

NEW

DPX-HS

Directional Valve specifically designed
for Mini and Midi-excavator applications

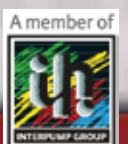
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**Higher controllability for
Mini-Midi excavators
through Walvoil technologies**



 **walvoil**
FLUID POWER E|MOTION



DPX-HS

Directional Valve specifically designed for Mini and Midi-excavator applications

The new DPX-HS is an hydraulic directional valve specifically designed by Walvoil for Mini and Midi-excavator applications. This type of machines is today typically controlled through two possible technologies:

- Load Sensing valves in combination with a Load Sensing pump provide a precise control, calibrated and independent speed for each function. Thanks to its ease of use it represents on one hand today's best technology for non professional operators and for the rental market. On the other side, machine reactivity and control smoothness can result defective, especially on specific and delicate functions like Slewing;
- Open Center valves in combination with 3 fixed pump system, represent a simpler and more cost effective solution, guaranteeing perfect force sensibility and fast control, but require on the other hand high operator skills.

The long experience and large presence of Walvoil and Hydrocontrol brands in this application field, with both traditional technologies, push towards a new evolution step, to further match the market requirements. The wide range of Walvoil products, a complete system approach allows a better interaction between components and a more proficient result on machine performance.

The new Walvoil DPX-HS innovative circuit combines Open Center and Load Sensing technology, in order to bring significant performance improvement and ease of use in a cost efficient and compact solution, in combination with a 2 pumps system (variable + fixed). DPX-HS valve, like all Walvoil products, is conceived, designed and produced in total compliance with the international standards.

DPX SERIES MAIN DATA		DPX050	DPX100	DPX160
Nominal flow rating	inlet port with compensator, stand-by 14 bar - 200 psi	80 l/min - 21 US gpm	120 l/min - 32 US gpm	230 l/min - 61 US gpm
	working ports, stand-by 14 bar - 200 psi	50 l/min - 13 US gpm	90 l/min - 24 US gpm	160 l/min - 42 US gpm
Max. pressure	P inlet port	300 bar - 4350 psi	300 bar - 4350 psi	300 bar - 4350 psi
	A and B working ports	350 bar - 5100 psi	300 bar - 4350 psi	300 bar - 4350 psi
Back pressure (max.) on outlet T port			up to 30 bar - 435 psi *	
		10 bar - 145 psi	10 bar - 145 psi	20 bar - 290 psi
Fluid temperature range	with FPM seals (VITON), standard	from -20°C to 100°C - from -4°F to 212°F		
Environmental temperature for working conditions		from -40°C to 60°C - from -40°F to 140°F *		

* depends on spool control type

How it works

The DPX-HS valve is a combination of Load Sensing-Flow Sharing sections (specifically for the Boom operation) and Open Center sections (specifically for Slewing and secondary functions).

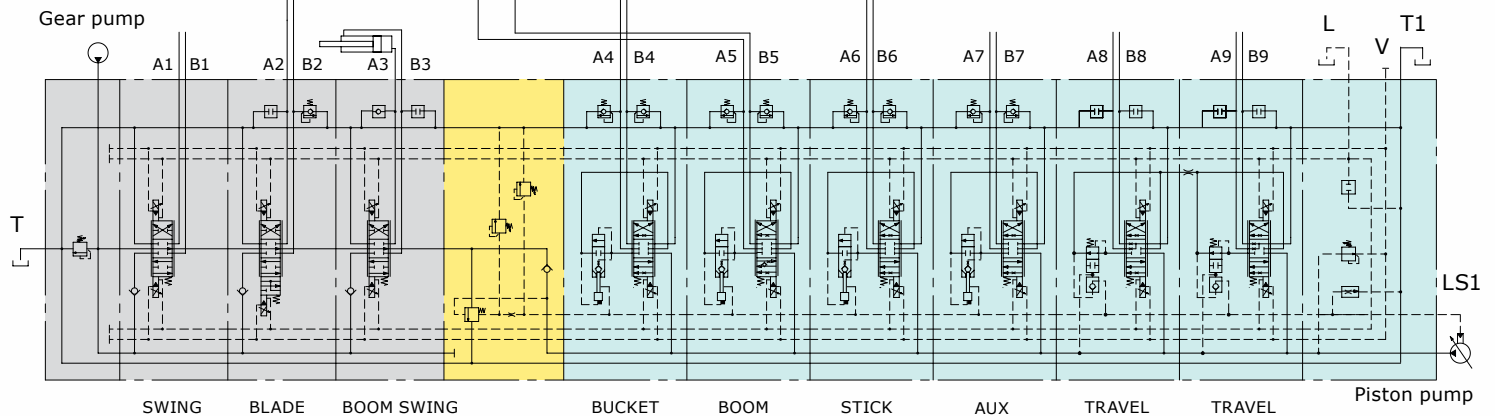
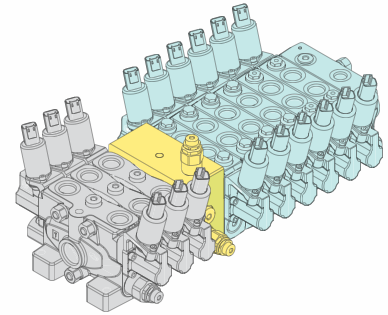
The simultaneous use of two technologies allows to draw the main advantages from both: Boom operations are simple, intuitive, totally independent from each other, while Slewing function is not even minimally affected by the simultaneous use of the Boom and keeps a completely independent control with Open Center typical smooth and soft start and brake. Additionally, on Mini-excavators, where up to 3 or 4 simultaneous operations are common, it is very easy to run into the problem of flow saturation. It happens every time that the operator is demanding more oil flow than the pump can deliver: the Flow Sharing helps to guarantee movement contemporaneity, but it results in a slowdown of actuators speed anyway.

The special DPX-HS circuit allows to autonomously share the fixed pump flow to boost the Boom operation whenever the variable pump cannot meet the flow demand. The addition of the fixed pump is very soft without the operator noticing it. The Slew function that typically needs the maximum controllability, keeps on having a priority on any other function. Additionally, the special device that allows the two pumps to sum, can be disabled by a dedicated relief valve that vents the fixed pump to tank. This system allows to define a pressure step that limits the power required for the engine. A better energetic use of the engine is hence possible.

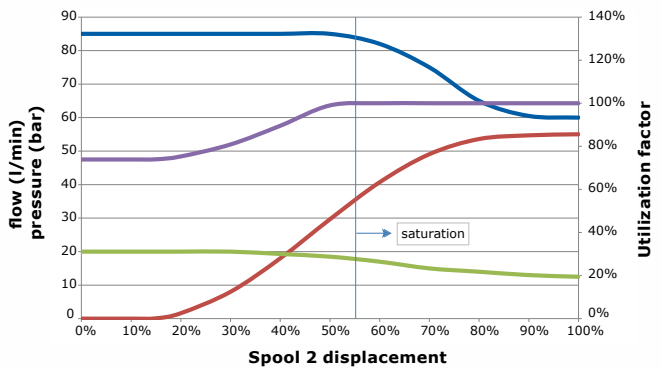
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DPX-HS (DPX100 configuration)

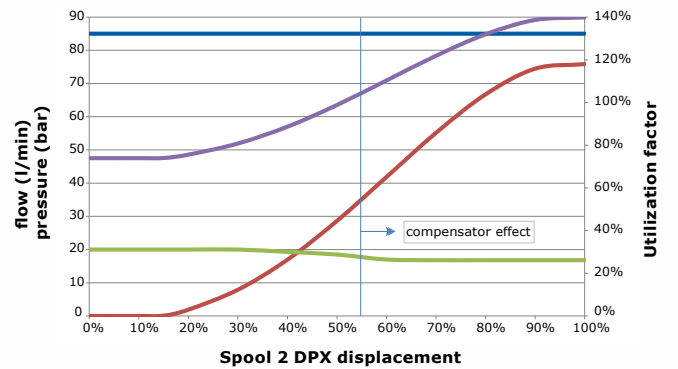


Features with standard L.S. system



— Spool 1 (flow) — Spool 2 (flow) — LS ΔP (pressure) — Variable displacement pump utilization factor

Features with DPX-HS system technology



— Spool 1 on DPX (flow) — Spool 2 on DPX (flow) — LS ΔP (pressure) — Variable displacement pump utilization factor

The importance of design and technology

The valve has stackable design: many different configurations can be realized by taking advantage of this innovative concept, to perfectly match the needs of each machine.

Any typical control is applicable to each section: from manual/lever actuation, to low pressure pilot actuation, to electrohydraulic actuation, always in very compact and reliable design.

Additional features like special Hydraulic Integrated Circuits can be easily installed in the complete valve.

All common excavator solutions like travel special control, regenerative arm, lowering control, low leak ports can be easily implemented on the valve.

Affordability, Sustainability and increased Productivity

The Open Center technology is commonly cheaper than the Load Sensing one: the choice to change some of the functions from Load Sensing to Open Center brings to a general cost efficiency that can result particularly interesting in some configurations.

Sizing and designing the machine: it is possible to downsize variable pump thanks to the contribution of fixed pump, reducing total cost as well.

The two pressure step system given by the dedicated relief valve allows a better match with engine characteristics, thus resulting in careful power and consumption management.

Machine productivity as well can get a positive boost by the DPX-HS circuit: the sum of two pumps results in fast and precise operations and in increased productivity.

Higher controllability and other advantages offered

The improved operability of the machine together with increased comfort and ergonomics are the main advantages of the new DPX-HS valve. Both professional and rental market operators can take the utmost advantage of this solution. The slewing smoothness and independent control can drastically reduce the operator's fatigue, by better managing acceleration and deceleration phases. Safety itself is hence increased.

Additional information

The system has been filed for patent (WO2017103100).

Different prototypes have been tested on hydraulic benches as well as on machines demonstrating the advantages of the combined technologies.

Different projects with major OEM will be started in the next months.

The system is available on:

- "50 size" suitable for 1-3 t Mini-excavator
- "100 size" suitable for 2-6 t Mini-excavator
- "160 size" suitable for 5-9 t Midi-excavator.

