



Inch valves are used in hydrostatic propel systems of mobile machines as an override control of variable pump. In such systems, in which variable pump with speed-dependent control are usually used, inch valve serves for braking or quick stop and for slow smooth take-off of the machine when the pump main control is not in function.

IV 08-2 is two-way mechanically operated,

IV 08-2H is two-way hydraulically operated,

IV 08-3 is three-way mechanically operated.

Two-way inch valves are applicable in systems with variable pump in which the inching function represents controlled (throttled) connection of pump control pressure with tank. Two-way valves are used e.g. in systems with older versions of Linde HPV-02 pumps, with Sauer pumps of SPV series.

Three-way valves are applicable in system with variable pump in which the inching function represents controlled step-less equalizing of pressures in both spaces of pump servo-cylinder. Three-way inch valves are used e.g. in systems with new versions of Linde HPV-02 pumps (HPV-02 CA) and with Sauer Danfoss pumps of 90 series.

## Description and function

### Two-way inch valve IV 08-2

Consists of housing with ports P and T, spool, operating rod, spring and sealing. In the spool there are two triangular grooves with progressively enlarging cross section.

Port P is connected with control pressure output of variable pump. When the operating rod connected with the spool is in basic position, connection between ports P and T is closed. When the operating rod is pushed inside the housing against the spring, ports P and T gradually connect over the spool grooves. As the rod moves inside, cross section of the grooves increases, throttled flow from P to T increases, control pressure in P decreases and thus also pump displacement decreases. When the operating rod and spool move back, the grooves cross section decreases, flow from P to T decreases too and control pressure in P increases.

**Two-way inch valve IV 08-2H**

consists of housing with ports P and T, control hydraulic cylinder with port X, spool, piston, spring and sealing. The basic function of IV 08-2H is similar to the IV 08-2. The difference is that the spool is moved by means of the piston with the auxiliary pressure entering port X, e.g. with pressure from a brake pedal.

**Three-way valve IV 08-3**

Consists of housing with ports P1, P2 and T, spool, operating rod, spring and sealing. The spool in this valve is longer, behind the grooves there is a cylindrical collar for separating the grooves space from port T.

Port P1 and P2 are connected with the servo-cylinder of variable pump in such way that P1 is connected with one side and P2 with the second side of the cylinder. When the pump swash plate is not in zero position – pump displacement is  $> 0$ , control pressure is either in P1 or in P2. When the operating rod is in basic position, connection between P1 and P2 is closed. When the rod moves inside the housing against the spring, cross section of the spool grooves increases, connection between P1 and P2 gradually opens, pressure difference between P1 and P2 decreases and pump displacement gradually changes to zero. When the spool is pushed back by the spring, grooves cross section decreases and the pressure difference between P1 and P2 increases, as well as the pump displacement. Port T serves for discharging leakage to tank.

**Technical data**

Nominal size			8 mm
Pressure	- nominal	$p_n$	20 bar
	- maximum	$p_{max}$	30 bar
Flow	- nominal	$Q_n$	6 dm <sup>3</sup> min <sup>-1</sup>
	- maximum	$Q_{max}$	25 dm <sup>3</sup> min <sup>-1</sup>
Operating rod stroke	- working		17 mm
	- idle (to the start of operation)		5 mm
	- maximum		25 mm
Fluid			mineral hydraulic oils
Viscosity	- recommended range		(20 to 65) · 10 <sup>-6</sup> m <sup>2</sup> s <sup>-1</sup>
	- minimum		8 · 10 <sup>-6</sup> m <sup>2</sup> s <sup>-1</sup>
	- maximum		250 · 10 <sup>-6</sup> m <sup>2</sup> s <sup>-1</sup>
Weight			2 kg