



Bridging the world

ThyssenKrupp Airport Systems



ThyssenKrupp



## Spanning the globe for the future



ThyssenKrupp Airport Systems is part of ThyssenKrupp Elevator (ES/PBB), which in turn is one of the six Operating Units at ThyssenKrupp Elevator AG with headquarters in Essen (Germany).

ThyssenKrupp Airport Systems manufactures, installs, operates and maintains passenger boarding bridges through three companies at locations around the world:

- ThyssenKrupp Airports Systems S.A., based in Mieres, Asturias (Spain).
- ThyssenKrupp Airport Systems Inc., based in Fort Worth, Texas (U.S.A.).
- ThyssenKrupp Airport Systems Co. (Zhongshan) Ltd., based in Zhongshan (P.R. China).

As at all ThyssenKrupp Elevator AG companies, sustainability is at the very core of who we are. We operate under sustainable development guidelines and in strict compliance with the latest international codes, dedicated at every level of the company to helping protect the environment and using resources efficiently.

Sustainable efficiency stands for trust, credibility and a positive attitude toward our planet. It is also the very foundation upon which the Operational Unit ThyssenKrupp Elevator (ES/PBB) operates. Our global commitment to sustainable efficiency pervades all company procedures, starting with the development of new technologies and covering the entire life cycle of our passenger boarding bridges.





## World-class technology and resources



ThyssenKrupp Airport Systems believes that quality is the key to successfully meeting our customers' needs. Our highly skilled personnel work at every level of the company to offer clients innovative design and the most advanced technology, as well as the very best in product reliability and service.

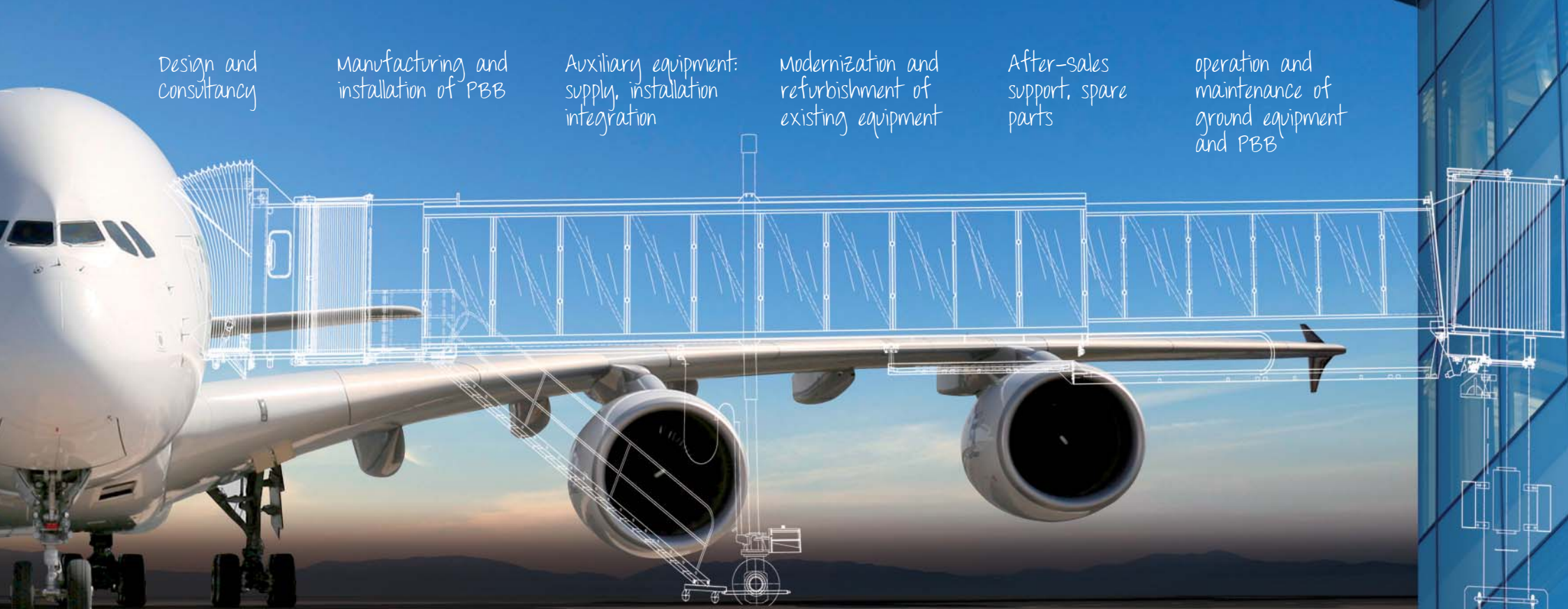
Continuous investment in research and development leads to state-of-the-art design, where precision and accuracy are applied to our passenger boarding bridge (PBB) production line. This is equipped with the latest in automation technology, developed exclusively to manufacture this product.

Our quality control protocols assure customers a product life cycle of over 20 years, backed by outstanding After-sales Service.

We have earned a wide range of quality certification:

- UNE EN ISO 9001:2008 Quality Management System
- UNE EN ISO 14001:2004 Environmental Management System
- OHSAS 18001:2007 in Health & Safety
- EN ISO 3834-2
- DIN 18800-7 (Class E) Welding Process
- Third party certifications by TÜV
- ETL listing certifying conformance to NFPA 415
- CSA Standard W47.1
- Underwrites Laboratory listing certifying conformance to UL#QGL





Design and  
consultancy

Manufacturing and  
installation of PBB

Auxiliary equipment:  
supply, installation  
integration

Modernization and  
refurbishment of  
existing equipment

After-sales  
support, spare  
parts

operation and  
maintenance of  
ground equipment  
and PBB

## Global gate solutions



ThyssenKrupp Airport Systems is not just a passenger boarding bridge manufacturer; we are the global partner for tailored solutions to our customers' needs.

Our expertise in the airport equipment industry allows us to accompany our clients from start to finish, from the design consultancy phase through to the handing over and beyond, with excellent operation and maintenance services.

Through our wide range of PBBs, a variety of auxiliary equipment such as Pre-Conditioned Air (PCA), Ground Power Units (GPU), Visual Docking Guiding System (VDGS), potable water cabinets and Heating Ventilating and Air-Conditioning (HVAC), we are able to meet all customer requirements from departure gate right to the

aircraft door. This is what makes us unique: one single point of contact offering a multitude of services.

Our complete After-sales Service covers the whole life cycle of our products, including preventive maintenance inspection and full maintenance through local service branches, training, operation, refurbishment and modernization, spare parts distribution and warranty support services.

Our vast experience in airport solutions and our commitment to quality, sustainability and health and safety, together with our presence throughout the world, assure clients that any project will be carried out successfully.

## What makes us different

- Galvanized steel components for the best protection possible against corrosion
- Lighter passenger boarding bridges
- Optimized safety and comfort
- Lower life cycle costs
- Sustainable manufacturing processes
- The utmost in product reliability
- Over 35 years of continuous research and development
- One single point of contact, a multitude of services

**...and over 4000 units worldwide**



## A-380 Solutions

Leading the market in A-380 boarding solutions which enable airports and airlines to achieve the shortest turnaround times.

ThyssenKrupp Airport Systems



ThyssenKrupp



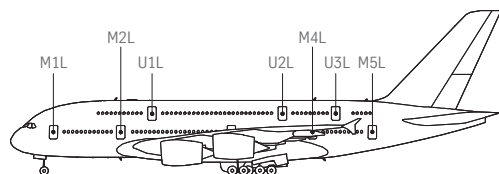
# Boarding the future

ThyssenKrupp Airport Systems (TKAS) offers complete, flexible global gate solutions. By providing project-tailored passenger boarding bridges (PBBs), the most diverse and demanding client requirements can be fulfilled.

TKAS production lines are equipped with the latest in resources and machinery which have been especially and exclusively developed for the manufacture of PBBs.

The overall concept is based on employing top quality materials and procedures to guarantee the highest standard of finishing. The corrosion protection system applied has been specially developed to improve reliability and extend service life far beyond the average.

Each airport has its own specific environment, which makes customization an absolute necessity in the development process of boarding concepts. Such is the case with A-380 gates. As of 2011, TKAS has installed over 250 PBBs for A-380 aircraft and can adapt to all different scenarios for A-380 docking gates:

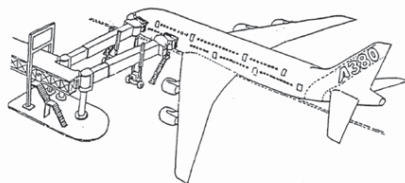


A-380 doors location

## A-380 double docking: 2 PBBs for the main deck

The basic ramp layout represents the most conservative concept. Servicing is carried out via the lower deck (M1L and M2L aircraft doors only) using Apron Drive PBBs.

The total time for boarding and disembarking is approximately 45 minutes.



ThyssenKrupp's two classic Apron Drive PBB configuration.

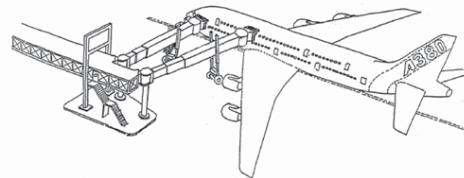
## A-380 double docking: 1 PBB for the main deck and 1 PBB for the upper deck

Both the lower (M1L/M2L) and upper (U1L) decks of the A-380 can be served with this improved 2 PBB solution.

The extended hydraulic elevation solution is based on proven technology implemented on ThyssenKrupp Airport Systems ship passenger boarding bridges for cruise ships and ferries.

The access to the U1L upper deck door results in a reduction of approximately 38 minutes in the total boarding/disembarking time.

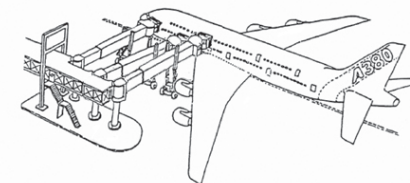
The reliability of this concept has been amply proven in TKAS installations, in both steel and crystal versions, at Heathrow, Zurich, San Francisco, Toronto, Madrid and Kuwait airports.



ThyssenKrupp's two Apron Drive PBB stand for lower and upper deck levels.

## A-380 triple docking: 2 PBBs for the main deck and 1 PBB for the upper deck

Apart from traditional double docking, TKAS offers a third solution by increasing the number of PBBs in order to further reduce turnaround time. It provides a flexible tool with which to present solutions for any A-380 passenger distribution scenario.



ThyssenKrupp's three Apron Drive PBB stand for lower and upper deck levels.

The configuration most in demand is carried out through doors M1L and M2L on the lower deck and door U1L on the upper deck, reducing the total time for boarding/disembarking to approximately half an hour.

With this configuration, the PBBs operate at a very short distance from each other. The TKAS collision avoidance system, proven at many reference airports, assures safe functioning.

### Europe, Middle East & Africa

Pol. Ind. Vega de Baina s/n  
33682 Mieres (Asturias) · SPAIN  
Tel.: + 34 98 544 6820 Ext. 967 · Fax: + 34 98 544 6519  
E-mail: [boardingbridges.tkas@thyssenkrupp.com](mailto:boardingbridges.tkas@thyssenkrupp.com)

### Americas

3201 North Sylvania Avenue Suite 117  
Fort Worth, Texas 76111 · USA  
Tel.: + 1 817 210 5000 · Fax: + 1 817 210 5043  
E-mail: [info.tkas.usa@thyssenkrupp.com](mailto:info.tkas.usa@thyssenkrupp.com)

### Asia-Pacific

Century Road, Torch High-Tech Industrial Development Zone, Zhongshan 528437  
Guandong Province · P.R.CHINA  
Tel.: + 86 760 8816 5888 · Fax: + 86 760 2332 4910  
E-mail: [tkasap@teczs.com](mailto:tkasap@teczs.com)



## Steel Apron Drive

The Steel Apron Drive passenger boarding bridge is currently the most demanded design. Its free movement on three axes (telescopic, elevation and rotation) allows for maximum flexibility in aircraft docking maneuvers while taking up the minimum amount of apron space.

ThyssenKrupp Airport Systems



ThyssenKrupp



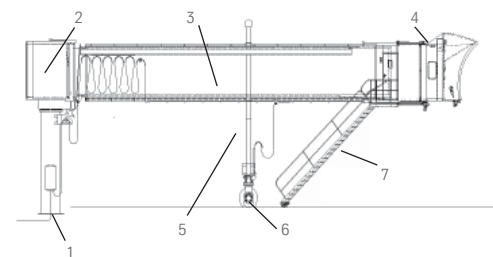
ThyssenKrupp Airport Systems (TKAS) offers complete, flexible global gate solutions. By providing project-tailored passenger boarding bridges (PBBs), the most diverse and demanding client requirements can be fulfilled.

TKAS production lines are equipped with the latest in resources and machinery which have been especially and exclusively developed for the manufacture of PBBs.

The overall concept is based on employing top quality materials and procedures to guarantee the highest standard of finishing. The corrosion protection system applied has been specially developed to improve reliability and extend service life far beyond the average.

## SYSTEM COMPONENTS

The TKAS Steel Apron Drive PBB includes the following main components:



1. Support column
2. Rotunda
3. Tunnels
4. Cabin
5. Elevation system
6. Drive system
7. Service stairs

## CHARACTERISTICS

The Steel Apron Drive PBB (AD) tunnel walls, which are a core piece of the product, are made of hot-dip galvanized sheets. Panels are welded via an automated spot system to guarantee high precision components, which assure longer lifetime, less repair and maintenance and reduced life-cycle costs.

The hydraulic elevation system provides extremely smooth adjustment operation while also reducing operating costs to a minimum.

Automatic systems, such as Point & Go and pre-positioning, help to automate PBB handling, hence reducing the possibility of human error.

The PBB is available in two- or three-tunnel versions.

## GENERAL TECHNICAL DATA

Passenger boarding bridge nomenclature description:

Model TB XY/ZK-N

TB: Apron drive steel

XY: approx. extended length (in m)

ZK: approx. retracted length (in m)

N: number of tunnels (2 or 3)

1 m = approx. 3.28 ft

Commercial denomination only, not to be used for layout purposes as real length varies slightly. Please contact us for exact data.

### Two-tunnel steel

MODEL

TB 15/11.0-2	TB 17/12.0-2	TB 19/13.0-2	TB 21/14.0-2
TB 23/15.0-2	TB 25/16.0-2	TB 27/17.0-2	TB 29/18.0-2
TB 31/19.0-2	TB 33/20.0-2	TB 35/21.0-2	TB 37/22.5-2
TB 39/23.5-2	TB 41/24.5-2	TB 43/25.5-2	TB 45/26.5-2

### Three-tunnel steel

MODEL

TB 23/13.5-3	TB 25/14.5-3	TB 27/15.0-3	TB 29/15.5-3
TB 31/16.5-3	TB 33/17.0-3	TB 35/17.5-3	TB 37/18.5-3
TB 39/19.0-3	TB 41/19.5-3	TB 43/20.5-3	TB 45/21.0-3

## PARAMETERS

### Dimensional Characteristics:

	meters	inches
<b>Rotunda</b>		
Internal diameter	2.44 m	96.00"
Free width at the neck of the rotunda	1.51 m	59.38"
Free height at the neck of the rotunda	2.30 m	91.44"
<b>Internal tunnel (tunnel A)</b>		
Free width	1.49 m	58.25"
Free height	2.10 m	83.00"
<b>External tunnel (tunnel B)</b>		
Free width	2.03 m	67.00"
Free height	2.67 m	92.50"
<b>External tunnel (Tunnel C in 3-part PBB)</b>		
Free width	2.03 m	77.00"
Free height	2.67 m	102.38"
<b>Cabin ring</b>		
Internal diameter	3.00 m	123.50"
<b>Service door</b>		
Width	0.70 m	36.00"
Height	2.00 m	80.00"
<b>Front door of cabin in 2-part PBB</b>		
Free width	1.54 m	67.00"
Free height	2.34 m	93.00"
<b>Front door of cabin in 3-part PBB</b>		
Free width	1.54 m	67.00"
Free height	2.68 m	93.00"
<b>Canopy</b>		
Free width	3.20 m	135.38"
Free height	3.02 m	125.69"
<b>Service stairs</b>		
Free width	750 mm	34.81"

## USEFUL LOAD & DESIGN LOADS

	EN Standard	USA
Live load	pmax = 300 kg/m²	40 Lb/Ft²
<b>Wind load:</b>		
· In service	pmax = 100 km/h	60 mph
· Non-operational (in parking position)	pmax = 150 km/h	90 mph

## ELECTRICAL CHARACTERISTICS

Main power supply (mains 400V/50Hz): 63 A

Start-up intensity (short time): 95 A

Three-phase power supply voltage:  
400 V ± 10% (3 phases, neutral and ground)

Power supply frequency: 50 Hz ± 5%

This data applies to a PBB with no supplementary elements (400 Hz, AACC, PCA, etc). Export models are designed to accommodate local power characteristics.

(USA only)

Main power amperage: 60 A

Three-phase power supply voltage:  
480 V ± 10% (3 phases, neutral and ground)

Power supply frequency: 60 Hz ± 5%

This data applies to a PBB with no supplementary elements (400 Hz, PWC, PCA, etc). Export models are designed to accommodate local power characteristics.

## STANDARDS & REGULATIONS (as applicable)

EU: European Directives (2006/24/ EC Machinery, 2006/95/EC Low Voltage, 2004/108/EC Electromagnetic Compatibility) and Harmonized Standards (EN 1915-1, EN 1915-2, EN 12312-4, EN 60204-1, EN 61000-6-4, EN 61000-6-2, EN 61000-3-11 and EN 61000-3-12)

The International (ISO, IEC) standard and NFPA upon request and specification.

CHINA: EU Standards & Regulations, GB standard (Chinese National Standard) and MH/T6028 (China aviation industry standard)

USA: USA/CSA codes AISC, AWS, ASTM, SAE, NEMA, NEC, UL, ULC and NFPA upon request and specification.

## CERTIFICATES (as applicable)

UNE EN ISO 9001:2008 Quality Management System, UNE EN ISO 14001:2004 Environmental Management System, OHSAS 18001:2007 Health & Safety Management System, EN ISO 3834-2 and DIN 18800-7 (Class E) Welding Process, third party certificate by TÜV, NFPA certificates\*

\* For detailed information, please contact our Sales offices.

## OPERATING RANGE

The Apron Drive PBB can handle the full range of aircraft categories from C to E, including the A-380.

The ergonomic design of the operator control panel ensures the easiest possible PBB operation.

Architectural requirements to be selected by each individual client according to their needs and demands.

### Europe, Middle East & Africa

Pol. Ind. Vega de Baina s/n  
33682 Mieres (Asturias) · SPAIN  
Tel.: + 34 98 544 6820 Ext. 967 · Fax: + 34 98 544 6519  
E-mail: boardingbridges.tkas@thyssenkrupp.com

### Americas

3201 North Sylvania Avenue Suite 117  
Fort Worth, Texas 76111 · USA  
Tel.: + 1 817 210 5000 · Fax: + 1 817 210 5043  
E-mail: info.tkas.usa@thyssenkrupp.com

### Asia-Pacific

Century Road, Torch High-Tech Industrial Development Zone, Zhongshan 528437  
Guandong Province · P.R.CHINA  
Tel.: + 86 760 8816 5888 · Fax: + 86 760 2332 4910  
E-mail: tkasap@teczs.com



## Crystal Apron Drive

The Crystal Apron Drive passenger boarding bridge has increased its share in the market enormously. Built on the same reliable platform as the Steel Apron Drive passenger boarding bridge, it conforms much better to current architectural trends and gives the passenger an immediate sense of location and comfort when boarding or disembarking at an airport.

ThyssenKrupp Airport Systems



ThyssenKrupp



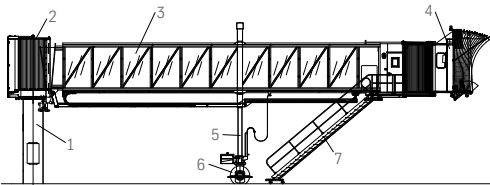
ThyssenKrupp Airport Systems (TKAS) offers complete, flexible global gate solutions. By providing project-tailored passenger boarding bridges (PBBs), the most diverse and demanding client requirements can be fulfilled.

TKAS production lines are equipped with the latest in resources and machinery which have been especially and exclusively developed for the manufacture of PBBs.

The overall concept is based on employing top quality materials and procedures to guarantee the highest standard of finishing. The corrosion protection system applied has been specially developed to improve reliability and extend service life far beyond the average.

SYSTEM COMPONENTS

The TKAS Crystal Apron Drive PBB includes the following main components:



1. Support column
2. Rotunda
3. Tunnels
4. Cabin
5. Elevation system
6. Drive system
7. Service stairs

CHARACTERISTICS

The Crystal Apron Drive PBB (ADC) tunnel walls are fully glazed. The characteristics of the glass depend on customer requirements, with a variety of options as to color, lighting and thermal and acoustic qualities.

The hydraulic elevation system provides extremely smooth adjustment operation while also reducing operating costs to a minimum.

Automatic systems, such as Point & Go and pre-positioning, help to automate bridge handling, hence reducing the possibility of human error.

The PBB is available in two- or three-tunnel versions.

GENERAL TECHNICAL DATA

Passenger boarding bridge nomenclature description:

Model TBC XY/ZK-N

TBC: Apron Drive Crystal

XY: approx. extended length (in m)

ZK: approx. retracted length (in m)

N: number of tunnels (2 or 3)

1 m = approx. 3.28 ft

Commercial denomination only, not to be used for layout purposes as real length varies slightly. Please contact us for exact data.

Two-tunnel crystal  
MODEL

TBC 14/11-2	TBC 15/11.75-2	TBC 17/12.5-2	TBC 18.5/13.25-2
TBC 20/14-2	TBC 21.5/14.75-2	TBC 23/15.5-2	TBC 24.5/16.25-2
TBC 26/17-2	TBC 27.5/17.25-2	TBC 29/18,5-2	TBC 30,5/19,25-2
TBC 32/20-2	TBC33.5/20.75-2	TBC 35/21.5-2	TBC36.5/22.25-2
TBC 38/23-2	TBC 39.5/23.75-2	TBC 41/24.5-2	TBC 42.5/25.25-2
TBC 44/26-2	TBC 45.5/26.75 -2		

Three-tunnel crystal  
MODEL

TBC 23/13.1-3	TBC 26/14.1-3	TBC 29/16.1-3	TBC 32/16.6-3
TBC 35/17.1-3	TBC 38/18.6-3	TBC 41/19.6-3	TBC 44/20.6-3

PARAMETERS

Dimensional Characteristics:	meters	inches
Rotunda		
Internal diameter	2.44 m	96.00"
Free width at the neck of the rotunda	1.51 m	59.38"
Free height at the neck of the rotunda	2.30 m	91.44"
Internal tunnel (tunnel A)		
Free width	1.50 m	59.06"
Free height	2.10 m	83.00"
External tunnel (tunnel B)		
Free width	1.77 m	69.69"
Free height	2.39 m	94.50"
External tunnel (tunnel C in 3-part PBB)		
Free width	2.04 m	80.32"
Free height	2.67 m	105.63"
Cabin ring		
Internal diameter	3.00 m	123.50"
Service door		
Width	0.70 m	36.00"
Height	2.00 m	80.00"
Front door of cabin in 2-part PBB		
Free width	1.54 m	67.00"
Free height	2.34 m	93.00"
Front door of cabin in 3-part PBB		
Free width	1.54 m	67.00"
Free height	2.68 m	125.25"
Canopy		
Free width	3.20 m	135.38"
Free height	3.02 m	125.69"
Service stairs		
Free width	750 mm	34.81"

USEFUL LOAD & DESIGN LOADS

	EN Standard	USA
Live load	pmax = 300 kg/m²	40 Lb/Ft²
Wind load:		
· In service	pmax = 100 km/h	60 mph
· Non-operational (in parking position)	pmax = 150 km/h	90 mph

ELECTRICAL CHARACTERISTICS

Main power supply (mains 400V/50Hz): 63 A

Start-up intensity (short time): 95 A

Three-phase power supply voltage:

400 V ± 10% (3 phases, neutral and ground)

Power supply frequency: 50 Hz ± 5%

This data applies to a bridge with no supplementary elements (400 Hz, AACC, PCA, etc). Export models are designed to accommodate local power characteristics.

(USA only)  
Main power amperage: 60 A  
Three-phase power supply voltage:

480 V ± 10% (3 phases, neutral and ground)

Power supply frequency: 60 Hz ± 5%

This data applies to a bridge with no supplementary elements (400 Hz, PWC, PCA, etc). Export models are designed to accommodate local power characteristics.

STANDARDS & REGULATIONS (as applicable)

EU: European Directives (2006/24/ EC Machinery, 2006/95/EC Low Voltage, 2004/108/EC Electromagnetic Compatibility) and Harmonized Standards (EN 1915-1, EN 1915-2, EN 12312-4, EN 60204-1, EN 61000-6-4, EN 61000-6-2, EN 61000-3-11 and EN 61000-3-12)

The International (ISO, IEC) standard and NFPA upon request and specification.

CHINA: EU Standards & Regulations, GB standard (Chinese National Standard) and MH/T6028 (China aviation industry standard)

USA: USA/CSA codes AISC, AWS, ASTM, SAE, NEMA, NEC, UL, ULc and NFPA upon request and specification.

CERTIFICATES (as applicable)

UNE EN ISO 9001:2008 Quality Management System, UNE EN ISO 14001:2004 Environmental Management System, OHSAS 18001:2007 Health & Safety Management System, EN ISO 3834-2 and DIN 18800-7 (Class E) Welding Process, third party certificate by TÜV, NFPA certificates\*

\* For detailed information, please contact our Sales offices

OPERATING RANGE

The Crystal Apron Drive Telescopic PBB can handle the full range of aircraft code categories C to E, including the A-380.

The ergonomic design of the operator control panel ensures the easiest possible PBB operation.

Architectural requirements to be selected by each individual client according to their needs and demands.

Europe, Middle East & Africa

Pol. Ind. Vega de Baina s/n  
33682 Mieres (Asturias) · SPAIN  
Tel.: + 34 98 544 6820 Ext. 967 · Fax: + 34 98 544 6519  
E-mail: boardingbridges.tkas@thyssenkrupp.com

Americas

3201 North Sylvania Avenue Suite 117  
Fort Worth, Texas 76111 · USA  
Tel.: + 1 817 210 5000 · Fax: + 1 817 210 5043  
E-mail: info.tkas.usa@thyssenkrupp.com

Asia-Pacific

Century Road, Torch High-Tech Industrial Development Zone, Zhongshan 528437  
Guandong Province · P.R.CHINA  
Tel.: + 86 760 8816 5888 · Fax: + 86 760 2332 4910  
E-mail: tkasap@teczs.com



## Noseloader

The Noseloader passenger boarding bridge is a technical solution designed to enable docking maneuvers in areas with aircraft size and parking restrictions.

ThyssenKrupp Airport Systems



ThyssenKrupp



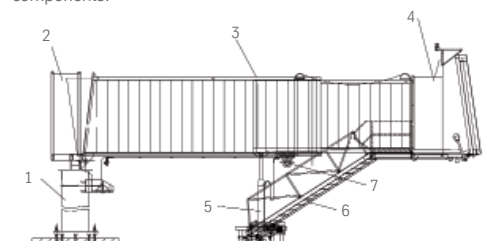
ThyssenKrupp Airport Systems (TKAS) offers complete, flexible global gate solutions. By providing project-tailored passenger boarding bridges (PBBs), the most diverse and demanding client requirements can be fulfilled.

TKAS production lines are equipped with the latest in resources and machinery which have been especially and exclusively developed for the manufacture of PBBs.

The overall concept is based on employing top quality materials and procedures to guarantee the highest standard of finishing. The corrosion protection system applied has been specially developed to improve reliability and extend service life far beyond the average.

## SYSTEM COMPONENTS

The TKAS Noseloader PBB includes the following main components:



- |                   |                             |
|-------------------|-----------------------------|
| 1. Support column | 5. Elevation system         |
| 2. Walkway        | 6. Service stair            |
| 3. Tunnels        | 7. Telescoping drive system |
| 4. Cabin          |                             |

## CHARACTERISTICS

The Noseloader PBB (NL) is a specific design that allows tunnel movement on two axes: vertical (elevating/lowering) and horizontal (extension/retraction).

It is a technical solution, designed to enable aircraft to park very precisely within an allocated stand.

## Options

**Steel:** The tunnel walls are made out of hot-dip galvanized sheets. Panels are welded via an automated spot system to guarantee high precision components, which assure longer lifetime, less repair and maintenance and reduced life-cycle costs.

**Crystal:** The tunnel walls are fully glazed. The characteristics of the glass depend on customer requirements, with a variety of options as to color, lighting and thermal and acoustic qualities.

The electro-hydraulic elevation system provides extremely smooth adjustment operation while also reducing operating costs to a minimum.

Automatic systems, such as pre-positioning, help to automate PBB handling, hence reducing the possibility of human error.

The PBB is available only in the two-tunnel version.

## GENERAL TECHNICAL DATA

Passenger boarding bridge nomenclature description:

Model NL XY/ZK-N

NL: Noseloader

XY: approx. extended length (in m)

ZK: approx. retracted length (in m)

N: number of tunnels

1 m = approx. 3.28 ft

Commercial denomination only, not to be used for layout purposes as real length varies slightly. Please contact us for exact data.

Two-tunnel steel  
MODEL

NL 9/6.5	NL 10/7.5	NL 11/8.5	NL 12/9.5
NL 13/9	NL 14/10	NL 15/11	NL 16/12
NL 17/13	NL 18/14	NL 19/15	NL 20/16
NL 21/17	NL 22/18	NL 23/19	

## PARAMETERS

Dimensional Characteristics:	meters	inches
<b>Connection passage</b>		
Free width	1.83 m	59.38"
Free height	2.55 m	91.44"
<b>Internal tunnel (tunnel A)</b>		
Free width	1.46 m	57.56"
Free height	2.10 m	83.19"
<b>External tunnel (tunnel B)</b>		
Free width	1.71 m	67.00"
Free height	2.35 m	92.50"
<b>Service door</b>		
Width	0.70 m	30.00"
Height	2.00 m	80.00"
<b>Front door of cabin in 2-part PBB</b>		
Free width	1.48 m	67.00"
Free height	2.30 m	93.00"
<b>Canopy</b>		
Free width	3.20 m	135.38"
Free height	3.02 m	125.69"
<b>Service Stairs</b>		
Free width	750 mm	34.81"

## USEFUL LOAD & DESIGN LOADS

	EN Standard	USA
Live load	pmax = 300 kg/m <sup>2</sup>	40 Lb/Ft <sup>2</sup>
<b>Wind load:</b>		
· In service	pmax = 100 km/h	60 mph
· Non-operational (in parking position)	pmax = 150 km/h	90 mph

## ELECTRICAL CHARACTERISTICS

Main power supply (mains 400V/50Hz): 50 A

Start-up intensity (short time): 75 A

Three-phase power supply voltage: 400 V ± 10% (3 phases, neutral and ground)

Power supply frequency: 50 Hz ± 5%

This data applies a PBB with no supplementary elements (400 Hz, AACC, PCA, etc). Export models are designed to accommodate local power characteristics.

(USA only)

Main power amperage: 45 A

Three-phase power supply voltage: 480 V ± 10% (3 phases, ground )

Power supply frequency: 60 Hz ± 5%  
This data applies to a PBB with no supplementary elements (400 Hz, PWC, PCA, etc). Export models are designed to accommodate local power characteristics.

## STANDARDS & REGULATIONS (as applicable)

**EU:** European Directives (2006/24/ EC Machinery, 2006/95/EC Low Voltage, 2004/108/EC Electromagnetic Compatibility) and Harmonized Standards (EN 1915-1, EN 1915-2, EN 12312-4, EN 60204-1, EN 61000-6-4, EN 61000-6-2, EN 61000-3-11 and EN 61000-3-12)

The International (ISO, IEC) standard and NFPA upon request and specification.

**CHINA:** EU Standards & Regulations, GB standard (Chinese National Standard) and MH/T6028 (China aviation industry standard)

**USA:** USA/CSA codes AISC, AWS, ASTM, SAE, NEMA, NEC, UL, ULc and NFPA upon request and specification.

## CERTIFICATES (as applicable)

UNE EN ISO 9001:2008 Quality Management System, UNE EN ISO 14001:2004 Environmental Management System, OHSAS 18001:2007 Health & Safety Management System, EN ISO 3834-2 and DIN 18800-7 (Class E) Welding Process, third party certificate by TÜV, NFPA certificates\*

\* For detailed information, please contact our Sales offices.

## OPERATING RANGE

The Noseloader PBB can handle the full range of aircraft from categories C to E.

The ergonomic design of the operator control board ensures the easiest possible PBB operation.

Architectural requirements to be selected by each individual client according to their needs and demands.

## Europe, Middle East & Africa

Pol. Ind. Vega de Baina s/n  
33682 Mieres (Asturias) · SPAIN  
Tel.: + 34 98 544 6820 Ext. 967 · Fax: + 34 98 544 6519  
E-mail: boardingbridges.tkas@thyssenkrupp.com

## Americas

3201 North Sylvania Avenue Suite 117  
Fort Worth, Texas 76111 · USA  
Tel.: + 1 817 210 5000 · Fax: + 1 817 210 5043  
E-mail: info.tkas.usa@thyssenkrupp.com

## Asia-Pacific

Century Road, Torch High-Tech Industrial Development Zone, Zhongshan 528437  
Guandong Province · P.R.CHINA  
Tel.: + 86 760 8816 5888 · Fax: + 86 760 2332 4910  
E-mail: tkasap@teczs.com



## Dual Commuter

The Dual Commuter passenger boarding bridge has been designed to handle a wide range of aircraft, including regional commuter and narrow-body aircraft.

ThyssenKrupp Airport Systems



ThyssenKrupp



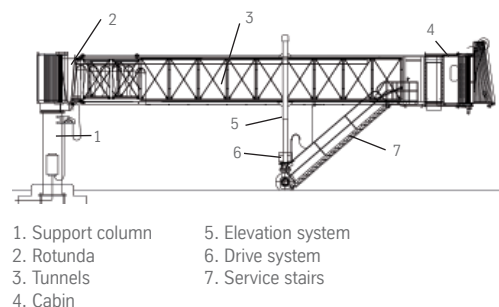
ThyssenKrupp Airport Systems (TKAS) offers complete, flexible global gate solutions. By providing project-tailored passenger boarding bridges (PBBs), the most diverse and demanding client requirements can be fulfilled.

TKAS production lines are equipped with the latest in resources and machinery which have been especially and exclusively developed for the manufacture of PBBs.

The overall concept is based on employing top quality materials and procedures to guarantee the highest standard of finishing. The corrosion protection system applied has been specially developed to improve reliability and extend service life far beyond the average.

## SYSTEM COMPONENTS

The TKAS Dual Commuter PBB includes the following main components:



## CHARACTERISTICS

The Dual Commuter PBB (DL) represents an important technological innovation in the field of aircraft handling. The DL PBB operates under the same flexible conditions as the traditional Apron Drive PBB.

Although its construction is similar to that of the Apron Drive PBB, it is defined by its smaller, skewed cabin, which allows serving propeller and regional aircraft.

The hydraulic elevation system provides extremely smooth adjustment operation while also reducing operating costs to a minimum.

Automatic systems, such as Point & Go and pre-positioning, help to automate PBB handling, hence reducing the possibility of human error.

The PBB is available in the two-tunnel version only.

## Options

**Steel:** The structure of the tunnel walls is made of hot-dip galvanized steel. Elements are welded via an automated spot system to guarantee high precision components, which assure longer lifetime, less repair and maintenance and reduced life-cycle costs.

**Crystal:** The tunnel walls are fully glazed. The characteristics of the glass depend on customer requirements, with a variety of options as to color, lighting and thermal and acoustic qualities.

## GENERAL TECHNICAL DATA

Passenger boarding bridge nomenclature description:

Model DL (C) XY/ZK-N

DL: Dual Commuter

DLC: Dual Commuter crystal

XY: approx. extended length (in m)

ZK: approx. retracted length (in m)

N: number of tunnels

1 m = approx. 3.28 ft

Commercial denomination only, not to be used for layout purposes as real length varies slightly. Please contact us for exact data.

### Two-tunnel steel MODEL

DL 15/11,3-2	DL 17/ 12,3-2	DL 19/ 13,3-2	DL 21/14,3-2
DL 23/15,3-2	DL 25/16,3-2	DL 27/17,3-2	DL 29/18,3-2
DL 31/19,3-2	DL 33/20,3-2	DL 35/21,3-2	DL 37/22,5-2
DL 39/23,5-2	DL 41/24,8-2	DL 43/25,8-2	DL 45/26,8-2

### Two-tunnel crystal MODEL

DLC 21/14,3-2	DLC 25/17-2	DLC 29/19-2	DLC 33/21-2
DLC 37/23-2	DLC 39/24-2	DLC 41/24,8-2	DLC 43/25,8-2

## PARAMETERS

### Dimensional Characteristics:

<b>Rotunda</b>	
Internal diameter	2.44 m
Free width at the neck of the rotunda	1.51 m
Free height at the neck of the rotunda	2.30 m
<b>Internal tunnel (tunnel A)</b>	
Free width	1.19 m
Free height	2.11 m
<b>External tunnel (tunnel B)</b>	
Free width	1.47 m
Free height	2.39 m
<b>Cabin ring</b>	
Internal diameter	1.50 m
<b>Service door</b>	
Width	0.70 m
Height	2.00 m
<b>Front door of cabin</b>	
Free width	1.62 m
Free height	2.38 m
<b>Canopy</b>	
Free width	2.40 m
Free height	2.35 m
<b>Service stairs</b>	
Free width	700 mm

## USEFUL LOAD & DESIGN LOADS

Live load	pmax = 300 kg/m²
<b>Wind load:</b>	
· In service	pmax = 100 km/h
· Non-operational (in parking position)	pmax = 150 km/h

## ELECTRICAL CHARACTERISTICS

Main power supply (mains 400V/50Hz):	63 A
Start-up intensity (short time):	95 A
Three-phase power supply voltage:	
400V ± 15% (3 phases, neutral and ground)	
Power supply frequency:	50 Hz ± 5%
This data applies to a PBB with no supplementary elements (400 Hz, AACC, PCA, etc). Export models are designed to accommodate local power characteristics.	

## STANDARDS & REGULATIONS (as applicable)

**EU:** European Directives (2006/24/ EC Machinery, 2006/95/EC Low Voltage, 2004/108/EC Electromagnetic Compatibility) and Harmonized Standards (EN 1915-1, EN 1915-2, EN 60204-1, EN 61000-6-4, EN 61000-6-2, EN 61000-3-11 and EN 61000-3-12)

The International (ISO, IEC) standard and NFPA upon request and specification.

**CHINA:** EU Standards & Regulations, GB standard (Chinese National Standard) and MH/T6028 (China aviation industry standard)

## CERTIFICATES (as applicable)

UNE EN ISO 9001:2008 Quality Management System, UNE EN ISO 14001:2004 Environmental Management System, OHSAS 18001:2007 Health & Safety Management System, EN ISO 3834-2 and DIN 18800-7 (Class E) Welding Process, third party certificate by TÜV, NFPA certificates\*

\* For detailed information, please contact our Sales offices

## OPERATING RANGE

The Dual Commuter can handle aircraft ranges from categories C to E, including most commuter and narrow-body jets (SAAB 2000/ SF 340, EMBRAER /120\*/135/145, ATR 42/72, CANADAIIR RJ 70/100, FOKKER 50 \*, FOKKER100, BAE 146, AIRBUS A 319, AIRBUS A 320, AIRBUS A 321, DC 9, MD 80/90, B 727, B 747 and B 757) and propeller planes, such as Do328 and Beechcraft 1900 D.

\* Special ramp required.

The ergonomic design of the control board ensures the easiest possible PBB operation .

For certain aircraft, propeller protection is needed. Please consult us for specific aircraft types.

**Architectural requirements to be selected by each individual client according to their needs and demands.**

### Europe, Middle East & Africa

Pol. Ind. Vega de Baina s/n  
33682 Mieres (Asturias) · SPAIN  
Tel.: + 34 98 544 6820 Ext. 967 · Fax: + 34 98 544 6519  
E-mail: boardingbridges.tkas@thyssenkrupp.com

### Americas

3201 North Sylvania Avenue Suite 117  
Fort Worth, Texas 76111 · USA  
Tel.: + 1 817 210 5000 · Fax: + 1 817 210 5043  
E-mail: info.tkas.usa@thyssenkrupp.com

### Asia-Pacific

Century Road, Torch High-Tech Industrial Development Zone, Zhongshan 528437  
Guandong Province · P.R.CHINA  
Tel.: + 86 760 8816 5888 · Fax: + 86 760 2332 4910  
E-mail: tkasap@teczs.com



## Low Level

The Low Level passenger boarding bridge is a solution designed for small airports where the terminal boarding gates are on the same level as the apron.

ThyssenKrupp Airport Systems



ThyssenKrupp

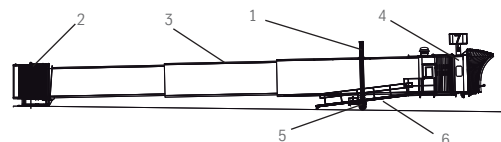
ThyssenKrupp Airport Systems (TKAS) offers complete, flexible global gate solutions. By providing project-tailored passenger boarding bridges (PBBs), the most diverse and demanding client requirements can be fulfilled.

TKAS production lines are equipped with the latest in resources and machinery which have been especially and exclusively developed for the manufacture of PBBs.

The overall concept is based on employing top quality materials and procedures to guarantee the highest standard of finishing. The corrosion protection system applied has been specially developed to improve reliability and extend service life far beyond the average.

## SYSTEM COMPONENTS

The TKAS Low Level PBB includes the following main components:



1. Elevation system
2. Rotunda
3. Tunnels
4. Cabin
5. Drive system
6. Service stairs

## CHARACTERISTICS

The **Low Level PBB (LL)** is a solution specifically designed for small airports where the terminal boarding gates are on the same level as the apron. The difference is that the rotunda is fixed directly to the apron. It can be installed without a foundation, allowing for substantial cost savings in the construction budget.

The aircraft mix ranges from a Boeing 757 to a Q400, including a wide range of narrow-bodies. The PBB is available as a crystal or steel solution.

The hydraulic elevation system provides extremely smooth adjustment operation while reducing operating cost to a minimum.

Automatic systems, such as Point & Drive and pre-positioning, help to automate PBB handling, hence reducing the possibility of human error and eliminating the possibility of collision between

the PBB and any of the aircraft elements (fuselage, propeller, aerials, etc).

The PBB is available in two- and three-tunnel versions.

### Options

**Steel:** The tunnel walls structure is made out of hot dip galvanized steel. Elements are welded via an automated spot system to guarantee high precision components, which assure longer lifetime, less repair and maintenance and reduced life-cycle costs.

**Crystal:** Tunnel walls are fully glazed. The characteristics of the glass depend on customer requirements, with a variety of options as to color, lighting and thermal and acoustic qualities.

## GENERAL TECHNICAL DATA

Passenger boarding bridge nomenclature description:

Model LL (C) XY/ZK-N

LL: Low Level steel

LLC: Low Level crystal

XY: approx. extended length (in m)

ZK: approx. retracted length (in m)

N: number of tunnels (2 or 3)

1 m = approx. 3.28 ft

Commercial denomination only, not to be used for layout purposes as real length varies slightly. Please contact us for exact data.

### Two-tunnel steel

MODEL

LL 15/11,3-2	LL 17/ 12,3-2	LL 19/ 13,3-2	LL 21/14,3-2
LL 23/15,3-2	LL 25/16,3-2	LL 27/17,3-2	LL 29/18,3-2
LL 31/19,3-2	LL 33/20,3-2	LL 35/21,3-2	LL 37/22,5-2
LL 39/23,5-2	LL 41/24,8-2	LL 43/25,8-2	LL 45/26,8-2

### Three-tunnel steel

MODEL

LL 23/13,5-3	LL 25/14,5-3	LL 27/15,0-3	LL 29/15,5-3
LL 31/16,5-3	LL 33/17,0-3	LL 35/17,5-3	LL 37/18,5-3
LL 39/19,0-3	LL 41/19,5-3	LL 43/20,5-3	LL 45/21,0-3

### Two-tunnel Crystal

MODEL

LLC 17.0/12.50-2	LLC 21.5/14.75-2	LLC 23.0/15.50-2	LLC 24.5/16.25-2
LLC 26.0/17.00-2	LLC 27.5/17.75-2	LLC 29.0/18.50-2	LLC 30.5/19.25-2
LLC 32.0/20.0-2	LLC 33.5/20.75-2	LLC 35.0/21.50-2	LLC 36.5/22.25-2
LLC 38.0/23.00-2	LLC 39.5/23.75-2	LLC 41.0/24.50-2	LLC 42.5/25.25-2
LLC 44.0/26.00-2	LLC 45.5/26.75-2		

### Three-tunnel Crystal

MODEL

LLC 23.00/13.10-3	LLC 26.00/14.10-3	LLC 29.00/16.10-3	LLC 32.00/16.60-3
LLC 35.00/17.10-3	LLC 38.00/18.60-3	LLC 41.00/19.60-3	LLC 44.00/20.60-3

## PARAMETERS

Dimensional Characteristics:	meters	inches
<b>Rotunda</b>		
Internal diameter	2.43 m	95.60"
Free width at the neck of the rotunda	1.51 m	59.37"
Free height at the neck of the rotunda	2.32 m	91.25"
<b>Internal tunnel (tunnel A)</b>		
Free width	1.46 m	57.66"
Free height	2.11 m	83.18"
<b>External tunnel (tunnel B)</b>		
Free width	1.69 m	66.72"
Free height	2.36 m	92.87"
<b>Cabin ring</b>		
Internal diameter	3.00 m	118.13"
<b>Service door</b>		
Width	0.91 m	36.00"
Height	2.03 m	80.00"
<b>Front door of cabin</b>		
Free width	1.55 m	61.13"
Free height	2.39 m	94.50"
<b>Canopy</b>		
Free width	2.98 m	117.41"
Free height	3.13 m	123.09"
<b>Service stairs</b>		
Free width	711 mm	28.00"

## USEFUL LOAD & DESIGN LOADS

	EN Standard	USA
Live load	pmax = 195 kg/m <sup>2</sup>	40 Lb/Ft <sup>2</sup>
<b>Wind load:</b>		
· In service	pmax = 104.6 km/h	60 mph
· Non-operational (in parking position)	pmax = 144.8 km/h	90 mph

## ELECTRICAL CHARACTERISTICS

Main power supply (mains 480V/60Hz): 40 A

Start-up intensity (short time): <95 A

Three-phase power supply voltage: 480V ± 15% (3 phases , ground)  
60 Hz ± 5%

Power supply frequency: 60 Hz ± 5%  
This data applies to a PBB with no supplementary elements (400 Hz, AAC, PCA, etc). Export models are designed to accommodate local power characteristics.

## STANDARDS & REGULATIONS (as applicable)

**USA:** USA/CSA codes AISC, AWS, ASTM, SAE, NEMA, NEC, UL and ULc and NFPA upon request and a specification.

## CERTIFICATES (as applicable)

UNE EN ISO 9001:2008 Quality Management System, UNE EN ISO 14001:2004 Environmental Management System, OHSAS 18001:2007 Health & Safety Management System, EN ISO 3834-2 and DIN 18800-7 (Class E) Welding Process, third party certificate by TÜV, NFPA certificates\*

\* For detailed information, please contact our Sales offices.

## OPERATING RANGE

These Low Level PBB can handle a wide range of aircraft from categories C to E, including most commuter and narrow-body jets: DASH 8\*, EMBRAER 145, ATR 42/72, CANADAI R J 70/100, FOKKER 50\*, FOKKER 100, BAE 146, AIRBUS A 319, AIRBUS A 320, AIRBUS A 321, DC 9, MD 80/90, B 727, B 747, B 757

\* Special ramp required.

The ergonomic design of the control board ensures the easiest possible PBB operation.

For certain aircraft, propeller protection is needed. Please consult us for specific aircraft types.

**Architectural requirements to be selected by each individual client according to their needs and demands.**

### Europe, Middle East & Africa

Pol. Ind. Vega de Baina s/n  
33682 Mieres (Asturias) · SPAIN  
Tel.: + 34 98 544 6820 Ext. 967 · Fax: + 34 98 544 6519  
E-mail: boardingbridges.tkas@thyssenkrupp.com

### Americas

3201 North Sylvania Avenue Suite 117  
Fort Worth, Texas 76111 · USA  
Tel.: + 1 817 210 5000 · Fax: + 1 817 210 5043  
E-mail: info.tkas.usa@thyssenkrupp.com

### Asia-Pacific

Century Road, Torch High-Tech Industrial Development Zone, Zhongshan 528437  
Guandong Province · P.R.CHINA  
Tel.: + 86 760 8816 5888 · Fax: + 86 760 2332 4910  
E-mail: tkasap@teczs.com



#### **Europe, Middle East & Africa**

Pol. Ind. Vega de Baiña s/n

33682 Mieres (Asturias) · SPAIN

Tel.: + 34 98 544 6820 · Ext. 967 · Fax: + 34 98 544 6519

E-mail: [boardingbridges.tkas@thyssenkrupp.com](mailto:boardingbridges.tkas@thyssenkrupp.com)

#### **Americas**

3201 North Sylvania Avenue Suite 117

Fort Worth, Texas 76111 · USA

Tel.: + 1 817 210 5000 · Fax: + 1 817 210 5043

E-mail: [info.tkas.usa@thyssenkrupp.com](mailto:info.tkas.usa@thyssenkrupp.com)

#### **Asia-Pacific**

Century Road, Torch High-Tech Industrial Development Zone, Zhongshan

528437 Guandong Province · P.R.CHINA

Tel.: + 86 760 8816 5888 · Fax: + 86 760 2332 4910

E-mail: [tkasap@tecs.com](mailto:tkasap@tecs.com)

[www.thyssenkrupp-elevator-espbb.com](http://www.thyssenkrupp-elevator-espbb.com)