Case Study

THE SIMPLE PALLETTIZING SOLUTION - LR03

Skincare and cosmetic products have a long way to go before they land on shop shelves. A crucial step between production and delivery is palletizing packed goods. A leading German manufacturer of brand name products was looking for a flexible palletizing robot expressly for this purpose, one each for a total of seven production lines. These robots had to be able to stack assortments of sealed cardboard boxes ranging in weight from 3 to 15 kilo and measuring from 230 x 154 x 91 mm (L x W x H) to a maximum of 335 x 250 x 266 mm.

“Due to the relatively low ceiling height of less than four meters as well as the very limited amount of floor space available in the building in question, our customer expected a decidedly compact palletizing solution,” explains Langhammer Sales Manager Hans-Jörg Steffens. In addition, an easy to operate and maintain palletizing was called for, one with the option of subsequent expansions. The entire existing system was to be replaced and upgraded in two successive stages – while still maintaining the maximum amount of system productivity.
THE SOLUTION

The Langhammer palletizing specialists received the order based on their proposed concept and delivered a high-performance and modularly expandable central palletizing system with seven linear robots of the LR03 type within only three months. Each of these robots receives oncoming boxes at a transfer unit positioned at a height of 2,500 mm. These boxes are of one sort and are supplied and singled out by the conveyor technology on-site.

At the transfer position the robots clock in the boxes via brake belt and infeed rollers, they are then driven against a stop and pre-grouped for multiple picking by a servo-motor driven pusher onto a stainless steel textured plate. When layer patterns require product rotation this is carried out by the fourth robot axis.

The cycle output of the LR03 equipped with a multiple gripper achieves six cycles per minute. Depending on the stacking pattern, three, four or six products can be palletized at the same time per cycle.

Each LR03 is equipped with four Siemens Simotion servo-axes (X,Y, Z + C) and has a range of approximately 3.5 meters in length. The maximum free handling weight of the machine is 150 kg, including the weight of the gripper which comes to about 80 kg. The pick and place movement is controlled by a Siemens Simotion motion control; operation and visualization are handled by a Siemens color touch panel (GUI) with symbol and extended text display.

Of the 99 available programming memory slots in the base configuration, three different palletizing programs were configured for all seven linear robots. Overall there are 21 different programs in the first expansion stage of the system. “The controls are completely open and not a ‘black box,’ as is the case with other systems,” says Hans-Jörg Steffens.

The customer can modify the programs himself. Langhammer makes the source programming code for this purpose available to the customer on a CD. In addition, if required, the new Palletmaker program from Langhammer can be installed later for automatic offline programming of stacking patterns. “The customer was pleased with this modular concept and the fact that the installed servo-axes and the motion control both come from Siemens,” commented Hans-Jörg Steffens.
THE BENEFITS

In many areas the LR03 linear robot is an economic alternative to articulated robots. It does not move freely in space but within a clearly defined working area from left to right and top to bottom. The crucial advantage is its modular design. The LR03 can not only be precisely adapted in terms of dimensions to a specified area, but it can also be upgraded later with a minimum of effort and disruption of production. The customer, for example, can install a different gripper or, thanks to the open controls concept, set up additional palletizing programs (pallet stacking patterns) at any time. “The LR03 design has been kept so simple that the user can handle its maintenance and the replacement of spare parts on his own,” explains Hans-Jörg Steffens. Obtaining spare parts is a cost-effective affair as only standard components, readily available on the after market, have been installed.

The LR03 helps to save costs in other ways as well: Its Siemens Simotion drive units convert braking energy into electric current, not into heat. This results in a power consumption of 1.0 to 1.5 kW/h for each LR03 in normal use - a valuable environmental aspect. A further advantage for the customer: the stand alone machine arrives, painted in the color of choice, as a finished, ready to use system - all from one source. This high-quality unit stands out due to its compact design and the minimum amount of space it requires.

Access to box grouping and palletizing areas is provided by the central cell door in the safety area of the LR03. Each robot has a safety area of its own and can be stopped for maintenance purposes without needing to shut down the other linear robots. The maintenance personnel are protected at all times by the individual safety cells.

In contrast to conventional articulated robots no foundations are required. This reduces construction costs and moving the machine can be done flexibly and cost-effectively.

SUMMARY

The compact LR03 linear robot from Langhammer with drive unit, servo-axes, and Siemens controls and touch panel is an economic and maintenance-friendly alternative to articulated robots.
Case Study LR03

TECHNICAL DATA

Length: 3700 mm
Height: 3700 mm
Width: 2500 mm

12” Siemens MP 377 Color Touch Panel

Power consumption: 1.0 to 1.5 kW/h in normal operation