

# SIPA

PALLETISING AND  
DEPALLETISING SOLUTIONS

CONVENTIONAL  
AND ROBOTIC



 **SIPA**



# GENIUS AND ROBBY:

## CONVENTIONAL AND ROBOTIC PALLETISING AND DEPALLETISING SOLUTIONS

More than **fifty years' experience** and the continuous drive towards **innovation** have made Sipa one of the worldwide leading companies in this sector. A range of complete, reliable end-line solutions able to satisfy all the **needs of the bottling, food processing and chemical/pharmaceutical** sectors.

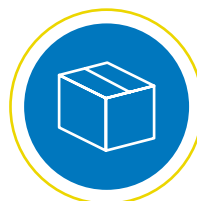
The range includes both conventional "double column" frames and robotic solutions in order to find the optimal configuration based on the operating conditions of the plant, the product to be handled, the output and variables to manage.

### PRODUCTS THAT CAN BE PROCESSED

Depending on the product to be treated, the different solutions can be equipped with suitable gripping heads for handling:



**PACKS**



**CARTONS**



**CRATES**



**LOOSE  
PET BOTTLES**



**LOOSE  
GLASS BOTTLES**



**GLASS  
PET JARS**



**TIN  
CONTAINERS**

### MODULAR PLATFORM WITH MAIN MODULES

To adapt to several production needs, logistics and structural constraints of the plant, the central body with the various gripping heads is completed by a series of accessory modules:

- Product feeding and layer preparation area(rollers, modular chain, active preparation, etc.)
- Pallet conveyors
- Pallet magazine
- 90° pallet deviator
- Pallet rotating device
- Pallet shuttles
- Pallet control device
- Interlayer placing/removing device
- Interlayer magazine

### INTEGRATION INTO COMPLETE LINES

Considering the various sizes and types of packaging, **end-line management** is becoming increasingly important to assure the final **efficiency** of a complete line. We have applied all of our **design experience** to creating increasingly **flexible and reliable solutions** to serve efficient, **high-performance** complete lines.





# LAYER PREPARATION SOLUTIONS

## CONVENTIONAL

Sipa Range include conventional layer preparation requiring a divider and layer formation area with static pack-turning device:

- **Rollers** with 1-2 inlets (Basic solution with row spacers)
- **Modular chains** with 1-2 inlets

Modular chains advantages:

- No problems of product stability (ex. critical petaloid base)
- Higher performances and reduced maintenance
- No need of row-spacers (no mechanical modifications for future sizes)

## LAYER PREPARATION WITH ACTIVE PACK ORIENTATION AND ARRANGEMENT.

These solutions offer an innovative alternative to conventional layer preparation. They can be integrated upstream of any kind of conventional or robotic palletizer. Thanks to these systems we are able to satisfy any kind of market request, both in terms of productivity (from low/average to high speed) and logistics (in line or orthogonal infeed, with high or low level feeding).

The range include:

- **Fastlayer**: with anthropomorphic robots
- **Active Layer**: frame with linear axis

Considering the most recent drinks market trends, which require lighter bottles, and the increasingly aggressive marketing needs which generate a multiplication of sizes to be handled, this solution achieves three important results:



### SOFT HANDLING

Transport improvements of some containers and assures extremely delicate handling, in order to avoid any kind of damage to the product.



### CHANGE-OVER

Reduction of change-over times or adaptation to new products.



### FLEXIBILITY

Increased performance with small footprint and easy to use.

### Main features

- The size change is managed simply through a selection process on the operator panel, and usually no mechanical components need to be replaced.
- The regular and continuously moving of modular chains pack conveyors avoids excess friction on the pack bases and assures handling stability with all base shapes.
- Two sections infeed conveyors assuring the adequate dosing of the packs feeding.
- The optimization of the different cycles leads to high performance and limits the working speed of the different components. This guarantees reliability and reduction in wear over time.

This **rubber-coated clamp system** adds a further two movement axes, allowing several packs to be handled at the same time without compromising on the accurate and delicate handling of the packs. This gripping solution guarantees a very **fast, accurate** and **soft pack rotation**: the elimination of hits is very important for the last generation of lightened bottles. This system is also available with automatic adjustment.

**PATENTED  
GRIPPING HEAD**







## FASTLAYER

Robotic layer preparation for **medium and high-speed lines**.

The system uses **clamp-type heads** (a SIPA patent) installed on 1 or 2 anthropomorphic robots mounted in parallel, which move continuously and synchronously with the conveyor belt below. The packs are delivered along the layer-forming conveyor in a single row, appropriately spaced, and the robots work against the flow, orienting and arranging the packs to prepare the layer, according to the selected palletization layout.

The robots are mounted above the conveyor, optimizing the working area.

### THE RANGE INCLUDE:

- Fastlayer 1.1R: 1 infeed conveyor - 1 Robot
- Fastlayer 2.1R: 2 infeed conveyor - 1 Robot
- Fastlayer 2.2R: 2 infeed conveyor - 2 Robots

## ACTIVE LAYER

It is the layer preparation system designed to **optimize the medium and low speed palletization plants** with orthogonal or in line infeed. It is composed of a **clamp type head** (SIPA patent) installed on linear axes, suitable to handle several packs at the same time, and moves in accordance with the flow of the packs arriving on the below belt chain.

The system is retro-operated with position control by brushless and asynchronous motor gears.

### THE RANGE INCLUDE:

- **Active layer A:** orthogonal infeed for packs and cartons
- **Active layer L:** inline infeed for packs and cartons
- **Active layer R:** inline infeed for rows of bulk containers





# GENIUS

## CONVENTIONAL PALLETISER

**Genius** is a global project based on a standard double column central unit which, by adding the different modules in the series, **can create customized solutions** according to speed, container type and programs.

The range includes steady and moving pallet palletisers and depalletisers which match the **highest performances** available in the market today, and is designed to allow every user to find the best solution to suit their own specific needs:

- Low or high level infeed, **steady pallet**
- High level infeed, **moving pallet**

### GENERAL FEATURES AND ADVANTAGES

The main driving forces behind the Genius project were:

- Operational flexibility and further reduction in change-over times.
- Increase in structural rigidity.
- Optimization of cycle to increase performance, extreme precision of movements with improved control of the different movements using state-of-the-art electronic solutions.
- Fully automatic system requiring limited operator intervention, operating in complete safety.
- Extremely simple, complete operator control panel. It can be integrated with an advanced control and supervision system.
- Limiting maintenance and components subject to wear (e.g. lubrication-free transmission).
- Green approach: reduced consumption and operating noise. Attention to the recyclability of materials used.

### TECHNICAL CONFIGURATIONS

- Product infeed can be orthogonal or in line, often used for high operating speeds.
- The whole range is designed to accept a variable number of product infeed.
- All models can be integrated with layer preparations by packs rotation without impact.
- Multi-pallet version is available on request.
- Possibility to handle all main pallets on the market trouble-free, with highly customizable solutions (half and third pallets, displays, dollies, etc.).



## PRODUCTS THAT CAN BE PROCESSED

PAL	<div><div></div><div>PACKS</div></div> <div><div></div><div>CARTONS</div></div> <div><div></div><div>CRATES</div></div> <div><div></div><div>LOOSE PET BOTTLES</div></div> <div><div></div><div>LOOSE GLASS BOTTLES</div></div> <div><div></div><div>GLASS PET JARS</div></div> <div><div></div><div>TIN CONTAINERS</div></div>							
	GRIPPING SYSTEM	Halving platform	Halving platform	Jaws	-	-	Vacum	Vacum
				Halving platform	Pliers	Sweep-off	Sweep-off	Magnetic
				Hooks	Cups	Cups	-	-
	STEADY PALLET	PTF/PTF-V	PTF/PTF-V	PM PTF/PTF-V	-	-	PV	PV
					PP	PS	PS	PH
					PR	PR	-	-
	MOVING PALLET	PTF/A	PTF/A	PM/A	-	-	-	PH/A
				PG/A				





# GENIUS AUTOMATIC PALLETISERS STEADY PALLET TYPE

The steady pallet palletiser range have infeed from below (in some cases the product can also be fed from the top). According to the product to be handled, the standard central unit can be integrated with various heads and accessory elements:

- **PTF:** layer transfer by halving platform for packs and cartons (even crates with the same head), clusters and multipacks. Up to **320 layers/hour**
- **PTF/V** layer transfer by halving platform for packs and cartons (even crates with the same head), clusters and multipacks, version with double moving platforms for high output lines. Up to **420 layers/hour**
- **PM-PG:** layer transfer by centralized jaw head (PM) and hook head (PG) for plastic crates. Up to **360 layers/hour**
- **PP- PR:** layer transfer by pliers-type head. (PP) and cap-type head (PR) for full or empty PET and glass bottles. Up to **250/300 layers/hour**
- **PV:** with vacuum head for empty loose containers (PET and glass). Up to **360 layers/hour**
- **PS:** sweep-off head for full glass loose containers. Up to **150 layers/hour**
- **PH:** with magnetic head for tin containers or jars with metal lids. Up to **360 layers/hour**

# GENIUS AUTOMATIC PALLETISERS MOVING PALLET TYPE

The range of moving pallet palletisers has been designed mainly for high production needs and/or to solve logistics and space problems. Product infeed is from above.  
The appropriate head must be chosen according to the different products to be handled:

- **PTF/A:** layer transfer by halving platform for packs and cartons (even crates with the same head), clusters and multipacks. Up to **600 layers/hour**
- **PM-PG/A:** layer transfer by centralized jaw head (PM) and hook head (PG) for plastic crates. Up to **600 layers/hour**
- **PH/A:** with magnetic head for tin containers or jars with metal lids. Up to **360 layers/hour**





# ROBBY PAL

## ROBOTIC PALLETISING AND MANIPULATION SYSTEMS

The **Robby** system is based on a comprehensive approach developed by Sipa to meet the increasing market demand of **packaging flexibility and efficiency** for a wide range of containers and packaging.

By integrating an anthropomorphic robotic arm with the other components required, Sipa can create equipment and systems for palletising/depalletising and handling packages, crates, cartons, packs, bottles, cans, pallets and interlayer pads.

Thanks to their **versatility**, robotic applications can be easily configured according to the product they handle:

### LAYER PALLETISER

An extremely **complete solution** to handle different types of containers and products. Thanks to its versatility and reliability, it is one of the most widely-used on medium- and high-speed bottling lines. This configuration can use the following head types:

- halving platform for packs and cartons
- jaws and hooks for plastic crates with and without windows
- magnet with release for tin containers or those with metal lids
- vacuum head for uniform, stable packs (e.g., packs of cans)

### ROW PALLETISER

This type of pickup is suitable **for low and medium speed lines**, but it can also handle special-shaped or large containers. The size and shape of the grippers have been designed on the basis of the type of container or package to be handled: Packs, Cartons, Crates, Big size bottles.

On this type of equipment, accessory devices can be integrated into the product gripper head (for example, interlayer or empty pallet grippers) which greatly reduces the amount of space required.

### LOOSE PRODUCT PALLETISER

This configuration is used to palletize both **filled and empty loose containers** in glass or PET. Head types that may be used in this configuration are:

- cups-type
- row pliers-type for lipped bottles only
- vacuum head
- halving platform for big loose containers only

### MULTIHEAD PALLETIZER SOLUTION

A single palletisation robot can handle a variety of products utilizing **two different layer preparation zones and two different head types**, i.e., one for packs and the other for loose bottles. The robot can work only one type of product at the same time and needs a semi-automatic head changeover to work another type of product.



## KEY VALUES



#### FLEXIBILITY

It can handle any type of container under any conditions and serve multiple lines at the same time (i.e., multi-head versions).



#### SPACE SAVING

The system allows for solutions with a reduced footprint, and it easily adapts to working areas of any size and layout, including pre-existing lines.



#### CHANGEOVER

Changeover downtime is very short, both for product format and head changes. Pallet layout can be modified by simply reprogramming the control panel.



#### MODULARITY

Robotized applications can be modular and integrated by combining applications with different functions. Custom configurations can be created to meet a wide range of needs.



#### CONVERTIBILITY

Robby can be relocated or converted easily in the event the installation needs to be modified in the future.



#### PERFORMANCE

Movements are extremely precise and consistent, the system can be applied to a wide range of production speeds, including high-end.





# ROBBY PAL - GRIPPING HEADS

In addition to its experience in creating the right system configuration and managing installation electronics, Sipa's breakthrough lies in the design and realization of a **gripper head for each product type and all manipulation modes**.

The range includes:

- halving platform
- pliers-type
- jaw-head and hook
- permanent magnet with release
- vacuum head
- inflatable pipes
- suction cup

Available on request **multifunction heads**, designed to handle not only the product but also other related elements such as empty pallets, plastic or cardboard interlayer pads, display trays, etc.

Thanks to their versatility, robotized applications are fully suitable for **"special" operations**, such as decanting system, bottle transfer, product pallet configuration, checking for empty pallets, etc.



KEG HANDLING HEAD



VACUUM HEAD



SUCTION CUPS HEAD



MAGNETIC HEAD



LAYER GRIPPING HEAD



MULTIPURPOSE GRIPPING HEAD



SELF-ADJUSTING  
PLIERS GRIPPING HEAD  
FOR ROW



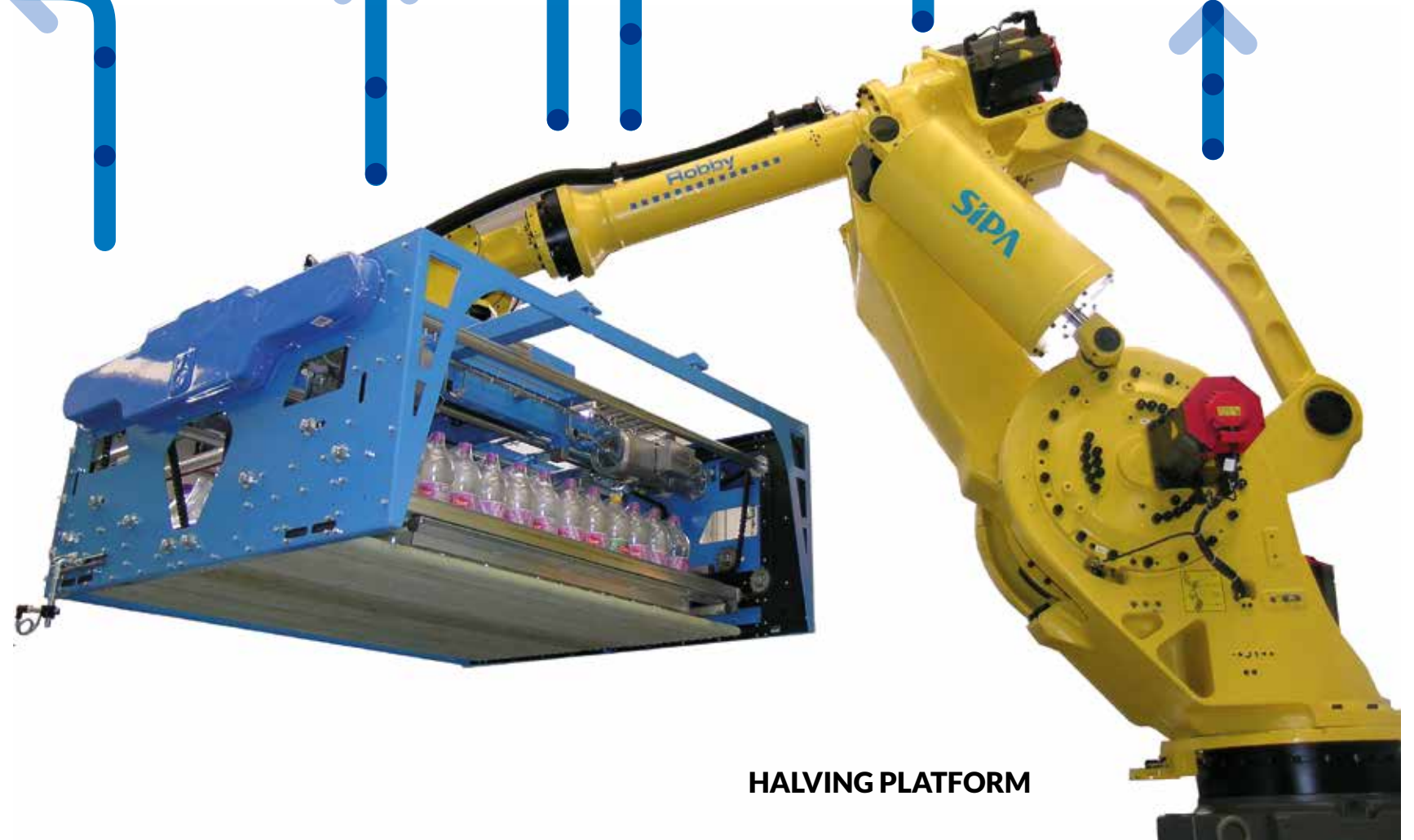
PLIERS-TYPE GRIPPER  
FOR BIG SIZE  
CONTAINERS



PLIERS-TYPE  
GRIPPER FOR DOUBLE  
ROW HANDLING



PLIERS-TYPE FOR  
PLASTIC CRATE WITH  
INDEPENDENT SECTOR  
GRIPPER



HALVING PLATFORM



# ROBBY RACK

## PALLETISER FOR LARGE-SIZE CONTAINERS ON RACKS OR PALLETS

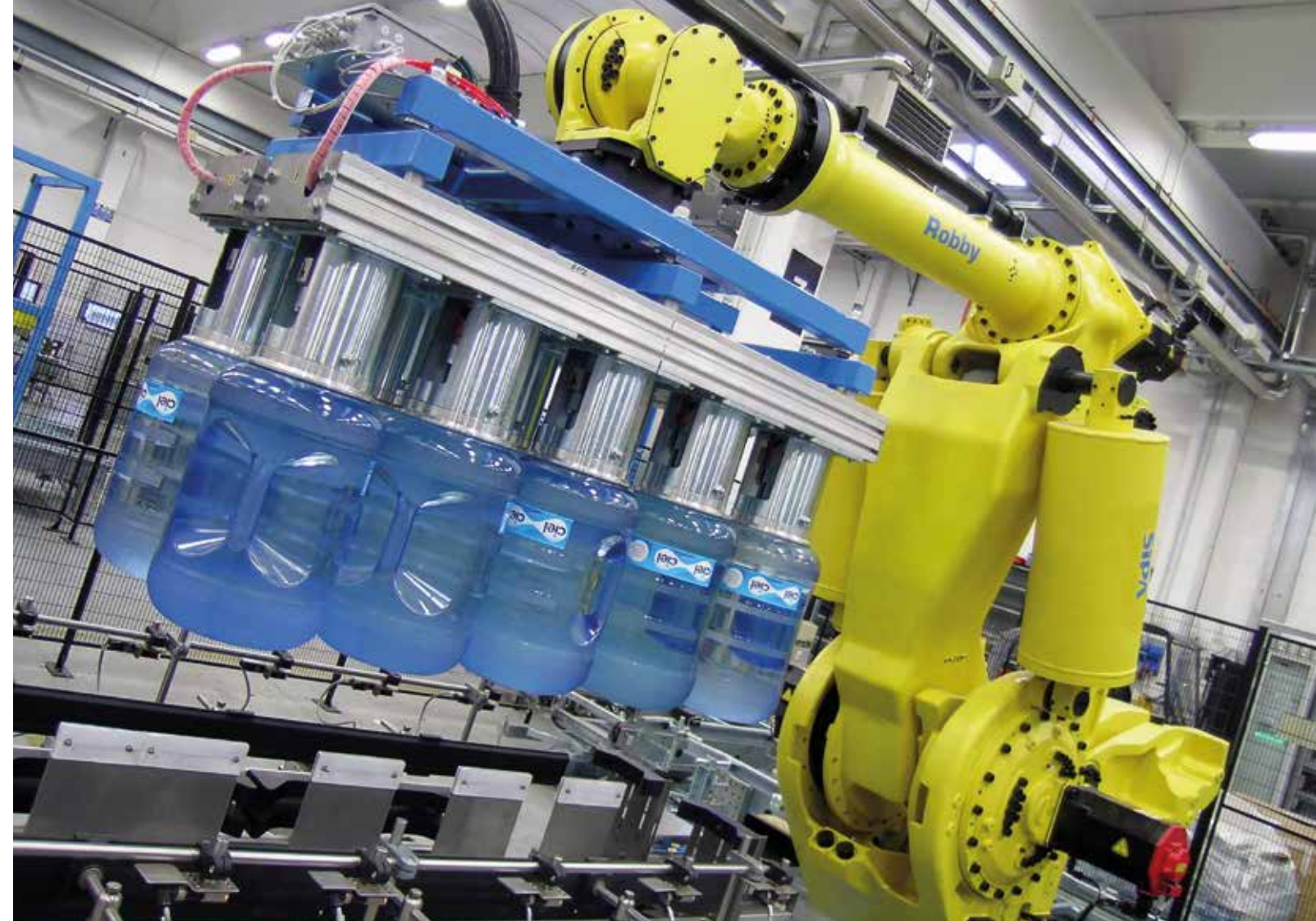
This application is particularly suitable for handling **from 5 litres up to 5-gallon bottles**.

Sipa first presented this configuration in 2000 and since then has acquired significant experience in handling a range of 5-gallon bottle types, including round, triangular and rectangular.

**Numerous types of racks** have also been utilized in both metal and plastic, and palletization on pallets completes the configuration options for this type of application.

Its 6-axis robotic configuration is especially good for complex movements, making it extremely suitable for handling “special” containers and packages, including large ones such as canisters, drums, kegs, etc.

Again, here the heart of the application is its head designed for optimum gripping during the entire handling process, without damaging the container in any way. Depending on the installation speed, **multiple heads** can also be mounted in order to handle a number of containers simultaneously (from 1 to 10 during the racking of full 5-gallon bottles) with the choice of robot model based on the weight to be handled.



A modular gripping system has been designed to provide for interchangeability of the grippers as the installation evolves over time.

For these operations, movement precision, reliability and consistency are fundamental, but there are also safety measures against unforeseen problems, such as damaged or defective racks. In these situations, the internal safety program stops the machine before the installation is damaged.

Robby Rack may be used for either **depalletising or palletising lines**, as well as in combined cycles to simultaneously empty and fill the rack.

If required by the application, **self-adjusting grippers** to handle special racks or ones of different sizes can also be supplied.



# GENIUS

## AUTOMATIC DEPALLETISERS RANGE

A range of complete, reliable depalletising solutions able to satisfy all the needs of the bottling, food processing and chemical/pharmaceutical sectors.



The range of **steady pallet depalletisers** with product outfeed from the bottom is extremely flexible and was designed to allow every user to create the most appropriate solution for their own needs. Based on a standard central unit and customization with different heads and accessory modules, it is possible to handle the widest range of container shapes.









- **DS**: sweep-off depalletiser with complete layer transfer by independent jaw head and intermediate table for empty loose containers such as glass, PET bottles and jars. Up to **180 layers/hour**
- **DSV**: similar to the DS model but with a special head that increases overall productivity. Up to **230 layers/hour**
- **DM-DG**: layer transfer by centralized jaw-type heads (DM) and hook heads (DG) for plastic crates, with or without window. Up to **320 layers/hour**

- **DH**: with a magnetic head for tin containers or jars with metal lids. Up to **360 layers/hour**

The range of **moving pallet depalletisers** with product outfeed from the top has been designed mainly for high production needs. In some cases, on the other hand, this configuration is particularly useful for solving logistics and space problems.

- **DC/A**: with independent movement jaws-type heads for glass, PET bottles and jars. Up to **360 layers/hour**
- **DH/A**: with a magnetic head for tin containers or jars with metal lids. Up to **360 layers/hour**
- **DM-DG/A**: layer transfer by centralized jaw-type head (DM) and hook head (DG) for plastic crates, with or without window

## PRODUCTS THAT CAN BE PROCESSED

	 PACKS	 CARTONS	 CRATES	 LOOSE PET BOTTLES	 LOOSE GLASS BOTTLES	 CANS	 GLASS PET JARS	 TIN CONTAINERS
DEPAL	GRIPPING SYSTEM	-	-	Jaws	Sweep-off	Sweep-off	Sweep-off	Magnetic
		-	-	Hooks	-	-	-	-
		-	-	DM	DS/DS-V	DS/DS-V	DS/DS-V	DH
	STEADY PALLET	-	-	DG	-	-	-	-
MOVING PALLET	-	-	DM/A	DC/A	DC/A	DC/A	DC/A	DH/A
	-	-	DG/A	-	-	-	-	-

### GENERAL FEATURES

- The depalletised layer is fed onto the line both on chain and air conveyors.
- Automatic system, requiring limited operator intervention, operating in complete safety.
- Extremely simple, complete operator control panel. Can be integrated with an advanced control and supervision system.







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