

# RETROFITTINGS



FOR UNIVERSAL  
MACHINING CENTERS



**AUTOMATION**  
**OPTIMIZATION**  
**EFFICIENCY**

# RETROFITTING OPTIONS



## Increased productivity and economic efficiency with complementary accessories

Our extensive range of accessories increases the flexibility of our 5-axis universal machining centers while at the same time boosting productivity and cost efficiency.

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## Would you like to know more?

Just ask – we will be happy to provide an **OFFER WITH NO OBLIGATION!**

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## CHARACTERISTICS

- Hardware:
  - ▶ VPN-LAN router installed in the electrical cabinet
  - ▶ Option: Key-operated switch for activation/deactivation of remote machine diagnostics
- The GROB service hotline staff can trace all movements on the control system

## YOUR ADVANTAGES



### QUALITY

- Extensive options for intervention in almost all control areas as well as for analysis
- Options for installing software updates, programs, etc.



### ECONOMIC EFFICIENCY

- Increased productivity thanks to rapid troubleshooting
- Less time-consuming technician services

## REQUIREMENTS

- **CONTROL SYSTEM**  
SIEMENS SolutionLine, HEIDENHAIN
- **CUSTOMER**  
Network capability must be ensured, Remote Support Service Agreement for use of remote machine diagnostics

## Up to 80 % less technician services

Machine failure is never planned. This makes receiving quick and uncomplicated assistance in an emergency all the more important. With remote machine diagnostics, our highly qualified GROB service hotline staff can begin fault analysis and troubleshooting immediately.





## Moving into a digital future

With our modularly developed GROB-NET<sup>4</sup>Industry web applications, you can network and digitalize your production processes across plants, making your manufacturing even more efficient.



### GROB<sup>4</sup>LINE

- +
- The machine in view via smartphone



### GROB<sup>4</sup>ANALYZE

- +
- Feedback from the machine for the CIP process



### GROB<sup>4</sup>ANALYZE OFFICE CLIENT

- +
- Flexible data analysis



### GROB<sup>4</sup>OEE

- +
- Reduce machine downtime, increase efficiency



### GROB<sup>4</sup>TOOLDATAEXCHANGE

- +
- Tool data is automatically transferred



### GROB<sup>4</sup>CONNECT

- +
- Connection from the real world to the ERP system



### GROB<sup>4</sup>INTERFACE

- +
- Easy route to machine communication



### GROB<sup>4</sup>PORTAL

- +
- The secure cloud for industry



### GROB<sup>4</sup>CARE

- +
- Service and maintenance portal



### GROB<sup>4</sup>OPTIMIZATION

- +
- Motorized spindle process evaluation



### GROB<sup>4</sup>TRACK

- +
- Machine axes in view at all times



### GROB<sup>4</sup>AUTOMATION

- +
- Intuitive production control software for unmanned operation



### GROB<sup>4</sup>PILOT

- +
- Multi-functional machine operation



### GROB<sup>4</sup>COACH

- +
- Programming, simulation, training



## WANT TO KNOW MORE?

You can find a detailed description of the individual GROB-NET<sup>4</sup>Industry products in our **GROB-NET<sup>4</sup>INDUSTRY BROCHURE** in our GROB Download Center.



## CHARACTERISTICS

- Hardware:
  - ▶ BIS-V evaluation unit
  - ▶ BIS-C or BIS-M write-read unit
- Can be deselected in the HMI screen
- Installation and cycle adaptation by GROB

## YOUR ADVANTAGES



### ECONOMIC EFFICIENCY

- Efficiency increase via automated tool management
- Simple data evaluation for process statistics and service life optimization
- Setup time is reduced
- Omission of manual tool data entry



## REQUIREMENTS

- **CONTROL SYSTEM**  
SIEMENS SolutionLine, HEIDENHAIN
- **SUITABLE TOOL HOLDERS**

## Production instead of entering tool data

An increasing number of tools and their data require a sophisticated tool management system. To simplify management, the BALUFF coding system can be retrofitted. The current data (name, dimension, wear, service life, etc.) are stored directly on the tool by means of a chip and are automatically read and processed when the machine is equipped.

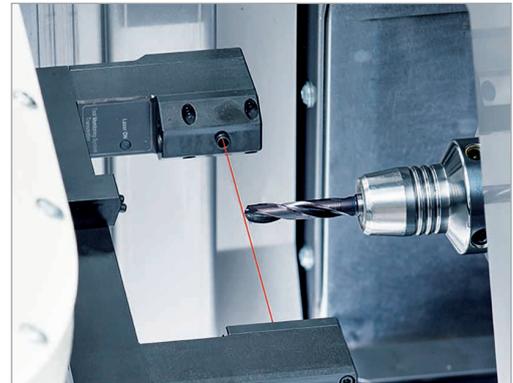


## Monitor your tools directly where they are used

The BLUM laser measurement system installed on the rotary table monitors each tool used by means of high-precision optical and automated tool geometry measurement under operating conditions. Incorrectly equipped or inaccurately set tools and tool damage/wear are detected promptly, preventing damage to the part or subsequent tool.

### CHARACTERISTICS

- Hardware: BLUM LC50-DIGILOG/LC52-DIGILOG
  - ▶ 50: Installed combined laser measurement system enables tool monitoring and measurement
  - ▶ 52: Laser measurement system enables contactless optical tool monitoring and measurement, even for turning tools
- Tool length, radius and form measurement
- Check for wear and changes to geometry
- Check for concentricity and dirt in the tool holder



### YOUR ADVANTAGES



#### QUALITY

- Highest production quality with tool wear detection
- Measured values can be transferred to other machines
- High-end laser optics with a focused laser beam for exceptionally rapid and precise monitoring



#### ECONOMIC EFFICIENCY

- Automated tool measurement and monitoring
- Prevention of subsequent damage due to undetected tool breakage

### REQUIREMENTS

- **CONTROL SYSTEM**  
SIEMENS SolutionLine, HEIDENHAIN iTNC530, TNC640
- **SUITABLE CLAMPING**

# LOAD-DEPENDENT DRIVE ADJUSTMENT (LST/LAC)



## Axis movement at ideal speed

For each part, the software determines the optimum drive and pilot control parameters for the A', B', and Y' axes of your universal machining system depending on the weight to move. These are stored part-specifically and accessed during the machining process.

### CHARACTERISTICS

- Determination and storage of the optimum controller settings based on inertia
- Particularly suitable for customers with a wide variety of parts (dimensions/weight)
- Pure software upgrade
- Load-dependent parameter set switchover of the swivel axes (A' and B' axes) and the Y' axis
- Each parameter set can be assigned to a part

### YOUR ADVANTAGES



#### QUALITY

- Optimized drive parameters ensure highest-quality machining
- Machine movement adapted to part weight



#### ECONOMIC EFFICIENCY

- No swinging of the axes
- Use of optimized drive parameters for the A', B', and Y' axes

### REQUIREMENTS

- **CONTROL SYSTEM**  
SIEMENS SolutionLine (LST), HEIDENHAIN (LAC)

## Optimum quality with GROB swivel axis calibration (GSC)

Every machine tool has slight systemic geometric deviations in the rotary axes. These individual, minimal deviations add up to a volumetric deviation in geometry within the work area. With GSC, these geometric deviations are compensated for by the machine control system.

### CHARACTERISTICS

- Hardware:
  - ▶ Touch probe (if not already present)
  - ▶ Kinematics measuring case
- Simple software upgrade
- Determination of current kinematics via 3D touch probe and a high-precision gauge ball
- Optimization of swivel accuracy based on measurement results



### YOUR ADVANTAGES



#### QUALITY

- Compensation for machine- and temperature-dependent geometric deviations
- Ensures consistent production accuracy even with changes to the ambient conditions



#### PRODUCTIVITY

- Simple machine geometry measurement
- Rapid improvement of current machine accuracy for the entire work area

### REQUIREMENTS

- **HARDWARE**
  - ▶ From GROB Generation 1 series onward
  - ▶ Geometry and laser required in advance (additional repair if necessary)
  - ▶ If required: Measurement and correction from GROB Generation 2 and higher
- **CONTROL SYSTEM**  
SIEMENS SolutionLine version 4.5.2 onward, HEIDENHAIN
- **COMPONENTS**
  - ▶ Compatible touch probe



## Setup and monitoring: fast and reliable

The touch probe with HSK holder enables simple part setup and part measurement during the machining process. Thanks to the secure Frequency Hopping Spread Spectrum transmission protocol, even difficult work environments are no problem.

### CHARACTERISTICS

- Hardware:
  - ▶ Battery-operated Renishaw touch probe with tool holder
  - ▶ Renishaw RMI receiver
  - ▶ Various touch probe versions available
- Easy loading from the tool magazine
- In addition to the RMP 600: RMP 400 now available \*
- Required for the machine kinematics (GSC) option

### YOUR ADVANTAGES



#### QUALITY

- High-precision via repeat accuracy of  $\pm 1 \mu\text{m}$
- Increase in part accuracy
- RMP 400: High accuracy possible with technical enhancement



#### PRODUCTIVITY

- Collision prevention via part measurement before machining
- Reduction of downtimes for alignment and measurement of parts and clamping fixtures

### REQUIREMENTS

- **CONTROL SYSTEM**  
SIEMENS SolutionLine, HEIDENHAIN

\* Only RMP 400 possible for G150 (for use of GSC light/advanced).

## Prevent total destruction with a reaction time of <math><1\text{ ms}</math>

In the event of a collision, the CMS machine protection system stops all axis movements of the machining center within milliseconds to minimize damage to the machine, tools, and clamping fixtures.

### CHARACTERISTICS

- Additional force sensors at the axes to monitor
- Evaluation unit in the electrical cabinet
- Additional monitor with HEIDENHAIN/FANUC controls
- Targeted shutdown of axis drives when limit values are exceeded
- Freely definable limit values
- Control independence

### YOUR ADVANTAGES



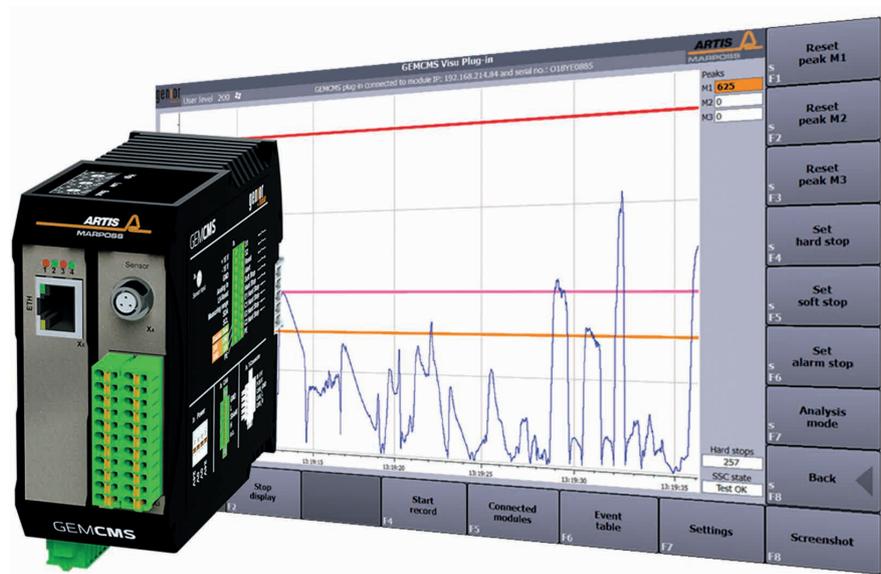
#### ECONOMIC EFFICIENCY

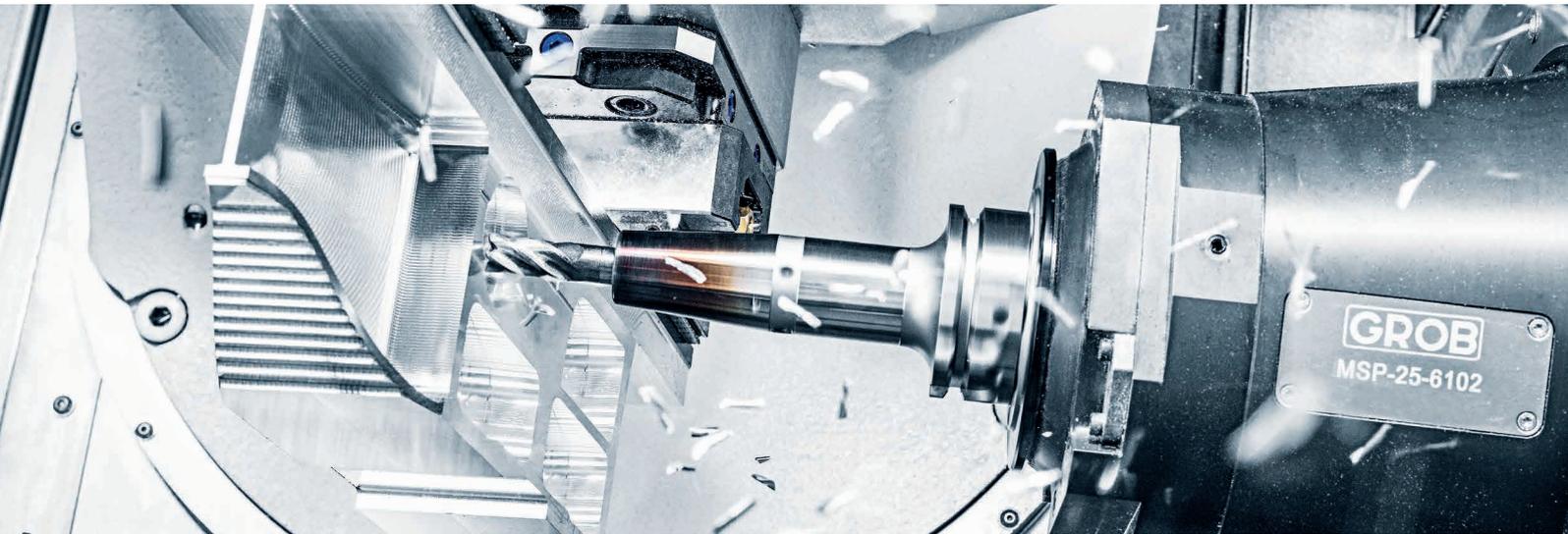
- Prevention of downtimes due to machine, tool or clamping fixture damage
- Prevention or reduction of repair costs for collisions
- Save 25 % of the insurance premium in connection with machine insurance from HELVETIA



#### HEALTH

- Increased operator safety for possible collisions when testing new part programs





## Collision prevention

Dynamic collision monitoring (DCM) monitors machine components (motor spindle and swivel/rotary table) and stops axis movements before impending collisions.

### CHARACTERISTICS

- No hardware adjustment necessary
- License can be purchased with the SIK number of the control system and the option can be activated via remote machine diagnostics
- Interference contours must be stored in the parameters for the DCM software by the programmer
- Active when a CNC program is processed or the axes are moved manually
- Detection of impending collisions, leading to immediate stop of axis movements
- Color-coded on-screen display of the collision object

### YOUR ADVANTAGES



#### ECONOMIC EFFICIENCY

- Prevention of downtimes due to machine, tool or clamping fixture damage
- Prevention or reduction of repair costs for collisions



#### HEALTH

- Increased operator safety for possible collisions when testing new part programs

### REQUIREMENTS

- **CONTROL SYSTEM**  
HEIDENHAIN



## Take advantage of our competence

Complex components and capacity bottlenecks are two reasons for running new components at our facilities. Our experienced technicians optimize your process, ensuring the highest level of machine efficiency.

### CHARACTERISTICS

- Feasibility check for your components
- Your component is run in the GROB Technology and Application Center (TAC) in Mindelheim
- Optimization of your machining process with a focus on machine efficiency and machining quality
- Adaptation of post processors on our machine
- Trial machining option at the GROB TAC in Mindelheim
- Production of prototypes or small series at the GROB TAC in Mindelheim
- Detection of impending collisions, leading to immediate stop of axis movements
- Color-coded on-screen display of the collision object

### YOUR ADVANTAGES



#### QUALITY

- Solid expertise for efficient machining and highest quality



#### ECONOMIC EFFICIENCY

- Optimized use of all machine functions and cycles
- Feasibility check for your components



#### SUSTAINABILITY

- Less burden on production
- Learning effect for your programmers



## Simplified program execution via external memory

With this function, you can process part programs directly from any external data storage. In addition, you can now use other functions such as "jumps" and "grinding" and carry out the program correction during an NC stop.

### CHARACTERISTICS

- Pure software upgrade: EES (Execution from External Storage) from SIEMENS
- The following are available as external data storage:
  - ▶ Local drive (any type)
  - ▶ Global USB to TCU
  - ▶ Windows drives (both from PCU and from a server)
- Uniform syntax for subroutine calls – no more EXTCALL calls required

### YOUR ADVANTAGES



#### ECONOMIC EFFICIENCY

- Processing of externally stored machining programs of any size
- Problem-free processing of a combination of externally and locally stored programs and cycles without special syntax
- Save time with the ability to stop and correct externally stored programs
- Program correction possible with NC stop

### REQUIREMENTS

- **CONTROL SYSTEM**  
SIEMENS SolutionLine
- **HARDWARE**  
NCU 730.3B PN or higher

## Environmental and employee safety that pays off

If the cutting fluid remains immobile for a long period of time, germs and fungi will develop that are harmful to both your employees and the quality of the cutting fluid. The automatic cutting fluid circulation allows the machine to be switched off with the cutting fluid still being circulated regularly. This counteracts gumming and fungus growth.

### CHARACTERISTICS

- Hardware: For recirculation when the main switch has been switched off:
  - ▶ Additional LOGO logic module from SIEMENS
  - ▶ Key-operated switch for activation/deactivation
- Individually selectable switch-on times

### YOUR ADVANTAGES



#### QUALITY

- Maintaining lubricating and cooling properties leads to consistent part quality



#### ECONOMIC EFFICIENCY

- Reduced purchase and disposal costs due to increased cutting fluid service life
- Cumulative potential savings (after five years): €15,284.60\*



#### SUSTAINABILITY

- Energy savings, as the machine can be switched off



#### HEALTH

- Fewer health concerns by permanently reducing germs and fungi



### REQUIREMENTS

- **CONTROL SYSTEM**  
SIEMENS SolutionLine, HEIDENHAIN
- **HARDWARE**  
Remote controlled main switch (GROB standard)

\* GROB Mindelheim reference machine. Savings may vary depending on machine type and usage. Calculation based on 2021 electricity prices

## Programmable via the HMI – time-controlled warm-up program start

A longer period of machine inactivity leads to a difference in the ideal operating temperature of the machining center (e.g., after a weekend). When the machine is switched off (main switch set to OFF) and the remote operation switch is activated, the automatic time-controlled warm-up program start is activated. The machining center is then started by the warm-up program and brought to operating temperature before actual part production in this case. The activation time of the warm-up program can be set individually by the machine operator.

### CHARACTERISTICS

- Hardware: For recirculation when the main switch has been switched off:
  - ▶ Additional LOGO logic module from SIEMENS
  - ▶ Key-operated switch for activation/deactivation
- Software:
  - ▶ Only required if cutting fluid circulation is already present (see page 15)

### YOUR ADVANTAGES



#### QUALITY

- Higher part quality



#### ECONOMIC EFFICIENCY

- Immediate production start at beginning of shift

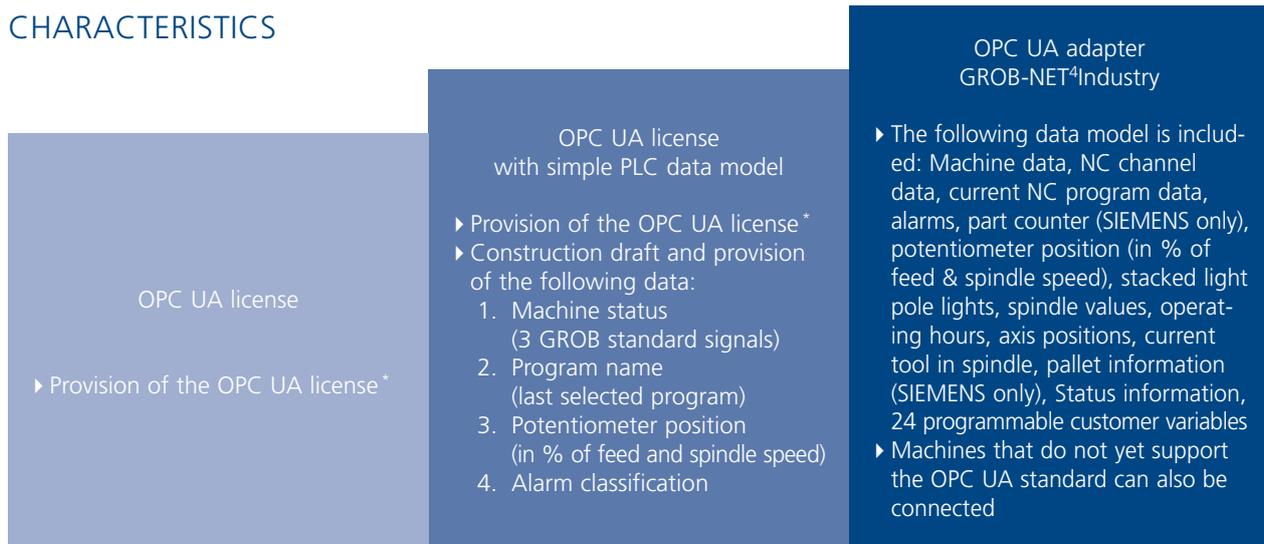
### REQUIREMENTS

- **CONTROL SYSTEM**  
SIEMENS SolutionLine
- **HARDWARE**  
NCU 730.3B PN or higher



OPC UA is a data exchange standard for industrial communication (machine-to-machine or PC-to-machine communication). The open-source interface standard is independent from the manufacturer or system supplier of the application, from the programming language the respective software was programmed in, and from the operating system the application is running on.

## CHARACTERISTICS



## YOUR ADVANTAGES



### QUALITY/ECONOMIC EFFICIENCY

- OPC UA license with simple PLC data model
  - Immediately accessible simple PLC data model
- GROB-NET<sup>4</sup>Industry OPC UA adapter
  - Immediately accessible data model without additional programming
  - No control system licenses required
  - No PLC modifications required
  - Simple installation
  - Excellent scalability
  - Manufacturer independent

## REQUIREMENTS

- **OPC UA LICENSE**  
SIEMENS, HEIDENHAIN \*
- **OPC UA LICENSE WITH SIMPLE PLC DATA MODEL**  
SIEMENS, HEIDENHAIN \*
- **GROB-NET<sup>4</sup>INDUSTRY OPC UA ADAPTER**  
SIEMENS, HEIDENHAIN, FANUC, BECKHOFF, other control systems supporting MTCConnect

\* The control systems and versions must be taken into account and checked (SIEMENS > 4.07 HE 640 iTNC)

## Up to 40 % longer cutting fluid service life due to continuous cleaning

The oil skimmer reliably removes floating foreign oils and contaminants from the cutting fluid (KSS). By using a skimmer, you can maintain high cutting fluid quality even when machining with a lot of metal dust and reduce downtimes due to clogged components.

### CHARACTERISTICS

- Oil skimmer with collecting vessel and level switch
- Electrical connection including motor protection

### YOUR ADVANTAGES



#### QUALITY

- Improvement of the machining quality by maintaining cooling and lubricating properties



#### ECONOMIC EFFICIENCY

- Reduction of machine malfunctions due to blockages and deposits
- Cost savings by extension of the cutting fluid service life



#### SUSTAINABILITY

- Less environmental burden due to longer cutting fluid change intervals



#### HEALTH

- Less health risks because of fewer germs in the cutting fluid



### REQUIREMENTS

- **CONTROL SYSTEM**  
SIEMENS SolutionLine, HEIDENHAIN
- **HARDWARE**  
Internal machine cutting fluid tank



## Consistent quality no matter where your machine is

Fluctuations in temperature due to open hall gates can have a negative impact on the accuracy of your machining. To counteract these fluctuations, you can protect your machine against drafts with our thermal insulation.

### CHARACTERISTICS

- Hardware:
  - ▶ Oil-resistant thermal insulation all around the machine including screws
- Thermal insulation
- Preventing drafts under the machine

### YOUR ADVANTAGES



#### QUALITY

- Reduction of the impact of drafts on accuracy

## Your GROB machine keeps cool even in extreme heat

Extremely high ambient temperatures lead to high temperatures in the electrical cabinet. These can damage the components installed there and lead to machine shutdown. To increase the performance of the electrical cabinet cooling, an additional cooling unit is installed in the electrical cabinet door. The mode of operation is similar to a decentralized air conditioning system.

### CHARACTERISTICS

- Hardware retrofit:
  - ▶ Cooling unit mounted on the electrical cabinet door
  - ▶ Thermometer in the electrical cabinet
- Setting options directly on the cooling unit

### YOUR ADVANTAGES



#### ECONOMIC EFFICIENCY

- Air-conditioned electrical cabinet for optimum operating temperature
- Prevention of faults or malfunctions due to overheating electrical components
- Prevention of machine malfunctions at extremely high ambient temperatures

### REQUIREMENTS

- **CUSTOMER**  
Sufficient space on the electrical cabinet door





## Benefit from a significant reduction in electricity consumption with non-cutting downtime

The topic of sustainable production is becoming increasingly important in mechanical engineering. You can see from our upgradable energy saving profile (ESP) that sustainability not only serves the environment but also lowers your operating costs.

### CHARACTERISTICS

- Software upgrade – no additional hardware required
- Staggered shutdown of electrical consumers (e. g., pumps or drives) during non-cutting downtime
- Individually adjustable stage model
- Dedicated HMI interface for easy operation

### YOUR ADVANTAGES



#### **ECONOMIC EFFICIENCY**

- Ensuring that production is resumed as quickly as possible after switching to energy-saving mode
- Easy activation using remote machine diagnostics
- Can be combined with energy consumption measurement for visualization and data export

### REQUIREMENTS

- **CONTROL SYSTEM**  
SIEMENS SolutionLine version 4.5 onward



## Always keep an eye on energy consumption

The measuring device records the energy values for electrical inputs, outputs or the energy consumption of individual devices. Electrical measurements are recorded and shown transparently on a display. In addition to the assessment of the system status and the network quality, the measurement data can be integrated into higher-level automation and energy management systems.

### CHARACTERISTICS

- Hardware:
  - ▶ PAC type PAC3200 measuring device
  - ▶ Induction loops in front of the consumer
- Installation possible in the electrical cabinet door
- Intuitive operation using four function keys



### YOUR ADVANTAGES



#### ECONOMIC EFFICIENCY

- Monitoring of energy-saving measures such as energy-saving profiles (ESP)



#### SUSTAINABILITY

- Energy consumption visualization
- Simple data export for further analysis

### REQUIREMENTS

- **CONTROL SYSTEM**  
SIEMENS SolutionLine, HEIDENHAIN TNC640

## Increased productivity

With the volume cutting package, unplanned machine downtimes can be avoided by preventing chip build-up via special flushing nozzles at various areas of the machine. This package is available for machines with and without a pallet changer.

### CHARACTERISTICS

- Volume cutting package with detection element and flushing function for machines with or without a pallet changing system
- Additional flushing function in the work area, the cross-side slanted machine bed and the extraction hood is available for machines with or without a pallet changer system
- Improved pre-separation for less chips and cutting fluid for the extraction system
- Increased flow speed at the detection point connection and in the pipe

### YOUR ADVANTAGES



#### PRODUCTIVITY

- Prevention of chip build-up via special flushing nozzles
- Preventing unplanned downtime

### REQUIREMENTS

- **HARDWARE**  
Dependent on machine version (note "pallet changer" standard option)



## GROB Service: Maintenance and inspection

As part of the annual inspection, our experts determine the actual condition of your machine and check safety and function-relevant assemblies using our machine-specific checklists. Possible fault sources can be detected and eliminated in advance before they even become a problem.

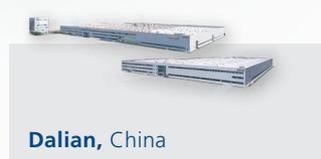
- + Provision of the necessary inspection equipment by GROB
- + Regular monitoring and calibration of the inspection equipment
- + Meaningful and extremely accurate results



# GROB WORLDWIDE



## PRODUCTION PLANTS



Would you like to contact us?

The teams at our sites will be pleased to assist you further.



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