

Vickers®

Pressure Relief



Sequence, Unloading, Back Pressure, Counterbalance, and Reducing Valves

“R”, “UR”, and “X” 03/06/10/12 Series

Pressures to 210 bar (3000 psi) – Flows to 284 l/min (75 USgpm)



VICKERS

Released 7/94

686

Series R(C)*-03/06/10/12 Sequence, Unloading, Back Pressure, and Counterbalance Valves

Ratings

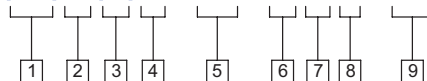
Rated Pressure (Maximum)*	210 bar (3000 psi)
Rated Capacity (Maximum)**	
R*-03	45 l/min (12 USgpm)
R*-06	114 l/min (30 USgpm)
R*-10 and R*-12	284 l/min (75 USgpm)

* 140 bar (2000 psi) permitted on the full piston area at the bottom cover ("P" connection), and at the top cover (spring chamber). See tank drain information on page 4.

**Rated capacities are based on using fluid with a specific gravity of 0.865 and a viscosity of 20 cSt (100 SUS).

Model Code

(F3)R(C)S - 06 - B P 1 - 30



1 Special seals

F3 – For mineral oil and fire resistant fluids. Mounting face seals of RCG model are standard Buna-N unless specified as F3.
Blank – Omit for standard, R(C)S, and R(C)T models.

2 Valve type

R – Pressure control valve

3 Integral check valve

C – Reverse free flow check

4 Connections

G – Manifold or subplate mounting
S – SAE straight thread
T – NPTF thread*

*Not recommended

5 Valve size

03 – 3/8" pipe or 0.7500-16 UNF-2B straight thread (0.500 tubing)
06 – 3/4" pipe or 1.0625-12 UN-2B straight thread (0.750 tubing)
10 – 1 1/4" pipe or 1.6250-12 UN-2B straight thread (1.250 tubing)
12 – 1 1/2" pipe or 1.8750-12 UN-2B straight thread (1.500 tubing) (not available in R(C)G models)

6 Pressure range

X – 0,7 to 2,1 bar (10 to 30 psi)
Y – 2,1 to 4,1 bar (30 to 60 psi)
Z – 4,1 to 8,5 bar (60 to 125 psi)
A – 5,2 to 17,2 bar (80 to 250 psi)
B – 8,5 to 35 bar (125 to 500 psi)
D – 17,2 to 70 bar (250 to 1000 psi)
F – 35 to 140 bar (475 to 2000 psi)

7 Remote control connection

P – Auxiliary remote pressure control connection (not available with X, Y, or Z pressure ranges or in R(C)G-03 models)
Blank – Omit if not required

8 Valve application type

1 – Internal drain directly operated
2 – External drain directly operated
3 – External drain remotely operated
4 – Internal drain remotely operated

9 Design number

Subject to change. Installation dimensions same for designs 30 through 39.

Series R(C)*-03/06/10/12 Sequence, Unloading, Back Pressure, and Counterbalance Valves

General Data

Vickers "hydrocushion" type pressure control valves are used to control the sequencing, unloading, back pressure, and counterbalancing of oil flow in hydraulic systems. Control is initiated by a pressure rise which can be sensed either internally (directly) or remotely. Models are available with or without integral reverse free flow checks.

Pressure Adjustment

Pressure ranges – (see model code page 3) are maximum controllable, and each model selected should be well within the range given to afford fine increments of adjustment. Pressure setting must be at least 17 bar (250 psi) lower than the system relief valve setting.

Pressure can be adjusted by loosening a jam nut and turning an adjustment screw. Turning clockwise increases pressure, and turning counterclockwise decreases pressure.

Installation Data

Mounting

Because all R(C)T and R(C)S models have optional pressure inlets connected by a through passage, the valves may be mounted "in-line". The valves may also be teed to a line by using either one of the pressure inlets and plugging the other.

The remote pressure control connection on type 3 and 4 valves must be connected to an external pilot pressure source sufficient to operate the valve at the desired pressure setting and flow conditions.

Tank Drain

The discharge outlet of valve types 1 and 4 must be piped to tank at atmospheric pressure. The drain connection on types 2 and 3 must be piped directly to tank at atmospheric pressure. Any pressure at the drain port must be added to the pressure setting of the valve.

Auxiliary Remote Pressure Control "P"

All models (except R(C)G -03 and those with an "X", "Y", or "Z" pressure adjustment range in their model code) are available with an auxiliary remote control connection. Required pressure at the auxiliary connection is $\frac{1}{16}$ of the normally required control pressure for the "F" pressure range and $\frac{1}{8}$ of the normally required control pressure for the "A", "B", and "D" pressure ranges. (This applies to -22 design and up.)

Brake Valve

A brake valve is used in the exhaust line of a hydraulic motor to: 1) prevent overspeeding when an overrunning load is applied to the motor shaft; and 2) prevent excessive pressure buildup when decelerating or stopping a load.

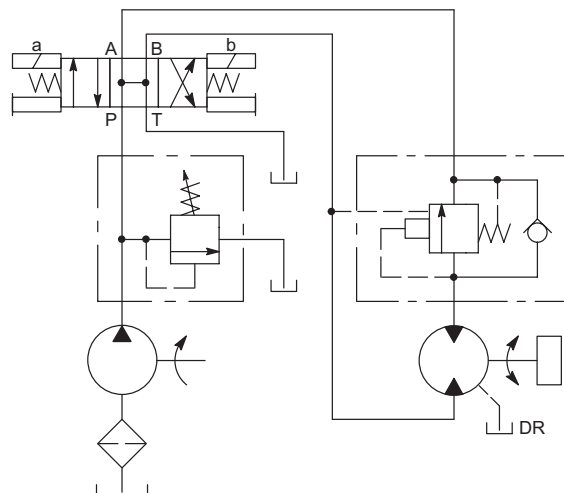
When the "RC" valve is used as a brake valve, it has a solid spool (no drain hole through the center), and there is a remote operating pressure connection in the bottom cover directly under the spool. This connection is teed into the supply line to the motor. The internal control connection is also used under the small piston and senses pressure from the primary port of the "RC" valve, which is connected to the motor exhaust port.

When the load is being accelerated, pressure is maximum at the motor inlet and under the large area of the brake valve spool, holding it in the full open position and permitting free flow from the exhaust port of the motor.

When the motor gets up to speed, load pressure still holds the brake valve open unless the load tries to run away. If this happens, the pressure falls off at the motor inlet and in the remote control pressure passage. The spring force tends to close the valve, thus increasing the back pressure on the motor, tending to brake it.

When the directional valve is shifted to neutral, inertia may cause the motor to continue rotating against the brake valve. Until the motor stops turning, it will operate as a pump, drawing fluid from the motor outlet through the directional valve and circulating it back to the motor inlet. Motor leakage oil will be made up by drawing oil into the loop through the tank port of the valve. At this time, pressure at the motor outlet tending to bring it to a stop will be whatever is required under the small piston to overcome the brake valve setting.

Typical Application: Brake Valve



Series R(C)*-03/06/10/12 Sequence, Unloading, Back Pressure, and Counterbalance Valves

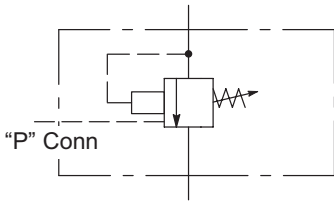
Graphical Symbols

Type P Back Pressure and Counterbalance Valves

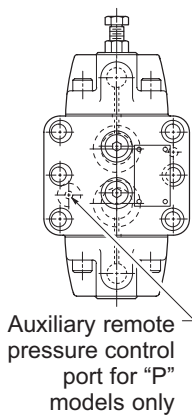
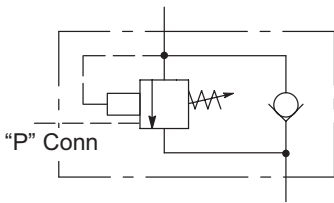
Auxiliary remote control operated with "P" connection – Internal drain (model "*P1" shown)

R(C)G Valves

Back Pressure (RG)

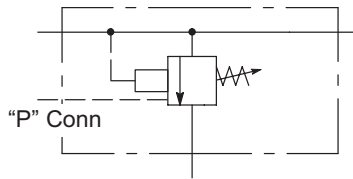


Counterbalance (RCG)

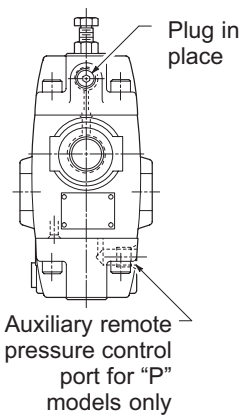
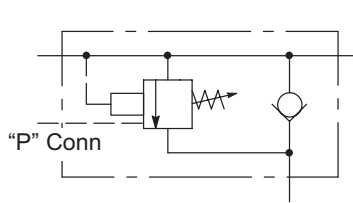


R(C)S/T Valves

Back Pressure (RS/T)



Counterbalance (RCS/T)

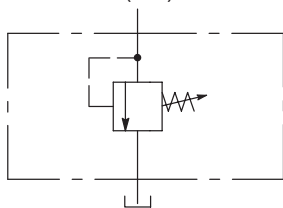


Type 1 Back Pressure and Counterbalance Valves

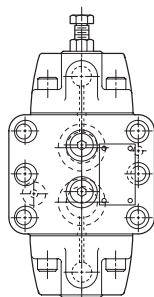
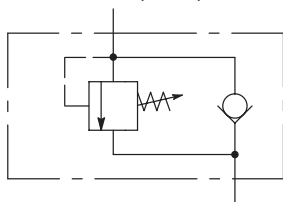
Internally operated – Internal drain

R(C)G Valves

Back Pressure (RG)

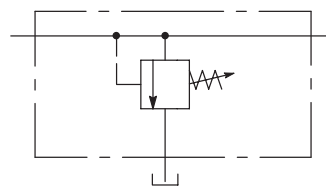


Counterbalance (RCG)

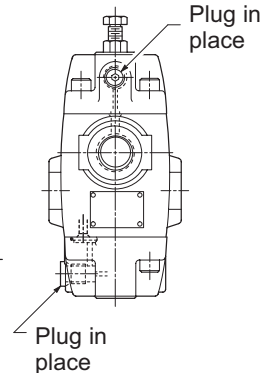
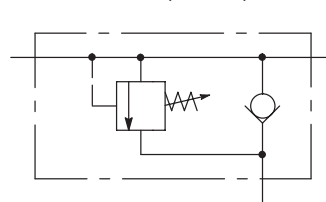


R(C)S/T Valves

Back Pressure (RS/T)



Counterbalance (RCS/T)



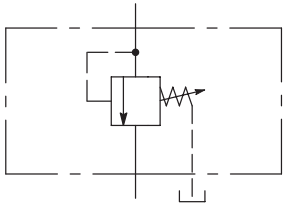
Series R(C)*-03/06/10/12 Sequence, Unloading, Back Pressure, and Counterbalance Valves

Type 2 Sequence Valves

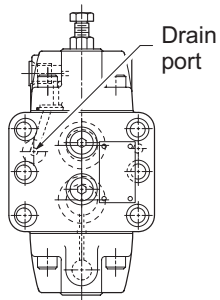
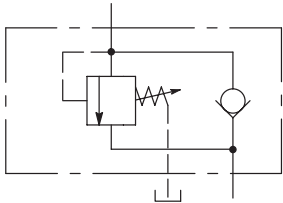
Internally operated – External drain

R(C)G Valves

(RG)

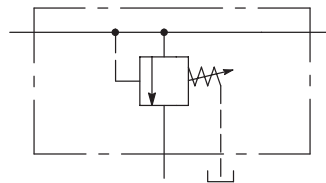


(RCG)

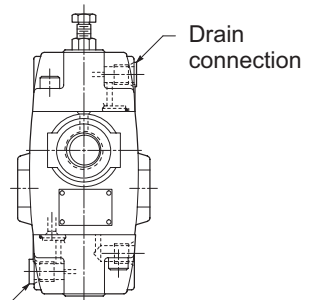
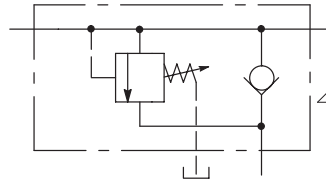


R(C)S/T Valves

(RS/T)



(RCS/T)

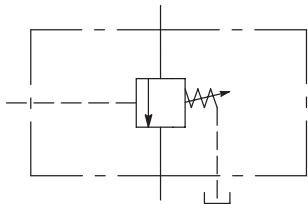


Type 3 Sequence Valves

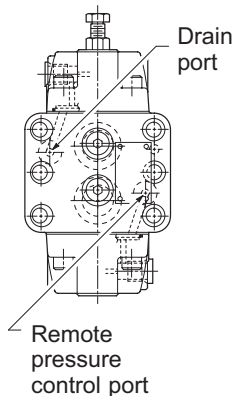
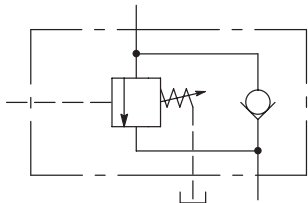
Remote control operated – External drain

R(C)G Valves

(RG)

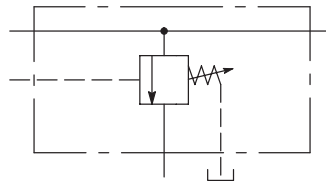


(RCG)



R(C)S/T Valves

(RS/T)



(RCS/T)

