

Passenger Walkway ALW4200

Standards

This equipment is in compliance with EN 1915-1:2013, EN 1915-2, EN 1915-3, EN 1915-4, EN 12312-1:2013, Machinery Directive 2006/42/EC also applicable IATA recommendations AHM 910, AHM 913, AHM 915, AHM 904, AHM 920.

General description

The ALW4200 passenger stairs are electro powered; self-propelled universal passenger stairs for non-traffic purposes with limited speed up to 6km/h. Stairs are prepared for and can be towed for longer distances with towing vehicles on the transport routes. Thanks to their height range from 1.8 m up to 4.2 m is this stair suitable for the vast majority of today's aircraft. They are particularly suitable for the following aircraft:

- A318, A319, A320, A321
- B707, B727, B737, B757
- BAe146
- DC8, DC9
- EMB170/175, EMB190/195
- F28, F100
- IL-18, IL-62
- MD80, MD90
- TU134, TU154
- YAK-42
- BAC 1-11
- RJ70/85/100
- Trident

Designed in accordance with the latest technical standards, the ALW4200 stairs combine passenger convenience with safety and economy. Our ALW4200 stairs have been developed at every stage in a modular design and are available with a wide range of standard options that enable every customer to have customised passenger stairs tailored to his particular requirements. TIPS passenger stairs meet all normal safety standards and can be easily adapted to any special safety requirements in effect locally. The vehicle is characterized by optimum handling, high resistance to wind and improved transparency for the user. Own manufactured housings and frames, designed specifically for the purpose, has a significantly longer life time and minimal maintenance costs, which assure low TCO and makes the vehicle ideal for long-term use.

Chassis

Strong steel construction made from steel profiles and steel tubes is the basis of the vehicle and carries the axis drive, stabilizers, staircase and the stairs lifting system.

Axle, Wheel unit

Front axle: Rigid steering axle

Rear axle: High torque radial piston wheel motors

Tyres: 245/70 R 17,5

Steering

Hydraulic steering system

Drive system

Asynchrony drive motor 24V/4KW AC Phase voltage 3 x 15 V

Electro motor is connected to radial piston pump, with fixed displacement. Electromotor is controlled with AC speed controller. Velocity depends to number of motor revolutions. Nominal speed is limited to 6 km/h in forward and to 4 km/h in backward direction.

Braking system

Service brake: During driving – braking is operated with hydrostatic drive.

Parking brake: Drum brake – mechanically released for towing purposes– hydraulically released during auxiliary drive

Options:

- – *Spare wheel*
- – *Side protection koterm panels*

Hydraulic system

This is divided into the hydrostatic drive system and the operating hydraulics. First system is drive with the electro-powered pump for the drive unit and seconds the gear electro-powered pump for the operating hydraulics and steering system All valves are electrically actuated. The hydraulic pipes consist mostly of metal tubes. Flexible tubes are only used for movable passages. The hydraulic valve block and the electro motors are protected splash guard.

2nd asynchrony motor 24V/4KW AC Power 4 KW

Options:

- *Hydraulic oil pre-heating system*
- *Hydraulic tubes and fittings made of stainless steel*

Stabilisers

Four hydraulically-operated stabiliser jacks hold the stairs firm in their working position and guarantee maximum stability. In the event of pressure-loss, they are secured by a pilot operated check valve.

Option:

- *Coloured stabiliser feet in red*
- *Stabiliser feet base made of Vulkullan – antistatic protection*
- *Red – White colouring of the stabiliser foot protection*

Vehicle lighting

Vehicle is as a self-propelled unit which can be driven on the non-traffic purpose areas and can be towed on the traffic purpose areas. The vehicle is equipped with two rear red, two front white and amber side reflectors on each side. For better visibility of the docking and driving around the aircraft floodlight is mounted under the platform and on the front of the vehicle.

Staircase

The stairs are of telescopic design, where their platform height is adjusted by altering the number of steps that are extended. The great advantage of this method of construction is that step risers are constant all along the staircase, irrespective of a position of the upper staircase, when it is extended and locked.

The tilting control allows the slant of the stairs to be altered through a range of $\pm 3^\circ$ from the horizontal position.

The lower section of the staircase is hinged to the chassis and consists of 10 steps. The 9-step telescopic section is slide able on a lower staircase rails, being pushed by hydraulic cylinder and locked mechanically in a position, where the steps of lower and upper staircases reach alignment.

The fixed and telescopic sections are linked by an intermediate platform. The total depth of the intermediate platform is 900 mm.

Sides

The sides of the staircase are made of mutual coverings that prevent jamming pieces of clothes and luggage during the operation of steps. Staircase lighting (Neon) is integrated in the sides and is protected from damage. The stairwell and platform have on the fence, at the defined height, integrated handles, which are protected throughout with thermoplastic coating.

At the entrance to the stairway there are built-in safety straps with a STOP sign. The locking part is made of thermoplastic material, and is further covered by a rubber guard that protects the sides from damage in case of an

uncontrolled release of the lock. The risk of falling off the platform is prevented with a fixed barrier which can be easily removed when the stairs are docked on the aircraft.

Option:

- *Stair light with automatic control (time relay, moving sensor)*
- *Stair light with automatic control (time relay, moving sensor, twilight sensor)*
- *Open canopy for staircase with sliding roof (inclusive reversing camera system)*
- *Closed canopy for staircase with sliding roof (inclusive reversing camera system)*
- *Fully closed canopy for staircase with bellow (inclusive reversing camera system)*
- *Staircase lighting system (LED)*
- *Yellow painted edges of stairs*

Open canopy:

Canopy over staircase and platform. Additional sliding canopy over platform, electrically operated, can be extended 1.000 mm to ensure clean fit with various fuselage shapes.

Differences of technical data from basic model because of open canopy:

Minimum headroom: 4500mm

Total weight: 7650kg

Wind stability: 45kn

Closed canopy:

Staircase and platform with canopy and closed sides with windows.

Additional sliding canopy section over platform can be extended 1.000 mm to ensure clean fit with various fuselage shapes.

Differences of technical data from basic model because of closed canopy:

Minimum headroom: 4500mm

Total weight: 8000kg

Wind stability: 45kn

Fully closed canopy:

Closed staircase with concertina docking seal inclusive video system for reversing (optional)

Staircase and platform with canopy and closed sides with windows. Electrically- powered concertina docking seal fitted to front section of platform to permit seamless enclosure of aircraft doors. This provides passenger comfort of the same standard as a stationary passenger bridge.

When the concertina seal is extended, the drive motor is automatically blocked to ensure that there can be no damage caused to either plane or stairs by incorrect movement of the stairs.

On the left and right of the platform there are sliding windows which allow the circulation of air to be regulated if the weather is hot.

Differences of technical data from basic model because of fully closed canopy:

Overall width: 3500mm

Minimum headroom: 4750mm

Total weight: 8000kg

Wind stability: 45kn

Platform

The main platform has an effective width of 2.900 mm and a depth of 2.800 – 3.100 mm. The wideness of the platform assures to all models of aircrafts the passenger doors can be opened within the platform even in docked position.

The front section of the platform is movable and mounted on bearings. It can move up to 400 mm to the rear and through an angle of $\pm 10^\circ$ to its vertical axis. This ensures perfect docking with all shapes of fuselage even when the stairs are not positioned straight to the aircraft. Two gas-operated springs ensure that there is always a constant pressure to the body of the aircraft. The front edge of the platform has the additional protection of a thick non-marking tubular rubber bumper.

All walking surfaces are in non-slip aluminium section with drain holes for water. Covering mounted under steps and platform.

The lighting for the staircase and the platform is integrated into the strings and protected against damage from hand-baggage and passengers feet.

Circular-section plastic handrails are fitted to the side sections on both sides at the ergonomically-correct height.

Option:

- *Additional positions lights (2)*
- *Additional working light*

- *Mirror right side on the platform*
- *Mirror right and left side on the platform*
- *Platform with sliding floor 400 mm operated by two linear motors*
- *Docking sensor inclusive automatic drive cut-off*
- *Contactless docking sensor inclusive automatic drive cut-off*

Tilting

Tilting consists of a pair of hydraulic cylinders fitted to a frame. The system supports the staircase and determine the angle of the staircase, varying $\pm 3^\circ$ from the middle position.

The pilot operated check valves assure stability of the tilting system even in the event of pressure-loss or breakage of a hydraulic flexible line.

Option:

- *Auto follow without back up shoe*
- *Auto follow with back up shoe*
- *Safety back up shoe*

Driver's Position

The driver's position is positioned on the left side of the main platform. This allows the driver a clear, unobstructed view of the docking areas. Large rear-view mirror mounted right facilitates reversing and manoeuvring in restricted areas.

Option:

- *Canvas cover for back support*
- *Canvas for the driver's position*

Electrical system

The electrical control system is divided into a number of separate circuits and has slow-acting fuses. All control elements are clearly located in a side-mounted sheet- steel cabinet. An PLC module is responsible for the control logic. This makes it possible for control and locking sequences to be tailored easily to customer's individual requirements. Onboard charger with the external status light and socket for external power supply (features 400V/ 32A/50Hz).

Voltage 24 V. Batteries 24 V, 720Ah. Battery main switch

Option:

- *Integrated battery charging unit with drive lock including fast acting fuse (FI)*
- *Battery monitoring with control light*
- *External battery charging status control tower*
- *Automatic cable drum for charging cable*
- *Sun photovoltaic cells 2 X 240 W for battery charging (mounted on staircase sides)*
- *Sun photovoltaic cells 1200 W for battery charging (mounted on roof)*

Operating

Top priority has been given to ergonomic design and straightforward handling in practical operations. This enables operators to work with the ALW4200 in perfect safety. Located on the upper platform of the stairs you find the operating panel. All controls including the steering wheel for driving and operating the stair are ergonomically positioned. A dead-man's control takes care on drivers' safety.

Option:

- *Remote access to PLC (costs only once)*
- *Platform height pre-selection*
- *Telescope section with auto-retract-function*

Emergency operations

Considerable attention has been paid to the consequences of possible malfunctions of the ALW4200 passenger stairs. In particular, steps have been taken to ensure that the stairs can be removed from the aircraft rapidly and safely in the event of either or both drive and hydraulic breakdown. The stabiliser jacks can easily be retracted and the hand brake can be released with hand level. Hydraulic drive circuit is by losing the electric power automatically set to bypass mode – towing mode. Towing forward can be done by using the front towbar. Towing speed is allowed up to 25 km/h. During towing procedure the stairs must be in retracted position. Towing back (away from the plane) is possible by using the rear tow hook.

- **Option:** emergency operation via DC pump

Towbar

Stairs can be attached to a towing vehicle with a towbar, and can be towed for shorter or longer distances with a maximum speed of 25 km/h.

Surface treatment

Passenger stairs feature a special coating. All structural parts are protected by hot dip galvanising process. Coated areas are first protected with primer, followed by a powder coating finish in RAL colour of customers choosing. This ensures durable surface protection and an attractive aesthetic appearance even after a long-term use.

Option:

- *Corrosion wax protection lower area of chassis*
- *Additional painting of galvanised parts*

Technical data

Dimensions:

Overall length, stairs retracted: approx. 7060mm
Overall length, stairs extended: approx. 8860mm
Chassis length: approx. 7000mm
Chassis width: 2600mm
Total width overall (with following wheel): 3500mm (3685mm)
Wheel base: 3200mm
Track: 2290mm
Distance between stabiliser jacks (length): 4740mm
Distance between stabiliser jacks (width): 2380mm
Ground clearance: 150mm
Minimum headroom (standard version): 3350mm
Minimum headroom (with concertina docking seal): 5000mm
Turning circle: approx. 16000mm
Platform height minimum at -3° inclination: 1800mm
Platform height maximum at +3° inclination: 4200mm
Overall width lower staircase: 1200mm
Overall width upper staircase: 1500mm
Overall width platform: 2900mm
Angle of stair case mid position: 35°

Performance

Driving Speed: <6km/h
Towing speed: <25km/h
Maximum gradient: 7%
Braking power parking brake: 18%

Tank Capacity

Hydraulic reservoir: 70 litres

Load Capacity, Payload and Weights

Load capacity: 320kg/m² on steps and platform

Payload: 55 persons

Total weight (standard version): 7300kg

Electrical System

Working voltage: 24V

Battery capacity: 720Ah

Illumination: 50 lux

Wind Stability

Maximum wind speed: 50kn

