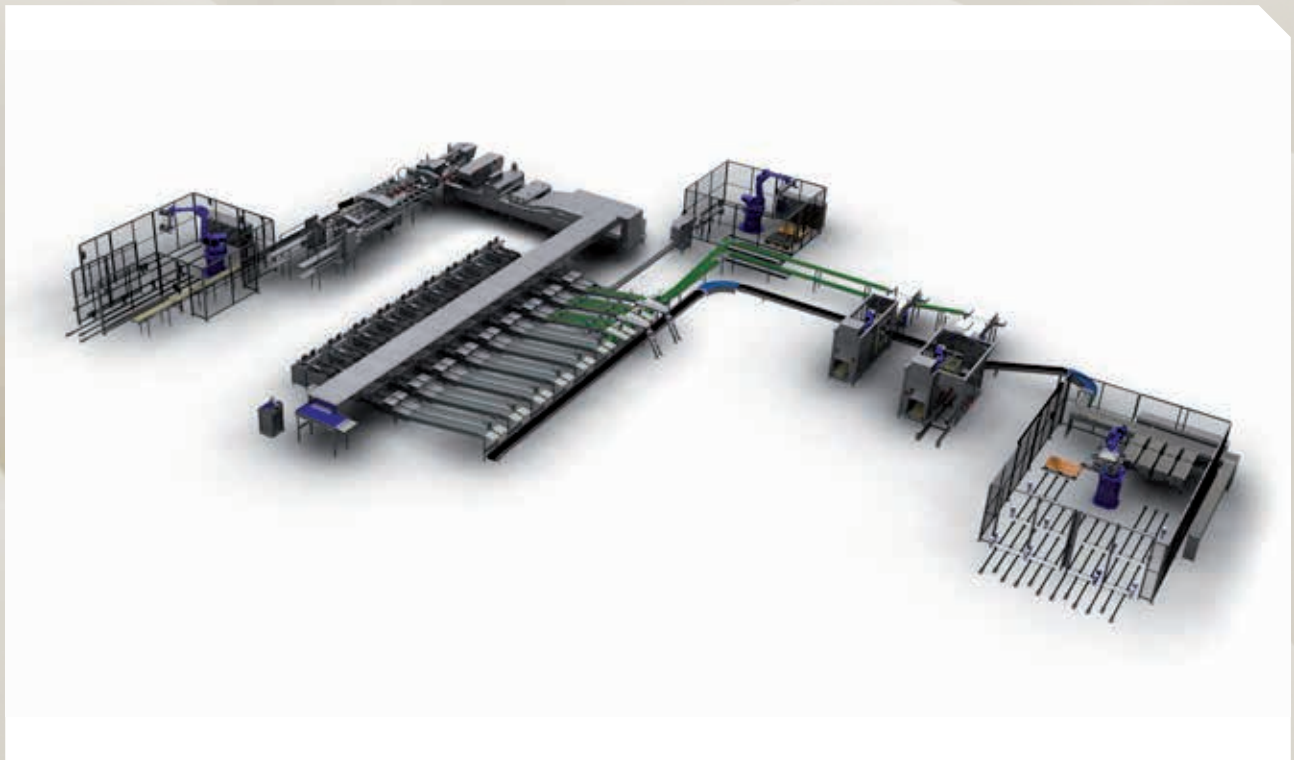
MOBA

GRADING - PACKING - PROCESSING

Autopack

MOBA ROBOTICS | CASE PACKERS | CONTIFLOW | TRAY STACKER | EASY LIFT



PROFIT STARTS WITH CARE



Introduction Autopack

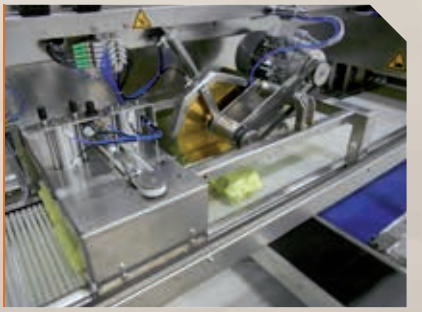
Moba has an excellent reputation when it comes to egg grading and packing machines. To live up to this reputation Moba is continuously striving after innovating its products and services for its customers. Working together in real co-development with customers is the ultimate way to create the best solutions.

With many decades of experience in egg grading and packing, the field of automation in front of and behind egg grading equipment in the egg industry is in general relatively unexplored. Every egg producer or packing station has its own portfolio of products, packages and the logistics surrounding these products. In order to design a total solution for your specific situation, Moba has developed a well balanced group of Autopack modules that can handle All various packing activities found in egg packing stations. In general, with Autopack we mean all automation in the egg business where packed eggs, in trays or consumer packs, are automatically processed, so in general all peripheral equipment around an egg grading machine.

With these modules, tailor made solutions for your particular needs can be designed.

With over 100 Autopack installations worldwide, Moba has an excellent track record in automation in the egg industry. Next to reducing labor costs, the gentle handling of the eggs ensures the output in the best possible quality. The fact that all Autopack functions are part of one technical family ensures identical and easy to use software. High standards for integration and sharing of connections, result in total traceability throughout the production chain. The Autopack product line ensures that all your end products are also handled with “The Gentle Touch”.

Autopack offers a large variety of machines. With this large variety Moba can adjust any situation to your benefit. These machines can also be installed in combination with third party equipment. This brochure describes all Autopack related machines and also offers examples and ideas for creating complete projects.


Contents

Total Solution Provider

When it comes to Autopack solutions, it always concerns custom made projects. Your situation is always special. Your building is different, your mix of different products is special and your requirements and budget are unique. For that reason there is never a standard situation. We therefore like to talk about projects rather than products.

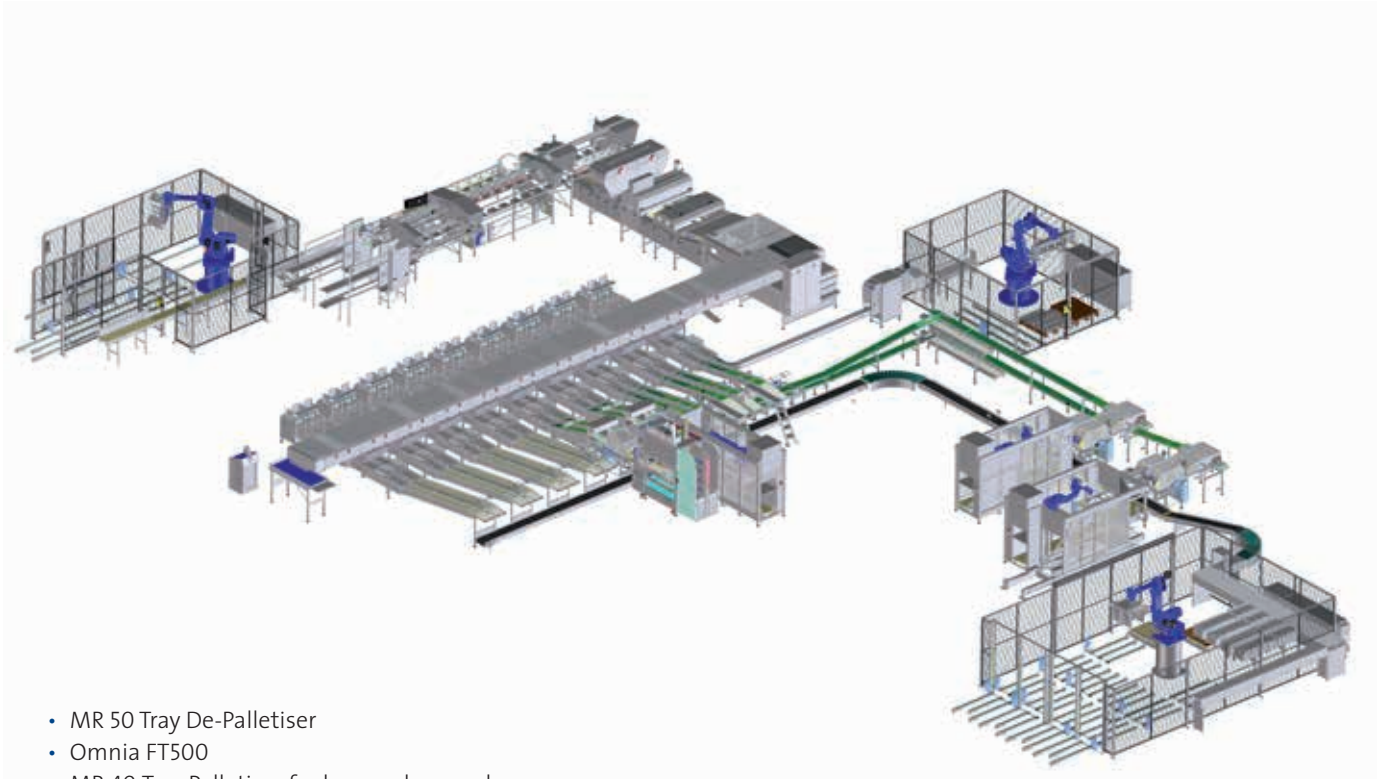
In general, Moba's way of working in such situations is as follows: In case of a customer request, our sales team makes a first inventory of ideas and wishes. In a first meeting a global idea is created whether Autopack could be a profitable solution for you. Of course such a scan of possibilities is without any obligations.

As from this first meeting, a technical expert is assigned to the project. From the moment of creating these first rough outlines, until the possible completion of the whole project design, you can count on the right experience that directly teams up with the sales representative.
In a second meeting, some of the rough ideas are proposed. The discussion should not yet be about the technical solutions, but concentrates more on your wishes. You tell us what you want to achieve and let us create technical solutions to match your requirements as good as possible. Once we have a complete overview of the building, your product range, pack types and logistic needs, our expert is able to create a dedicated proposal for you, including detailed calculations. Sometimes it is a "direct hit" and all parties are satisfied, but in general there follows a period ofthe idea's, technical options and budgets fine tuning from both sides. It is very likely that the Autopack expert will visit your site, together with the sales representative to accomplish this tuning phase together with you. This is very important to Moba; it is our vision that the best solutions are created in real co-development. We want to implement projects WITH you, not only FOR you.

In case of a situation where both parties agree on a project, a project manager is immediately assigned to the job. He takes over the responsibility from the Autopack designer that guided the definition phase and from now on will form the "tandem" with the sales representative. Both share the responsibility of managing your project, from the first line on paper, through the production phase, until after the project is officially installed, tested and handed over to your staff.

This way of working, where a very clear contact between our two companies is created, has proven to be very efficient. In daily practice we see that one or more of your staff members become part of a joined team that realizes the project. By doing so, we create maximum flexibility even in the implementation phase and surprises are avoided. With these projects significant investments are involved; we are dedicated to creating what you deserve: only the best!

Example of an Autopack project



- MR 50 Tray De-Palletiser
- Omnia FT500
- MR 40 Tray Palletiser for large volume sales
- MR 10 Case Packer 'inline'
- CP 12 Case Packer
- MR 10 Case Packer 'offline'
- MR 30 Case-Display-Combi 'offline'
- Contiflow system to connect different Autopack units
- MR 60 Case Palletiser for end products

Moba Robotics

Moba teamed up with Motoman, a Yaskawa subsidiary and global leading supplier of industrial robots. A partnership with a strong and global operating company was a must for Moba to meet the long term commitment to our customers, securing availability of service and parts for many years. With a portfolio of more than 175 different types of robots, the best possible types could be selected for the specific tasks performed in the egg industry, resulting in the Moba Robotics (MR-) series.

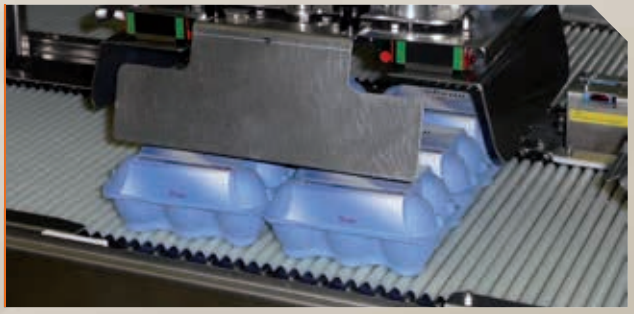
Moba Robotics are designed to automatically process egg packaging. Within our MR-series product line we have the following types available.

Type	Purpose	Directly connected to egg grading machine	Linked to grader via transport conveyors
MR 10	To pack consumer packs into cases and crates	Yes	Yes
MR 20	To pack consumer packs and sealed trays onto pallets, into displays or shippers	Possible*	Yes
MR 30	Combines capabilities of MR 10 and MR 20	Possible*	Yes
MR 40	To pack trays, pulp and/or plastic onto pallets	No	Yes, via Tray Stacker
MR 50	To de-palletise stack of trays from the Eggs cargo System™	Yes	N.a.
MR 60	To palletise cases and crates filled with consumer packs and/or trays	N.a.	Yes

**limited number of configurations.*

Open pack reject and pack rotation unit

Rotation head of pack rotation unit



MR 10 - 20 - 30

The MR 10-20-30 models are part of the "Moba Robotics" series. This range is designed to handle consumer packs and pack these into cases, crates, display pallets or shippers.

Versatile gripper head with exchangeable gripper plates.
With vacuum this head also picks and places layer pads.

The MR 10 is specifically designed to pack consumer packs and trays into cases or crates. It connects either "inline", that is directly behind the Omnia packing lanes, or "offline" via Contiflow. Depending on the number of packs, it can pick up in a single cycle. The MR 10's capacity can vary from 30,000 (80 cases) up to more than 40,000 eggs (110 cases) per hour. As a rule of thumb approximately 12 cycles per minute can be calculated, resulting in a basic capacity of 35,000 eggs (97 cases) per hour, based on 48 eggs per packing cycle.

The smart design of the gripper head allows for not only packing rows of consumer packs. The MR 10 is also capable of packing patterns as well as trays into cases. When required, the robot is capable of turning individual layers of consumer packs or trays by 90°.

The infeed system of the MR 10 can be configured in different ways. When configured inline, the MR 10 will have a double infeed conveyor, which fits directly to the Omnia take-away conveyor, in case the MR 10 is connected with a Contiflow system, mostly a single infeed conveyor is used. The double infeed will only be configured if a specific pattern demands it.

Further on, there are several options available that can be fitted in the supply of the MR 10. Packs can be checked whether they are properly closed, packs can be split and can be turned in case a pattern needs to be processed.

The standard robot gives room for at least 3 empty cases (based on the largest case). This empty case buffer allows an operator to maintain several robots at the same time. Optionally, the empty case supply can be further automated by connecting a (3rd party) case erector.
When a case is filled, there is room for 1 full case. This allows for a buffer when a case cannot be placed right away onto the case conveyor. When connected behind the Omnia, the full case is first turned by 90°, before it is actually placed onto the transversal full case conveyor. By doing this, the window needed to transfer the case is kept as tight as possible, making the best use of the case conveyor's capabilities.

Each product requires specific adjustments. During installation, customer specific product properties such as pack type, pattern, number of layers and case type will be programmed into the robot's product library. In case other products are required in the future, they can easily be added. Time to physically change products during regular production is a matter of a few minutes. Besides physically changing gripper plates and setting the height of the case allignment unit (when required), all adjustments are carried out automatically.

The MR 20 packs consumer packs or sealed trays on- or into display pallets or shippers. It can be connected behind the egg grading machine in a limited number of configurations, but will mostly be connected offline, through a conveyor system such as Contiflow.
Depending on the type of egg pack, the capacity of the MR 20 can vary from 25,000 up to more than 40,000 eggs per hour. The capacity depends not only on the number of cycles that are needed to form a single layer, but also on the number of layer pads processed. As a rule of thumb, one can count with 7.5 cycles per minute, with an average of 80 eggs per cycle. This results in a basic capacity of approximately 36,000 eggs (100 cases) per hour.

The infeed system of the MR 20 can be configured in different ways. When configured inline, it will have a double infeed conveyor, which fits directly to the Omnia take-away conveyor; in case the MR 20 is connected with a Contiflow system, mostly a single infeed conveyor is used. The double infeed will only be configured if a specific pattern demands it.

Further on, there are several options available that can be fitted in the supply of the MR 20. Packs can be checked whether they are properly closed, packs can be split and can be turned in case a pattern needs to be processed.

Pallet de-stacker, 7 pallets maximum
Automatic pallet destacking in combination with using display sleeves enables production with minimal efforts

The special gripper head construction allows the robot to be capable of building up a pattern so stable it can be stacked into free air. This way of display loading makes stacking possible up to 18 layers high. Stacking in free air, opposite to stacking into a prepared display box, results in a higher capacity, a better view on the process and reduction of cardboard costs as only a sleeve is needed. When processing displays with a pre-fitted sleeve or shipper, the MR 20 is capable of packing up to 13 layers high.

The standard pallet conveyor system of the MR 20 has, besides the loading position, room for 2 empty pallets and 3 full pallets. In case a pallet de-stacker is added to the MR 20, the empty pallet buffer can be extended with 7 extra pallets, with only a minimum increase of footprint. The pallet loading position of the MR 20 is designed in a way that the pallet-base is always completely levelled, thus creating the best possible position for a well stacked display.

Optionally, the pallet conveyor system can be connected to a 90° transfer system. This opens up possibilities to fit pallet conveyor extensions into whatever direction and even connect multiple MR 20's to a central pallet transport conveyor.
Finally, the full pallet pick-up always joins 2 full pallets, to be picked up in one go by a ride-on pallet truck or fork lift.

The MR 30 is a smart combination of the capabilities of MR 10 and MR 20 into a very flexible application for further automation of your packing station. This robot can be set up either as case packer or as a display loader.
Since the footprint of the MR 30 is identical to the MR 20, inline configurations are limited and sometimes demand modifications to the Omnia as well. The MR 30 can be equipped with all options that are also available for the MR 10 and 20.

MR 10 standard features
- Robot cell with gripper head
- Single pick up position
- 1 case packing line with:
  - 3 empty positions
  - 1 full case buffering position
  - 1 loading position
- Sliding access doors on both sides

MR 10 options
- Extended gravity conveyor for manual input of empty cases
- Double pick up position to connect to Contiflow
- Case alignment unit
- Open pack reject conveyor for inline configuration
- Pack rotation unit, to be able to create ready-to-pick-up patterns
- Pack splitter
- Extra full case buffering position
- Connection to a 3rd party case erector

MR 20 standard features
- Robot cell with gripper head
- Single pick up position
- Straight display loading and transport line with
  - 2 empty positions
  - 1 loading position
  - 3 full positions
- Layer pad storage and handling
- Safety screens for pallet outfeed
- Sliding access doors on both sides

MR 20 options
- Double pick up position
- Sliding access doors on both sides
- 90° pallet transport transfer
- Open pack reject conveyor for inline configuration
- Pack rotation unit, to be able to create ready-to-pick-up patterns

MR 30 overview of loading positions

Heavy duty pallet transport on chains

- Pack splitter
- Pallet transport extensions; per 2 pallet positions
- Pallet de-stacker, 7 pallets maximum
- Safety screen in pallet infeed, to handle 'pre-sleeved' pallets

MR 20 'Shipper'

- Robot cel with gripper head
- Double pick-up conveyor
- Pack Rotation Unit
- Straight special shipper transport conveyor with:
  - 2 empty positions
  - 1 loading position
  - 3 full positions
- Layer pad storage and handling
- Safety screens on pallet in- and outfeed
- Sliding access doors on both sides

The 'shipper' configuration is also available in the MR 30 .

MR 30 standard features

- Robot cell with gripper head
- Single pick up position
- 1 case packing line with:
  - 3 empty positions
  - 1 loading position
  - 1 full case buffering position
- Straight display loading and transport line with:
  - 2 empty positions
  - 1 loading position
  - 3 full positions
- Layer pad storage
- Safety screens for pallet outfeed
- Sliding access doors on both sides

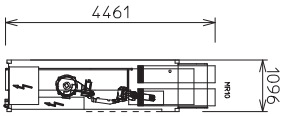
Dimensions (lxwxh) **• MR 10** **• MR 20** **• MR 30**	 4,461 x 1096 x 2,900 mm* 5,570 x 2,141 x 2,900 mm* 5,570 x 2,141 x 2,900 mm* **max. operational height*
Configurations **• MR 10** **• MR 20** **• MR 30**	 Right-handed only Left- and right-handed Left- and right-handed
Capacity (eggs per hour) **• MR 10** **• MR 20** **• MR 30**	Depending on pattern: 30,000-40,000+ 25,000-40,000+ 25,000-40,000+
Power	7 KVA
Voltage	200 – 230V 3ph + N 50-60 Hz Or 380 – 415V3ph + N 50-60 Hz
Air	Capacity: 15m³ /hour *(defined as free air with pressure of 1 bar)* 6.5 – 8.5 bar, dewpoint 3°C *(an air dryer is recommended)*

MR 30 options

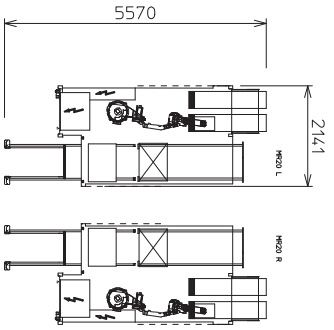
- Extended gravity conveyor for manual input of empty cases
- Double pick up position
- Case alignment unit
- Open pack reject conveyor for inline configuration
- Pack Rotation Unit, to be able to create ready-to-pick-up patterns
- Pack splitter
- Extra full case buffering position
- Connection to a 3rd party case erector
- 90° pallet transport transfer
- Pallet transport extension; per 2 pallet positions
- Safety screen in pallet infeed, to handle 'pre-sleeved' pallets

MR 10 and MR 30 are able to load cases and crates

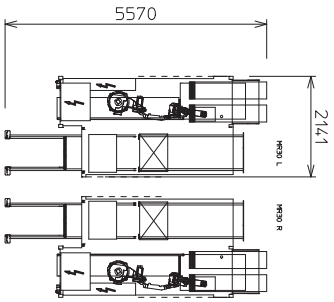
Standard lay-outs



MR 10

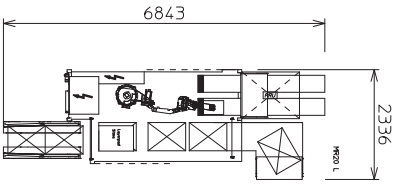


MR 20

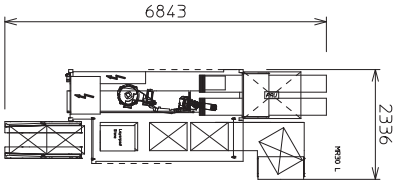


MR 30

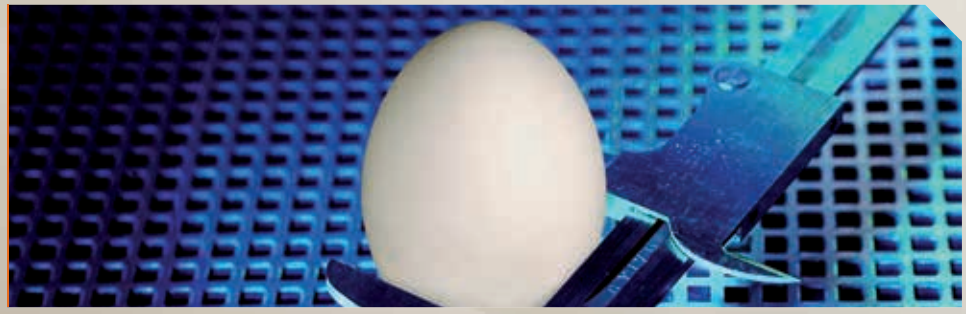
Shipper



MR 20

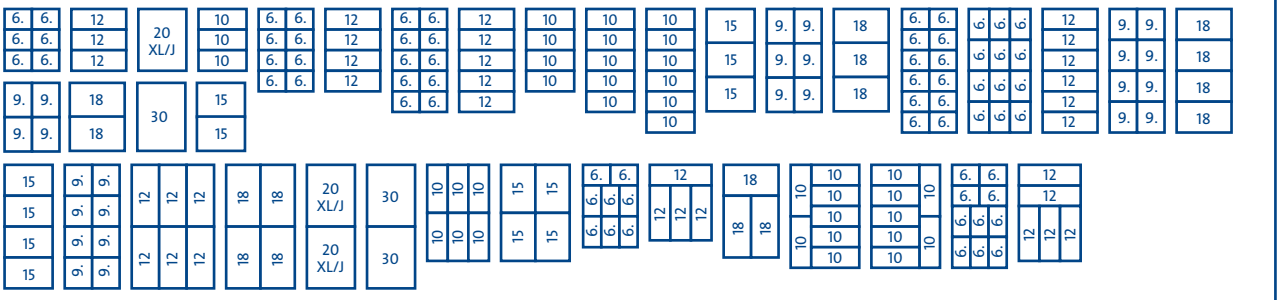


MR 30



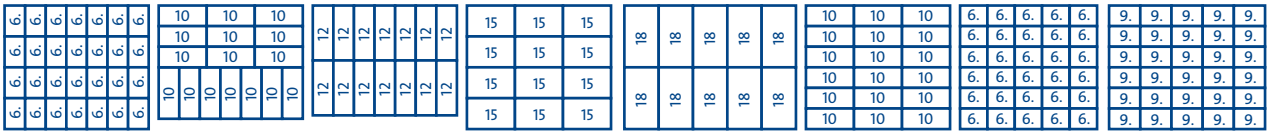
Patterns*

Case packing

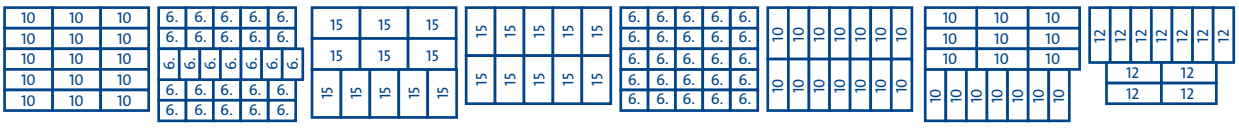


Display loading

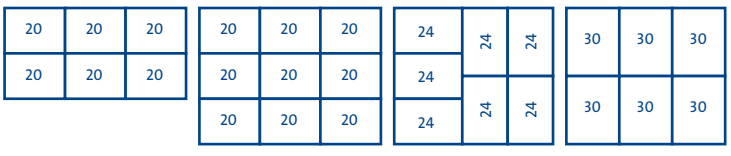
Pallets- consumer packs



Shipper- consumer packs



Pallets- sealed trays



**) General information; Final capabilities of the robot with regard to commonly used patterns depend on the specific properties of the packs that need to be processed.*

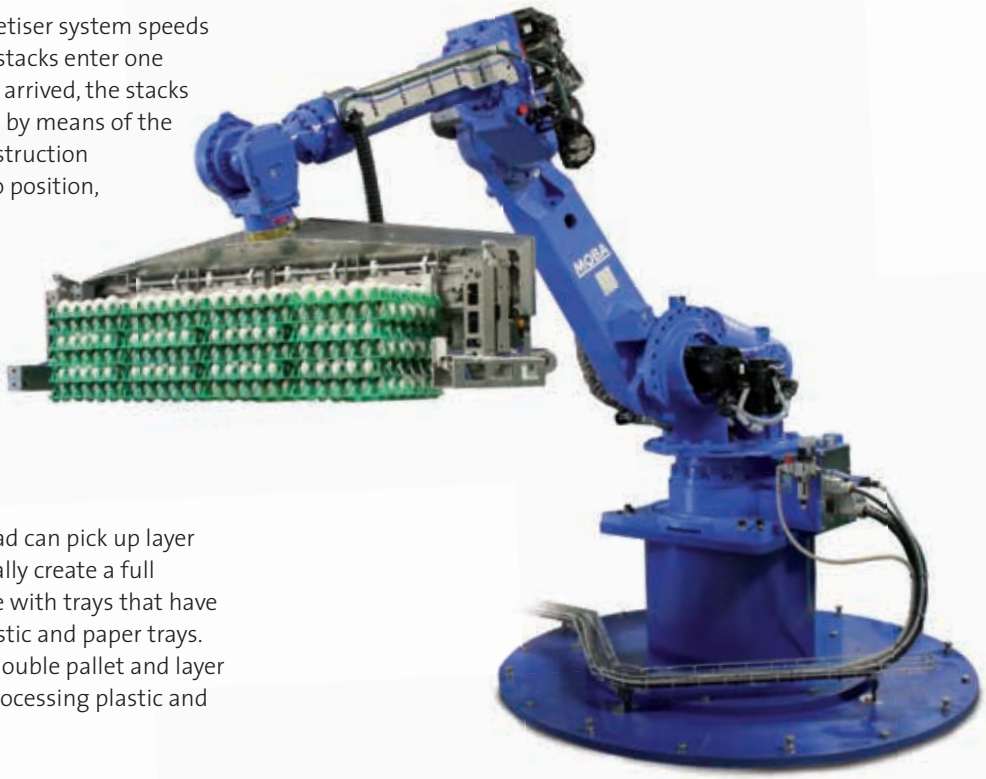
Double safety features

Optional handling of paper trays

MR 40 Tray Palletiser

MR 40 Tray Palletiser is a robotic system that automatically places a row of stacks, 6 trays each on a pallet. The MR 40 is capable of palletizing stacks of trays coming from 1 or 2 farmpackers or packing lanes from an egg grading machine. It has a max capacity of 108,000 eggs (300 cases) per hour and can process both plastic and pulp trays and stacks on wooden pallets with cardboard layer pads, as well as on the *Egg Cargo System*™ (ECS).

It goes without saying that a tray palletiser system speeds up the actual palletizing process. The stacks enter one by one and when the fourth stack has arrived, the stacks are picked up and placed on the pallet by means of the patented pick-up forks. Its unique construction means that the stacks are not slid into position, but are put down in exactly the right position. The pins then are withdrawn effortlessly from underneath the trays. The special roller conveyors at the pick up position ensure that the batch to be picked up is always exactly positioned, regardless of the conditions such as tray quality or air humidity.



Besides stacks of trays, the gripper head can pick up layer pads and empty pallets, to automatically create a full pallet. The gripper head is able to cope with trays that have different row-pitches, for example plastic and paper trays. In case the MR 40 is configured with double pallet and layer pad stacks, the system is capable of processing plastic and pulp simultaneously.

User friendly touch screen

De-palletising stacks of empty trays to the automatic denester filler

If cardboard layer pads are used, the stacks can be rotated by 90 degrees per layer. By doing this, the top- and the bottom side of the tray-cups are exactly opposite. In this way the trays carry the stack weight and not the eggs. This results in a more stable pallet with less risk for cracks during transport.

The pallet loading positions can also be fitted with an automatic pallet transport system that is low enough to offload the pallets with a simple pallet jack. The basic pallet transport can carry 2 full pallets (1 loading and 1 full), and can easily be added to almost any configuration, without changing the actual footprint. When required, the pallet transport system can be extended outside the robot cell in combination with a safety screen with muting function.

The generic software adds a lot of flexibility to the MR 40. Once the robot is phisically installed, the software only needs to be set up to match the desired configuration. All possible configurations are already on board and ready to use. This also means that installation of the MR 40, regardless of its configuration, is a matter of a few days. The impact on your regular production is kept to a minimum. In case you need to expand or change the functionality of the MR 40, like switching to a new tray type, adding a pick up position, a pallet position adding automatic empty stack loading, it is a matter of modifying the physical lay-out by our service department, activating the changes in the software and the MR 40 is good to go. Certain standard lay-outs even allow for configuration changes on the fly. This means that the operator can switch from multiple pallet loading positions to multiple pallet and layer pad stacks with a single push of a button.

Standard features

- Suitable for the Eggs Cargo System™ (ECS)
- Single pick up and pallet loading position
- Empty pallet stack; maximal 12 pallets high
- Layer pad storage; The pallet underneath the layer pads is processed by the robot as well
- Capable of adapting to slant floors
- Maximum full pallet height (ECS): 6 layers
- Smart safety fence with sliding doors
- Access door for the operator
- Open construction; obstacles in the cell are avoided as much as possible

Options

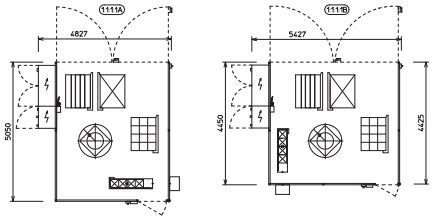
- Processing of pulp trays and cardboard layer pads (maximal 5 stacks high)
- Second pick up position
- Full pallet transport conveyors; inside the robot cell, or in combination with a safety fence
- Extra pallet loading positions on floor, maximum 4 pallet loading positions
- Automatic pitch adjustment in the gripper head
- De-palletising stacks of empty trays to the automatic denester filler.
- Pallet weighing
- Internet connection for remote service
- Second empty pallet stack
- Second layer pad storage
- Simultaneous production with 2 different pack types (for example plastic and pulp)*
- Enlarged base plate for weak floors

**) Only with suitable configurations*

Standard layouts MR 40 (auto-pallet transport is optional)

With added pallet transport

1-1-1-1



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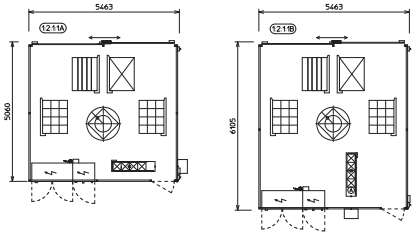

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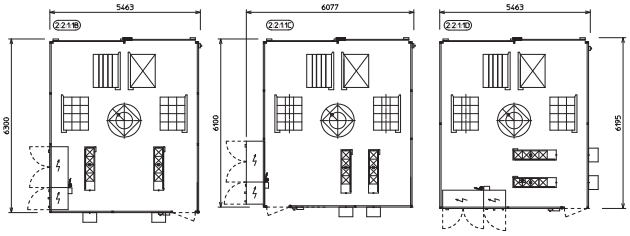

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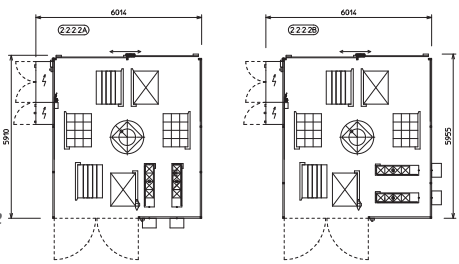

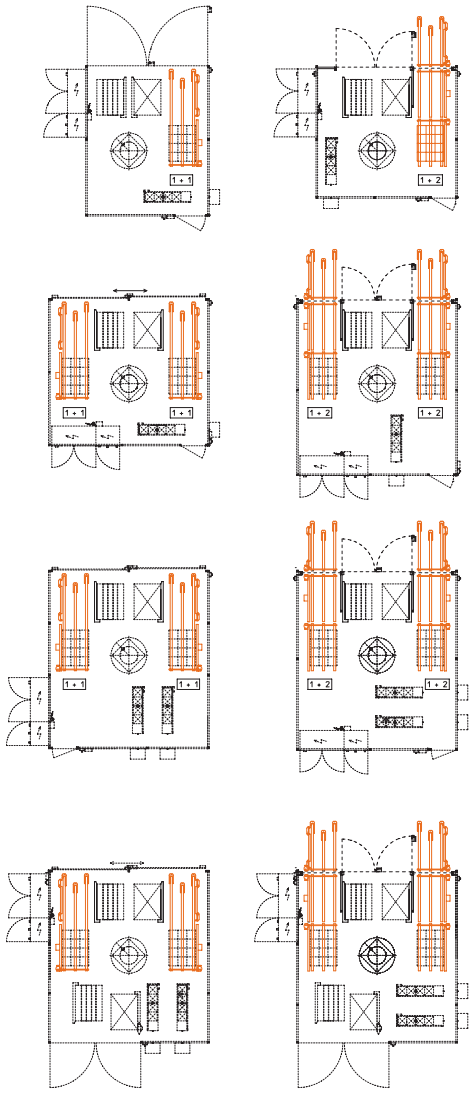

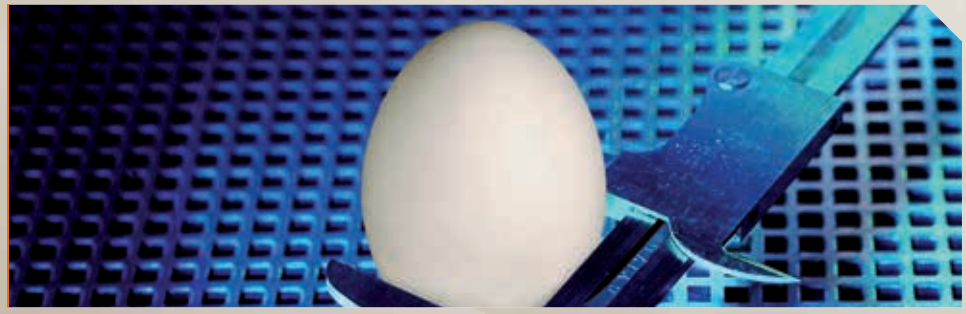

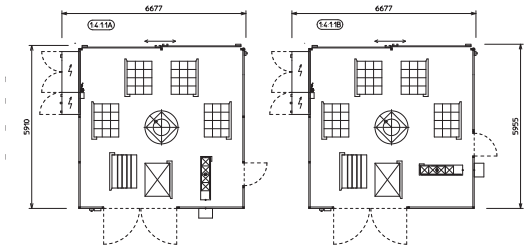

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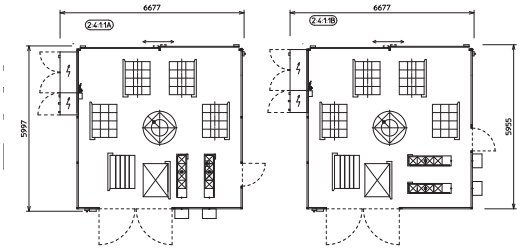

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Pallet position

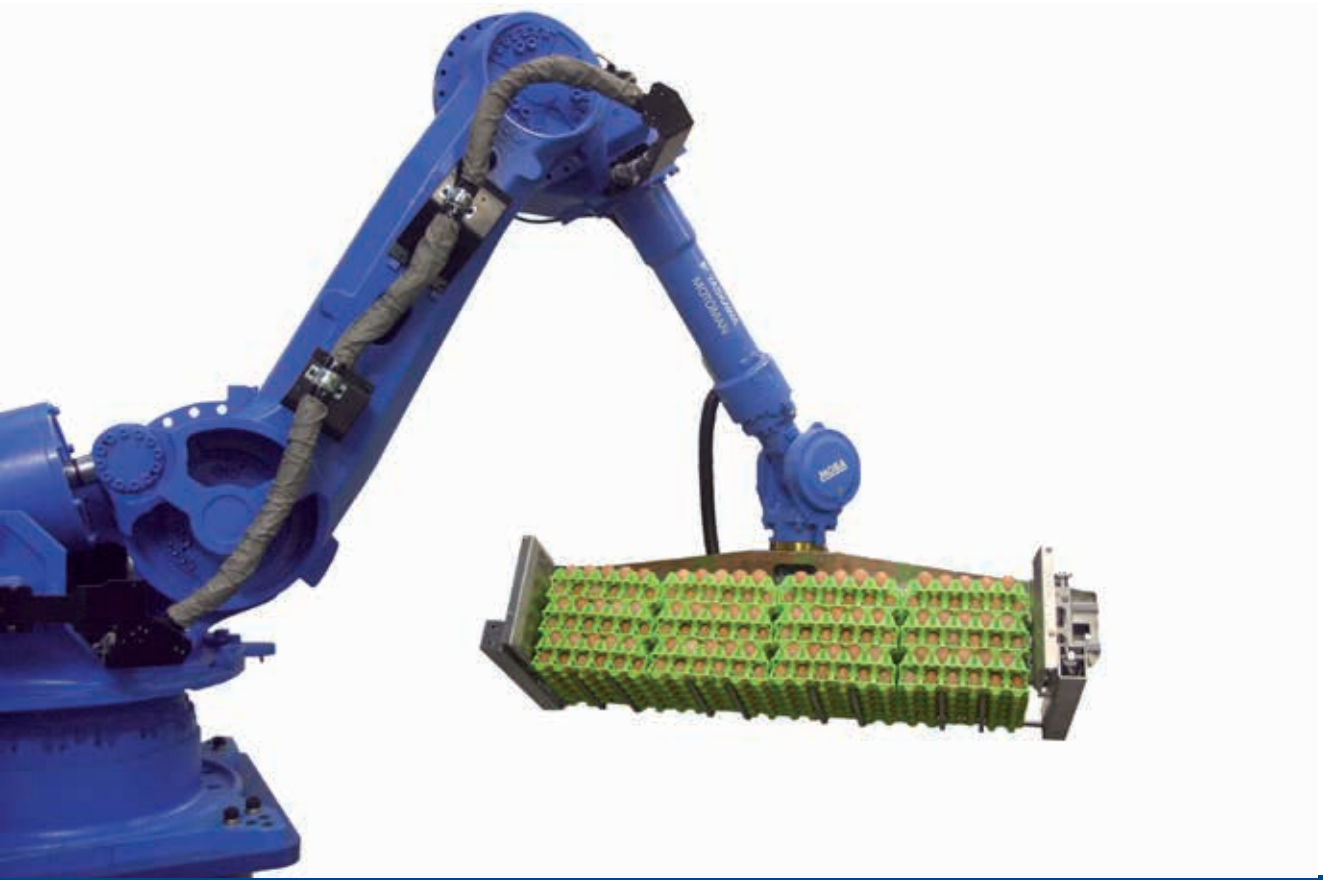
Empty pallet

Layer pads

Dimensions	See lay-outs
Capacity	Max. 108,000 eggs (300 cases) per hour
Power	11 KVA
Voltage	200 – 230V 3ph + N 50-60 Hz Or 380 – 415V3ph + N 50-60 Hz
Air	Capacity: 0.4 m^3 /hour (ECS) Capacity: 1.6 m^3 /hour (pulp trays) *(defined as free air with pressure of 1 bar)* 6.5 – 8.5 bar, dewpoint 3°C *(an air dryer is recommended)*
No. of Layers	ECS max. 6 layers Pulp trays max. 5 layers Plastic other than ECS max. 5 layers

MR 50 De-Palletiser

MR 50 De-Palletiser is capable of de-palletising pallets of the *Eggs Cargo System*™ (ECS) and has a net capacity of 180,000 eggs (500 cases) per hour. It can be connected to loaders with a continuous running pre-loader belt such as for example the TVS 60, TVS 120, FL 350 and FL 530.



MR 50 net capacity 180,000 eph

Gripper head takes 4 stacks of eggs simultaneously from pallet onto the pre-loader belt

Full pallets are placed on the automatic pallet transport system by a ride-on pallet truck or fork lift. Supplier shifts can be actived at the MR 50's full pallet entrance and are automatically forwarded with the product flow through the Omnia grading system. The pallet transport consists of 4 independent transport sections that can hold a maximum of 4 full pallets in the standard configuration. Further on, the MR 50 pallet transport conveyors are designed to be pressure washed.

Once the full pallet has arrived at the de-palletising position, the robot scans the pallet to determine the number of layers present and the position of the stacks. Pallet allignment prior to de-palletising is not necessary. The MR 50's gripper head is capable of determining the exact location of the stacks on the pallet with great accuracy. The gripper head takes 4 stacks of eggs simultaneously from the pallet onto the pre-loader belt. In order to bridge the gap that will be created during a pallet change, the pre-loader is divided into multiple conveyor belts. The speed and accuracy of the MR 50 combined with a balanced preloading system guarantee a net output of 180,000 eggs (500 cases) per hour.

Layer pads and empty pallets are also automatically picked up and stacked onto a separate empty pallet and layer pad storage. Completed stacks are automatically transported outside the cell.
The MR 50's flexible HMI is designed to have the same look and feel as the Omnia grader's MMI. Therefore, the controls will feel familiar from the first time the operator has to work with the MR 50.

The MR 50 comes in 4 standard lay-outs. Together with the flexibility of the preloader conveyors, almost every possible lay-out can be created. Optionally, the pallet transport conveyors can be extended to have more buffer space.

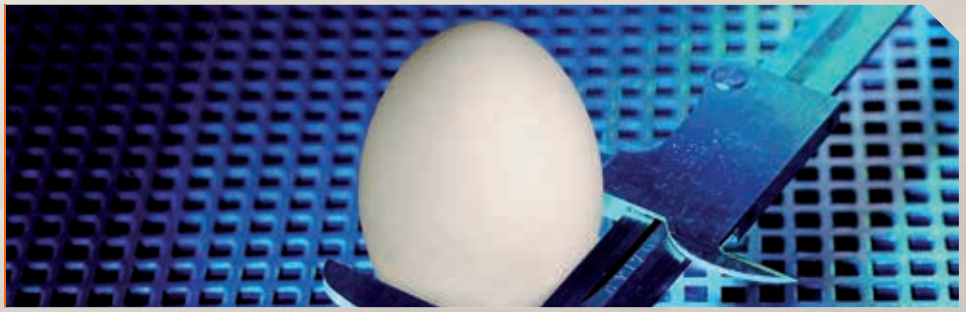
Standard features

- De-palletising of pallets of the *Eggs Cargo System*™
- Full pallet conveyor with room for 4 full pallets
- Stock conveyor with room for 2 pallet stacks and 2 layer pad stacks
- Maximum pallet height: 6 layers
- Smart safety fence, including safety screen with muting function on infeed
- Two access and exit doors for operators

Options

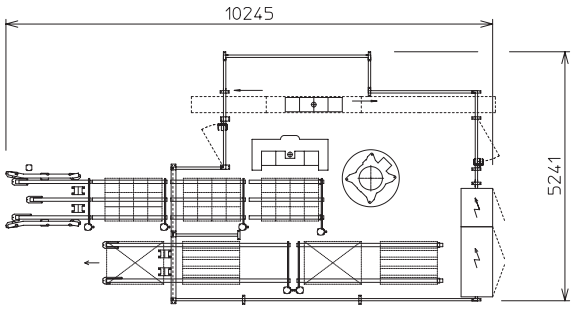
- Pallet transport extensions for a larger full pallet buffer (2 pallets per extension)
- Enlarged base plate, in case of weak floors

Dimensions	See lay-outs
Net capacity	190,000 eggs (530 cases) per hour
Power	11 KVA
Voltage	200 – 230V 3ph + N 50-60 Hz Or 380 – 415V3ph + N 50-60 Hz
Air	Capacity: 0.7 m3 /hour *(defined as free air with pressure of 1 bar)* 6.5 – 8.5 bar, dewpoint 3°C *(an air dryer is recommended)*
No. of Layers	Max. 6 layers



Standard layouts MR 50

Config.C Left-Hand.



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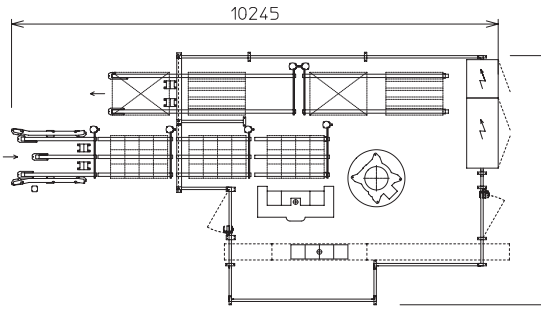
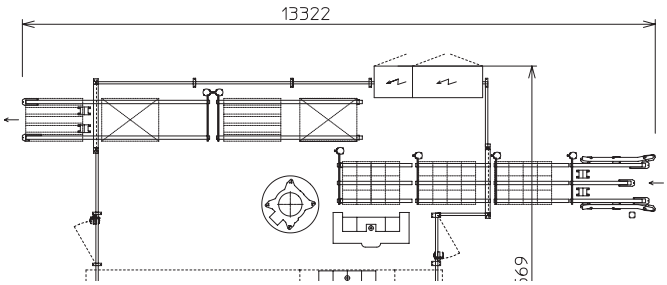


Config.B Left-Hand.



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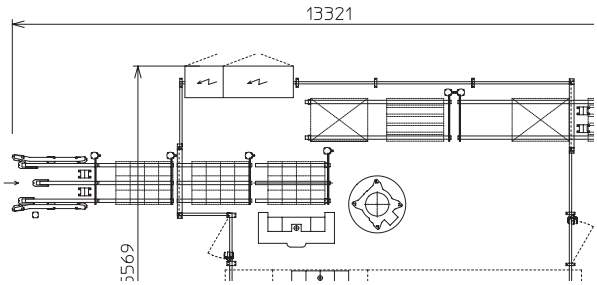


Pallet position

Empty pallet

Layer pads

MR 60 Case Palletiser

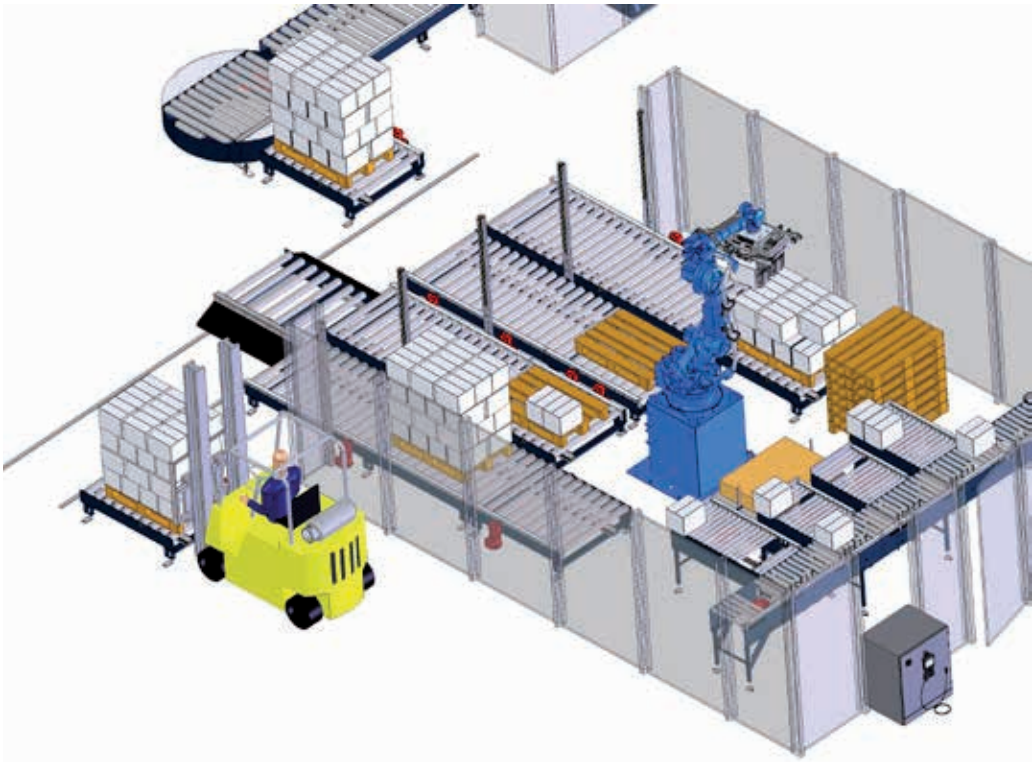
Consumer packs can be put in cases or crates by manual loading, or by automation through case packers of the CP or MR-series. Full cases are mostly manually stacked on pallets for transport to the retail or distribution centre. The MR 60 Case Palletiser is a robotic implementation that is able to automatically identify, sort, pick up and place cases or crates with a predefined pattern onto a pallet.

A case transport conveyor system must always be regarded as a vital part in a packing station. A properly configured case conveyor can really make a difference. Knowing this, it is logical to treat the MR 60 Case Palletiser as an addition to the entire important case handling system.

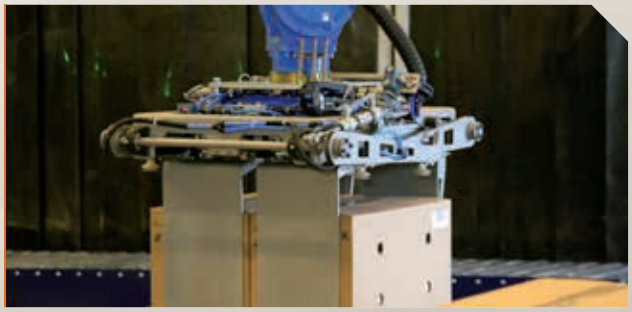
The advantages of this approach are important:

- The MR 60 can be fitted to any existing case conveyor system; additional modifications are kept to a minimum.
- The system does not necessarily have to pick all products; the focus is on the 'fast runners' to make the actual palletising process as efficiently as possible in every way.
- Possibility to easily expand automation in case palletising by adding a 2nd MR 60.
- The main case transport system is kept intact. There is always an exit available in case of undesired stops.

Automatic palletising of cases or crates is a matter of choice. It depends on the number of products that are processed on a daily basis, but also on the frequency and the amount



Flexible grippper head capable of picking and placing 2 cases at the same time



Case transport to multiple pick-up points

of identical products per hour. Focussing on therefore really brings out the best of the MR 60. Implementation of this robot will not only reduce the amount of hard work to be performed in a packing station, it can lead to a reduction of absence due to physical strain.

Once the MR 60 identifies the product, the system decides to what pick up point the case has to be directed. It is also possible that the product is not automatically processed. If this is the case, the system can forward the product to a manual palletising location.

The gripper head is the heart of the MR 60. With this gripper, the MR 60 is capable of picking and placing at least 2 cases at the same time. Placing cases together on the pallet however is not always possible. To be able to cope with this fact, the gripper is capable of placing the picked up cases individually on the pallet.
Special feature of the gripper is that it supports the case, rather then compressing it during transport. Especially for open top cases that contain a rather fragile product, such as eggs, this feature is vital. Further on, the gripper can pick up empty pallets and layer pads.

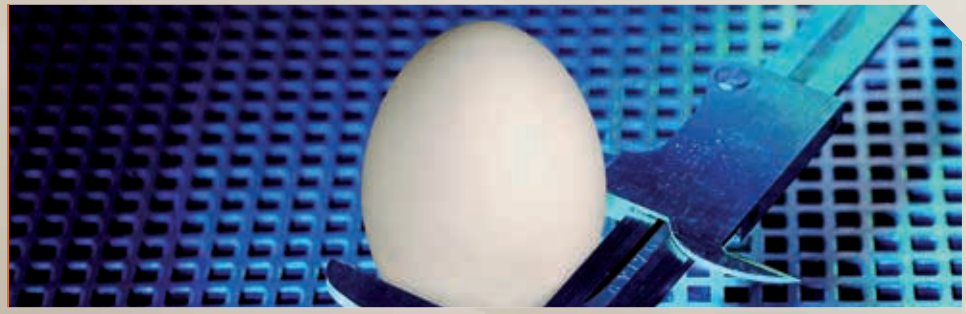
The number of pick up points and pallet loading points is variable, but in most cases the MR 60 will have 4 pick ups and 4 pallet loading positions. Pallet loading positions are standard integrated in the pallet transport system. This system automatically transports full pallets outside the robot cell in combination with a safety screen with muting functionality.
Finally, there is room for an empty pallet stack and layer pad storage. The location of these stores is flexible. A pallet stack can be located on either side of the robot. In the standard configuration, the layer pads are stored in front of the pallet loading position.

Standard features

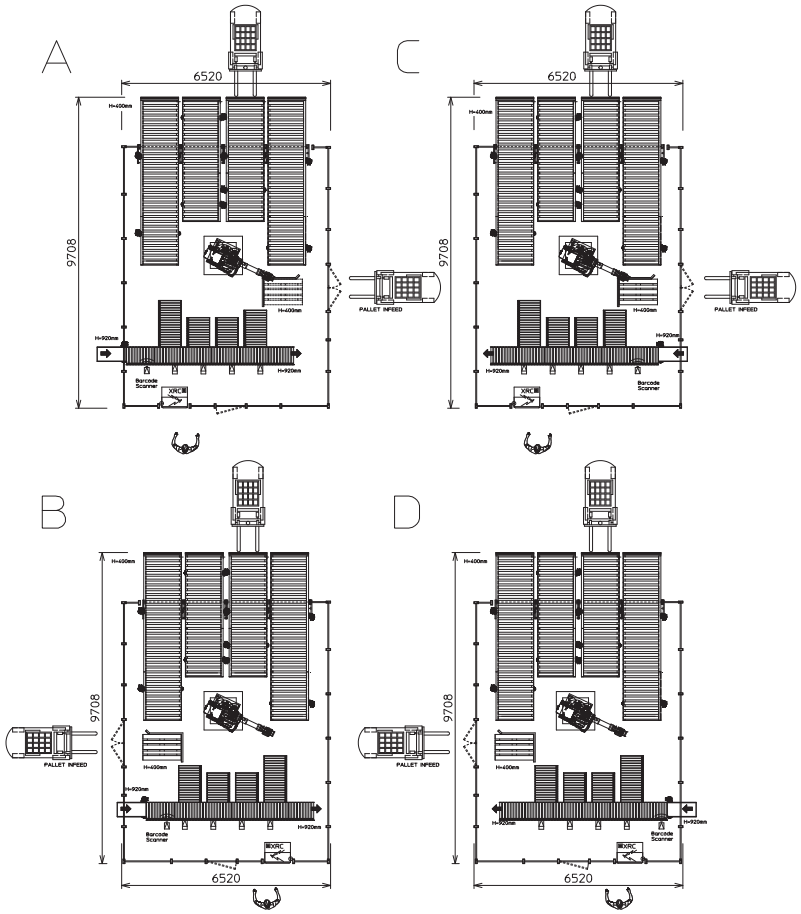
- Product identification by barcode
- Automatic sorting to 4 individual pick up points
- Exit to divert cases to a manual palletising position
- 4 pick up points to arrange the correct number of cases for pick up
- 4 pallet loading positions with automatic full pallet transport outside the cell
- Empty pallet stack
- Safety fence, including safety screens with muting function on full pallet exit
- Operator access point

Options

- Layer pad storage
- Fixed pallet positions to the floor, in combination with sliding doors
- Empty pallet stack allignment unit
- Extended pallet transport conveyors
- Limited number of pick up points
- Limited number of pallet loading positions
- Full pallet rotation unit
- Transverse pallet transport with an automatic guided transport vehicle
- Full pallet wrapping system to reduce additional + packing material



Various lay-out configurations



Dimensions	See lay-outs
Capacity	Depending on pattern; 3-4 cycles/min.
Voltage	200 – 230V 3ph + N 50-60 Hz Or 380 – 415V3ph + N 50-60 Hz
Air	Capacity: 4 m³ /hour *(defined as free air with pressure of 1 bar)* 6.5 – 8.5 bar, dewpoint 3°C *(an air dryer is recommended)*
Maximum pallet height	Approx. 2275 mm, including pallet

CP 10

CP 12

Case Packers

Packing consumer packs and trays into cases and crates is a physically demanding and monotonous task with a high risk of causing cracks in the end product. With the help of the latest innovations and techniques Moba found a solution for this: the Case Packers.

Moba designed a series of Case Packers that can be placed directly behind the packing lanes of your egg grading machine, or via a conveyor system also known as Contiflow (see separate chapter "Contiflow" in this brochure). All Moba Case Packers are stainless steel machines, which automatically pack consumer packs or trays into cases or crates. They can also handle different types of packs and patterns. Depending on the packs and patterns you wish to process, the right Case Packer can be selected. Within our Autopack product line we have the following Case Packers available; CP 10 and CP 12.

Type	Configuration	Purpose	Directly to grader	Linked to grader via transport conveyors
CP 10	Twin	Pack types with 6 eggs/row only • For 36 or 72 eggs/layer	Yes	Also possible
CP 12	Twin	Pack types with 5 or 6 eggs/row • For 36, 48, 60 or 72 eggs/layer	Yes	Also possible

CP 10

The CP 10 is a stainless steel Case Packer that automatically packs consumer packs and trays into cardboard cases or plastic crates. The CP 10 is originally built for the North American market and it can handle different basic types of "square" patterns which are mainly used in this market (30-tray, 3x12 and 2x18 with always 6 eggs in one pack row).

Touchscreen of CP 10: Easy operation.

CP 10: Handpacking still possible by feed-through conveyor.

Discharge conveyor shifts a full case onto the case conveyor.

The CP 10 combines 2 individual packing robots in one compact machine. These units can be operated individually. For example, one CP 10-half packs trays in cases while the other half packs consumer packs. Depending on the type of egg pack each unit can pack up to 25,000 eggs per hour. This means that the entire Case Packer can pack up to 50,000 eggs per hour. When required, trays and consumer packs are placed in cases while being turned at 90 degrees per layer.

Each case pattern requires specific measurements. The pack type and number of layers are the basis for programming these case patterns. With the help of the control system, programming the different patterns is simple. Moba will program your required patterns once and your machine knows your standard products and will remember all types of case patterns for further use. When you need other types of patterns in the future, you can easily program your own patterns. With the user friendly LCD touch screen, your Case Packer can be programmed within several seconds.

The Case Packer ensures that all consumer packs and trays are handled in the gentlest way. They are picked up carefully by the gripper. Then placed precisely at each packing level in the case, where an ingenious mechanism allows the packs and trays to be released quickly and safely and thus ensuring the best product handling possible.

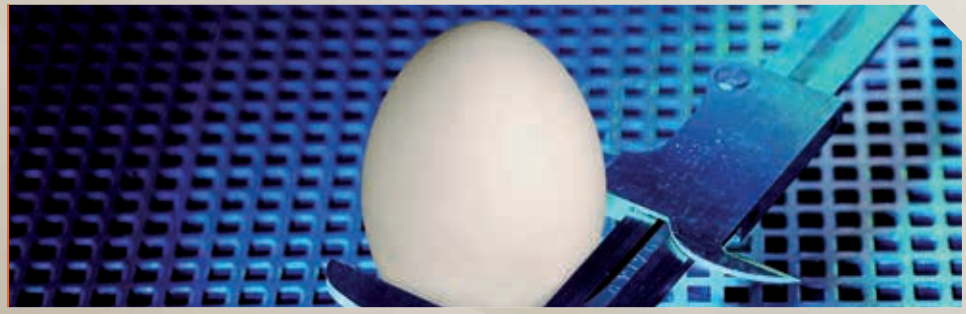
The Case Packer is configured with an empty case buffer for cardboard cases. The buffer is designed to stack cases above each other and supplies the Case Packer with empty cases when needed. Per CP 10-half, 3 empty case positions are available. This makes it possible that one operator can easily manage several Case Packers. Plastic crates can be fed to the CP 10 by means of a conveyor the length of which determines the buffer capacity. If a case or crate is full, it is pushed on to a discharge conveyor and another empty case from the buffer is again placed at the loading position.

Standard features

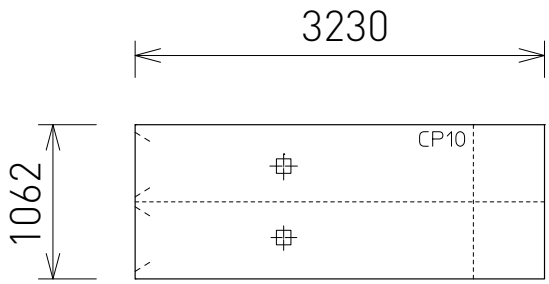
- Stainless steel
- 2 case packing robots combined in one compact machine
- Capacity of 50,000 eggs per hour in total (depending on the type of egg pack)
- Handles consumer packs and trays
- Handles cases (designed for packs with 6 eggs per pack row)
- Empty case buffer
- PLC as a reliable control system
- Quick and easy programming via LCD touch screen

Options

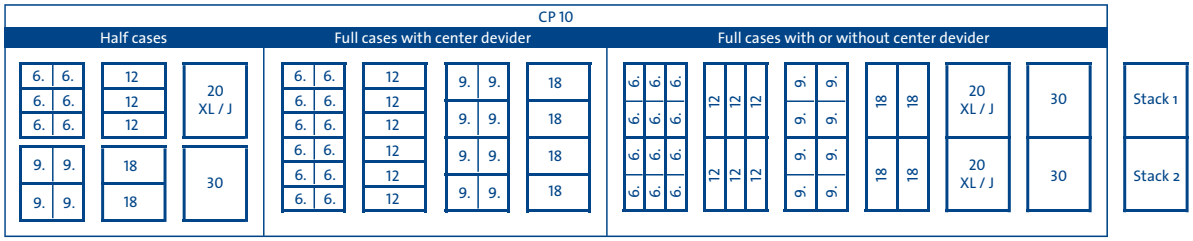
- Connection to an automatic case erector
- Handling of many plastic crates- types (additional crate-feed conveyor)



Specifications and Patterns CP 10



Dimensions	Additional length behind packing lanes (lxwxh): 2,330 x 1,062 mm x 2,270 mm Maximum required height: 2,900 mm
Capacity	25,000 eggs/hr per half case packer (both twins together 50,000 eggs/hr)
Power	7kVA
Voltage	200-240V or 380-415V, 3 phase
Air	Pressure minimum 6 bar Consumption Average 150 l/min. Peak 300 l/min. (defined as free air at 1 bar) Max dewpoint 3°C (an air dryer is recommended)
No. of layers	Programmable between 2 and 6 layers



6. 6. & 9. 9. symbols

CP 10 : NOT separated packs only.

CP 12

The CP 12 is the “big brother” of the CP 10. Just like our other Case Packers, the CP 12 is also made of stainless steel. This CP 12 which packs consumer packs and trays into cases as well as crates, not only for packs with 6 eggs per pack row is also suitable for packs with 5 eggs per row. Again, the CP 12 is combining two individual packing robots in one compact machine. For example, one packing robot packs trays in cases and the other robot packs consumer packs into crates. Depending on the pack type, each CP 12-half can pack up to 25,000 eggs per hour. In total, the entire Case Packer can pack up to 50,000 eggs per hour. Compared to the CP 10, the CP 12 can handle a larger variety of patterns.

Compact setup of 2 x CP 12 plus top tray denesters side by side

The CP 12 gripper can handle various rows of consumer packs

The CP 12 can be adapted to a wide range of case sizes

Trays (and when required consumer packs) are placed in cases and crates while being turned at 90 degrees per layer. Each pattern requires specific machine settings. The type of pack and number of layers are the basis for programming these case and crate patterns. With the help of the control system, programming the different patterns is simple. Moba will program your required patterns during the installation and the CP 12 knows your standard products and will remember all types of case patterns for further use. When you need new types of patterns in the future, you can easily program your own patterns. With the user friendly LCD touch screen, the CP 12 can be programmed within several seconds.

The Case Packer ensures that all consumer packs and trays are handled in the gentlest way. They are picked up carefully by the gripper. Then placed precisely at each packing level in the case or crate, where an ingenious mechanism allows the packs and trays to be released quickly and safely and thus ensuring the best possible product handling.

This Case Packer is also configured with an empty case buffer for cases. Per CP 12-half, 3 empty case positions are standard available, allowing one operator to manage multiple Case Packers easily. An optional empty crate conveyor is available for feeding plastic crates. If a case or crate is full, it is pushed onto a discharge conveyor and another empty case or crate from the buffer is again placed at the loading position.

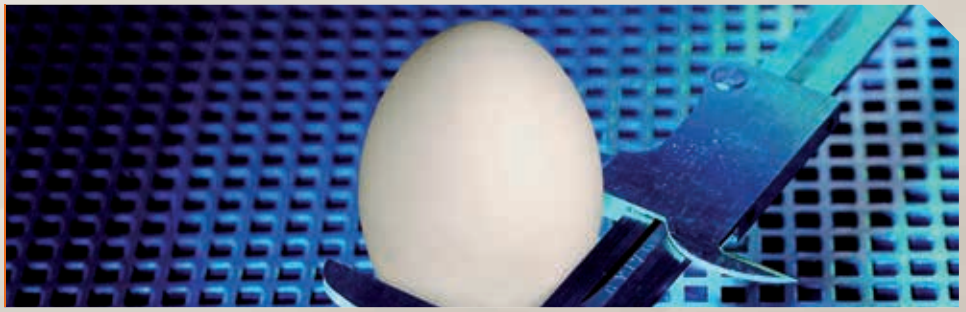
Optionally, the CP 12 can be fed by an automatic case erector, further reducing human labour and increasing continuous performance.

Standard features

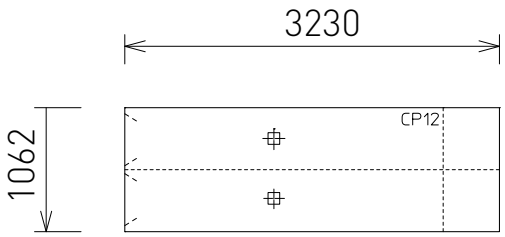
- Stainless steel
- 2 case packing robots combined in one compact machine
- Capacity of 50,000 eggs per hour in total (depending on the type of egg pack)
- Handles a wide range of consumer packs and trays
- Suitable for packing cases and crates
- Empty case buffer
- PLC as a reliable control system
- Quick and easy programming via a LCD touch screen
- Manual conveyor

Options

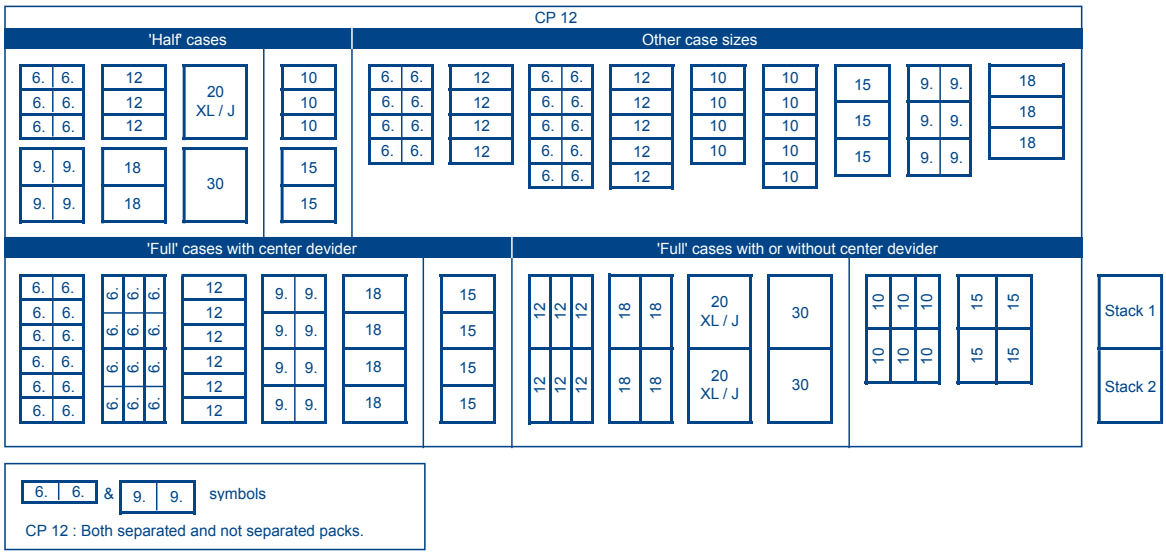
- Empty case conveyor
- Connection to an automatic case erector



Specifications and Patterns CP 12



Dimensions	Additional length behind packing lanes (lxwxh): 2,716 x 1,062 x 2,270 mm, Maximum required height: 2,900 mm
Capacity	25,000 eggs/hr per half Case Packer (both twins together 50,000 eggs/hr)
Power	7kVA
Voltage	200-240V or 380-415V, 3 phase
Air	Pressure minimum 6 bar Consumption Average 150 l/min. Peak 300 l/min. (defined as free air at 1 bar) Max dewpoint 3°C (an air dryer is recommended)
No. of layers	Programmable between 2 and 6 layers



Autopack Peripherals

The way consumer packs or trays are packed varies per country, sometimes even per region. In case of further automation of the packing process, in many occasions only the basic case packing or display loading function is required. However, in other situations, the basics are simply not sufficient. Before the packs are actually processed, some other actions are required to 'prepare' the packs for final packing. To be able to provide a suitable solution for these more advanced requirements, Moba has developed a number of features that can be added to the CP and MR-series.

Example of 3rd party case erector connected to a Case Packer

Discharge conveyor turns a full case onto the case conveyor

Inline open pack reject conveyor

In any batch of packs, a few bent or torn packs can occur that cannot be closed properly. If packed manually, they are simply closed by the operator, but in an automated situation an open or half closed pack can create problems. A system that is able to detect such a problem pack is a necessity. Therefore Moba developed the inline open pack detect and reject system. In case a faulty pack is detected, the pack is forwarded onto the reject conveyor that is placed below the pack supply conveyor of the CP or MR. Automatic discarding of open packs makes sure that the constant product flow is continued.

Pack Splitter

Many pack types are designed to be split after being filled with eggs. Often this is done manually during packing or in the supermarket. In these situations, for example a 2x6 pack has been processed as a "normal" 12 pack. With the pack splitter however, it is possible to split the packs automatically before packing (in cases, crates or displays). The splitter ensures that the consumer packs are separated accurately and fast. The splitter can be integrated with either the CP or MR-series. Even when applied to manual packing, it can already speed up the packing process considerably. In case the splitting function is not required, it can be deactivated by the push of a button.

Pack Rotation Unit (PRU)

This optional feature enables CP or MR machines to handle not only rows of 6 eggs, but also patterns. The PRU is designed to 90° turn consumer packs before entering the pick-up point. It can be integrated into any supply line.

Case conveyor

Once the cases and crates are fully packed, they are transported to a case conveyor. In most situations, the case conveyor transports different types of cases coming from multiple sources.
After being shifted onto the case conveyor, the packed cases and crates are transported onwards to the palletising area.

Connection to automatic case erector

All Moba Case Packers (CP or MR) are fed manually with empty cases or crates. Depending on the size, several empty cases can stand waiting in line, acting as a buffer. This ensures that one operator can easily manage multiple machines. A further step in automation is to connect an automatic case erector to the Case Packer. There are many reliable case erector systems on the market that could be integrated within a Moba Case Packing solution.

Pack splitter

Display pallet de-stacker

Display pallet de-stacker

In order to be able to create a larger buffer of empty displays, the empty pallet transport system of the MR 20 or MR 30 can be extended into various directions. This enables the operator to leave the robot system alone for a longer time.

In case the displays are formed into free air, there is also a more compact solution available. The pallet de-stacker can be connected to the standard MR 20 or MR 30 pallet transport conveyor system. It offers room for an extra seven empty pallets on a very small footprint.

Contiflow

Contiflow is a generic name for Moba's logistic conveyor system. Some modules of the Autopack product line can be placed directly behind your egg grading machine, while other equipment must be connected via conveyors. Also in many situations it is preferable to not place MR or CP modules directly behind the machine, but elsewhere, for logistic or flexibility reasons. In all situations where an intelligent and flexible conveyor system is needed, Moba can provide the necessary solution: "Contiflow".

Example of a 4 level Contiflow system

Example of a straight-forward Contiflow with 3 levels, just to bring packs to a 3rd party system just after the egg grading machine

Detail of 2 eject conveyors set at 2 different cross conveyor levels

Total flexibility as well as backup: Manual packing still possible

Contiflow is a logistic system that takes filled consumer packs or trays automatically onwards to the right destination for final processing. Every packing lane of an Omnia, Moba's autopack modules and even 3rd party equipment can be flexibly connected to Contiflow. Each Contiflow is tailor made to your specific needs.

Levels

A Contiflow system can consist of maximal four levels that are placed above each other. This guarantees a footprint as efficient as possible and ensures the best product transport per square meter. Further on, a high degree of accessibility for maintenance is guaranteed.

Cross conveyors

Contiflow usually starts with the connection to an egg grading machine. Moba egg grading machines can interface in a standard way with Contiflow. It connects to one or more packing lanes of an egg grading machine. The normal take away conveyor used for manual packing is replaced by a conveyor system. This system is able to buffer and shift the more sophisticated packs onto a transport conveyor, transverally placed behind the egg grading machines' packing lanes. These 'cross conveyors' can handle up to approx. 45,000 eggs per hour.

The units that "shoot" the pack onto the cross conveyors are called the "eject conveyors". The eject conveyors are of course controlled by an intelligent overhead system to avoid collisions. Just before each eject conveyor, a buffer space is allocated to ensure that the grading continues while the eject conveyor has to wait for the traffic system to give a "green light".

If Contiflow consists of more levels, each packing lane of the grader can be set to feed any of the Contiflow levels, to create full flexibility. Furthermore, there is a manual output. This is in fact a 5th top level, used when a product requires manual packing and further processing via Contiflow is not desired. Besides higher flexibility, this is also a welcome backup function in case further processing is stopped due to, for example, maintenance. Every Contiflow system is custom designed to your specific requirements. Projects can vary from a simple conveyor connecting a single 3rd party shrinkwrapper to complete installations with hundreds of meters of transport systems carrying many functions out. The list below gives an idea about the features of Contiflow.

Standard features

- Buffer function per connected grader packing lane
- Eject conveyor per connected grader packing lane
- Cross conveyors
- PLC traffic system

Contiflow options

Unlike basic case packer and display loading functions, there are configurations where a straightforward conveyor system that brings consumer packs or trays from A to B is not sufficient. As an addition to the standard Contiflow system, Moba has developed a number of optional functions that can be integrated into the Contiflow conveyor system.

Example of a 90-degree angle configuration

Example of centralized inkjet in Contiflow

Buffer conveyors
A good example where a buffer function can be included is in front of an offline positioned CP or MR-series packer. This ensures that the egg grading machine can operate continuously, even if for a short moment of time the automatic function is stopped.

Open pack reject conveyor
In any batch of packs, a few bent or torn packs can occur that will not close properly. If packed manually, they are simply closed by the operator, but in an automated situation, an open or half-closed pack can create problems. A system that is able to detect such a problem pack is a necessity. Therefore, Moba developed the open pack reject conveyor. A pusher takes a faulty pack onto the reject conveyor, making sure the constant product flow is continued.

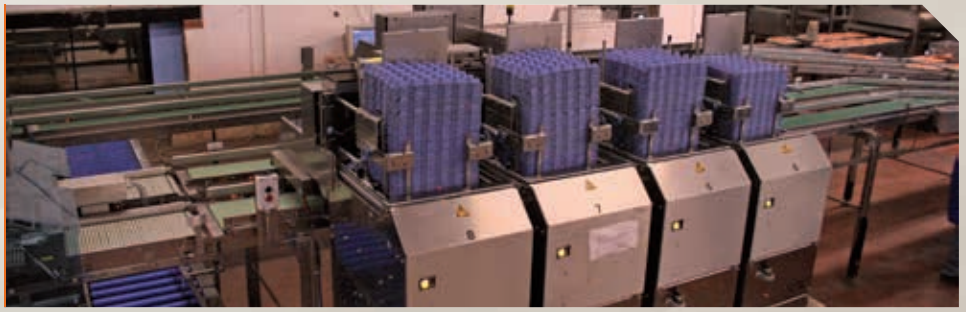
Curves
Contiflow offers two options, if a change of direction in a conveyor is required. The first one is to integrate an eject conveyor that shifts the product flow onto the next conveyor, positioned at a 90 degree angle. In such a situation, the orientation of the packs, in respect to the transport direction, rotates by 90 degrees. If change of direction is required without a change of orientation, the curve option is used.

Cross over
Contiflow can transport different types of packs. Each pack needs to be transported to the correct final destination. The Cross over is a mechanically controlled switch that can take out packs from a product flow and move these packs to another conveyor. Detection systems signal what kind of pack-type is transported by the conveyor. Cross-overs are specifically used to sort out different products from a main transport conveyor (Trieur). In order to create complex patterns for display or shipper loading, cross-overs can be implemented as well.

Pack sorting device (“Trieur”)
In various occasions, Contiflow can be used to transport different products at the same level. This is done in order to, for example, get the packs towards a shrink- and sleeve wrapping machine. Thus it is also possible to code the packs by a centralized inkjet or labelling system.
In order to be able to re-sort the different kinds of packs back to individual (manual) packing positions, a Trieur is the right solution.
The manual packing positions of the Trieur are set up in a way that they can easily connect to CP or MR machines.

Inkjet provision
When it is necessary to print a text or logo onto consumer packs, an inkjet provision is available as well. This device is generally placed behind an open pack reject conveyor. Custom made solutions to ensure computerized control from the Omnia egg grading machine towards such a provision can be designed. Solutions for labelling systems are also possible.

Example: a 4-channel top tray denester

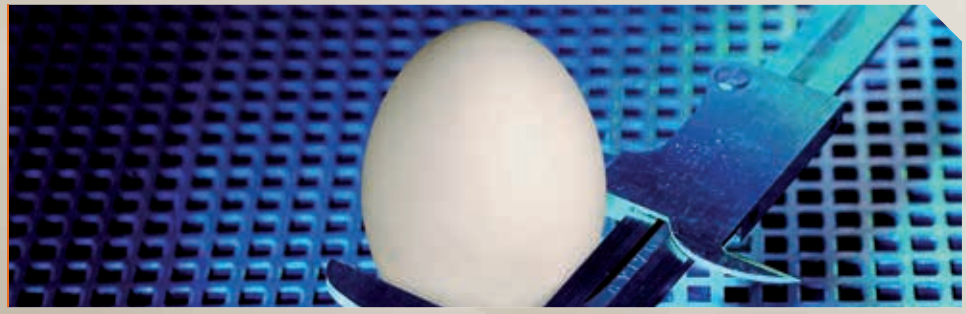


Top tray denester

When filling trays into cases or stacking trays on top of each other, it can be required to place empty trays on top of the filled egg trays - the so called top trays. A top tray denester can place empty trays directly on top of the filled trays or on the conveyor towards, for example, the Case Packer. It is common in combination with a MR 40 or shrink-wrap machine. The capacity of a top tray denester is approximately 27 top trays per minute.

Integration of third party equipment

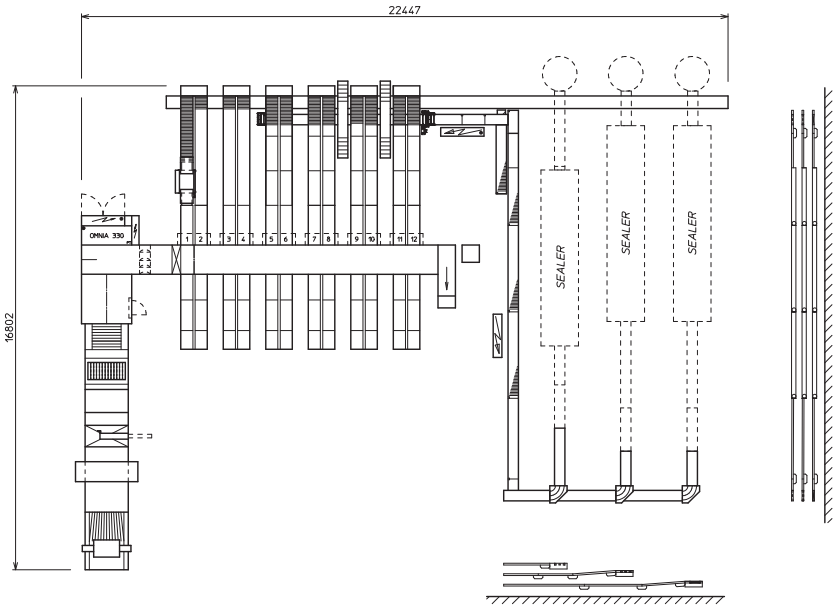
Contiflow can also be used to connect to third party equipment. Most often, the following equipment is combined with Contiflow: shrink wrappers, sleeve wrappers, strappers, etc. Depending on the wishes of the customer, Contiflow can specifically be designed and installed to the required needs.



Capacities Contiflow in eggs per hour (cases per hour)

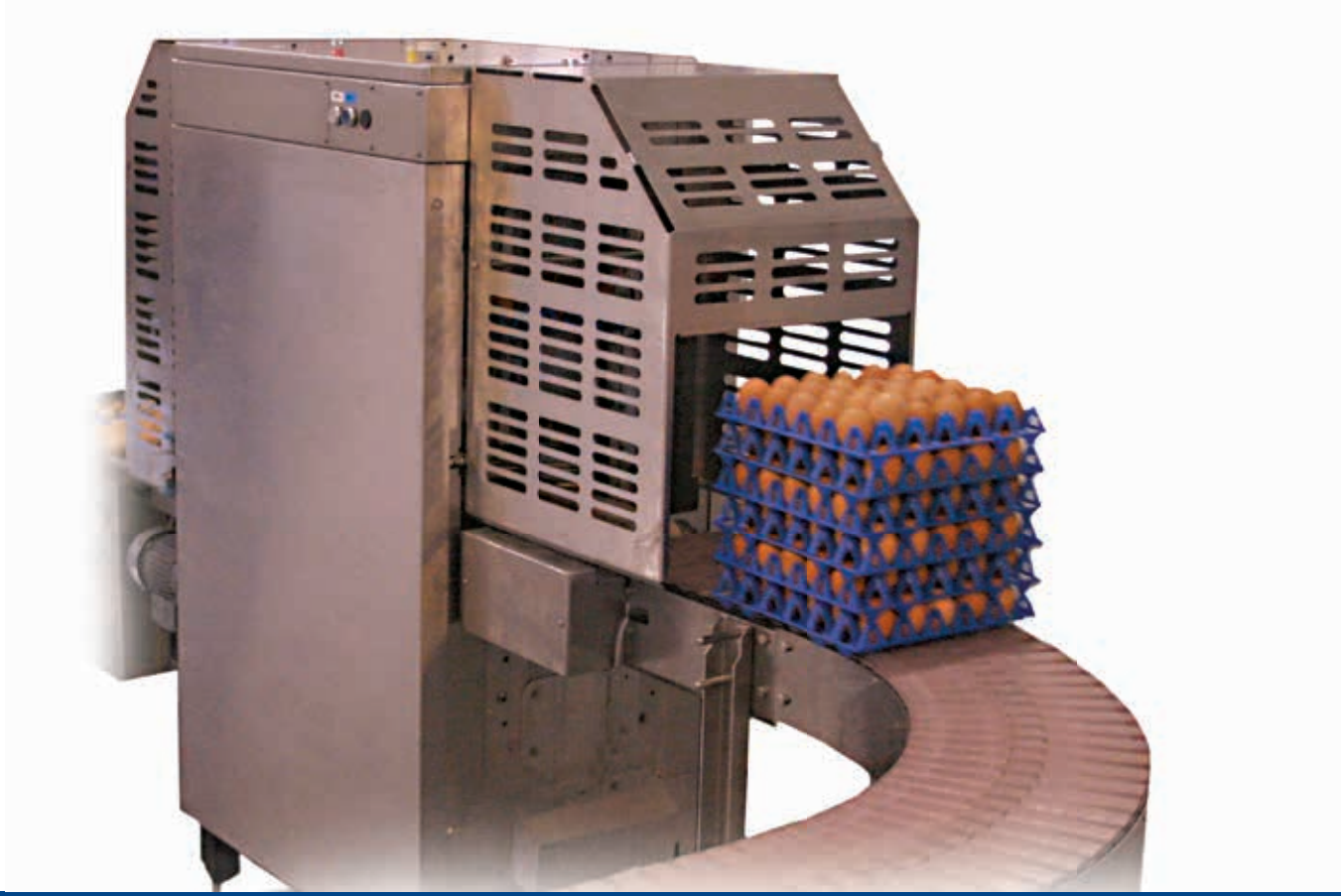
	1 level	2 levels	3 levels	4 levels
Belt speed = 20 meters/ minute (trays):				
20 egg tray	48,000 (133)	96,000 (266)	144,000 (400)	192,000 (533)
24 egg tray	54,720 (152)	109,440 (304)	164,160 (456)	230,880 (641)
30 egg tray	48,600 (135)	97,200 (270)	145,800 (405)	194,400 (540)
Belt speed = 40 meters/ minute (consumer packs):				
10 egg pack	48,600 (135)	97,200 (270)	145,800 (405)	194,400 (540)
12 egg pack	48,960 (136)	97,920 (272)	146,880 (408)	195,840 (544)
15 egg pack	52,200 (145)	104,400 (290)	156,600 (435)	208,800 (580)
18 egg pack	62,640 (174)	125,280 (348)	187,920 (522)	250,560 (696)

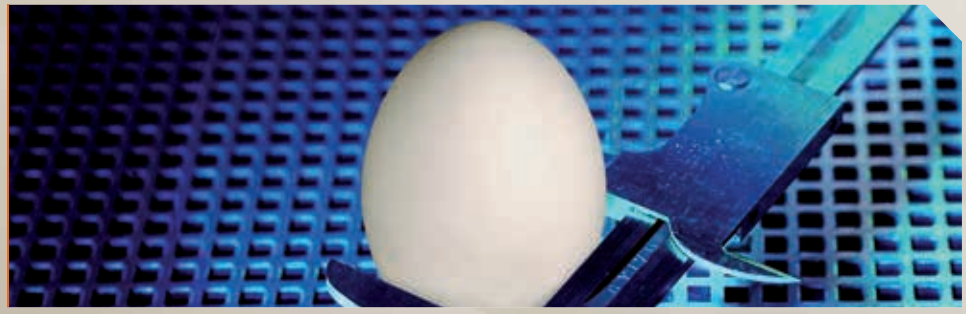
Example lay-out of a 3 level Contiflow



Tray Stacker

The Tray Stacker TS 10 is a stainless steel machine that can automatically stack 6 trays on top of each other. It is a compact machine that, apart from being connected to a farmpacker, can be integrated in a packing line of an egg grading machine. The TS 10 can also be installed away from the grader in a stand-alone configuration, through a conveyor system.





By constantly turning the unfinished stack at 90 degrees, a stack of 6 trays is being created. Once a stack is ready, the machine automatically transports the stack onto a take-away conveyor is also used when an MR 40 is implemented into your configuration.

With the growth of the market potential of plastic trays, new demands were also placed on the actual tray-stacking process. Especially behind a grading machine, where the plastic trays were basically always used for off grades, the Tray Stackers and conveyors were subject to much more pollution, compared to the traditional pulp tray. Specifically, the stability of the stack itself has become increasingly more important, because of automatic tray palletizing.

Transport

The infeed- (trays) and the take-away conveyor (stacks) are very robustly constructed. The conveyors are made of special "hard-to-get-dirty/easy-to-clean" plastics and a sturdy stainless steel frame. The whole transport system is designed in such a way that a minimum of support legs is required, which makes cleaning of the floor under the machines less difficult. Further on, the conveyors are made as much as possible out of one piece, in order to keep the number of transfers to a minimum.
Another important feature of the transport conveyor system is flexibility. Placing a TS 10 away from the grader or connecting it to a farmpacker/Tray Palletiser has become easy with the possibility of creating bends and straight sections from the same conveyor.

Specifications Tray Stacker TS 10

Capacity	1,200 trays per hour; 36,000 eggs(100 cases)/hour
Power	0.5 kVA
Voltage	200 – 230V 3ph + N 50-60 Hz Or 380 – 415V3ph + N 50-60 Hz

Easy Lift

Lifting a stack of trays is hard work. A stack of six trays can weigh more than 12 kilos. To make this work easier, more precise and quick, Moba has developed a special aid: Easy Lift.

The Easy Lift can be mounted on the floor or the ceiling

Lifting four stacks at once

Upper and lower handles for easy (un) loading high pallets

The Easy Lift enables operating personnel to carry out lifting off egg trays faster and efficient. The Easy Lift is a perfect solution for your personnel and your business. Every day, all around the world, millions of eggs are transported on pallets. Twelve stacks of trays on a single layer and five or even six layers high. Economically palletising and de-palletising of egg trays is one of the tasks that the Easy Lift is perfectly cut out for.

Its simple double-button operation and long reach make the Easy Lift exceptionally user friendly. With the special patented fork grip, four stacks seem almost weightless and can be moved with ease. Even if a layer is not quite straight, or the layer pads are bent, it is no problem at all for the fork grip. The fingers of the fork grip effortlessly adjust to each situation. Furthermore, the fork can easily be adjusted to different tray sizes. The grip is fitted with an "upper handle" and a "lower handle". By holding on to the lower handle, heavy egg stacks can be positioned or picked up even above your head.

The Easy Lift has a robust steel hinged arm, which is balanced using compressed air. Operation is fully pneumatic, so that an electrical connection is not required. The arm is fixed to a column attached to the floor, it fully pivots and can reach any point within a radius of 2.6 meters. The grip itself can be swiveled in all directions thanks to a rotating joint. The Easy Lift is practically maintenance-free. Since it operates using compressed air (if dry and clean) breakdowns are kept to an absolute minimum.

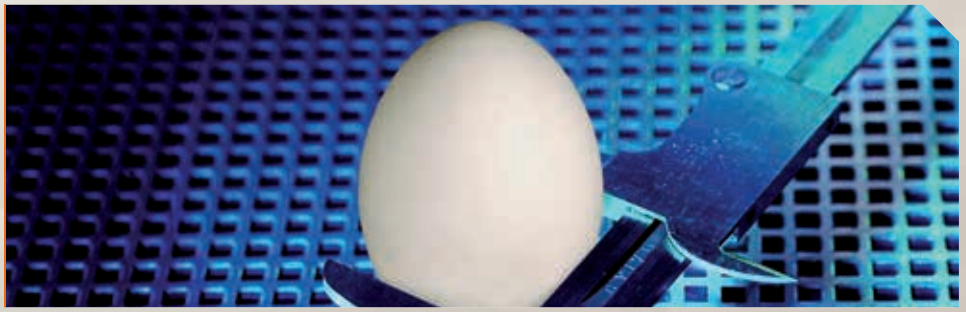
When moving heavier weights, safety is the most important thing. Four stacks of egg trays weigh no less than 50 kilos. And that's why the Easy Lift is constructed from only the highest-quality components and materials available in the market. This results in a safe and reliable product.

Standard features

- Floor mounted configuration
- Stainless steel floor mount
- Reliable fork grip
- Grips 4 stacks
- Low maintenance
- Fully pneumatic

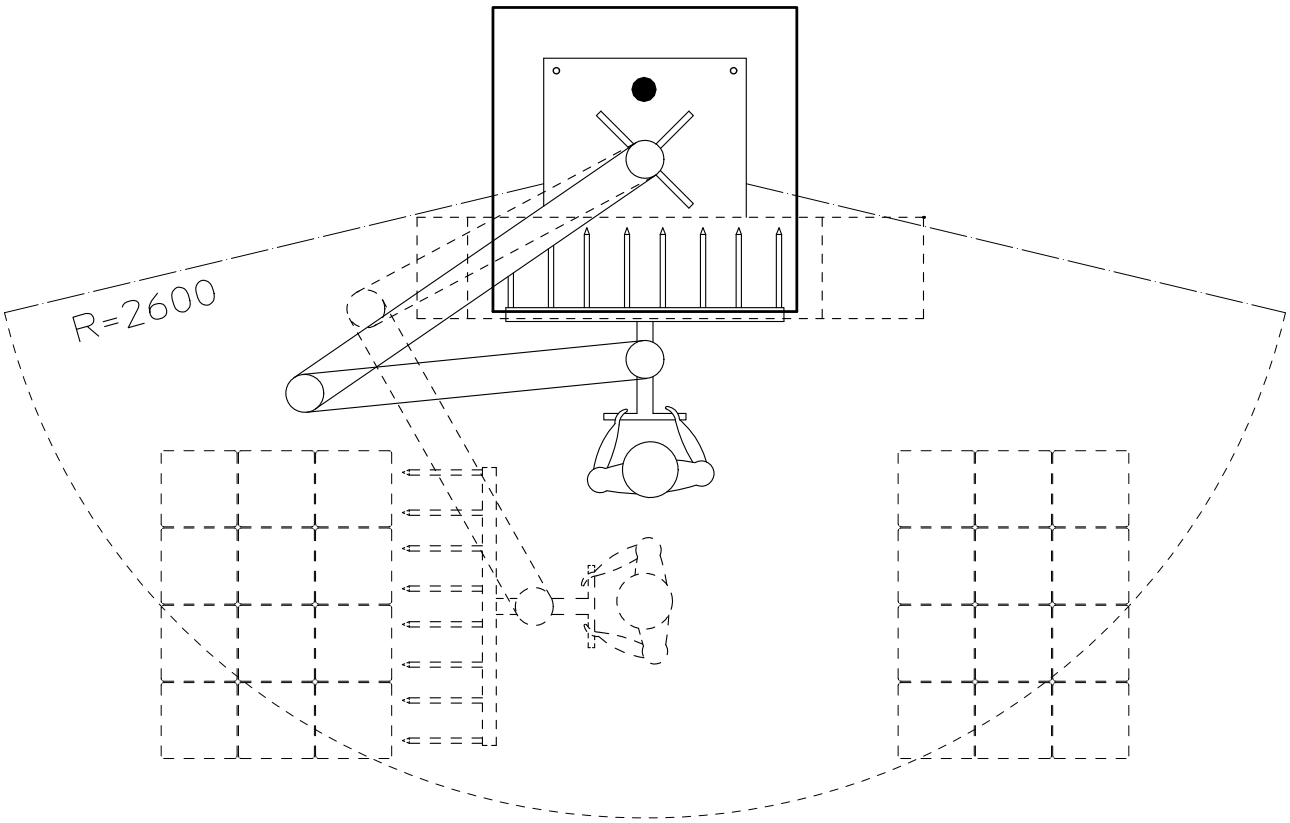
Options

- Mounting on ceiling instead of floor mount
- Custom made heights on request



Specifications Easy Lift

Capacity	four stacks placed in 22 seconds, giving a capacity of 120,000 eggs per hour
Radius of working area	R=2.6 meters
Height of working area	H= 2.10 meters
Maximum load	75 kilos (including grip)
Minimum ceiling height with 5 layers per pallet	H=3.40 meters
Minimum ceiling height with 6 layers per pallet	H=3.75 meters
Air	pressure minimum 6 bar
Color	blue, RAL 5013



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