

CytroBox in the machining of castings

INTELLIGENT HYDRAULIC SUPPLY SYSTEM FOR THE AUTOMOBILE INDUSTRY

With the CytroBox from Bosch Rexroth, special machinery manufacturer August Mössner is exploring new routes when it comes to hydraulic supply systems. In the initial project, the integrated unit feeds a system for the rough working of engine blocks. For the customer BMW, the space required by the hydraulic supply system is halved, while the level of performance is maintained and energy efficiency is increased. The IoT-capable power unit is also quieter and, with CytroConnect, features an integrated IoT service for predictive maintenance.

Time is tight in the automobile industry. The same is true for the rough working of engine blocks which leave the foundry at BMW's Landshut plant every 25 seconds before being transported to the new transfer system from Mössner. With its complex and highly automated processes, the transfer system really speeds things up. After recognizing a component, it applies a DMC code, decorates it and saws it. The line then splits into two: the combustion chamber and sump sides are sawed flat before the component is aligned and clamped so that the central feeders can be pressed out. The rough engine blocks now go through the 3-in-1 decorating before being checked and automatically palleted.

STATEMENT OF OUR CUSTOMER ABOUT CYTROBOX...

"We deliberately wanted to move away from classic supply systems with a housing and opted for an integrated concept from our hydraulic partner Bosch Rexroth. Thanks to the CytroBox, our foundry technology is not only more compact, quieter and more energy efficient – it's also IoT-capable. All of these future requirements were met at once."

**Marco Schulz, Construction
Manager, August Mössner**

...AND CYTROCONNECT

"Via the integrated CytroConnect IoT service, we hope to offer our customers new, complementary i4.0 services and even predictive maintenance in a near future."

**Marco Schulz, Construction
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SAME PERFORMANCE WITH HALF THE SPACE

Another factor in the machine manufacturer's decision was its positive experiences with the CytroBox's "little brother": at Mössner the CytroPac, a small power unit, is now the standard for supplying ancillary functions requiring up to 4 kW of power. "Using the Cytro principle for medium power applications up to 30 kW was a logical step for us," said Schulz. The smaller footprint is just one of the advantages it has over traditional hydraulic power units. Mössner now requires just half the space of what they used to for the two units, which both supply hydraulic functions for clamping, moving casted parts and for pressing out the central feeders. The fact that the CytroBox provides at least the same level of performance in an area of just half a square meter is the result of the integrated design concept developed by Rexroth. With the help of simulation technology, the industrial hydraulic experts were able to reduce the size of the oil tank by 75 percent without reducing its service life. The flow-optimized control block and the compact synchronous servo motor in the CytroBox's variable-speed drive further reduce the amount of space required.

INNOVATIVE HYDRAULIC SUPPLY SYSTEM

Mössner supplied the entire system and in addition to its great speed and precision, it has another special feature: the special machinery manufacturer from Eschach in Southern Germany has used a new, integrated hydraulic supply system for hydraulically clamping, aligning and pressing out the central feeders. Visually, the two units look more like a server cabinet than a hydraulic power unit. As Construction Manager Marco Schulz explained, this is no coincidence: "We deliberately wanted to move away from classic supply systems with a housing and opted for an integrated concept from our hydraulic partner Bosch Rexroth. Thanks to the CytroBox, our foundry technology is not only more compact, quieter and more energy efficient – it's also IoT-capable. All of these future requirements were met at once."



AS QUIET AS AN OPEN OFFICE LANDSCAPE

The solution not only has a small footprint – it is very quiet when operating as well. The entire system reaches no more than 75 dB(A) which means that it meets the limit values set by BMW even without a housing. The noise emissions thus lie somewhere between an open office landscape and a loud conversation. If the system does not need any oil, the unit switches off the supply and goes into stand-by mode. “Even when operating, the unit is so quiet that our PLC programmer chose to sit right next to the CytroBox,” said Schulz. “That says it all.”

ENERGY-EFFICIENT POWER PACKAGE

Rexroth Project Manager Michael Hüneke explained why the needs-based supply system used by Mössner is more energy efficient: “With this application, the unit stands still for around 15 percent of the time and doesn’t use any energy. Under load, the power consumption is just 80 percent of what it was in the previous machines, even though the installed power is the same. This means a saving of almost a third of the power consumption.” The CytroBox achieves this efficiency by cleverly combining a frequency converter, a synchronous motor and an axial piston pump. “Pre-defined controllers match the energy requirement to the particular situation,” explained Hüneke. “The speed is reduced under partial or no load and increased under full load with a highly dynamic response.”

CYTROCONNECT: HYDRAULICS FOR THE INTERNET OF THINGS

With the integrated CytroConnect IoT service, Bosch Rexroth offers everything needed for a highly available hydraulic supply solution. The browser-based dashboard by CytroConnect Monitor provides operators with the relevant operating status, free of charge and regardless of their user interface - whether it be a smartphone, a tablet or a PC. The CytroConnect Maintain service, which can be subscribed to on a monthly basis, assesses the reliability and life cycle of the hydraulic fluid and drive unit – both key components. The CytroConnect Predict service allows for a predictive analysis of the overall system and also enables the pay-per-use functionality. With the help of the machine learning algorithms, offered by the Rexroth Online Diagnostics Network (ODiN), maintenance can be planned and carried out more cost-effectively and the maximum operating life of individual components can be exploited.

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IOT-READY WITH PAY PER USE

The unit's IoT capability was another key customer requirement. Integrated sensors, condition monitoring capacities and the option of activating IoT services such as predictive maintenance at short notice make the CytroBox a future-proof solution in the eyes of Marco Schulz. "Via the integrated CytroConnect IoT service, we hope to offer our customers new, complementary i4.0 services and even predictive maintenance in a near future," he revealed. "Bosch Rexroth's pay-per-use offering will serve as a flexible basis here."

IMPORTANT STEP TOWARDS STANDARDIZATION

With the introduction of the plug-and-play Cytro solutions, Mössner's days of laboriously building complex units are over. Standardization simplifies many processes: from engineering with straightforward ordering and circuit diagrams available immediately, to quick deliveries and commissioning via plug and play together with needs-based IoT services. "Up until now, the hydraulic supply system was always the last link in the chain," said Markus Fuchs, Purchasing Manager at August Mössner. "Now the situation has changed: the hydraulic supply system reduces our time to market, makes our systems future viable and increases the benefits for our customers."

CYTROBOX: THE FUTURE OF HYDRAULICS HAS BEGUN

The digital transformation is revolutionizing processes throughout the entire value chain. The secure exchange of information and the networking of machines are the major challenges for machinery and system manufacturers, such as press machine manufacturers. In particular, forming technology could become more cost-efficient, faster and more intuitive by means of IoT technologies. The new hydraulic power unit from Bosch Rexroth optimizes production with its intelligent and energy-efficient modular design, allowing press manufacturers to operate much more economically.

The CytroBox...

- is uncompromisingly compact:
Space Savings up to 50%
- conserves on energy:
Energy Savings up to 80%
- is really quiet:
Less than 75dB (A)
- is connected:
100% Connected Product

Features:

- Maximum operating pressure 315 bar
- Maximum flow 160 l/min
- Power 30 kW
- Capacity fluctuation 50 l