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PREFACE

This manual aims to instruct the installers and operators of the ZP5000 Water and Oil Separator Box about the best installation and handling practices of the equipment. The rigorous accomplishment of the instructions here contained warrants a bigger durability of the equipment and a bigger easiness/reliability of its installation.

We remember that the no accomplishment of any of the instructions here contained will annul the product warranty.

USED ABBREVIATIONS

In order to facilitate the reading of this manual, some abbreviations are used, like as:

- **CSAO – ZP5000**  Water and Oil Separator Box ZP5000
- **SSAO**  Water and Oil Separator System
- **MPF**  Pre-filter Module
- **MIE**  Effluent Inspection Module
- **MCO**  Oil Collection Module
Preface

USED SYMBOLS

Along this manual, you will found some symbols. Their meanings are described bellow:

**HINT**

*This symbol indicates that the following instructions can and will facilitates the installation/operation of the equipment.*

**WARNING**

*This symbol indicates that the following instructions are of extreme importance for the good operation of the equipment. The no accomplishment of these instructions will result on bad operation of the equipment at short or long term and can, inclusive, to culminate on contamination.*

**DANGER**

*This symbol indicates that the following instructions are of extreme importance for the security of the involved people and of the installation and/or operation of the equipment.*

Do you have some doubt? Do you have some problem, critique or suggestion?

If along the reading of this manual or of the equipment installation or operation you have some doubt, suggestion or critique, feel free for to contact us!

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Att. Technical Assistance

We will have great pleasure on attending you!
INTRODUCTION

Nowadays, many commercial and industrial operations generate oily effluents. These effluents can generate environmental contaminations and therefore needs of previous treatment. The CSAO – ZP5000 is an equipment designed for to treat water resultant of this type of process before to be thrown on the sewerage system or collected, according the in force legislation, thus preserving the environment.

This equipment is able for to separate oily products free from served water, allowing the output of the effluents with concentration of up to 20 mg/l of oils and greases. Each CSAO – ZP5000 can treat up to 5000 liters of water per hour.

ZEPPINI SSAO

Although this manual treats only the CSAO – ZP5000, it is important to understand that it is part of a bigger system called “Zeppini Water and Oil Separation System” (SSAO). The more complete is the system, the bigger will be its efficiency.

The Zeppini water and oil separator system, is composed by the following equipments: Affluent Collectors, Inspection Box with Filter, Pre-filter Module (MPF), CSAO – ZP5000, Effluents Inspection Module (MIE) and Oil Collection Module (MCO).

The served waters are, on the track operations, collected by the Affluent Collectors (Track Grooves) and after passing by the Inspection Box with Filter (where the debris like leaves and plastic bags are retained), it are thrown on the Pre-filter Module for the removal of the solid sediments like earth and sand. After this, it are thrown on the CSAO – ZP5000 that will separate the water and the oil. The oil is directed toward the MCO and the treated water pass by the MIE for possible collection for analysis of the effluents and it follows for the sewerage or collection according to the in force legislation.
For the good operation of the system it is necessary to dimension correctly the served waters flow and to warrant the no emulsification (undue usage of detergents with high concentrations, solvents, etc.) and whirling (purge of pressure vases, etc.) of the served waters flow. On commercial and industrial facilities that has areas for refueling and washing vehicles or parts, it is recommended to have at least one independent CSAO for each area.

The effluents treated by the CSAO must be frequently monitored. It is important to foresee on the system installation, one collection point of the effluents in order to facilitate this control.
CSAO – ZP5000

The CSAO is composed by two stages, that is:

Reaching the CSAO, the contaminated water is conducted to the first compartment (first stage). On this compartment there is a deflector that has the function of to cause the first separation between the water and the free more oils and it retains also the solid minerals (sand, stones). Moreover, the deflector directs evenly the water flow toward the coalescent elements.

The second stage consists on to submit the flow to a controlled dripping regime through the coalescent elements, where the small oil drops are grouped (coalescence phenomenon) and it goes to the water surface, forming an oily coating.

After this phase, the oily coating is manually collected by an internal tubing system Skimmers by where it goes until the MCO for posterior disposal according to the in force legislation. The treated water, on its turn, follows by the 4 in. effluents output tubing, existing on the CSAO.
IMPORTANT

1. This system aims to separate the served waters from the free oils. Oil portions chemically emulsified on the water will not be separated by this system. The effluents to be treated must not contain high concentrations of detergents and solvents.

2. The water must reach the SSAO preferring by gravity. The pumping of the effluent toward the SSAO input can reduce the system efficiency, since the pumping will cause a higher mixture between water and oil.
TRANSPORTATION AND STORAGE

The correct storage of the **CSAO – ZP5000** is very important for to warrant the equipment integrity. For to store this product follow carefully the following instructions:

**Store carefully the CSAO – ZP5000, preserving it from impacts, sharpened objects and flexion.**

**Protect the CSAO – ZP5000 from the ultraviolet rays (UV) keeping it stored on a protected place until the moment of its installation.**

**Don’t put heavy objects over the CSAO – ZP5000.**

**Don’t remove the protective coating from the CSAO – ZP5000 until the moment of its installation.**

**Transport the CSAO – ZP5000 on adequate vehicles and protected from sharpened objects that could damage it.**

**When carrying the CSAO – ZP5000, take care for to don’t move it during the transport. If necessary, tie it, in such a way for doesn’t deform it.**

**When transporting the CSAO – ZP5000 manually or with the aid of machines, avoid impacts that could compromise its structures.**

**If necessary to stack the CSAO – ZP5000, do it carefully. Equipments bad stacked can slip and to cause personal injuries or product damages.**
CSAO – ZP5000 COMPONENTS

1. Oil Collector Line Connections .................................................. 1 ass.
2. Ø4 in. Effluent Output Line Connection ................................. 1 ass.
3. Coalescent Element ................................................................. 3 parts
4. Case Cover ........................................................................... 2 parts
5. Ø1 in. Skimmers Assembly ..................................................... 2 parts
7. Case ..................................................................................... 1 part
Details of the Oil Collector Line Connections

1. Fixed Flange ................................................................. 1 part
2. Sealing Ring ................................................................. 1 part
3. Flange (nut) ................................................................. 1 part
4. Adapter – thread ........................................................... 1 part
5. Ø4 in. Sealing Flange ....................................................... 1 part
6. Ø4 in. Sealing Ring ......................................................... 1 part
7. Ø4 in. Tightness Nut ....................................................... 1 part
8. Ø4 in. Elbow ................................................................. 1 part
9. Ø4 in. Prolonging Tube ................................................... 1 part

Details of the Affluent Input Line and Effluents Output Connections

5. Ø4 in. Sealing Flange ....................................................... 1 part
6. Ø4 in. Sealing Ring ......................................................... 1 part
7. Ø4 in. Tightness Nut ....................................................... 1 part
8. Ø4 in. Elbow ................................................................. 1 part
9. Ø4 in. Prolonging Tube ................................................... 1 part

At the moment of the reception, check if all the materials were sent on the correct quantity and if it doesn’t presents damages or defects. Reject the materials supplied out of the manufacturer specifications!
INSTALLATION

NECESSARY TOOLS AND MATERIALS

For to install the CSAO – ZP5000 it's necessary at least the usage of the following tools and materials as described below:

1. Hack-saw frame
2. Saw for plastic material (PVC)
3. Adhesive for plastic tubes (PVC)
4. Sandpaper for plastics (PVC)
5. Spade
6. Hoe
7. Medium sand (according to the pit opening)
8. Type 1 stone

INSTALLATION PROCEDURE

The CSAO – ZP5000 installation is divided on 5 main phases, as follows:

1st Phase – Box Preparation
2nd Phase – Positioning of the CSAO Case
3rd Phase – Box Grounding/Filling
4th Phase – Tubing Installation
5th Phase – Previous Operation

Observe the procedures and security warnings described along of the installation instructions.
1st Phase – Box Preparation

Step 1

Prepare a pit with rectangular shape and such dimensions that the distances between each one of the box lateral walls is at least of .30 m.
Installation

Step 2

The pit depth must be such that, after to add a .20 m sand layer (as described on the Step 4). The box upper cover must remain at a distance of .30 m to .70 m from the finished floor in order to allow its operation and maintenance. For the pit depth adjustment it must be considered a fall between the served waters gutters and the box entry of at least 2% related to its distance ($L$), according to the figure below. On the cases where this dimension can’t be accomplished, please contact the manufacturer.

It's recommended to install the CSAO – ZP5000 on a place of easy access for operation and maintenance and near to the output toward the sewerage or collection place.

During the pit preparation and while it remains open, isolate it with cones and striped tape for to avoid the fall of peoples and vehicles.
Step 3
Remove the earth removed from the place for an area away from the pit.

It's important to use adequate material for filling the pit around the CSAO – ZP5000. The local earth must be discarded and not used with this purpose.

Step 4
At the bottom of the pit, create a layer of gross sand with depth of .20 m for the CSAO – ZP5000 deposition, considering an extra filling of sand on the concavity existing between the two portions of the box. Compact it hydraulically (the depth of .20 m must be the layer final measure, after the compactness). Refer the figure bellow.

On the cases where the CSAO is installed on the following conditions: masonry pit not stanch, absence of track over the box or the elevated groundwater, follow the anchorage procedures before to go on with the installation according to the instructions of the “ANCHORAGE” chapter, page 24.
2nd Phase – Case Positioning

Step 1
Position the CSAO – ZP5000 in order to keep an even lateral distance of at least .3 m.

! The box case must be always leveled. Inclines for any extremity will cause bad operation of the system.
3rd Phase – Pit Grounding/Filling

Observe attentively the prescriptions of this manual about the pit grounding/filling in order to don’t compromise the CSAO–ZP5000 structure.

Step 1
Put clean water on the interior of the CSAO up to a height of .3 m.

Step 2
Make a layer of .2 m of medium sand evenly distributed around the box.

Step 3
Compact hydraulically the sand layer put on the Step 2.

Step 4
Repeat sequentially the Steps 1, 2 and 3 up to reach the CSAO input and output connections.

Step 5
Install the tubing according to the 4th Phase and afterwards finalize the pit grounding/filling procedure until the complete tubing coverage.

Step 6
After the last sand layer, for a best finishing, put a type 1 stone layer around the CSAO up to the access cover level.

Don’t compact mechanically the earth put over the pit, as this can damage the CSAO–ZP5000.
If the height between the CSAO covers and the sidewalk chamber cover is superior to the sidewalk chamber shroud height, make at the tip perimeter, a masonry wall for to close this space, being the height of this masonry variable according to the CSAO installation depth.

This space must be completely filled with the 1st sand layer.
The CSAO must be installed under a sidewalk layer, since this equipment isn't designed for to support any type of traffic.

The equipment can't remain exposed to the sunrays for long time, with the risk of to compromise the resistance of the material used for its manufacturing, could still, be damaged during its installation or operation.

If the compactness procedure isn't followed (3rd Step), there is the risk of collapsing or crack of the CSAO – ZP5000.

Isn't recommended the usage of mechanical compacters, due the risk of to damage the CSAO.

After the end of the installation phase, make a general cleaning of the entire system, removing any remaining debris.
4th Stage – Tubing Installation

Step 1
Clean the ends of the PVC tubes that will be connected to the CSAO in order to remove all the dirty and oiliness existing. For to provide an efficient connection, apply an even layer of plastic tube adhesive on the tubing ends.

Step 2
On the CSAO affluent input connection, connect the 4 in. PVC tube coming from the MPF, following the connection instructions described on the Step 1.

Step 3
On the CSAO effluents output connection, connect the 4 in. PVC tube, and the other tube end should be connected to the MIE and afterwards it should follow toward the sewerage or collection, following the connection instructions described on the Step 1.

Step 4
On the CSAO oil output connection, connect the 1 in. PVC tube, and the other tube end should be connected to the MCO, following the connection instructions described on the Step 1.
5th Phase – Previous Operation

**Step 1**
Make a complete cleaning on the entire system removing any debris after the end of the SSAO complete installation.

**Step 2**
Fill the CSAO with clean water.

**Step 3**
Lift the (Skimmers) at 90° related to the oil output connection and remain on this position until the draining operation.

**Step 4**
Liberate the water served flow for the beginning of the SSAO operation.

**WARNINGS**

*Defects caused to the equipment due installation errors will not be covered by the product warranty.*

*If some abnormality on the equipment is detected, contact Zeppini before the product installation.*
ANCHORAGE

The CSAO anchorage procedure is used when the equipment is installed inside of masonry pit not stanch, there isn’t track over the equipment or when it’s installed on locals that have elevated groundwater, for to warrant the equipment stability on the ground.

NECESSARY MATERIALS

For to make the CSAO – ZP5000 anchorage is necessary at least the usage of the following materials, as described bellow:

1. Concrete - 0,12 m³.
2. 6 moulds for the anchors manufacture (buckets or cans of 12 liters)
3. 6 portions of 20 cm of iron bar
4. Chain inserted on polyethylene circular tube of 1 in. or polyester tape of appropriate width with hooks on the extremities.

EXECUTION PROCEDURE

The anchored CSAO – ZP5000 installation is divided on 2 main phases, as follows:

1st Phase – Anchor preparation
2nd Phase – Anchored system installation
1st Phase – Anchor preparation

Step 1
Bent the portions of iron bar on the omega shape “Ω”.

Step 2
Fulfill the 12 liters moulds with concrete.

Step 3
Insert the bent iron bars on the superior portion of the moulds with concrete still fresh in order to form the anchors hooks where it will be fixed the belt.

Step 4
Wait the concrete cure.

2nd Phase – Instalación del sistema ancladoa

Consider that the following steps must be executed after the Phase 1 of the Installation Procedures, Chapter “INSTALLATION” on the page 15.

Step 1
Increase the pit depth in .3 m on the lateral portion between the pit wall and the box, according to the figure on the page 26.

Step 2
Position the anchors on the pit bottom in order to align the fixation hooks for the coupling of the polyester belt.

Step 3
Cover the anchors with sand and made the compactness, leaving visible the hooks.

Step 4
Follow the Phase 2, Chapter “INSTALLATION” on the page 18.

Step 5
Fixate the belts on the anchors hooks by the extremities.
Step 6
Tension the belts through the turnbuckles on the hooks, two by two, according to the figure below.

Step 7
Follows the installation from the Phase 3, Chapter “INSTALLATION” on the page 19.
The **CSAO – ZP5000** operation is summarized on the removal of the separated oil, what must be done according the following sequence:

**Step 1**
Position the *(skimmer)* oil collector existing on the first portion approximately at 1.0 to 2.0 cm bellow the water level.

**Step 2**
Open partially the cock existing on the oil collect tubing conducting the oil through the collector recipient.

**Step 3**
Close the cock existing on the oil collect tubing as soon as you observe the beginning of water exit.

**Step 4**
Return the oil collector of the first portion to its original position.

**Step 5**
Position the oil collector *(skimmer)* of the second portion approximately at 1.0 to 2.0 cm bellow the water level.

**Step 6**
Open partially the cock existing on the oil collect tubing conducting the oil through the collector recipient.

**Step 7**
Close the cock existing on the oil output tubing as soon as you observe the beginning of the water exit.

**Step 8**
Remove the oil contained on the **MCO** through the suction pump and discard it according to the in force legislation.
For to avoid the entry of water on the MCO, upon the end of each process, keep the skimmers at 90° related to the CSAO – ZP5000 oil output connection until the next draining operation.

Keep the CSAO covers always set on the case, avoiding the entry on the box of the water coming from the track, causing spilling and possible ground contamination.

The frequency of the CSAO operation for the separated oil removal will be defined according to the oil quantity generated by the facility. It’s recommended, on the beginning, to check daily the water level, or still at each track washing.

The oil removal could be done during the CSAO – ZP5000 normal operation.
MAINTENANCE

The CSAO – ZP5000 maintenance consists on the equipment internal components cleaning observing the following sequence.

Step 1
Block up the served water flow on the CSAO input.

Step 2
Remove the liquids and debris contained inside the box and stores it on appropriated stanch recipients.

Step 3
Identify the position of the coalescent elements on the box, in order for to keep the original position after the maintenance.

Step 4
Remove the coalescent elements pulling it by the eyelets.

Step 5
Remove and discard the solid minerals (sand and stone) accumulated inside the CSAO according to the in force legislation.

Step 6
Wash the coalescent elements with jet of water on a place that contributes after to the CSAO.

Step 7
Reassemble the coalescent elements on the CSAO on the positions identified early, according to the Step 3, using eyelets.

Step 8
Fill the CSAO with clean water up to the operating system (at the level of the effluents output connection).

Step 9
Return the served water flow toward the CSAO.

Step 10
Through the collection gutters, return carefully the liquids and residues stored early on the Step 2.
The CSAO – ZP5000 maintenance frequency will be defined according to the residues quantity received by SSAO system. We recommend realize initially this operation at least at each 2 months.

The CSAO – ZP5000 maintenance must be done on periods without the contribution of the served waters.

Never make the coalescent elements cleaning out of the contribution area of the CSAO.

The liquids and residues coming from the CSAO cleaning must be packed on appropriated recipients for posterior disposal according to the in force legislation.
ANNEX

Water and Oil Separator Box