automation

Perfectly aligned components and system solutions

ENGEL

be the first

The dynamics of the market pose increasingly more complex challenges to your production. ENGEL automation offers solutions which exactly match your required automation depth: from catalogued components for modular solutions to professional engineering projects for system solutions.
Automation competence at all levels: We design and deliver complete production systems where all sequences from the injection moulding machine and robot to the automation peripherals are perfectly synchronised. You can therefore rely on the highest part quality, stable processes and maximum productivity – and that your entire production runs smoothly.

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ENGEL automation – overview

your partner for innovative injection moulding applica-

ENGEL is the global market leader for injection moulding machines.
And: Number 1 in the automation of entire production cells. In addition to our sales subsidiaries and our worldwide service network, more than 450 specialists at ENGEL are dedicated to the development and production of standard and system solutions for innovative technologies in all sectors. Our competence centres provide you with focused know-how for your application, CE certification, and efficient, complete project engineering.

Extensive service portfolio

the entire production cell from a single source

ENGEL develops and produces all essential components for the automation of your injection moulding cell. Your optimal solution is composed of a multitude of products with extensive options. Experienced technology companies supply us with selected supplementary equipment.
From the conceptual idea to implementation and service, you have a responsible contact person at your side

Optimally matched products

everything fits together perfectly everything works together

The mechanical and control engineering integration of individual components results in appealing, very compact solutions whose function is optimised in terms of performance and user-friendliness.
Many components are perfectly coordinated already during the construction and are available as tested standard modules

Worldwide automation centres

the consistent solutions and best service from Europe to Asia and America

Experts from our worldwide automation centres offer support in the design and conception of your automation cell, drawing on the know-how and expertise of the entire ENGEL network. If you intend to set up production cells with the same standards in different countries and continents, ENGEL is the perfect partner for solutions and support.

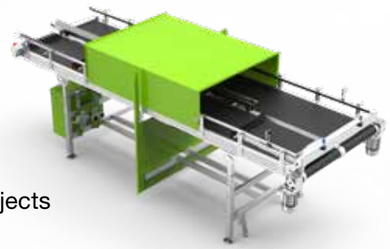
Over 40 years of of automation experience

benefit from the technology leader's expertise

ENGEL has been developing and producing injection moulding machines since the 1950s, and robots since the 1980s. Benefit from the wide range of applications and the well-engineered as well as continuously developed products and services. Thousands of installed automation cells with ENGEL robots and thousands of new applications each year create confidence and continue to inspire our customers.

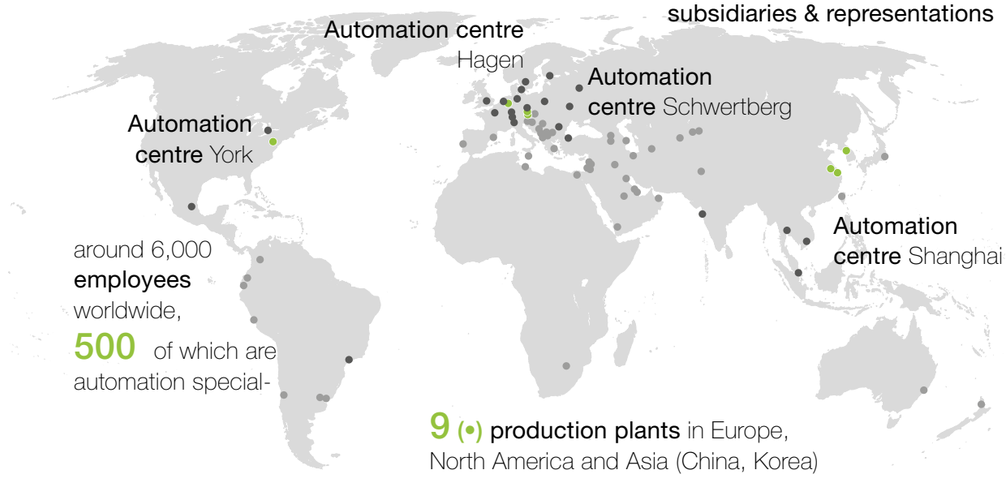
1.900
robots
per year

over
25.000
installed **robots** and
automation solutions



300
system projects
per year

in **85** (•) countries
subsidiaries & representations



around 6,000
employees
worldwide,
500 of which are
automation special-

9 (•) **production plants** in Europe,
North America and Asia (China, Korea)

ENGEL automation – added values
our digital solutions for the smart factory

As an innovative leader, our focus has always been on the continuing development of product functions and the entire line of products. We thus set new standards in the automation technology of entire production cells with injection moulding machines. Numerous unique characteristics in mechanics, control technology and software result in faster commissioning, more efficient and precise processes, longer product life cycles and higher energy savings.

inject 4.0
our digital solutions for the smart factory

To continuously increase customer benefit has always been a top priority for ENGEL. Whether the complete integration of peripherals, customised automation concepts or the introduction of the control unit generation CC300 - the optimised production cell is the focus of our development work. In addition to many innovative solutions related to mechanics, drive, electrics and pneumatics, extensive inject 4.0 functions have already been tried and tested in practice which significantly increase automated cell productivity in the age of Industry 4.0.

smart production
Increase productivity

■ **virtmould**
innovative simulation software for ENGEL machines and robots

The virtmould program is an available option for the ENGEL CC300 control and is used to simulate ENGEL injection moulding machines and robots at a PC or laptop. virtmould allows creation, editing and testing of part data sets without having to interrupt the production process.

■ **authentig**
Manufacturing Execution System for optimal production control

With the intelligent MES, production is under control - perfect for managing data records, optimising set-up times and fulfilling documentation requirements. With the help of its various modules, you can very easily create production plans on your PC at any time or check the status and progress of production from your desk.

smart service
Increase availability

■ **e-connect und e-connect.24**
ENGEL services available any time and any place

The free ENGEL e-connect customer portal groups all the information you need for your entire production cell. With a login you have access to all necessary information at any time. Regardless whether machine status or service activities. ENGEL e-connect.24 provides you with qualified round-the-clock remote maintenance and online support. 560 worldwide service engineers will help you quickly identify the problem and get things back under control – at any time.

smart machine

Increase process stability

■ iQ vibration control
active vibration compensation for rapid and precise positioning

Our ENGEL viper linear robots use acceleration sensors to measure the vibrations close to the gripper at the end of the vertical axis and compensate for them via closed-loop control in the control unit and the servo drives. This innovation also compensates for robot vibrations caused by the construction on a vibrating machine or contact with tool and ejector –
shorter cycle times and higher process reliability during insertion, removal and depositing.

■ event control
event-dependent wait for self-optimized cycle time

Our ENGEL robots use sensors to monitor analogue values such as vibrations, vacuum and weights, and continue the process when defined values are reached. This eliminates the need for tedious adjustment of too long waiting times - shorter process cycle times.

■ multidynamic
load-dependent speed optimization for best performance

The ENGEL viper linear robots optimise their speed depending on the load and stroke. Maximum speed is driven with lower loads and strokes, and the speed is reduced with higher loads and longer strokes to meet the requirements of a stable process. This applies to both the linear and the rotation axes.
The result is a perfect blend of cycle times, precision and durability.

■ efficiency control
Cycle-time dependent speed optimisation.

ENGEL robots adjust the speed in the depositing sequence of the machine. The robot moves only as fast as required by the injection moulding cycle - lower energy consumption and increased robot service life.

integrated control

integrated control concept for machine,
robot and peripheral equipment

ENGEL robots are available as "stand-alone" devices with their own control unit and Euromap 67 interface to the injection moulding machine. However, most customers choose the "Integrated Control Concept" from ENGEL for good reasons. The robot can be operated entirely from the CC300 machine panel, and extended signal exchange for optimal interaction of both devices is carried out directly by the control units via software variables. The same concept is used for the integration of other intelligent peripheral devices, such as complex feed and discharge systems or processing stations.

■ centralised, uniform operation of machines, robots and peripherals -
less training effort and faster commissioning
■ broad exchange of machine data – fast and error-free cell configuration and set-up
■ common parts data management for robot and machine - faster retooling
and error prevention
■ central variable and message management of the entire cell – easy access
for Industry 4.0 and fast trouble shooting
■ real-time synchronisation of robot and machine states
and movements (shape, ejector, core pulls) – shorter
cycle times, collision avoidance and any
number of mould functions

programming wizard
guided and intuitive creation of
simple sequences directly on the robot

Our robot technology is used for simple Pick & Place applications to extensive sequences with inserting, quality control, post-processing of parts, assembly and complex depositing. Particularly for the quick and short set-up of simple sequences, the ENGEL control unit has an assistant to guide the operator through the configuration of the removal and depositing sequence.

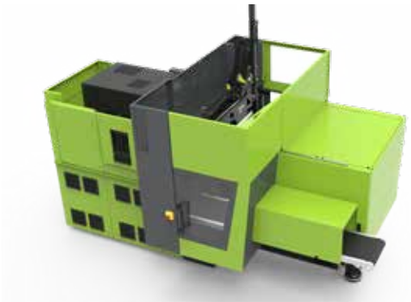
function library
the comprehensive library of
practical sub-programs

ENGEL robots have a large selection of extended process sequences which are fully integrated into the operating modes and operating masks and can be easily added or removed by configuration – fast configuration even of complex automation sequences and tested stable function.

integrated mechanics
constructive solutions for the
most compact of production cells

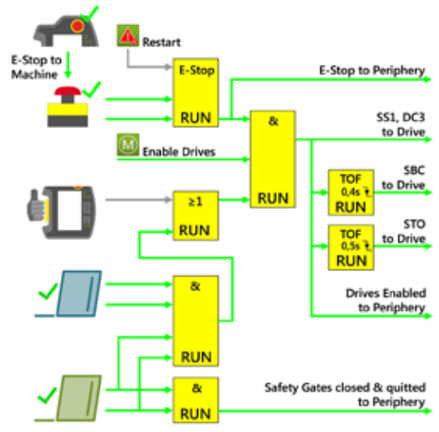
According to CE, the safety gate and other parts of the protective cover must be raised to 2,200 mm specifically for small and medium-sized machines equipped with robots. ENGEL offers numerous options for injection moulding machines that perfectly integrate conveyor belts, slides, and the robot itself. This is the fastest possible way we can create a safety-certified and space-saving automation cell for your application.

ENGEL victory 80 with sprue slide and
e-pic B servo-motorized sprue picker



ENGEL e-motion 50 with widened safety gate,
integrated conveyor belt HLi and e-pic Z robots

integrated safety
integrated safety technology from a single source



- All components and the overall solutions of ENGEL automation are already CE certified or, in the event of customised solutions, they can be easily tested.
- Constructive safety for personal protection in the form of heights, distances and strengths for machine and cell protection devices.
- electrical standardised safety packages for shared or separate operation of machine and automation
- safety control and safe bus system for simple expansion of the emergency stop circuit of the production cell
  – quick overview of safety condition of the production cell
  – detection of states during remote maintenance
  – reduced extent of wiring, which reduces error susceptibility

maintenance control
continuous monitoring of robot parameters parameters
for scheduled maintenance

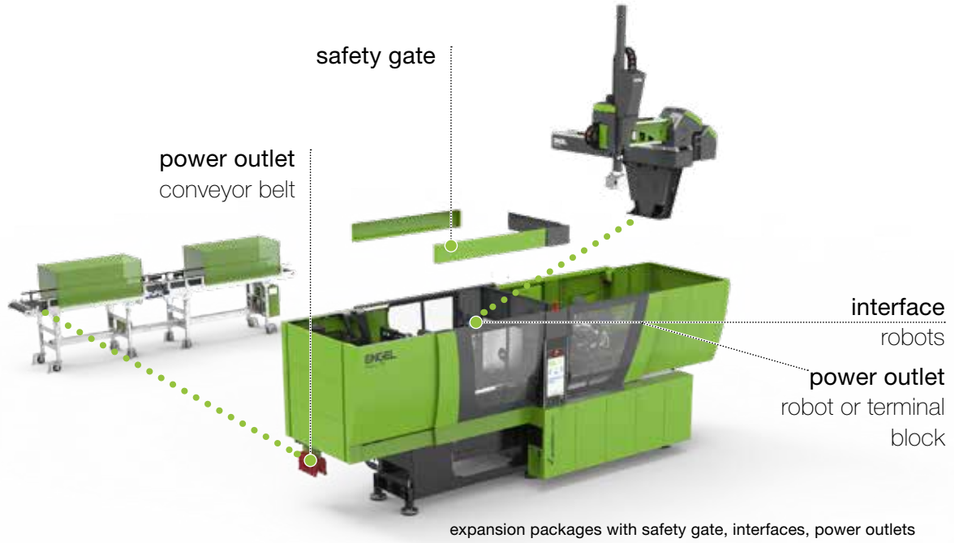
ENGEL robots are equipped with a high level of intelligence:

- If the drive temperatures change, a warning is issued, and the dynamics are reduced as of a certain threshold value.
- Reliable and precise lubrication using controlled central lubrication is ensured; monitoring and signalling when changing lubricants.
- In any case, uninterrupted production is guaranteed up to the planned maintenance.

Ready-to-run Automation

modular system solutions

Modular system solutions
to easily extend the machines for automation



expansion packages with safety gate, interfaces, power outlets

Injection moulding machine options for automation
to easily connect automation to the machines

Numerous automation options of the injection moulding machine are available for the joint purchase of the injection moulding machine and the robot, or for retrofitting the injection moulding machine with a robot, which facilitates the interaction and safe functioning of the individual devices in the cell.
According to CE, the safety gate and other parts of the protective cover must be raised to 2,200 mm specifically for small and medium-sized machines equipped with robots. There are also numerous options such as conveyor belts, slides, enlargements, etc. which can be integrated directly into this safety gate – mechanics integrated. With or without robots, ENGEL offers a safety-certified and space-saving automation cell in the fastest possible way.

Our machines can be equipped with all commercially available signal interfaces to the robot. When the robot control unit is running on the machine control unit - control integrated - the ER-IS interfaces are used for extended communication between machine and robot.

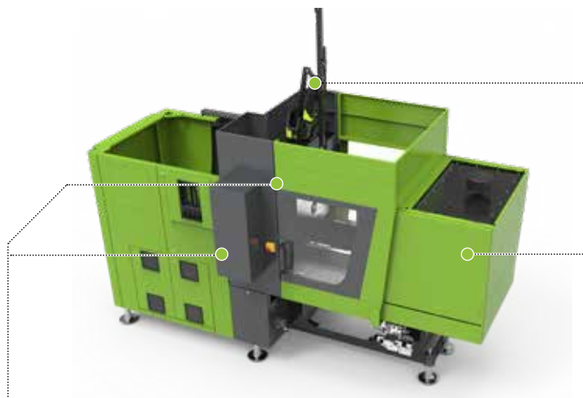
The machines can also supply power directly in the form of sockets for robots and conveyor belts. The robot control system controls the clocking and reversing mode of the conveyor belts. All worldwide voltages and connector standards are available.

Chutes and conveyor belts for free-falling parts
simple and precise positioning under the injection moulding machines

Chutes and switches in the machine are used to separate sprues, rejects and good parts to several conveyor belts. These conveyor belts are available in numerous design variants and for all machine depositing sides.

Pickers and shafts
integrated in the safety gates
smallest machine floor space with sprue pickers

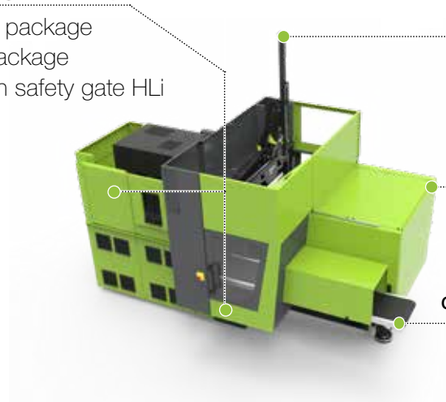
Sturdy pneumatic or dynamic servo-motorized sprue pickers are mounted on the stationary mould mounting platen. Ready-made CE-certified solutions for discharge shafts and chutes are integrated directly into the machine protection.



Robots and conveyor belts integrated in the safety gate
compact injection moulding cells with robots and conveyor belts

The machine safety gate of small and medium-sized machines is widened, which is the easiest method for depositing on a conveyor belt with a robot. Shortest cycle times are achieved, especially for tie-bar-less injection moulding machines with horizontal removal movement.

injection moulding mach. options
e-pic Z expansion package
viper expansion package
Chute integrated in safety gate HLi



robots
e-pic Z
viper

injection moulding mach.
victory
e-motion
e-mac

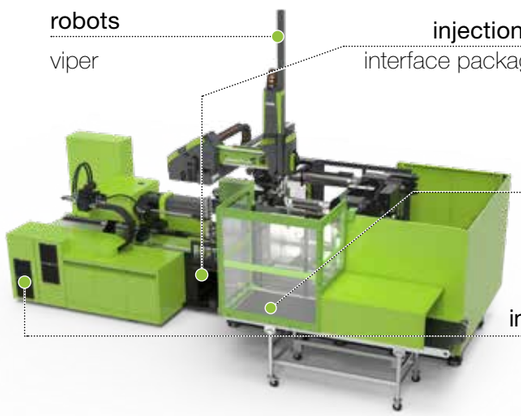
conveying technology
conveyor systems HLi

Robots and conveyor belts with integrated safety shaft
simple equipping of large machines with robots and conveyor belts

The conveyor belts with the protective structure are simply docked with a guide rail to the safety gate of a standard machine. By moving the conveyor belt, the tool area is accessible and robot and machine operation is stopped.

robots
viper

injection moulding machine options
interface package for integrated robot (ER-IS)
or stand-alone robot (EM 67)



conveying technology
conveyor systems ESC 2

injection moulding machines
duo up to 900 t
e-motion >= 280 t

Free-standing safety guardings and conveyor systems for all depositing sides
modular layouts or for individually configured automation cells

From numerous combinations of ENGEL injection moulding machines with ENGEL linear robots, pre-configured standard layouts can be selected depending on the depositing side (front, back, lengthwise). For individual cell build-up, the modular system safety technology - safety systems – offers all design options - perfect connection to the machine, appealing overall design, CE certified.

injection moulding machines
victory
e-motion
e-mac
duo

robots
e-pic Z
viper

safety technology
safety systems

conveying technology
conveyor systems FB

injection moulding machine options
safety guard risers open,
closed or lengthwise depositing
interface package integrated robot (ER-IS)
or stand-alone robot (EM 67)

Project automation
customized system solutions

Customized system solutions

for individual requirements

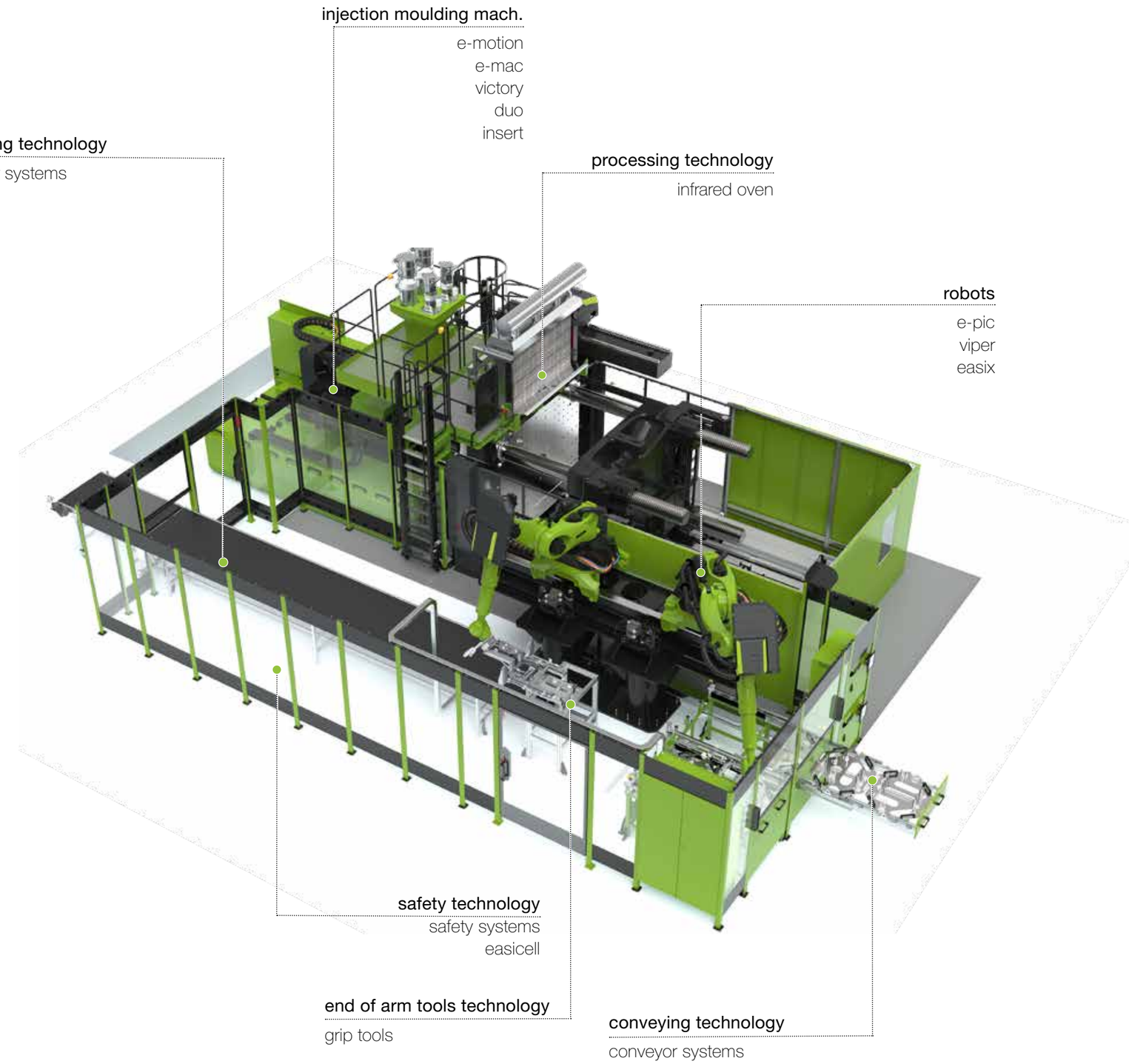
Should you need more than the combination of standard automation components such as robots, conveyor belts, safety guarding, etc., the ENGEL automations systems team will develop your individual system solution according to your requirements.

Our specialists access a comprehensive set of sophisticated process modules, develop components and functions according to your customer-specific requirements, and integrate your preferred devices and standards.

Professional project handling
from inquiry to the service of your automation project

In parallel to our global network of branches for injection moulding machines, ENGEL automation centres in America, Asia and Europe are your local contact persons.

- Development of solution concepts for your individual part requirements
- Design, programming and documentation according to your standards
- Production and commissioning at ENGEL and your plants worldwide
- Training of operators and maintenance personnel for your independence
- Service for maintenance, repairs and modifications



Flexible process modules
modules for fast system integration times
and stable production processes

ENGEL has standardized over many years the individual process steps which are repeated in customer-specific automation projects concerning the injection moulding machine. The configuration of these stable modules paired with individual add-ons leads to quickly installable and reliable solutions for your application.

The trend towards increasing the degree of automation with the pre-treatment and post-treatment of feed parts and injection moulded parts in parallel to the machine cycle increases the production flow, reduces production space and manpower and increases your productivity as a result.

Global reference applications
using application experience to gain a head start
in all industries

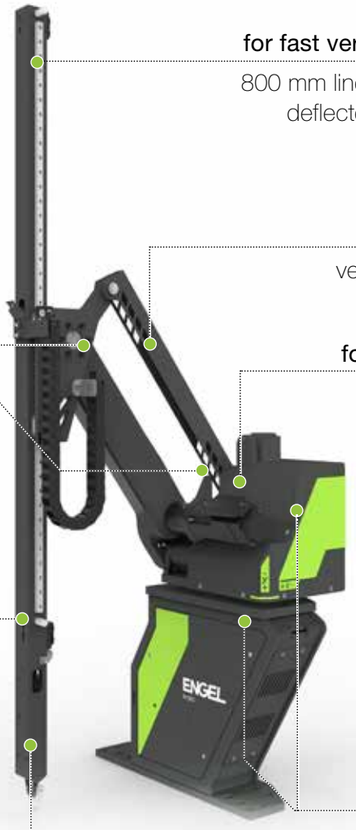
In recent decades, ENGEL has implemented automation projects in numerous projects and industries worldwide. This wealth of experience with diverse technologies forms the basis for continuous innovations in new applications.

Robots

innovative technology optimized for
all injection moulding applications

e-pic B
the dynamic servo sprue picker

Based on the technology of the tried and tested Pick & Place robot e-pic Z, the e-pic B combines linear movements with a swivel arm for a completely new type of kinematics. The new servo sprue picker is an economical choice, especially where sprue needs to be removed very quickly but the parts must be removed manually or fall freely from the machine.



for fast vertical stroke
800 mm linear axis with deflected belt drive

for fast cross stroke
vertical maintenance-free 100° B-rotation axis

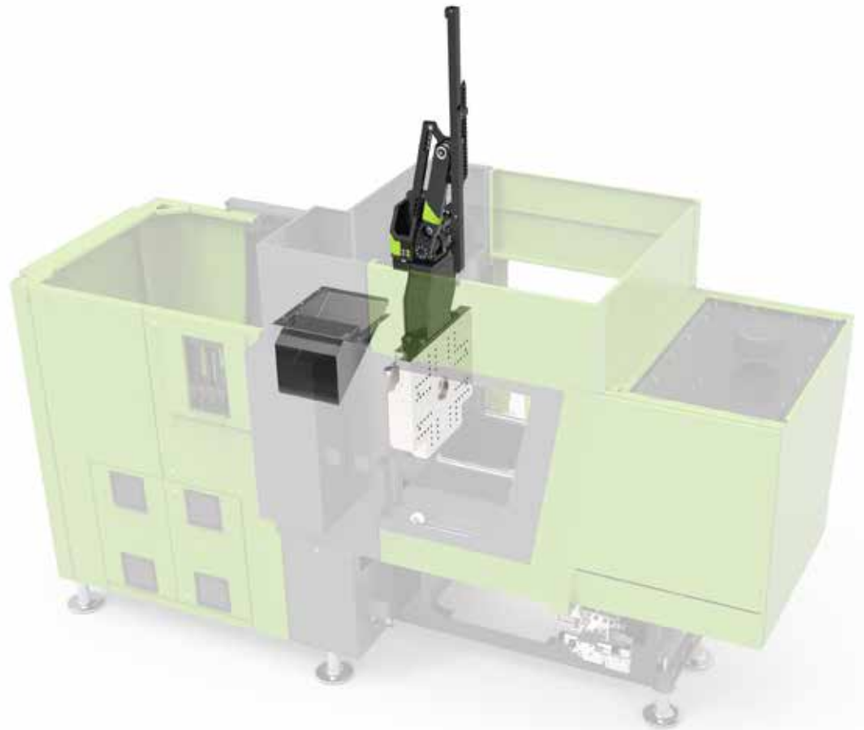
for fast part removal
500 mm range with horizontal, maintenance-free rotation axis and lightweight carbon arm

for easy mould change
can be rotated out of the working range

for flexible gripper design
sufficient pneumatic and electric interfaces

compact design
control cabinet integrated in the mechanics

for various applications
up to 1 kg parts weight



programmable and energy saving

ROI after 3 years of operation
low power consumption as compared to pneumatic sprue pickers
fast and efficient operation
integrated control – the integrated control concept for machine, robot and peripheral devices
can be used as a stand-alone robot
with Euromap 67 interface
lowest maintenance cost and power consumption
100% electric
can be used in any power grid
1 phase multi-power supply
simple configuration of injection moulding machine, robot and peripheral devices
ready-to-run automation – the modular system solutions

e-pic Z
the smart pick & place linear robot

Out-of-the-box - simply connect, switch on and start: The e-pic Z offers you a cost-effective and energy-efficient introduction to automation. It guarantees you a quick, safe and simple manipulation of the parts and together with the short intervention times, a trouble-free production process is guaranteed. The extra bonus: Thanks to its newly developed rotary arm kinematics, it is very compact and can be installed in the injection moulding machine in a space-saving manner.

for flexible layout above movable platen
mechanism moves only as far as the required stroke in the part removal direction

for fast part removal
580 mm range with horizontal, maintenance-free rotation axis and lightweight carbon arm

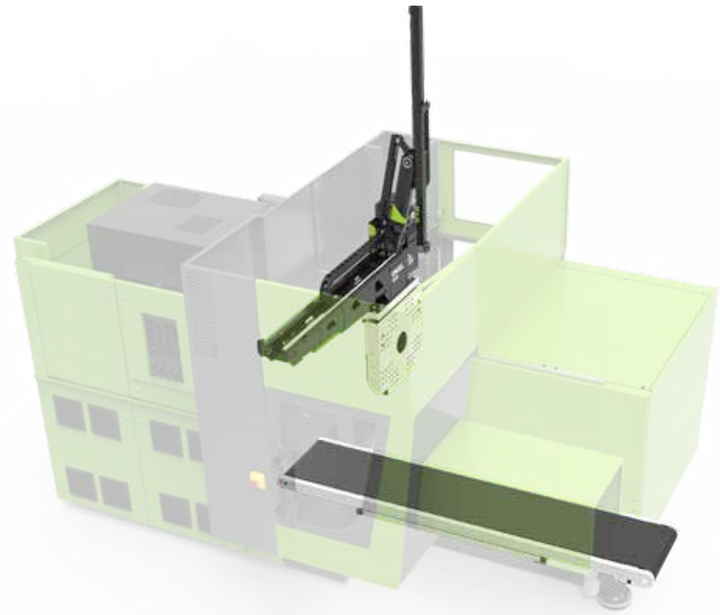
for fast vertical stroke
750 mm linear axis with deflected belt drive

for flexible gripper design
sufficient pneumatic and electric interfaces

for various applications
3Nm swivel axis
up to 2 kg parts weight

compact design
control cabinet integrated in the mechanics

for fast cross stroke
up to 1400 mm horizontal, maintenance-free Z-linear axis



compact and economical

easy setup
dynamic swivel movements with linear positioning data

precise depositing
including rasterizer

fast and efficient operation
integrated control – the integrated control concept for machine, robot and peripheral equipment

can be used as a stand-alone robot
with Euromap 67 interface

low maintenance cost and power consumption
100% electric

can be used in any power grid
1 phase multi-power supply

for the simple configuration of injection moulding machine, robot and peripheral devices
ready-to-run automation – the modular system solutions

viper
the high-performance linear robot

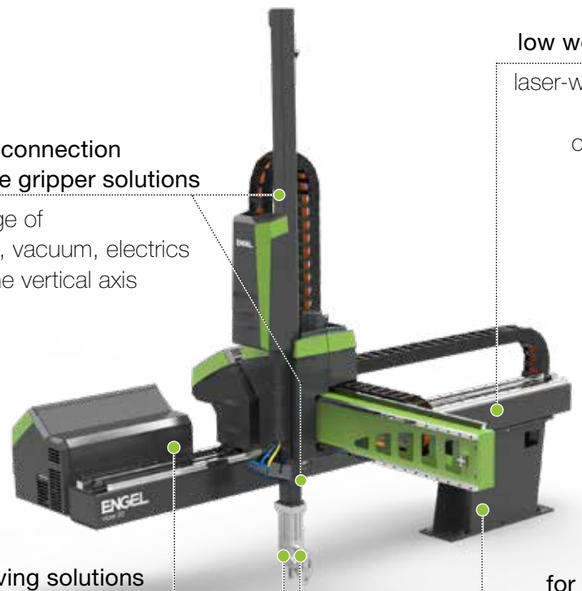
Work with experience: ENGEL has been building power linear robots since 1980. The viper perfectly complements your efficient production cell and its innovative design gives you improved load-carrying capacity with a low deadweight. In addition, the smart software packages ensure that all movements are perfectly harmonised.

for high stiffness, low weight, best dynamics

laser-welded, optimised steel construction of the part removal axis

for flexible connection of extensive gripper solutions

diverse range of pneumatics, vacuum, electrics directly in the vertical axis



for space-saving solutions

compact control cabinet at cross stroke or universal cabinet on ground

for stable ready-made solutions, mechanically optimised

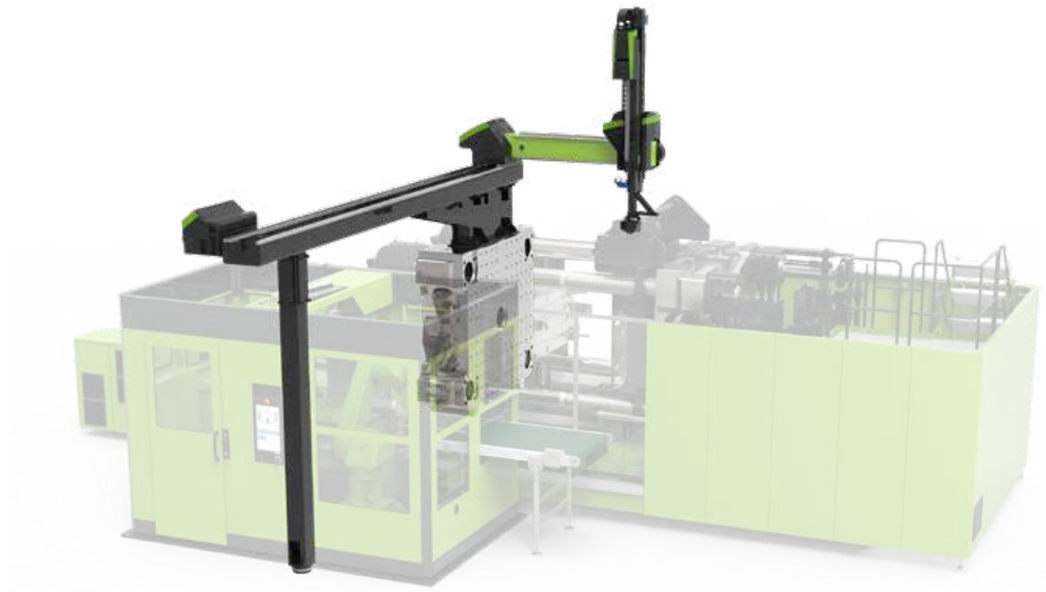
standard stands and supports for all ENGEL machines

one line of robots for all machines

loads from 6 to 120 kg
strokes for 30 to 5,500 tons

for flexibility for all orientation requirements

broad portfolio of pneumatic and servo-motorized A-B-C rotation axes



versatile for all machine sizes

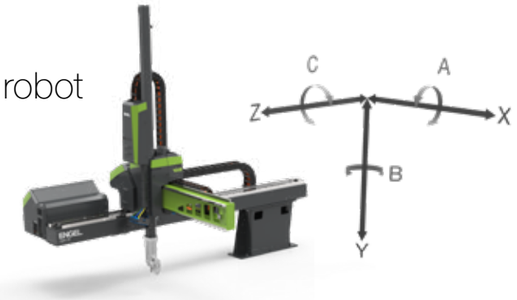
effort-saving and synchronous parts removal
Soft-Servo – torque control of horizontal axial forces

fast and efficient operation
integrated control – the integrated control concept for machine, robot and peripheral equipment

precise, fast, energy-efficient and gentle mechanical movements
smart machine / robot with all intelligent functions

simple configuration of injection moulding machine, robot and peripheral devices
ready-to-run automation – modular system solutions

viper
the high-performance linear robot



Sizes

[kN]	500	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	20000	30000	40000	55000
e-pic Z	●	●	●												
viper 6	●	●	●	●											
viper 12	●	●	●	●	●										
viper 20		●	●	●	●	●	●	●							
viper 40			●	●	●	●	●	●	●	●	●	●			
viper 60						●	●	●	●	●	●	●	●		
viper 90											●	●	●		
viper 120												●	●	●	●

Technical information

Type	demolding stroke X	demolding stroke X range	vertical stroke Y single	vertical axis Y telescopic	traverse stroke Z
	[mm]	[mm]	[mm]	[mm]	[mm]
e-pic Z	**400**	X+180	**750**	750	1140-1400
viper 6	**400**	X+184	**600**/800/1000		1160-2840
viper 12	**400**/600	X+214	**600**/900/1200	900/1200	1160-3320
viper 20	**500**/700/900	X+296	**800**/1000/1300/1500	800/1000/1300/1500	1400-6200
viper 40	**700**/900/1200	X+318	**1100**/1500/1900	1100/1500/1900	1880-8120
viper 60	**1000**/1300/1500	X+375	-	1400/1800/2200/2600	2360-10040
viper 90	**1500**/2000	X+547	-	1800/2400/3000	2360-10040
viper 120	**2000**/3000	X+547	-	1800/2400/3000/3600	3320-10040

Technical information

type	MM clamping force	nominal load capacity	max. load capacity	servo driven rotary axis			pneumatic driven rotary axis		double robot	double arm
	[kN]	[kg]	[kg]	[Nm]			[Nm]			
				A	B	C	B	C		
e-pic Z	280-2200	2	2					3		
viper 6	280-2500	6	6		25	25	5	6		
viper 12	280-4000	15	15		25	25	9,3	30		
viper 20	900-700	20	30	25/70	25/70	25/70		30/75		
viper 40	2200-15000	40	55	70/210	70/210	70/210		75/120	●	
viper 60	5000-23000	60	75	210	210	210		120/240	●	●
viper 90	10000-32000	90	90	125	390	390			●	
viper 120	15000-55000	120	120	125	390	390			●	●

Additional viper variations

Based on the flexible and extensive modular viper product system, there are special versions for longer strokes, higher speeds as well as the arrangement of additional axes for part and sprue handling.

viper 12 and 20 sprue

for three-plate moulds - second vertical pneumatic arm

viper 60 and 120 double arm

for tandem moulds – second vertical servo arm

viper 40 to 120 dual robot

for dual machine operation

viper side entry*

for fast side-entry applications

viper 20 speed*

for fast top-entry applications

*available upon request

easix
the multifunctional articulated arm robot

Work in all dimensions: The easix articulated arm robot is ideally suited for positioning tasks with a high freedom of orientation and for machining tasks with precise path travel characteristics. Making your production even more efficient. No matter whether you need a particularly flexible automation solution or face special requirements, such as cleanroom production.

for flexible solutions for all application fields and machines
loads from 6 to 240 kg and ranges up to 3,900 mm

for reduced spare part quantities, same know-how of the operators and maintenance personnel
same peripheral control modules as for the viper linear robot

for high reliability and worldwide service
sturdy mechanics from market leaders

for flexible connection of extensive gripper solutions
wide range of pneumatics, vacuum, electrics directly in the vertical axis

for large machines and production cell extensions
7th-/linear axis suitable for extended work area

for stable, finished solutions, mechanically optimised
Standard stands and consoles for all ENGEL machines at various assembly positions

Sizes

[kN]	500	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	20000	30000	40000
TX40	●													
TX60	●	●	●											
TX90, KR6, KR10	●	●	●	●	●									
RX160, KR16		●	●	●	●	●	●	●						
TX200, KR30, KR60				●	●	●	●	●	●	●	●	●	●	
KR90								●	●	●	●	●	●	
KR120								●	●	●	●	●	●	●
TX340SH, KR150											●	●	●	
KR210, KR240										●	●	●		

Technical information

ENGEL	type	nominal load capacity	range of Axis 5	repeata-ability	cleanroom class ISO 14644-1	floor	wall	ceiling	con-sole
		[kg]	[mm]	[mm]					
TS40, TS60, TS80	SCARA	7.15	400-800	+/- 0.01	6"	●	●		
TX40	6-Achs	2	450	+/- 0.02	5"/4"/2"	●	●	●	
TX60	6-Achs	3.7	600-850	+/- 0.03	5"/4"/2"	●	●	●	
KR-6 sixx	6-Achs	6	700-900	+/- 0,03	2"	●	●	●	
TX90	6-Achs	14	900-1350	+/- 0.04	5"/4"/2"	●	●	●	
KR-10 sixx	6-Achs	10	900-1100	+/- 0.03	2"	●	●	●	
KR-16-2	6-Achs	16	1610-2110	+/- 0.05	4"/2"	●		●	●
RX160	6-Achs	30	1600-1900	+/- 0.05	5"/4"/2"	●		●	●
KR30	6-Achs	30	2033-3100	+/- 0.07	2"	●		●	●
KR60	6-Achs	60	2033-2952	+/- 0.06	-	●		●	●
TX200	6-Achs	130	2000-2400	+/- 0.1	5"/4"	●		●	●
KR90	6-Achs	90	2700-3700	+/- 0.06	-	●		●	●
KR120	6-Achs	120	2900-3900	+/- 0.05	-			●	
KR150	6-Achs	150	3100-3700	+/- 0.06	-	●			●
TX340SH	6-Achs	165	3450	+/- 0.1	-				●
KR210	6-Achs	210	2700-3300	+/- 0.05	-	●			●
KR240	6-Achs	240	2500-3130	+/- 0.06	-	●			●

as easy to use as a linear robot

for flexible handling tasks and precise parts handling
full range of orientation and consistent path travel

fast and efficient operation
integrated control – the integrated control concept for machine, robot and peripheral equipment

precise, fastest, energy-efficient and mechanics-friendly movements
smart machine / robot with all intelligent functions

with professional project management by our ENGEL team
Project automation – the customized system solutions

easix TS
the fast SCARA robot

Ideally suited for fast pick & place tasks when sorting inserts or depositing finished parts. An additional kinematic type in the robot set from ENGEL.

high reliability and world-wide service

sturdy mechanics from market leader

flexible solutions for sorting and depositing applications

Loads up to 7 kg and range up to 800 mm

stable, finished solutions, mechanically optimised

standard consoles for various assembly positions

pick & place: separation and sorting

for the shortest cycle times and high-speed tasks
the innovative four-axis robot kinematics

fast and efficient operation
integrated control – the integrated control concept for machine, robot and peripheral equipment

precise, fastest, energy-efficient and gentle mechanical movements
smart machine / robot with all intelligent functions

with professional project management by our ENGEL team
Project automation – the customized system solutions

ER-USP
the sturdy pneumatic sprue picker

The universal solution for simple sprue or parts removal for small to medium-sized machines.

for all machines up to 300 tons

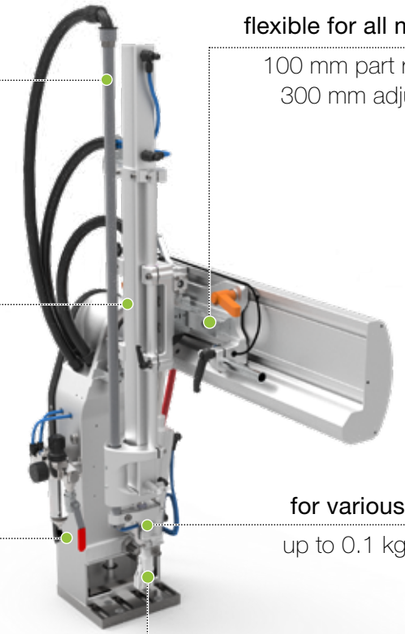
vertical stroke up to 700 mm

suitable for machine rear and front side depositing

a swivel axis +/- 90°
cross stroke up to 1,342 mm

flexible for all mould heights

100 mm part removal stroke
300 mm adjustment range



long service life

sturdy construction of aluminium

for various applications

up to 0.1 kg sprue weight

for easy mould change

set with B-axis for turning away

reliable and long-lasting

fast and efficient operation
integrated control – the integrated control concept for machine, robot and peripheral devices

can be used as a stand-alone robot
with Euromap 67 interface

End of arm tools technology

ingenious tools for inserting, removing and processing

grip tools
the versatile technology for the complete solution from ENGEL

In order for your robot to fully utilise its potential, the robot arm and gripper must be perfectly coordinated with each other and with the mould: The grip tools by ENGEL ensure an even more efficient and productive use of the robot. Our standard grip tools are the ideal solution for many different areas of application.

ENGEL is also the best partner when there are special requirements for grip tools technology: We have a grip on everything, and can provide you with individually designed, special editions. Through us, you get everything from a single source – take advantage of our comprehensive product portfolio!

grip tools – customer specific*

designed by ENGEL for your application

kits - universal

the practical cases with a wide range of universal components for do-it-yourself construction

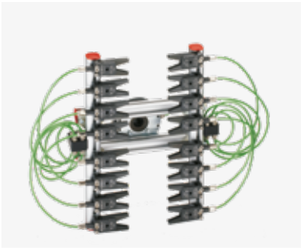
*available upon request

quick-change systems - efficient

retool to a new part in no time at all

sprue grippers - solid

pneumatic or electrical grip tools for secure hold



weight measurement systems - precise*

to determine the part weight directly on the grip tool.

- compact, complete system
- quality control and logging of the part weight with no clipboard
- cycle-time savings

Conveying technology

flexible solutions for efficient parts transport

conveyor systems
the fully automated conveyor tech-

- **from one source**
  machine and conveyor belt are perfectly synchronised
- **the optimum solution for every requirement**
  ENGEL conveyor systems are available in belt, box, pallet, slide and tray versions
- **integrated control unit**
  the conveyor system control is integrated into the machine control unit.
- **TÜV/CE certified**
  The conveyor system is already certified by ENGEL with the complete system.
  You save time, expenses and risk.
- **quick and trouble-free start-up**
  From project planning to takeover, the entire responsibility lies with ENGEL.
- **maximum output**
  All processes are optimised and perfectly synchronised.
- **best ENGEL quality**
  15,000 conveyors on the market and more than 2,000 conveyors produced each year are proof of unparalleled know-how and competence.

The whole is more than the sum of its parts. For this reason, ENGEL as a system supplier and world market leader in injection moulding technology attaches particular importance to ingenious solutions and a smooth process. From production and automation to the management of ready-for-transport individually packaged goods with our tried-and-trusted ENGEL conveyor systems. These are intelligent conveyor belt solutions, which transport your high-quality moulded parts out of your production unit quickly and carefully.

With or without a robot, free-standing, or as an integrated solution. Whether as bulk material, in boxes, on pallets or trays: ENGEL conveyor systems always provide just the right solution for you to gain a decisive competitive advantage in the market.

conveyor systems GFB / WFB / ZFB
the optimised conveyor belt
for freely falling parts

- for the front, rear or side of the machines
- guide plates
- standard PVC belt temperature resistant up to 80°Celsius
- load capacity 12 kg/m

options*

- special belts
- outlet chutes
- medical version

flat conveyor belt
GFB60

conveying lengths: 1,000 to 5,000 mm
belt widths: 300 to 600 mm

incline conveyor belt
WFB60

conveying lengths: 1,000 to 4,700 mm
belt widths: 300 to 600 mm

Z-type conveyor belt
ZFB60

conveying lengths: 1,000 to 4,700 mm
belt widths: 300 to 600 mm

*available upon request

conveyor systems HLi
the conveyor technology integrated into the safety gate for viper and e-pic Z

Options*:

- reverse mode
- clearing switch with light beam guard
- guide plates/cross stays/special belts

HLi conveyor belt
integrated into the safety gate

for mould change:
movable for unhindered access

load: 15 kg/m

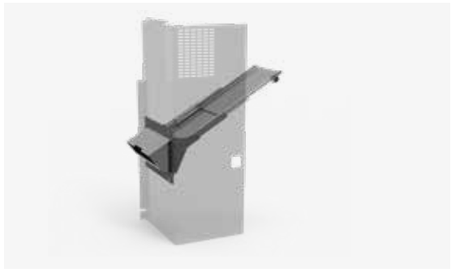
conveying lengths: 1,900 to 5,200 mm

belt widths: 350 to 600 mm

HLi chutes
integrated into the widened safety gate

for mould change:
pneumatically extendible and folding for free access

chute width: 375 mm



*available upon request

conveyor systems ESC
the conveyor belt with integrated safety shaft

Options*:

- Operating panel with clearing switch
- Guide plates / Cross stays / Special belts
- Docking device for safe removal if not required for production

ESC 1 conveyor belt
with integrated safety enclosure*

including aisle cover and safety tunnel for front side of machine, with polycarbonate windows for optimal process monitoring

load: 15 kg/m

conveying lengths: 3,000 to 4,000 mm

belt widths: 600 to 1,600 mm

height: 2,500 mm

ESC 2 conveyor belt
with integrated safety guard*

including aisle cover and safety tunnel for front side of machine, with polycarbonate windows for optimal process monitoring

for mould change or maintenance:
rollers and grips for easy moving

rollers and handles for easy removal during mould change or maintenance

load: 15 kg/m

conveying lengths: 3,000 to 4,000 mm

belt widths: 600 to 1,600 mm

height: 2,500 mm

*available upon request

conveyor systems FB
the universal free-standing conveyor belt
in all dimensions

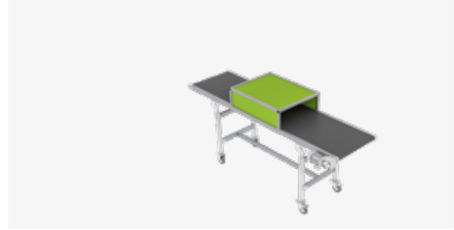
- infinitely adjustable belt inclination
- anti-creep protection
- infinitely adjustable depositing height
  from 1,000 to 1,200 mm
- standard PVC belt
  temperature-resistant up to 80°C
  (briefly up to 100°C)
- belt speed 6 m/min

options

- safety tunnel
- reversible design
- motor attachment position changed (right, vertical)
- operating panel with clearing switch
- light beam guard (loading/unloading position)
- baffles (standard height 60 mm)
- different variations of the belt
  (e.g. anti-static, wear-resistant, temperature-resistant up to 90°C/120°C,...)
- height adjustable - 750 - -900 mm (restrictions for EN ISO 13857),
  1,200 - -1,500 mm
- frequency inverter for belt speed regulation
- additional locking in the floor
- cleanroom version*
- version as multi-level conveyor belt*

*available upon request

FB60 conveyor belt free-standing

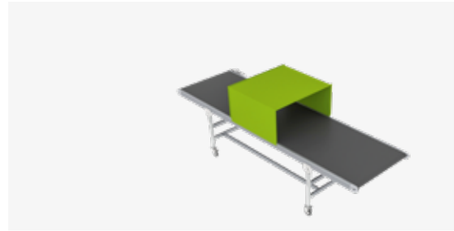


load: 15 kg/m

conveying lengths: 1,000 to 5,000 mm
(in 500 mm steps)

belt widths: 250 to 600 mm

FB100 conveyor belt free-standing



load: 25 kg/m

conveying lengths: 1,000 to 8,000mm
(in 500 mm steps)

belt widths: 350 to 1,600mm
(in 250mm steps)

conveyor systems RFB*
the ideal strap belt conveyor for parts
with low contact to the surface

RFB strap belt conveyor

anti-creep protection

placement height: steplessly adjustable
from 1,000 – 1,200 mm

belt inclination: steplessly adjustable

belt speed: 6m/min

load: 30 kg/m

PU strap: temperature-resistant to 80°C
(briefly up to 100°C)

conveying lengths: 2,000 to 6,000mm
(in 1,000mm steps)

belt widths: 500, 1,000 and 1,500 mm

options:

manual width adjustment

belt synchronisation

*available upon request

conveyor systems ECB
the perfect box transfer for bulk material

for the automatic feed-through and filling of cartons,
boxes or small load carriers by robot

- operator console for EMERGENCY STOP button
- KLT sizes:
  - KLT 6 147 (600 x 400 x 147 mm)
  - KLT 6 280 (600 x 400 x 247 mm)
- load capacity 12 kg/container
- light beam guards for position detection

options

- increased position accuracy to ± 1 mm centring
- intermediate layer magazine integrated (not available for ECB 2/2 & 3/1)
- cleanroom version*

ECB 1/1 box transfer
with conveyor belt and scissor roller conveyor*

conveying direction: cross- or lengthwise

capacity: 11 containers for cross-,
9 containers for lengthwise

2 operating sides

box change time: 11s

ECB 1/2 box transfer
with conveyor belt and roller conveyor

conveying direction: cross- or lengthwise

capacity: 11 containers for cross-,
9 containers for lengthwise

2 operating sides, incl. 2 safety tunnels

box change time: 11s

*available upon request

ECB 2/1 box transfer
with 2 conveyor belts

conveying direction: cross- or lengthwise

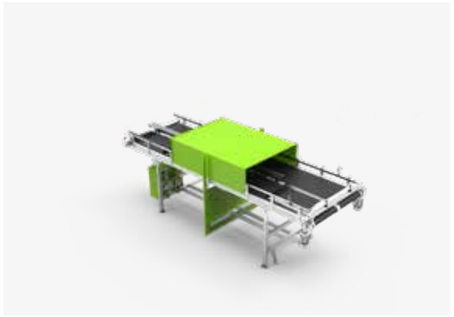
capacity: 11 containers for cross-,
9 containers for lengthwise

2 operating sides

2 safety tunnels incl.

box change time: 11s

ECB 2/2 box circulation
1 level with 2 conveyor belts*



conveying direction: lengthwise

capacity: 9 containers

1 operating side, incl. 1 safety tunnel

box change time: 12s

conveyor belt function
clearing switch

ECB 3/1 box circulation
2 levels with 3 conveyor belts*

cross conveying direction:

capacity: 11 containers

1 operating side, incl. 1 safety tunnel

box change time 17s

clearing switch

ECB M box
layer magazine

intermediate layer: max. 590 x 390 mm

stack height: max. 480 mm

stack weight: max. 5 kg

separate inserting and removal position

*available upon request

conveyor systems ECS
the ergonomic shutting table for feeding and executing parts of the cell

The ideal solution if you need to feed or divert parts to or from the production unit during the manufacturing process.

- control console for request open / load acknowledgement / emergency stop
- light beam guards for position detection
- magazine plate pick-up (base plate)

options

- cleanroom version*

ECS 1 shuttle table single

conveying direction: lengthwise
operation: manual or electrical
table size variants:
640 x 440 x 100 mm or
840 x 640 x 100 mm
load capacity: 60 kg manual, 40 kg electrical
max. part height: 100 mm

ECS 2 - 2 sliding table

conveying direction: lengthwise
operation: manual
table size variants:
640 x 440 x 100 mm or
840 x 640 x 100 mm
max. load: 40 kg per shelf
max. part height: 100 mm

*available upon request

conveyor systems ETS
the automatic tray server and transfer for trouble-free feed through of bulk goods

- light beam guards for position detection
- clearing switch
- lengthwise conveying direction
- SMC pneumatic components (5-8bar operating pressure)
- tray size: 600 x 400 mm (refer to data sheet for details of minimum requirements)
- capacity 5 trays
- tray change time 5s
- max. stacking weight 25 kg

options

- additional conveyor belts for inbound and outbound transport of tray stacks
- exact tray centring for robot depositing; centring tolerance: ± 0.5 mm
- testing of tray alignment outer contour / inner contour
- tray rotation unit for correct alignment (tray position detection)
- reinforced destacking function via suction cups
- destacking unit guide plates, incl. tray orientation guide
- own control unit S7, operating terminal with touch screen and emergency stop (only for VIPER 1.0 and older)
- stack height monitoring
- signalling unit (2, 3 or 4 messages)

ETS 4 tray server 2 sides

feeding and removal of the trays: on two opposite sides of the cell
conveying section: with 2 tunnels and anti-creep protection (excl. safety guard)

ETS 5 tray server 1 sides

feeding and removal of the trays: on the same side of the cell
conveying section: with 1 tunnel and anti-creep protection (excl. safety guard)

*available upon request

conveyor systems ECP
the sturdy EURO-pallet transfer for large parts

ECP – pallet transfer

light beam guards for position detection
conveying direction: lengthwise
operating console: emergency stop and clearing switch
foundation angle
collision protection
positioning accuracy: +/- 10 mm
pallet size: EURO DIN
1,200 x 800 x 166 mm
capacity: 3 or 5 pallets
pallet change time: 20s
weight per pallet: 250 kg max.

ECP M pallet magazine

capacity: 10 pallets stacked
conveying direction: lengthwise

conveyor systems ECC
universal chute for all applications

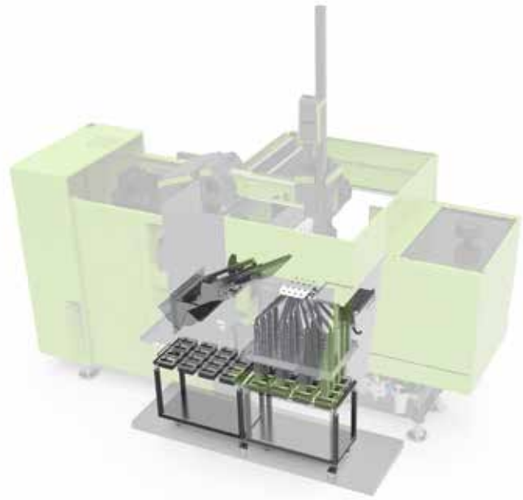
ECC chute

length: from 1,250 to 2,000 mm
width: from 250 to 850 mm
height: 1,150 to 1,550 mm (at pivot point)
options:

- cover
- separator
- assembly from the top

*available upon request

conveyor systems EKS
the configurable cavity seperation
for quality assurance



EKS cavity separator*

- integrated into the expanded safety gate
- change module for different number and images of cavities
- configurable container cart
- storage function for changing containers without interrupting production

options:

- automatic advance of the container carts
- chute and quality shelf integrated in the safety gate

*available upon request

Cell system technology

smart safety systems for unobstructed production and employee protection

Cell system technology

smart safety systems for unobstructed production processes and employee protection

easicell

the universal compact cell for encapsulated machining tasks

Thanks to its standardized but modular structure, easiCell simplifies the integration of robots as well as the process units upstream and downstream of injection moulding, such as laser processing.
These components can be quickly removed from the system in order to be replaced with other units. Extended down times and the associated losses during changes in production are now a thing of the past.

safety systems

the matching modular safety guarding for individual cell configuration

An ingenious complete system offers all-round safety: ENGEL safety systems is a sophisticated personal protection system for system construction according to EN ISO 14120. You benefit from all the advantages and safety of the CE-compliant cell.

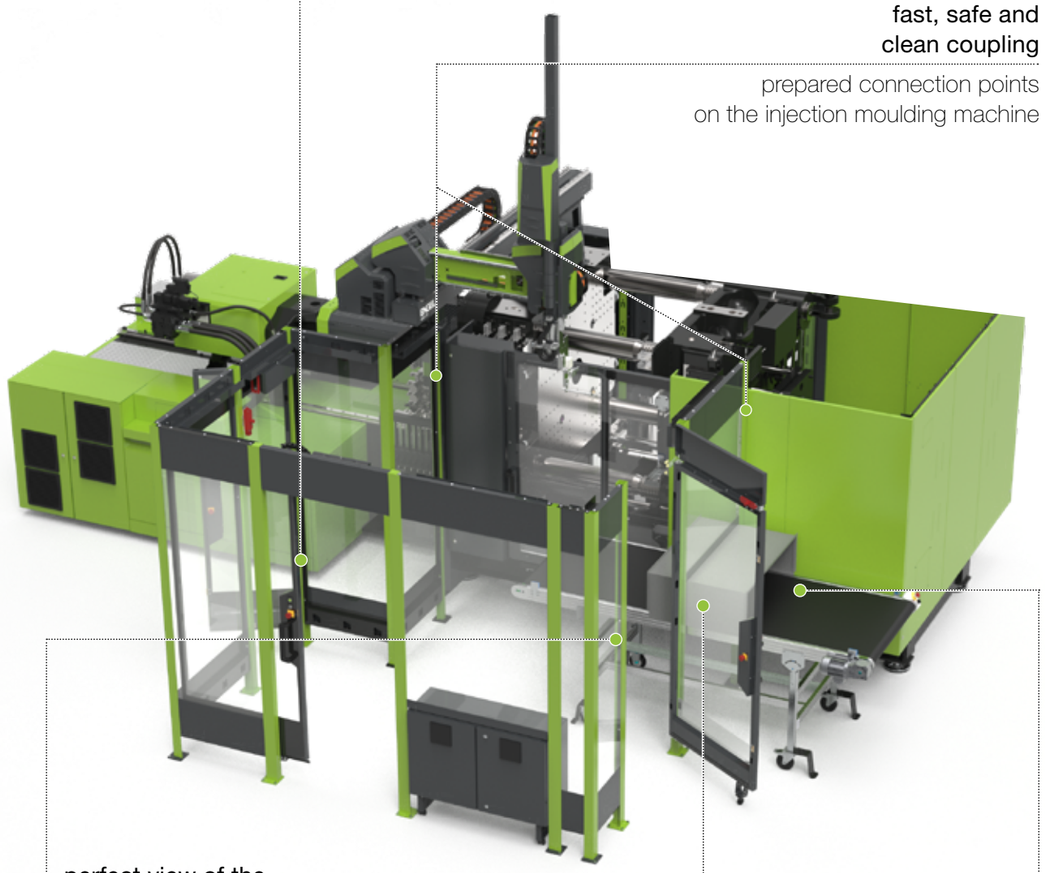
- standard layouts for numerous machine/robot combinations - simplest availability of certified safety technology
- no time-consuming and expensive additional certification required
- overhead protection – front side design variants of the automation cells

flexible solutions for the operation of the injection moulding machine with cell

safety package 2 for closed and 3 for open safety gate

fast, safe and clean coupling

prepared connection points on the injection moulding machine



perfect view of the running process

extensive range of protective panels
widths 250, 500, 750, 1,000 mm
or special dimensions in 50 mm intervals
Height 2,500 mm, polycarbonate panes,
optional wire mesh, individual layouts

best use of space for all needs

Revolving/sliding door or light beam guard
Widths of 750 to 1,500 mm.
closed or open at top

safely remove or feed any parts in the production process

individually adapted openings with safety tunnel

Processing technology
precision products for part handling

Processing technology
precision products for part handling

ENGEL offers multiple solutions for the processing of parts before inserting them into the injection moulding machine, or after removal. The result is completely finished products from an automated production system that includes all processing steps.

infrared oven
the compact infrared ovens for the efficient heating of semi-finished products

The ENGEL infrared oven adjusts to the requirements of the given components, and is available in various sizes, with or without a sliding table. In order to optimally heat the components, the heating area can be sub-divided into individually adjustable zones. Even smaller components can be efficiently heated in a large oven, as required. Thanks to its compact design, the oven can be easily installed in any production cell and effortlessly transported by forklift or crane.
The control unit is completely integrated into the familiar ENGEL CC300 control software, and is very intuitive and ergonomic for the operator to handle. Set-up time is minimal, and the oven can be adapted to different semi-finished products at any time. All process data can be continuously monitored and logged.

- integration of the oven control unit into the machine control unit – uniform operation for machine and peripherals on the panel and manual control unit
- modular regulation of the heating fields – energy efficiency at homogeneous surface temperature
- pyrolysis function for material residues - self-cleaning

output of room temperature
optional exhaust system for heating unit and sliding table

flexible for a wide range of applications
modular for component sizes up to 1,100 x 1,610 mm and capacities up to 175 kW

best absorption - high depth effect
heat input through infrared radiator 2.5 to 3.5 µm

optimal adjustment of clearance part/heater
height adjustment of the heating

fully automated operation
optional servo-motorized sliding table

Training
more efficiency in injection moulding

Training
more efficiency in injection moulding

Enhanced product quality, more stable processes and boosted output with a maximum of good parts – a thorough understanding of your injection moulding machine, your robot and the interaction of individual process steps enables you to get more out of your injection moulding system. ENGEL training supports you in achieving this goal. With an extremely comprehensive program of highly practical training courses. This ranges from seminars and specialized workshops to certified training.

ENGEL robotics basics (ERB)
basic skills for operating ENGEL viper robots

After the seminar, participants will be familiar with the mechanical design and the controls, and capable of setting up and using the standard programs.
Prerequisite: Basic knowledge of injection moulding machines

- structure of the robot system
- work area setup
- function, operation, standard programs
- interpreting error messages

Practical exercises: adjustment of the standard programs under production conditions
Prerequisite: basic knowledge of injection moulding machines

ENGEL robotics advanced (ERA)
operating ENGEL viper robots for advanced users

After the seminar, participants will be capable of programming ENGEL viper robot systems and also of quickly and effectively changing or adapting various sequences.
Prerequisite: Good working knowledge of ENGEL viper robots, seminar ERB

- work area setup
- sequence editor basics
- explanation of ENGEL standard sequences

Practical exercises: defining various program processes
Prerequisite: good working knowledge of ENGEL viper robots, ERB seminar.

ENGEL robotics six axis (ERS)
operation of ENGEL articulated arm robots easix KR

After the seminar, the participants will be familiar with the design and coordinate systems as well as operation and programming the six-axis robot. More complex program sequences can be created and adapted based on this knowledge.

- design of the robot
- sequence editor
- coordinate systems

Practical exercises
Prerequisite: good working knowledge of sequence programming, ERA seminar.

ENGEL robotics control (ERC)
control technology and maintenance from ENGEL linear robots

Effective performance of maintenance tasks on ENGEL viper robot systems, and quick troubleshooting and error correction. After the seminar, participants will be familiar with robot control elements and their functions, and with troubleshooting procedures.
Prerequisite: Good working knowledge of electrical technology and machine operations

- system components
- control modules, calibration of the drives
- robot setup
- error messages and correcting errors

Practical exercises: adjustment and calibration, troubleshooting
Prerequisite: good working knowledge of sequence programming, ERA seminar.

In addition to the training described above, you can also book a basic and advanced training for the ENGEL e-pic. Or book an individually configured special training for your entire team and at your own site.
More information at **www.engelglobal.com**

Service

support you need – around the clock and around the world

ENGEL services

to ensure sustainable good results and optimal functionality for your machine park

e-connect

your online portal for ENGEL services

The free e-connect customer portal groups all the information you need for your system. Logging in will let you access all necessary information at any time. Whether machine status or service activities - fast and easy communication via our internet platform ensures efficient processing and reduces aggravating wait times. For optimum planning of maintenance windows and maximum system availability.
All machines and production cells supplied by ENGEL from the first order onwards are stored in the system and their current status can be viewed. For a clear presentation, you can simulate the individual structure of your machine park in the system and assign the production facilities to different halls or departments online.

e-connect.24

fast remote maintenance around the clock

Perfect online support, directly on your machine: ENGEL e-connect.24 gives you access to qualified remote maintenance and online support around the clock. 560 service engineers worldwide help you at any time to quickly identify the fault and get things back under control: in a case of a maintenance issue or fault, the system allows you to send an electronic service request to your first level support technician. Our specialists immediately start looking for the cause of the problem via a remote connection.mote-Verbindung unmittelbar mit der Ursachensuche.

EN 2018-09

ENGEL
be the first

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