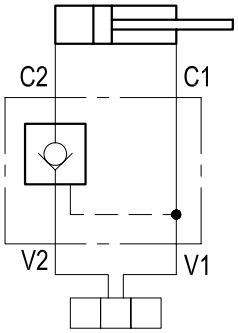
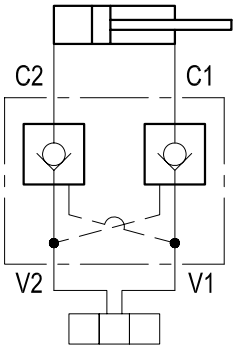
PILOT OPERATED CHECK VALVES

They are non-modulating valves which allow free flow through the check valve into the actuator (V2 to C2) and then block the reverse flow until they feel a pilot pressure directly proportional to the load in the pilot line, so that the pilot piston can push the check poppet off its seat. They can lock loads in a leak free mode and they are well suited for many clamping applications or to prevent a negative load from falling down in case of hose failure. They should be fitted as close as possible to the actuator, either flange mounted or connected through metallic pipe.
Their ON/OFF operation makes them suitable for holding applications, but unsuitable to control the motion of overrunning loads that would cause a loss of pilot pressure: without pilot pressure the check valve closes and does not open until adequate pilot pressure is restored again, generating hunting motion.
Pilot operated check valves should never be used with paired cylinders: pilot pressure would open first the valve with less load, transferring the complete load to the other valve, with substantial pressure increase and possible cylinder failure.





Pilot operated check valve modules are available in SINGLE ACTING and DOUBLE ACTING version: in both cases, one of their basic parameters is the

Pilot Ratio “R”, defined as Pilot piston area / Check valve seat area.

When a pilot operated check controls the cylinder annular chamber it must always have a Pilot Ratio “R” significantly higher than the cylinder internal ratio “φ”, where “φ” = Cylinder full bore area / Cylinder annular area. In this case, the pilot pressure, intensified by the cylinder ratio “φ”, is additive to the annular side load pressure and the opening of the check valve requires considerable higher force.