

LINE MOUNTING COUNTERBALANCE VALVES

Oilcomp Ltd. manufactures a wide range of counterbalance valves, cartridge, for in-line mounting or flanged directly to the actuator, with flow rates up to 380 l / min. and maximum working pressures of 350 bar.

The counterbalance valve generally are used to allow the static and dynamic control of an hydraulic actuator, that can be controlled on one or both branches of power supply, depending on whether the valve choice is single or double acting.

These functions are made possible;

-) For the static condition ,therefore without providing energy to the system in question, by the secure stopping of the return flow and consequently of the actuator.

-) For the dynamic condition by the pilot pressure required for the descent of the load, which consequently does not escape to the action of the operator. In fact, the cavitation that is potentially generated by the load tends to reduce the pilot pressure with the effect of closing the valve and then to slow the load descent.

In order to ensure the valve closing in any condition, in addition to holding in static condition, the pressure setting of the valve must be at least equal to 30% more than the maximum pressure generated by the maximum load allowed by the system, ie $P_t \Rightarrow 1.3 \times P_{max}$.

In addition, great importance has the choice of pilot ratio to allow better operation under dynamic conditions. The resulting pressure of pilotage, is expressed by the following formula:

$$P_{pil} = \frac{P_t - P_c}{R_p} \quad (Bar.)$$

P_{pil} : Pilot pressure.

P_c : Pressure made by load.

P_t : Counterbalance valve pressure setting.

R_p : Pilot ratio.

Generally it follows that low pilot ratio provides better dynamic control of load and greater stability in hydraulic system, while a high pilot ratio ensures greater efficiency at the expense of potentially loosing of stability.

The closed center setup, suffix "CH", allows to minimize the effect of back pressure possibly present in the system, which is normally added to the set pressure of the valve changing it from real.

Attention: when using closed center spool valve in the system, a counterbalance valves with the suffix "CH" in the order code must be selected. Otherwise, the system with spool valve in neutral position keep pressurized lines A and B, and consequently piloted and open the valves.

Caution: refer to the operation and maintenance manual of the machine where the valves are installed before performing any maintenance or calibration. Always make sure you have secured and locked mechanically load before performing any maintenance or adjustment on counterbalance valves.

Always perform adjustments or maintenance on the valves in machine stopped and hydraulic system stopped with no residual energy, and be sure to act in the system in conditions of maximum security, to avoid possible hazardous conditions.

Warning: Counterbalance valves are not pressure relief valves or energy saving devices. Instability phenomena may occur when system operating pressure goes below 50 bars.

DUAL COUNTERBALANCE VALVES

Oilcomp LTD produces a wide range of counterbalance valves flangeable on hydraulic motors. The double balancing valves are used to control the load in both directions of rotation of the motor, and are made by double counterbalance valves plus a shuttle valve which has the function of allowing the opening and closing of the hydraulic safety brake.

In order to ensure the valve closing in any condition, in addition to holding in static condition, the pressure setting of the valve must be at least equal to 30% more than the maximum pressure generated by the maximum load allowed by the system, ie $P_t \Rightarrow 1.3 \times P_{max}$.

The pilot pressure is to be determined by the following formula:

$$P_{pil} = \frac{P_t - P_c}{R_p + 1} \quad (\text{Bar.})$$

P_{pil} : Pilot Pressure
 P_c : Load Pressure

P_t : Valve pressure setting
 R_p : Pilot ratio

Several pilot ratio are available, in general from 3:1 up to 10:1; see specific valve data sheet for options available.

Generally it follows that low pilot ratio provides better dynamic control of load and greater stability in hydraulic system, while a high pilot ratio ensures greater energy efficiency at the expense of potentially losing stability, therefore the pilot ratio choice represents the best possible compromise between these components.

In any case, the pilot pressure with a maximum allowable load applied must be equal to or exceeds the opening pressure of the brake. When this condition is not met, it is necessary to increase the pressure setting of the valve, if this is compatible with the performance allowed by the valve itself, or change the pilot ratio.

In order to protect the actuator from maximum pressure peaks to which it may be subjected, other configurations are possible which include a dual relief valve together with double counterbalance valves and shuttle for brake release.

In this way it is possible to limit the maximum pressure which the actuator is subjected during both cases of overrun or deceleration. For proper operation of this additional element always make sure that the emergency brake is opened simultaneously at the beginning of the movement and who is involved in closing only after the arrest of the moving elements controlled by the valve in question.

Caution: The hydraulic pressure that remains in the pipes of the system can keep accidentally open the safety brake. Therefore always check that there is no back pressure on the lines coming from and going to the counterbalance valve, and use distributors in configuration to the open center, with lines A and B connected to the Tank line in the neutral position.

Caution: refer to the operation and maintenance manual of the machine where the valves are installed before performing any maintenance or calibration. Always make sure you have secured and locked mechanically load before performing any maintenance or adjustment on counterbalance valves.

Always perform adjustments or maintenance on the valves in machine stopped and hydraulic system stopped with no residual energy, and be sure to act in the system in conditions of maximum security, to avoid possible hazardous conditions.

SINGLE COUNTERBALANCE VALVES FOR WINCHES

Oilcomp LTD produces a wide range of counterbalance valves flangeable on hydraulic motors. The counterbalance valves for applications on winches are composed from a counterbalance valve plus a shuttle valve which has the function of allowing the opening and closing of the hydraulic safety brake.

In order to ensure the valve closing in any condition, in addition to holding in static condition, the pressure setting of the valve must be at least equal to 30% more than the maximum pressure generated by the maximum load allowed by the system, ie $P_t \Rightarrow 1.3 \times P_{max}$.

The pilot pressure is to be determined by the following formula:

$$P_{pil} = \frac{P_t - P_c}{R_p + 1} \text{ (Bar.)}$$

P_{pil} : Pilot Pressure
 P_c : Load Pressure

P_t : Valve pressure setting
 R_p : Pilot ratio

Several pilot ratio are available, in general from 3:1 up to 10:1; see specific valve data sheet for options available.

Generally it follows that low pilot ratio provides better dynamic control of load and greater stability in hydraulic system, while a high pilot ratio ensures greater energy efficiency at the expense of potentially loosing of stability, therefore the pilot ratio choice represents the best possible compromise between these components.

In any case, the pilot pressure with a maximum allowable load applied must be equal to or exceeds the opening pressure of the brake. When this condition is not met, it is necessary to increase the pressure setting of the valve, if this is compatible with the performance allowed by the valve itself, or change the pilot ratio.

Caution: The hydraulic pressure that remains in the pipes of the system can keep accidentally open the safety brake. Therefore always check that there is no back pressure on the lines coming from and going to the counterbalance valve, and use distributors in configuration to the open center, with lines A and B connected to the Tank line in the neutral position.

Caution: refer to the operation and maintenance manual of the machine where the valves are installed before performing any maintenance or calibration. Always make sure you have secured and locked mechanically load before performing any maintenance or adjustment on counterbalance valves.

Always perform adjustments or maintenance on the valves in machine stopped and hydraulic system stopped with no residual energy, and be sure to act in the system in conditions of maximum security, to avoid possible hazardous conditions.