



SAFETY AND INSTRUCTION MANUAL

**OIL COLLECTOR WITH FLOATING
GUTTER FOR INDOOR AND OUTDOOR
USE IN WINDTURBINE GE 1.5 - 2.5**

GENERAL ELECTRIC WIND ENERGY

1.	Object.....	3
2.	Description	4
	2.1. General Overview.....	4
	2.2. Component description.....	4
	2.3. System capabilities.....	8
3.	Regulations and standards applied	9
4.	Safety devices.....	9
5.	Applications allowed.....	9
6.	Mounting.....	10
	6.1. Previous indications.....	10
	6.2. End use of the oil collector.....	14
7.	Storage	15
8.	Waste treatment.....	16
9.	Forbidden methods of use.....	16

1. Object

This manual provides recommendations in order to achieve safe and appropriate use by workers responsible for the use of equipment "oil collector with floating gutter for outdoor and indoor use in wind turbine GE 1.5" in order to avoid accidents due to improper handling of equipment.

It is remarkable that for the **use and handling of the oil collector must be physically fit and have read and understood these instructions.**

The oil collector is used to contain the oil that can descend outside and inside the tower of the turbine, containing the oil in the base by containers.

The owner and user or workers must take responsibility by adopting the best practices described in this manual. Therefore, the information contained herein should be made known to the handling personnel and it must be understood in its entirety.

All the workers must be in perfect physical and mental condition. It is forbidden the use under the influence of alcohol, drugs or medications that may cause danger to themselves or others.



Do not use the oil collector if you are not in perfect condition because it can affect your safety and to the others.

The owner is responsible for meeting all safety requirements and other measures included in this Instruction Manual as well as to transmit that information to the operators responsible for handling and workers affected.

2. Description

2.1. General Overview

The instruction manual is inside of the container with the safety indicators.



2.2. Component description

The components and references that conform the oil collector are:

- Reference: **COL_INT_01** Two sections of inner collector of 3,500 mm in length fitted with two drains.



- Reference: **EQUI_GEN_01**. A pair of latex gloves + Kit cleaning rags + wiping plastic tape.



- Reference: **COL_EXT_01** Two sections external collector of 6,750 mm in length and equipped with three outlets and ratchet straps for attachment.



- Reference: **EQUI_GEN 02**. Six hoses 800 mm length and two hoses 700 mm length.



- Reference: **EQUI_GEN 03**. 4 bottles of 25 liters with safety signs.





The whole kit is stored in a trunk of dimensions 1,100 mm x 400 mm x 800 mm with a weight of 21 kg

The weight of the trunk which contains the two collectors (interior and exterior) valves and the tubes is 21 kg.

The weight of the bottles are 5.6 kg.

- Indoor oil collector.

Consists of two sections of manifolds in a U shape, length 3500 mm each. Each collector has 3 outlets. Drains are equidistant from each other. In order to allow the passage of oil through the drains are placed opening and closing valves equipped with hoses 0.5 m long and bottles.

To tie it into the tube of the turbine has neodymium magnets. Is made of reinforced plastic (PVC 630 gr.) and inside of it has hooks 400 mm aluminum equidistant from each other.

For binding to the inside of the tube is necessary to have laminated tape.



- Outdoor oil collector

Consists of two manifolds, in a U shape, length 6750 mm each. Each collector has 3 outlets. Drains are equidistant from each other. In order to allow the passage of oil through the drains are placed opening and closing valves equipped with hoses 1 m long and bottles.

To attach to the outside of the turbine tube has neodymium magnets. Is made of reinforced plastic (PVC 630 gr.) and inside of it has hooks 400 mm aluminum equidistant from each other. The junction of the collectors is performed by two tensioning ratchet and Velcro tape. It also has 2 caps to cover flashing ratchet tensioners.



Use extra care when handling the oil collector; rough handling may cause injury to the operator.

2.3. System capabilities.

Volume outer collector without bottles: 200 litros.
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Volume outer collector with bottles: 300 litros.

Volume inner collector without bottles: 110 litros.
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Volume inner collector with bottles: 210 litros.

3. Regulations and standards applied

The materials such as collector with gutter, Velcro or ratchet tensioner have not been subject to specific legislation or policy. In any case the components must meet the minimum requirements set out in:

- Royal Decree 1215/1997 of 18 July laying down minimum safety and health for workers' use of work equipment.

4. Safety devices.

Stability:

The stability is ensured by the neodymium magnets available to both oil collectors; inside and outside.

Also in the external model features 2 ratchet tensioners that ensure attachment to the tube of the turbine.

On the other hand hooks arranged inside the collector ensure correct positioning.

Illumination devices:

It has not been provided any method of illumination. Because the intended use it is outdoors, if natural illumination is not enough all works must be suspended in order to ensure a safe operation.

If it is envisaged that the machine have additional illumination or a electrical generator that provide additional illumination which allows manipulation you must check that the device, if available, will not cause glare or create distracting shadows.

5. Applications allowed.

The oil collector is used to collect oil that may fall outside and inside the GE 1.5 wind turbine. Several bottles contain the oil; it must be disposal or recovery under the environmental regulations.

It is used outdoors to a maximum temperature range of between -15° C and 50° C.

It can not be used in potentially explosive or extremely acidic or oxidizing salt atmospheres. Thus it must not be used on surfaces with sharp edges or with metal elements such as might cause the breakage of the textile elements from the collector. Neither should be used for handling dangerous goods, such as mass fusion or radioactive materials, among others.

6. Mounting

6.1. Previous indications.

Shall be prepared before begin operations all necessary tools and materials checking that provides the requirements set in this manual.



Always check before each cycle the conservation status of the various elements.

If the status of a component can not guarantee the safety in use, the work will be suspended until competent technical staff can check the damage and can make a diagnostic. If it is negative, indicate the repairs to be made. The replacement must be made by elements with the same characteristics and mechanical properties.

The working area at all times must to be free of any element, so that no interference in the process.

The workspace shall be free of foreign matter.

The assembly proceeds as follows:

1. Gathering all the necessary material in an appropriate space, without foreign elements and signaling and limiting the working area.



It can be transported for two workers by the rings that it has in both sides.



2. Installation of oil collector inside:

- Placement the oil collector inside the inner tube by neodymium magnets.



- Union the oil collector inside with plastic tape.



- Placement of drains and oil collection to bottles.



3. Installation of oil collector outside the turbine:

- Placement the oil collector outside the external face of the tube by neodymium magnets.



- Union of the external oil collectors by tensioning ratchet.



- Place rain gutters on the two tensors ratchet.



- Placement of drains and oil collection to bottles.



In this way the external and internal oil collector is operational.

**Notes for handling:**

The handling and transport of all components shall be in such a way as to ensure stability, so there is no risk of detachment or unexpected movements.



Mandatory use of gloves against mechanical injuries. Category I.



Mandatory use of safety shoes. Category II.



Mandatory use of head protection. Category II.



Mandatory use of eye protection. Category II.

6.2. End use of the oil collector.

Remove in reverse order of assembly.



The oil collector may contain traces of oil, which can cause skin irritation, so it must be taken into account by the operator at the time of collecting the oil bottles. Mandatory to use nitrile gloves in this case.



Mandatory use of nitrile gloves. Category I.



Mandatory use of safety shoes. Category II.



Mandatory use of head protection. Category II.



Mandatory use of eye protection. Category II.

Roll on the hub transport and transport it to the desired location.



7. Storage

When not using, the oil collector will be stored without any risk or interfere with other operations.

This placement must be in rolled condition in its natural equilibrium position under cover, so as to protect from inclement weather and any other type of aggression (shock, vibration, extreme temperatures or corrosive products, ...) which they can void or alter the properties of materials.

The intermediate elements can be used between the oil collector and the storage surface, such as wood, so that there is no direct contact with the ground.

The surface and the intermediate elements must to be horizontal, stable and resistant with enough capacity to ensure the stability of the oil collector for the duration of storage.

8. Waste treatment

Consideration will be given the statutory requirements and recycling of components as far as possible to contribute to sustainable development. Specifically stated in Regulation 1013/2006 on shipments of waste and EU regulation 413/2006 on shipments of waste.

The removal of the waste (bottles with oil) from the machine to the substation of the windfarm will be conducted by windfarm staff in their work vehicles.

From this point it is necessary to have the assistance of an authorized agent to remove the waste to a recycling point.

9. Forbidden methods of use

Never use:

- Without check the oil collector by visual inspections looking for deformations, cracks ... that security compromise.
- Without having checked and kept the work area of the oil collector free of foreign elements.
- On a sloping surface or obstacles.
- On surfaces or areas with sharp stones with sharp points.
- Without secure the position of the various components to manipulate, so that it can be controlled unequivocally its position at all times.

In general, **all modes are forbidden from use not expressly specified in this manual.**

The oil collector **will not be used if deterioration occurs, damages or other circumstances that commit the safe operation of the workers who handle or by third people.**



Do not use elements other than those specified in this manual.

The operators responsible for handling the oil collector should refuse to perform any operation in case of doubt about the way of handling or if there are no adequate security conditions.

No modifications will be made affecting the original design, as it may adversely affect the safety of persons and / or equipment.