

fluid

DAS UNABHÄNGIGE TECHNIKMAGAZIN

HYDRAULICS

How Straddle Carriers of the latest generation steer 26

COMPRESSED AIR

Autonomous artificial swallows and pneumatic assistants: Festo's Tech Talk 34

MECHATRONICS

More reliable hydraulics in presses and injection moulding machines 28

COVER STORY

Miniature solenoid valves as life-savers 20



m connect

Flexible and connected
How intelligent hydraulics change
CNC-strechbenders 16



One application area for the drive solution is mining.

image: AdobeStock/Luis Sandoval M

New cooling system series for industrial gear units

Gear units and air cooling systems from one modular range

For the heavy duty gear units produced by SEW-Eurodrive, Universal Hydraulik has developed special air cooling systems which are ideally suited to the modular concept adopted by the gear unit manufacturer. Thanks to a special feature of their construction, the cooling systems are exceptionally compact and efficient.

There are many industries in which heavy loads are moved with high torques, for example mining, wood processing, process engineering, and the building materials industry. For these heavy duty applications, SEW-Eurodrive offers a range of industrial gear units. A modular system enables the drive solutions to be configured for their specific tasks.

When it comes to cooling these industrial gear units, the company relies on Universal Hydraulik. This vendor has supplied the heavy duty gear unit manufacturer with application-specific solutions to cool and lubricate its gear units for over ten years.

Several years ago, the two companies cooperated to develop standard solutions for oil/water cooling that fit the modular concept implemented by SEW-Eurodrive. Now, the oil/air cooling was to be re-engineered in the same way: The aim of the gear unit manufacturer was to

be able to respond much more quickly and flexibly to the users' requirements for these systems as well. The modular concept was to be developed further so that in future they would be able to supply users with parts from stock in this area too.

Essential capabilities of gear unit cooling systems

At their first meeting, the two companies defined what the cooling systems were expected to do. The meeting was attended by Pascal Springer (Sales) from Universal Hydraulik and Christian Luft (Development), Tamiem Badawi (Product Management) and Julian Gunkel (Purchasing) representing SEW-Eurodrive. They had a substantial agenda:

- The cooling systems should have a broad performance bandwidth and they should completely cover the performance ranges of standard gear units.
- SEW-Eurodrive's own motor series should be used on the new air coolers.
- All cooling systems should be operable at 50 Hertz and 60 Hertz.
- The dimensions of the cooling systems should be adapted to fit the gear units.

the author

Pascal Springer, deputy sales manager at Universal Hydraulik



The manufacturer implemented the internal bypass for the air cooling systems in a full-flow solution. *image: Universal Hydraulik*



The air cooling systems fit seamlessly in the gear unit manufacturer's modular system. *image: Universal Hydraulik*

- The gear unit manufacturer also requested a surface coating in „OS3“ conforming to factory standard as corrosion protection.
- The developers also agreed that an internal bypass in the air cooling unit would be an innovation that might save space and costs. The bypass essentially serves to reduce loss of pressure throughout the system during the cold start phase of the unit. Until this time, the pipework for the bypass was routed externally and equipped with a complicated non-return valve.

Outstanding features of the cooling systems

In the next step, Universal Hydraulik devised the final cooling unit concept. Thermodynamic models of the individual gear unit loading conditions were created and discussed in great technical detail. The company evaluated the characteristic curves of the impeller at 50 Hertz and 60 Hertz, and selected motors on the basis of its findings.

The manufacturer applied the OS3 coating to the individual components of the cooling systems in accordance with the specification. In consultation with SEW developer Christian Luft, the supplier adjusted the design of the cooling systems to the structural size of the gear units.

And finally, the design engineers worked out a block concept for the bypass inside the cooling system.

The remarkable feature is that the air cooling systems can now be equipped with both an internal pressure bypass and a thermal bypass. Furthermore, the internal bypass was implemented in a full flow solution. Many competitors only offer partial flow solutions. Ultimately, the exterior piping was dispensed with entirely! Consequently, the cooling system is not only more compact but also more efficient, and it saves costs.

Cooperation continues

In the intervening time, seven cooling system sizes have been defined, ranging from four kilowatts to 40 kilowatts and covering the standard module bandwidth. Higher outputs of 100 kilowatts, surpassing the standard, have already been produced as well.

The two companies have successfully wrapped up the modular air cooling system project – almost: Christian Luft and Pascal Springer are already working on another air cooling system prototype for a series of very small and compact gear units. *do ■*

*Pascal Springer,
Universal Hydraulik*

OS3 surface protection

SEW-Eurodrive offers its products with a variety of coatings. In this respect, the company is guided by the corrosivity categories defined in DIN EN ISO 12944-2. The OS3 coating corresponds to category C4 (high). This protection layer is suitable for environments with high humidity and occasionally heavy atmospheric and

chemical pollution. Occasional wet cleaning with acid- or alkaline solution containing agents is intended. Coastal regions with moderate salt burden are suitable as locations. Possible applications include for example sewage treatment plants, port cranes or open-cast mining installations.