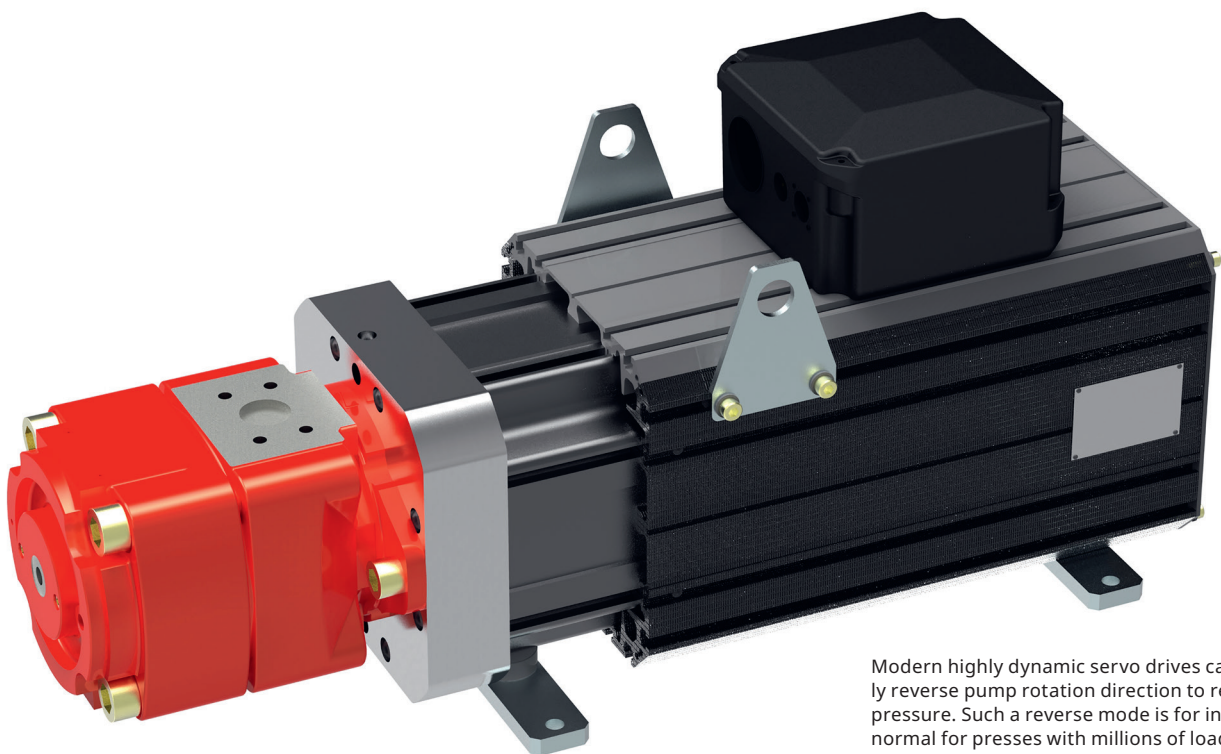


Reliable Effectiveness

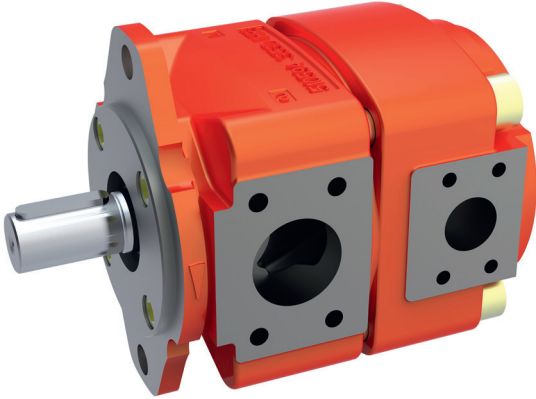
QXEH series internal gear drive units



Modern highly dynamic servo drives can briefly reverse pump rotation direction to release pressure. Such a reverse mode is for instant normal for presses with millions of load cycles, and it requires a high pump operational safety. The non-compensated QXEH/QXEM units can achieve this without problems thanks to their symmetric structure requiring no extra pressureretaining valves.

The safe, energy-efficient Bucher Hydraulics QXEH Series to increase the competitive edge

The spectrum of possible applications of the Bucher Hydraulics QXEH Series internal gear drive units ranges from injection moulding machines to general aggregate construction and up to wind power plants. But however different their applications with specific requirements may be, all of them have the same aim: to achieve greater competitiveness. Every particular highly competitive market demands the highest productivity as well as cost and energy efficiency. The Bucher Hydraulics experts have therefore expanded the product portfolio of internal gear drive units with the QXEH Series. With its low noise level, exceptional controllability in a highly dynamic reversing mode and a high level of operational safety, it successfully plays its trump card with its special construction design.



Regardless of application, the Bucher Hydraulics QXEH/QXEM internal gear drive units impress with their low operating noise, good controllability, energy efficiency, high reliability and long life. The design features a pinion technology, which allows to minimise downtimes and the total cost of ownership thus making it possible for users to optimise their productivity.

The QXEH Series non-compensated basic design allows to install long pressure build-up sections over the whole crescent arranged symmetrically. The pinion shaft design includes pinions and shafts manufactured as a single piece. The single-stage drive unit requires no sealing and compensating elements for internal sealing of the pressure area.

The design enhances customer value

Right at the QXEH development stage Bucher Hydraulics fully focused on customer value. This resulted in better values of dynamics, noise, availability and energy efficiency, as proven by related benchmark tests (comparing product of several suppliers) of certain major injection moulding machine manufacturers. The intrinsic low noise emission and low current flow frequency allows mechanical engineering companies to save on costs by excluding additional noise reduction measures while end users may enjoy the quietly running pump at frequencies which are very comfortable to human ear.

Good controllability of highly dynamic processes made possible by eliminating gap compensating elements is an additional advantage. The free-running gear with pinion and sprocket in the non-compensated QXEH pump allows for simple and quick parameterisation over the whole pressure and speed range.



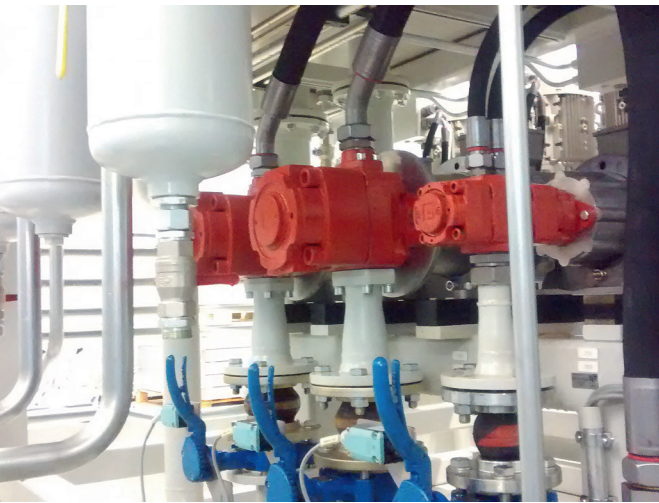
The orderly pressure build-up along the crescent with very long pressure build-up sections is a major characteristic of the non-compensated QXEH/QXEM units. The pinion technology (pinions and shaft as one piece) with free-running gear in highly precise machined chambers and completely balanced suction and pressure areas provide for low noise emission and good controllability. At the same time, this structure is a guarantee of high operational safety and increase in productivity.

Focus on energy efficiency and productivity

The QXEH Series offers an economic basis for implementation of key projects in all fields of application. Energy efficiency and increase in productivity. When it comes to energy, the drive unit scores with its high hydraulic-mechanical efficiency. The non-compensated system features very low mechanical friction. Moreover, medium is fed in the pump through internal cast metal suction and pressure channels to cause low flow turbulence. Both of these technical features lower energy consumption.

At the same time, the symmetric structure with a fixed crescent without sealing elements ensures maximum operational reliability of the QXEH Series which allows the users to benefit from a high machine productivity. This is particularly true in the case of highly dynamic servo drives, where the pump briefly switches over to reversing mode to avoid pressure peaks. Enclosed in a precisely manufactured chamber, the QXEH Series units contain a free-running gear and do not have sealing elements in the crescent, thus requiring no special backup pressure at the pump outlet. So the pump absolutely perfectly runs even in reverse mode with pressures at the outlet of up to 1 bar. This not only pays off through the drive unit reliability but also allows to save costs and energy for auxiliary valves required for other pumps as means of protection against failure in reverse operation.

For operation in a multi-quadrant mode, Bucher Hydraulics has developed a special design: The QXEM internal gear drive unit. One of the central points in the QXEM Series is its symmetric structure, with identical high and low pressure areas. With special metering grooves and lubrication systems as well as two same-size pressure-tight connections, the design is specially optimised for 2 and 4 quadrant modes and is thus ideally suited to both directions of rotation at high and low pressures.

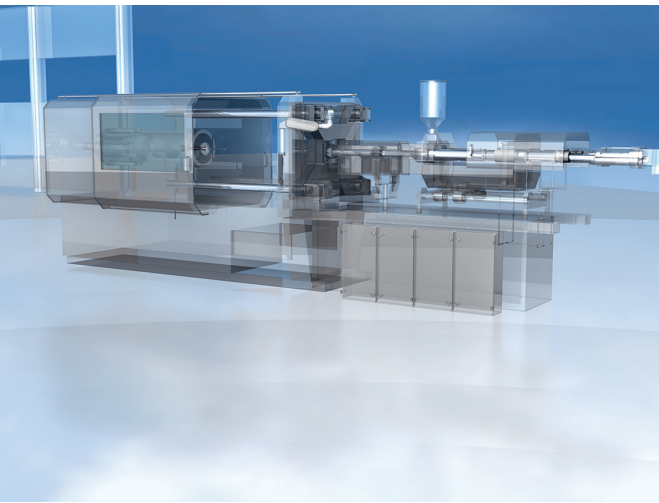


Bucher Hydraulics offers aggregate manufacturers pumps that are optimal for any application. As an addition to the QX Series, the innovative QXEH/QXEM units now have a single-stage drive unit for pressure range of up to 280 bar. Be it drives with constant or variable speed, operators may rely on design-based reliability and low operating noise of the pump running within a broad temperature and viscosity range.

Aggregate construction profits from injection moulding experience

A broad application variety of hydraulic assemblies almost always allows to make their adaptation for special purposes. Small batch sizes are not uncommon so experience in process stability of a particular design is often lacking. But it makes a difference when installing the QXEH drive units which have proven their functional stability over the past several years, with highest quantities made on injection moulding machines.

Both production safety and operational reliability are already there, besides the QXEH Series special design has demonstrated its operational safety through long service life after millions of load cycles, as used in injection moulding machines. For applications with pressures of up to 280 bar, the pump is a proven single-stage option for QX systems currently in use. Because the pump reliably runs within a broad temperature and viscosity as well as speed range, there are no limits to aggregate construction.

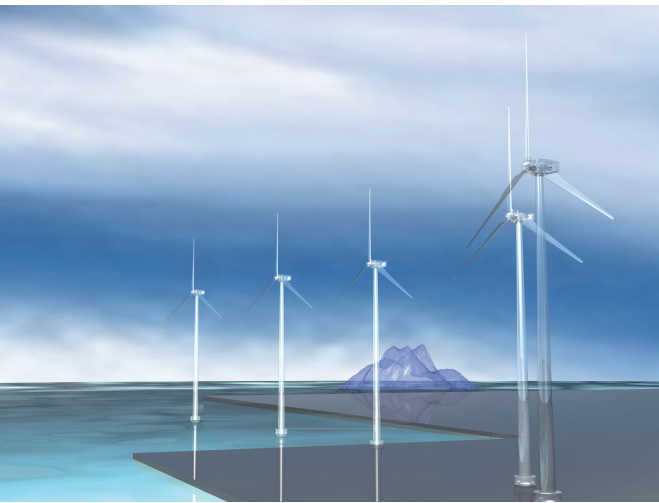


A trendsetter from edging to deep-drawing

Irrespective of the application, the QXEH design allows the user to enjoy the benefits of the internal gear drive unit in a variety of ways. Similar to injection moulding machines, it meets the strict low noise emission requirements in folding and bending machines, too. At the same time, there is a clear trend to decentralisation of linear drives for separate cylinders, where the use of the QXEM internal gear drive units with individual control results in higher product quality.

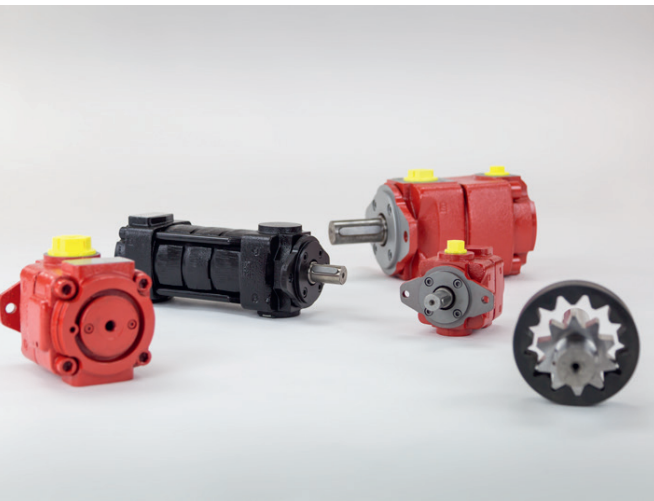
Saving energy is the major reason of new trends in deep drawing presses and forging presses. The automotive industry, as the main customer of these presses, requires new alternatives to the conventional pumps with large volumes conveyed and drives with constant speed, whose energy consumption is very high over the complete cycle. This is where the QXEM units can capture the countersinking energy and be used for raising tools or for pressing in a machine that operates in parallel. This allows to consistently use this energy in time-delayed operations of multiple presses. Depending on a machine cycle, the speed may lower up to zero thanks to which more and more press manufacturers are switching to smaller scaled variable speed drives and smaller pumps. Lower displacement volumes of the QXEH pumps may be selected through higher maximal speeds. This allows to lower torques and therefore use smaller cost-effective drives.

There is a trend of increased use of servo drives to individually adapt current flow to load cycles in pressure casting plants. Apart from the general advantages of controllability, service life and operational safety, the QXEH units feature ideal suitability for low-flammable media like HFC when used with pressure casting plants, in view of potential fire hazard. With the non-compensated systems, a few moving parts and high-strength materials, and by excluding any non-ferrous metals, the highest standards are fulfilled by using such medium without any problems. Moreover, the flow configuration, special toothing and long pressure build-up sections in the crescent allow to avoid the HFC-related risk of cavitation.



Safety in wind power plants

For many years now, Bucher Hydraulics has been presented with two-stage QX internal gear drive units in wind power plants. In such applications the requirements for operational safety are much higher than any other criteria. This is partially due to extreme environmental conditions, broad temperature ranges, high safety standards and often to the fact that it is difficult and costly to reach destinations, like in offshore applications. The pump for the blade adjustment drive (pitch) delivers to high-pressure storage and runs at high speed for central components: Should it fail, the whole turbine immediately switches off, and operators bear great losses. The proven reliability of the Bucher Hydraulics internal gear drive units allows to effectively prevent such a scenario. The rugged construction provides for longer service life and results in lower maintenance costs.



Impressive technology

Independently from application: The QXEH non-compensated design with a special tothing geometry and just two moving parts features low operating noise and low pulsation. Even under highly cyclical loads, this rugged construction impresses with its long life and has proven to be extremely reliable in highly dynamic variable speed drives. The QXEH units are an ideal addition to the Bucher Hydraulics QX drive series available with one to three consecutive pressure levels from 125 to 400 bar and now expanded with a single-stage QXEH series having a maximal operating pressure of 280 bar.

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