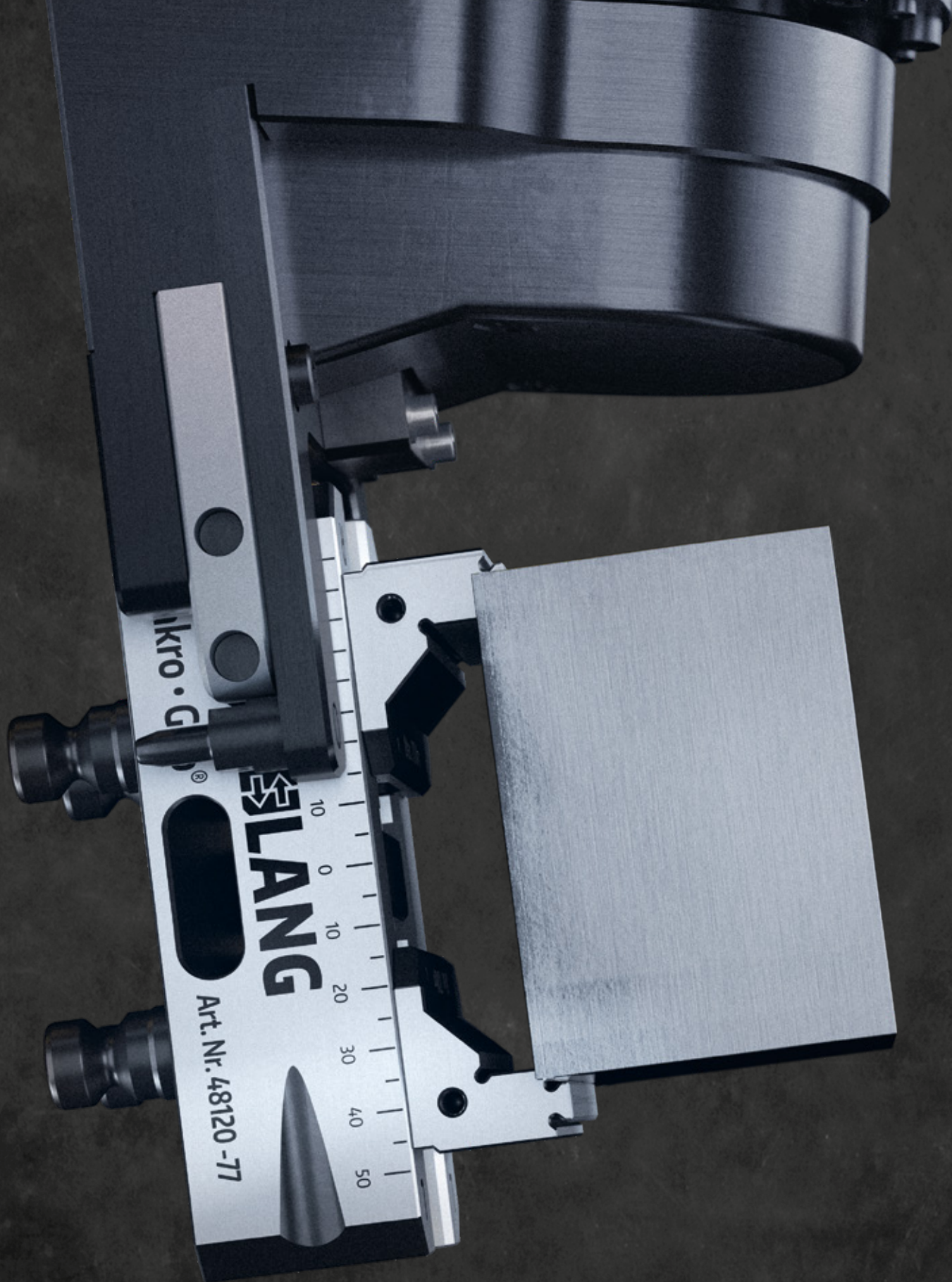




AUTOMATION

— VERSION 1/2018



**LANG
TECHNIK**

simple. gripping. future.

Contents

The necessity of automated manufacturing	4
Stamping Technology in automated production	5
From one source	6
RoboTrex components	10
RoboTrex at a glance	14
Program assignment via probe	16
What our customers say	17
RoboTrex 52	20
RoboTrex 52 Automation Trolley	22
RoboTrex 52 Zero-Point System	23
Makro•Grip® 5-Axis Vice 77	24
RoboTrex 96	28
RoboTrex 96 Automation Trolley	30
RoboTrex 96 Zero-Point System	31
Makro•Grip® 5-Axis Vice 125	32
Clean•Tec Cleaning Fan	36
Makro•Grip® Mobile Storage Unit	37

More efficiency, automatically!

The necessity of automated manufacturing

In recent years, many manufacturing companies have increased their degree of automation to assist with stronger competition, cost pressures and the current shortage of skilled labor. In order to increase machining hours and spindle run times, a reasonable degree of automation appears to be mandatory.

Automation systems by LANG will cover every need from single part to large-scale production. They can be retrofitted to almost any machining centre. A simple, uncomplicated operation and a quick return on investment make our systems appealing, especially to smaller companies or those just starting out in automated manufacturing.

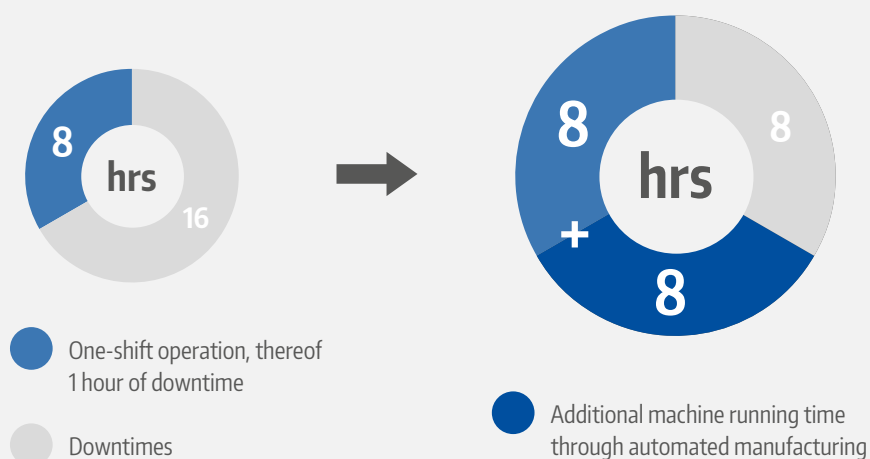
Reduce costs – Increase productivity

LANG offers solutions to automatically (un-)load machine tools with vices.

- ✓ You increase machining hours and your output dramatically
- ✓ You relieve employees and upgrade their jobs at the same time
- ✓ You can produce almost unmanned

Quick return on investment

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





Tip for your benefit:

Stamping Technology in automated production

The form-closure effect, created by pre-stamping a workpiece, ensures you will hold a workpiece with constant and consistent quality and with high process reliability. Two factors, which are particularly essential for automated production:

1. Wear-free clamping with the Makro-Grip® 5-Axis Vice:

The application of force to the workpiece takes place during pre-stamping. As a result, the 5-Axis Vice does not have to penetrate the workpiece during the clamping process, but only holds it in a form-fitting manner with very low actuation force.

2. The tooth contour of the Makro-Grip® 5-Axis Vice:

Competitors clamping devices with sharp holding teeth tend to wear rather quickly, especially when clamping high-tensile material. As a consequence, holding forces diminish, ultimately leading to vibration. Makro-Grip® stamping teeth take the shape of truncated pyramids and cannot seat deeper into the workpiece. They offer a defined, consistent end stop making highly repeatable insertion of the workpiece possible.

This high level of process reliability allows machine capacities to be easily relocated. The main part of the workpiece machining or the first setup can take place unmanned in a second or third shift. With the additional time available, tools and machines do not have to be stressed to their maximum capacity, which means that they can produce in a resource-saving manner, having positive effects on safety.

By shifting the main cutting to unmanned shifts, the range of tasks for the machine operator also changes. Additional capacities are free, in which the operator's time can be used even more efficiently.

Zero-Point Clamping, Workholding and Automation

All from one source

LANG was the very first workholding manufacturer to offer solutions that influenced multiple production processes. Along with offering our customers innovative clamping solutions, in order to increase production output and efficiency, LANG also set the goal of optimising upstream and downstream processes for workpiece machining.

Today, LANG can look back on more than a decade of automated production, incorporating many years of experience into continuous process optimisations. With a perfectly coordinated, proven package of clamping technology, zero-point clamping systems, automation, and the patented stamping technology, we build an atmosphere that allows our customers to remain competitive and well prepared for the challenges of the future.

Quick-Point® Zero-Point Clamping System

The modular Quick-Point® zero-point clamping system can be retrofitted to almost any machine table, making it a perfect solution for high speed changeovers of vices, fixtures and workpieces. Whether vertical or horizontal machining, 3-, 4- or 5-axis applications, there is a model that fits your needs. Its flexibility, high positioning accuracy and reliable, durable construction make it one of the best in its class and the industry benchmark in zero-point clamping.



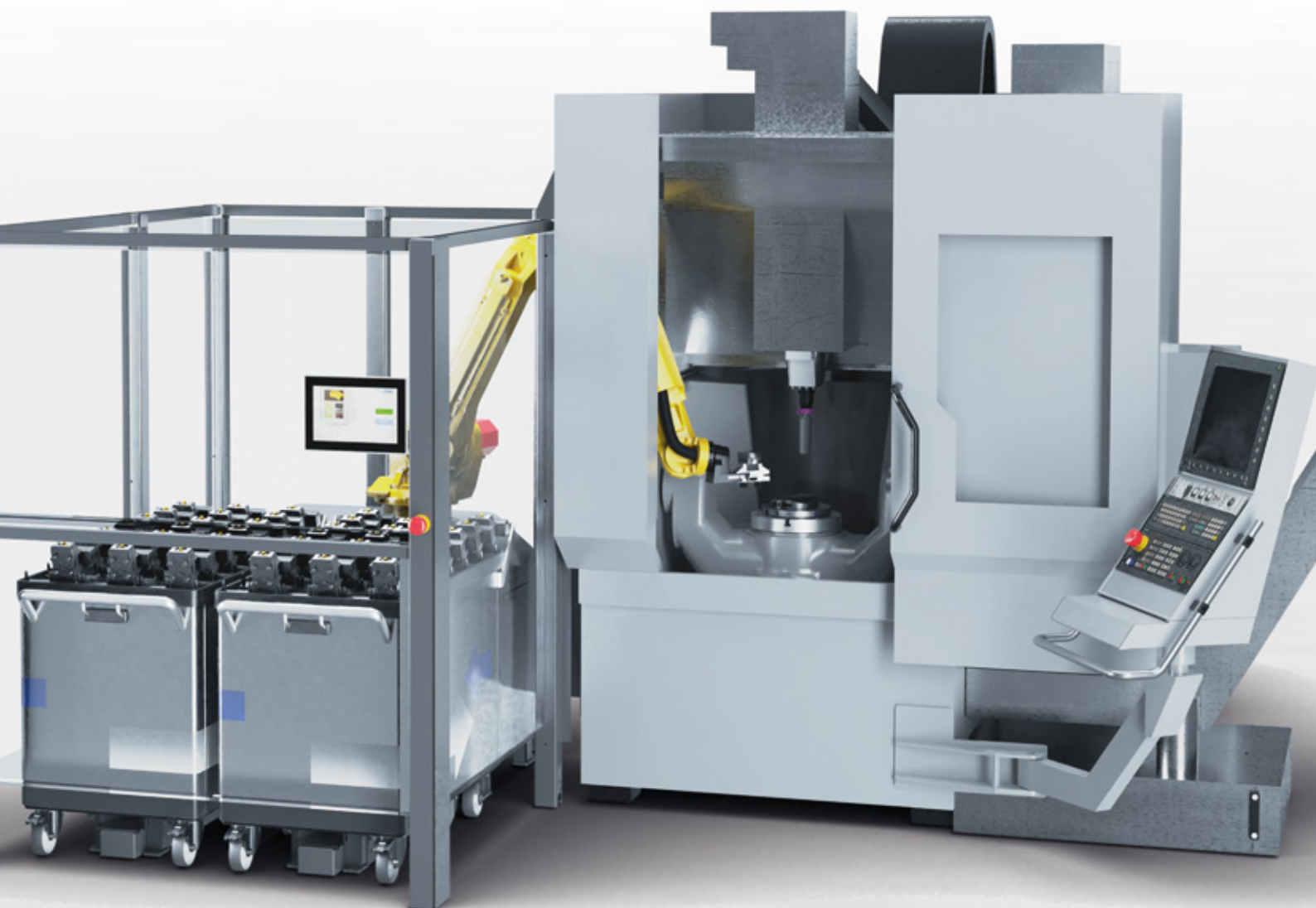
Makro-Grip® Stamping Technology



Makro-Grip® stamping technology ensures wear-free clamping of high-tensile material via our patented form-closure technology where other, conventional clamping devices reach their limits. Clamping scenarios that require high holding power, but where the potential for workpiece deformation exists, are easily and reliably mastered with pre-stamping the workpiece. The combination of pre-stamping and the Makro-Grip® 5-Axis Vice is the best solution for 5-sided machining and has no comparable product on the market.

Makro-Grip® Raw Part Clamping / Conventional Workholding

From raw material to finished product – A solution that fits all of your challenging clamping tasks. Where maximum accessibility is required, the compact Makro-Grip® 5-Axis Vice is your choice for 5-sided machining. In addition the modular clamping package is completed with multiple clamping systems for contour and round parts (Avanti, Profilo, Preci-Point), along with the Vario-Tec Vices for the machining of the 6th side.



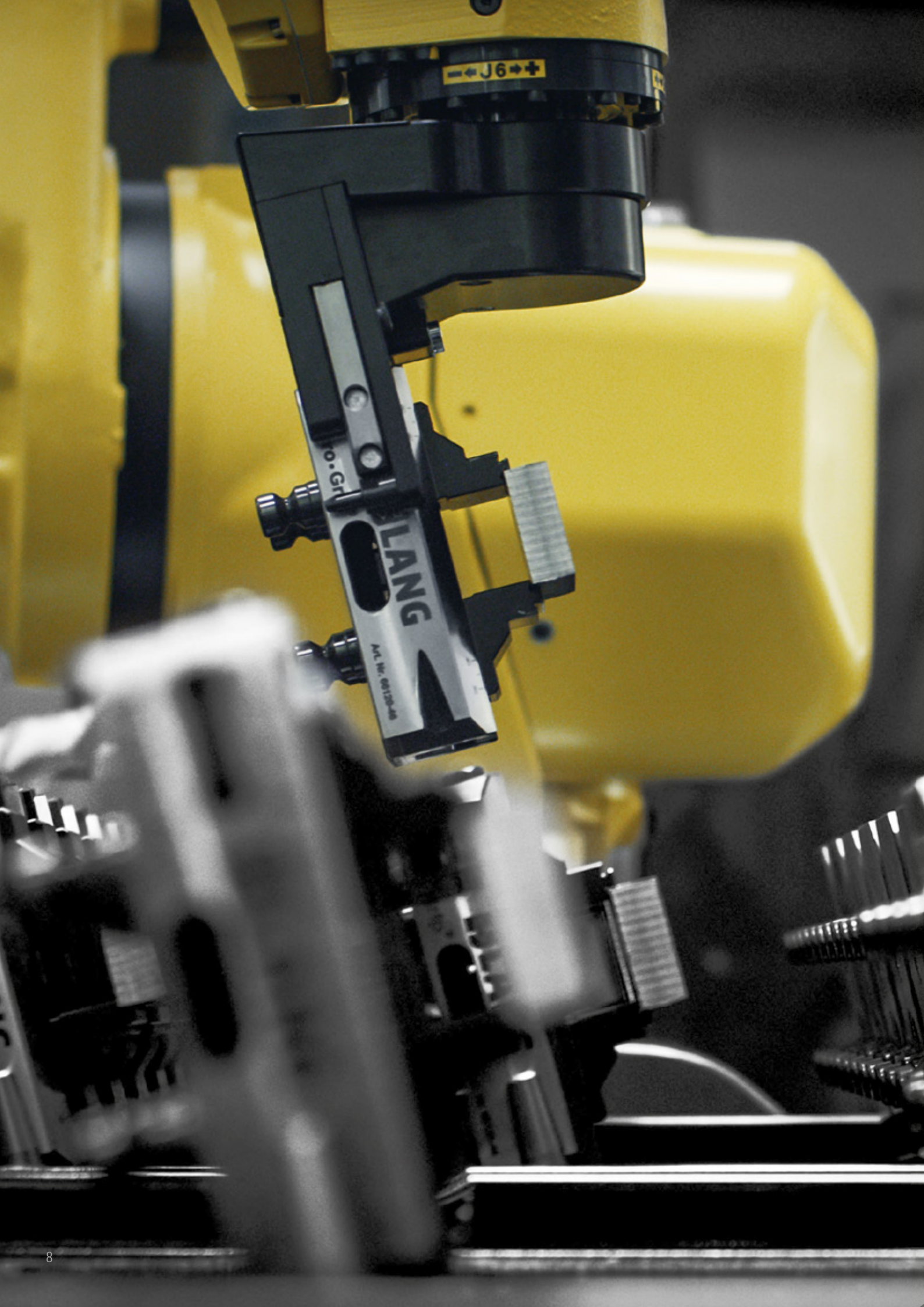
RoboTrex Automation System

More efficiency, automatically! The innovative and patented trolley system of the RoboTrex automation creates flexibility and guarantees extended machining hours and machine tool utilisation, even during unmanned evening and weekend shifts. Thanks to the offline preparation of the trolleys, the RoboTrex is (re-) loaded quickly and without machine tool downtime. The trolley ensures maximum space utilisation with the patented, angled mounting of the vices.

Clean·Tec Cleaning Fan

Clean·Tec is the practical, time saving solution for the removal of chips and coolant from the machine table, fixtures and/or workpieces before unloading. Used like any other tool from the tool changer, the blades are opened and closed with the adjustment of the spindle rotation.





RoboTrex

Automation System

RoboTrex Components

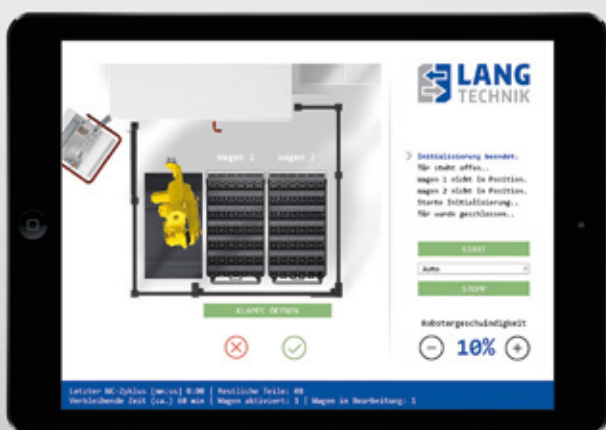
The Robot

Proven quality

RoboTrex automation relies on proven FANUC quality, utilising M-20iA and M-710iC/50 models. Both are standard industrial robots with six axis operation and maximum loads of 20 kg and 50 kg respectively. With their compact design, they fit perfectly into the overall concept of RoboTrex.

Both are equipped with collision detection and an electronic safety fence system, ensuring the utmost process reliability. After an unlikely malfunction, they automatically perform a reference run.

With RoboTrex automation, the industrial robots arrive in a ready-to-operate and preprogrammed state, simplifying and reducing the amount of training that is necessary.



The Control

Easy operation

The simple, intuitive, user friendly control reduces training requirements to a minimum. Knowledge about robots is not necessary.

Among others, some basic functions are:

- Start/Stop
- Selection and deselection of automation trolleys
- Adjustment of operating speed

The Automation Trolley

The centre piece of the system



In the true sense of the word, the automation trolleys are simply mobile storage units. The special feature is the patented, angled positioning of the vices. It ensures maximum space utilisation on a small footprint. Great accessibility to the vice allows set up and changeover right on the trolley. This can take place anywhere, off-line.

Thanks to the integrated entry system, if an automation trolley is pre-loaded, the RoboTrex system can be equipped within seconds by simply exchanging trolleys. An automation trolley with finished workpieces can be removed or replaced at any time during the operating mode. Machine downtimes are reduced to a minimum and an “endless loop” in production processing is possible.

Interchangeable, automation trolleys are automatically recognised by RoboTrex. They can be used on different RoboTrex systems, increasing the flexibility of your production process. If an automation trolley is deactivated, it simply remains within the system during operation, no additional space needs to be freed.

On request, the automation trolleys can be retrofitted with special equipment. The maximum possible number of vices depends on the desired workpiece size. Optionally, RoboTrex is available with up to four automation trolleys and (depending on the machine tool interface) each trolley can be assigned to a specific machine program.

The Clamping Device

Highest holding forces

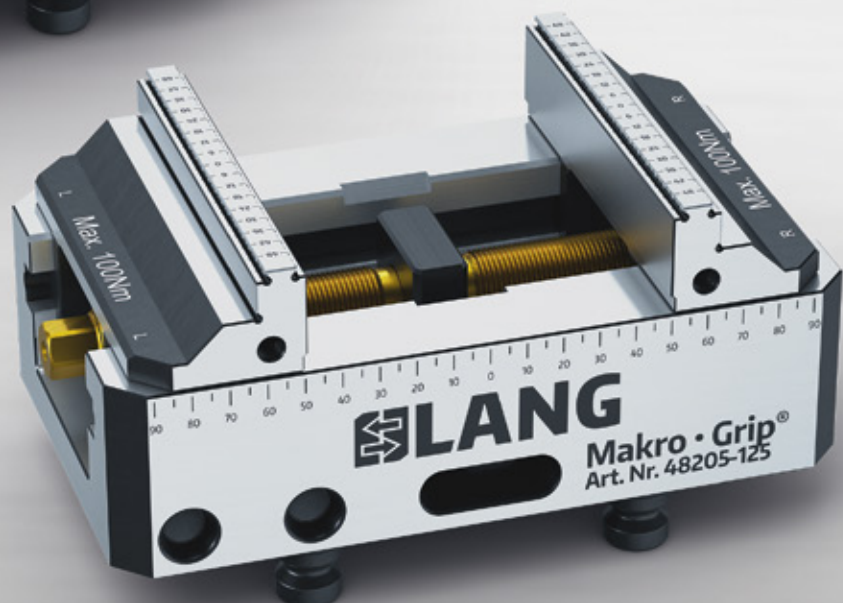
Compact 5-Axis Vices along with Makro-Grip® stamping technology offers ideal conditions for automated production (see page 5).

The workpiece is held with a form-closure fit in the 5-Axis Vice at low actuation force without material deformation or wear on the clamping device, ensuring maximum process reliability.

Due to its lateral gripping grooves, the vice is taken directly by the robot from the automation trolley; no additional pallets are necessary and space is saved.

Centre jaws for dual clamping can now be used with the vice, increasing the capacity of the entire RoboTrex by at least twice as much.

Have you previously purchased a Makro-Grip® 5-Axis Vice 77, item no. 47120 or a Makro-Grip® 5-Axis Vice 125, item no. 47205? If you would like to use them automatically in the RoboTrex, no problem! The main body can easily be reworked for it.





The Zero-Point System

Versatile operation

Like all Quick-Point® products, the RoboTrex zero-point plates feature a repeatability of < 0.005 mm along with a simple design and operation.

The zero-point clamping system of RoboTrex Automation can be controlled in two ways:

1. **Manually by the robot.**
2. **Pneumatically by the machine tool.**
3. **Pneumatically by an external interface.**

Due to its low overall height, it is possible to automate mounted 5-axis tables. The RoboTrex zero-point plates are equipped with Ø 20 mm clamping studs and are therefore compatible with any Quick-Point® plate with 96 mm stud spacing.

RoboTrex at a glance

Progressively more efficient

Easy retrofitting to machine tools

Fast installation to existing or new machine tools. Communication between automation system and machine tool via acknowledgeable M-function.



Quick loading of automation system

Off-line loading and changeover of automation trolleys guarantee quick (re-)loading of the RoboTrex without interrupting the machining cycle.

Maximum utilisation of space

Patented, angled mounting of vices ensures maximum utilisation of space. The perfect accessibility allows exchanging of workpieces, without removing the vice from the trolley.



Working manually

An integrated door in the enclosure of the RoboTrex ensures access to the machine, which enables the operator to work manually (e.g. exchange or measure parts) at any time.



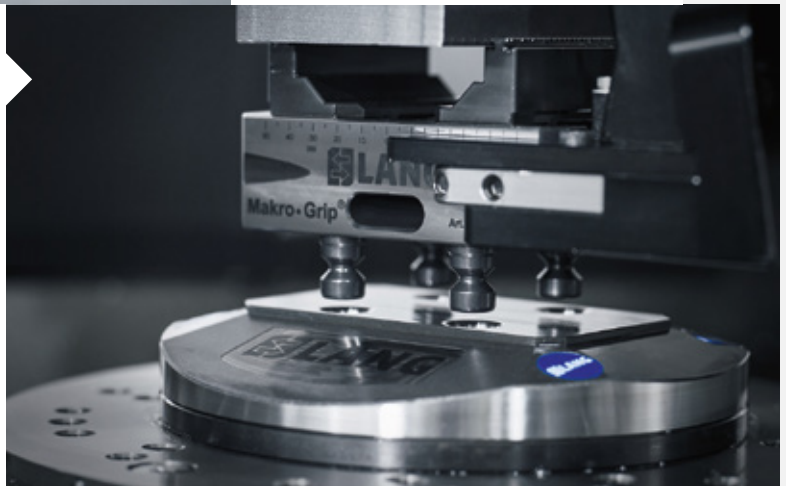
Simple operation

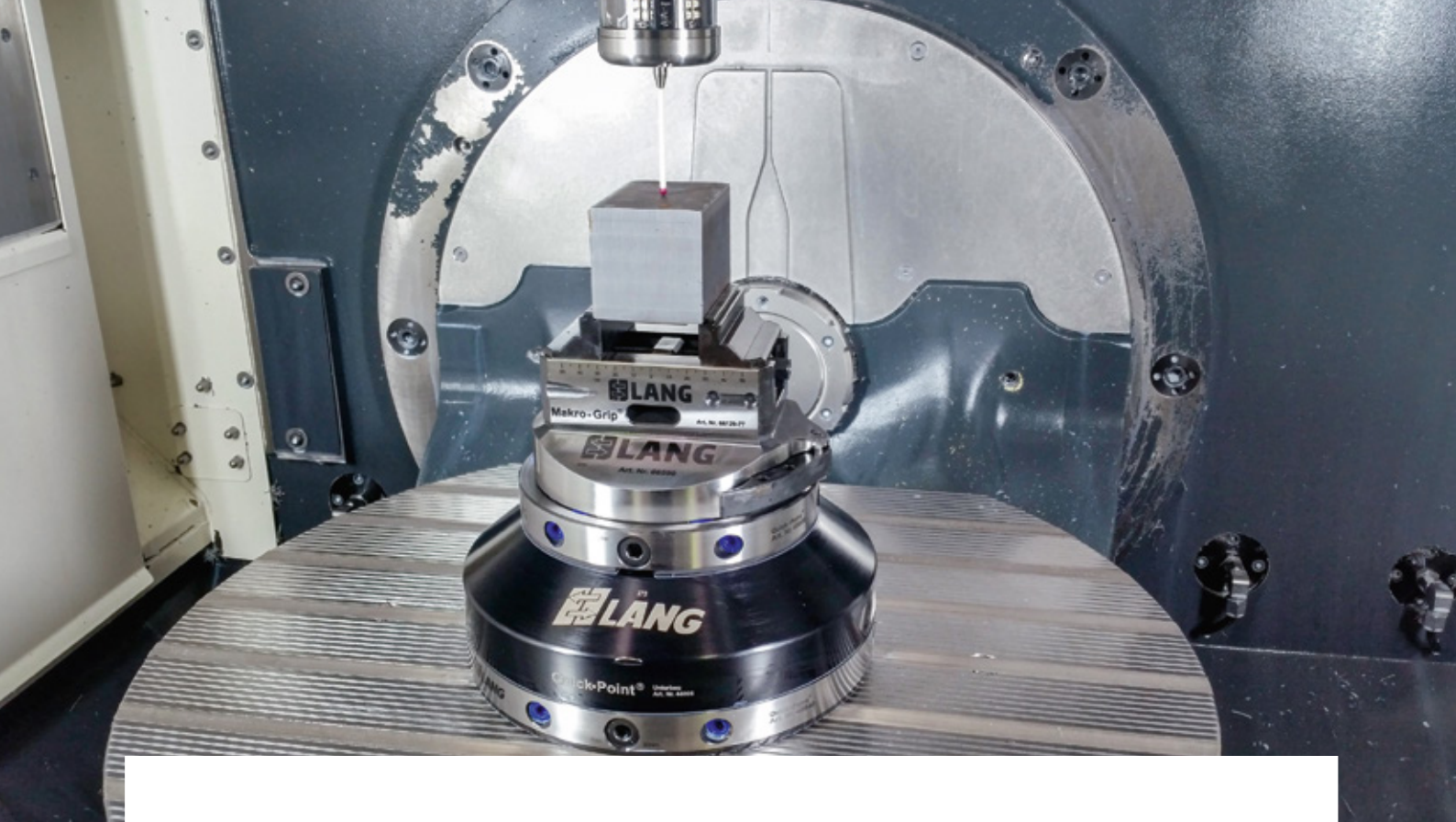
Pre-adjusted and pre-programmed robot with simple, user friendly control.



No additional utilities necessary

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





Tip for your benefit:

Program assignment for single part production via probe

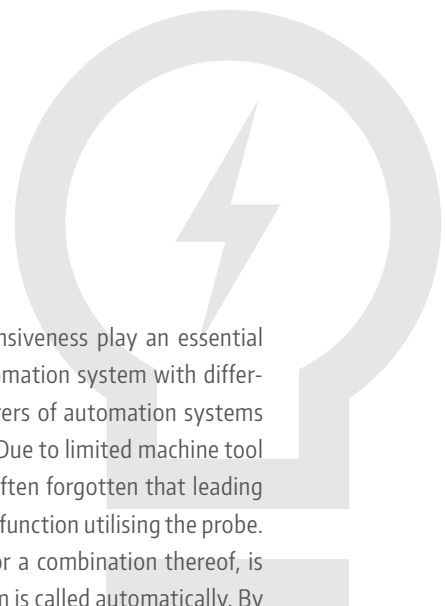
Single part production and the resulting flexibility and responsiveness play an essential role in today's automated production. In order to load an automation system with different types of parts and machine them in one cycle, manufacturers of automation systems use different strategies and concepts for program assignment. Due to limited machine tool interfaces this often turns out to be rather complicated. It is often forgotten that leading control manufacturers already offer a standard part recognition function utilising the probe.

In this example, the part size in the x-, y- or z-direction, or a combination thereof, is measured by the probe and the corresponding assigned program is called automatically. By measuring directly on the workpiece, the risk of incorrect loading of the pallet or clamping device is eliminated.

With this procedure, part recognition can also be realised with the simple control of RoboTrex Automation.

At first glance, the additional probing operation may be viewed as extending cycle times, but it is outweighed by the positive impacts of increased process safety and the utilisation of additional operating hours of an unmanned shift.

For more information, please contact your LANG partner or sales representative.



Automating with RoboTrex pays off – according to our customers

In order to organise the process safety of unmanned production, new tasks have been created for the team. The employees plan and secure the production. Automation makes it possible for the employee to take care of more things than inserting parts. In addition, scheduling reliability has improved and the quantity of parts has increased by almost 50 % due to planning security.

→ Heiko Blochwitz, **Mechanische Werkstätten Blochwitz GmbH & Co. KG**,
09326 Geringswalde



The key to profitability is a productive night shift without operators being present. With minimum effort we were able to make better use of our machine capacities and as a result increased our productivity tremendously. In less than a year the practical solutions by LANG Technik were amortised.

→ Simon Oreskovic, **Zelos Zerspanung**, 63856 Bessenbach



RoboTrex has been running error-free for several weeks now. This was well beyond my expectations!

→ Oliver Tschaggelar, area manager contract manufacturing, **Hagmann Tech AG**,
CH-2545 Selzach.

In order to increase machine run times Hagmann Tech AG decided to buy another RoboTrex 52 automation system shortly after installing their first unit. Since Juni 2018 a RoboTrex 52 with 4 trolleys is up and running.



The RoboTrex is a technically sound, great value-for money and space-saving product. LANG Technik is able to store a great number of parts on a very small footprint. One of the big advantages of the system: Due to the modular interface it can be connected to any machine tool – independently from the machine tool manufacturer.

→ Christian Müller, **MWF Technik GmbH & Co. KG**, 56427 Siershahn

RoboTrex Applications



DMU 60 eVo linear



DMU Milltap700



Doosan DNM 500



Hermle C 12 U



Makino DA 300



DMU 75 monoblock



Makino DA 300



DMU 60 evo



DMU 50



Hermle C 40 U



DMU 50 ecoMill



Grob G350

RoboTrex 52

Automation System

Technical requirements

- Free acknowledgeable M-function or standardised automation interface
- Loading via automatic side window or machine door
- Zero-point clamping pneumatically or mechanically (no utilities inside the machine tool required!)
- Almost any machine tool can be retrofitted with a LANG automation system
- Retrofitting done by machine tool manufacturer or LANG Technik



Technical data

Trolley storage capacity	30 / 42 parts Special vice alignment on trolley available upon request
max. storage capacity	120 / 168 parts Dual vices increase maximum storage capacity
max. workpiece size	120 × 120 × 100 / 120 × 100 × 70 mm Special vice alignment allows different part dimensions
max. workpiece weight	12 kg
Footprint	from 1.70 × 2.20 m
max. QTY of trolleys	4 pcs.



ROBOTREX 52 AUTOMATION SYSTEM

ITEM NO.	BASIC EQUIPMENT
66000	Complete robotic automation system incl. enclosure, trolley entry system and 1 automation trolley

RoboTrex 52 Automation Trolley



ROBOTREX 52, AUTOMATION TROLLEY

ITEM NO.	STORAGE CAPACITY	PART SIZE	WEIGHT
66030	30	120 × 120 × 100 mm	167 kg
66042	42	120 × 100 × 70 mm	170 kg

Maximum load capacity of trolley: 500 kg
Upon request, special or custom vice alignments on the trolley can be realised. The maximum quantity of vices is determined by the requested workpiece size.
Below are two possible setups, allowing for larger workpieces.



Storage capacity: **20 vices**
Maximum part size: **90 × 60 × 160 mm**



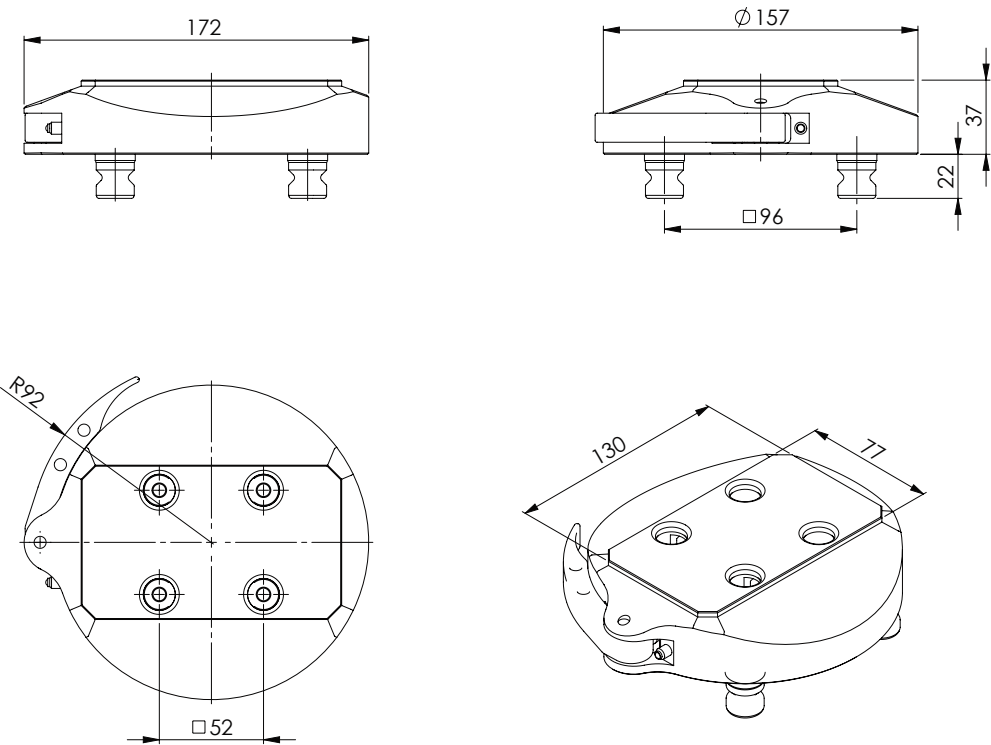
Storage capacity: **21 vices**
Maximum part size: **210 × 50 × 50 mm**

RoboTrex 52 Zero-Point Clamping System



ROBOTREX 52, ZERO-POINT PLATE

ITEM NO.	DIMENSIONS	WEIGHT
66500	Ø 157 × 37 mm	4,8 kg



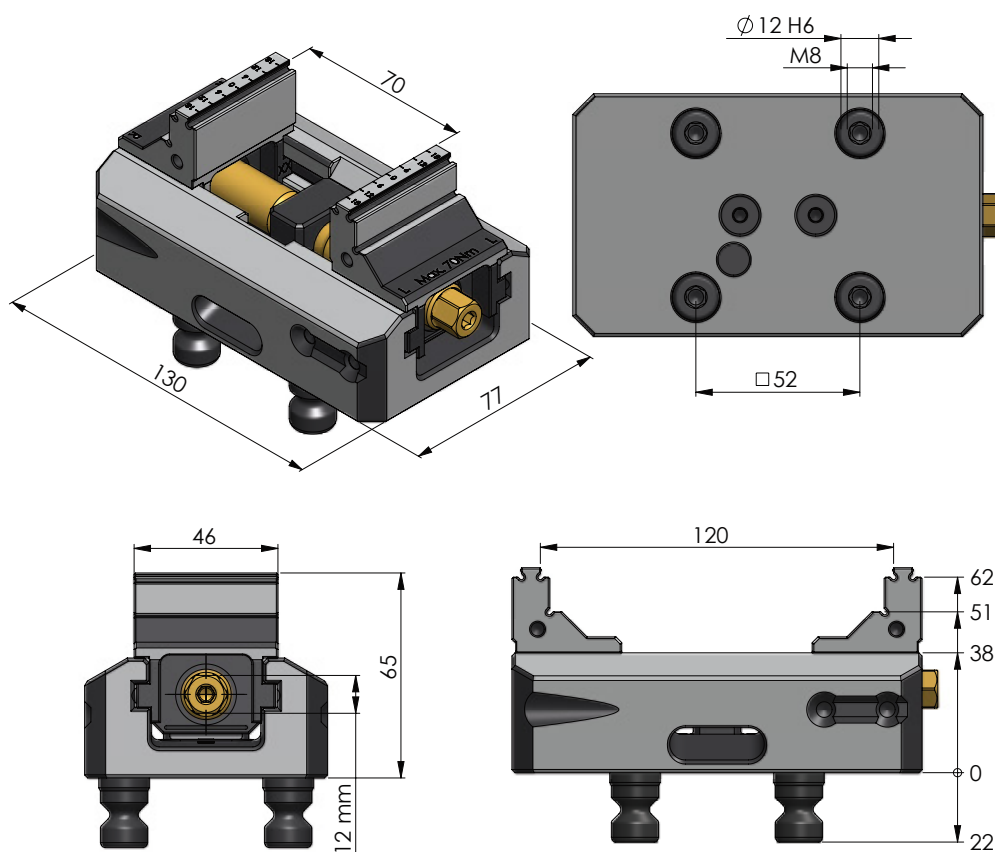
Makro·Grip® 5-Axis Vice 77



MAKRO·GRIP® 5-AXIS VICE 77, JAW WIDTH 46 MM

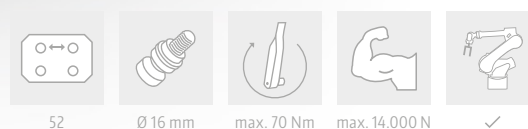


ITEM NO.	LENGTH	JAW WIDTH	CLAMPING RANGE	WEIGHT
48120-46	130 mm	46 mm	0 – 120 mm	2,5 kg

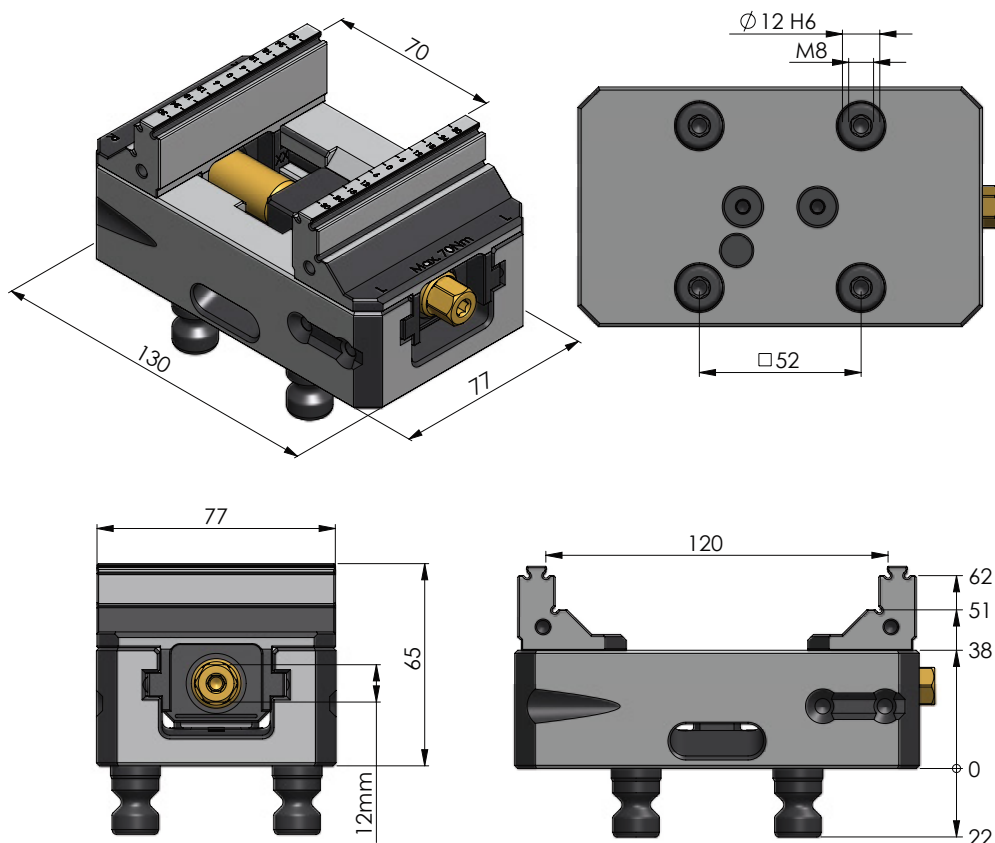




**MAKRO-GRIP® 5-AXIS VICE 77,
JAW WIDTH 77 MM**



ITEM NO.	LENGTH	JAW WIDTH	CLAMPING RANGE	WEIGHT
48120-77	130 mm	77 mm	0 – 120 mm	2,9 kg



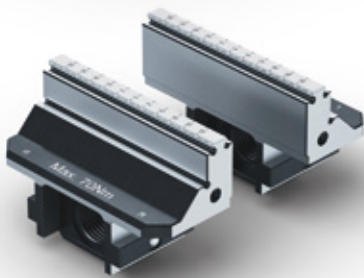
Makro·Grip® 5-Axis Vice 77

Spare Jaws



SPARE JAWS FOR MAKRO·GRIP® 77, JAW WIDTH 46 MM

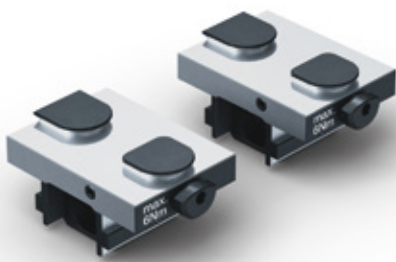
ITEM NO.	FOR	UNIT
48077-4620	48120-46	1 pair



SPARE JAWS FOR MAKRO·GRIP® 77, JAW WIDTH 77 MM

ITEM NO.	FOR	UNIT
48077-7720	48120-77	1 pair

Avanti Jaws for automated manufacturing



AVANTI BASE JAWS FOR MAKRO·GRIP® 5-AXIS VICE 77

ITEM NO.	FOR	UNIT
44771-46	48120-46	1 pair
44771-77	48120-77	1 pair



AVANTI ADD-ON JAWS, SOFT

ITEM NO.	JAW WIDTH	MATERIAL	DIMENSIONS	UNIT
44468-26	46 mm	Steel (16MnCr5)	57×38×26 mm	1 pc.
44469-26	46 mm	Aluminium (F50)	57×38×26 mm	1 pc.
44778-36	77 mm	Steel (16MnCr5)	78×58×36 mm	1 pc.
44779-36	77 mm	Aluminium (F50)	78×58×36 mm	1 pc.
44778-56	77 mm	Steel (16MnCr5)	78×58×56 mm	1 pc.
44779-56	77 mm	Aluminium (F50)	78×58×56 mm	1 pc.

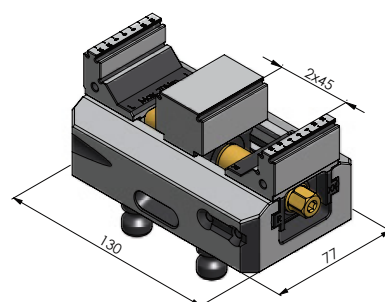
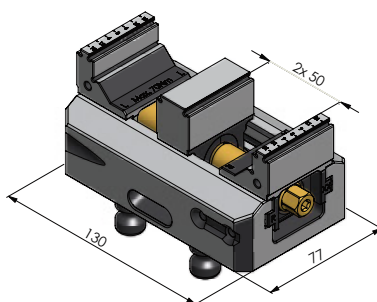
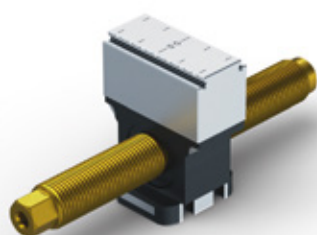
Add-on jaws fit the new base jaw version and also the previous one.

Makro·Grip® 5-Axis Vice 77

Centre Jaw and Spindle

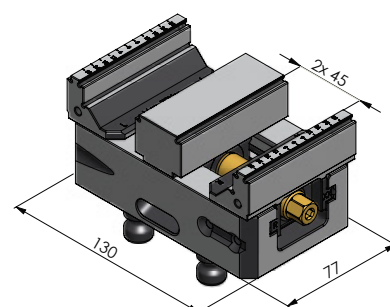
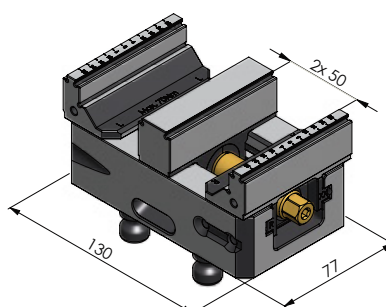
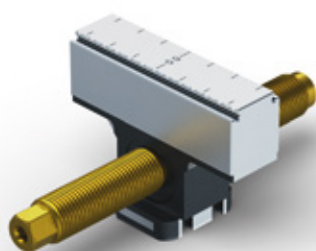
NEW

The Makro·Grip® centre jaw is now available for the automation vice, potentially doubling the workpiece capacity!



CENTRE JAW AND SPINDLE FOR MAKRO·GRIP® 5-AXIS VICE 77, JAW WIDTH 46 MM

ITEM NO.	FOR	CENTRE JAW WIDTH	SPINDLE LENGTH	CLAMPING RANGE
48120-TG4617	48120-46	17 mm	135 mm	2 × 50 mm
48120-TG4627	48120-46	27 mm	135 mm	2 × 45 mm



CENTRE JAW AND SPINDLE FOR MAKRO·GRIP® 5-AXIS VICE 77, JAW WIDTH 77 MM

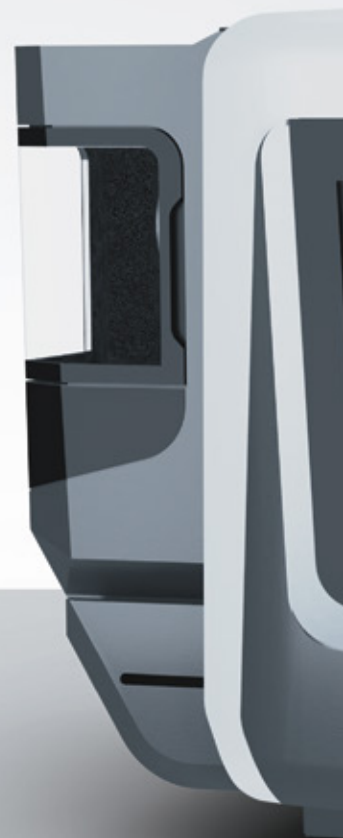
ITEM NO.	FOR	CENTRE JAW WIDTH	SPINDLE LENGTH	CLAMPING RANGE
48120-TG7717	48120-77	17 mm	135 mm	2 × 50 mm
48120-TG7727	48120-77	27 mm	135 mm	2 × 45 mm

RoboTrex 96 NEW

Automation System

Technical requirements

- Free acknowledgeable M-function or standardised automation interface
- Loading via automatic side window or machine door
- Zero-point clamping pneumatically (no utilities inside the machine tool required!)
- Almost any machine tool can be retrofitted with a LANG automation system
- Retrofitting done by machine tool manufacturer or LANG Technik



Technical data

Trolley storage capacity	15 / 16 parts Special vice alignment on trolley available upon request
max. storage capacity	60 / 64 parts Dual vices increase maximum storage capacity
max. workpiece size	205 × 205 × 90 mm / 205 × 150 × 150 mm Special vice alignment allows different part dimensions
max. workpiece weight	30 kg
Footprint	from 2.00 × 2.70 m
max. QTY of trolleys	4 pcs.



ROBOTREX 96 AUTOMATION SYSTEM

ITEM NO.	BASIC EQUIPMENT
64000	Complete robotic automation system incl. enclosure, trolley entry system and 1 automation trolley

RoboTrex 96 Automation Trolley



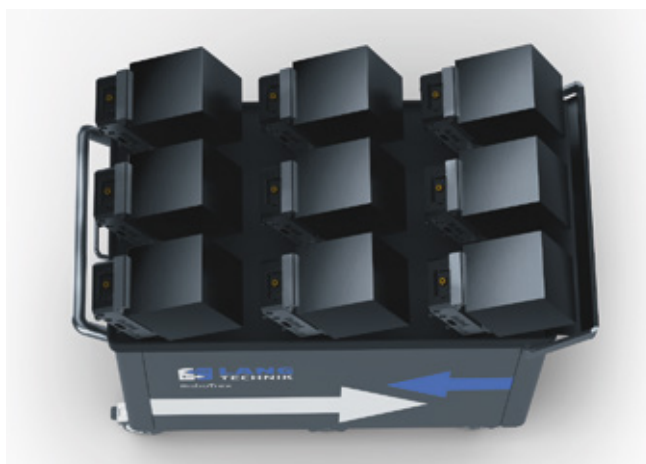
ROBOTREX 96, AUTOMATION TROLLEY

ITEM NO.	STORAGE CAPACITY	PART SIZE	WEIGHT
64015	15	205 × 205 × 90 mm	178 kg
64016	16	205 × 150 × 150 mm	174 kg

Maximum load capacity of trolley: 500 kg

Upon request, special or custom vice alignments on the trolley can be realised. The maximum quantity of vices is determined by the requested workpiece size.

Below is a possible setup, allowing for larger workpieces.



Storage capacity: **9 vices**

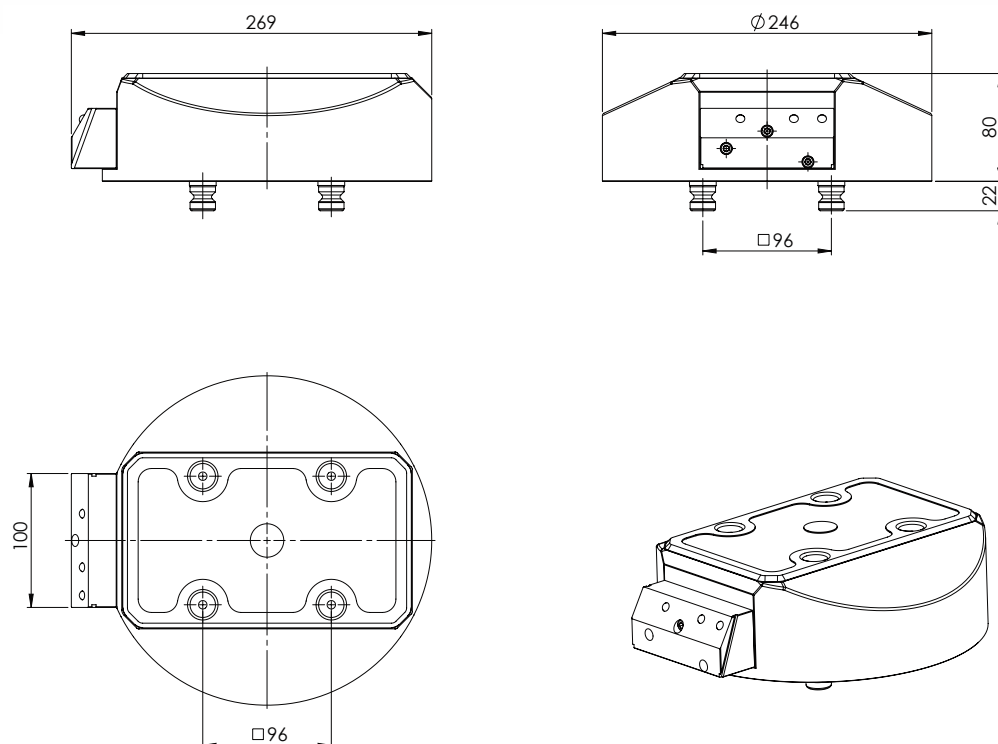
Maximum part size: **205 × 168 × 200 mm**

RoboTrex 96 Zero-Point Clamping System



ROBOTREX 96, AUTOMATION BASE TOWER

ITEM NO.	DIMENSIONS	WEIGHT
64500	Ø 246 × 80 mm	13,0 kg



Makro·Grip® 5-Axis Vice 125



MAKRO·GRIP® 5-AXIS VICE 125,
JAW WIDTH 77 MM

96

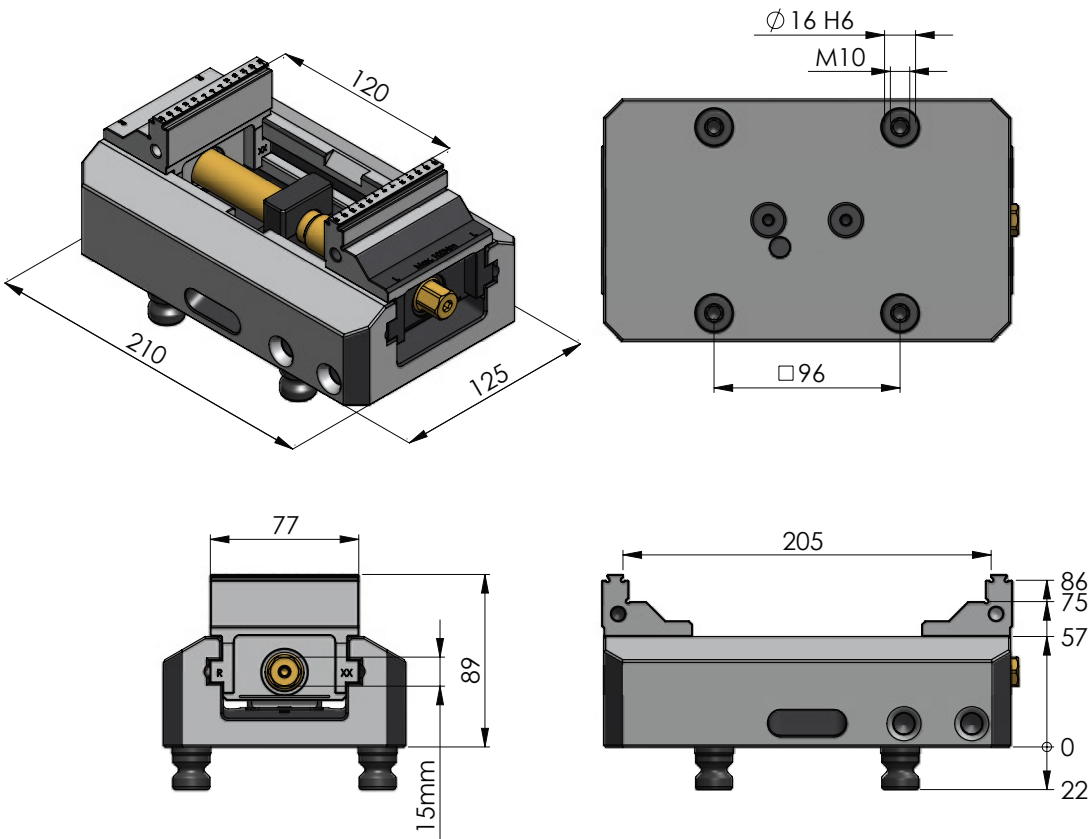
Ø 20 mm

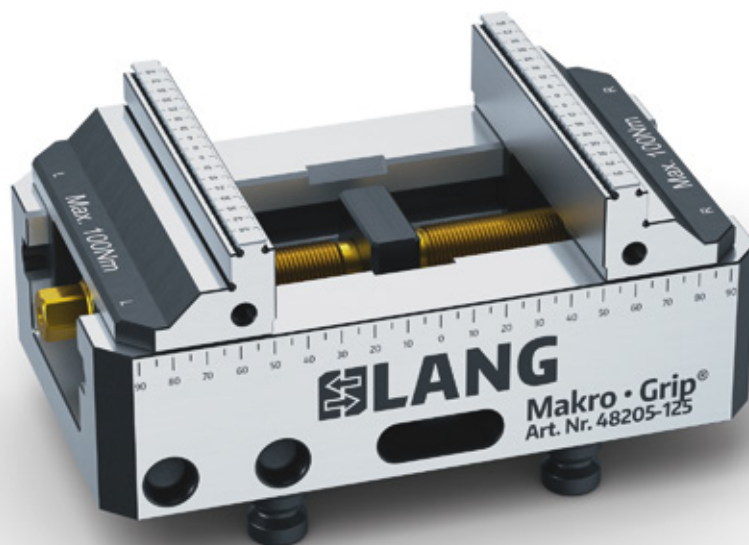
max. 100 Nm

max. 20.000 N

✓

ITEM NO.	LENGTH	JAW WIDTH	CLAMPING RANGE	WEIGHT
48205-77	210 mm	77 mm	0 – 205 mm	9,1 kg

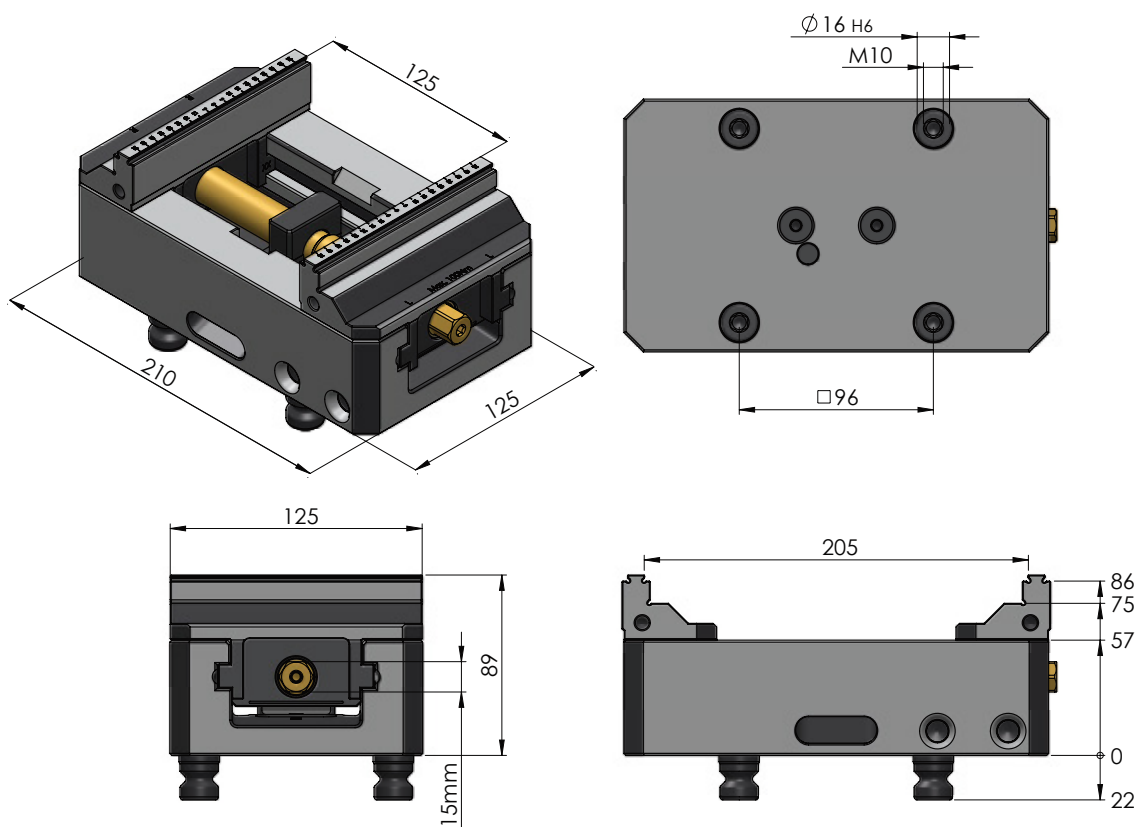




**MAKRO-GRIP® 5-AXIS VICE 125,
JAW WIDTH 125 MM**



ITEM NO.	LENGTH	JAW WIDTH	CLAMPING RANGE	WEIGHT
48205-125	210 mm	125 mm	0 - 205 mm	10,2 kg



Makro·Grip® 5-Axis Vice 125

Spare Jaws



SPARE JAWS FOR MAKRO·GRIP® 5-AXIS VICE 125 JAW WIDTH 77 MM

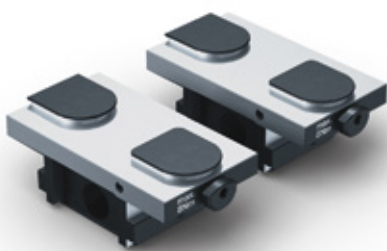
ITEM NO.	FOR	UNIT
48125-7720	48205-77	1 pair



SPARE JAWS FOR MAKRO·GRIP® 5-AXIS VICE 125 JAW WIDTH 125 MM

ITEM NO.	FOR	UNIT
48125-2520	48205-125	1 pair

Avanti Jaws for automated manufacturing



AVANTI BASE JAWS FOR MAKRO·GRIP® 5-AXIS VICE 125

ITEM NO.	FOR	UNIT
44251-125	48205-125	1 pair



AVANTI ADD-ON JAWS, SOFT

ITEM NO.	JAW WIDTH	MATERIAL	DIMENSIONS	UNIT
44258-46	125 mm	Steel (16MnCr5)	126 × 77 × 46 mm	1 pc.
44259-46	125 mm	Aluminium (F50)	126 × 77 × 46 mm	1 pc.
44258-76	125 mm	Steel (16MnCr5)	126 × 77 × 76 mm	1 pc.
44259-76	125 mm	Aluminium (F50)	126 × 77 × 76 mm	1 pc.

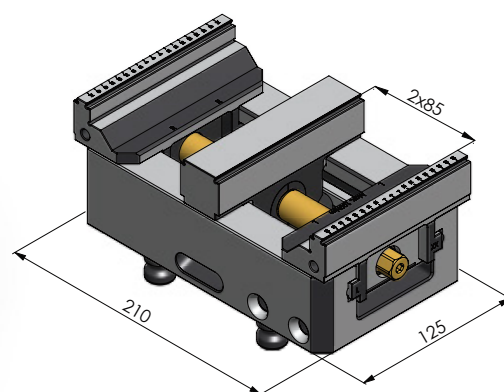
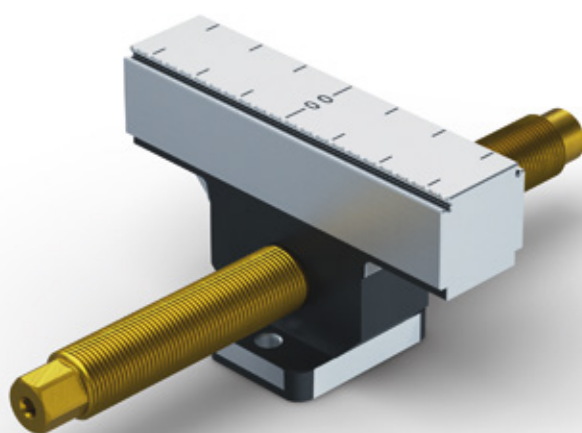
Add-on jaws fit the new base jaw version and also the previous one.

Makro·Grip® 5-Axis Vice 125

Centre Jaw and Spindle

NEW

The Makro·Grip® centre jaw is now available for the automation vice, potentially doubling the workpiece capacity!



CENTRE JAW AND SPINDLE FOR MAKRO·GRIP® 5-AXIS VICE 125, JAW WIDTH 125 MM

ITEM NO.	FOR	CENTRE JAW WIDTH	SPINDLE LENGTH	CLAMPING RANGE
48205-TG2527	48205-125	27 mm	214 mm	2 × 85 mm

Clean•Tec Cleaning Fan



Save expensive compressed air – use Clean•Tec



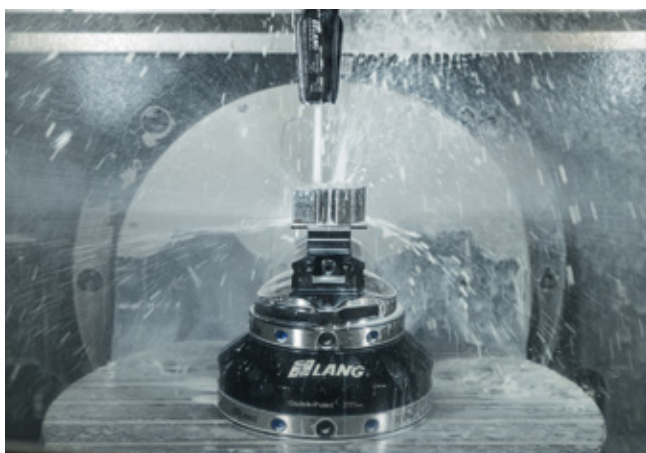
- 1 Fibreglass compound body with steel centre core. Can be clamped in every common shank Ø 20 mm
- 2 Rigid retaining spring for the secure closing of blades after the cleaning process
- 3 Strong and wear-resistant carbon fibre wings for best durability – even with tough chipping
- 4 Slim design to space saving storage in tool exchanger

CLEAN•TEC CLEANING FAN

ITEM NO.	Ø WITH OPEN WINGS	RPM RANGE
30160	160 mm	6.000 – 12.000
30260	260 mm	5.000 – 8.000
30330	330 mm	3.000 – 8.000

SPARE PART KIT (4 WINGS, INCL. SPRINGS + PINS)

ITEM NO.
30164
30264
30334



Bore for rinsing and cleaning with coolant (especially deep pockets).



Wings open and close automatically by switching the machine tool spindle on and off.

Makro·Grip® Mobile Storage Unit

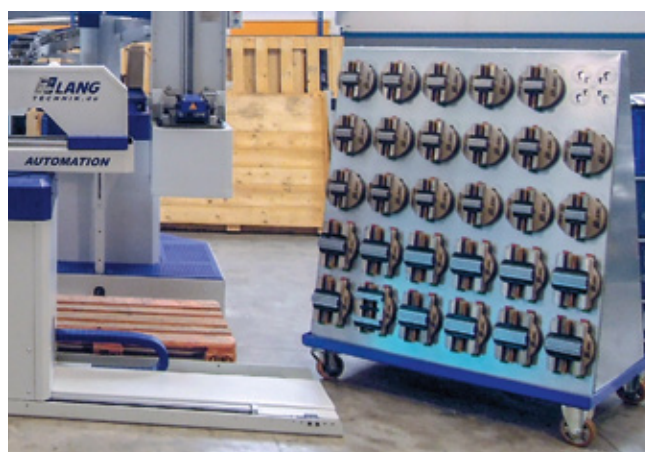
Space saving stocking solution for vices and fixtures



- 1 Space to hold up to 60 devices (30 devices on each side)
- 2 Convenient handle for pushing and pulling the unit
- 3 Non-corrosive galvanised sheet steel
- 4 Powder coated coolant collecting tray with integrated drain screw
- 5 Both Quick·Point® spacings 52 and 96 mm integrated

MAKRO·GRIP® MOBILE STORAGE UNIT

ITEM NO.	STORAGE CAPACITY	DIMENSIONS	WEIGHT
61060	max. 60 clamping devices	1.200 × 800 × 1.500 mm	160 kg



€ Efficiency,
⌚ speed
↔ and flexibility.

RoboTrex meets the requirements
for future-oriented manufacturing.

Experience the RoboTrex live

Visit our Training and Technology Centre in Neuhausen/Germany and
convince yourself of the benefits of an automated manufacturing.

Training and Technology Centre

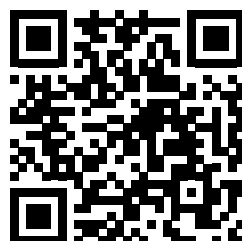
Zabergäustr. 5, 73765 Neuhausen

Phone: +49 7158 9038-10, Fax: +49 7158 9038-50



Video

Do not miss to watch the RoboTrex video!



Imprint

Title:

LANG Automation – Version 1/2018

Date of Printing 11/2018

Editor:

LANG Technik GmbH

Albstraße 1-4

D-73271 Holzmaden

Tel.: +49 7023 9585-0

Fax: +49 7023 9585-100

Internet: www.lang-technik.de

E-Mail: info@lang-technik.de

E-Mail Sales: sales@lang-technik.de

Legal provisions:

Copyright 2018

LANG Technik GmbH

All rights reserved. Reprint, recording in online-services, internet and duplication on data carrier as CD ROM, DVD, etc., or in extracts are prohibited. Misprints, errors and changes are subject to modifications. All indications of weight are approximate values. Illustrations can vary from articles.



Get your free
copy of the new
LANG catalogue
2019/2020!



→ facebook.com/langtechnik
→ instagram.com/langtechnik

→ twitter.com/langtechnik
→ youtube.com/user/LangTechnik