Efficiency that works

ENGEL automation

ENGEL
be the first.

Linear thinking. **Sys**

stem thinking.

System thinking.

Efficiency that works.
ENGEL automation.

Straight ahead. And efficient. As a linear robot from ENGEL. That's how we solve your automation tasks. The **intelligent ENGEL viper linear robot is the optimum solution** for many of these tasks. It is powerful, dynamic, stable and fast. And it features maximum operating convenience.

But ENGEL automation does not only think "linear". We always see the injection moulding process as a whole. That's why **you can always expect complete system solutions from ENGEL**. Highly integrated production cells. Turn key. Total solutions in which the individual system components such as the machine, multi-axis industrial robot, linear devices, camera technology, tracing solutions and much more are perfectly coordinated.

All this is in the interests of efficiency. For premium parts quality, stable processes and increased overall productivity for your injection moulding production.

rthinking.

powerful

ENGEL viper.
The **powerful** linear robot

Maximum stability, impressive dynamics and maximum user-friendliness. The new ENGEL viper combines all of these things with ease: it saves weight thanks to its innovative design using laser-welded steel sections and convinces users with a substantially higher load-bearing capacity.

More efficiency due to intelligence. Thanks to clever software such as vibration control and mass identification, it automatically reduces structure-borne vibration, even with longer axis dimensions, and optimises its movements and dynamic values to achieve better efficiency. The impressive results: ultra-fast cycle times and maximum productivity accompanied by low energy consumption.

The benefits

Lightweight but powerful

- Optimum dynamics
- Highest load-bearing capacity
- Uncompromising design

More intelligence

- Mass identification
- Vibration control
- Efficiency control

Even greater convenience

- Compact drive technology
- Simple operation
- Flexible installation

The range of applications

By virtue of its high performance and economy, the ENGEL viper has established itself with customers who purchase it even without a new ENGEL machine.

ENGEL viper

- on an **ENGEL injection moulding machine**
- on an injection moulding machine **of another manufacturer**
- as a **replacement** for an older robot

The ENGEL viper **series**

ENGEL viper 6

Nominal load-bearing capacity:	6 kg
X-axis:	300/400 mm
Y-axis:	400/600/800/1,000 mm
Z-axis:	1,040–2,960 mm
Rotary axes:	B/C pneu

ENGEL viper 12

Nominal load-bearing capacity:	12 kg
X-axis:	400/600 mm
Y-axis:	400/600/900/1,200 mm
Z-axis:	1,040–2,960 mm
Rotary axes:	B-/C-pneu, B-/C-servo

ENGEL viper 20

Nominal load-bearing capacity:	20 kg
X-axis:	500/700 mm
Y-axis:	800/1,000/1,300/1,500 mm
Z-axis:	1,400–6,200 mm
Rotary axes:	A/B/C pneu (A/B/C-servo)

ENGEL viper 40

Nominal load-bearing capacity:	40 kg
X-axis:	700/900/1,200 mm
Y-axis:	1,000/1,300/1,600/1,900 mm
Z-axis:	1,880–8,120 mm
Rotary axes:	C pneu (A/B/C-servo)

ENGEL viper 60

Nominal load-bearing capacity:	60 kg
X-axis:	1,000/1,300/1,500 mm
Y-axis:	1,400/1,800/1,600/2,200/2,600 mm
Z-axis:	1,880–8,120 mm
Rotary axes:	C pneu (A/B/C-servo)

ENGEL viper 90

Nominal load-bearing capacity:	90 kg
X-axis:	1,500/2,000 mm
Y-axis:	1,800/2,400/3,000 mm
Z-axis:	2,360–10,040 mm
Rotary axes:	A/B/C-servo

Lightweight but **powerful**

powerful

Laser-welded steel construction
Weight-optimised

The laser-welded steel construction of the ENGEL viper provides a **substantially higher level of flexural rigidity** per unit of length compared to aluminium. This ensures accurate positioning. Overall, the robot can cope with significantly higher working loads than similar handling devices. In addition, the new mechanical design brings two further benefits: it enables mirrored variants due to the extremely compact robot configuration. This results in substantially reduced space requirements. In addition, the design permits maximum distance between guides – for a high degree of stability of the robot.

Wide range of possible combinations.

Thanks to the **wide range of standard options,** the ENGEL viper offers a multitude of different combinations, e.g.

- **Dual tower** (two robots on the ejection axis, e.g. for stack moulds)
- **Dual robots** (two robots on the Z-axis)
- **Mirrored variants (operator side, non-operator side)**
- **Sprue picker** (for 3-platen moulds)

rful

optimisation

Greater **control**

More **intelligence**

elligence Efficiency **faster**

Mass identification

Due to this patented technology **the robot detects the working load automatically within a cycle.** And adapts the dynamic values accordingly. Thanks to this dynamic model the ENGEL viper ensures a uniform mechanical load. Which means:

- The robot moves faster when it has less to carry. **Benefit to you: shorter cycle times and increased productivity.**

- The robot moves slower when it has more to carry than normal. This protects the mechanical components, **ensuring an even longer robot service life.**

Efficiency control

According to the motto "as fast as necessary – not as possible", the robot optimises the acceleration and speed values. And it **minimises robot waiting times.**

- Take-off starts "just in time"
- Freely selectable waiting period in take-off position
- Avoidance of unnecessary stress for mechanism and drive train
- Assurance of a long service life
- Reduced energy consumption, resulting in up to 25% lower costs

Vibration control

Thanks to this software, **structure-borne vibrations are reduced**. This substantially increases path and positioning accuracy. The positive consequence: shorter cycle times are possible. This software has been filed for patent.

No vibrations are good vibrations
No vibrations

Even greater **convenience**

Even greater
State-of-the-art

Less air consumption

convenience

Drive technology: state-of-the-art

The ENGEL viper is fast, thanks to state-of-the-art Ethercat bus technology. And it is spacesaving. Due to the extremely compact design of the switch cabinet, which houses six servoaxes. The robot operates with multiturn absolute position encoders. Benefit to you: the elimination of robot components permits maximum availability. The referencing usual in other robots after switching on/off is unnecessary with the ENGEL viper. Besides the added convenience and safety, this also gives you considerable time savings.

Further drive technology highlights of the ENGEL viper:

- Drive diagnosis directly on control unit
- Optional central lubrication – linear axes are lubricated path-dependently

50% less air consumption

The operator can easily set the vacuum system on the control unit. This eliminates the need for manual adjustment on the robot, for which purpose ladders or other climbing aids are required. **The new pneumatic system cuts air consumption by 50%.**

Everything under **control.** With the **RC 200 robot control unit.**

Robot control unit = machine control unit

Because ENGEL supplies injection moulding machines and robots from a single source, **full integration of the two control landscapes is guaranteed** without the need for a Euromap 67 interface. The RC 200 robot control unit is integrated into the machine control unit CC 200 as a subsystem.

The benefits

- **Simple operation:** uniform, concise and logical operation of the machine control, also for robot control
- Single **data management** for injection moulding machine and robot
- Considerably **increased productivity** thanks to synchronised movements

It speaks **all languages**

A state-of-the-art control unit needs to keep on top of highly complex processes. While providing for quick and simple programming. The ENGEL RC 200 fulfils this requirement to perfection. It speaks **the language of the machine operator as well as that of the system adjuster and programmer**.

The robot control unit speaks **the language of the system operator and adjuster**

In the so-called **simple view** the robot sequence is clearly and simply displayed in the form of a circle. The sequences are graphically visualised in chronological order on the cycle. In addition, the operator sees the current working position of the robot. By pressing one of the sequence icons the adjuster can adapt its function to the desired sequence or select a completely new sequence.

No programming skills needed

Numerous predefined standard sequences in the control unit are available to the operator for different applications in automation. The adjuster does not require any programming skills. He simply selects a sequence and can adjust the process sequences contained therein to current requirements by exchanging options. All settings (positions, speeds and waiting times) required for the selected sequence are displayed in a clearly laid out setup page.

This means simple automation tasks can be peformed cost-effectively **without additional programming personnel.** Furthermore, tooling times are reduced.

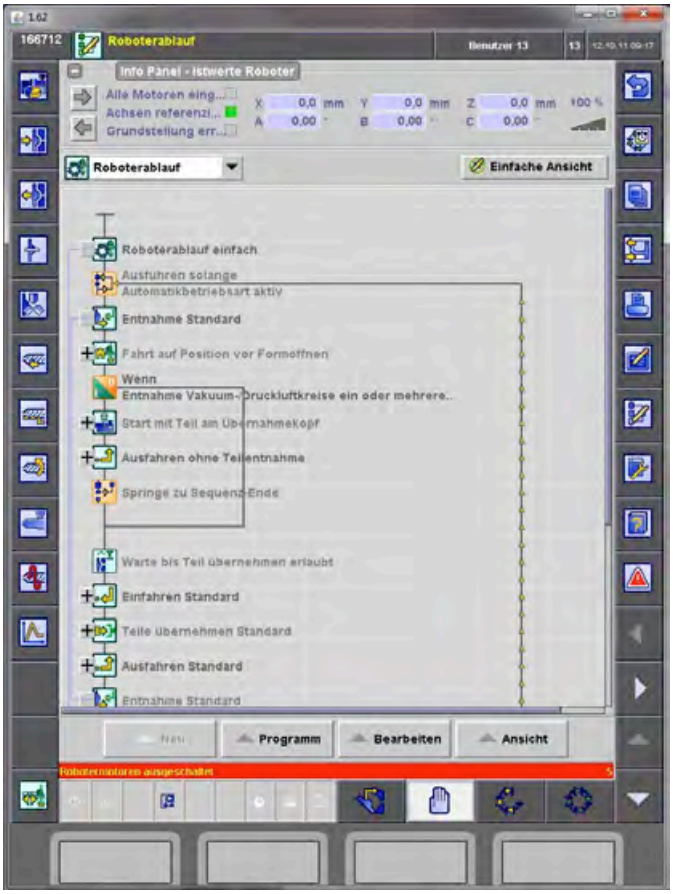
Ideal for system operators and adjusters: *the viper Wizard guides the system operator through the menu.He only needs to decide yes or no. Once all questions have been answered, he will be guided through the positions which must be set for the complete program sequence based upon his choice. The next step is the simple view (picture right).*

The robot control unit speaks **the language of the programmer**

If complex control tasks are to be performed, the system programmer can discharge them quickly and efficiently with the ENGEL RC 200 in the **extended view**. The extended view offers the full spectrum of functions.

The robot or automation sequence is displayed with graphic symbols. To simplify the view, instruction groups are combined into sequences. **This produces a clear overview, even of complex sequences.** The zoom function is used to open up sequences and display all instructions of the respective sequence. Instructions to be inserted are simply selected from an extensive function list and placed at the appropriate position in the sequence.

Parameters are set directly in the graphic display by pressing the instruction graphic in the sequence. This enables **even complex sequences to be configured in the shortest time.**



For programmers – extended view of the RC 200: *the parameters are inserted directly into the graphic display, so that even complex sequences can be quickly configured.*

"Anyone who can use the injection moulding machine can also operate the robot."

Full integration of six-axis robots

In addition to the linear robots, the multi-axis industrial robots can also be fully integrated into the ENGEL system philosophy **– without a Euromap 67 interface.** This is made possible by ENGEL easix. With this innovation the ENGEL RC 200 or CC 200 control unit can control the six rotational axes of industrial robots.

The industrial robot is thereby programmed with the **familiar and simple graphical instructions** of the RC 200 control unit.

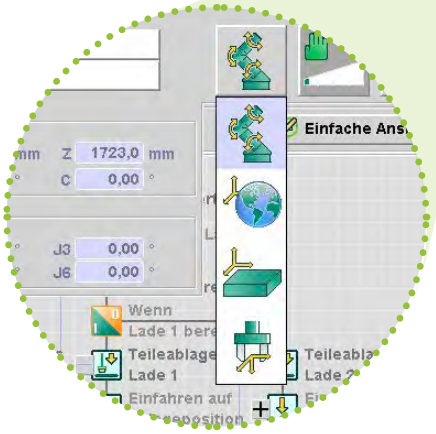
The additional movement instructions for the industrial robot can be seamlessly integrated into the graphical user interface of the extended view. An operator who is able to prepare the sequences for linear robots **can also quickly learn to program jointed arm robots**.

ENGEL customers are thus perfectly prepared to respond to the demands of the future. The trend towards a higher degree of automation is continuing.

integration

s robot

Simple integration of an industrial robot thanks to ENGEL easix: *for simple and cost-effective implementation of your six-axis robot applications in medical technology. Particularly in combination with tie-bar-less injection moulding machines and filter-fan units, all benefits are combined in a compact production cell (Picture: Stäubli robot TX90).*



Competence for system solutions. **Turn key.**

Highly integrated production cells from one source.

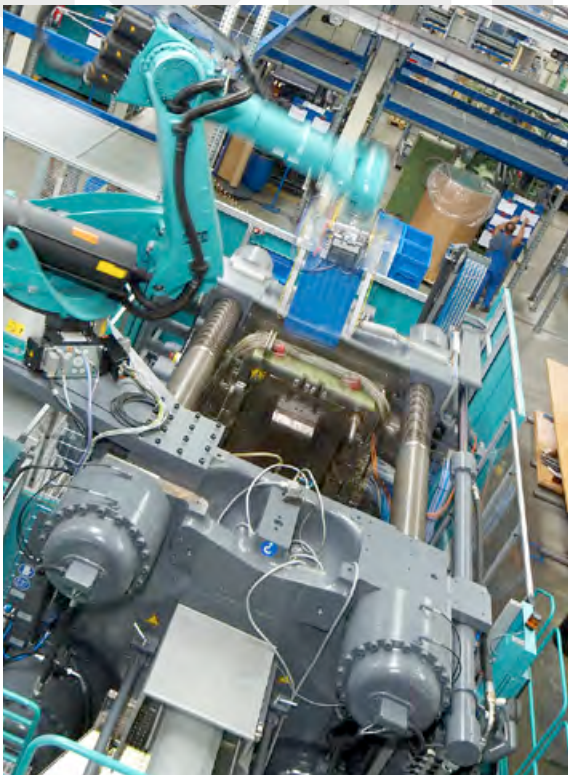
Whether multi-component injection moulding, in-mould labelling or insert technology: the trend towards **integration of several process steps** into a highly-automated production cell continues at a fast pace.

Do you need complex, highly integrated production cells, in which several injection moulding machines produce parts, linear robots **interact perfectly** with industrial robots and extensive processing steps such as quality control using state-of-the-art camera technology, selection and packaging?

The specialists at ENGEL automation systems **will handle the overall concept systems** and implementation of your demanding projects. And they will ensure that all parts are precisely coordinated and mesh seamlessly into one another.

In the service of efficiency. For premium parts quality, stable processes and increased overall productivity.

System solutions automatic



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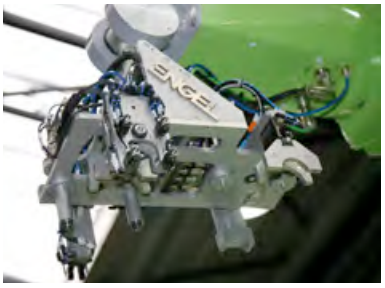
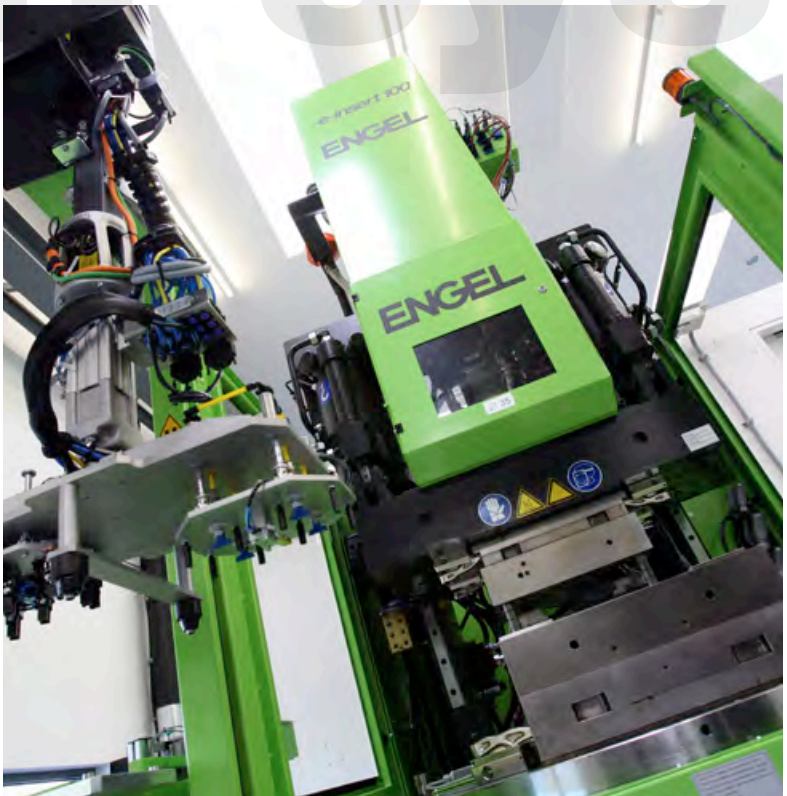
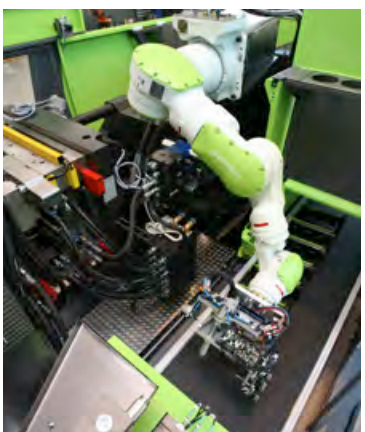
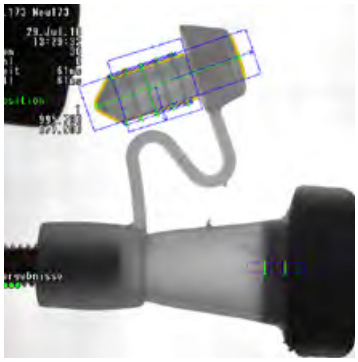


ompetence
on system

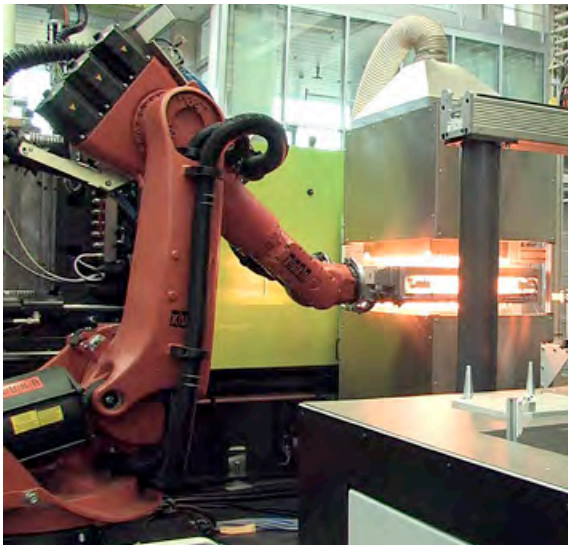


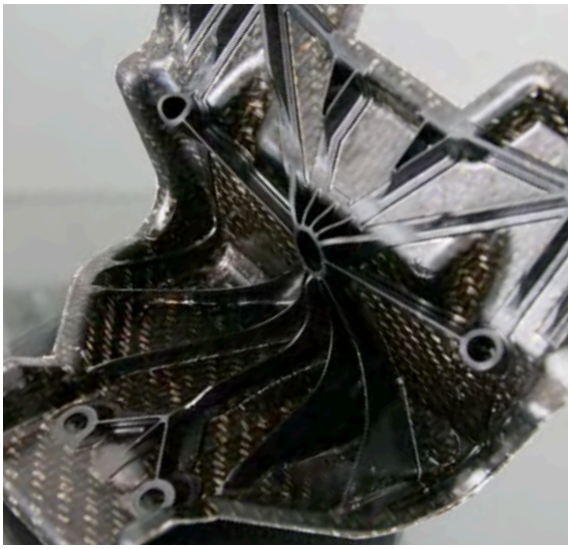


ENGEL turnkey system *– door panel production at Dura Automotive in Strakonice, Czech Republic: two large ENGEL duo 900 machines, each equipped with an ENGEL viper 40 linear robot, stand parallel to one another. Between them are the units for finishing moulded parts: a laser unit, two plasma treatment units, two six-axis robots, a foam unit and a hardening oven.*



Extremely compact design of the overall system *– innovative clean room production of a 2K medical valve. A six-axis robot by Stäubli removes the parts, using a camera to inspect and deposits them sorted by cavity. A highlight: the six-axis robot control unit is fully integrated into the CC 200 machine control of the ENGEL victory (to learn more about six-axis robot integration see pages 16 | 17).*





Competence in lightweight construction: *steering column of PA, reinforced with organic sheeting (replaces steel and aluminium sheets): the production cell with an ENGEL duo 500 pico, two ENGEL linear robots and an industrial robot, as well as a laser cutting unit.*

Competence Experie

30 years of experience in automation

ENGEL recognised the **trend towards injection moulding automation at an early stage.** The first robots for the automation of injection moulding machines were developed in ¹980. Only a few years later, the production of robots started with the founding of ENGEL Automation Technology – an independent division within the ENGEL Group.

These 30 years of experience **have produced a high level of automation competence** which we implement in your projects.

Global leader

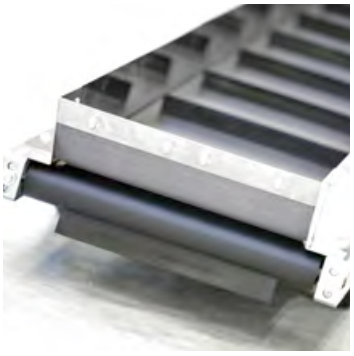
Today nearly one in two automated production cells sold by European injection moulding machine manufacturers is supplied by ENGEL, as is one in four robots delivered to the injection moulding industry in Europe. This makes ENGEL the clear global leader in injection moulding machine automation. **More than ¹5,000 ENGEL robots are currently deployed worldwide.** ENGEL Automation Technology currently has three locations: Dietach (Austria), Schwertberg (Austria) and Hagen (Germany).

ence **Global** leader **Robots**










save money
up to € 5.000,-

Efficiency Bonus!
ENGEL viper!

ENGEL Linear robot replacement investment
up to 5.000 €
EFFICIENCY BONUS !*

From OLD to NEW!

Migrate to state-of-the-art production efficiency. Exchange your old linear robot*) for a new and powerful ENGEL viper.
And save money! Up to Euro 3,500,--

How to claim your bonus:

- Register - Learn Details
- Return the identification plate or the CPU of your old linear robot to ENGEL
- Purchase of a new ENGEL viper robot
- Redemption of the efficiency bonus

ENGEL viper 6	**€**	**750,-**
ENGEL viper 12	**€**	**1.000,-**
ENGEL viper 20	**€**	**1.500,-**
ENGEL viper 40	**€**	**2.000,-**
ENGEL viper 60	**€**	**2.750,-**
ENGEL viper 90	**€**	**3.500,-**
ENGEL viper 120	**€**	**5.000,-**

*) the old robot must at least be three years old (valid for all manufacturer brands)

ENGEL automation
ENGEL AUSTRIA GmbH | A-4311 Schwertberg | tel: +43 (0)50 620 0 | fax: +43 (0)50 620 3009
email: sales@engel.at | www.engelglobal.com

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ENGEL Efficiency Bonus, ENGEL viper, Okt. 2013

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