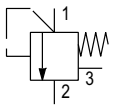
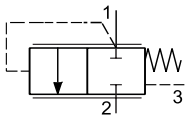
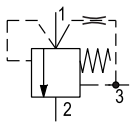
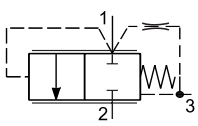
Application examples

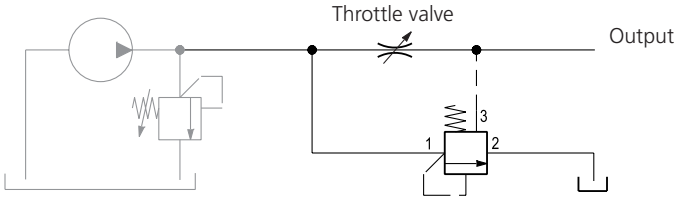
Introduction

The Application examples section offers examples of connecting Logic valves to the hydraulic circuit. Depending on the valve type and connection to the hydraulic circuit, the Logic valve can be used as a three-way normally closed, two-way normally open pressure compensator, a pilot-operated pressure relief valve, a pilot-operated pressure reducing valve or a pilot-operated directional control valves.

Logic valve SL2H-BP3/2I12* (normally closed NC)

Symbol	Equivalent symbol	Symbol	Equivalent symbol
SL2H-BP3/H2I12*		SL2H-BP3/H2I12*D5	
			

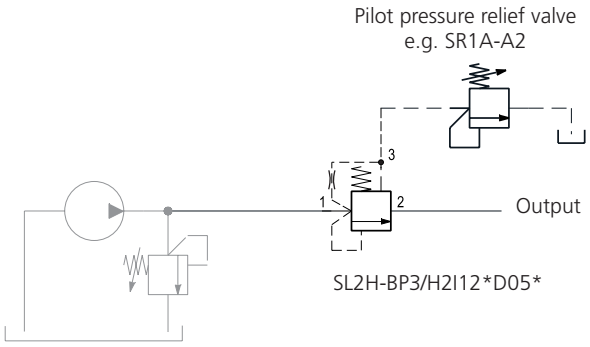
Pressure drop stabilization



SL2H-BP3/H2I12*

Logic valve stabilizes the pressure drop at the throttle valve, making the flow independent of load change on the actuator and of fluctuating pump pressure. The position of the compensator spool is controlled by the pressure difference to sense upstream and downstream of the throttle valve. The pressure drop is determined by the pressure of the spring on the face of the spool and is stabilized by overflow returning some of the incoming fluid back to the tank. In the baseline position the logic valve is closed. Flow rate, i.e. also speed of movement of the actuator's output element, can be controlled continuously by changing the flow cross-section of the flow throttle valve or by changing the pressure drop on the logic valve using an adjusting screw.
The logic valve is connected in parallel to the flow throttle valve, maintaining a constant pressure drop by dividing the pump flow. When the actuator stops, the valve opens, allowing full fluid flow from the pump to the tank with low pressure losses. This way it works as an unloading valve and protects the circuit against overload. Valves are also suitable for system pressure regulation pumps with constant geometrical volume to control flow depending on load (Load Sensing).

Pressure control

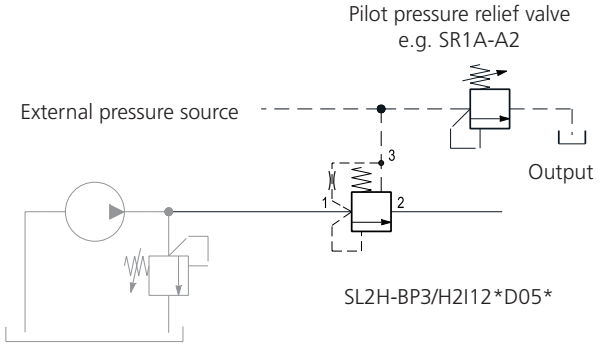


SL2H-BP3/H2I12*D05*

The valve is connected in the hydraulic circuit as the main stage of a pilot-operated pressure relief valve. Port 3 is connected to the pilot pressure relief valve that controls the pilot pressure. Pilot pressure is generated either internally by connecting ports 1 and 3, or it is generated by an external pressure source. It is advisable to mount the valve in a steel block due to material erosion downstream of port 2.

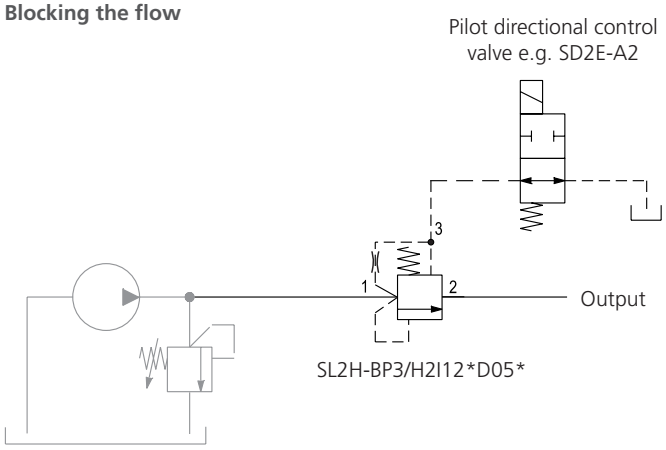
If the pilot pressure at port 3 exceeds the pressure setting on the pilot pressure relief valve, the pilot pressure relief valve opens and depressurizes the pilot channel. The pressure at port 1 overcomes the spring force and moves the spool of valve SL2H, opening the valve and allowing the fluid to flow from port 1 to port 2.

With this connection, valve SL2H behaves like a pilot-operated pressure relief valve. The system pressure at port 1 corresponds to the pressure setting on the pilot pressure relief valve.



SL2H-BP3/H2I12*D05*

Blocking the flow

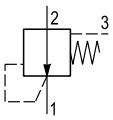
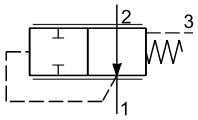
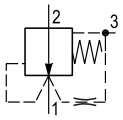
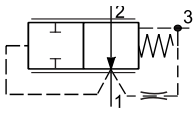


A pilot directional control valve is connected to port 3 of the load shuttle valve.

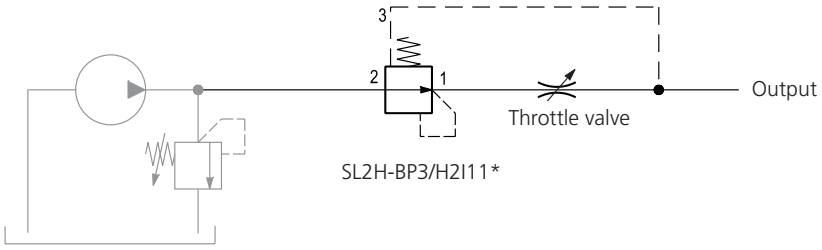
If the pilot directional control valve is in the closed position, the pressure at port 3 is identical with the pressure at port 1 and the spring of the load shuttle valve keeps the spool in the no-flow position. As soon as the pilot directional control valve is reset to the flow position, the pilot channel is depressurized.
The pressure at port 1 overcomes the spring force and moves the spool of load shuttle valve SL2H, opening the valve and allowing the fluid to flow from port 1 to port 2.

With this connection, load shuttle valve SL2H acts as a pilot-operated directional control valve but without protection of the hydraulic circuit against pressure overload.

Load shuttle valve SL2H-BP3/2I11* opened in baseline position

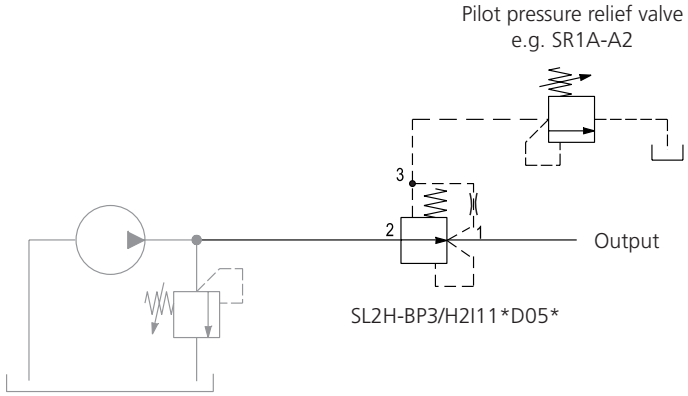
Symbol	Equivalent symbol	Symbol	Equivalent symbol
SL2H-BP3/H2I11*		SL2H-BP3/H2I11*D5	
			

Pressure drop stabilization



The load shuttle valve stabilizes the pressure drop at the flow regulator, making the volume flow independent of load change on the actuator and of fluctuating pump pressure. The position of the compensator spool is controlled by the pressure difference read upstream of the valve (1) and downstream of the valve (3). The pressure drop is determined by the pressure of the spring on the face of the spool and is stabilized by throttling the flow (2 → 1) by the spool. In the baseline position the load shuttle valve is opened. Flow rate, i.e. also speed of movement of the actuator's output element, can be controlled continuously by changing the flow cross-section of the flow regulator or by changing the pressure drop on the load shuttle valve using an adjusting screw. The load shuttle valve is connected between the pump and the flow regulator (input connection), if the load force acts positively, i.e. against the movement of the actuator's output element.

Pressure control



The load shuttle valve is connected in the hydraulic circuit as the main stage of a pilot-operated pressure reducing valve. Port 3 is connected to the pilot pressure relief valve that controls the pilot pressure. Pilot pressure is generated internally by connecting ports 1 and 3.

If the pilot pressure at port 3 exceeds the pressure setting on the pilot pressure relief valve, the pilot pressure relief valve opens and depressurizes the pilot channel. The pressure at port 1 overcomes the spring force and moves the spool of load shuttle valve SL2H, closing the valve and reducing the pressure at port 1.

With this connection, load shuttle valve SL2H behaves like a pilot-operated pressure reducing valve. The reduced pressure at port 1 corresponds to the pressure setting on the pilot pressure relief valve.