covers.	Wear suitable safety devices before any maintenance on the machine. Only specialized personnel can access the electrically connected parts. The electrical part of the machine built by the installer must comply with the standards in force EN 60204-1.
	Hot surfaces: mechanical objects placed inside the machine can reach temperatures higher than 60 ° degrees in case of malfunction	Wait for the parts to reach room temperature



7 DESCRIPTION AND SPECIFICATION

7.1 CORRECT USE

The SD-Sludge Screw Press has been developed and designed for the dewatering of sludge with medium-small particles. This machine, made of stainless steel, has the purpose of thickening and dewatering the sludge at the same time. The **incoming liquid sludge**, with a **concentration** that can vary between **0.8 - 5% of solids**, and a **maximum pressure of 0.8 Bar**, can reach a **solid concentration in the outlet between 15 and 30%** depending on the type of incoming mud and its good flocculation.

Any other use of the machine will cause the invalidation of the guarantee, exempting FLUITECO from any responsibility.

The SD provides performance if the sludge is flocculated in an optimal manner before being placed in it.

By optimal we mean a flocculation of the mud with particles between 1 and 3cm in relation to the type of sludge which must not break before entering the SD.

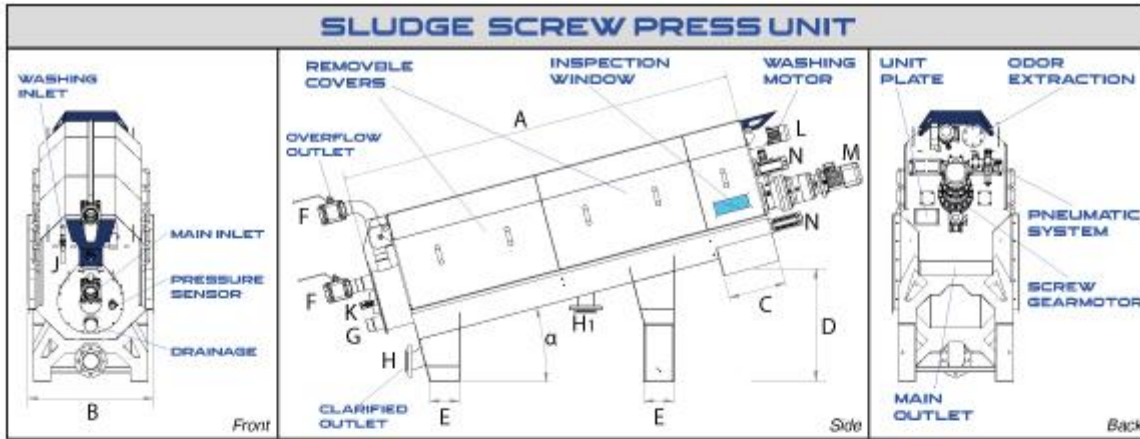
To preserve the durability of the machine, it is extremely important to clean it before turning off the machine. Therefore it must be emptied of the sludge present inside it and must perform cleaning cycles.

The management of the systems must take place automatically with the start of the sludge feed pump after switching on the SD screw.



7.2 TECHNICAL FEATURES

Here are the characteristics and dimensions of the main SD models produced by FLUITECO.



TECHNICAL DATASHEET					
Model	SD200	SD400	SD700	SD900	SD1200
FLOW					
Solids Content	Hydraulic Capacity m3/hr				
<2%	1,1	3,8	8	16,3	21
3-6%	0,8	1,8	3,9	7,7	15
7-10%	0,55	1,3	2,4	5,1	7,7
FILTRATION STAGES					
Wedge Wire	0,5 0,4 0,15mm		0,5 0,4 0,25mm		
DIMENSIONS					
A	2500mm	2770mm	4200mm		5200mm
B	618mm	874mm	1230mm	1458mm	
C	300mm	400mm			
D	680mm	740mm	760mm	930mm	
E	207mm				
α	15°		10°		
PIPES					
F	2"	3"		4"	
G	3"	4"	5"	6"	
H	3"	4"	5"	6"	
H1	None		5"	6"	
J	3/4"			1"	
Washing l/h	540	600	780	990	
MOTORISATIONS & DEVICES					
K	Pressure Sensor (OPTIONAL)				
L	0,12kW			0,18kW	
M	0,55kW	0,75kW	1,5kW	2,2kW	3kW
rpm	up to 0,86				
N	50/100	80/100			
Air l/s	2-4				
Air System	COMPLETE INCLUDED - IN-BOX SS OPTIONAL				



8 USE OF THE MACHINE

8.1 CHECKS AND START-UP

Checks to be performed before start-up:

- Check the positioning of the machine's ground fixings and verify their integrity.
- Check the hydraulic connections.
- Check the compressed air connection.



- Check the electrical connections of the wash and coil motors.
- Check that the covers are well closed and locked with the appropriate bolts.
- Check that all safety devices and risk indications for the integrity of the operators are indicated on the machine through the appropriate signs (such as stickers).
- Check the tension of the transmission cable
- Check that the direction of rotation of the propeller is shown using the appropriate sticker with arrow placed on the gearmotor (see photo below)





WARNING:

During the first startup it is necessary to carefully check every detail that may appear to be faulty, for example: high vibrations, high noise, etc.

The check procedure (See 8.1 CHECK AND START-UP) before starting must be carried out with care every time the machine remains stationary for a long period of time (more than a week).



8.2 WASHING SYSTEM

The machine is equipped with a motorized washing system.

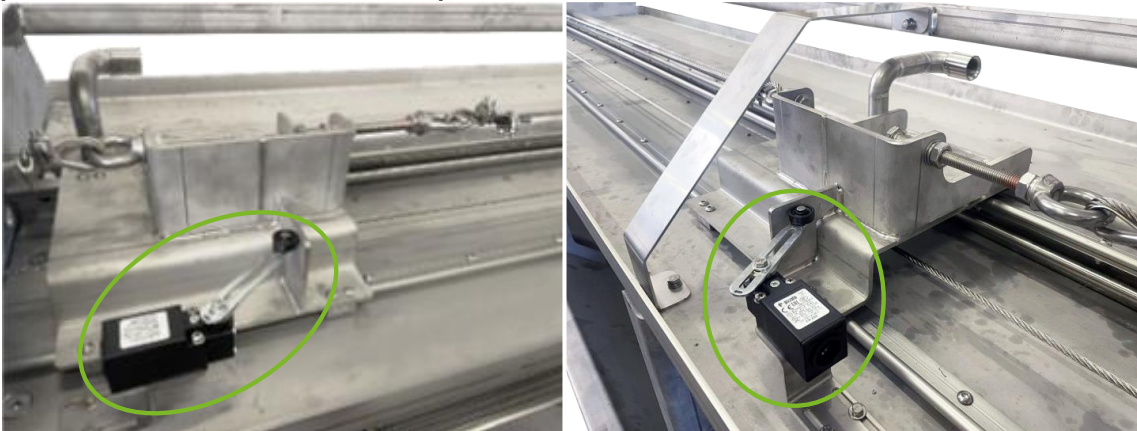
It consists of an octagon-shaped tube with nozzles, which moving along the entire filter drum will wash every single point with reduced water consumption.



By means of the dedicated motor, the trolley that slides on two tracks allows the linear forward-backward movement of the washing.



This linear movement of the forward-backward washing is possible by means of two limit switches (**See 4 Electrical connections**).



In any case, this operation is not possible without a timed circuit that manages it. This is supplied together with the control panel (OPTIONAL ON REQUEST).

The operating logic of the washing system is as follows:

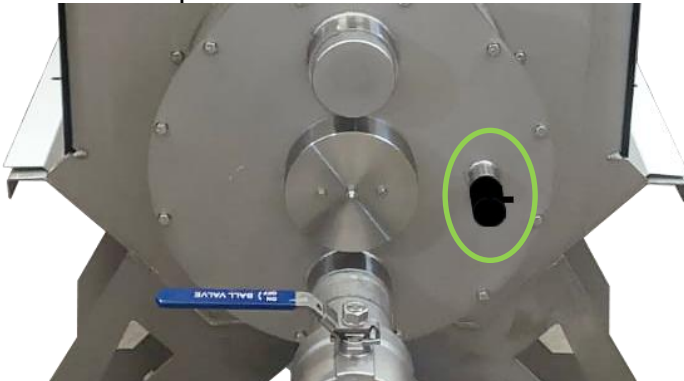
- The solenoid valve opens
- The washing motor starts (with a timer) and the trolley attached to it when it touches one of the two limit switches the direction of travel will be reversed.



NOTA: N°1 washing cycle is defined by the succession of the closed contact of 2 limit switches. Washing must always start from the resting point.

Pressure Sensor (OPTION on Request)

The SD unit can also be equipped with a pressure sensor, which has the purpose of sending the machine into protection in the event of excessive pressure.





8.3 PERIODIC MAINTENANCE

8.3.1 GREASING



The machine's screw is supported in the rear part by the motor, but in the front part it is supported by a bushing which must be periodically greased.

Using a greasing pump it is suggested to introduce grease at least once a month (3/4 pumping).



Grease pump

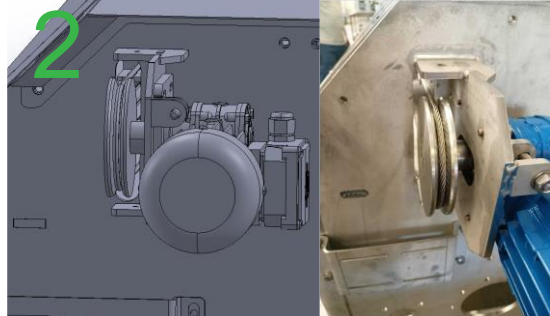
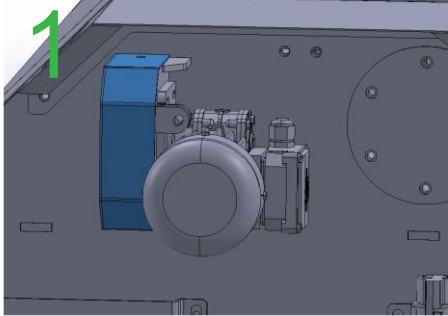
The guides and the carriages must be lubricated periodically every 6 months.

This operation must be performed by disconnecting the machine from the electric current, then opening the bolted covers and manually performing the lubrication.

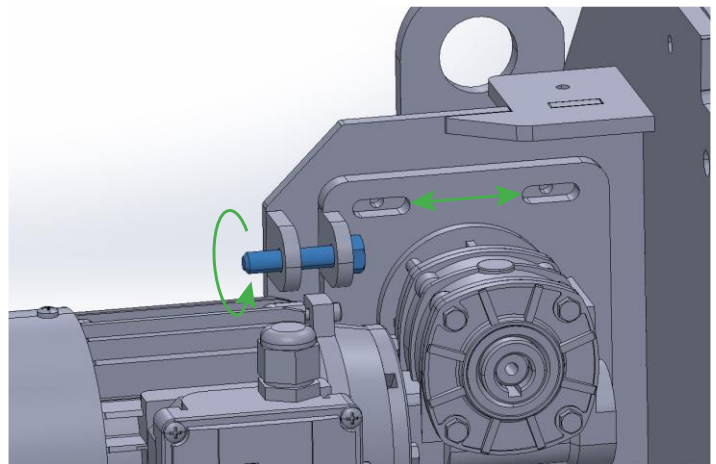


8.3.2 Cable tensioning

- Disconnect the machine from the electricity
- Remove the cover protecting the rear pulley (Highlighted in Blue).



-To tension the cable tighten the nut indicated below





9 MAINTENANCE

9.1 PRELIMINARY SAFETY OPERATIONS



WARNING: *Before carrying out any maintenance operations, switch off the electricity.*

SAFETY CONDITIONS IN CASE OF MAINTENANCE

In case of particular dangerous conditions, n°2 people must be present.

Maintenance of the appliance must only be carried out by trained and qualified personnel.

Before proceeding with maintenance, it is necessary to inform all personnel present in the plant.

Any maintenance intervention must be carried out with the machine switched off.

Each time, before restarting the machine, make sure that all safety signals and protections are efficient; be sure that all work tools have been removed and be sure that other personnel are not working on the machine.



WARNINGS: to ensure perfect operation of the machine, use only original spare parts!

9.2 PERIODIC CHECKS

It is possible to divide the periodic checks into two distinct parts:

9.2.1 CHECKS TO BE PERFORMED EVERY 10 WORKING HOURS

DESCRIPTION
Check the bolts and screws securing the sludge feed pipe
Electric motors and gearboxes: check the noise level
Check the efficiency of the washing system

9.2.2 PERIODIC CHECKS

DESCRIZIONE	FREQUENZA
Efficiency of the filter drum	Weekly
Check the efficiency of the washing system	Weekly
Fixing bolts	100 hours
Absence of clogging in the outlet area	Weekly
Electric motor	Monthly
Cable & pulleys	Every 6 Months

To lubricate the gearmotor refer to the use and maintenance manual.



9.3 HOW TO ORDER REPLACEMENT PARTS

To order spare parts it is necessary to specify the following data:

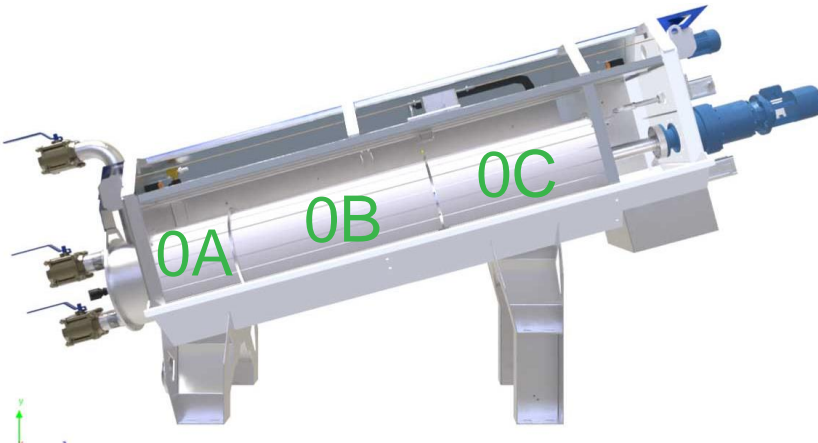
Machine type and model, serial number, year of manufacture and part number.

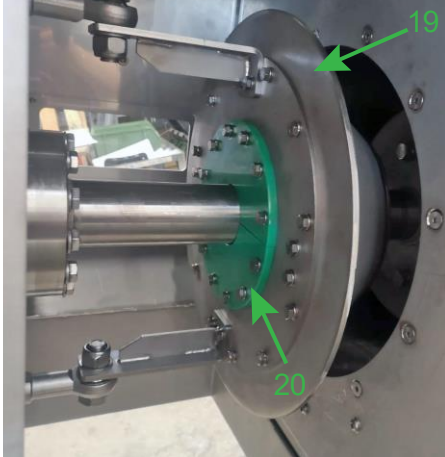
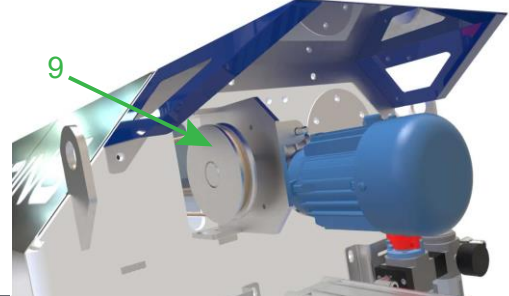
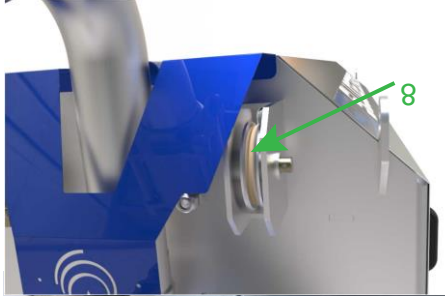
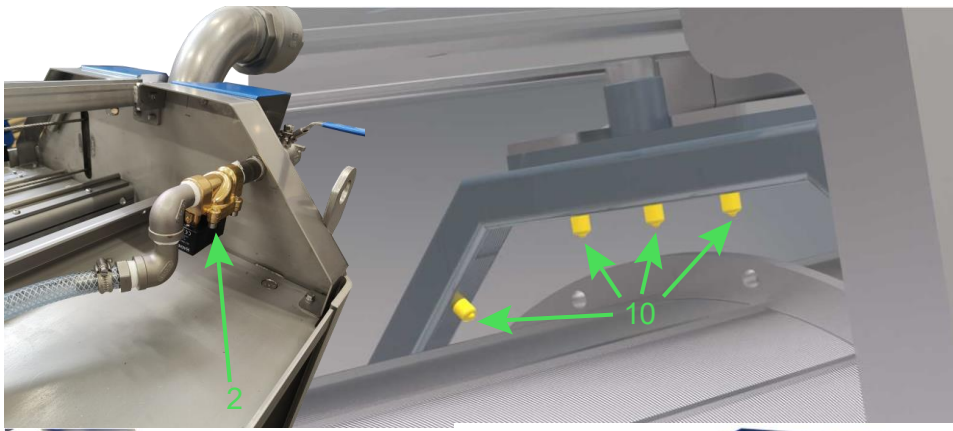
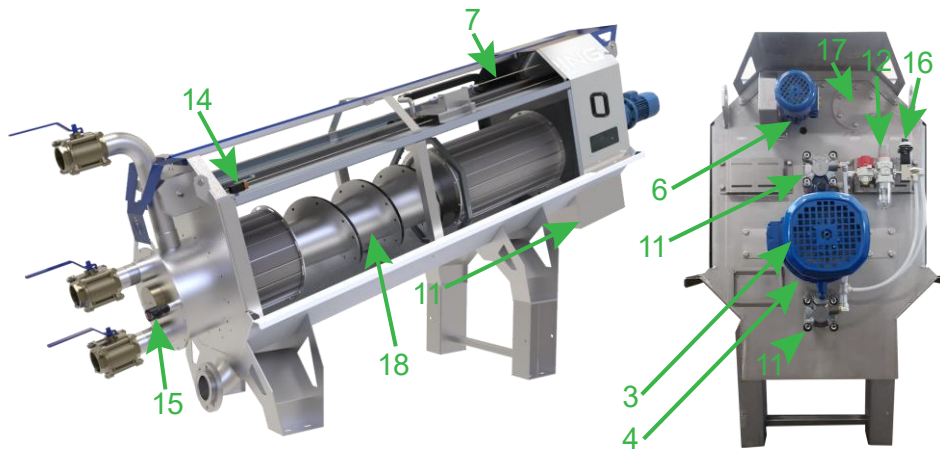
A photo of the machine plate (located above the dewatered sludge discharge) is very useful for finding the information requested above. See "1.2 Identification of the machinery"

Below is the list of spare and non-spare parts:

Position	Description
0	Drums
1	Brushes / Rubberized sectors
2	Solenoid valve for washing (optional, when supplied)
3	Primary electric motor - See Nameplate
4	Primary Motor Reducer - See Nameplate
5	Wash Motor - See Nameplate
6	Wash Motor Reducer - See Nameplate
7	Washing handling cable
8	Front pulley
9	Rear pulley - Engine pulley
10	Nozzles
11	Pneumatic cylinder
12	Pressure gauge
13	Bushing
14	Limit switch
15	Pressure sensor
16	Exchanging valve
17	Ventilation cover
18	Spira
19	Against cone
20	HDPE crescents for counterpressor cone.

* Below are images with Position n°



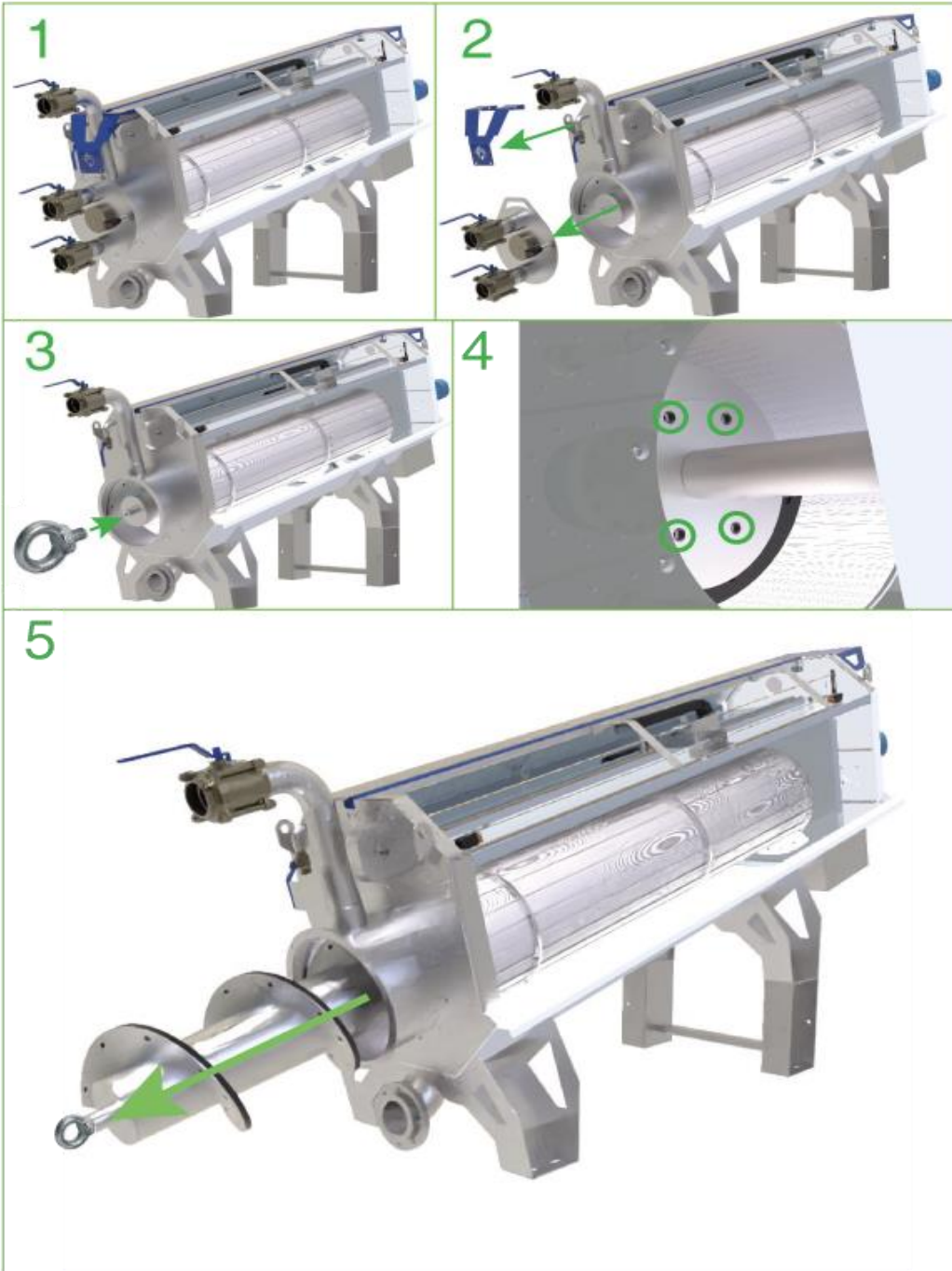




9.4 HOW TO REMOVE THE SCREW

To replace the screw and/or change rubber sectors or brushes, follow the instructions below.

- Remove the front plate (with the Fluiteco logo lasercutted on it) - See 2
- Remove the front disc - See 2
- Screw an eyelet on the front shaft - See 3
- Unbolt the motor shaft from the screw; To do this, open the counter-pressure cone completely and remove the bolts as circled in the image - See 4
- Using the previously screwed eyelet, pull the loop out - See 5





9.5 HOW TO REPLACE THE SCREW

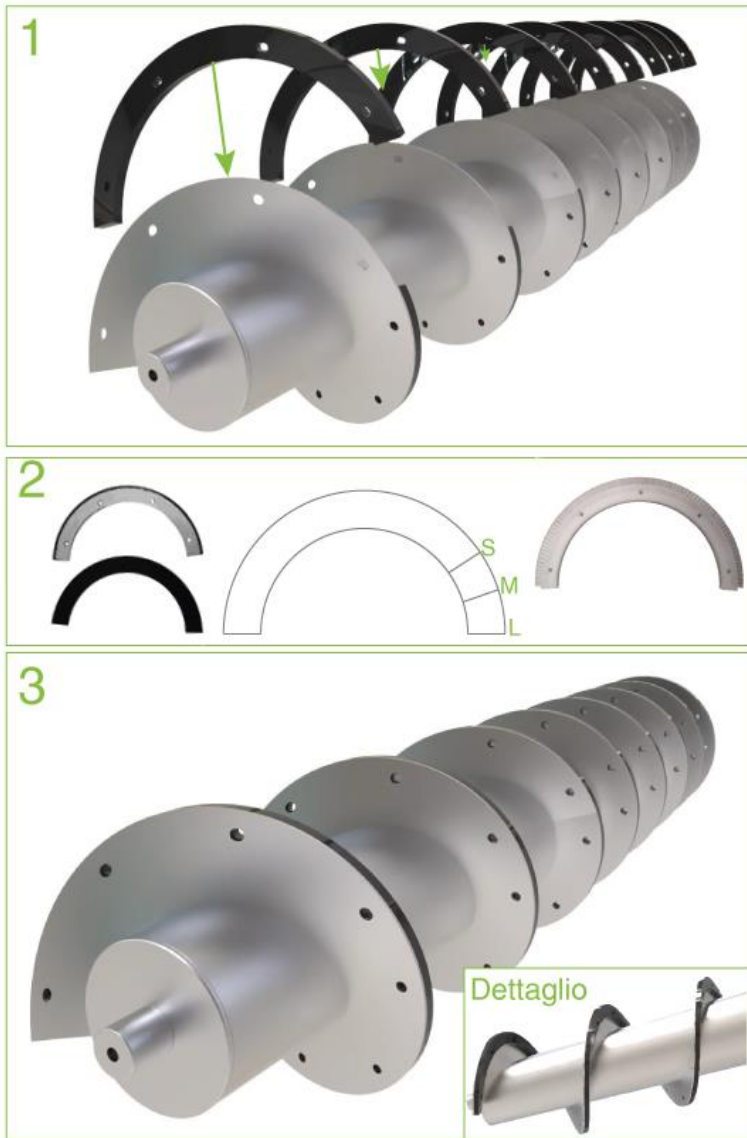
To replace, follow the instructions in point 9.4 and to remove it and, conversely, to install the new one.

9.6 REPLACEMENT OF RUBBERIZED SECTORS or BRUSHES

To remove the sectors or brushes it is sufficient to unbolt them from the screw.

The installation of the new ones is very simple, however, attention must be paid to the variable pitch screw which have sectors of 3 different lengths. To recognize them overlap them. Assemble the longer ones (See 2-L) starting from the sludge inlet side, proceed with those of medium length (See 2-M) and finally install the shorter ones (See 2-S) towards the dewatered sludge outlet side. If the screw is at a constant pitch, the sectors / brushes are all the same.

In both cases these must be mounted on the side of the screw that faces the motor (See 3 - Detail)





10 LONG-TERM STORAGE

In case of storage for long periods:

Clean the machine in the screening, transport and compaction areas.

Put the machine in a wooden crate and store it in a covered area.

Gearmotor: follow the instructions as per manual.

Before restarting the machine, proceed as for the first start-up (See 8.1 CHECK AND START-UP).

10.1 DEMOLITION OF THE MACHINE

In case of machine demolition, separate the different materials that make up the machine:

The plastic, brushes and gaskets must be separated and left in an appropriate area

The other parts must be recycled as ferrous materials.

The gear motor oil must be left in an appropriate area.

It is advisable to contact specialized companies for the recovery of machinery for disposal.

PRECAUTIONS: The demolition of the machine must be carried out in accordance with the general and local environmental protection regulations.

11 TROUBLESHOOTING

Problem					
THE MACHINE DOES NOT START. THE ELECTRIC MOTOR DOES NOT WORK					
THE MACHINE WORKS, BUT AFTER FEW SECONDS THE MOTOR STOPS					
THE GEARMOTOR IS WORKING, BUT THE SCREWS DO NOT MOVE					
THE SCREENED MATERIALS ARE NOT DISCHARGED WHEN EXITING THE MACHINE					
				Cause	Solution
●				No electrical power	Verify the electrical grid
●				Wrong electrical connections	Restore them
●	●			Wrong motor protection settings	Adjust it
●				Grit tension is too low, Frequency is too high	Check the grid's conditions
		●	●	Damaged feeding screw	Check and replace the feeding screw
●				The gearmotor might have sustained some damage	Check that the gearmotor is correctly connected with the grid and that the 3 phases' tension is the same that the one in the plate
	●			The shaft bearings are damaged	Replace them
	●			High percentage of solid materials in the outlet flow	Check the inlet
			●	Solid exit blocked	Remove the materials blocking the exit



12 PROBLEMS IN TERMS OF PERFORMANCE AND POSSIBLE SOLUTIONS

PROBLEMS	SOLUTIONS
Sludge at the outlet is not dry and/or a large quantity of sludge comes out from the drum	Flocculation is not good. Please check the flocculated sludge at the inlet of the unit. Flakes must be big and strong enough to be squeezed by the sludge screw press.
Sludge screw press stops to discharge the dried sludge	Please check the pressure of the pneumatic counterweight. The pressure is probably very high. Please check the activation instructions at page 23 of the present manual. Please check the inlet flow. May be that SD screw press is receiving higher flow rate higher than the maximum capacity.
Clarified liquid contains a large quantity of solids	Flocculation is not good. Please check the flocculated sludge at the inlet of the unit Please check the pressure of the pneumatic counterweight. The pressure is probably very high Washing system worksexcessively. Please try to reduce the number of the washing cycles.
Performance of the SD screw press is variable	Check the quality of the flocculation at the inlet of the unit. If the percentage of solids present in the sludge changes, the quantity of polymer must also change in relation to it, to maintain the same level of flocculation.
SD sludge screw press discharge liquid sludge from Dried sludge outlet	



13 Analysis of the risks highlighted in the design phase of the SD Fluiteco machine and countermeasures adopted

13.1 Analysis of the risks highlighted in the design phase of the machine and countermeasures adopted

Description of the component	Danger	Countermeasure	Probability	Impact	Risk
Transport screw	Access possible from the loading hopper or from the unloading mouth	Loading hopper with prohibition sign for the introduction of hands	1	1	1
Pneumatically controlled conical counter presser	Unloading area	Unloading mouth with signaling prohibition of introducing hands	1	2	2
Biological risk	Transport area	Hinged and bolted covers. The opening of the side covers can only take place when the machine is turned off by personnel equipped with a key to open the bolts and with the main power switch set to off	1	1	2
Risk of electrocution	Electric motor	Hinged and bolted covers. The opening of the side covers can only take place when the machine is turned off by personnel equipped with a key to open the bolts and with the main power switch set to off	1	1	1



13.2 Analysis of residual risks in the operating phases of the machine

Risk description	Risk description	Countermeasure	Probability	Impact	Risk
Risk of permanent physical damage from crushing of limb (s)	Risk of permanent physical damage from crushing of limb (s)	<ul style="list-style-type: none"> • Inform personnel of possible risks 	• 1	• 5	• 5
Risk of permanent physical damage from crushing of limb (s)	Risk of permanent physical damage from crushing of limb (s)	<ul style="list-style-type: none"> • Prohibition sign notifying the introduction of hands near the loading hopper 	• 2	• 5	• 10
Biological risk	Biological risk	<ul style="list-style-type: none"> • Absolute prohibition of manual access to the loading hopper 	• 1	• 2	• 2
Risk of electrocution	Risk of electrocution	<ul style="list-style-type: none"> • Inform personnel of possible risks 	• 1	• 1	• 1