



AVANTI GUARD LOCKING SYSTEM FOR LIFT FENCES

User's Manual and Installation Instructions



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Limited Warranty

Avanti Wind Systems A/S warrants that commencing from the date of shipment to the Customer and continuing for a period of the longer of 365 days thereafter, or the period set forth in the standard Avanti warranty, the Avanti Guard Locking System for Lift Fences (“Product”) described in this Manual will be free from defects in material and workmanship under normal use and service when installed and operated in accordance with the provisions of this Manual.

This warranty is made only to the original user of the Product. The sole and exclusive remedy and the entire liability of Avanti under this limited warranty, shall be, at the option of Avanti, a replacement of the Product (including incidental and freight charges paid by the Customer) with a similar new or reconditioned Product of equivalent value, or a refund of the purchase price if the Product is returned to Avanti, freight and insurance prepaid. The obligations of Avanti are expressly conditioned upon return of the Product in strict accordance with the return procedures of Avanti.

This warranty does not apply if the Product (i) has been altered without the authorization of Avanti or its authorized representative; (ii) has not been installed, operated, repaired, or maintained in accordance with this Manual or other instructions from Avanti; (iii) has been subjected to abuse, neglect, casualty, or negligence; (iv) has been furnished by Avanti to Customer without charge; or (v) has been sold

on an “AS-IS” basis.

Except as specifically set forth in this Limited Warranty,

ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NON-INFRINGEMENT, SATISFACTORY QUALITY, COURSE OF DEALING, LAW, USAGE OR TRADE PRACTICE ARE HERBY EXCLUDED TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW AND ARE EXPRESSLY DISCLAIMED BY AVANTI. IF, PURSUANT TO ANY APPLICABLE LAW, TO THE EXTENT AN IMPLIED WARRANTY CANNOT BE EXCLUDED AS PROVIDED IN THIS LIMITED WARRANTY, ANY IMPLIED WARRANTY IS LIMITED IN TIME TO THE SAME DURATION AS THE EXPRESS WARRANTY PERIOD SET FORTH ABOVE. BECAUSE SOME STATES DO NOT PERMIT LIMITATIONS ON THE DURATION OF IMPLIED WARRANTIES, THIS MAY NOT APPLY TO A GIVEN CUSTOMER. THIS LIMITED WARRANTY GIVES CUSTOMER SPECIFIC LEGAL RIGHTS, AND CUSTOMER MAY HAVE OTHER LEGAL RIGHTS UNDER APPLICABLE LAWS.

This disclaimer shall apply even if the express warranty fails of its essential purpose.

In any cases of dispute the English original shall be taken as authoritative.

1 Caution

- a) AVANTI Guard Locking system is designed to be installed on the fences of the platforms in wind turbines. The system is designed to be used in combination with the AVANTI service lift.
- b) This system avoids the use of the Avanti service lift if any fence with Guard Locking system installed on it is open. Besides, the system locks the fence's door of any protected platform until the service lift is correctly positioned on the platform.
- c) This manual always needs to be represented in the language of sale.
- d) Activities at height are dangerous and may lead to severe injury or even death. Gaining an adequate apprenticeship in appropriate techniques and methods of protection is important and is your own responsibility. Users are obliged to read and understand this User Manual. Further they need to be properly equipped and instructed with the use of the necessary fall arrest equipment and emergency procedures in case of injury or sudden illness.
- e) Only trained and authorized personnel by Avanti are allowed to install / inspect the Guard Locking System. Users going to install AVANTI Guard Locking System need to be familiar with the installation section of this manual.
- f) It's prohibited for the user to do any modification or use non-original Avanti components when assembling AVANTI Guard Locking System. Re-use of demounted AVANTI Guard Locking System or parts is not allowed.
- g) Using other elements as an actuator (tools, spare keys...) in order to neutralize the Guard Locking System is strictly forbidden.
- h) Any changes or other uses beyond this manual are strictly forbidden.

2 Danger

- a) Working under the influence of alcohol, drugs or any medication which can interfere with the safety are also much prohibited.
- b) If there are any doubts about the safety of the AVANTI Guard Locking System, or parts of it aren't properly fixed, deformed or damaged with cracks or similar incompatible harms, it must not be used – Please contact the manufacturer immediately.

3. User's Manual

Description of the equipment

3.1 Purpose

The Guard Locking System described in this User's Manual is a security system which avoids using the AVANTI service lift if the platform fences are not properly closed and locked at any time, as well as opening a protected fence at any platform while the service lift is not correctly positioned on the platform.

The use of the AVANTI Guard Locking System with other equipment or manufacturers is strictly forbidden.

3.2 Function

The Guard Locking System uses a system of security locking switches installed on the fences on wind turbine platforms. Another switch detects the right position of the service lift on the protected platform. These switches are connected through connection boxes on the platform to the main control box.

The service lift cannot operate until all the protected fences are closed and locked.

The fences remain closed and locked until the service lift is stopped and properly positioned on the platform, actuating the position switch of the platform. In this position the guard locking can be unlocked while pressing the button.

In case of lost of power supply at any time, the guard locking can be opened manually by actuating the locking switch with a triangle key (Fig. 1).

The position of the locking device is monitored; therefore the service lift will not operate while the locking switch is manually unlocked.

The control box, installed at the bottom platform shows, by means of a green light, that all of the doors are closed and therefore, the service lift is ready to be used.

If the power supply is on, and the green light is off, at least a protected fence is open, or a security locking switch has been manually opened. The Guard Locking System is ready to be used with dual power supply (400V / 690V AC), by modifying the control box wiring configuration when installing.

3.3 Components

1. Control box on bottom platform
2. Position switch
3. Connection box on middle and top platforms
4. Locking switch
5. Actuator

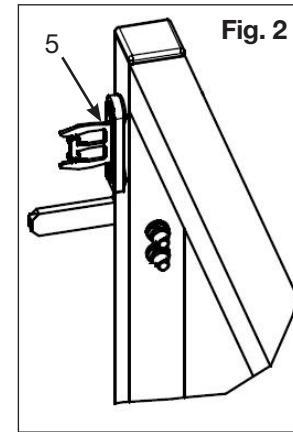


Fig. 3

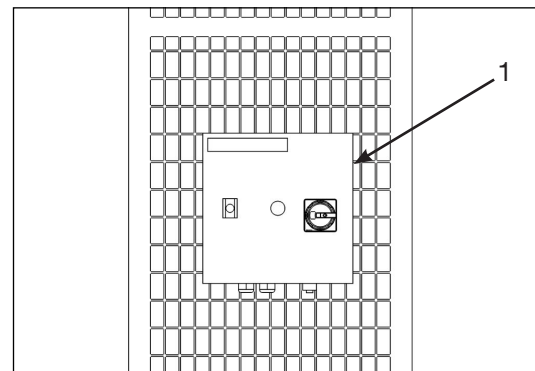


Fig. 4

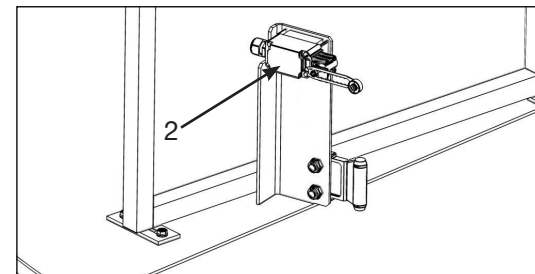
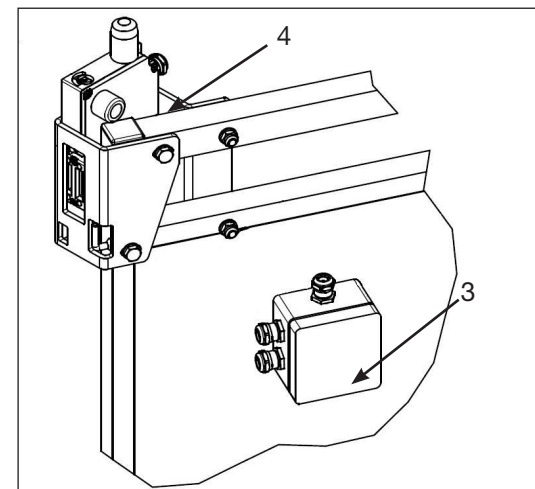


Fig. 5



3.4 Maintenance

Time (performance)	Component	Details
Daily (user)	Operation of the system	Open and close the door of the fence at any platform, by pressing the button when the service lift activates the position switch.
Annually (expert)	Locking switch and actuator	Check the adjustment of the actuator at each platform. Adjust if necessary. Replace the locking switch if it doesn't detect and lock the actuator after adjustment.
Annually (expert)	Position switch	Check the adjustment of the position switch lever at each platform. Adjust if necessary. Replace the position switch if it doesn't detect the service lift after adjustment.
Annually (expert)	Electrical wires	Check the state and fixation of the connection wires. Replace those where any damage were observed.

3.5 Inspection

Before use

Each time using the AVANTI service lift the user has to inspect the performance of the Guard Locking System, by:

- Checking the green light at the bottom platform control box is on, when the lift is placed at the bottom platform and its door is closed.
- Checking the Guard Locking System at the intermediate platforms by opening and closing the protected doors of the fence when the service lift activates the position switch. In this position, the locking switch unlocks the fence when pressing the button at the locking switch.

Periodical examination

A periodical examination at least every 12 months is essential for the safety of the AVANTI Guard Locking System. The examination must be performed by a competent person from Avanti or authorized by Avanti, following the test form at the back of this manual.



If any component of the AVANTI Guard Locking System is found not OK, it must be removed / replaced by a new AVANTI component.

The result of the periodic examination must be recorded in test form.

3.6 Troubleshooting

All the tests and repairs of electrical components must be performed by an authorized electrician only!

Danger! Unplug the power supply before opening either connection boxes or control box.

Breakdown	Cause	Solution
The service lift neither goes up nor down. All the fences are closed. Green light at the control box is off.	Power supply is off.	Turn on the power supply.
The service lift neither goes up nor down. The green light at the control box is off. Power supply is on.	One or more fences are open at some intermediate platform.	Close fences at any platform.
	One or more locking switches are manually unlocked.	Check every locking switch and lock them with the triangle key.
	Control box not properly wired for the specific power supply.	Modify control box connections according to the wiring diagram (690V default configuration).
	Some locking switch fails.	Check every switch: 1. Check the adjustment between locking switch and actuator, and adjust them if necessary. 2. Test or replace the defective locking switches or damaged actuators.
	Wiring connections fail.	Test and repair if necessary supply cable, electrical boxes connections and wiring between connection boxes, according to the wiring diagram.
The locking switch does not unlock at any platform with the service lift actuating the position switch.	The locking switch fails.	1. Check the connection of the locking switch to the connection box. 2. Replace the locking switch if it is damaged.
	The position switch does not detect the service lift.	1. Check the connection of the position switch to the connection box. 2. Check the adjustment between the position switch and the service lift. Adjust if necessary. 3. Replace the position switch if it is damaged.
	The button fails.	1. Check the connections of the button at the locking switch according to the wiring diagram. 2. Replace the button if it is damaged.
The service lift goes up and down with a fence open. Green light at the control box is on.	The locking switch at that fence has been neutralized with any element or spare actuator.	Take off the element used to neutralize the interlock system and let it know to the person responsible for the windturbine.  Danger! Do not use the service lift until the breakdown was repaired.
	Wiring connections fail.	Check wiring connections according to the wiring diagram.  Danger! Do not use the service lift until the breakdown was repaired.
The service lift goes up and down with all of the fences closed. Green light at the control box is off.	The light is defective	Check the light and its wiring, and repair or replace it.

4. Installation manual

Fitting instructions

AVANTI Guard Locking System is tested and approved only to be installed on wind turbines where AVANTI service lift is installed. In case of doubt, please contact AVANTI.

Please familiarize yourself with these instructions and the User's Manual before installing the Guard Locking System. Ensure that all specified parts are present before commencing installation.

No warranty is provided against damage and injury resulting from not following this "User's Manual and Installation Manual" i.e. reconstruction or modification of equipment or use of non-original parts which are not approved by the manufacturer.

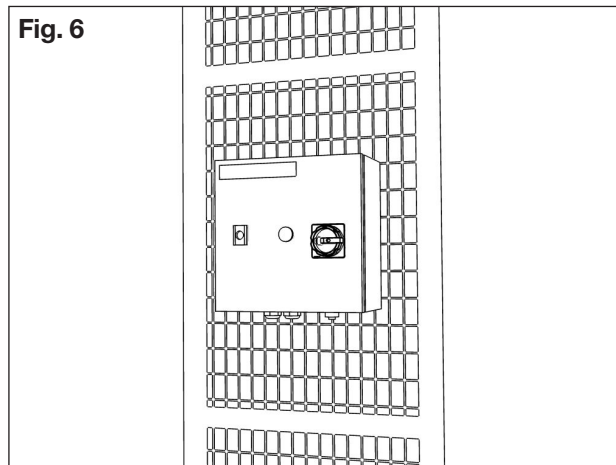
The Guard Locking System can be installed on different types of fences. Different parts and accessories are available depending on the fence design.

Specific assembly instructions for fences and Guard Locking System are defined and available for different types of wind turbine. This technical documentation will be available for technical personnel authorized by Avanti.

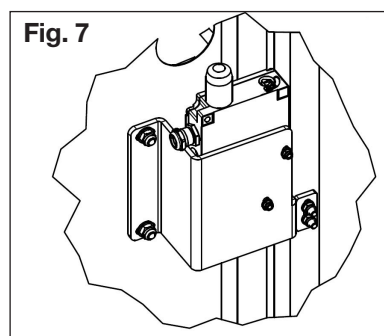
The fence design shall comply with the relevant standards and local regulations. Avanti shall verify the compliance of the design prior installation.

4.1 Installation at the bottom platform

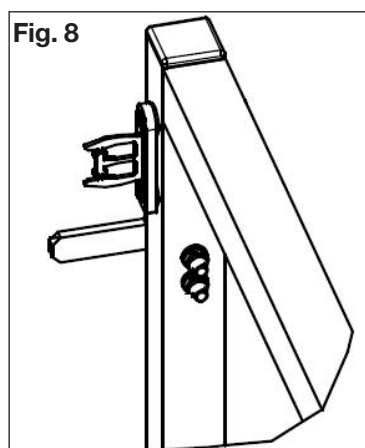
1. Install the control box on the fence, by means of the nuts and bolts supplied. Holes have to be drilled on the fence if necessary (Fig. 6).



2. Mount the locking switch on the fix part of the fence, by means of the brackets, bolts and nuts supplied. Holes have to be drilled on the fence if necessary (Fig. 7).

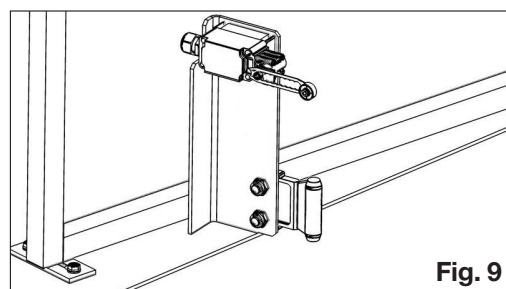


3. Assemble the switch actuator on the door by means of the supplied hardware. Holes have to be drilled on the door if necessary (Fig. 8). Check the mechanical performance and adjust the position of the locking switch if necessary.



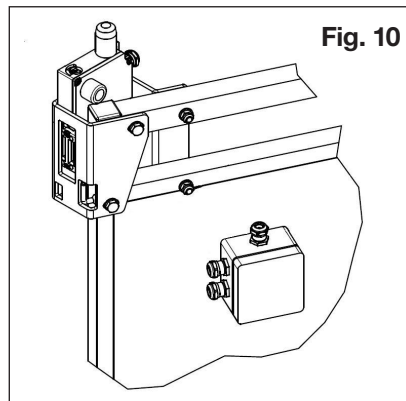
4. Connect the locking switch cable to the control box and fix the wire to the fence by means of plastic strips.

5. Fix the position switch support to the left wire fix support by means of the hardware supplied (Fig. 9). Fix the wire to the fence by means of plastic strips. Check the mechanical performance of the position switch and adjust the lever if necessary.



4.2 Installation at the upper platforms

1. Mount the locking switch and the connection box on the fix part of the fence, by means of the brackets, bolts and nuts supplied. Holes have to be drilled on the fence if necessary (Fig. 10).



2. Assemble the switch actuator on the door by means of the supplied hardware. Holes have to be drilled on the door if necessary (Fig. 8). Check the mechanical performance and adjust the position of the locking switch if necessary.

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3. Fix the position switch support to the left wire fix support by means of the hardware supplied (Fig. 9). Fix the wire to the fence by means of plastic strips. Check the mechanical performance of the position switch and adjust the lever if necessary.

4.3 Connection and final test

1. Connect all the connection boxes from one platform to another by means of the connection wires supplied, according to the wiring diagram supplied.

2. Fix the connection wires along the tower by means of plastic strips.

3. The control box is supplied by default for 690V AC power supply. If the power supply is 400V, modify connections at the control box according to the wiring diagram supplied inside it.

4. Connect the control box to the lift and to the power supply at the bottom platform according to the wiring diagram supplied.

5. Switch on the electrical box. Check the green light at the control box is on.

6. Open and close the fence door on every platform to check that the system works properly.

4.4 Dismantling Instructions

Caution!

Modification of the electrical connections must be performed by an authorized electrician only!

Caution!

Disposal of waste must be done according to the local regulations.



Danger!

Switch off the power supply before opening either connection boxes or control box.

Do follow the installation instructions in the inverse order, by:

1. Switching off the general power supply.
2. Disconnecting all the connection boxes at the upper platforms.
3. Dismantling all the locking switches and position switches at all the platforms.
4. Dismantling the control box at the bottom platform.

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