



INNOVATIVE AUTOMATION AND MEASUREMENT TECHNOLOGY
SOLUTION FOR EMCOTURN E65 CONVINCES PROPART



EMCOTURN E65 with gantry loader and workpiece measuring device

Requirement profile and implementation

- / Large-scale production
- / Automatic loading and unloading
- / Automatic measuring of the gear parts
- / Automatic wear compensation
- / Automatic process monitoring
- / Manless production

Successful cooperation between Propart, the measurement technology specialist OBERON and EMCO enables unmanned production.

The Polish company PROPART has been specializing in the machining of metal, cast and forged parts, especially cast iron, steel and aluminium since its foundation in 1990. The company started with 25 employees* and 10 machines – today a team of about 200 employees works with a machine park of 100 CNC machines for different branches. The Polish company also has its own paint shop for painting with powder and water paints.

With thirty years of experience, PROPART is today a renowned supplier of Machine parts for the automotive industry, general mechanical engineering, and the hydraulic and pneumatic industry.

The company has all the necessary certifications to be able to operate as a supplier in the automotive and commercial vehicle industry. PROPART supplies various forged steel and aluminium components to the automotive and commercial vehicle industry and applies the quality processes PFMEA, PCP and APQP. The company produces brackets, balance levers, wishbones, engine mounts, shock absorber components, silencer components, hub and wheel flanges, clutch elements, drive shafts and brake components. For the mechanical engineering industry PROPART produces machine parts in various dimensions and complexities in small, medium and large series. Typical parts are, for example, constructional elements of forklift trucks, balance levers, wishbones, elements of supporting structures for industrial means of transport, aluminium components for industrial heat sinks, rope wheels for cranes and portals, shafts and axles and other moving parts of machines.



Another focus of the company is the production of a wide variety of valve bodies, hydraulic pumps, single and double sided pistons and proportional valves. The focus here is on ensuring the precise machining of these parts, as they are exposed to high gas or hydraulic pressure – so dimensional accuracy and high surface quality are essential. In most cases, components of this type require additional processing such as hardening and surface coating. Propart works with proven suppliers for these processes to provide a complete, one-stop shop for a component that can operate under particularly difficult high-pressure conditions. In 2015, the company was able to realize another innovative implementation in cooperation with the Technical University of Poznan. The Polish company and the university developed a new solution for the machining of industrial valve bodies within the framework of a research project. In addition to the above industries, the company also offers machining of housings and bearing housings, components for wind farms, fasteners for rails, pulleys, joints and much more.

The project with EMCO

With the EMCO lathes of the EMCOTURN E65M series PROPART manufactures gear components for the automotive industry. In cooperation with the Austrian machine tool manufacturer, the company has developed a workpiece measuring device for the EMCO lathes, which is fully implemented in the process of machining car transmission parts by checking the relevant diameters and automatic correction of the cutting tools, thus increasing the quality of the parts. For PROPART, the main reasons for carrying out the project with EMCO were the individual technological solution offered by EMCO, EMCO's solution-oriented approach to the requirements, flexibility, direct access to EMCO designers and the transparent, mutual exchange of information and experience between the two companies. From the very beginning, EMCO has shown great interest and commitment to professional cooperation. Furthermore, the economic benefit for PROPART was an important factor. By implementing the workpiece measuring device, production costs in the company could be reduced and quality could be optimized (reduction of production defects by enabling the automatic dimension correction of the measuring device). The increased precision in the production of gear parts improves the quality of the parts and thus increases the competitiveness of PROPART. The automation of the machines solves the problem of the prevailing lack of skilled workers at least in certain areas and helps to reduce the personnel costs.



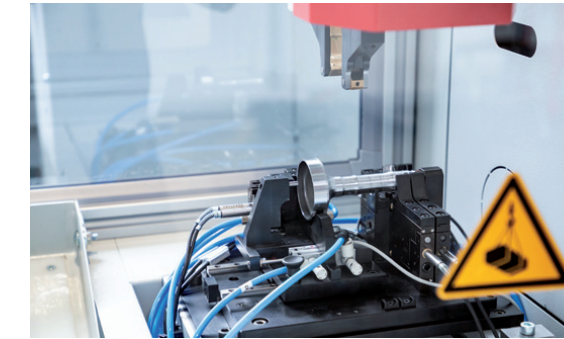
Owner and project manager of PROPART in front of the EMCOTURN E65

Perfect interaction between machine and measuring technology

The challenge in this project was definitely to find the right measuring devices for this type of parts, which can also be easily connected to the machine. A completely new workpiece measuring device for automatic data correction of the cutting tools was then developed, which enables quality control at the highest level and contributes to a significantly better quality output of the machines. In numerous coordination processes between PROPART and EMCO, the important cornerstones for this development were worked out – for this the PROPART employees were on site at EMCO's headquarters in Hallein. During the visit, the main task of the two companies was to establish a connection between the machine and the measuring device. The communication and functionality between the workpiece measuring device and the CNC lathe were tested and refined during a joint acceptance test. The mutual exchange of experience during the automation process was particularly instructive. For the first time, PROPART used the integration of the workpiece measuring device in a machine tool that works according to the feedback principle, i.e. the flow of information between the machine tool and the measuring device takes place in both directions. The result is the automatic detection of tool wear and the automatic change to a comparable tool. The solution developed by EMCO is now in automatic operation 24 hours a day, five days a week at PROPART.

How did the cooperation go?

The Austrian machine tool dealer was previously only known on the Polish market for its training machines and systems. The presentation about the personalized automation systems that EMCO has built and implemented since 1985 was an important step in building trust. Rafał Młodak, with over 20 years of experience in the industry, played a key



role in the implementation of the entire project and in the decision making process regarding the purchase of machine tools and the start of a wider cooperation with EMCO. In the end, the project was realized 100% according to plan. The key to success proved to be the thorough preparation and design phase, based on the commitment of the three companies: PROPART – OBERON and EMCO. The PROPART company's chairman of the board, device designers and constructors were involved in the project. The OBERON company acted as a hardware supplier and developer of the software for the measuring device. Execution documentation and diagrams had to be evaluated and improved in cooperation with the programming department. Rafał Młodak from EMCO presented the project to PROPART, explained it and guided the company through the phases of implementation. SOLER Service and Solution was responsible for the installation of the lathes, commissioning and implementation into production. Both companies benefited from the constant exchange and the added value for PROPART are the results achieved with EMCO's customized, tailor-made solution. The successful implementation of the project led to the fact that PROPART wants to use further measuring instruments in the future. Another plus is the support of the highly qualified team of technicians from SOLER Service and Solution, the official service partner of EMCO in Poland, whose experience and skills could be used during the project phase.

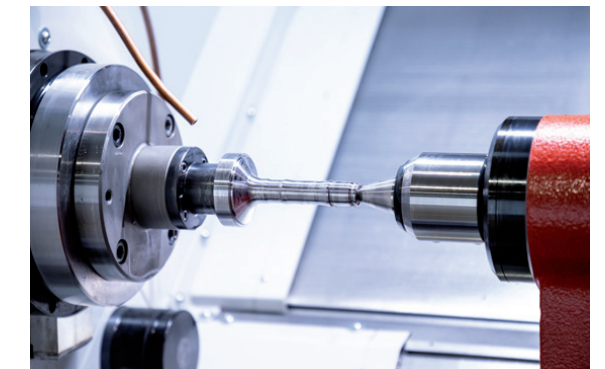
PROPART and EMCO: Partners for the future

From the very beginning, the project demanded solutions that went beyond the standard. This includes, above all, the design of the measuring device and machines as well as the flow of information between the machine and the workpiece measuring device. Due to the successful implementation of the turnkey solution, PROPART is very interested in further cooperation with EMCO. The topics of the future at PROPART in Poland will definitely have to do with the further automation of the product lines.



Propart Sp. z o.o. specialises in manufacturing and machining steel, cast iron and aluminium components. The company was founded in 1990 and its main shareholder is the German company a & f Grosserien GmbH. PROPART holds the certifications EN ISO 9001, ISO 14001 and IATF 16949. The production volume of the company includes: Suspension elements, pulleys, gear bodies, impellers, block and cable pulleys, elements of braking systems, equipment for engines and components for hydraulic and pneumatic systems.

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Technical Data

Work area

Swing over bed	Ø 610 mm
Swing over slide	Ø 360 mm
Distance between centers on tailstock version	682 mm
Main spindle / counter spindle distance	840 mm
Maximum turning diameter	Ø 500 mm
Maximum part length	520 mm
Maximum bar diameter	Ø 65 (95) mm

Travel

Travel in X / Z	260 / 610 mm
Travel in Y	80 (+/-40) mm

Main spindle

Speed range	0 – 5000 (3500) rpm
Maximum drive power	22 kW
Max. torque on the spindle	305 (380) Nm
Spindle nose DIN 55026	A2-6 (A2-8)
Spindle bearing (inner diameter at front)	105 (160) mm
Spindle bore hole	73 (105) mm

Counter spindle

Speed range	0 – 5000 rpm
Maximum drive performance	16,5 kW
Max. torque on the spindle	125 Nm
Spindle nose DIN 55026	A2-6
Spindle bearing (inside diameter at front)	105 mm
Spindle bore hole	73 mm

Tailstock

Tailstock travel	500 mm
Maximum thrust	8000 N
Maximum travel speed	approx. 20 m/min
Tailstock bore taper	MT4

C-axis

Round axis resolution	0,001°
Rapid motion speed	1000 rpm

Tool turret

Number of tool positions (all driven)	12
VDI shaft (DIN 69880)	30 (40) mm
Tool cross-section for square tools	20 x 20 (25 x 25) mm
Shaft diameter for boring bars	32 mm
Tool change time	0,2 (0,3) sec.

Driven tools DIN 5480

Speed range	0 – 5000 (4500) rpm
Maximum torque	25 Nm
Maximum drive power	6,7 kW

Feed drives

Rapid motion speed X / Y / Z	30 / 15 / 30 m/min
Feed force in the X / Y / Z	5000 / 7000 / 7000 N
Feed force in the Z2 axis (counter spindle)	8000 N
Positioning scatter Ps VDI 3441 in X / Y / Z	2 / 2 / 2 µm *

* For machines including laser measurement and pitch error compensation

Coolant system

Tank volume (optional)	230 (830) liters
Coolant pressure (optional)	3,5 (14 / 25) bar
Pump power (optional)	0,57 (2,2 / 3) kW

Power consumption

Connected load	39 kVA
Compressed air	6 bar

Dimensions and weight

Height of spindle center above floor	1150 mm
Machine height	2100 mm
Machine footprint L x D	3450 x 2080 mm
Total weight	approx. 6500 kg

EMCO SL1200

Bar length	250 – 1100 mm
Bar diameter	approx. Ø 8 – 95 mm
Material support	ca. 560 mm
Length	1700 mm
Width	1250 mm
Height (Spindle center)	1090 – 1380 mm
Weight approx.	approx. 500 kg

Safety devices CE compliant

beyond standard /

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