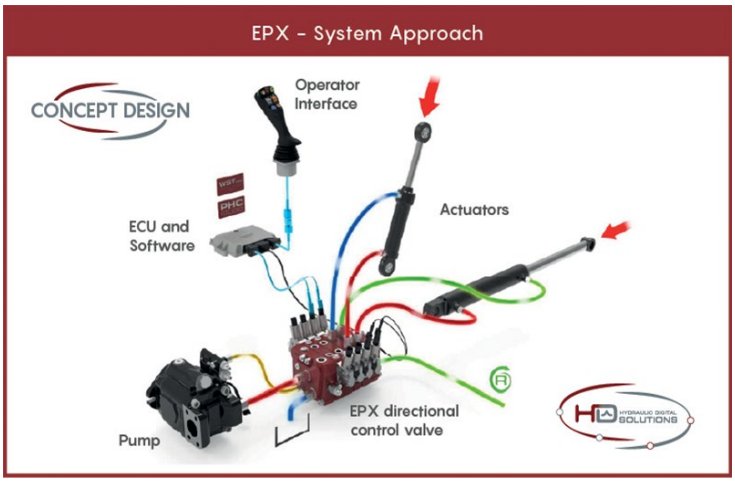
PRESS

AT BAUMA 2025 THE EVOLUTION OF EPX – ENERGY RECOVERY VALVE FROM WALVOIL



Hydraulic systems have evolved to maximize the predictability of actuation speed. Flow compensation is a well-known technology that mechanically corrects the actuator speed if it exceeds the operator's demand due to inertial load. This is achieved through a mechanical device introducing a pressure drop to limit the flow when necessary.

Walvoil's EPX – Energy Recovery Valve, part of the **Hydraulic Digital Solutions**, innovates beyond the industry standard with a three-way device that not only limits actuation speed but also recovers stored gravitational and kinetic energy.

The most common advanced hydraulic systems do include in the main control valve a hydraulic compensator.

This 2-way mechanical device allows to limit the flow rate to the actuator through a restriction. Typically, this compensator is placed in the delivery line that connects the pump to the actuator inlet. Two technologies are present now on the market: when the compensator is placed upstream the spools the technology is known as "pre-compensated" systems, vice versa when the compensator is placed "downstream" to the spool, that technology is called "post compensated" and allows flow sharing operation.

This feature is very useful when the flow request by the operator is more than the pump possibilities: in this condition, the directional control valve maintains the flow repartition between sections. The hydraulic system is then typically completed with counterbalance valves to improve further the actuation precision.

EPX's approach combines two key innovations:

Meter-out compensation

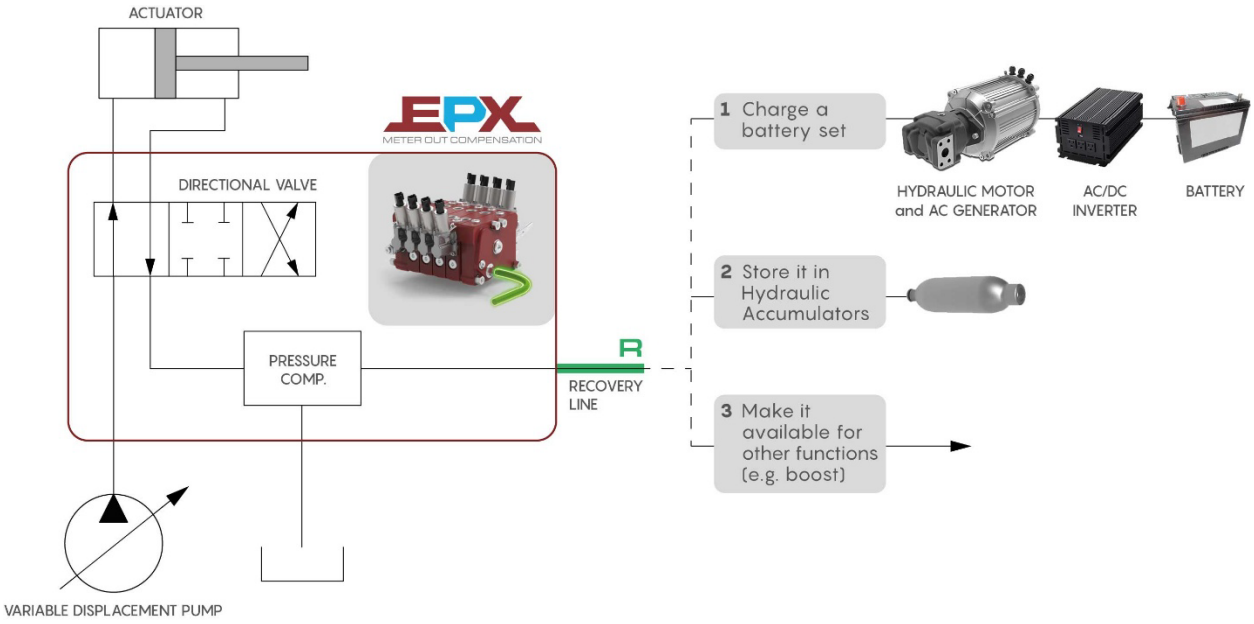
This design improves the control of unbalanced loads. Meter-out compensation provides extra flow restriction when the load is unbalanced, preventing unwanted velocities due to the load on the cylinders or motors. This innovation also simplifies the load control valves: in a meter-out system the meter compensator protects against

load drifting. The secondary valves are used in this case only as safety equipment. These safety valves, typically flanged on the cylinder, are designed to have minimal pressure drop and minimal impact on regular valve operation. Example of simplified safety valves are pilot-operated check valve or an electric on/off valve.

Three-way compensation

This patented design introduces an extra flow path to the meter-out compensator. During operation, the compensator measures the fluid pressure: if the pressure exceeds a determined threshold, an extra path is opened, pressurizing the recovery line with the stored energy in the actuator.

The combination of these two innovations provides a flow-sharing solution that can recover stored energy in the machine.



Energy recovery strategies: multiple options thanks to R line

EPX technologies are evolving to minimize the environmental impact and stabilize the power consumption of the next generation of hydraulic systems.

Testing activities on **wheel loaders** have demonstrated a **20% of energy saving** combining recoverable energy and reduction of compensation losses.

Energy saving thanks to EPX Solution adoption

Other case studies:

Case study #1 - Lifter

Industrial lifters are used to move materials in harbours. A typical working cycle has lifting and lowering operation with and without load. EPX technology stabilizes the power demand of the actuators allowing smaller components and steady-state operation.

Case study #2 - Telehandler

One of the quickest evolving construction machines, telehandlers represent several challenges: a hybrid machine between a crane and wheel loader needs perfect control of all the functions and low dissipation in short stroke. EPX avoids counterbalance dissipation and provides a source of recovered energy.

Case study #3 - Compact wheel loader

Compact wheel loaders are quickly evolving through electrification allowing their usage in closed and noise sensitive environments. EPX provides a solution that limits the hydraulic dissipation in the electric application.

For further information, **visit Walvoil at bauma 2025** or email marketing@walvoil.com

Reggio Emilia - I, 15 March, 2025

Walvoil: from a mechanical company to one of the world's leading players in hydraulics and mechatronics

Walvoil Spa, part of the Interpump Group since 2015, and with over fifty years of life behind it, is one of the world's leading manufacturers of hydraulic products, electronics and complete mechatronic systems; it designs the future of motion in close relationship with its customers and partners, operating in different sectors and markets.

It is present in Italy with six production sites divided between the provinces of Reggio Emilia and Bologna, and a new Innovation Center, which is the heart of all Research & Development activities.

It can also count on eight branches in four continents and a capillary sales network, which allows the company to be close to its main customers and markets around the world.

The company employs 1,500 people in Italy; over 2,500 in total worldwide.

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