

# Automated Customizable and Standardized Palletizers and Tray Handling Systems



4 Chamber Palletizer, Trolley load and unload

## Characteristics

The BBS palletizer is a modular handling system for small load carriers/trays, for the inward and outward transfer of parts/components into or from production lines.

The standard design of the palletizer is very flexible and suitable for a wide range of applications thanks to its consistent modularization.

There can be 2, 3 or 4 loading and unloading slots. The handling of the slc/trays and the components stored on it is realized depending on the requirements (servo)electrically, pneumatically, robot-based or via linear handlings.

In addition to the systems that are used under „normal“ ambient conditions, we offer various models that can be qualified and validated for use in cleanrooms as it is required for many applications in the field of life sciences, electronics and semiconductor manufacturing or even in the optical industry.

Palletizers from BBS can be integrated into autonomous production systems and for example be loaded and unloaded with AGVs.

## Areas of Application



Automotive



Aerospace



Life Science



Consumer



Electronics



Energy Storage



Renewable



Railway

# BBS Palletizers and Tray Handling Systems Trolley load/unload Version

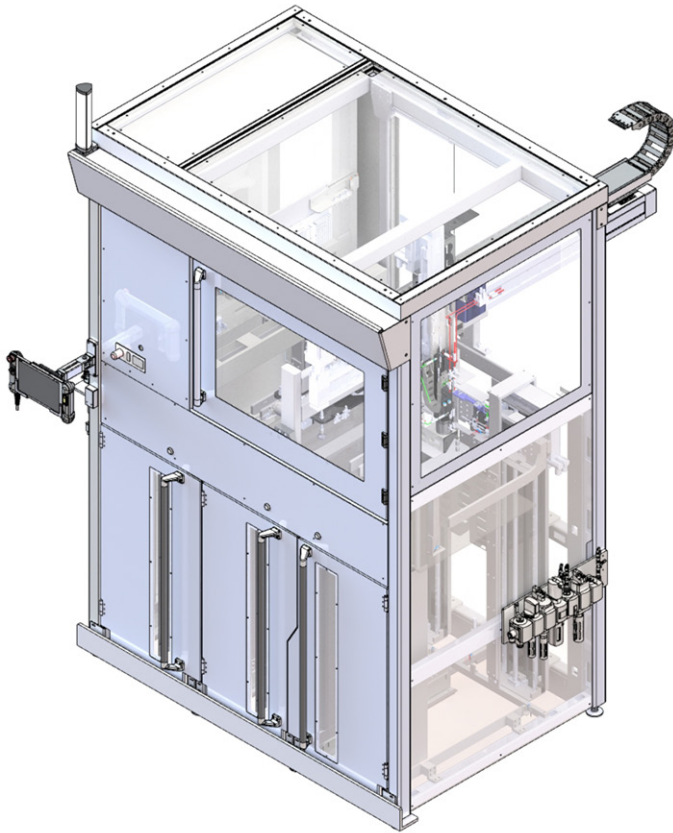


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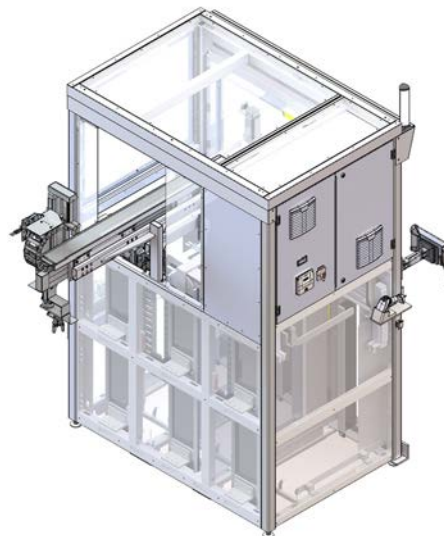
The automatic palletizing system is used to load and unload parts with and into trays (small load carriers) stacked on manually moved trolleys.

Loaded trays are fed to the tray handling system on a trolley. Tray handling is performed by pneumatic or electrically driven axes and conveys the tray from the stack to the unloading position. There, the components are unloaded by an appropriate handling system and fed to the production system. When unloading of a tray is complete, the empty tray is moved over the empty tray stack and gets placed there. This tray stack is also on a trolley.

In the case of an unloading system, the process is carried out analogously in reverse order. Empty tray stacks are fed to the tray handling system by a trolley and then get automatically conveyed to the loading position. Loading takes place there and as soon as the tray is fully loaded, it is stacked on the unloading trolley.



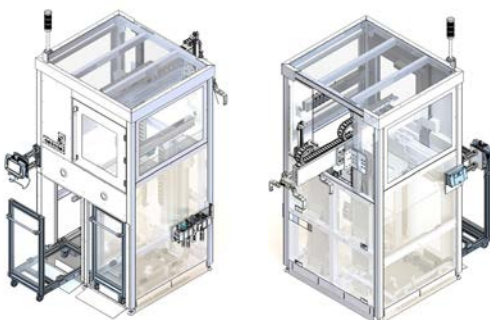
3 chamber system, front view



3 chamber system, rear view



4 chamber system, front and rear view



2 chamber system, front & rear view

## Basic Specs (4, 3 & 2 Chamber)

- Width 2410 mm, 1850 mm, 1265 mm
- Depth 2785 - 2190 mm
- Height 2350 - 2775 mm
- slc dimensions 600 x 400 x 200 mm (standard)
- Max. weight of loaded tray: Approx. 10 kg
- Cycle time for load/unload sequence: 6 sec
- Max. lift weight with product: 15 kg
- BALLUFF I/O Link
- FESTO Pneumatic valve control
- FESTO CMMT servo Motor
- FESTO CPX pneumatic valve control
- FESTO CMMP servo Motor
- THK/HIWIN/BOSCH linear motion axis
- Trolley without handle (Door to close the cover)
- Tray stack height 600 - 800 mm
- Tray stack weight up to 100 kg
- Profinet link
- Slave mode control (No PLC/iPC included)
- Input voltage: 400V/ 50 Hz
- Safety level: SIL 2
- Weight: 700 - 1000 kg

## Optionals

- NRE for gripper design
- Other than standard size slc
- Handheld scanner
- ESD-compatible equipment (color, acrylic covers)
- Cabinet cooling unit
- iPC/PLC
- HMI
- Additional trolleys
- Trolleys with handle for version without doors

Further customization possible, please ask

# BBS Palletizers and Tray Handling Systems Automated Conveyor load/unload version

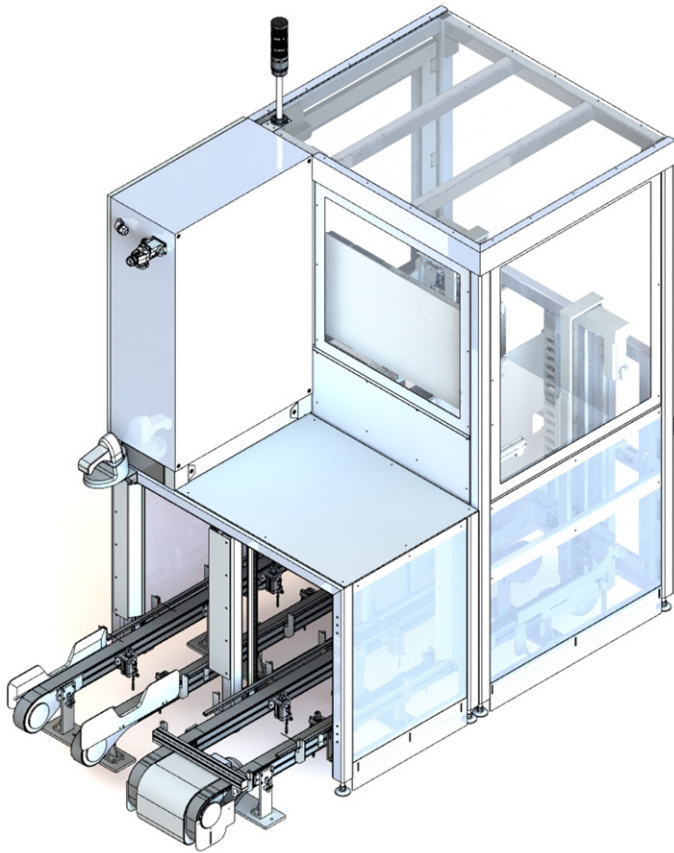


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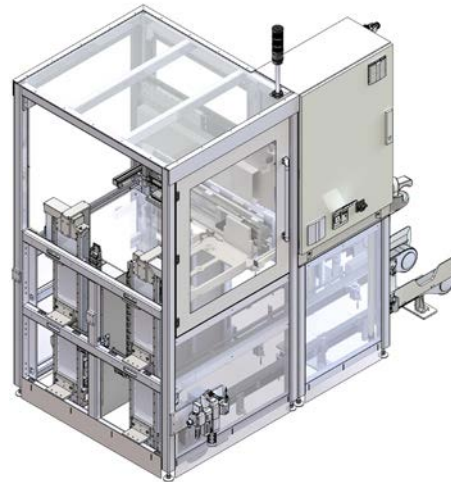
The automatic palletizing system is used to feed and unload parts with and into trays (small load carriers). The stacked trays are placed on electrically driven conveyors and get fed to the tray handling system.

Tray handling is performed by pneumatic or electrically driven axes and conveys the tray from the stack to the unloading position. There, the components are removed by an appropriate handling system and get fed to the production system. When unloading of a tray is complete, the empty tray is moved over the empty tray stack and deposited there. The empty tray stack is also on a conveyor that electrically moves the stack out of the palletizer.

In the case of an unloading system, the process is carried out analogously in reverse order. Empty tray stacks are fed to the tray handling system by a trolley and then automatically conveyed to the loading position. Loading takes place there and as soon as the tray is fully loaded, it is stacked on the conveyor on the opposite side of the system. The conveyor finally moves the tray stack out of the palletizer to the unloading position.



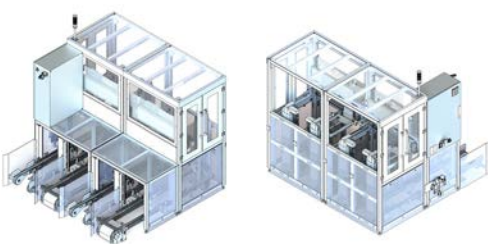
2 chamber system, front view



2 chamber system, rear view



3 chamber system, front and rear view



4 chamber system, front & rear view

## Basic Specs (4, 3 & 2 Chamber)

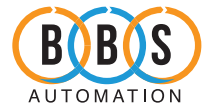
- Width 2800 mm, 1950 mm, 1350 mm
- Depth 2685 mm, 2685 mm, 2385 mm
- Height 2850 mm, 2850 mm, 2350 mm
- slc dimensions 600 x 400 x 200 mm (standard)
- Max. weight of loaded tray: Approx. 10 kg
- Cycle time for load/unload sequence: 6 sec
- Max. lift weight with product: 15 kg
- BALLUFF I/O Link
- FESTO pneumatic valve control
- FESTO CMMT servo motor
- FESTO CPX pneumatic valve control
- FESTO CMMP servo motor
- THK/HIWIN/BOSCH linear motion axis
- Trolley without handle (Door to close the cover)
- Max. tray stack height 720 mm
- Max. conveyor load: 240 kg
- BOSCH infeed/outfeed conveyor
- Profinet link
- Slave mode control (No PLC/iPC included)
- Input voltage: 400V/ 50 Hz
- Safety level: SIL 2
- Weight: 800 - 1000 kg

## Optionals

- Clean room compliant design, see rear page
- NRE for gripper design
- Other than standard size slc
- Handheld scanner
- ESD-compatible equipment (color, acrylic covers)
- Cabinet cooling unit
- iPC/PLC
- HMI

Further customization possible, please ask

# Automated Conveyor load/unload Version for Clean Room Application



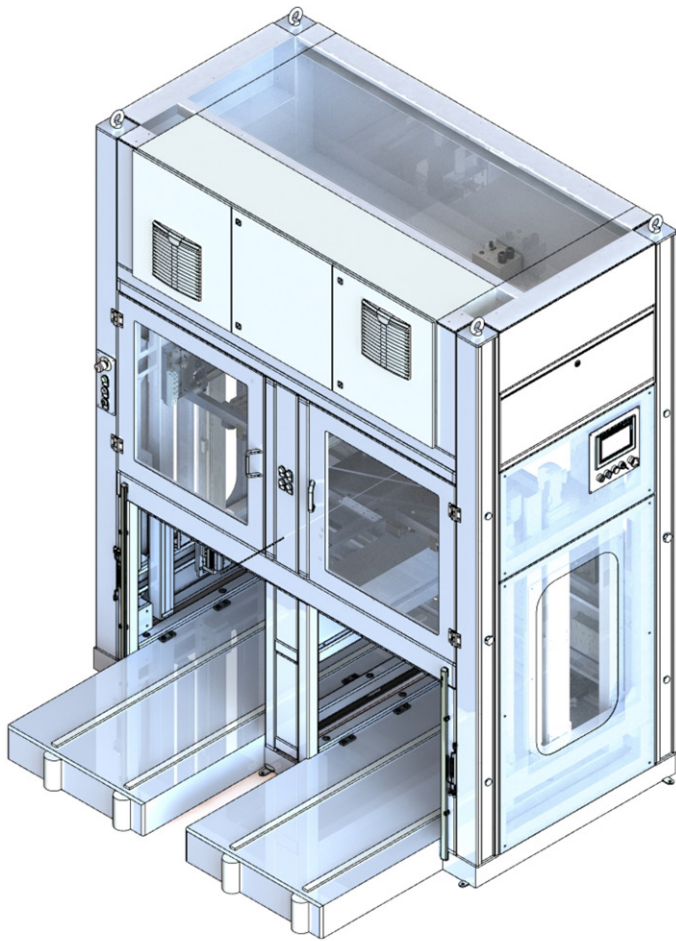
## Function

The palletizing system for clean room applications is modified from the 2-chamber palletizer with conveyor.

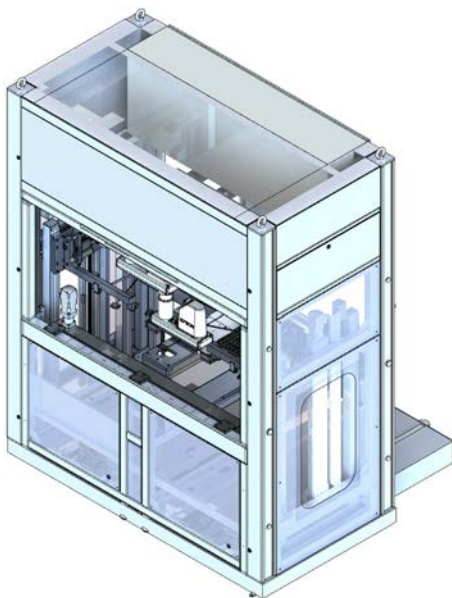
Tray stacks with loaded parts are fed to the tray handling system by an automatic conveyor or with an AGV by moving the stack into the infeed chamber of the palletizer. Tray handling is performed partly by electrically driven axes and by pneumatically driven, covered axes. Axes convey the tray from the stack to the unloading position. There, the components are removed by a Scara robot and fed to the production system. When the unloading of a tray is finished, the empty tray is moved over the stack for empty trays and set down there. This tray stack is also located on a conveyor or an AGV.

When the maximum stack height is reached, the tray stack is automatically moved out by the conveyor or AGV.

The clean room compatible palletizer is certified to be used for life science and pharmaceutical applications but also for electronics, optical and other kinds of products.



2 chamber system, front view



2 chamber system, rear view

## Basic Specs

- Size 1100 x 1800 x 2500 mm
- Tray dimensions 350 x 250 x 100 mm
- Max. weight of loaded tray: Approx. 10 kg
- Cycle time for load/unload sequence: 4 sec
- Stack height up to 600 mm
- FESTO pneumatic sliders (covered version)
- FESTO partly pneumatic / electric tray handling, pneumatic version clean room compatible
- FESTO separate valve control
- SIEMENS I/O link
- FESTO CMMP servo motor
- HIWIN linear motion axis
- MISUMI conveyor (infeed & outfeed)
- 1 conveyor per chamber
- Epson SCARA robot, clean room ISO class 3
- Clean room compatibility for entire system up to ISO class 7 (acc. ISO 14644-1)
- Max load on conveyor: 150 kg
- Slave mode control (No PLC included)
- Profinet link
- Input voltage: 400V/ 50Hz
- Safety level: SIL 2
- Machine weight: 900kg

## Optionals

- NRE for gripper design
- Other than standard size silc
- Handheld scanner
- ESD-compatible equipment (color, acrylic covers)
- Cabinet cooling unit
- iPC/PLC
- HMI

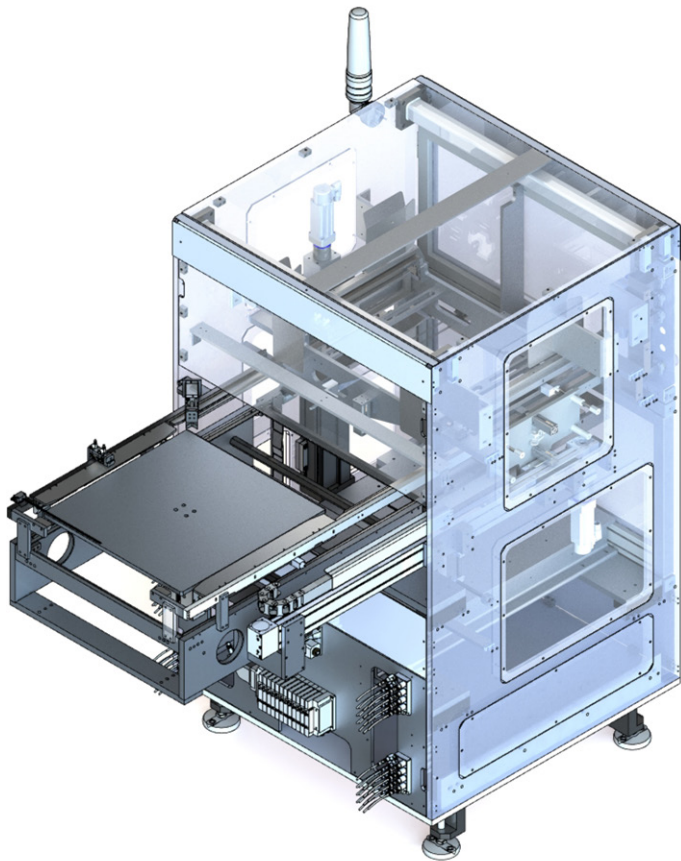
Further customization possible, please ask

## Function

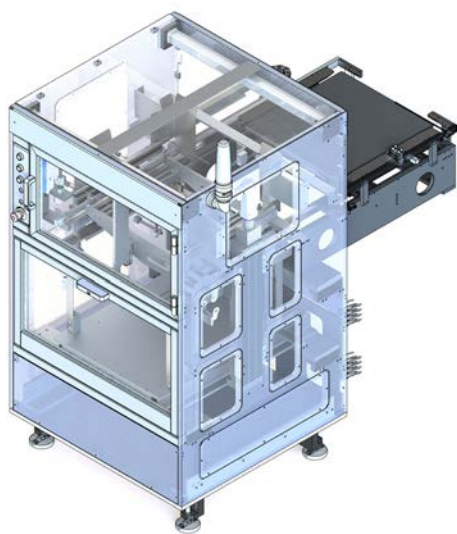
This variant is a single-chamber palletizing system for manual loading and unloading of trays.

The operator opens the lower access door to manually insert a tray stack with inserted parts into the palletizing system. Then the tray stack is moved to the unloading position and the tray gripper removes the first tray from the stack to carry it upwards, where in the next step it is transferred by a horizontal axis to the standby pick position. Meanwhile, the tray gripper moves down again to take the next tray from the stack.

Now the parts are removed by a robot or servo unloading handling. As soon as the tray is empty, the horizontal axis moves back again and positions the empty tray behind the tray removal door. As soon as the empty tray stack is complete, the operator opens the unloading door and unloads the stack of empty trays.



Front view



Rear view

## Basic Specs

Size 1750 x 1000 x 1960 mm  
Tray dimensions 600 x 545 x 30 mm  
Max. weight of loaded tray: 10 kg  
Cycle time for load/unload sequence: 6 sec  
Stack height up to 200 mm  
Max. lift weight with product: 10 kg  
Max. weight of stack: 60 kg  
FESTO separate valve control  
IFM I/O Link  
Allen Bradley servo Motor  
FESTO linear motion axis  
Trolley with handle  
Slave mode control (No PLC included)  
Profinet link  
Input Voltage: 400V/ 50Hz  
Safety level: SIL 2  
Machine weight: 500kg

## Optionals

NRE for gripper design  
ESD-compatible equipment (color, acrylic covers)  
Cabinet cooling unit  
iPC/PLC  
HMI

Further customization possible, please ask

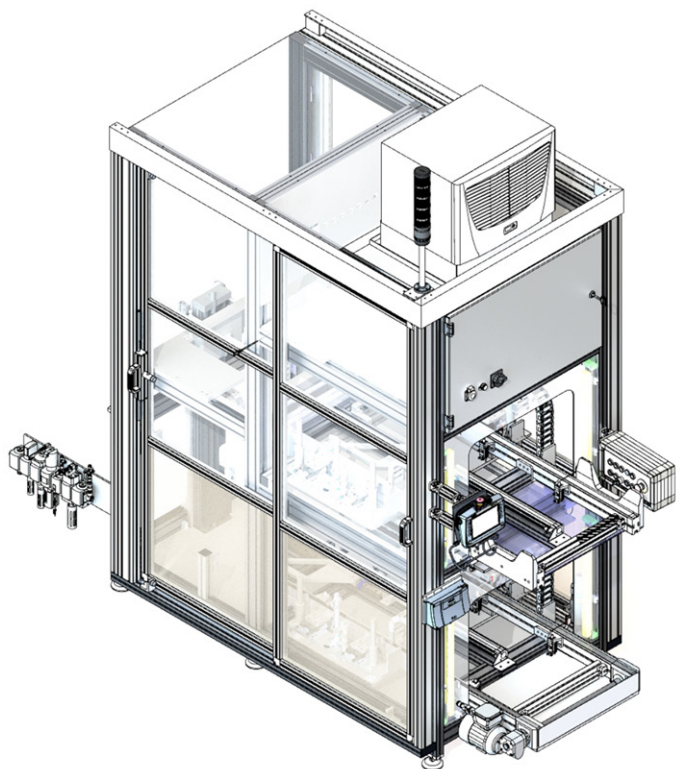
# Automated over/under load and unload Version



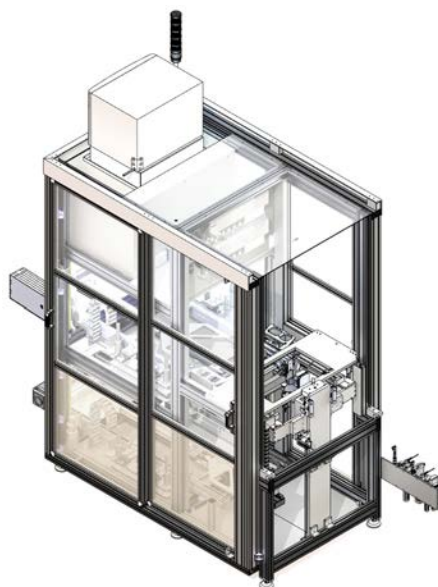
## Function

Unlike conventional palletizers, where the tray stacks are fed and removed in the lower area on the left and right, this is done in the Over/Under variant by means of two conveyor belts arranged one above the other.

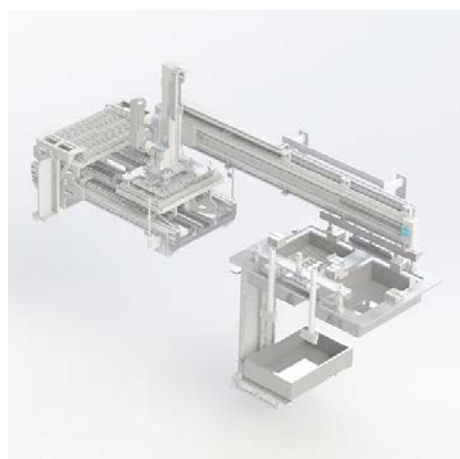
The operator loads the upper conveyor with the tray stacks in which parts are inserted. The trays are automatically removed from the stack by lifting the entire stack and leaving the bottom tray on the conveyor. This tray is conveyed inwards to the standby position and from there it is pushed to the unloading position. There it is lifted, fixed and calibrated in position. A corresponding unloading device (robot, unloading handling) removes the parts from the tray for feeding into the production line until the tray is empty. A vertical axis lifter then removes the empty tray and conveys it to the lower conveyor. The tray is then pushed into the stacking position. As soon as the maximum stacking height is reached, the tray stack is moved to the outside.



Front view



Rear view



Box handler for over/under palletizer

## Basic Specs

- Size 2350 X 1200 X 2710 mm
- KLT Dimensions 600 x 400 x 70 mm
- Max stack height 700 mm
- FESTO pneumatic sliders & lifters
- AIMS profile structure
- FESTO separate valve control
- BALLUFF I/O Link
- HIWIN Linear motion axis
- BOSCH wide conveyor, max load 240 kg
- Both side door sliding features
- Part transfer via Robot (Excluded)
- Empty Tray collection at bottom level
- Maximum tray stacks up to 10 pcs.
- Max. weight of 1 tray + product: 10 kg
- Slave mode control (No PLC included)
- Profinet Link
- Input Voltage: 400V/ 50Hz
- Safety level: SIL 2
- Machine weight: 700kg

## Optionals

- NRE for gripper design
- Other than standard size tray
- Handheld scanner
- ESD-compatible equipment (color, acrylic covers)
- Cabinet cooling unit
- iPC/PLC
- HMI

Further customization possible, please ask

# Add-On Scope for BBS Palletizers



## Customized Tray Design

- BBS offers support in the development of new designs for customized tray sizes according to the given specification, if there are special tray size requirements that are not covered among the standard palletizing tray sizes.

## AGV Integration (Automated Guided Vehicle)

- BBS is currently in development phase for the integration of an AGV with palletizer to make the palletizer fully automated system without human intervention.
- All loading and unloading is handled by an AGV, as shown in the right example. BBS can offer AGV integration for palletizers as an additional scope.

## Customized painting of palletizer

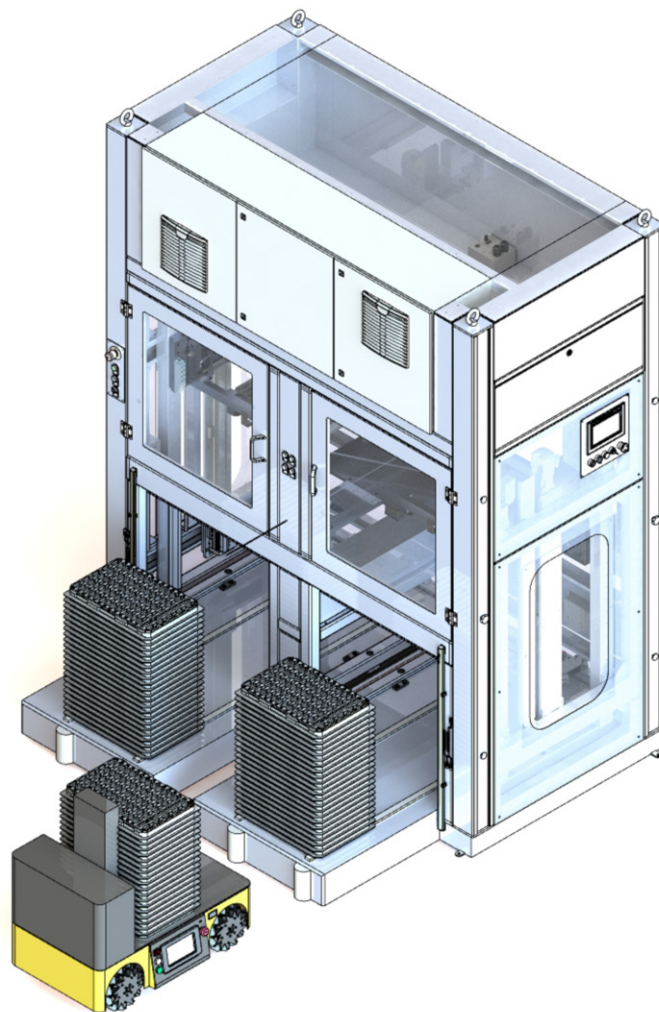
- BBS can provide for customized/special color request for palletizers according to the RAL No. & type of texture requirement.

## Preferred Component Selection

- In general, BBS has used certified standard brand components for palletizers for key components (pneumatics, PLC, linear guide, profile, servo motor, drivers, actuators, safety, remote I/O, sensors, electrical components, etc.).
- BBS is open to customize or modify certain components according to the customer's preferred component list.

## MES integration/ Industry 4.0 System

- Integrating Manufacturing Execution Systems (MES) with palletizers helps streamline factory operations by managing and monitoring all work in progress, including providing real-time visibility, traceability of materials and products throughout their lifecycle, and facilitating corrective action for defective products.
- BBS can provide a separate package for MES development and integration with the main palletizer assembly line.



## BBS Penang

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