

**Appreciate smart tools
in CNC automation.**

**Ask for minor adjustments,
not major modifications.**

We'll empower you.

CLAMP**BOOSTER**

Welcome to the World of CLAMPBOOSTER.

Automating mechanical clamping devices.

CLAMPBOOSTER

What is the CLAMPBOOSTER?

The CLAMPBOOSTER is an End-of-Arm Tool (EOAT) for industrial robots and collaborative robots (cobots) designed to automate **manual machine vises**. It enables the automation of CNC machining centers **without retrofitting existing machines with automatic clamping systems**.

Is the CLAMPBOOSTER a robot accessory?

No. The CLAMPBOOSTER is not a conventional robot peripheral. It is a solution that **enables automation** by extending the machine and the clamping device, thereby closing a critical gap in automated manufacturing processes.

What applications is the CLAMPBOOSTER designed for?

- CNC machining centers (3-axis and 5-axis)
- Brownfield / retrofit automation projects
- High-mix manufacturing for small, medium and series batch sizes
- Hybrid operation (manual + automated)
- Series production without shift operation (24/7)

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How does the CLAMPBOOSTER work?

The CLAMPBOOSTER docks directly onto the machine vise. Thanks to integrated sensors, it autonomously detects whether the vise needs to be opened or closed. It performs the clamping or unclamping operation automatically **without an explicit robot command** and then signals process readiness to the robot.

Does the robot control the vise?

No. The robot is only responsible for positioning. The actual clamping process is performed autonomously by the CLAMPBOOSTER.

How is the torque set?

The torque is specified via the supplied HMI or external control, is monitored by software, and can be freely adjusted within a range of **5 to 100 Nm**.

How is the opening width defined?

The opening width is defined by the number of spindle revolutions. This allows precise and repeatable opening distances to be set.

How does the system detect whether a workpiece is correctly clamped?

During the clamping process, the CLAMPBOOSTER monitors the **spindle rotations in relation to the defined opening path**.

If the specified torque is **not reached within the defined spindle travel**, the system detects that the workpiece is missing or incorrectly positioned.

The permissible travel distance is freely configurable and based on the defined opening path of the vise. This enables reliable plausibility checking **without additional sensors**.

How does the system work?

The CLAMPBOOSTER's spin socket is **spring-preloaded** and can move axially by approximately **25 mm (≈ 1 inch)** into the housing. This means:

- If the vise spindle is not perfectly aligned, the spin socket compresses into the unit instead of applying force to the vise.
- This triggers a rotation of the nut.
- No damage occurs, and no precise alignment by the robot is required.
- During this axial travel, the system continuously measures the movement and reliably detects when the spindle is fully engaged.

After docking, the CLAMPBOOSTER performs a short, slow clockwise rotation in automatic mode:

- If **torque is detected within less than 90° of rotation**, the system assumes the vise is closed → the CLAMPBOOSTER automatically initiates the opening cycle.
- If **no torque is detected**, the system assumes the vise is open → the CLAMPBOOSTER starts the closing cycle.

As a result, the robot does **not need to know the absolute spindle position** or distinguish between open and closed states. This logic is handled entirely by the CLAMPBOOSTER.

Which additional functions are integrated?

The CLAMPBOOSTER includes further integrated functions to improve robustness and process reliability:

Integrated air blow-off nozzle

For removing machining residues such as chips or coolant from the clamping device and the workpiece, improving process reliability and repeatability.

Integrated laser pointer (Class 1)

Used as a visual alignment aid for positioning the CLAMPBOOSTER on the vise and aligning the air blow-off nozzle. This simplifies setup, docking, and commissioning, especially during initial installation or program teaching.

Positioning function

Depending on spindle rotation, the system can realize different vise opening widths in a controlled and repeatable manner.



What integration options does the CLAMPBOOSTER offer?

The CLAMPBOOSTER is intentionally designed to require **as little communication with the robot as possible**, resulting in a robust, flexible, and easy-to-integrate automation solution. The following integration levels are available:

1. Stand-alone operation (minimal invasive)

The CLAMPBOOSTER operates as an autonomous system. The robot only positions the tool at the vise. Opening, closing, monitoring, and process release are handled entirely by the CLAMPBOOSTER.

2. Standard robot integration

Optional integration via digital/analog signals or Ethernet-based fieldbuses such as **Profinet, Ethernet/IP, EtherCAT, or Modbus** for status and process signals.

3. Deep system integration (control cabinet integration)

For customers with advanced integration requirements, the CLAMPBOOSTER is available as an **single component solution**. Control and drive components can be integrated directly into existing automation and control cabinet concepts (e.g. via Profinet).

This represents the **deepest level of integration** and enables tight coupling with higher-level PLC and control systems.

Which vises are compatible with the CLAMPBOOSTER?

Thanks to interchangeable docking plates and spin sockets, the CLAMPBOOSTER is compatible with nearly all common machine vises, including:

- LANG
- HWR
- SCHUNK
- Gressel
- Allmatic
- SMW
- Power / high pressure vises
- and many others (custom solutions available on request)

Can multiple vises be automated?

Yes. The CLAMPBOOSTER can operate multiple vises within one machine, even with different torque values and opening widths (based on the same docking plate and spin socket are used). If required, a quick change of the torque interface and socket can be performed, typically **within approximately 2 minutes**.

Can one robot serve multiple machines?

Yes. A key advantage of the CLAMPBOOSTER is the ability to automate **multiple machines with a single robot**.

Is machine modification required?

No. No pneumatic or hydraulic connections inside the machine are required. The existing **CE conformity of the machine remains fully intact**.



What preparation is required on the vise?

Only minimal, clearly defined preparations are required. **Two drilled holes for torque support pins are sufficient. No further modifications are necessary.**

1. Front-side space for torque support pins

Adequate space must be available on the front side of the vise to install the torque support pins, which safely absorb the applied torque and prevent robot load.

- **Up to 70 Nm:**
 - Minimum clearance from pin: 2 mm
 - Pin diameter: \varnothing 6 mm
 - Hole depth: 13 mm
- **Above 70 Nm:**
 - Minimum clearance from pin: 3 mm
 - Pin diameter: \varnothing 8 mm
 - Hole depth: 17 mm

2. Axial fixation of the vise spindle

The spindle must be axially fixed. During clamping, axial movement must not exceed **3 mm**.

How is the CLAMPBOOSTER mounted?

Cobots: Mounted between ISO flange and gripper; Industrial robots: Mounted directly on the tool flange.

How long does opening or closing take?

Approx. **5 to 10 seconds**.

What connections are required?

Power supply: 100–240 V AC

Compressed air: 5–6.5 bar (air blow-off and housing overpressure)

Robot interfaces: Digital/Analog I/O, Profinet, Ethernet/IP, EtherCAT or Modbus



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Is training required, does anything change for the worker?

The CLAMPBOOSTER integrates seamlessly into existing processes. Training effort is minimal. The operator only sets two familiar parameters: 1. Clamping torque and 2. Opening revolutions. Setup and manual operation remain unchanged.

Is hybrid operation possible?

Yes. The machine can be operated manually or automatically at any time – ideal for day and night operation.



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Advantages Compared to Automatic Clamping Systems

Why CLAMPBOOSTER instead of an automatic vise?

- No new clamping systems required
- No machine modifications
- No new programs or quality assurance processes
- Maximum flexibility for changing workpieces
- Continued use of existing vises

How does it differ from pneumatic or hydraulic solutions?

- No additional energy connections inside the machine
- Precisely defined torque
- Repeatable opening paths
- Reduced system complexity

www.clampbooster.de

A product by idee-werk. Made in Bavaria, Germany.