

AUTOMATION. The demands placed by the converters on rapidly-running processes, high article numbers and molded part quality are putting the manufacturers of automation systems to the test. Consequently, the manufacturers are increasingly offering individually-tailored, all-in systems, on a modular basis, which can be aligned to the job in question in each case.

Plastics Processing – Rapid and Reliable

The automation of plastics processing operations has now become standard in industry. The converters' stringent demands on the process reliability of the robots and control apparatus, on the speed of the demolding and handling units, on the customizability of the individual systems and, not least, on cost aspects, is making the selection of the correct system into a highly complex matter. And the manufacturers are continuing to develop their systems still further in a bid to convince the plastics converters of the advantages of automated processing.

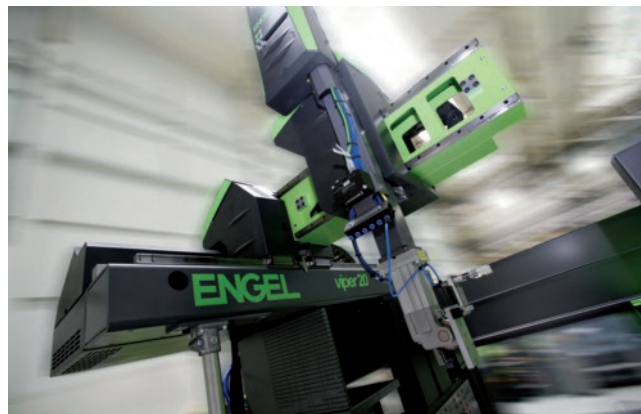


Fig. 1. The Viper robot series can be seen in a number of different applications (photo: Engel)

Engel "Controlled Vibration"

The trend for companies to present themselves to customers as system suppliers is making itself felt in automation technology, too. Engel Austria GmbH, Schwertberg, Austria, for example, is presenting its new series of linear robots. These go under the name of Viper (**Fig. 1**) and are set to replace the ERC series. The design of the Viper models with their laser-welded steel profiles has led to savings on the machine weight, thus giving rise to high dynamics. Various software features ensure shorter cycle times, increase productivity and make for a longer service life. A spe-

cial program is able to establish the material that is being handled online and adapt the dynamic values accordingly, thus enhancing the acceleration behavior; "vibration control" reduces the natural vibration with long axle dimensions too, and "efficiency control" optimizes the productivity-to-energy-consumption ratio for the robot movement. The self-optimizing acceleration and velocity values keep the waiting time prior to handling to a minimum, thus avoiding unnecessary loads on the mechanics and power train.

▶ Hall 15, booth B42 and C58

Wittmann Protection against Collisions

With 70 exhibits from seven different product areas, Wittmann Robot Systeme GmbH, Gross-Umstadt, Germany, is one of the exhibitors with

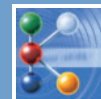
the biggest product range. In the field of robots and automation systems, Wittmann will be presenting its W873 robot and the R8 control generation, inter alia, which offers an extended range of functions. Key modifications to details and other improvements differentiate the new robot from the preceding W773 model. The load-carrying capacity is now 125 kg, with a maximum vertical

stroke of 3,000 mm; a version with a vertical stroke of 3,600 mm and a load-carrying capacity of 60 kg is similarly available. The demolding stroke is designed to be 2,000 mm as standard, and the horizontal axle is supplied in lengths of 4,000 mm and more. The robot is equipped with the R8 control unit, which permits a large number of additional functions. These include servo-operated rotations in axes A, B and C. Complex part removals can be achieved through independent vacuum and gripper circuits. Cylinders incorporated in the grippers are controlled as integral, uniform function blocks.

The new control generation (**Fig. 2**) is not only equipped with the already familiar real-time functions of TruPath, SmartRemoval, Soft-Torque, PartTrack plus the energy-saving option, EcoMode, but also with the innovative ACD function (Automatic Collision Detection). At speeds of less than 250 mm/s, this safety function, which is permanently active in the background, instan-



Fig. 2. The new R8 control generation offers active collision protection (photo: Wittmann)



taneously recognizes any increase in the motor torque during horizontal displacement and switches off the motor once a preset threshold value has been reached.

► Hall 10, booth A04

Fipa Getting a Strong Grip

With intelligent vacuum technology, Fipa GmbH, Ismaning, Germany, is supporting companies to reduce their energy consumption and hence their operating costs. The newly developed ejectors in the EKPP, EKP and EMM series operate with a compressed air control that is independent of the compressed air network and thus get by with less compressed air. In this way, they can save up to 50 % on their energy costs. In addition, less compressed air also means less sound emission.

The large-area gripper with six different basic formats from 70 x 70 mm² up to 160 x 160 mm² fastens onto any part, inde-

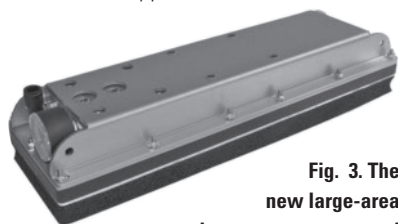


Fig. 3. The new large-area grippers save energy and operating costs (photo: Fipa)

pendently of the material, size, shape and weight and the position in which the workpiece is clamped (Fig. 3). The vacuum that is required is generated by integrated ejectors or an external vacuum supply. The valve technique employed has a high leakage tolerance. In this way, when the vacuum is generated, more air can be sucked out between the gripper and the workpiece, making it possible to tolerate a greater porosity in the product being handled and the suction mat. Suction openings that are not in contact with the product remain closed, thus reducing the compressed air consumption and the energy costs. Both on the ejectors and the large-area grippers, the valve technology is protected against dirt, thus ensuring a high system availability and a high level of process reliability.

► Hall 10, booth E66



Fig. 4. The ONP1-A ultrasound-based, magnetostrictive displacement measurement unit is easy to install (photo: Gefran)

Gefran Visual Programming

As a supplier of all-in solutions for the automation of plastic processing machines, Gefran Deutschland GmbH, Seligenstadt, Germany, offers three application packages for injection molding, extrusion and blow molding. The user-friendly programming tool, GF_Project, with graphic user guidance is particularly suitable for developers who prefer a visual programming method. Gefran is also presenting a complete HMI range in its GF_Vedo series. Users can choose between 14 high-performance operating terminals with high-grade processors and touch screens, ranging in size from 3.5" to 15". The GR_Looper control unit is available as an all-in-one solution for the temperature control. The functions of eight or 16 independent control channels are concentrated in a small space.

From the sensor product range, the ONP1-A no-wear displacement measurement units are being displayed (Fig. 4), which are based on the patented ONDA magnetostrictive technology. The new sensor, which is noted for its simple installation, maintenance and availability, constitutes an alternative to potentiometric displacement measurement units in injection molding and blow molding machines.

► Hall 10, booth F20

Kuka The Strongest Console Robot

Kuka Roboter GmbH, Augsburg, Germany, is meeting plastic-sector requirements with its new generation of Quantec-series console robots and the KR C4 control unit generation.

The console robots divide up into two series. The Quantec K ultra, with a weight of 270 kg and a span of 2,900 mm, plus a load-bearing capacity of 120 kg, is claimed by the company to be the world's strongest console robot with the highest power density, while the Quantec K prime is designed for a payload of between 90 and 210 kg. The console robots are 12 % lighter than their predecessors and hence easier to mount on injection molding machines. In conjunction with the control unit and a new drive technology, the robots should shorten demolding times by up to 25 %. The work area is extended considerably towards the front, and also underneath, by having axle 2 shifted 400 mm towards the front.

The new KR C4 control system incorporates not only the robot, movement, sequence and process control but also a full-scale safety controller (Fig. 5). This means that the control system is able to fulfill all assignments alone, and the hardware components that imposed restrictions have been replaced by intelligent software functions. As a further feature, the control system incorporates an intelligent energy management



Fig. 5. The KR C4 control unit incorporates all the functions for reliable and efficient operation of the robots (photo: Kuka)

system which considerably reduces the energy consumption in standby mode. When production is not running, a "virtual main switch" reduces the power consumption of the control unit, in increments, by up to 90 %. When the robot is needed again, the short start-up time ensures the system is available again immediately.

► Hall 12, booth C49

ASS Operation within a Very Confined Space

When classical handling technology comes up against its limits, ASS Maschinenbau GmbH, Overath, Germany, implements its PA-forming process. If conventional grippers can no longer be employed for very small parts or filigree contours, ASS produces individually adapted grippers by the laser sintering process (Fig. 6). Since this rapid manufacturing gets by without molds, the solutions are implemented promptly for the company's customers, and are also produced in small batch sizes. The time it takes to build the generatively-manufactured gripper depends on different parameters, such as the layer thickness, the scanning speed of the laser and the size of the part. The complexity has no influence on the costs. In addition, the grippers can be combined with the familiar handling techniques, such as a robot hand or vacuum suction units – air channels can also be incorporated in the geometry.

► Hall 10, booth J22



Fig. 6. Laser sintered handling components are aligned to individual jobs (photo: ASS)

Hahn Automation Process Cell for Cleanroom Applications

Hahn Automation GmbH, Rheinböllen, Germany, is putting its full range of handling units on show for the first time. The SmartLine series of linear robots is made up of units for those making the initial move into automation and includes four sizes with standardized axle lengths and equipment packages for "pick and place" jobs which require a load-bearing capacity of between 3 and 15 kg. For more demanding handling assignments and loads of between 5 and 8 kg, the company offers its FlexLine series with individually configurable telescopic and tandem axles. To satisfy stringent demands and high loads of between 6 and 80 kg, the company supplies its ProLine linear robots in five different sizes. A comprehensive kit with different fitting options permits adjustment to the job on hand. The portfolio is rounded off by removal units that offer two design levels for sprues and small parts. The SmartPickers have a pneumatic drive, while the ProPicker series has servomotor drives.

Alongside this, Hahn Automation is presenting a process cell for cleanroom applications. The MasterCell-CleanRoom (Fig. 7) can be used to carry out machining operations under cleanroom conditions that comply with Classes 8 and 7, or alternatively, Classes 6 and 5 to DIN EN ISO 14644-1. A laminar flow unit is positioned above the full area of the cell. As standardized automation platforms, the cells are designed to be combined with injection molding machines for medical-technology and pharmaceutical production.

Fig. 7. The modular MasterCell-CleanRoom is used for assembly applications under cleanroom conditions (photo: Hahn Automation)

As standardized automation platforms, the cells are designed to be combined with injection molding machines for medical-technology and pharmaceutical production.

► Hall 11, booth E25

Star Automation Emphasis on Efficiency

Star Automation Europe S.p.A., Caselle di Santa Maria di Sala, is showing the result of its development work: the two revised series of Gxe and ixel linear robots (Fig. 8). The Italian manufacturer focused first and foremost on increased efficiency. Both series are now being presented with improved energy efficiency and more rapid axle movements. They also have a new, user-friendly

Fig. 8. The linear robots combine improved energy efficiency with faster movement sequences

(photo: Star)

control system with a bigger LCD touch screen display. Star is exhibiting two automation systems for part handling and packaging, as well as an in-mold labeling application.

► Hall 11, booth G74



Hekuma Production Learns to Sprint

Hekuma GmbH, Eching, Germany, is presenting an overview of its comprehensive range of products for the high-performance handling and processing of injection molded parts. An automation system which increases productivity for what are currently still free-falling molded parts is being displayed by way of an innovation. The central components of Hekuma's automation units are the proven linear handling units, Heku 2 and Heku 3. A new drive layout, new drive components and a new control concept are intended to shorten intervention times in the injection mold still further. All the system components are also available in a cleanroom version.

The HekuCell is being presented as a further exhibit. This is a compact and flexible high-performance handling cell that can be combined with small and medium-sized horizontal injection molding machines (Fig. 9). With a six-axle rotating arm robot, it is designed for automatic part handling on fast-running injection molding machines.

► Hall 10, booth D40



Fig. 9. The HekuCell as a standard module for automating part removal on small and medium-sized injection molding machines (photo: Hekuma)

KuZ Leipzig Assembly Solution for Micro-optical System

The Kunststoff-Zentrum in Leipzig (KuZ), Germany, working together with partners, has developed a modular automation and assembly solution for the production of inexpensive micro-optical systems in plastics in flexible batch sizes. This production cell (Fig. 10) is being shown in operation for the first time on the KuZ and DesmaTec booth (D75, Hall 13). Working on the basis of the shot weight-optimized, two-component micro-injection molding process, the system takes in downstream steps, such as assembly, handling, logistics and in-line measuring and testing methods. It is based on the formicaPlast-2K modular micro-injection molding machine. This process integration saves work steps, energy, material and cycle time. A large number of application options result for function-integrated micro-optic systems in optoelectronics, medical technology, tele-

communications and measuring technology.

► Hall 13, booth D79

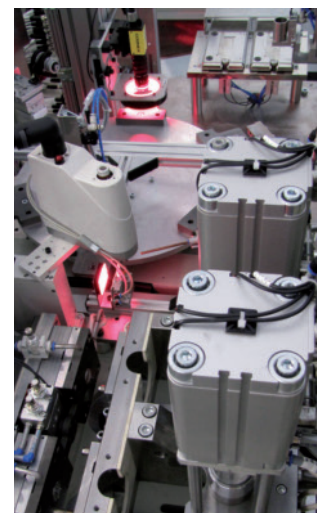
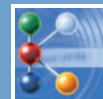


Fig. 10. Modular assembly solution for the production of micro-optic components with quality control (photo: KuZ)



Waldorf Safety First

Waldorf Technik GmbH & Co. KG, Engen, Germany, is presenting applications for its medical-technology automation solutions – on its own booth and on the booths of two injection molding machine manufacturers. On the Netstal booth (D24, Hall 15), all 96 grippers for removing the cap closures produced under cleanroom conditions are individually controlled so as to ensure a flexible response to any problems that may occur. If an individual cavity remains blocked off by the continuous quality control, the production cell will continue to operate unchanged. The robot promptly segregates out blocked products. The product quality and patient security that is so essential in this market is thus guaranteed on a permanent basis.



Fig. 11. Modular handling systems permit customized alignments

(photo: Waldorf)

At Sumitomo (SHI) Demag (Hall 15, booth D22), the focus is on a system for producing pipette tips with 32 cavities. The handling systems used are of a modular design, so that they can be rapidly aligned to new products (**Fig. 11**). The top priority during the removal and cavity-based deposition of the parts is 100 % product quality here too. This is why the pipette geometry is subject to a comprehensive inspection by cameras.

► **Hall 7A, booth B02**

Sepro Cartesian Solutions

With the S5 line embedded in the Visual 2 control unit, Sepro Robotique GmbH, Rödermark, Germany, is presenting the fifth generation of its “Cartesian automation solutions”. Robots S5-25 and S5-35 were developed for a clamping force range of 1,200 to 4,500 kN and 3,500 to 8,000 kN respectively and, with their new mechanics, permit higher operating speeds. Compared with the fourth generation, the S5 line offers a 50 % increase in payload capacity up to a maximum part weight of 20 kg and a 16 % higher stroke capacity. The demolding arm on the new series has been made 10 % narrower. This shortens the opening displacement

for the mold, leading to shorter cycle times, too.

► **Hall 10, booth D59**

Conclusion

The manufacturers of automation systems are responding to the requirements of the plastics processors and are now offering systems that are safer and faster and operate with greater precision than previous generations. Great value is placed on ease of handling and the simple set-up of the systems. The ongoing trend towards energy efficiency is similarly affecting automation too and is forcing the manufacturers to engage in constant further development work – a visit to the fair could thus certainly pay off. ■

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