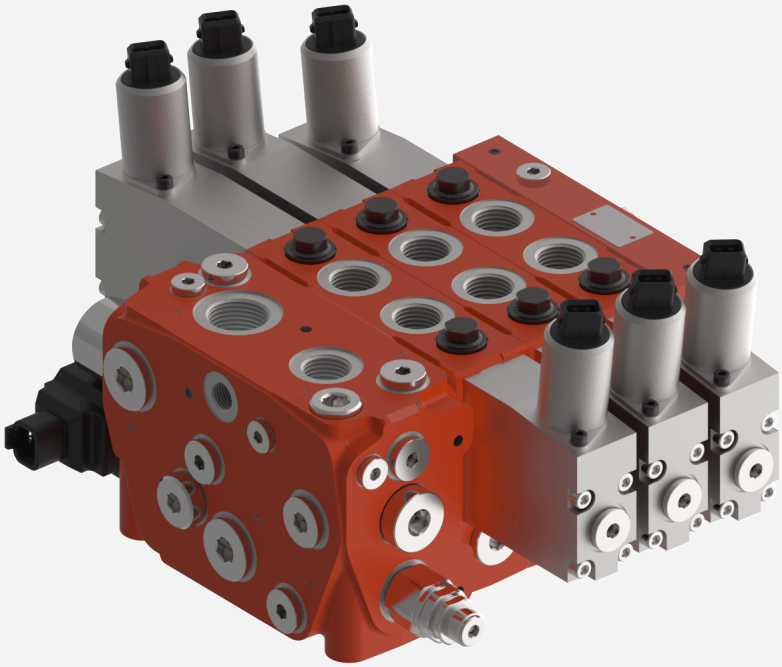
BUCHER hydraulics

Proportional Flow Sharing Valve

HDS14



Flexibility with superior control

- Versatile controls
- Custom valve configurations
- Advanced control features
- Compact & flexible design

General Information

The new HDS14 completes Bucher Hydraulics flow sharing control valve range.

The commitment of machine manufacturers, to comply with the global guidelines of energy saving and functional safety, has increased considerably in recent years, forcing the entire supply chain to a big effort in order to follow the technological innovation trend. In this context, the consolidated leadership and extensive know-how in telescopic loaders, material handling and earth moving applications, the deep experience in the field, the powerful capacity to develop innovative solutions and the strong commitment to anticipate the upcoming technical and application needs of our customers, have guided Bucher Hydraulics in the development of the new flow-sharing size 10 directional valve HDS14.

The flexible and versatile construction, with a wide range of inlet and outlet covers options as well as of controls, gives the designer a high degree of freedom in the choice of the valve configuration and of the hydraulic circuit, which fits in the best way the machine requirements.

Each valve section can be equipped with a load holding valve as well as flow sharing or priority pressure compensators, whose stability and smooth behaviour grant high levels of system controllability.

The wide range of controls, combined with innovative solutions and compact dimensions, makes HDS14 a powerful and flexible product able to fulfil all the requirements of modern compact machines.

The standard inlet cover is designed with a flexible core arrangement in order to create different circuits to satisfy the requirements of several applications.
Simpler and more cost effective customized castings are foreseen, to satisfy specific hydraulic circuits of OEM machines.

The similar internal core arrangement allows to easily combine HDS14 and HDS24 elements with simple or complex interfaces, in order to adapt the valve section to the flow requirement of the specific valve function.

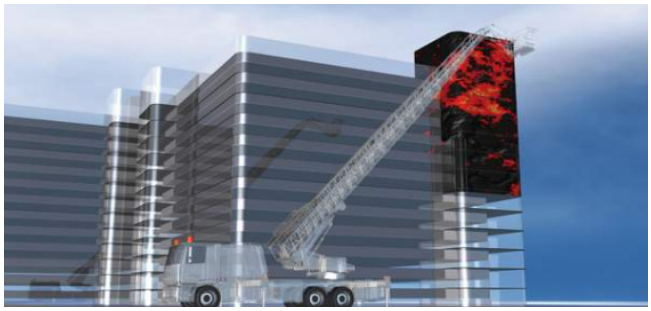
Areas of Application

Compact wheel loader
– Integration of safety devices according to Machinery Directive.
– Wide choice of controls from manual to EHO
– Floating function for every control type

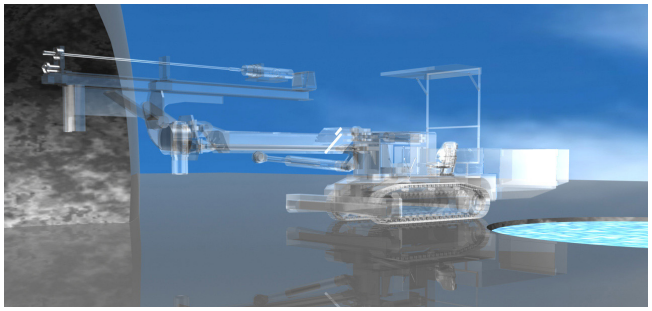
Compact telehandler
– Asymmetrical spools for millimetric movements with full load during lowering and lifting.

Agricultural attachment
– Easy switch between LS and fixed displacement tractor
– Customised spools from 3 up to 80 l/min

Aerial platform
– Priority function for one or more sections
– High stability during pump saturation



Mining machinery
– Robust design for every environment
– High precision of arm positioning



Boom mowers
– Combination of proportional and ON-OFF controls
– Floating function with low pilot pressure

Features and Advantages

Inlet cover

The flexible core design of the inlet cover permits to choose among a wide range of options, like:
- Standard inlet compensator for fixed displacement pump (13 bar margin pressure)
- LPU (Low Pressure Unloading) inlet compensator, for a reduced energy consumption during idling and stand-by periods of the machine working cylce
- LS/OC commuter plug, for easy commutation between LS and fixed displacement pump tractors
- 3-way inlet compensator for fixed dispalcement pump, suitable for HPCO hydraulic systems
- Dummy inlet compensator for LS-Pump
- P, P1, T, T1, LS, Pp and Tp ports guarantee for easy installation
- Clipper valve directly acting on P-line, for LS-Pump relief protection.
- Electric ON/OFF by-pass valve on LS signal

End cover

Depending on the working element controls, the following end plates are available:
- Basic end plate, for all type of controls (manual, ON/OFF, EHO, hydraulic), without ports, when there is an external source of reduced pressure
- End cover with P, T, LS ports, equipped with LS drain valve and PPRV pilot pressure generator, for all configurations with at least one EHO section, when an external source of pilot pressure is unavailable

Local compensator and load check valve

The working element can ben equipped with:
- Standard flow sharing compensator FS
- Load sensing priority compensator PR
- Dummy compensator, for section without compensation

The load check valve can be added or not, independently from the compensator type

Controls

HDS14 is available with a wide range of control types, like:
- Single manual lever with spring return to neutral position and different detent functions
- Mechanical cross lever joystick for simultaneous control of two sections
- Direct acting ON/OFF controls, with 30 W coils for low power consumption
- HP pure hydraulic control, when the existing low pressure hydraulic joystick architecture is the best option for the machine
- EHO electro-proportional actuation

Spools

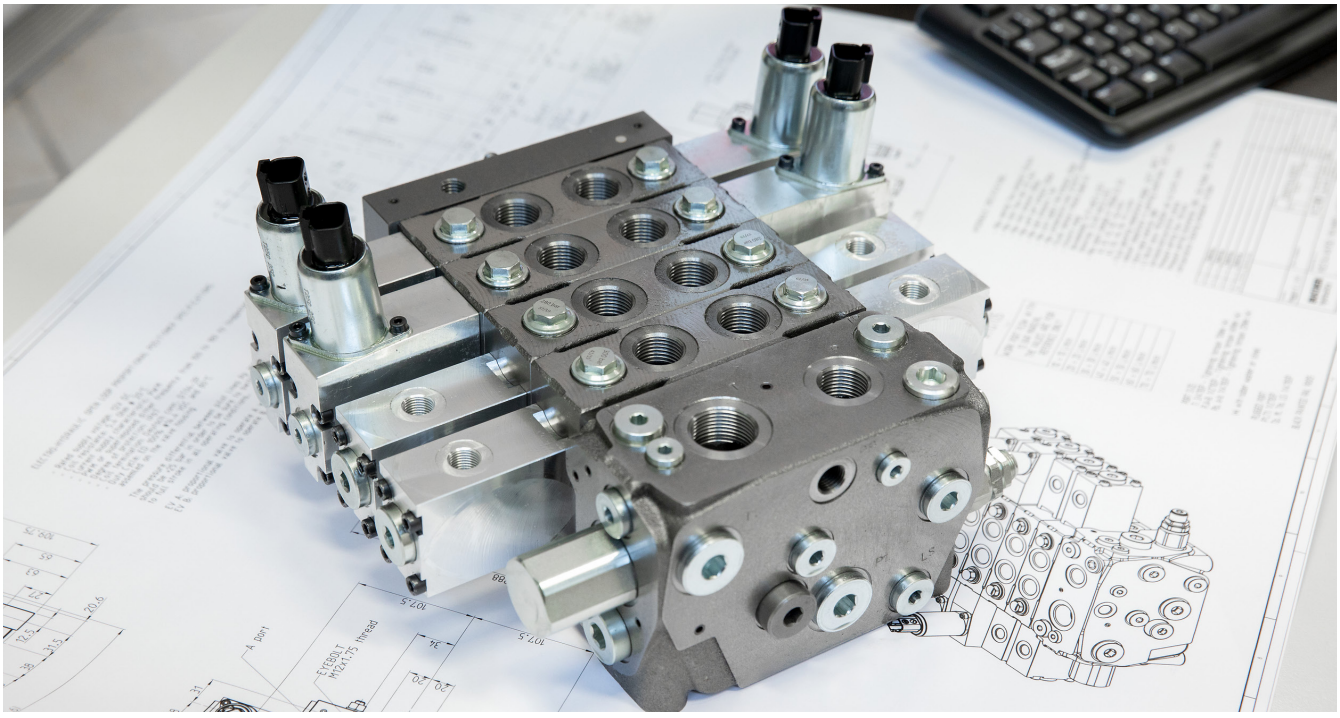
Wide range of available spools for:
- Basic manual actuation, suitable for EHO and HP controls as well
- Direct acting ON/OFF actuation, from 3 l/min up to 30 l/min
- EHO actuation, up to 80 l/min output on port, suitable for pure hydraulic control as well
- 4th floating function available for many flow rates (EHO and hydraulic controls)
- Special spools available on request, for asymmetric flow rates, with linear and parabolic output

Working section

Two main castings are available:
- 32 mm casting, for EHO and HP controls, with 3/8“ BSP Ports or equivalent
- 38 mm casting, for manual operated sections and ON/OFF sections
- PO - Pilot operated check valves, single or double acting, are available for direct mounting on A-B ports (38 mm casting only)

Straight travel

The tracked machines need a different kind of pressure compensation, when simultaneously actuated for straight forward movement on rough terrain. HDS14 offers this option with special machined casting and dedicated devices, which allows a much faster prototype phase: the orifice dimension ca be easily modified by changing an external plug, without need of dismantling the block

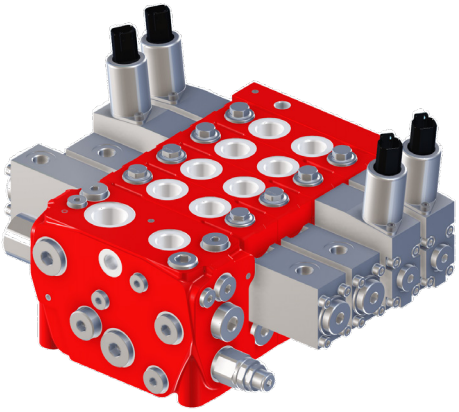


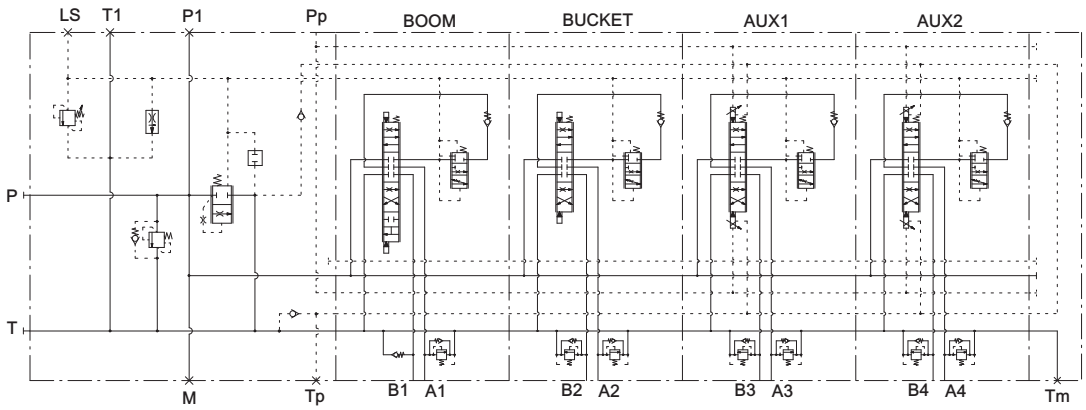
Technical Data

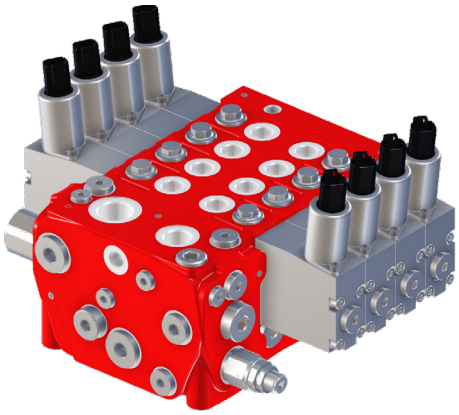
Features

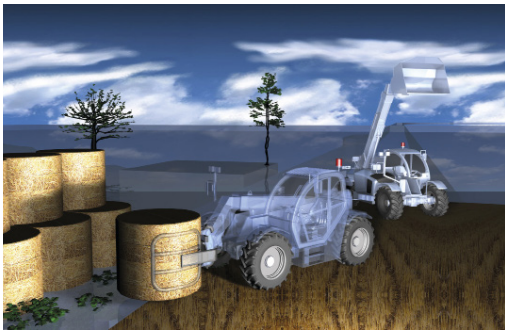
Max inlet flow	with fixed diplacement pump @ 13 bar stand-by	110	l/min
Nominal Work port flow		80	l/min
Max inlet pressure (P)		280	bar
Max work ports pressure (A/B)		320	bar
	With EHO special version static pressure	210	bar
	Standard	30	bar
Max back pressure (T)	With electro-hydraulic positioner (EHO)	5	bar
Max internal leakage A/B-> T (at 100 bar, 23 mm^2/s) :	Without port valves std	12	cm^3/min
	With port valves std	16	cm^3/min
Fluid	mineral oil based		
Fluid temperature (with NBR seals)	-20°C/ +80°C		
Max fluid contamination	recommended	from 15 to 75 mm^2/s	
Viscosity operating range	admissible	from 12 to 400 mm^2/s	
Max number of elements		12	
Ambient temperature	with mechanical/hydraulic/pneumatic devices	from -30 to +60 °C	
	with electric/hydraulic/electrohydraulic devices	from -30 to +50 °C	

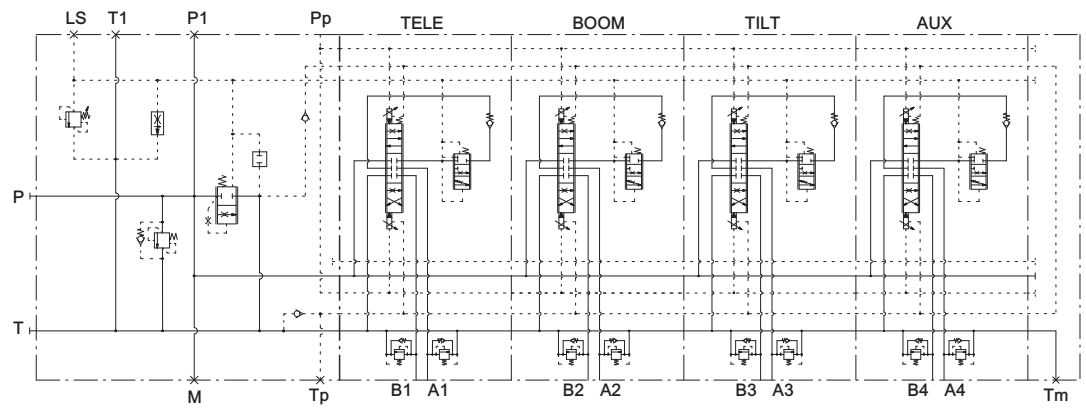
Hydraulic circuits combination examples





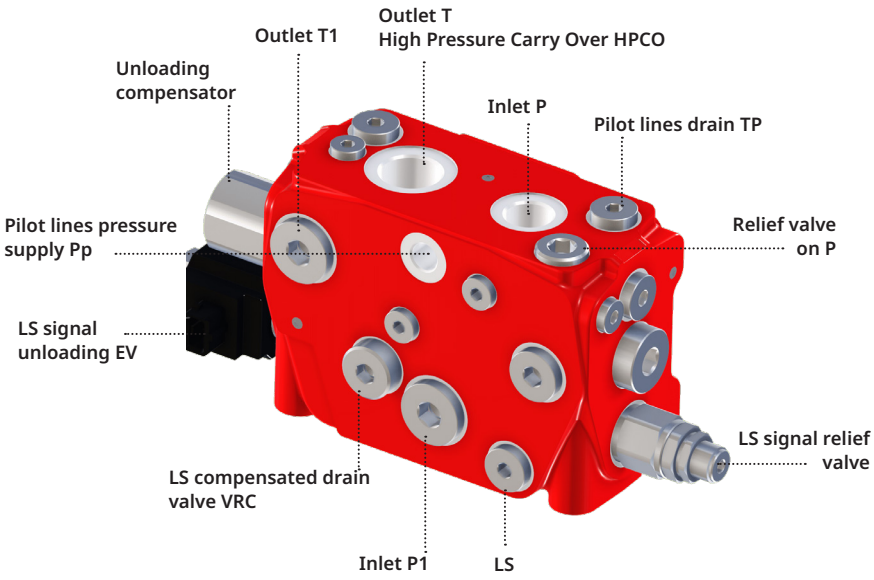






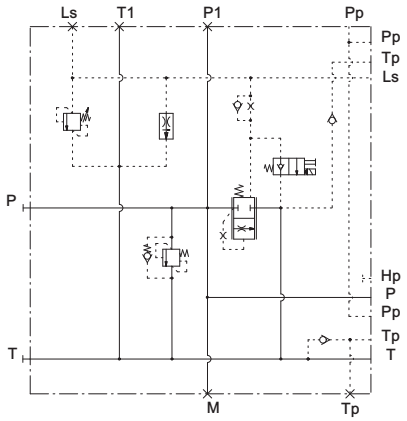
Dimensions and Characteristics

Standard inlet cover options

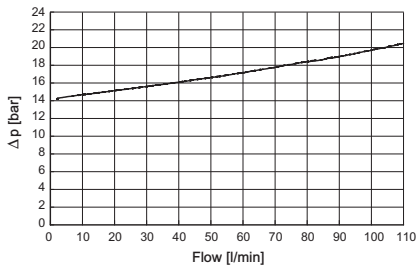


System with fixed displacement pump (FP) example

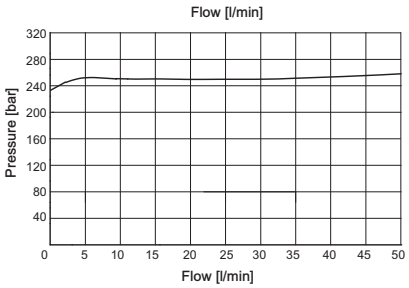
With LS relief valve + P relief valve + LS signal unloading valve + VS valve + VRC valve



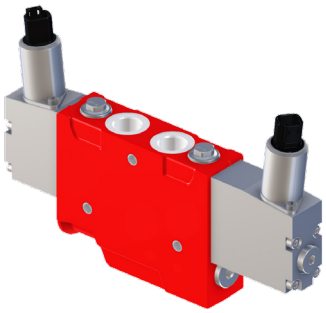
Unloading compensator P → T characteristic



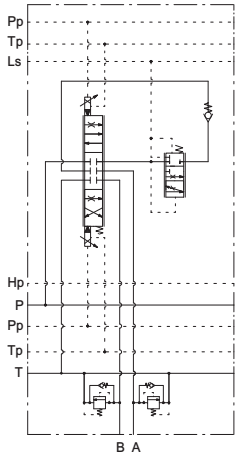
LS relief valve

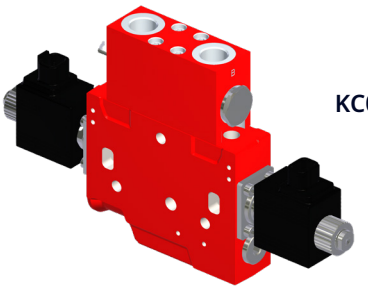


Working section arrangements

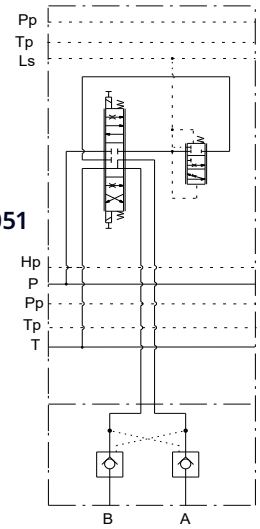


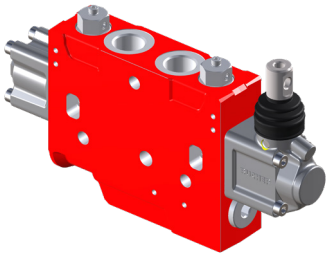
KLS



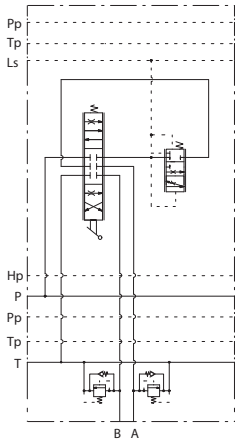


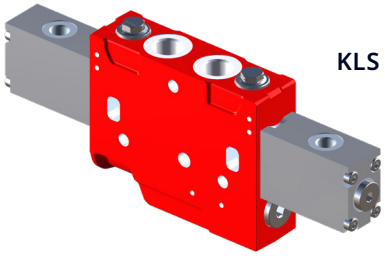
KC051





KCS





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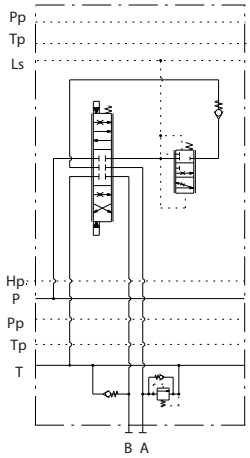
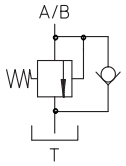
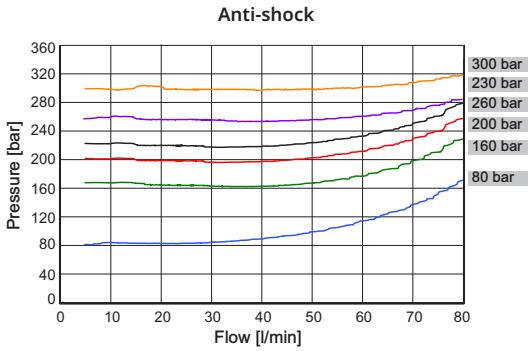
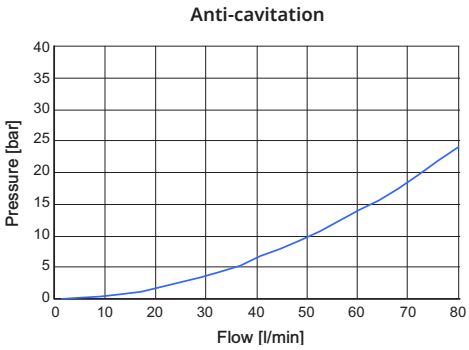


Anti-shock and anti-cavitation valve (UC)







Available spools for EHO/HP controls

Spool ref.	Nominal flow
A2020S	20 l/min
C3030S	30 l/min
A4040S	40 l/min
*AW5050S	50 l/min
C5050S	50 l/min
A6060S	60 l/min
*AW7050S	70/50 l/min
*AW7060S	70/60 l/min
*AW7070S	70 l/min
C7070S	70 l/min
*AW8080S	80 l/min

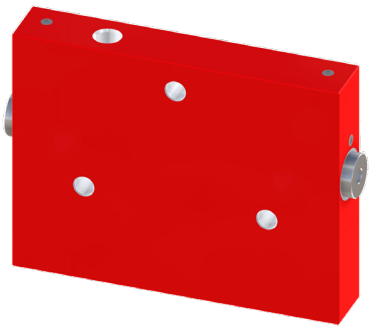
(*) AW spool is suitable for 4th floating position

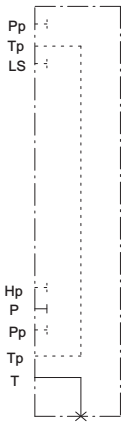
Available spools for manual control

Spool ref.	Nominal flow
A2020S	20 l/min
C2020S	20 l/min
C3030S	30 l/min
A4040S	40 l/min

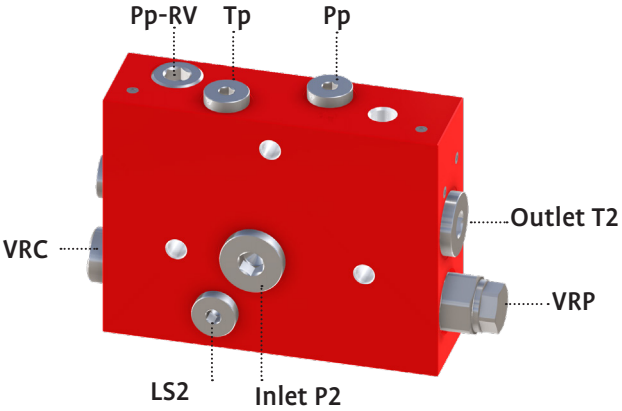
End cover arrangements

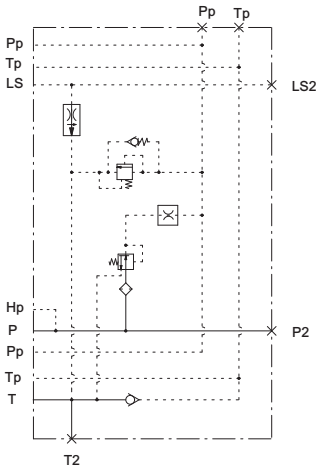
Basic end plate



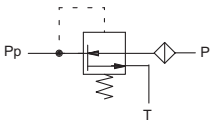


PH end cover



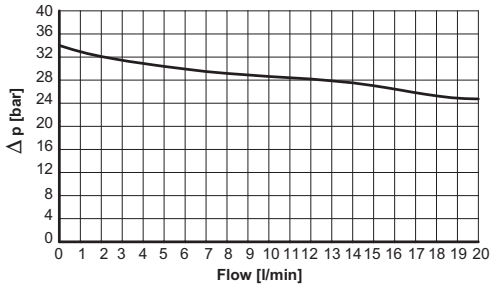


Pressure reducing valve (VRP)

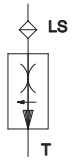


Type	Nominal pressure bar
VALV VRP08-T32-F	32

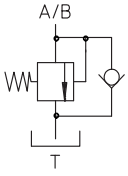
Pressure vs flow curve P → Pp (reducing)



LS signal flow compensated drain valve (VRC)

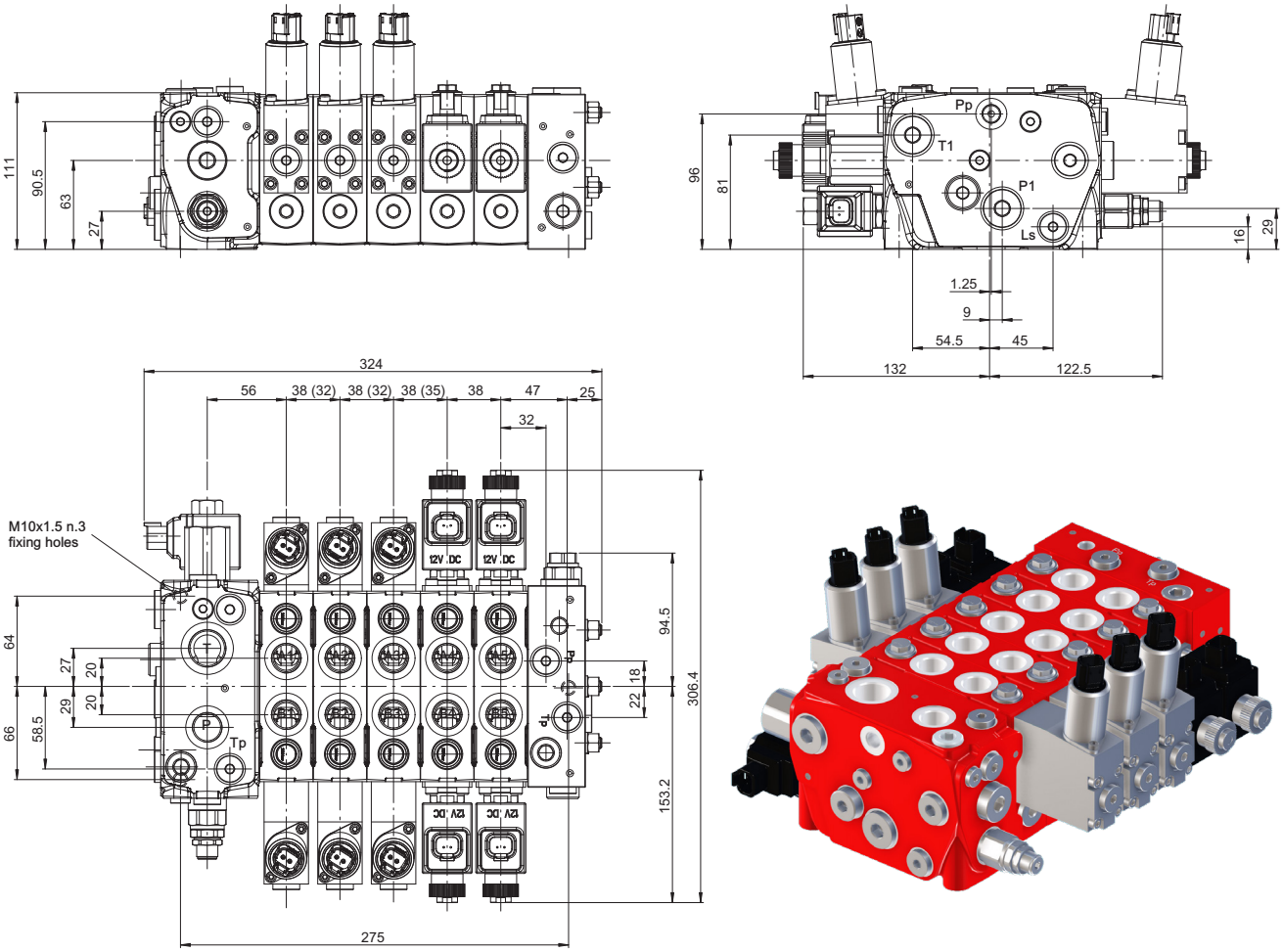


Type	Nominal flow l/min
VALV VRC D. 0,5	0,35

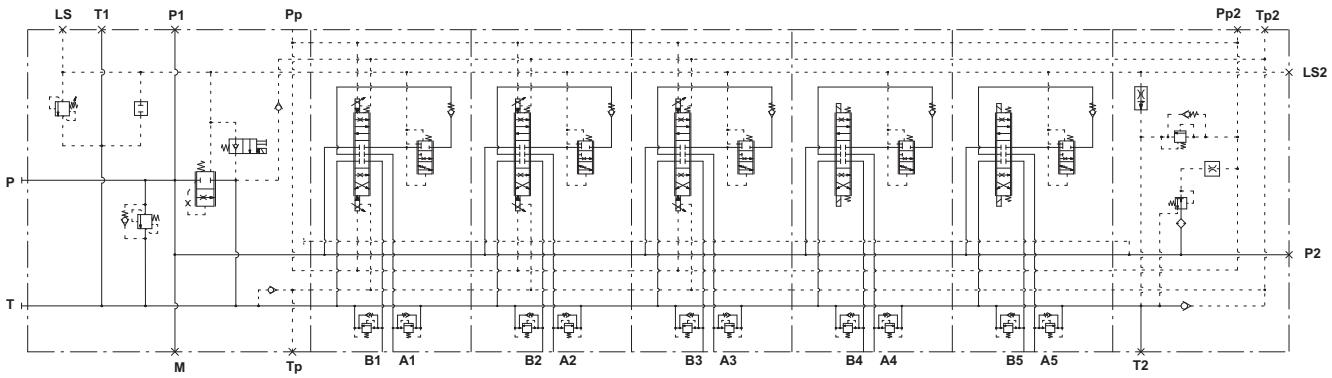


Type	Pressure setting at 10 l/min (bar)
VALV Pp-RV T.40	40

Dimensions



Hydraulic scheme



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