

# PERMAGSA

GREENSTAR CANTIELEVER



## *User Guide*

## Content

### 1 General Information

- 1.1 Greenstar
- 1.2 Objective
- 1.3 Copyrighth
- 1.4 Safety

### 2 Technical Information

#### 2.1 Mounting

- 2.1.1 Functions
- 2.1.2 Nomenclature
- 2.1.3 Static load
- 2.1.4 Fixing
- 2.1.5 Wiring
- 2.1.6 Contraindications
- 2.1.7 Energy sources

#### 2.2 Operations and settings

- 2.2.1 Description of the functioning of the machine
- 2.2.2 Settings

#### 2.3 Maintenance

- 2.3.1 General notes
- 2.3.2 Inspection intervals

#### 2.4 Trouble shooting

### ANNEX:

- Annex A: Electrical Wiring
- Annex B: Machine Technical Data
- Annex C: General Dimension
- Annex D: Brake Information
- Annex E: Brake TUV Certificate CE + A3
- Annex F: Encoder Information
- Annex G: Encoder Certificate
- Annex H: TUV+EMC+CE

## 1- GENERAL INFORMATION

### 1.1-GREENSTAR

GREENSTAR, the latest generation of permanent magnet synchronous machines for the lift industry, are designed, developed and manufactured under the highest quality standards by Permanent Magnets S.A., known in the market as Permagsa.

GREENSTAR is made using the modular technology. This kind of technology provides the best advantages at the time of mounting, high efficiency, cost effective, among others.

Due to the compact desing, the GREENSTAR has the best characteristics for the market:

- Ecofriendly
- Low weight
- Little dimension
- Lowest noise

This characteristics together with the high security of the brakes, make the GREENSTAR the ideal machine for the machine room less elevators.

### 1.2-OBJECTIVE

The target of this users guide is provide a little guide with the characteristics of the GREENSTAR and it main components (brake and encoder). Also this catalogue include a guide of mounting, installation and maintenance.

This manual should be read by the people in charge of mounting, installation and maintenance. PERMAGSA takes no responsibility caused by passive attitude on this manual.

### 1.3-COPYRIGTH

No part of this manual may be reproduced or transmitted, in any form or by any means, including but not limited to photocopying, recording, or information storage and retrieval systems, for any purpose without prior written permission of PERMAGSA.

### 1.4-SAFETY

The mounting, installation, and maintenance of the GREENSTAR machines, is only allowed to be done by qualified personnel following the safety at work regulations and general recommendations.

## 2- TECHNICAL INFORMATION

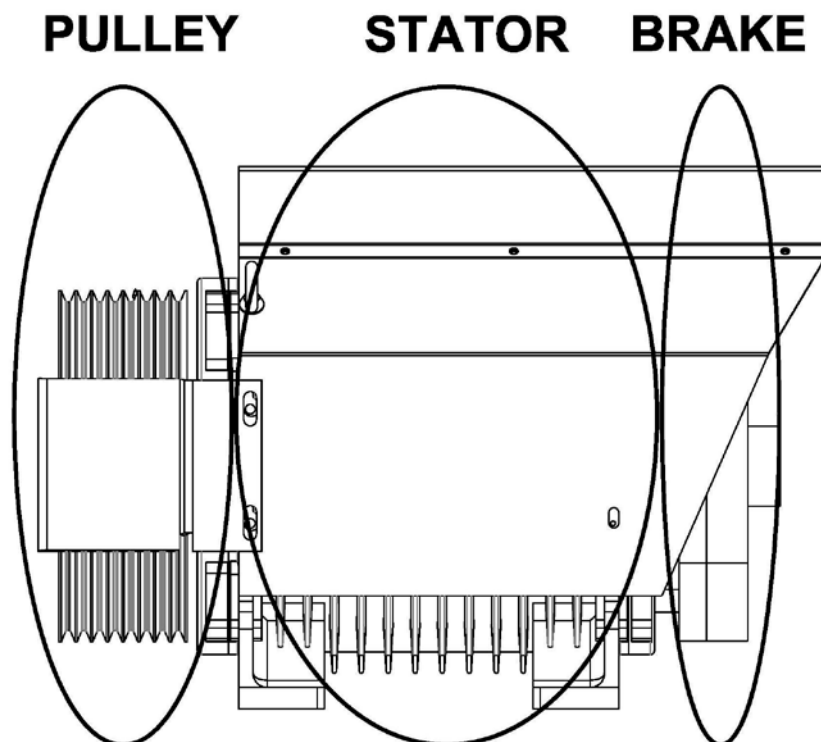
### 2.1. MOUNTING

#### 2.1.1 Functions:

The objective of the machine is move and stop the lift as per the users indications. The traction pulley and braking system is directly linked to the machine axe so that there are no intermediate union. The method of traction is called by adherence, namely that the traction is through the friction between the cables and the grooves of the pulley. The braking system is composed by a dual electromechanical brake shoe so it is able to stop the lift with just one of them. The operation should be through frequency inverter with closed loop.

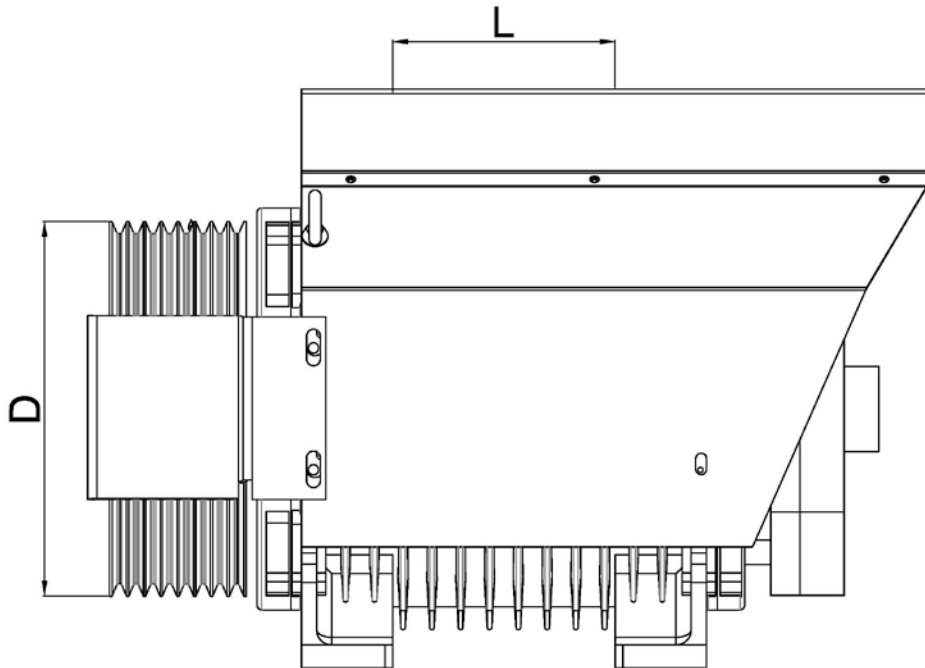
#### 2.1.2 Nomenclature:

To understand the nomenclature of each model of machine, is important to know the structure of PERMAGSA machines (except Home elevator) that is shown in the following picture:



The name of each machine is composed by Gc or GcH letters followed by three numbers and the structure is the following:

Gc-L-W-D



**“Gc” Letters:**

These letters mean: GREENSTAR CANTIELEVER (the general name of the machines). Machine starting with Gc will be 12 pole machine, machine estarting GcH, will be 18 pole machine.

**Number “L”:**

As is shown in the picture, “L” is the length in mm of the stator. Following PERMAGSA catalog L could have these values: 75mm / 115mm / 150mm / 225mm / 300mm. This variable affects proportionally to the nominal torque of the machine.

**Number “W”:**

This number refers to the type of winding of the machines. The value of W is the same as the maximun speed, in r.p.m., that the machine can work.

**Number “D”:**

As is shown in the picture, D is the diameter in mm of the traction pulley.

So for the model GC150-225-210:

Length of the stator: 150mm

Máximun speed: 225 r.p.m.

Diameter of the traction pulley: 210mm

Once is explained the name of the machines GREENSTAR CANTIELEVER, is important to know that all the models of machines (except Home Elevator) have the same distribution and due to the modular technology that is applied in the construction of the machines GREENSTAR CANTIELEVER, the difference between models is the length of the stator.

### 2.1.3 Static Load:

The static load admissible of the machines depends on the length of the machine, as each length has specific bearings:

- Stator length  $\leq 150\text{mm} = 1.700\text{kg}$
- $150 \leq \text{Stator length} \leq 225\text{mm} = 2.700\text{kg}$
- $225 \leq \text{Stator length} \leq 300\text{mm} = 3.500\text{kg}$
- GcH=5.000kg

### 2.1.4 Fixing:

Fixing: The fixing of the machine to the lift structure is made by four screws M16 and quality 8.8. For this, the base plate has 4 through holes of 18mm.

Position: It should always be installed in horizontal position. Also it can be installed both, at the top as in the bottom.

In the design of the structure of the lift should be taken into account the load of the machine to ensure a rigid set.

Paralelism: Should be maintained between the shaft of the machine and the ropes in a way that there is no diversion exceeding  $3^\circ$ , i.e  $90^\circ \pm 3$ . Otherwise the bearings are suffering big efforts.

Sliding load: Each machine is calculated to move and stop a particular weight, taking into account the duty cycle and the starts per hour. The load is calculated using the following formula, but it is important to know that the duty cycle and the starts per hour must be smaller than the values shown in the name plate:

$$Q = \frac{2 \times T}{9,8 \times r \times eff}$$

Where:

Q= Load

T=Nominal torque machine (available in our catalog).

eff= Shaft efficiency

Speed: The machine is ready to accelerate and decelerate the lift in the terms which marks the MIE-AEM.

### **2.1.5 Wiring:**

The electrical connections will be made taking into account the European Electrical Regulation (for the machine, for the brake and for dimensioning of the cables wires). In Annex A you will find the scheme to make the connections.

In order to avoid any problem due to  $dV/dt$  it is required to put use shortest possible cables within the inverter and the machine.

### **2.1.6 Contraindications to use:**

The machine is designed for use in the conditions explained in the previous points, is not allowed any other use or working conditions that are not specified in this manual, so that the manufacturer will decline any responsibility.

### **2.1.7 Energy Sources:**

The machine works through a frequency inverter so, the supply voltage will depend on the configuration of the frequency inverter. The rated consumption of the machine is marked in the name plate, so that the frequency inverter should be sized correctly.

The braking system will be feed by voltage of 207 Vdc. For this, it is necessary to provide an appropriate energy source.

The cooling system is made by a fan that it is activated through a thermal switch that is activated at 65°C.

### **2.1.8 Operating Conditions:**

- The drive must be installed in a building or a closed hoistway.
- Be aware of the recommendations exposed in this manual.
- Do not operate the machine in an explosive atmosphere.
- The temperature may be within 0°C and +40°C
- Maximum permissible humidity 85%.

## 2.2 OPERATIONS AND SETTINGS

### 2.2.1 Description of the functioning of the machine:

The principle of functioning in a gearless synchronous machine with permanent magnets in the rotor is that a high torque is achieved at very low revolutions. That way, it is needed only the machine, without any gear to reduce the speed and increase the torque. On the other hand the braking system is a double disk electromagnetic brake, sited in the other end of the shaft of the machine, so that there are no mechanical elements between pulley tractor unit and brake. Following the EN 81 regulation, this brake is able to stop the lift even with one of the two elements, so if the other doesn't work the lift can be stopped.

### 2.2.2 Settings:

The only setting range that it must be done is the encoder. It must be done a search of the electric pole position using as reference the magnetic pole, which is known as autotuning. For this operation is needed an inverter.

## 2.3 MAINTENANCE

### 2.3.1 General notes

- Observe the safety at work regulations.
- The machine is allowed to be opened by qualified personnel only who have especially been trained with regard to this drive.
- Take note of abnormal operating noise.
- The bearings have a lifetime lubrication. There is no possibility to relubricate. Maintenance is not necessary for the bearings.
- Never use a high-pressure cleaner for cleaning the machine.



### 2.3.2. Inspection Intervals

It will be biannual and includes the following points:

- Check the machine generally, and look if the paint is in good condition, (it has not oxide etc.)
- Check the status of electrical connections, drivers should be in good condition, without blows or damaged.
- Check the status of the pulley tractor unit, look if the wear of the slots is not excessive.
- Check the tighten the screws on the side covers, the screws on the lid pulley and the screws the machine with the chassis of the elevator.

## 2.5. TROUBLE SHOOTING

Fault	Causes	Remedy
Running noise	Bearing defective	Contact Permagsa
	Encoder defective	Change encoder
	VVVF-settings wrong	Check VVVF settings
Excessive temperature	Fan settings wrong	Check fan settings
	VVVF-settings wrong	Check VVVF settings
Machine will not start	Machine phases incorretly connected	Check machine connection
	VVVF-settings wrong	Check VVVF settings
	VVVF-defective	Check VVVF
	Brake doesn`t work	See brake faults
Brake does not release	Brake control defective	Check brakes settings
	Brake coil defective	Contact Permagsa