Motorsport: Many companies in the automotive industry or the world of motorsport, use the products from LANG for years to increase the efficiency of their production. Above all Formula 1 racing teams - they appreciate the flexibility of our clamping and automation solutions not only for mass production, but also for individual parts and small series in the prototype production.
Machine-Tool Automation

Benefits

- Maximum capacity utilisation
- Simplicity
- Quick amortisation

Applications

At a glance

- Can be attached to almost all machining centres
- Side or front loading of machine tool possible
- Small space requirements, flexible positioning towards machine tool
- Manual operation of machine tool still possible
- No additional medium inside of the machine tool necessary
- Simple and user-friendly functional principle
- Favourable purchase pricing, quick amortisation

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Small space requirements, flexible positioning towards machine tool
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No additional medium inside of the machine tool necessary
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Favourable purchase pricing, quick amortisation
The necessity of automated manufacturing

Increasing competition, cost pressures and skills shortages are challenges which have resulted in the fact that many manufacturing companies increased the degree of automation in recent years.

Meanwhile, a large number of companies mastered the balancing act between maintaining good processes and a targeted modernisation successful and consider themselves well equipped for the challenges of tomorrow. Automation people argue with the machine running times, increasing efficiency and lower costs per piece, when they describe the positive impact on their manufacturing processes.

An alarmingly high number of companies have not yet taken this step or have not perceived it as necessary. The subject of automation is approached hesitantly with concerns about small batch sizes, age of the machinery or simply the fear of major change.

Because of the past decade in which we have driven automation of our production processes consistently, we are convinced that these concerns are often unfounded. The reasons for that are presented to you below.

Low batch sizes and/or short machining times

Scenarios which each production company only knows too well, are short machining times, forcing the operator to wait in front of the machine for the next workpiece change or machine stoppages caused by other activities of the operator, who cannot keep pace with the fast pulsing.

However, this rather inefficient processes can turn into cash with an appropriate automation solution. Automated production processes do not only serve to expand an unmanned shift, but also optimise processes during the day.

The operator of the automation system gains a new window of time, often large enough to pursue other upstream/downstream activities increasing productivity during machine processing times, even with processing times of only 5 minutes and batch sizes as little as 10 parts.

Machine Tools we already have equipped:

Alzmetall, Bridgeport, Brother, Chiron, DMG, Doosan, Emco, Fanuc, Feeler, Fehlmann, Grob, GMC, Haas, Hedelius, Hermet, Hitachi Seiki, Hurco, Hyundai, Matec, Matsaura, Mazak, Mikron, Mitsubishi Seiki, Mori Seiki, OKK, Okuma, Quaser, Spinner, Stama, YCM, uvm.

We are sure your machine tool will look great with a LANG Automation, too!

Restructuring of habitual manufacturing processes

Long before the automated production the modern CAD/CAM systems and sophisticated tool technology in the machining industry have established. The realised average increases in value and improved machining strategies quickly lead to significantly lower processing times. However, this potential is unfortunately seldom used if e.g. machine tools rest after the end for 12 hours or more.

Even without increased staffing the machine running times can be dramatically increased through the support of automation, making the added value of CAD/CAM and tool count even more. This has a positive effect on the machine hour rate which is correspondingly lower.

Age and suitability of existing machines

SMEs in particular encounter with a corresponding order situation often at capacity limits. The obvious solution to this problem is usually the purchase of new machine tools and consequently increasing the staff. These mind games are legitimate, since new tools generally stand for an increase in productivity and increased reliability.

Companies which have no experience in the field of automated production, go the known way and invest in a new machine tool. The high cost factor is rarely questioned.

Since the adaptation of an existing machine to an automation system seems too complex and expensive, the optimisation and automation of the existing machinery is often disregarded.

This is exactly where LANG automation systems can make an impact! These do not require complex signal interfaces, automatically opening doors or media sources in the machine table. To get started with a LANG Automation you merely need a free, acknowledgeable M-function.

With brilliant simplicity and high efficiency our automation systems have a significant effect on your production today and prepare you for tomorrow’s challenges.
Eco·Compact 20 Automation

The proven Eco·Compact 20 automation system impresses with its simplicity and great usability, making it an ideal introduction to the automated production. This fact is reflected in particular in its low purchasing costs and the quick amortisation. The communication to the machine tool functions via an acknowledgeable M-code. The resulting low installation and training effort ensures that customers make money from the first day of use. The whole flexibility of the automation system is shown by the fact that after connecting the Eco·Compact 20, the machine tool can be used both in the automated and in the manual mode. The additionally available pivoting device (see picture p. 145: Hermle C400) leaves the possibility open to continue operating the machine tool manually if needed.

Machine tool and automation in perfect harmony

Choose the colour of the operation panel frame, the window stickers as well as the corner cappings individually! Adapt the design of your Eco·Compact 20 to the design of your machine tool without any surcharge! Further colour combinations on request.

Quick amortisation –

Expansion of a one-shift operation: Maximisation of manufacturing capacities and modernisation of processes

The diagram below is based on customer’s and own manufacturing experiences.

Sample calculation with common parameters:
Assuming an hourly machine rate of 60 EUR and a realistic, additional machine running time of 8 hours in the evening and night hours a gain of 480 EUR is created daily. Calculated using 46 working weeks a year, within only 7–8 months a return on investment would be realised on our automation system Eco·Compact 20! Even with considerably less machining time, you can achieve enormous gains. We would appreciate the opportunity to prepare you a customised, personal return on investment calculation – just ask your sales representative!
Eco•Compact 20 – Selection of realised applications:
Quick•Point® Automation Base Tower

Pneumatic-mechanical zero-point clamping system -
Matching interface for the Eco-Compact 20

Mounting options of the Quick•Point®
Automation Base Tower

The Quick-Point® automation base tower comes with clamping studs attached, which allows the machine operator to quickly and precisely exchange the base tower in seconds with use of our Quick-Point® zero-point system. The total height of this clamping set-up is 107 mm (80 mm base tower, 27 mm Quick-Point® plate).

It is also possible to add mounting bores to the angled surface of the aluminium base tower. The bore pattern can be added according to the T-slots of the machining table. Using this method of attaching the base tower directly to the machine table, the set-up height is only 80 mm.

Clamping studs are included for a quick change over. In addition a 40H7 centre bore for precise positioning of the base tower is included.

Including an aluminium handle bar for a quick change over of the tower.

Mounting option 1

Mounting option 2

NEW LOOK!

1. Ground, even surface – easy to clean
2. Guide rails guarantee troublefree loading with pallets - independent of pallet weight
3. Highest clamping force with the patented wedge system
4. Elevated pneumatic interface with optimal accessibility for the automatic opening, closing and retrieval of clamping situations
5. Interface adaptor for manual operation of the base tower. Can be connected to a pneumatic hose or operated directly with an air pressure pistol

Quick-Point® Automation Base Tower, incl. clamping studs Ø 20 mm

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Height</th>
<th>Diameter</th>
<th>Weight</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>46080</td>
<td>80 mm</td>
<td>bottom: 246 mm / top: 176 mm</td>
<td>12.6 kg</td>
<td></td>
</tr>
</tbody>
</table>
**Makro-Grip® Automation Vice**

The 5-Axis Vice for automated manufacturing.

1. Reversible jaws with Makro-Grip® holding teeth
2. Centring accuracy ± 0.02 mm
3. Double guided jaws
4. Coloured bumpers for indicating correct side when loading the storage tower/table
5. Equipped with clamping studs for precise clamping in the Quick-Point® zero-point clamping system
6. Additional clamping support for non-stamped or semi-finished parts
7. Threads for mounting endstops
8. Integrated automation interface can also be used as an ergonomic recessed grip
9. Corrosion-resistant, sturdy and handy steel body

**At a glance:**
- Best accessibility for 5-face-machining
- Exceptional holding power with lowest clamping forces due to the patented stamping technology
- Compact design and low weight for easy and ergonomic handling
- Integrated zero-point interface
- Perfect conveying of swarf thanks to a smooth transition from vice to automation base tower

**Applications of Makro-Grip® Automation Vices**
Makro•Grip® 77 Automation Vice

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Base length</th>
<th>Clamping range</th>
<th>Weight</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>46160</td>
<td>170 mm</td>
<td>0 - 160 mm</td>
<td>7.2 kg</td>
<td></td>
</tr>
</tbody>
</table>

Suitable spare jaws for the Makro•Grip® Automation Vice 77 can be found on page 88/89.

Makro•Grip® 125 Automation Vice

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Base length</th>
<th>Clamping range</th>
<th>Weight</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>46205</td>
<td>210 mm</td>
<td>0 - 205 mm</td>
<td>9.4 kg</td>
<td></td>
</tr>
</tbody>
</table>

Suitable spare jaws for the Makro•Grip® Automation Vice 125 can be found on page 92/93.
Makro·Grip® 77 Automation Dual Vice

1. Reversible jaws with Makro·Grip® holding teeth
2. Coloured bumpers for indicating correct side when loading the storage tower/table
3. Corrosion-resistant, rigid steel body with integrated interface for automation gripper
4. Double guided jaws
5. Threads for mounting endstops
6. Integrated automation interface can also be used as an ergonomic recessed grip
7. Equipped with clamping studs for precise clamping in the Quick·Point® zero-point clamping system

Retrofitting kit for converting the Dual Automation Vice into a 4-fold Clamping Vice

Adaption set (middle jaw + thread spindle)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Clamping range</th>
<th>Quantity</th>
<th>Weight</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>46200-TG17</td>
<td>4 x 90 mm</td>
<td>2 centre jaws</td>
<td>2 x 0.7 kg</td>
<td></td>
</tr>
<tr>
<td>46200-TG27</td>
<td>4 x 85 mm</td>
<td>incl. thread spindle</td>
<td>2 x 0.9 kg</td>
<td></td>
</tr>
</tbody>
</table>

lang-technik.de
**Makro-Grip® Mobile Storage Unit**

Space-saving stocking solution for pallets and fixtures.

1. Convenient handle for pushing and pulling the unit
2. Base dimensions 1200 x 1800 mm: ideal for transport on Euro pallets
3. Powder coated coolant collecting tray with integrated coolant drain screw
4. Space to hold up to 60 devices (30 devices on each side)
5. Non-corrosive galvanised sheet steel
6. Easy moving of the storage unit with rubberised casters

**Makro-Grip® Mobile Storage Unit**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Capacity</th>
<th>Dimensions</th>
<th>Weight</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>61060</td>
<td>max. 60 clamping devices</td>
<td>1200 x 800 x 1500 mm</td>
<td>160 kg</td>
<td></td>
</tr>
</tbody>
</table>

For all LANG workholding and fixtures with Quick-Point® grid system 52 and 96 mm.
The Robo-Trex automation system can be attached to existing machine tools. It communicates with the machine tool via one acknowledgeable M-function. Loading is done through the machine door or an integrated side window.

Optionally the Robo-Trex system is available with 4 shop trolleys. Thereby the storage capacity increases to 120/168 vices depending on the part size. The maximum space requirement is listed as 2.20 x 3.70 m.

Robo-Trex applications

The patented, edgewise mounting of the Makro-Grip® Robo ensures maximum utilisation of space. The perfect accessibility to the clamping device allows exchanging workpiece, without taking the vice out.

For the special storage on the trolley and for the gripping through the handling robot, clamping grooves are applied on both lateral sides of the Makro-Grip® Robo 77. In between is a practical swarf and coolant drain.

The clamping of parts with excess width is also conceivable by occupancy of e.g. every other storage space.

Robo-Trex Automation

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Basic equipment</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>66000</td>
<td>Complete robotic automation system incl. enclosure, trolley entry system and 1 shop trolley</td>
<td>145,144</td>
</tr>
</tbody>
</table>

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<td>145,144</td>
</tr>
</tbody>
</table>
Robo-Trex Automation

External preliminary set of the shop trolleys, excellent maneuverability and an integrated entry system enable a fast loading of the Robo-Trex automation by simple trolley exchange.

The storage capacity per trolley is 30 (part size max. 120 x 120 x 100 mm) or 42 vices (part size max. 120 x 100 x 70 mm).

The self-explanatory control via touch panel enables easy operation of the automation system, which reduces training costs to a minimum.

With a one-click dialing the workshop trolleys can be easily selected or deselected. In addition, an allocation of individual NC programmes of the machine tool is possible.

Modern articulated robot with integrated LANG gripper ensures easy accessibility to the machine table.

Due to the direct engagement of the vices additional support pallets are not needed.

Due to the low built of the zero-point clamping system, placed 5-axis tables (3+2) can be excellently automated as well.

The control of the zero-point clamping system can be done either pneumatically through the machine tool or mechanically through the robot.

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Robo-Trex Automation Trolley

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Storage capacity</th>
<th>Part size</th>
<th>Weight</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>66030</td>
<td>30</td>
<td>120 x 120 x 100 mm</td>
<td>167 kg</td>
<td></td>
</tr>
<tr>
<td>66042</td>
<td>42</td>
<td>120 x 100 x 70 mm</td>
<td>170 kg</td>
<td></td>
</tr>
</tbody>
</table>

Clamping/releasing of the zero-point plate is done mechanically by the robot.

Note: There is also a pneumatic type of zero-point plate available. Due to the individual adaptation to the machine tool the design may vary. Prices upon request.

Robo-Trex Zero-Point Plate

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Dimensions</th>
<th>Weight</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>66500</td>
<td>Ø 157 x 37 mm</td>
<td>4.8 kg</td>
<td></td>
</tr>
</tbody>
</table>

Clamping/releasing of the zero-point plate is done mechanically by the robot.

Note: There is also a pneumatic type of zero-point plate available. Due to the individual adaptation to the machine tool the design may vary. Prices upon request.

lang-technik.de
Makro-Grip® Robo 77

The new raw part clamping vice for the Robo-Trex Automation.

Technical features:
- Gripper groove for robots, as well as adaptation for placement on the shop trolley
- Lateral swarf/coolant drain in the base body
- Optimised spindle bearings for high repeatability
- Increased clamping force of the Makro-Grip® Robo 77 with jaw width 46 mm
- Makro-Grip® reversible jaws for use of the patented stamping technology
- Integrated Quick-Point® S2 zero-point adaptation

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Base length</th>
<th>Jaw width</th>
<th>Weight</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>66120-46</td>
<td>130 mm</td>
<td>46 mm</td>
<td>2.5 kg</td>
<td></td>
</tr>
</tbody>
</table>

Spare jaws for Makro-Grip® Robo 77 - Jaw width 46 mm

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Weight</th>
<th>Unit</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>66120-4620</td>
<td>0.6 kg</td>
<td>1 pair</td>
<td></td>
</tr>
</tbody>
</table>

In order to achieve best centring accuracy it is necessary to replace both jaws in case of a damage.

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Base length</th>
<th>Jaw width</th>
<th>Clamping range</th>
<th>Weight</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>66120-77</td>
<td>130 mm</td>
<td>77 mm</td>
<td>0 - 120 mm</td>
<td>2.9 kg</td>
<td></td>
</tr>
</tbody>
</table>

Spare jaws for Makro-Grip® Robo 77 - Jaw width 77 mm

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Weight</th>
<th>Unit</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>66120-7720</td>
<td>0.8 kg</td>
<td>1 pair</td>
<td></td>
</tr>
</tbody>
</table>

In order to achieve best centring accuracy it is necessary to replace both jaws in case of a damage.
Robo-Shelf Automation

The Robo-Shelf automation system can load the machine tool both from the machine door and from a side window. The full accessibility to the machine tool is ensured by a safety door. Thus, the option for a manual operation mode without automation remains. The Robo-Shelf works with almost any (existing) machine tool.

As already shown on the Eco-Compact 20 automation system, the option also exists with the Robo-Shelf of modifying defined elements of the shelving system to the colour of the machine tool. Ask us about it!

Shelves in flexible height for different part sizes and max. capacity utilisation:

- Distance of the shelves 330 mm: max. 81 Makro-Grip® 125 or 54 pallets (max. pallet size of 400 x 300 mm)
- Distance of the shelves 230 mm: max. 108 Makro-Grip® 125 or 74 pallets (max. pallet size of 400 x 300 mm)

Self-made pallets can also be used.

Robo-Shelf applications

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Robo•Shelf applications

Depending on the machine tool interface each pallet slot can be assigned to a program. Alternatively, pallet slots that have been previously assigned by the control of the automation can be called up via an acknowledgeable M-function.

The control of the zero-point clamping system can be done either pneumatically by the machine tool or mechanically by the robot.

The setup station with turntable allows a simple and uncomplicated assembly of the shelving system. While the operator loads the clamping device, the removal/supply is done at the same time by the robot.

On a footprint of only 3.60 x 3.20 m, the operator has up to 108 available pallet slots.

Robo•Shelf Zero-Point Plate

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Dimensions</th>
<th>Weight</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>63500</td>
<td>Ø 246 x 45 mm</td>
<td>14.0 kg</td>
<td></td>
</tr>
</tbody>
</table>

Clamping/releasing of the zero-point plate is done mechanically by the robot.

Note: There is also a pneumatic type of zero-point plate available. Due to the individual adaptation to the machine tool the design may vary. Prices upon request.

Robo•Shelf Support System

For mounting own fixtures or clamping devices.

Utilising the support system own fixtures and clamping systems of other manufacturers can be used with the Robo•Shelf Automation. The Support Base Plate’s scope of delivery is: 4x clamping studs Ø 20 mm, 4x bushings Ø 16 mm, 4x threaded pins M 10, 4x M 10 cylinder screws.

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Dimensions</th>
<th>Weight</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>63212</td>
<td>Robo•Shelf Support System (Support Base Plate + Aluminium Pallet)</td>
<td>400 x 300 x 54 mm</td>
<td>14.6 kg</td>
<td></td>
</tr>
<tr>
<td>63210</td>
<td>Robo•Shelf Support Base Plate</td>
<td>210 x 125 x 24 mm</td>
<td>5.0 kg</td>
<td></td>
</tr>
<tr>
<td>63211</td>
<td>Robo•Shelf Aluminium Pallet</td>
<td>400 x 300 x 30 mm</td>
<td>9.6 kg</td>
<td></td>
</tr>
</tbody>
</table>
Makro-Grip® Robo 125

In order to achieve best centring accuracy it is necessary to replace both jaws in case of a damage.

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Makro-Grip® Robo 125 - Jaw Width 77 mm

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Base length</th>
<th>Jaw width</th>
<th>Clamping range</th>
<th>Weight</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>63205-77</td>
<td>210 mm</td>
<td>77 mm</td>
<td>0 - 205 mm</td>
<td>9.1 kg</td>
<td></td>
</tr>
</tbody>
</table>

Spare jaws for Makro-Grip® Robo 125 - Jaw Width 77 mm

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Weight</th>
<th>Unit</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>63205-7720</td>
<td>2.2 kg</td>
<td>1 pair</td>
<td></td>
</tr>
</tbody>
</table>

Makro-Grip® Robo 125 - Jaw Width 125 mm

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Base length</th>
<th>Jaw width</th>
<th>Clamping range</th>
<th>Weight</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>63205-125</td>
<td>210 mm</td>
<td>125 mm</td>
<td>0 - 205 mm</td>
<td>10.4 kg</td>
<td></td>
</tr>
</tbody>
</table>

Spare jaws for Makro-Grip® Robo 125 - Jaw Width 125 mm

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Weight</th>
<th>Unit</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>63205-2520</td>
<td>2.8 kg</td>
<td>1 pair</td>
<td></td>
</tr>
</tbody>
</table>