Four Concepts of Load Control <mark>sun</mark> hydraulics

Machine: Industrial | Actuator: Cylinder | Function: Counterbalance, Load, Load Holding

Prepared for :

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Related Products

Cartridges

CBCA - 3:1 pilot ratio, standard capacity counterbalance valve

CWCA - 3:1 pilot ratio, vented counterbalance valve

CACA - 3:1 pilot ratio, vented counterbalance valve - atmospherically referenced

MWEM - Vented, balanced, load control valve

Summary



There are four basic principles to control a motor/cylinder:

- 1. Flow Q on the meter in side and pressure p on meter out
- 2. Pressure on the meter in side and flow Q on meter out
- 3. Pressure p the meter in side and pressure p on meter out
- 4. Flow Q on the meter in side and flow Q on meter out

Products

- Load-sensitive counterbalance: <u>CB**</u>, <u>CW**</u>, <u>CA**</u>
- Load-insensitive counterbalance: <u>MW*M</u>

Benefits of this circuit arrangement

- Circuit 1 describes the most common application of a standard (load sensitive) counterbalance valve: It can be seen as a relief valve with an adjustable setting depending on the pressure on the meter in side (port 3). The circuit describes an inexpensive load control that includes a relief function.
- Circuit 2 uses a non-load reactive (balanced) counterbalance like MW*M or MB*M. These circuits tend to be more stable because the counterbalance valve sees a constant pilot pressure. The circuit is more expensive because it requires an additional pressure control valve and offers no relief function.
- Circuit 3 is a typical application of a counterbalance valve to control torque in a motor. It has all the advantages of circuit 1.
- Circuit 4 demontrates both meter-in and meter-out. In practice, a precise meter-in & meter-out flow control is difficult because the pressure level can be very high or lead to cavitation at a low level.