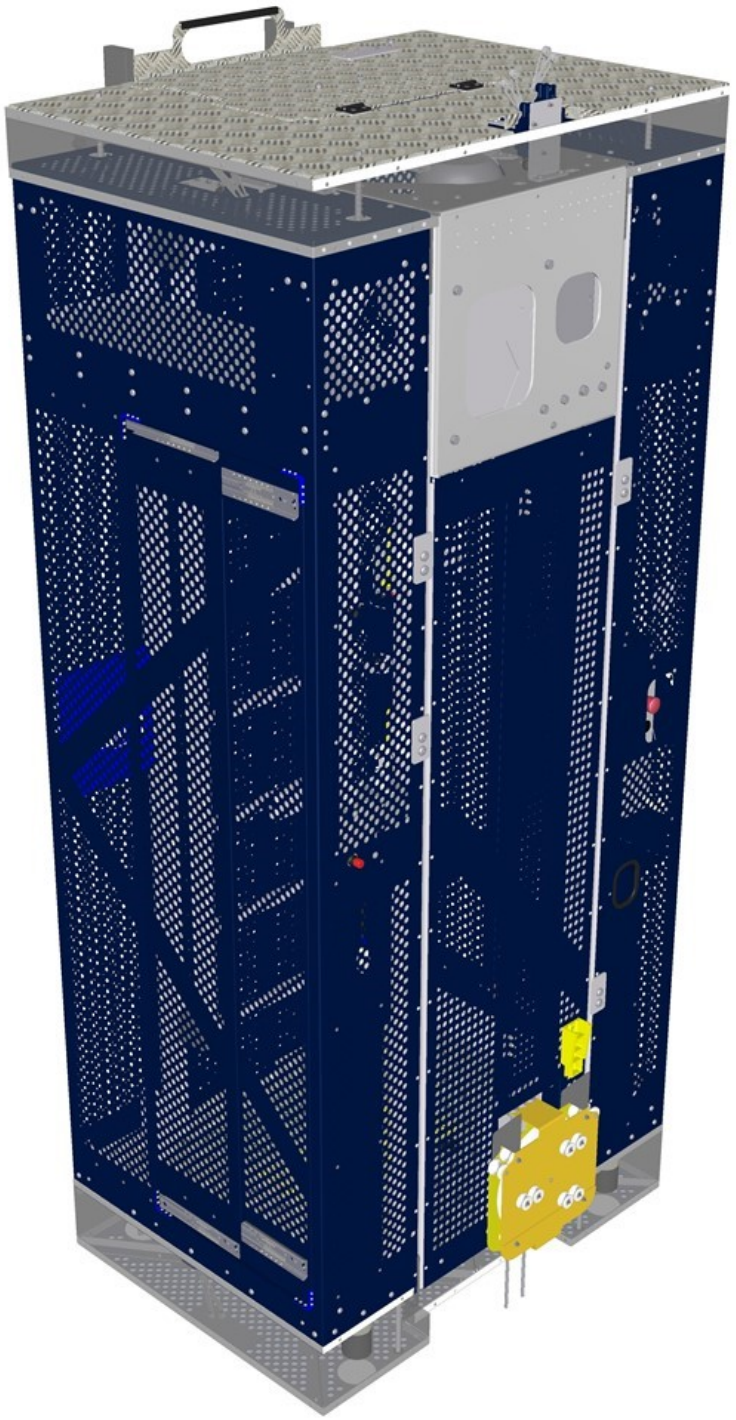
AVANTI SERVICE LIFT

Model: OCTOPUS XL120 Service Lift



User manual

Original instructions

AT00015389
English (EN)

User Manual – Service Lift Model OCTOPUS XL120
3rd Edition: July 2019 — Revision 1: 30/07/2019

CERTIFICATE

EC Type Examination

EC-Directive 2006/42/EC, Article 12, Section 3b
Machinery

Number of registration: 01/205/0833F/19

Certification body for machinery NB0035
at TÜV Rheinland Industrie Service GmbH
herewith confirms for the company

AVANTI WIND SYSTEMS TECHNOLOGY, S.L.
Calle Angeles (Los), Num. 88
Pol. Industrial Centrovia
50196 Muela (La) - (Zaragosa)
Spain

the close conformity of the product

Service lift inside wind turbine systems

Technical data:

Type:	Octopus L80	Octopus L95	Octopus L95 HD	Octopus XL120
- max. load capacity:	240 kg / 2 persons		350 kg / 2 persons	300 kg / 3 persons
- traction hoist:	M508		M608	
- fall arrest device FAD):	ASL508		ASL608	
- lifting speed:	18 m/min (50 Hz) or 21 m/min (60 Hz)			
- triggering speed of FAD:	30 m/min or 40 m/min			
- protection fences:	1.10 m			
- fence Interlock system:	Trapped-key or guard locking system	Trapped-key, guard locking system or electrical monitoring system	Trapped-key or guard locking system	Trapped-key or guard locking system
- max. distance between rung attachments:	3360 mm	2240 mm	1960 mm (one rung) 2240 mm (two rungs)	1960 mm (one rung) 2240 mm (two rungs)
- net weight:	205 kg	220 kg	233 kg	242 kg (one door) 250 kg (two doors)
- max. total travel height:	160 m	160 m	100 m	160 m
- Optional:		Wind turbine platform call or send/ call function		- 2 sliding doors, right & left - Wind turbine platform call or send/ call function

Modification E to the certificate 01/205/0833E/19 from 2019-02-18 - Change the max. travel height

with the requirements according to annex I of Directive 2006/42/EC about machinery and amending the Directive 95/16/EC of the European Parliament and the Council from May 2006 for adaptation of legal and administration regulations of the member countries regarding safety of machinery.

The verification was proved by EC-type approval test, Test-Report-No. 19_052-1 from 2019-07-20 and is valid only duly considering the requirements mentioned in this document.

This certificate is valid until 2024-07-29

Certification body
Notified under No. 0035
certifier

Dipl.-Ing. Walter Ringhausen

Cologne, 2019-07-29

TÜVRheinland® 0035 Notified Body

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TÜVRheinland®
Precisely Right.

Limited warranty

Avanti Wind Systems Technology, S.L. guarantees 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 Product[1)] 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 HEREBY 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)Avanti service lift ("Product")

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Contents

1 Introduction

1.1 Observations

This lift must only be used by trained people.

Additional copies are available from the manufacturer upon request.

This manual must always be available to the personnel responsible for the installation, maintenance and operation of the service lift.

This manual, including, but not limited to, measurements, procedures, components, descriptions, instructions, recommendations and requirements, is subject to change without prior notice. Please see the manuals section in the Avanti Website for the latest revisions of the manuals.

Any additional cost relate to or arising from any changes in the manuals does not entitle the customer to any form of compensation or other legal remedies.

NOTICE

The pictures and diagrams in this manual may not reflect the exact appearance, colors or layout of the product. This has no impact on its functionality or safety.

1.2 Symbols

DANGER

Immediate or possibly imminent danger. Risk of injury if not observed: Death or severe injury.

WARNING

Potentially hazardous situation. Risk of injury if not observed: Minor injury or material damage.

CAUTION

Hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

Useful tips for optimum working procedure.
Possible injury if not observed: None.

1.3 Cautions

Personnel must be of legal age. Personnel must be familiar with the relevant accident prevention instructions and must have received appropriate occupational heath and safety training.

The service lift must not be used by persons who are under the influence of alcohol or drugs and who may jeopardize working safety.

Personnel must wear PPE (safety helmet, full body harness, shock absorber, lanyard and slider) at all times and carry 2 way communication systems depending on local regulation.

The service lift is designed for a useful life of 20 years with an approximate use frequency of 12.5 h/year (250 h in total).

Installation and maintenance of the service lift must only be performed by certified technicians. The service lift must be inspected by a certified technician before its first use.

The service lift must be inspected at least once a year by a certified technician. In case of high use frequency or severe use conditions, more frequent inspections are required.

If more than one person is entrusted with installation, inspection or maintenance tasks, the employer must appoint a supervisor in charge of the operation.

Use and daily inspection of the service lift must only be performed by persons who have received the relevant training associated with the use and daily inspection of the Avanti service lift and who are in possession of a valid (not expired) certificate for the task.

If any damage or faults are found during operation, or if circumstances arise which may jeopardize safety: interrupt the work in progress immediately and notify the supervisor or employer.

The service lift must not be used in the event of a fire in the tower.

The service lift must only be used when the turbine is not generating power.

All wind farm regulations must be followed. The service lift must not be used during severe weather, including wind speeds over 25 m/s (55.5 mph).

If any supporting parts are repaired or replaced, the operational safety of the system must be tested and verified by a certified technician.

All test / repairs of electrical installations must only be performed by a certified technician.

All repairs to the traction, braking and supporting systems may only be performed by a certified technician.

Only original fault-free parts must be used. Use of non-original parts renders the manufacturer's warranty void and invalidates any type of approval. No modification, extension or reconstruction of the service lift is allowed without the manufacturer's prior written consent. No warranty is provided against damage resulting from reconstruction or modification of equipment or use of non-original parts that are not approved by the manufacturer.

In case self-locking nuts are used, these nuts must not be used once it has become possible to loosen by hand and in no case should they be reused, but must be replaced.

CAUTION

Avoid injury — follow all instructions.

NOTICE

The owner must verify the need for third-party service lift inspections with the local authority and comply with specified standards.

1.4 Terms and definitions

Terms	Definitions
Certified technician	Person who has gone through the relevant training associated with the scheduled task from Avanti or from a certified trainer and is in possession of a valid (non expired) certificate for the task.
User	Person who has gone through the relevant training associated with the Avanti service lift use and daily inspection and is in possession of a valid (non expired) certificate for the task.
Manual descent (Also manual no-powerdescent)	Action performed to descend the lift at a controlled speed without power supply by manually opening the hoist electromagnetic brake.

2 General information

2.1 Purpose

The purpose of the service lift is to transport persons, their tools and equipment to the most convenient height for performing work in the wind turbine (WTG).

Its use is limited to authorized users. Access to the WTG and consequently to the service lift is controlled and forbidden to the public.

The service lift is used primarily to transport technicians, their tools and spare parts from the bottom platform (or lowest accessible point) to the top platform (or highest accessible point).

The service lift is also used to access intermediate platforms for the inspection and maintenance of WTG connecting bolts and other equipment.

2.2 Scope

The product details are described throughout this manual.

The product consists of:

- A service lift, which is formed by:
  - A cabin
  - A traction system
  - A fall arrest device
  - Guiding system.
  - Control, safety and power systems (including an interlock system on platform fence doors).
  - A rescue pendant control (only mandatory if rescue route of service lift can be somehow blocked and in case of an external call control box is not installed at the bottom platform).

NOTICE

This manual contains instructions for one version of the Octopus lift:
Octopus XL120.

NOTICE

An EC type-examination by a Notified Body according to the Machinery Directive 2006/42/EC was performed.

2.3 Exclusions

The service lift must not be used outdoor or in potentially explosive atmospheres. The service lift is not designed to carry a person on the top.

Unless otherwise agreed with Avanti, the WTG manufacturer is responsible for integrating the service lift and ensuring compliance with the essential health and safety requirements as stated in the 2006/42/EC Machinery Directive and the applicable harmonized standards following Avanti recommendations.

This requires the supply of components, including but not limited to:

- Ladder system.
- Brackets for ladder sections.
- Platform fences with doors.
- Power supply protection.

2.4 Technical specifications

2.4.1 General specifications

The WTG manufacturer must also provide any additional relevant warnings, instructions and / or training specific to the integration of the service lift required for its safe and correct installation.

Service lift	OCTOPUS XL120
Main door type	Full sliding door[1)]
Main door interlock system	Guard locking
Service lift speed	18 m/min ± 10 % (50 Hz)
	21 m/min ± 10 % (60 Hz)
Rated load	300 Kg
Lift weight (max.)	242 kg. (one SD conf.) / 250 kg. (two SD conf.)
Guiding system	Aluminum ladder
Max. no. of persons	3 persons
Max. traveling height	160 m
Max. noise level	80 dB (A)
Power supply type	400V (50/60Hz) 3 Phase + N + PE
	690V (50/60Hz) 3 Phase + PE

(1) Optionally, depending on WTG configuration, cabin could feature 2 full sliding doors (one on the left, one on the right).

Operating temperature

-15 ºC - +60 ºC

Survival temperature

-25 ºC - +80 ºC

A low temperature kit is also available.

Operational temperature for low temperature:

-25 ºC - +40 ºC

NOTICE

Depending on national regulations, it may be necessary for a third party to approve the final installation.

NOTICE

The tower manufacturer's risk assessment must include a service lift integration study.

2.4.2 Traction system

Service lift	Hoist	Lifting capacity	Wire rope speed	Power	Rated current	Traction wire rope Ø	Unit weight approx.
Version	Traction system	Kg (lbs.)	m/min	kW	A	mm	Kg
Octopus XL120	M608 /400V 50Hz	600 (1320)	18	2	4.4	8.4	55
Octopus XL120	M608 / 690V 50Hz	600 (1320)	18	2	2.6	8.4	55
Octopus XL120	M608 / 400V 60Hz	600 (1320)	21	2.4	5.3	8.4	55
Octopus XL120	M608 / 690V 60Hz	600 (1320)	21	2.4	3.1	8.4	55

2.4.3 Fall arrest device

Service lift	Fall arrest device	Lifting capacity	Triggering speed	Ø Safety wire	Approx. weight
Version	Type	Kg (lbs)	m/min (ft/min)	mm	Kg (lbs)
Octopus XL120	ASL 608	600 (1320)	40 (131)	8.4	7 (15.4)

2.4.4 Traction and safety wires ropes

Service lift	Wire rope type	Wire rope diameter	Surface treatment	Mark/feature	Break resistance	Fastening
Octopus XL120	M608 / ASL 608	8.4 mm, 5x19	HDG	no	59 kN	2 t shackle

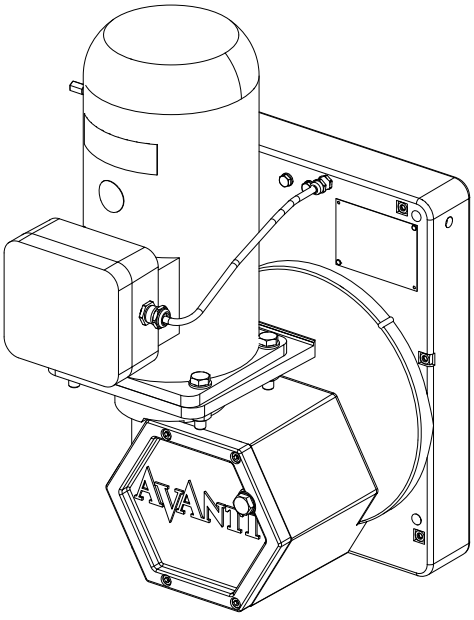


Figure 1 : Traction system

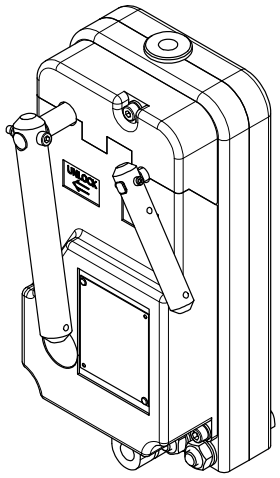


Figure 2 : Fall arrest device

2.5 Dimensions

2.5.1 Octopus XL120

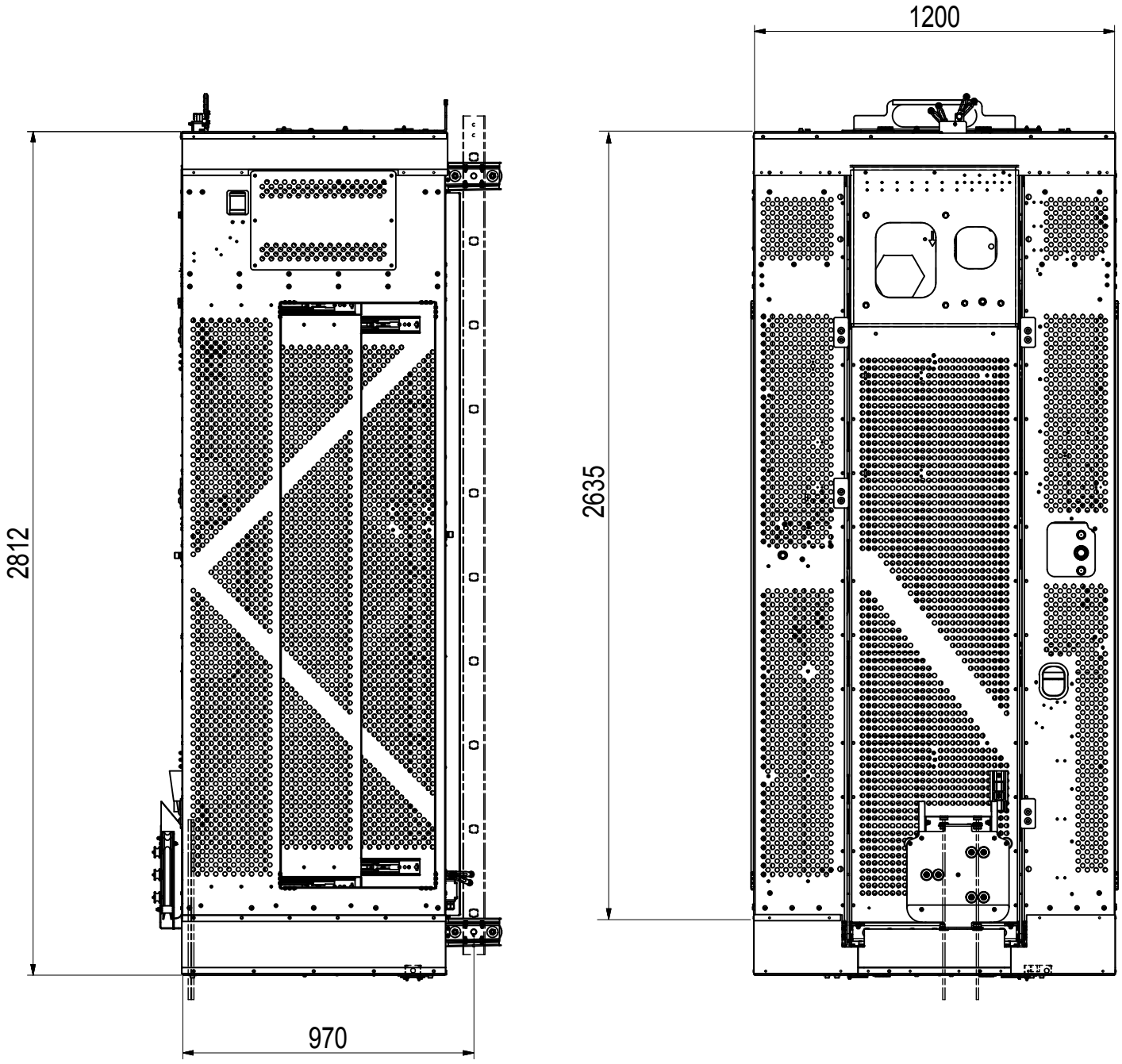


Figure 3: Octopus XL120 dimensions

3 Description

3.1 Service lift overview

3.1.1 Octopus XL120

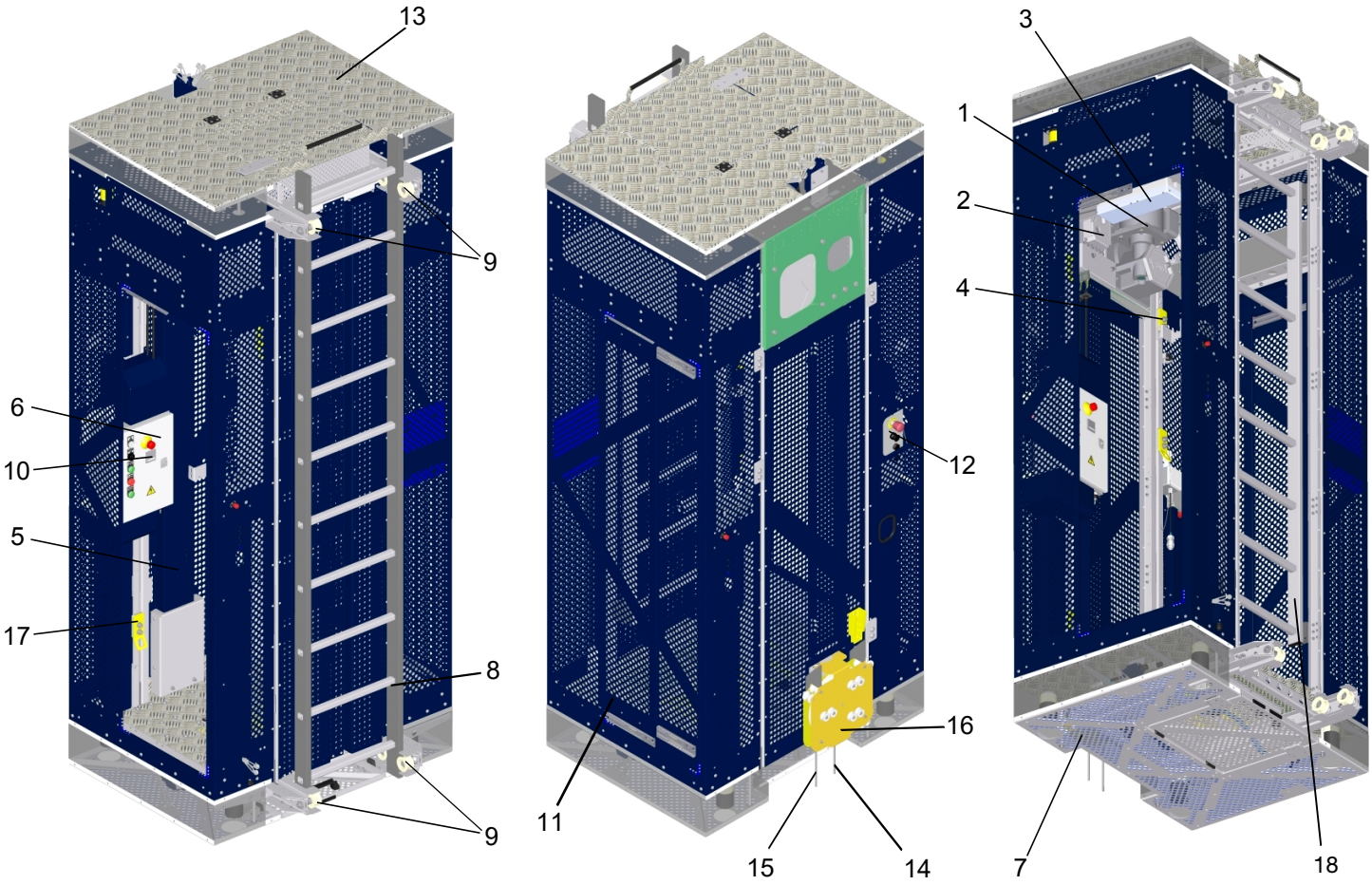


Figure 4: Octopus XL120 components

Octopus XL120 components			
1	Traction system	10	Hour counter
2	Fall arrest device	11	Full sliding door (x2)
3	Cabin light	12	External controls
4	Anchor points (x3)	13	Top obstruction device
5	Wire inspection cover	14	Safety wire rope
6	Main/User control box	15	Traction wire rope
7	Bottom obstruction device	16	Travelling cable pulley
8	Guide ladder	17	Additional anchor point (bottom hatches use)
9	Guiding rollers	18	Internal emergency ladder

DANGER

The lower anchor point must only be used for evacuation/rescue operation.

WARNING

The internal emergency ladder cannot be used as anchor point for user's PPE's

3.2 Cabin

3.2.1 Service lift doors

3.2.1.1 Main service lift door

Two configurations are available for the main ingress and egress of the service lift with the following door types:

– Full sliding door (on the right or on the left side).
– Optionally two full sliding doors (on the right and on the left side).

It features a guard locking system that:

• Prevents service lift to travel if the door is open. This opening condition is monitored by the guard locking switch (S19.3).

• Permits door to be opened only when service lift is levelled with a platform. This levelling condition is monitored by the platform level switch (S18) which is triggered by the platform level activation plates. Optionally, this levelling condition could be monitored by a photoelectric sensor which is activated by reflective plates or tapes located in each platform level.

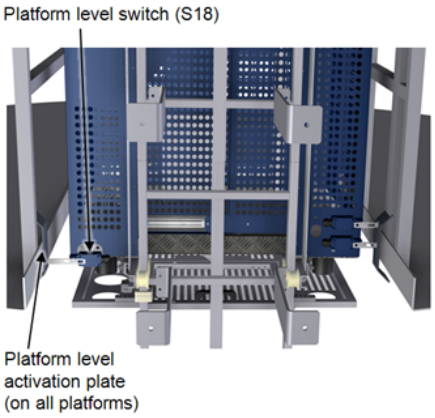


Figure 5: Platform level switch

It is possible to manually release guard locking system in order to open main door between platforms for maintenance tasks or installation of WTG parts.

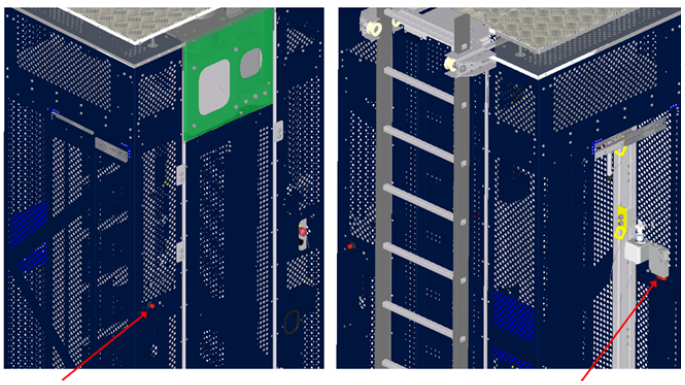


Figure 6: Manual release of guard locking system

Related to the optional configuration of 2 sliding doors, there would be 2 possible scenarios:

- A) The first door (D1) only could be opened when Platform level detection switch (S18) + Bottom or Top obstruction device switch (S2 or S1) are activated, while the second sliding door (D2) would be locked. The second sliding door (D2) only could be opened when Platform level detection switch (S18) is activated, while the first sliding door (D1) would be locked.
- B) The cabin features 2 platform level detection switches (S18.1 and S18.2). Depending on the platform, the platform level activation plate is located on the right side or on the left side, so only one of the platform level detection switches (S18.1 or S18.2) is activated, unlocking just the related door (D1 or D2).

3.2.1.2 Bottom hatches

The service lift has two bottom hatches, one on the floor of the cabin and the other on the bottom full cover obstruction device. These hatches allow egress and ingress from below.

The bottom hatches can be opened from both sides, the bottom cabin hatch opens inwards, and the bottom obstruction device hatch opens outwards. Each of them has a safety switch that interrupts control when hatch is opened.

3.2.1.3 Top hatch

The top hatch is mounted over the top full cover obstruction device and can be opened from both sides, thus allowing egress to and ingress from above.

Top hatch opens outwards. It has a safety switch that interrupts control when hatch is opened.

3.2.2 Wire inspection cover

Wire inspection cover allows safe and fast inspection of traction and safety wire ropes from inside the cabin while travelling.

The wire inspection cover must only be used for inspections and maintenance tasks.

WARNING

During maintenance tasks with the cable inspection cover open, the emergency stop of the user control box must always be activated.

3.2.3 Interior light

3.2.3.1 Service light

The service lift is optionaly equipped with a light inside the cabin. When service lift is connected to power supply, this light illuminates at all times.

3.2.3.2 Service light with emergency function

Optionaly the internal light is battery packed in order to illuminate the inside of the cabin in case of a power failure. When fully charged, it will last at least for 90 minutes.

3.2.4 Anchor points

The service lift features three anchor points inside the cabin.

An additional anchor point is available to be used when the user egress or ingress through bottom hatches.

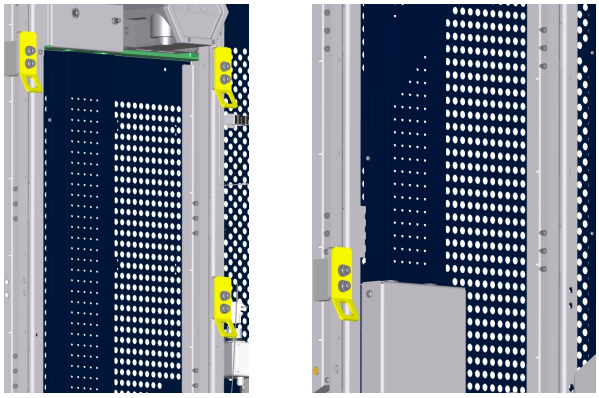


Figure 7: Anchor points

DANGER

The lower anchor point must only be used for evacuation/rescue operation.

3.2.5 Internal emergency ladder

The service lift features an internal emergency ladder that is part of the main frame of the service lift.

In case of emergency, this internal ladder allows users to reach the top hatch and accesing to ladder and ladder rail.

WARNING

The internal emergency ladder cannot be used as anchor point for user's PPE's

3.2.6 Fasten kit

The service lift features as option a special tool, called Fasten kit, for mechanically blocking the lift in order to perform installation/maintenance tasks below the suspended cabin. This kit is located inside the cabin (see Figure 8). It consists in two M16 screwed rods, that must be inserted through the holes of the top and bottom rollers assembly and along rungs of the guiding ladder, and finally blocked each with a M16 nut.

NOTICE

Optional feature.

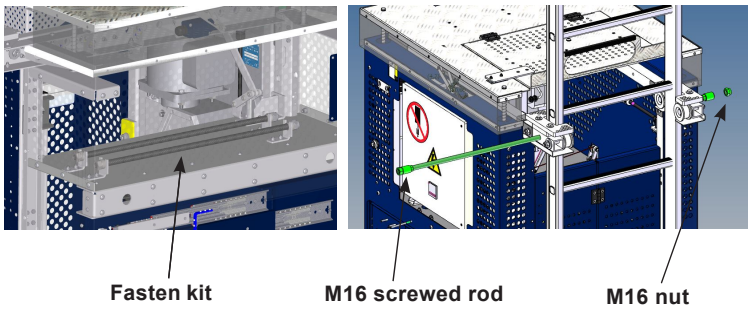


Figure 8: Fasten kit

3.3 Traction system

3.3.1 Traction hoist M608

Avanti M608 traction hoist is installed on the top of the cabin. It is an electrical powered hoist that powers the service lift up and down along a traction wire rope. It consists of a motor a gearbox and a traction system.

3.3.1.1 Electromagnetic motor brake

The M608 traction hoist is equipped with an electromagnetic spring-loaded brake that engages automatically when releasing the *UP* or *DOWN* control buttons, or following a power failure. Manual release of this electromagnetic motor brake is allowed in the M608 traction hoist. Once the electromagnetic motor brake is released, the motor speed is controlled by a centrifugal brake installed between the motor shaft and the gearbox.

3.3.1.2 Overload detection device

An overload detection device is built into the traction hoist. Incase of an overload, it will prevent the upward travel of the service lift (by interrupting control) and a buzzer will sound, until overload condition is eliminated.

3.4 Fall arrest device

3.4.1 ASL608 Fall arrest device

The service lift is equipped with the ASL608 fall arrest device which will be triggered in case of an overspeed condition.
The speed of the safety wire rope passing through the device is continuously monitored, and the jaws automatically close in the event of sudden excessive speed.
This device protects the service lift against traction wire rope breakages or traction system failures.
The fall arrest device can also be engaged or disengaged manually by acting directly on the fall arrest device levers.

3.4.2 Shock absorber

The fall arrest device is equipped with a shock absorber system.
Its function is to relieve the impact force on the cabin by means of the shock absorber displacement in case of the fall arrest device activation.

3.5 Controls

3.5.1 Control boxes

3.5.1.1 Cabin control boxes

3.5.1.1.1 Main control box

3.5.1.1.1a Automatic send configuration

Internal controls are hold to run.

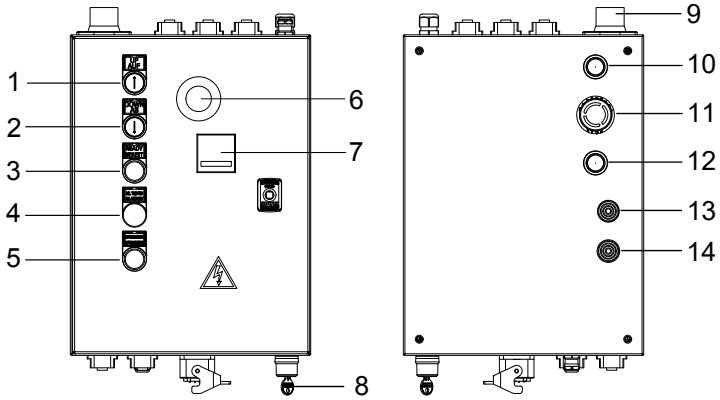


Figure 9: Main control box, automatic send configuration

Automatic send configuration	
1	UP button (internal)
2	DOWN button (internal)
3	Ready light (green)
4	ASL light (red)
5	Platform indicator light (green)
6	EMERGENCY STOP button (internal)
7	Hour counter
8	Shunt key for bottom obstruction switch
9	Trapped key switch[1)]
10	UP button (external)
11	EMERGENCY STOP button (external)
12	DOWN button (external)
13	Delay and overload buzzer
14	Manual descent buzzer

3.5.1.1.1b Send/call configuration

Internal controls are hold to run.

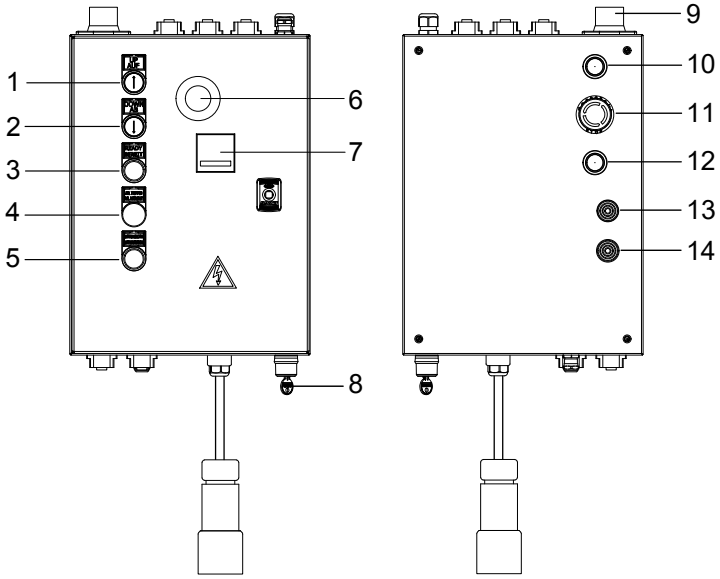


Figure 10: Main control box, send / call configuration

Send/call configuration	
1	UP button (internal)
2	DOWN button (internal)
3	Ready light (green)
4	ASL light (red)
5	Platform indicator light (green)
6	EMERGENCY STOP button (internal)
7	Hour counter
8	Shunt key for bottom obstruction switch
9	Trapped key switch[1)]
10	UP button (external)
11	EMERGENCY STOP button (external)
12	DOWN button (external)
13	Delay and overload buzzer
14	Manual descent buzzer

NOTICE

[1)]In case of installing the optional 2 sliding doors configuration and the trapped key system in fences, there is an additional trapped key switch with a second trapped key attached to the cabin with a wire rope or chain.

3.5.1.2 User control box

See section 3.5.1.1.1 Main control box. The User control box is integrated into the Main control box.

3.5.2 Platform control boxes

3.5.2.1 Bottom platform control box

There is a control box installed in the bottom platform. This control box has a main switch. Turn the switch to the OFF position to disconnect the power to the service lift. The main switch must be OFF when the lift is not in use, when leaving the wind turbine and while the wind turbine is operating. The switch must be OFF before the generator is turned on.

3.5.2.1.1 Automatic send configuration

3.5.2.1.1a Versions with guard locking

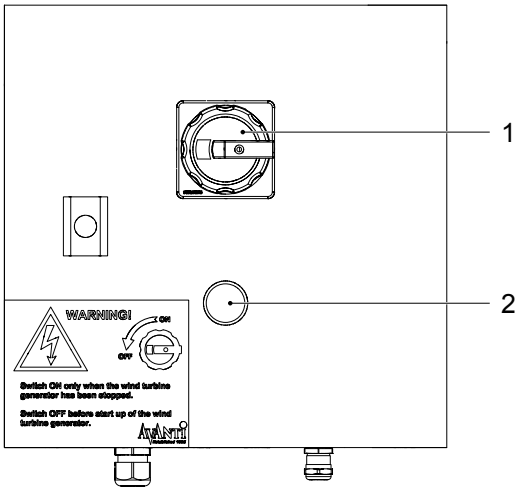


Figure 11: Bottom platform control box, automatic send configuration with guard locking

Bottom platform control box	
1	Main switch
2	Ready light (green)

3.5.2.1.1b Versions with trapped key or electrical switch monitoring system

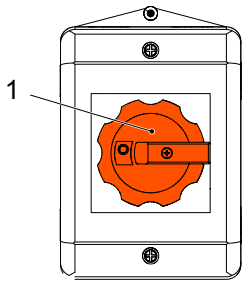


Figure 12: Bottom platform control box, automatic send configuration for fences with trapped key or electrical switch monitoring system

Bottom platform control box	
1	Main switch

3.5.2.1.2 Send / call configuration

All the controls are hold to run.

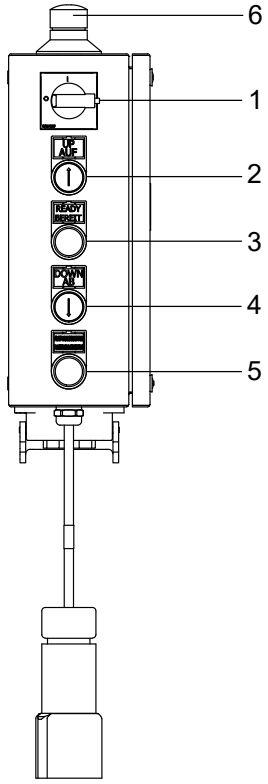


Figure 13: Bottom platform control box, send/ call configuration

Bottom platform control box	
1	Main switch
2	UP button
3	Ready light (green)
4	DOWN button
5	Platform indicator light (green)
6	EMERGENCY STOP button

3.5.2.2 Top platform control box

3.5.2.2.1 Send / call configuration

All the controls are hold to run.

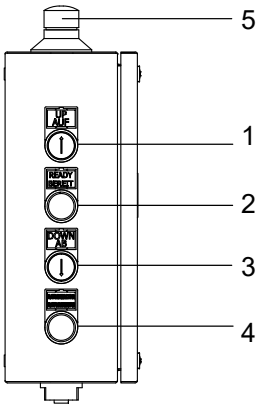


Figure 14: Top platform control box, send/call configuration

Top platform control box	
1	UP button
2	Ready light (green)
3	DOWN button
4	Platform indicator light (green)
5	EMERGENCY STOP button

3.5.2.3 Intermediate platform control boxes

3.5.2.3.1 Send / call configuration

3.5.2.3.1a Option 1

All the controls are hold to run.

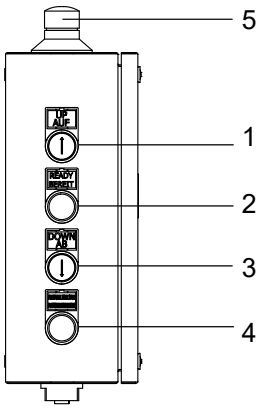


Figure 15: Intermediate platform control box, send/call configuration

Top platform control box	
1	UP button
2	Ready light (green)
3	DOWN button
4	Platform indicator light (green)
5	EMERGENCY STOP button

3.5.2.3.1b Option 2

There is also an option in the send/call configuration in which control boxes are mounted on the top and bottom platforms, and on the intermediate platforms the boxes only have an EMERGENCY STOP button.

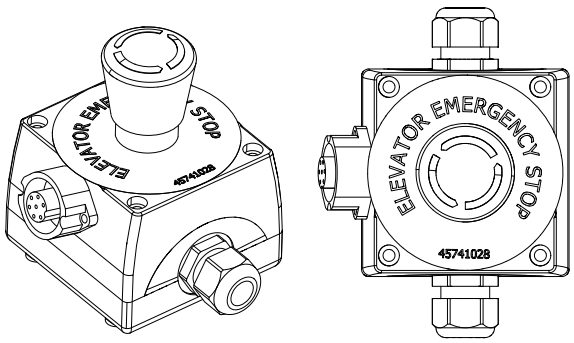


Figure 16: Emergency Stop box

3.5.3 Rescue pendant control

Rescue pendant control is only mandatory if rescue route of service lift can be somehow blocked and in case of an external call control box is not installed at the bottom platform. A blocked rescue route is an event where:

- A person is unconscious inside the service lift, blocking the bottom hatch,
- the rescuer is below service lift, and the service lift is stopped halfway through a platform hole, blocking rescue route since platform has no extra hatch.

NOTICE

See the Rescue guide placed next to the Rescue pendant control on the bottom platform fence.

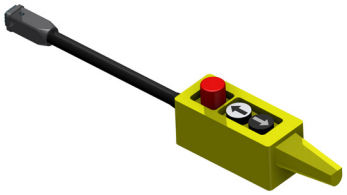


Figure 17: Rescue pendant control

CAUTION

There shall be one rescue pendant control per WTG; and it shall be stored in the WTG bottom platform. A clearly visible sign shall indicate its exact location.

It features three buttons: UP, DOWN and emergency stop button. When necessary, pendant control is plugged to cabin bottom socket. It has a 4 m long cable that permits service lift to be powered up/down that same distance. When plugged, pendant control does not override any safety switch. If any of them is triggered, no running will be possible; including the obstruction device switches. Therefore, there is no risk of moving service lift hitting rescuer. Pendant control overrides cabin control box, and service control box if installed.

3.6 Safety devices

3.6.1 Top obstruction device

The top obstruction device is installed on the top of the servicelift.

The device fully covers top cabin face. The cover is provided with a hatch in case of evacuation.

When top obstruction device is activated, service lift will stop ascent as a consequence of one of the top obstruction device switches triggered, this happens when the lift encounters an obstacle. Descent will be possible, for instance to remove the obstacle. The service lift features three top obstruction device switches in order to improve its sensitivity.

Optionally, top obstruction device could feature yellow flexiblesidecovers.

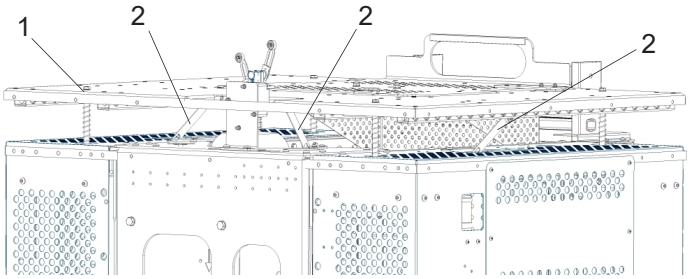


Figure 18: Top obstruction device

Top obstruction device	
1	Top obstruction device
2	Top obstruction device switches

3.6.2 Emergency top limit switch

The top limit switch and the emergency top limit switch are located at the top of the cabin, and triggered by a plate attached to the traction and safety wire ropes.

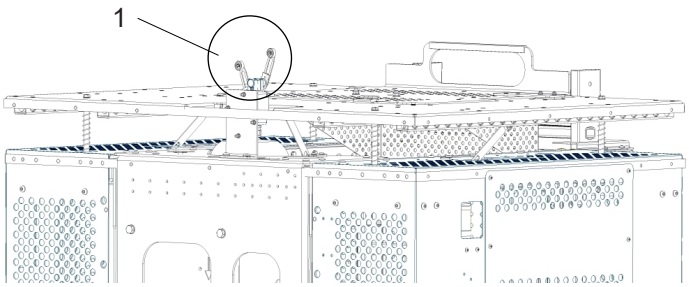


Figure 19: Top limit and Emergency top limit switches

Top limit and Emergency top limit switches	
1	Top limit and Emergency top limit switches

3.6.3 Bottom obstruction device

The bottom full plate obstruction device is installed on the bottom of the service lift.

The device fully covers bottom cabin face. The cover is provided with a hatch in case of evacuation.

When bottom obstruction device is activated, service lift will stop descent as a consequence of one of the bottom obstruction device switches being triggered, this happens when the lift encounters an obstacle or touches the ground. Ascent will be possible, for instance, to remove the obstacle. The service lift features three bottom obstruction device switches in order to improve its sensitivity.

In order to put the service lift on the ground, the bottom obstruction device functionality can be bypassed with the bottom obstruction override switch in the user control box. To do so, turn the bottom obstruction override switch while pressing the DOWN button.

Optionally, bottom obstruction device could feature yellow flexible side covers.

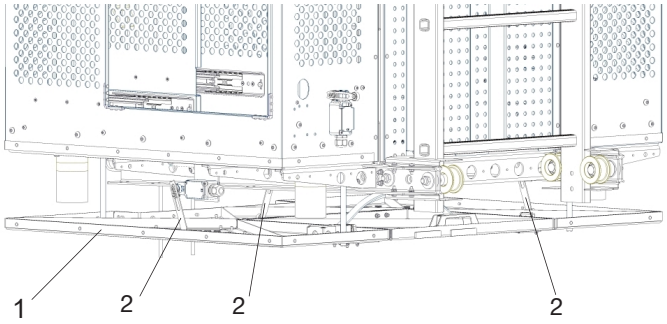


Figure 20: Bottom obstruction device

Bottom obstruction device	
1	Bottom obstruction device
2	Bottom obstruction device switches

WARNING

Release the DOWN button as soon as the rubber bumpers hit the floor. Otherwise the lift or the installation may get damaged.

3.6.4 Overload detection device

An overload detection device is built into the traction hoist. In case of an overload, it will prevent up the movement of the service lift (by interrupting control) and a buzzer will sound until overload condition is eliminated.

The overload detection device adjustment procedure is explained in the Installation and Maintenance Manual.

3.6.5 Warning light

An optional set of warning lights is mounted on the top and at the base of the lift. The flashes warn that the lift is moving.

3.6.6 Acoustic buzzer

An audible signal is installed with a warning function.

If the external buttons of the user control box or platform control boxes are used, the operation will be delayed and an acoustic warning emitted. This way, the persons next to or inside the cabin are alerted of an inminent movement of the service lift and can act accordingly. This same acoustic buzzer sounds while the cabin is overloaded.

Manual descent buzzer sounds during all the descent when user performs a manual descent.

3.7 Manual descent system

The service lift has a manual descent system that can be used in the event of a power failure emergency situation. *(See section 4.3.9 in Use of service lift)*

3.8 Guiding system

3.8.1 Guiding ladder

The service lift is guided by ladder. The guiding system function is to safely guide the service lift along the ladder stiles.
The guiding system consists of the guiding ladder and 4 sets of 2 guiding rollers each. The arrangement of the 4 sets is shown in the following figure.

Each roller is secured to the cabin supporting profiles and the surface of the rollers is made of a material that ensures smoothness though providing necessary endurance.

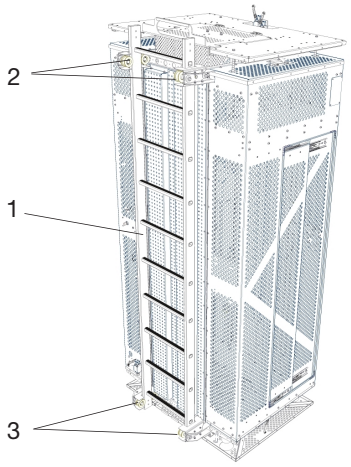


Figure 21: Guiding system

Guiding system	
1	Guiding ladder
2	Top guiding rollers
3	Bottom guiding rollers

3.9 Cable management

3.9.1 Travelling cable

Travelling cable is connected from power supply socket over mid tower´s height platform to service lift socket and it features a cable stocking on each end. A travelling cable pulley is suspended on the cable and is guided along the traction and safety wire ropes.

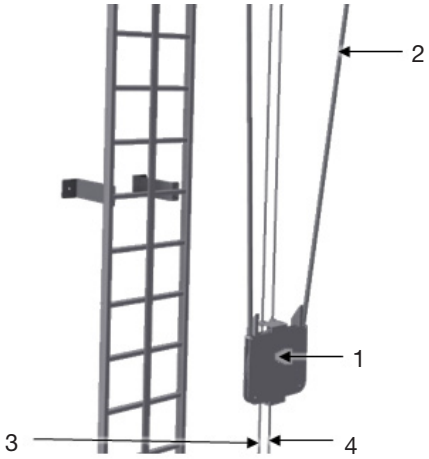


Figure 22: Travelling cable

Travelling cable	
1	Travelling cable pulley
2	Travelling cable
3	Traction wire rope
4	Safety wire rope

3.10 Platform fences

The platform holes shall be protected with platform fences. These platform fences consist of structures of different geometries depending on the platforms where they are installed.

The platform fences shall conform to EN 14122-3 and shall be equipped with a door (sliding and/or swinging) monitored with a trapped key system. Optionally, and apart from the trapped key system, the platform fence doors could feature guard locking switch system, or an electrical switch monitoring system.

3.10.1 Fence door interlock system

3.10.1.1 Trapped-key system

The platform fence door is equipped with a trapped-key lock that keeps the door locked while the service lift is not at the platform. The door can be unlocked using the trapped key in the cabin and opening the lock. The key will remain trapped until the door is closed and locked again.

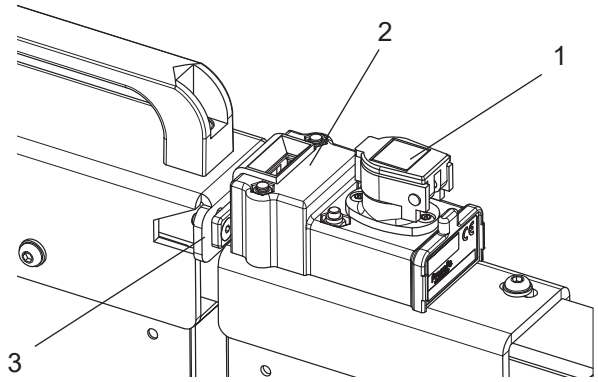


Figure 23: Trapped-key system

Trapped-key system	
1	Key
2	Safety lock
3	Actuator

3.10.1.2 Guard locking system

The platform fence door could be equipped with an interlock system that keeps the door locked while the service lift is not at the platform. The door becomes unlocked when the service lift is at the platform with the lift detection switch activated. From the moment the fence door is open, power is removed so the service lift cannot move. When the door is closed, the ready light is on.

During emergency use, for example during a power outage, where evacuation or rescue is necessary, the door guard locking switch can be unlocked by acting the mechanical Door Manual Release system from outside the fence, or from inside the fence.

This system is installed in place of the Trapped-key system.

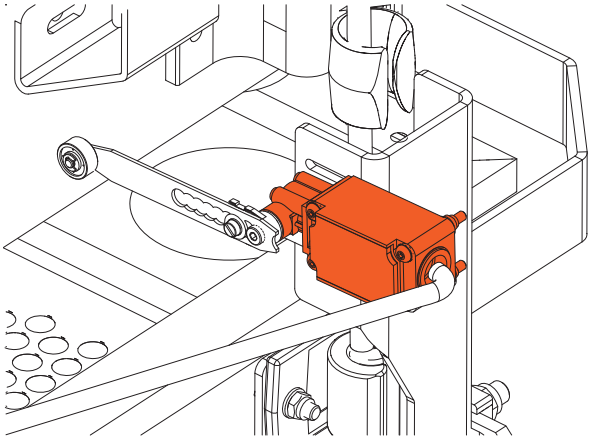


Figure 24: Platform position switch

3.10.1.3 Electrical switch monitoring system

An optional system is the electrical switch monitoring system. This interlocking mechanism is comprised of a mechanical locking unit and a switch unit. When the switch is opened, the power is removed so the service lift cannot move. This system allows users to evacuate to the ladder more easily, without having to jump over the fence. In this case, the fence doors must be self-closing doors, to avoid any user could fall from a platform if the fence door is left open.

NOTICE

Optional function.

NOTICE

A locking system is compulsory for CE versions if the platform fences have doors.

3.11 Information signs and documents

The following documents, signs and stickers are supplied with the service lift and must be always available.

Verify the integrity and legibility of all illustrations and information signs. Replace any illustrations or signs that are missing or an illegible.

Location	Documentation
Cabin	Serial number plate (including CE mark)
	Manuals inside blue bag
	Quick guide
	Evacuation guide
	Use of PPE label sign
	Max. load / N° persons label
	Wiring diagram inside blue bag
	Non standing on top label
	Fasten kit label (if available)
	Not anchor point label
	Manual descent label
	Main door guardlocking labels
User/Main control box	Electrical hazard warning label
Bottom platform fence	Rescue guide
	Rescue pendant control emergency sign

4 Daily inspection and instructions for use

4.1 Daily inspection

NOTICE

The daily inspection must be recorded for future reference filling in the User Log Sheet Appendix.

4.1.1 Overall

Function/System	Operations
Cabin and Cabin components	Visually check the cabin and its components are assembled correctly and these are free of cracks, dents and disparities. • Cabin structure • Doors and covers • (If provided) Internal light • Anchor points • Internal emergency ladder • Cabin control boxes • Hoist and Fall arrest device *(See figure 25: Check the FAD fixing adapter has moved downwards. Insuchcase, DONOT USETHE LIFT).* • Top and bottom obstruction devices • Switches • Warning lights • Guiding system (guiding rollers)
Installation components	Visually check that the WTG installation components are mounted in accordance with the specifications and without any noticeable defects or missing components. • Platform control boxes • Traction and safety wire ropes • Guiding system (guiding ladder) • Travelling cable pulley • Electrical cables and electrical plugs • Interlock system
Travel path	Visually check that there are no obstacles in the travel path which may obstruct the movement of the service lift.
Hour meter	Record the hour meter reading on the *User log sheet*.

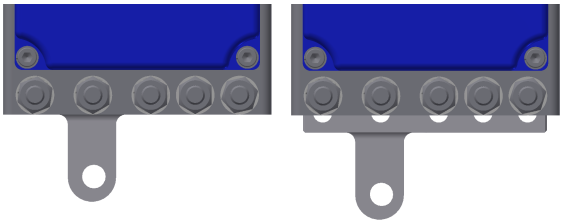


Figure 25: FAD fixing adapter

4.1.2 Control and safety devices

4.1.2.1 Internal cabin control

Check that the safety devices are in place and working:

Function/System	Operations
Main switch	1. Turn the main switch on the bottom platform control box to the *OFF* position. **The green light must be *OFF*. The service lift must not run.** 2. Turn the switch *ON*. **The green light must be *ON*.**
Green light (ready) - Service lift	1. Close and lock the bottom platform gallery door and the service lift door. 2. Turn the trapped key to the *ON* position (if installed). **The green light must be *ON*.** **It should not be possible to remove the trapped key unless it is switched *OFF* again.**
EMERGENCY STOP button	1. Press the *EMERGENCY STOP* button on the Main control box. **The service lift should not move *UP* or *DOWN*.** 2. Release the *EMERGENCY STOP* button.

Function/System	Operations
Service lift door switch	**1.** Open the service lift door. **2.** Press the *UP* and *DOWN* buttons on the Main control box. **The green light must be OFF and the service lift must not move *UP* or *DOWN*.** **3.** Close the service lift door and ascend the lift electrically a few centimeters at a height no corresponding to the platform. **The service lift door is only able to open by turning the emergency release lever up.**
EMERGENCY top limit switch	**1.** Press the *UP* button on the Main control box and during upward travel, press the EMERGENCY top limit switch manually. **The service lift shall stop immediately. Neither upward nor downward travel should now be possible.**
Bottom obstruction device	**1.** Descend the service lift until the bottom obstruction device hits the bottom platform. **The service lift must stop before the rubber bumpers hit the bottom platform. The service lift door and the fence door must be unlocked.**
Top obstruction device	**1.** Activate the top stop by pressing it down. **The service lift should not ascend until top obstruction device is released.**
Manual descent	**1.** Perform a manual descent test for one meter. **The service lift must descend and the buzzer must sound.**
Trapped key (if installed)	**1.** Turn the Trapped key to the OFF position (if installed) **The service lift should not move *UP* or *DOWN*.**
Fall arrest device	**1.** Ascend the lift electrically a few centimetres and observe the centrifugal weight during this process. **2.** Activate the fall arrest device by turning the lock lever counterclockwise. **3.** Press and hold the down button of the user control box. **The service lift should not descend.** **4.** Try to perform a manual descent and observe the centrifugal weight during this process. **The fall arrest device must support the load (if not, leave the lift and tag it out).** **5.** Ascend electrically again to unload the fall arrest device. **6.** Unlock the fall arrest device by turning the unlock lever clockwise. **There is an alternative method for checking the fall arrest device functionality, called the Stomp-test. The procedure is explained in the Stomp-test *Instruction Appendix*.**

DANGER

If any faults occur during work:

- *Stop working*
- *If required secure the workplace*
- *Rectify the fault*

DANGER

Make sure that nobody is exposed to danger below the service lift, for instance from falling parts.

4.1.2.2 External cabin control (Automatic Send)

The Automatic send mode function is only available from the control buttons outside of the cabin. It must be checked as follows (one technician inside the cabin / one technician outside):

Function/System	Operations
Ascend	1. Turn the main control box selector to *AUTOMATIC (if installed)*. 2. Press the external *UP* button on the Main control box. **The service lift should ascend.**
EMERGENCY STOP button	1. Press the external *EMERGENCY STOP* button on the Main control box. **The service lift stops.**
Descend	1. Pull the external *EMERGENCY STOP* button and press the external *DOWN* button on the Main control box. **The service lift must descend until the bottom obstruction device engages.**

4.1.2.3 Control from platform (Call or Send and Call function)

The Call or Send and Call mode functions are only availables from the platform control boxes. It must be checked as follows (one technician inside the cabin / one technician outside):

Function/System	Operations
Ascend	1. Press and hold the *UP* button on the bottom platform control box. **The service lift ascends with a delayed response**
EMERGENCY STOP button	1. Press the *EMERGENCY STOP* button on the bottom platform control box. **The service lift stops.**
Descend	1. Pull the *EMERGENCY STOP* button on the bottom platform box. Then press and hold the *DOWN* button on the bottom platform box. **The service lift must descend until the bottom obstruction device engages.**

4.2 Prohibited uses

DANGER

Failure to comply with the prohibited uses is extremely dangerous for the physical integrity of the users

When using the service lift it is forbidden to:

- Use the service lift beyond its intended purpose.
- Operate the service lift without following the safety warnings and operating instructions.
- Overload the service lift.
- Try to repair machine components. Only certified technicians are allowed to perform service on the machine.
- Use the ladder, unless service lift is out of service, or in case of evacuation or rescue.
- Manipulate switches and safeties.
- Place objects on the service lift roof.
- Travel on the service lift roof.

- Use the emergency manual release of the guard locking of the door lift or the fence doors during normal use.
- Remove the trapped key (if installed) from the wire rope.
- Have a trapped key in addition to the one/s installed in the service lift (if installed).

4.3 Use of service lift

4.3.1 Entry and exit

Two configurations are available for the main ingress and egress of the service lift with the following door types:

– Full sliding door (on the right or on the left side).
– Optionally two full sliding doors (on the right and on the left side).

4.3.2 Full sliding door

To enter the cabin follow these steps:

1. Open the door.
2. Enter the cabin.
3. Attach the shock absorber to the cabin anchor point.
4. Close the door.

To exit the cabin follow these steps:

1. Open the door.
2. Exit the cabin.
3. Release the shock absorber from the cabin anchor point.
4. Close the door.

Normal use

During normal use with the service lift connected to the electric grid, the sliding door is closed by pushing the actuator into the door guard locking switch. The control is interrupted if the door is not closed correctly.

When the cabin is at a platform, the lift detection switch or photoelectric sensor (optional features) is activated and the sliding door can be opened. In the cabin there is a handle to assist with opening the sliding door. Inside the cabin there is a position platform indicator. The green light is ON when the lift is at the platform.

Emergency use

During emergency use, for example during a power outage, where evacuation or rescue is necessary, the door guard locking switch can be unlocked by pushing the emergency red release button from outside the cabin or by turning the red release lever from inside the cabin. *(See Figure 6 in Section 3.2.1.1)*

- **Inside the cabin**
  Turn the red release lever to open the sliding door.
- **Outside the cabin**
  Press the red release button to open the sliding door.

4.3.3 Top/Bottom hatches

Top hatch

Top hatch can be opened from both sides, thus allowing egress to and ingress from above.

- **Inside the cabin**
  Use the internal emergency ladder to reach the top hatch.
  To open top hatch push it up. Once top hatch is open, ladder becomes totally accessible.
- **Outside the cabin**
  To open top hatch pull it up. Once top hatch is open, access inside the cabin by means of the internal emergency ladder.

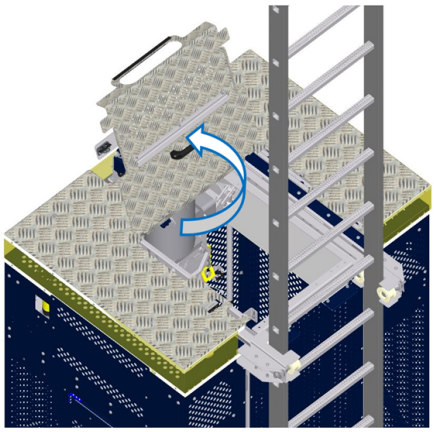


Figure 26: Top hatch

Bottom hatches

The service lift has two bottom hatches, one on the floor of the cabin and the other on the bottom full cover obstruction device. The bottom hatches can be opened from both sides, the bottom cabin hatch opens inwards, and the bottom obstruction device hatch opens outwards, thus allowing egress to and ingress from below.

- **Inside the cabin**
  Before using the bottom hatches, the user must anchored to the lower additional anchor point inside the cabin.
  To open the bottom cabin hatch pull it up. Once it is open, push down the bottom obstruction device hatch to open it.
  When both bottom hatches are open, ladder becomes totally accessible to exit through the bottom of the service lift.
- **Outside the cabin**
  To open the bottom obstruction device hatch pull it down. Once it is open, push up the bottom cabin hatch to open it.
  When both bottom hatches are open, the user must be anchored to the lower additional anchor point inside the cabin before access from the bottom of the service lift.

DANGER

The lower anchor point must only be used for evacuation/rescue operation.

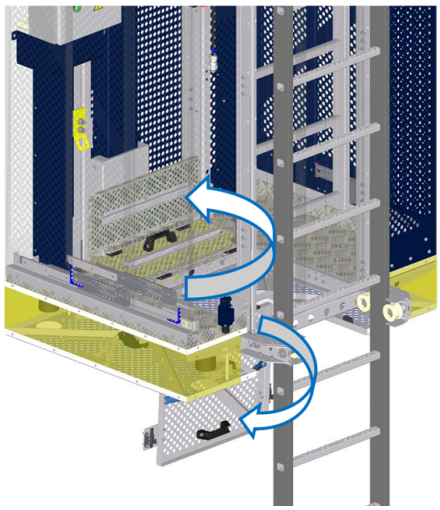


Figure 27: Bottom hatches

4.3.4 Stop/Emergency stop

a) Release the Up or Down button; the service lift should stop

If it does not:

b) Push the EMERGENCY STOP button, and all controls should be disabled.

4.3.5 Operation from inside the cabin (manual)

When the fence doors feature a guard locking system:

1. Turn the main switch of the bottom platform control box to the *ON* position.
2. Enter the service lift, close the bottom platform fence door, and the cabin door.
3. To go up or down, push and hold the *UP* or *DOWN* button as required.

When the fence doors feature a trapped-key system:

1. Turn the main switch of the bottom platform control box to the *ON* position.
2. Open the cabin door, remove the trapped key and open the bottom platform fence door.
3. Enter the service lift, close and lock the bottom platform fence door.
4. Turn the trapped-key switch to *ON*, and close the cabin door.
5. To go up or down, push and hold the *UP* or *DOWN* button as required.

To place the service lift on the floor after the bottom obstruction device has stopped the lift:

1. Turn the override bottom obstruction device switch clockwise and hold.
2. Press the DOWN button until the service lift rests on the floor, then release.

WARNING

In the event that the traction wire rope breaks or traction hoist fails, evacuate the service lift.

WARNING

Before closing the lift door, ensure that your equipment (i.e. lanyards) is not trapped or tangled with the closing door and / or with surrounding elements.

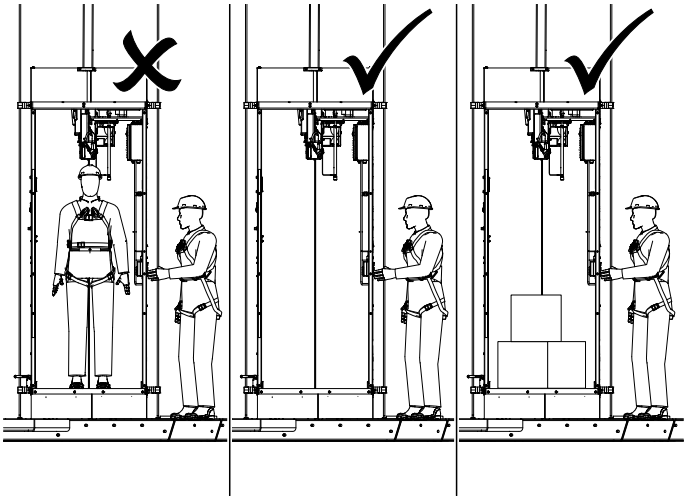
WARNING

To prevent the lanyards from tangling with surrounding elements, keep them properly attached to your body harness.

WARNING

To prevent the lanyards from tangling with the moving service lift, do not get close to the hoistway.

4.3.6 Operation from outside the cabin (automatic send configuration)



DANGER

Transportation of persons is forbidden if the operation is controlled from outside the service lift.

4.3.6.1 Operation by means of the external operating user control box

Bottom platform

When the fence doors feature a guard locking system:

1. Turn the main switch of the platform control box to the *ON* position (if installed).
2. Close the cabin door and the bottom platform fence door.
3. Push the external *UP* button.

When the fence doors feature a trapped-key system:

1. Turn the main switch of the platform control box to the *ON* position (if installed).
2. Close and lock the bottom platform fence door.
3. Turn the trapped-key switch to *ON*, and close the cabin door.
4. Push the external *UP* button.

Top platform

When the fence doors feature a guard locking system:

1. Close the cabin door and the bottom platform fence door.
2. Push the external *DOWN* button.

When the fence doors feature a trapped-key system:

1. Close and lock the top platform fence door.
2. Turn the trapped-key switch to *ON*, and close the cabin door.
3. Push the external *DOWN* button.

CAUTION

When the UP or DOWN button is pressed on the external control box in the cabin, the response of the cabin is delayed. During this delay, an acoustic signal will sound and the warning lights (if installed) are flashing. This way, any personnel in the surroundings are warned of the imminent movement of the service lift.

WARNING

Before closing the lift door, ensure that your equipment (i.e. lanyards) is not trapped or tangled with the closing door and / or with surrounding elements.

WARNING

To prevent the lanyards from tangling with surrounding elements, keep them properly attached to your body harness.

WARNING

To prevent the lanyards from tangling with the moving service lift, do not get close to the hoistway.

4.3.7 Operation from platforms (Call or Send and Call function)

When the fence doors feature a guard locking system:

1. Close the cabin door and the platform fence door.
2. Push and hold the *UP* or *DOWN* button in the platform control box to ascend or descend the cabin.
3. Then platform light (green) illuminates, cabin is aligned with a platform and can be opened.

When the fence doors feature a trapped-key system:

1. Close and lock the platform fence door.
2. Turn the trapped-key switch to *ON* in Main control box, and close the cabin door.
3. Push and hold the UP or DOWN button in the platform control box to ascend or descend the cabin.
4. Then platform light (green) illuminates, cabin is aligned with a platform and can be opened.

CAUTION

When the UP or DOWN button is pressed on the platform control box, the response of the cabin is delayed. During this delay, an acoustic signal will sound and the warning lights (if installed) are flashing. This way, any personnel in the surroundings are warned of the imminent movement of the service lift.

WARNING

Before closing the lift door, ensure that your equipment (i.e. lanyards) is not trapped or tangled with the closing door and / or with surrounding elements.

WARNING

To prevent the lanyards from tangling with surrounding elements, keep them properly attached to your body harness.

WARNING

To prevent the lanyards from tangling with the moving service lift, do not get close to the hoistway.

4.3.8 Overload detection device

An overload detection device is built into the traction hoist. In case of an overload, it will prevent the upward travel of the service lift (by interrupting control) and a buzzer will sound, until the overload condition is eliminated.

WARNING

When entering and starting the lift, the buzzer may sound briefly. This is due to temporary load peaks that occur when the lift starts to ascend. The control box is designed to not activate the buzzer or stop the lift due to these load peaks caused by the swaying of the cabin.

DANGER

The service lift must not be used if it is overloaded

DANGER

It is forbidden to carry out a manual descent in the event of service lift overload.

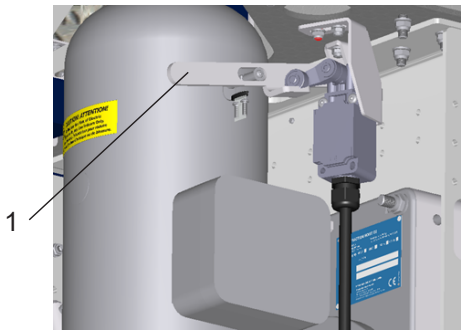
NOTICE

Only a Certified technician may adjust the overload limiter (Refer to "Adjustment of the of overload detection device" Appendix in Installation and Maintenance Manual).

2,1,9 K_ls_j bcqaclr

In case of power failure, a manual descent without power can be performed. To do so:

1. Verify that the fall arrest device is unlocked.
2. Check that there are no obstacles or persons in the travel zone.
3. Push the manual descent acting lever upwards. The service lift will start descent and a buzzer will sound. Move the manual descent acting lever up completely to avoid an excessive wear and overheating of the electromagnetic motor brake.
4. The electromagnetic motor brake is released.
5. The service lift descends with a limited controlled speed using a centrifugal brake installed between the motor shaft and the gearbox.
6. To stop the manual descent, stop pushing the manual acting lever upwards.
7. Every time a manual descent is made of the entire height of the tower, shall be recorded in the User log sheet and the system must be checked by a certified technician.



Dgespc 288 K_ls_j bcqaclr qwqrck

K_ls_j bcqaclr qwqrck	
1	Manual descent acting lever

CAUTION

During the manual descent, the doors, hatches and windows /covers of the lift must be kept closed.

WARNING

Every time that a whole tower height manual descent is performed, shall be recorded in the User log sheet, and the system must be checked by a Certified technician.

WARNING

Use the walkie-talkie to advise about the manual descent.
During the manual descent, stop the service lift just before reaching the bottom platform floor. If the lift stops before reaching the bottom platform, the bottom obstruction device will not get damaged.

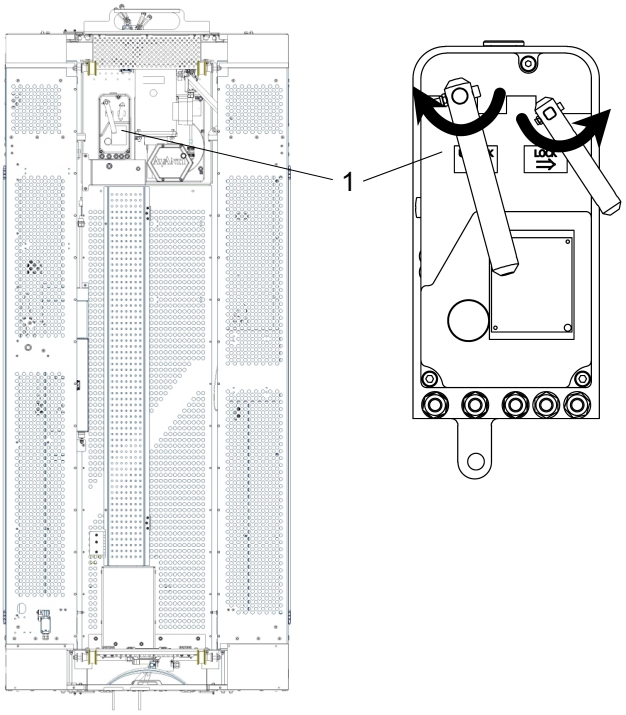
2,1,10 D_jj _ppcqr bctgac

The service lift is provided with the ASL608 fall arrest device which will be triggered in case of an overspeed condition.

This device protects the service lift against traction wire rope breakages or traction system failures.

The fall arrest device can also be engaged or disengaged manually by acting directly on the fall arrest device levers.

- The internal emergency ladder must be used for access to the fall arrest device levers. The user must observe all safety precautions and check that the lift doors are closed before going up.
- To activate the fall arrest device, turn the stop lever counterclockwise.
- To release the fall arrest device, turn the release lever clockwise.



Dgespc 298 Fall arrest device

K_ls_j bcqaclr qwqrck	
1	Fall arrest device

If the fall arrest device engages, simply disengage it by turning the *Unlock* lever clockwise until the fall arrest devic e is unlocked.

However, if the safety wire rope is under tension it is not possible to unlock the fall arrest device with the *Unlock* lever. If the safety wire rope is under tension:

1. Remove the load on the safety wire rope by pushing the *UP* button to move the service lift up a few centimetres.
2. Manually open the fall arrest device by turning the *Unlock* lever clockwise until the fall arrest device is unlocked.

In the event of power failure, if the fall arrest device is locked with the safety wire rope under tension, evacuate the lift in accordance with the evacuation procedure.

DANGER

The tension of the safety wire must be inspected regularly to ensure the full functionality of the fall arrest device.

DANGER

Before climbing on the internal emergency ladder, make sure the required PPEs are used, that the cabin doors are closed and that the personnel is attached to the anchor points inside the cabin.

WARNING

If the FAD fixing adapter has moved downwards, the FAD unit must be replaced by certified technician.

CAUTION

The safety wire rope and the attachment between the fall arrest device and the service lift are exposed to dynamic loads when a fall is prevented. When the service lift has returned to the bottom platform, test the fall arrest device functionality. Replace any defective components of the fall arrest device and return them for repair to Avanti.

CAUTION

If fall arrest device has engaged, an expert must verify the safety of the fall arrest device, the wire rope, and wire rope fastenings.

4.4 After use instructions

1. Bring the service lift all the way down, until the bottom obstruction device stops the cabin.
2. When leaving the wind turbine, turn the main switch in the bottom platform box to the OFF position to cut the power to the service lift.

NOTICE

Before leaving the WTG, ensure the lift is positioned in the bottom platform.

4.5 Troubleshooting

1. All tests and repairs to the electronic components should be performed by certified technicians only. The wiring diagram is placed in the power cabinet.
2. Repairs to the traction hoist, the fall arrest device and to the system's supporting components should be performed by certified technicians only.

CAUTION

Disconnect the power supply before opening the power cabinet.

DANGER

Stop. Attempting to use the lift will jeopardize work safety.

DANGER

Irresponsible behavior jeopardizes system safety!

WARNING

Further use of the lift with dirty wire ropes may result in damage to the wire rope traction.

DANGER

A defective fall arrest device can jeopardize the safety of the service lift.
Replace immediately.

Cause	*Solution*
THE SERVICE LIFT DOES NOT MOVE UP OR DOWN.	
A1 Emergency stop	
The fixed EMERGENCY STOP button has been activated. In the user control box or in any of the platform control boxes (bottom, top or intermediate platforms)	Deactivate the EMERGENCY STOP button by pulling it until it pops out.
A2 Wire rope loop on traction hoist.	
Damaged or defective wire rope or wire rope outlet causes problems.	**Stop work immediately!** Ask the supplier or manufacturer for help.
A3 Fall arrest device	
The fall arrest device is holding the service lift on the safety wire. 1. Lift wire rope breakage. 2. Hoist failure.	Evacuate the service lift according to the *Evacuation guide*.
A4 Obstacle	
The service lift is stuck on an obstacle.	Carefully remove the obstacle. Test the operational safety of affected tower sections. Inform the supervisor.

Cause	*Solution*
THE SERVICE LIFT DOES NOT MOVE UP OR DOWN.	
A5 Power failure	
Switch is not activated.	Turn the emergency stop button clockwise until it is released.
Grid voltage interrupted.	Find the cause and wait for the power to return.
Power supply between grid connection and control interrupted.	Test and if necessary repair the power cable, fuses, connections, and/or wiring from the control box.
A6 Functions of limit switch	
The emergency top limit switch has been pressed.	Perform a manual descent until the emergency top limit switch is released.
Door switch is not properly closed or is defective.	Close the door and test the door switch.
A top or bottom hatch switch is triggered.	Close the hatch.
A7 Protection switch overheated.	
A phase is missing.	Test/repair fuses, power supply and connection.
Motor is not cooling.	Clean the hood.
Voltage too high/low.	Measure voltage and power consumption on the loaded motor. If the voltage deviates from specifications, use a cable with increased dimensions.
A8 Brake does not open (no click on ON/OFF).	
Power supply, braking coil or rectifier defective.	Have a certified technician, repair / replace the power supply, braking coil and rectifier.
Braking rotor closes.	Return the traction hoist for repair.
A9 Guard locking switch and / or lock control box	
If guard locking system is provided, the guard locking switch and / or interlock control box is/are defective.	Test / repair defective components.
A10 Trapped-key system	
The fence door trapped-key system is active. The system switch is OFF.	Turn the trapped key to the ON position.
A11 Main switch	
The main switch is in the OFF position.	Turn the main switch ON.
A12 Rescue pendant control	
Rescue pendant control is plugged.	Use rescue pendant control in case of rescue event. Otherwise, unplug pendant control.

Cause	*Solution*
SERVICE LIFT GOES UP BUT NOT DOWN	
B1 Obstacle	
The service lift has encountered or is stuck on an obstacle.	1. Carefully move the service lift up and remove the obstacle. 2. Test the operational safety of affected platform components. 3. Inform the supervisor.
B2 Fall arrest device	
The fall arrest device is holding the service lift on the safety wire. • Excessive hoist speed. • Low release speed on fall arrest device.	1. Move the service lift upwards to relieve the safety wire rope. Unlock the fall arrest device by turning the unlocking lever, and test its function. 2. Functional test when the lift is back on the ground: Replace the traction system and fall arrest device and return the defective fall arrest device to Avanti for testing.
B3 Traction system	
Fault in the traction system controller circuit.	1. Insert the brake lever into the traction system and lower the lift manually. 2. If necessary, test connections, wiring, and relays.
B4 Bottom obstruction switch	
The bottom obstruction switch is defective or not connected properly.	Test the bottom obstruction switch connection and functionality. Replace the bottom obstruction switch if necessary.
The bottom obstruction switch is activated.	Move the lift up until the bottom obstruction switch is released.
SERVICE LIFT GOES DOWN BUT NOT UP	
C1 Obstacle	
The service lift is stuck on an obstacle.	1. Carefully move the service lift downwards and remove the obstacle. 2. Test the operational safety of affected platform components. 3. Inform the supervisor.
C2 Top obstruction switch	
The top obstruction switch is defective or not connected properly.	Test the top obstruction switch connection / function. Replace if necessary.
The top obstruction switch is activated.	Move the lift down until the top obstruction switch is released.
C3 Phases	
A phase is missing.	Test fuses and power supply.
C4 Output control circuit	
Fault in UP control circuit in the control box or traction hoist.	Test and possibly repair connections, wiring and relays.
C5 Overload	
Service lift is overloaded (buzzer sounds).	Test and / or reduce load until buzzer stops.

Cause	*Solution*
THE BUTTON LAMP IS NOT LIT ALTHOUGH THE OPERATION IS NORMAL.	
D Button lamp	
The button lamp is defective.	Have an electrician replace the lamp.
THE TRACTION SYSTEM GOES DOWN WHEN THE UP BUTTON IS PRESSED AND UP WHEN THE DOWN BUTTON IS PRESSED.	
E Phases	
Two phases are switched around in the power supply.	Have an electrician switch the two phases in the connector.
LOUD NOISE AND/OR SMOKE COMING FROM THE HOIST MOTOR.	
F Brake	
Brake closed or partially closed. Damage of hoist brake leading to brake function lost.	Stop work immediately! Call a supervisor for advice and potential repair of hoist.
THE MOTOR HUMS LOUDLY OR THE WIRE ROPES SQUEAK, BUT THE LIFT CAN GO BOTH UP AND DOWN.	
G Wire ropes	
Wire ropes are dirty.	If possible, immediately replace the traction system and return it to Avanti for testing or repairing.

NOTICE

If these steps do not identify the cause and rectify the fault:
Consult a certified technician or contact the manufacturer.

4.6 Out of service

1. **Securing the service lift:**
   Lower the service lift until the bottom obstruction device stops the cabin.
2. **Turn off the main switch to prevent inadvertent operation of the lift:**

   Switch off the main switch of the service lift to disconnect the power supply. Place a sign on the lift, indicating *out of service*.

   Contact the service technician for repair.

Appendix: Stomp-test Instructions

Alternative way to inspect the ASL during Daily Inspection before Operation

Purpose

The Stomp-test instruction can replace part of the daily lift verification and must be carried out by certified technician. The Stomp-test instruction describes an alternative way of checking the overspeed triggering and load arrest functions of the ASL models of the Avanti fall arrest device. Secondly, the test also documents that the safety brake maintains its grip on the safety wire rope after engagement. This test is called the Stomp-test.

The Stomp-test method can replace the daily obligations specified in the manual, such as lift descent, manual engagement of the fall arrest device, verification by short descent without power, unloading the fall arrest device by ascending, and observing the centrifugal weight unit through the window while using the lift. With the Stomp-test we test the capacity of the fall arrest device to activate in the event of overspeed and arrest the load.

Tools: None

Measuring equipment: None

Validity

The Stomp-test instructions are applicable for checking the installation of the fall arrest device (ASL). The Stomp-test must only be performed by trained users or certified technicians, and always following all the relevant safety rules.

Precautions

Take into account that the instruction only explains the steps to carry out the Stomp-test in the lift installation. It does not explain the safety precautions or the required use of the safety equipment.

Avanti recommends reading and understanding the physical steps in the Stomp-test and carrying out your own assessment of the risks and dangers according to the safety work procedures before starting the test.

1. Test preparation

The cabin ascends with an user inside and the bottom of the cabin is positioned at an approximate height of 3 m (10 ft) above the bottom landing floor platform.

2. Test

With the cabin parked at an approximate height of 3 m (10 ft) above the bottom landing floor, the user starts descending using electric current by pressing the *DOWN* button. When the cabin starts descending, the user stomps with one foot on the floor of the cabin. This is done by lifting one foot, positioning the lower leg at an angle of 90 degrees with the knee, and stomping the floor of the cabin. The user must make sure to have a solid footing during the stomping.

The stomp should activate the ASL and stop the electric descent of the cabin. The red light (if present on the control box) must light up and the cabin load must be hanging from the safety wire / fall arrest device.

If the ASL is not activated during the first test, restore the cabin to the position described in the preparation section above and stomp again with more force.

3. Test result

If the ASL is activated correctly after the stomp, the ASL will hold the cabin on the safety wire.

To ensure the proper grip of the safety brake, the user must activate the manual descent function. This must result in the ASL fall arrest device holding the cabin from the safety wire (manual descent is not possible).

If the activation of the ASL fall arrest device holds the cabin using the safety wires while manual descent is activated, the ASL fall arrest device is in good operating condition.

In order to release the ASL fall arrest device, push the *UP* button before unlocking the ASL fall arrest device manually.

If the ASL fall arrest device does not activate after the first or second Stomp-test, or cannot hold the cabin in fixed position:

- The user must descend the cabin immediately and park it on the landing floor on the bottom platform.
- Lock the installation to prevent use and contact Avanti to obtain more information.
- Document the execution of the procedure described in the User log sheet Appendix.
- In case of any queries about the instructions, please contact a local representative of Avanti to obtain assistance. - www.avanti-online.com

Changelog

Version	Date [mm/yyyy]	Description
01.01	02/2018	Service Lift User manual Model Octopus XL120
01.02	04/2018	Added Traction hoist M608 and ASL608
02.01	03/2019	EC Certificate updated Manufacturer updated to Avanti Wind Systems Technology, S.L.
02.02	06/2019	Certification manual Extend service lift travel path up to 160 m.
03.01	07/2019	EC Certificate updated

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