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Radial Piston Pumps

Radial piston pumps comprise pumping elements radially mounted in a pump housing driven by an eccentric shaft. This permits the pump to be mounted “in-tank” as a power pack installation or as an externally mounted pump with the normal suction and delivery lines. Pumps can be supplied in a number of configurations with the numbers of pistons (pumping elements) ranging from 1 piston through to 42 pistons. Pumps may be delivered as a single outlet unit or in a variety of multiple outlet configurations depending on the specific requirements of the application. Dual stage pumps combine a radial piston pump with a directly-coupled low-pressure gear pump. This, combined with a dual-stage valve, is useful in press applications where quick approach but slow pressing is needed.

Single and Multiple Outlet Pumps



Available as: individual pump
pump complete with motor
hydraulic power pack

P max: 700 bar

Q max: 91.2 l/min
displ = 64.18cm³/rev

R series pumps have ball bearings and the RG series of pumps have bushed bearings to increase the service life of the pump in extreme operating conditions.

The numbers in the table indicate the flow in litres per minute at a pump speed of 1450 RPM for a single outlet pump.

Design	No. of cylinders	Pmax 700 bar	Pmax 550 bar	Pmax 450 bar	Pmax 250 bar	Pmax 160 bar
7631	2	R 0.18	R 0.28	R 0.43	R0.92	
7631	3	R 0.27	R 0.42	R0.64	R 1.35	
7631	5	R 0.46	R 0.7	R1.08	R 2.27	
6010	1	R(G) 0.3	R(G) 0.5	R(G) 0.8	R(G) 1.7	R(G) 2.2
6010	2	R(G) 0.6	R(G) 1.0	R(G) 1.6	R(G) 3.3	R(G) 4.4
6010	3	R(G) 0.9	R(G) 1.5	R(G) 2.5	R(G) 5.1	R(G) 6.5
6011	5	R(G) 1.4	R(G) 2.6	R(G) 4.2	R(G) 8.3	R(G) 10.9
6011	7	R(G) 2.1	R(G) 3.7	R(G) 5.8	R(G) 11.8	R(G) 15.3
6012	10	R(G) 2.7	R(G) 5.3	R(G) 8.2	R(G) 16.8	R(G) 21.7
6012	14	R(G) 4.0	R(G) 7.4	R(G) 11.6	R(G) 23.5	R(G) 30.4
6014	20	R(G) 6.1	R(G) 11.0	R(G) 17.4	R(G) 35.0	R(G) 43.4
6014	28	R(G) 8.0	R(G) 15.0	R(G) 23.0	R(G) 47.0	R(G) 60.8
6016	42	R(G) 12.7	R(G) 22.0	R(G) 34.5	R(G) 70.0	R(G) 91.2

Multiple outlet pumps provide great flexibility for system designers. The outputs from each piston may be directed as a separate flow or groups of pistons may be combined to give specific flows. There are a great number of possible combinations and when used to give specific individual flows, the high efficiency of the piston pump permits greater accuracy than other types of flow dividers. Complete information on the possibilities is available from the local Stauff branch.

Two stage pumps

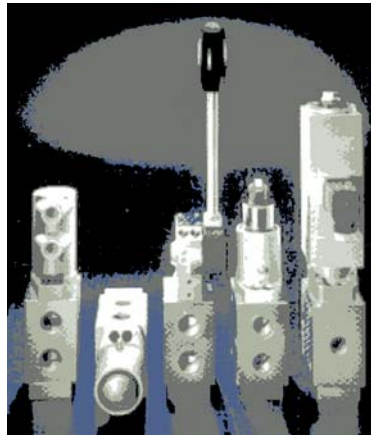


These consist of a high pressure R series pump directly coupled to a low pressure gear pump. The low pressure pump may be a Group 1, 2 or 3 metric pump in a range of displacements and the maximum flow possible from the largest Group 3 pump is 135 l/min. For the possible combinations of high pressure and low pressure flows, contact your Stauff branch. Two stage valve assemblies are also available to make high/low applications such as hydraulic presses a simple matter.

Directional Spool Valves type SG and SP, 2/2-, 4/2-, 3/2- and 4/3 way

The SG directional spool valves are for pipe mounting and the SP valves are for manifold mounting. They are widely used to control the direction of movement of hydraulic motors and cylinders. The wide range of spool configurations and the sturdy design make the valves suitable for applications in both mobile and fixed installations.

The SG type also has available an optional integrated pressure relief valve. Another option for the valves is enlarged ports and control grooves to minimise pressure surges.



Pmax: 200 ... 400 bar
Qmax: 12 ... 100 l/min

Actuation options

Solenoid -
 12V & 24V DC
 230V AC

Manual -
 with spring centering
 with detent

Roller head -

Pin head -

Pressure -

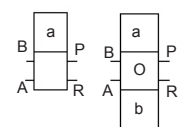
Hydraulic pilot, 12 - 20 bar
 Pneumatic pilot, 5 - 10 bar

Basic Type and Size

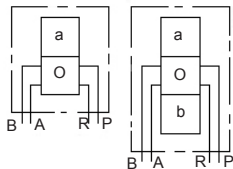
Individual valve for pipe connection	Manifold mount valve	Flow Q max (l/m)	Operating Pressure, Pmax (bar), for actuation				Port Sizes BSP
			Solenoid	Manual	Mechanical	Pressure	
SG 0		12	200	400	400	400	¼", 3/8"
SG 1	SP 1	20	200	400	400	400	3/8"
SG 2		30	315	400	400	400	3/8"
SG 3	SP 3	50	315	400	400	400	½"
SG 5		100	200	400	315	400	1"

Diagrammatic Symbols

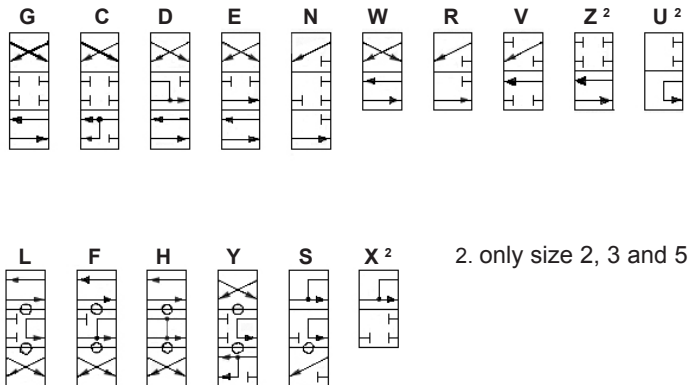
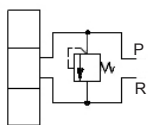
SG
 individual valve for pipe connection



SP
 individual valve for manifold mounting

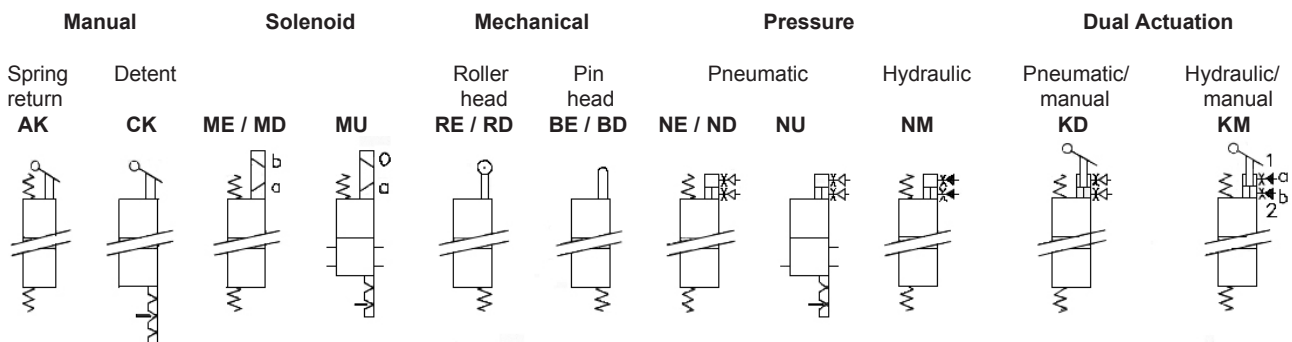


with pressure relief valve



2. only size 2, 3 and 5

Actuations



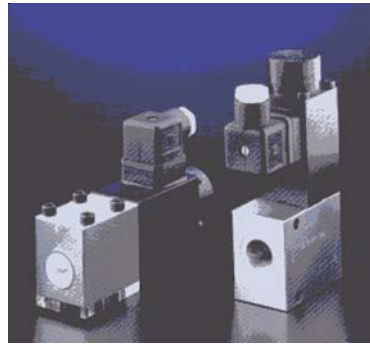
Order Example SG 1 G - AK

Manually operated, spring centered single spool valve, size 1 with screwed ports, flow path G.

Directional Seated Valves type BVG, BVE and BVP

The directional cone seated valves, types BVG, BVE and BVP are 2/2- and 3/2-way directional valves which are available in three sizes. The design permits flow in any direction at full system pressure.

The valves may be connected directly via pipes (type BVG) or mounted on customer supplied manifolds (type BVP and BVE). Type BVE is available only with solenoid operation but hydraulic, pneumatic or manual operation is available for the other models permitting a wide range of applications.



Pmax: 250 ... 400 bar
Qmax: 12 ... 50 l/min

Actuation Options

Solenoid -
 12V & 24V DC
 230V AC

Pressure -
 Hydraulic pilot, 24 - 320 bar
 Pneumatic pilot, 3.5 - 15 bar

Manual -
 BVG 1 valve only

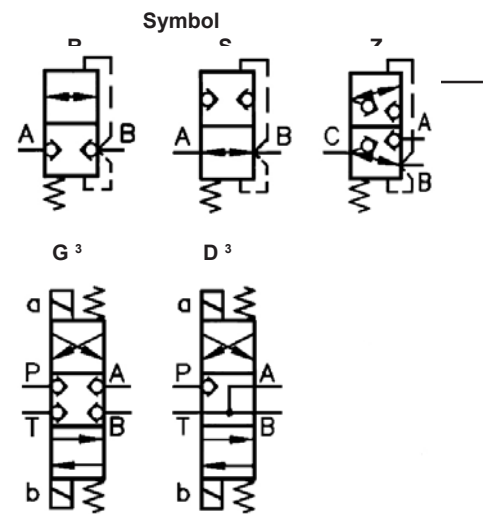
Basic Type and Size

Individual valve for pipe connection	Manifold mount valve	Flow Q max (l/m)	Oper. Press. P max (bar)	Port sizes (BSPP) A,B,C ²
BVG 1, BVG 2	BVP 1	12/20	400 / 250 ¹	1/4", 3/8"
BVG 3	BVP 3	50	320	1/2"
BVE 3 ⁴		70	400	1/2"

1. with electrical actuation GM.. and WGM
2. with type BVG
3. only size 1 and only with solenoid actuation
4. cartridge valve, also available with connection block for pipe connection

Other options

individual valve with orifice in one port
 2/2-way valve with bypass check valve
 twin valve version
 BVP 1 with ex-proof design
 additional elements to make 4/3 valve



Order Example BVG 1 - R - 3/8 - WG230

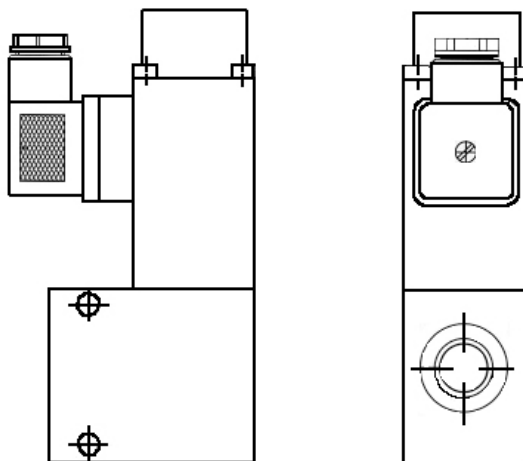
Size 1 BVG valve with 3/8" BSPP ports, flow path R (2/2-way function), 230V AC solenoid operation.

BVP 3 - Z - H

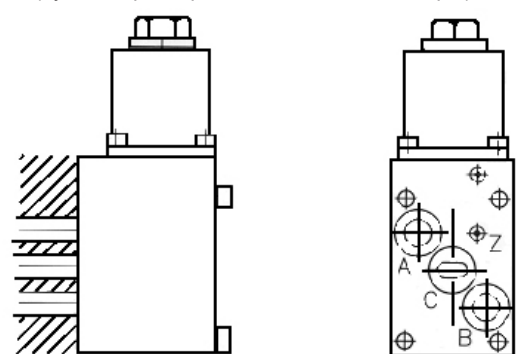
Size 3 BVP manifold mounted valve, flow path Z (3/2-way function), hydraulic pilot operation.

Examples

Type BVG for pipe connection
 (solenoid operated - see order example)



Type BVP for manifold mounting
 (hydraulic pilot operation - see order example)



Directional Seated Valves type WH

These zero leakage, directional seated valves use spring loaded balls as the valve elements. These compact valves are manifold or sub-plate mounted. Both 2/2 and 3/2 configurations are available and 3/3 and 4/3 functions are achieved by combining multiple valves on one manifold. The indicated flow path on the valve must be followed for correct functioning.



Pmax: 350 ... 450 bar
Qmax: 8 ... 30 l/min

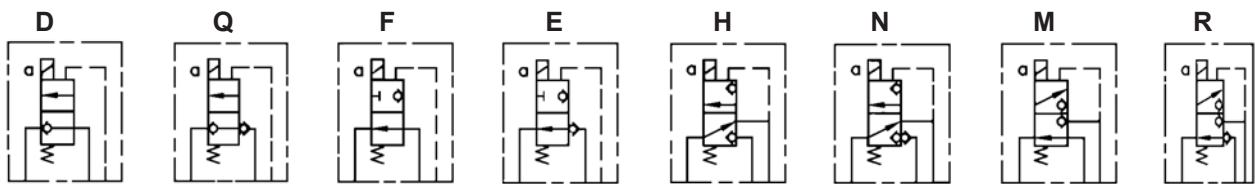
Actuation Options
Solenoid -
 12V & 24 V DC
 230V AC

Basic type and size	Flow Qmax (l/m)	Oper. Pressure Pmax (bar)	Port Size (of optional subplate)
WH1	8	450	1/4" BSPP

Subplate Options

Part No.	Size & Type	Port Size
WH1-1/4-2/2	Size 1, 2/2	1/4" BSPP
WH1-1/4-3/2	Size 1, 3/2	1/4" BSPP

Valve Symbols

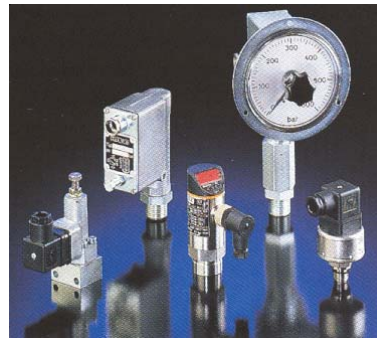


Order Example WH1F-G24

Size 1 WH valve with "F" flow pattern and 24V DC solenoid operation, without sub-plate.

Pressure Switches type DG

Pressure switches are electro-hydraulic devices where a spring-loaded piston sensing hydraulic pressure operates an electrical switch. The pressure setting is a simple spring adjustment. The electrical signal can be used for switching on or off an ancillary component, for initiating another part of the operating cycle, and for many other applications.



Pmax: 4 ... 700 bar

Design Options

- Female screwed port
- Male threaded connection
- Manifold mount
- Dial faced type
- Electronic type
- Dual switches

The normal switches have a hysteresis of between 8 ... 20%. This means that the pressure will have to drop by that much below the set point before the switch resets to the original mode. The exception is the electronic type, DG 5 E which has provision to set two independent switch points.

Basic type and Size	Brief Description	Pressure Adj. Range (bar)	Max. Pressure (Pmax)	Connection Thread (BSPP)	Symbol
DG 1R	adjustment by turn-knob on the dial face	20 ... 600	600	1/4" F or 1/2" M	
DG 33		20 ... 700	700		
DG 34	Compact design for manifold mounting	100 ... 400	700		
DG 35	Adj. by set screw	20 ... 250	700	1/4" M or 1/4" F	
DG 365		12 ... 170	700		
DG 36		4 ... 12	700		
DG 5 E	Electronic pressure switch with two switch points	0 ... 250 0 ... 400	400 600	1/4" F	

Direct-acting Relief and Sequence Valves type MV, SV, etc.

Direct-acting relief valves limit the maximum pressure in a hydraulic system thus safeguarding against excessive pressure.

Sequence valves maintain a constant pressure differential between the inlet and outlet of the valve.

The valves are available with screwed ports for pipe mounting, as a manifold mount valve, or as a cartridge type valve. Various maximum pressure settings are available to allow the system designer maximum flexibility.



Pmax: 700 bar
Qmax: 5 ... 160 l/min
Adjustment Options
 Tool adjustable
 Manually adjustable
Type Approval
 TUV approved version is available for use as accumulator safety valves.

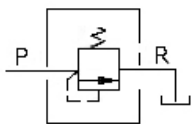
Basic Types and General Description

relief valve

MV^{1 5}

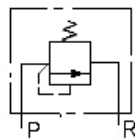
relief valve & sequence valve

MVS^{1 5} / **MVG**³ / **MVE**⁵ / **SV**¹



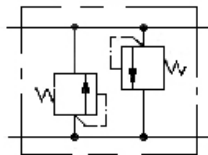
relief valve manifold mount

MVP⁵



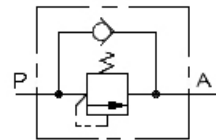
cross-line relief

DMV¹



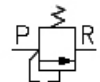
relief valve with reverse free-flow check valve

MVCS² / **MVGC**³ / **SVC**¹



relief valve & sequence valve.

MVB^{1 4}



Notes

- only sizes 4, 5, 6 and 8
- only sizes 4, 5, and 6
- only size 13 and 14
- other type kits are available
- TUV approval available, sizes 4, 5 and 6

Maximum permissible pressure in "R" outlet port

MV	20 bar	MVS, MVG, MVE	500 bar
MVB	200 bar	MVCS, MVGC	500 bar
DMV	350 bar	SV, SVC	500 bar

Valve Style

MV, MVS, MVG - 90° configuration with screwed ports

MVE - Cartridge type valve **MVB** - Assembly kit for integral manifolds, etc.

SV, SVC - In-line valve for straight pipe installation

MVCS, MVGC - 90° configuration with screwed ports

DMV - Cross-line relief valves with screwed ports

All valves are adjustable but the "R" in the code indicates that there is a hand adjustable knob eliminating the need for tools to adjust the settings

Maximum Pressure and Flow Ratings

A letter is used to indicate the maximum pressure setting of the valve. In the table below, the maximum pressure setting and also the maximum flow are set out against the available valve sizes. The first figure is the maximum pressure in bar and the second is the maximum flow in l/min. The possible BSPP port sizes are shown for those valves with screwed ports. In the order code, a number denotes the screwed port size: 1 = 1/4", 2 = 3/8", 3 = 1/2", 4 = 3/4" and 5 = 1".

Size	13	14	4	5	6	8
	H: 700/5	N: 50/8 M: 200/8 H: 400/8	F: 80/20 E: 160/20 C: 315/20 B: 500/20 A: 700/12	F: 80/40 E: 160/40 C: 315/40 B: 500/40 A: 700/20	F: 80/75 E: 160/75 C: 315/75 B: 500/75 A: 700/40	E: 160/160 C: 315/160
	1/4"	1/4"	1/4" 3/8"	3/8" 1/2"	1/2" 3/4"	3/4" 1"

Order Example

MVS 52 BR

Relief or sequence valve with 90° configuration, screwed ports 3/8" BSPP (Code 2), pressure range up to 500 bar (Code B), with manually adjustable pressure setting (Code R).

MVP 13 HR

Manifold mount valve, size 13, pressure range manually adjustable (Code R) between 20 and 700 bar (Code H).

Pilot Operated Check Valves type RH and DRH

The pilot operated check valves type RH and DRH are used for blocking one or two pressure lines, as pilot operated drain valves, or as idle circulation valves to unload a pump or other part of a system. As an option, the valves may be equipped with a pre-release to prevent decompression surges in the event of high pressure and high flow. The type DRH has many variations and options such as in-line design, manifold mounting design, shock valves, relief valves to prevent slow pressure build-up, and a leakage port to prevent unintended opening of the valve due to pressure rises caused by leaking spool valves. All components are steel.

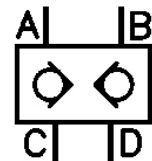
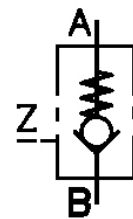


Pmax: 400 ... 700 bar
Qmax: 15 ... 160 l/min

Design Options

with or without decompression function
in-line design
manifold mount design
integral relief valve
leakage oil port
selectable pressure range

Basic Type & Size	Flow Qmax (l/min)	Pressure Pmax (bar)	Release Ratio P(A or B) / PZ	BSPP Ports	
				Service Ports	Pilot Port
RH 1	15	700	2.7	1/4"	1/4"
RH 2	35	700	3	3/8"	1/4"
RH 3V	55	500	5 - 8	1/2"	1/4"
RH 4V	100	500	6 - 11	3/4"	1/4"
RH 5V	160	500	7 - 13	1"	1/4"
DRH 1	16	500	2.5	1/4"	-
DRH 2	30	500	2.5	3/8"	-
DRH 3	60	500	2.5	1/2"	-
DRH 4	90	400	2.5	3/4"	-
DRH 5	140	400	2.5	1"	-

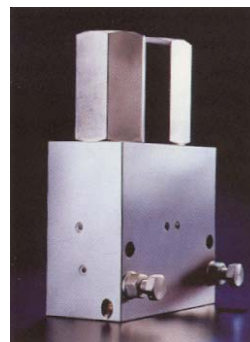


N.B. Models with the letter "V" indicate that there is a decompression function in the valve.

Counterbalance valves type LHK

Counterbalance or load-holding valves are pressure valves which act on the return flow side of double acting cylinders or motors. They stop the load running away allowing controlled lowering of a cylinder load or a motor driven load such as a winch.

The valves are available as single valves (see LHT 33 P-11) or as double acting valves (see LHK 44 G-21). All components are steel.

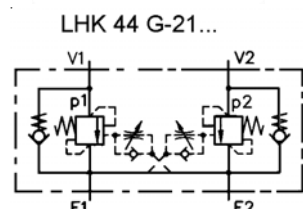
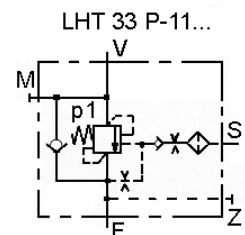


Pmax: 360 ...450 bar
Qmax: 250 lpm

Design Options

In-line mounted
Flange mounted
Cartridge valve
Internal relief valves
Shuttle valves for double acting valves

Basic type and size	Flow Qmax lpm	Oper. Press. Pmax bar	Pilot ratio	Ports (BSPP)
LHK 22	20	400	1 : 4.6	3/8"
LHK 33	60	360	1 : 4.4	1/2"
LHK 44	100	350	1 : 4.4	3/4"
LHDV 33	80	420	1 : 8	1/2"
LHT 2	20	400	1 : 8	1/4"
LHT 3	130	450	1 : 7	1/2"
LHT 5	250	450	1 : 6	1"



For further details, refer to Leaflets D7100, D7770 and D7918

Cartridge Pilot operated Check Valves type CRH and RHC

Pilot operated check valves are used in hydraulic circuits where the directional control valves exhibit normal spool leakage. They can also be used as hydraulically operated drain valves or as "idle circulation" valves.

The type CRH valves are pilot operated cartridge type valves and the type RHC valves are designed as screw-in valves. The RHC valves are available with a decompression (pre-release) function for high pressure and high flow applications. The mounting ports are of a simple, easily-machined design. Ask for machining details.

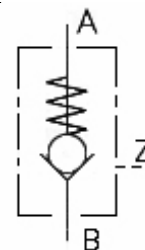


Q max: 80 l/min (CRH)
200 l/min (RHC)
P max: 500 bar

Optional Pilot Ratios available

Option: decompression (pre-release)

Basic type & size	Flow (Qmax) l/min	Op. Press. P max (bar)	Release Ratio $P_A : P_Z$	Mounting thread
CRH 1	30	500	2.6	M16 x 1.5
CRH 2	50	500	2.6	M20 x 1.5
CRH 3	80	500	2.5	M24 x 1.5
RHC 1	15	500	2.6	M16 x 1.5
RHC 2	25	500	2.6	M20 x 1.5
RHC 3	55	500	2.5	M24 x 1.5
RHC 4	100	500	2.5	M30 x 1.5
RHC 5	150	400	2.8	M36 x 1.5
RHC 6	200	400	2.5	M42 x 1.5
RHC43/3V	100	500	4.3	M36 x 1.5
RHC53/4V	150	400	4.3	M38 x 1.5



Cartridge & In-Line Check Valves, type RK

Check valves are used to block flow in one direction and permit free flow in the opposite direction. The RK check valve is a spring-loaded, ball seated type which, by design, is tolerant of contamination.

The mounting ports are easily machined for the screw-in RK type. Housings for in-line installation are available on request or easily manufactured. Installation tools are also available to ensure correct assembly of the insert.



Q max: 6 ... 120 l/min
P max: 400 ... 700 bar

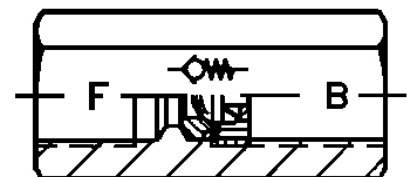
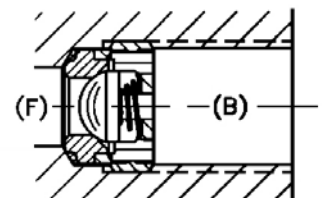
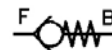
Design option:
screw-in valve insert

valve insert in housing for in-line installation

Size	Thread BSPP	Flow Q max (l/m)	Pressure Pmax (bar)	Part No. insert	Part No. c/w housing
0	1/8"	10	700	RK0	RK0G
1	1/4"	20	700	RK1	RK1G
2	3/8"	50	700	RK2	RK2G
3	1/2"	80	500	RK3	RK3G
4	3/4"	120	500	RK4	RK4G

Type RK...

Installed in blocking direction



RK..G

Order Example

RK 1
screw-in check valve, type RK, size 1

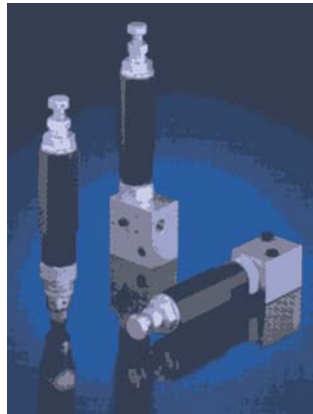
RK 2 G
RK check valve, size 2, in housing for in-line installation

N.B. Extraction tools for the inserts are available

Pressure Reducing Valves type CDK

Pressure reducing valves in a hydraulic circuit maintain a constant outlet pressure even though the input pressure is higher and variable. They are used to supply a secondary circuit with lower pressure fluid without affecting the higher pressure in the primary circuit.

The CDK valve is a directly controlled type and is a seated type which has no leakage when closed and therefore no need of a drain line. A reversal of flow is possible up to $2 \times Q_{max}$. The valve stocked is a pipe mounted version but cartridge types are also available.



Q max: 15 l/min
P max:
 inlet - 500 bar
 outlet - 400 bar
Adjustment Options
 Tool adjustable
 Manually adjustable

Basic Types and General Description

cartridge valve

pipe connection version
with optional pressure switch

manifold mounting version

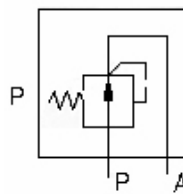
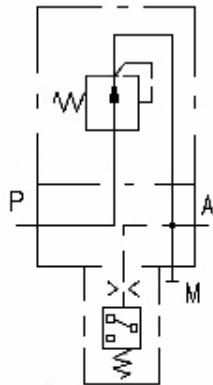
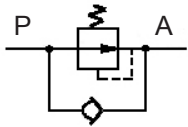
CDK 3 - ..

CDK 3 - .. - 1/4 - DGS.

CDK 3 - .. - P

**Pressure Range
Pmax A**

**Tapped Ports
(BSPP)**



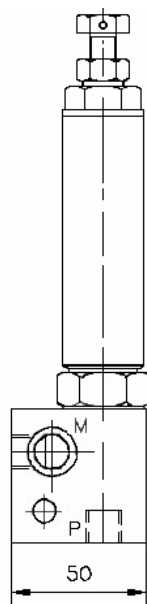
..-08	400 bar
..-1	300 bar
..-2	200 bar
..-5	130 bar

1/4" for the pipe mounted version

Order Example

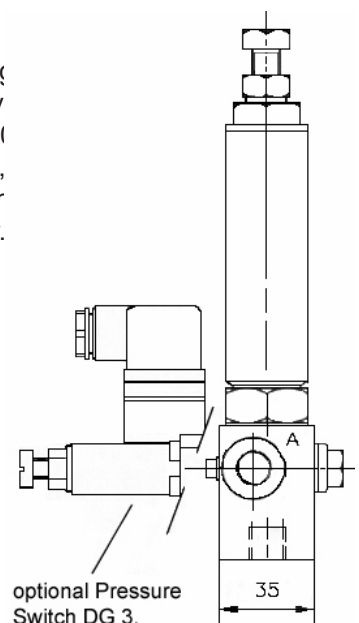
CDK 3 - 1 - 1/4 - 250

Pressure reducing valve, pipe connection (1/4" BSPP), pressure range 30 to 300 bar (Code 1), tool adjustable version, preset to 250 bar



CDK 3 - 1 - 180

Pressure reducing valve, cartridge type, pressure range 30 to 300 bar (Code 1), adjustable version preset to 180 bar.



Throttle type Flow Valves, Q, QR, QV and FG

Throttle valves are flow control valves and are used to limit the flow in accumulator and control circuits. They feature a slotted throttle section which is much less sensitive to contamination than annular type throttle valves.

The valves Q, QR and QV are available in five sizes covering flow rates up to 120 l/min. The fine throttles, type FG, are preferred for applications where the switching speeds of directional valves have to be adjusted, the prevention of pressure surges is required, or for the damping of oscillations, etc.

The throttle effect can be adjusted by the thread, altering the effective slot length and the valves are only available as "tool adjustable" versions.



Pmax: 300 ... 400 bar
Qmax: 0 ... 80 l/min

Design Options

- cartridge design
- individual valve for pipe mounting
- 90° housing
- banjo bolt
- swivel housing

Basic Type & Size	Flow Qmax (l/m)	Pressure Pmax (bar)	Schematic Drawings of the devices			Symbol
			Standard screw-in throttle	Banjo bolt	Swivel housing	FG, Q
FG, FG1, FG2	0.15	300				
Q20, QR20, QV20	12	400				FG1, QR
Q30, QR30, QV30	25	400				
Q40, QR40, QV40	50	400				FG2, QV
Q50, QR50, QV50	90	400				
Q60, QR60, QV60	120	400				

Hydraulic Accessories - In-line filters

Many devices such as pressure gauges, pressure switches, accumulators, etc., are installed in hydraulic systems by means of fittings. To protect the device from unwanted contamination, in-line filters can be employed.

Hawe has two types of filters for this purpose - a coarse screen for such material as drilling swarf, and a wire mesh filter with a finer micron rating which is only for low flow applications. The screen is available as a screw-in disc for fitting to either a machined port or a housing body.



Pmax: 350 ... 700 bar

Design Options

- In-line housing
- Screw-in version

StrainerDisc	Thread Size	Example of mounting in a housing	Screw-in in a threaded port	Symbol	Housing BSPP female / female
HFC1/4	1/4" BSP				SHF1/4 1/4" BSPP
HFC3/8	3/8" BSP				SHF3/8 3/8" BSPP
HFC1/2	1/2" BSP				SHF1/2 1/2" BSPP

N.B. Available on request are the fine wire mesh filters (100µm) and the part number is HFC...F with the BSP size inserted.

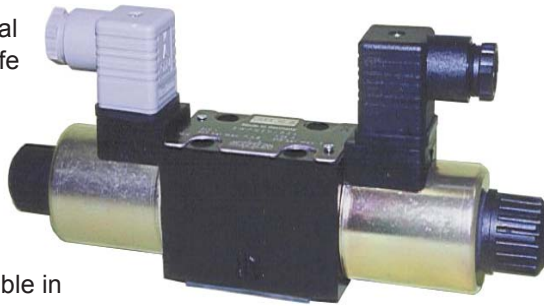
Directional Control Valves, Solenoid Operated, CETOP 3 mounting

CETOP 5 valves are available on request

Have solenoid operated directional control valves offer long, reliable life with optimum performance.

A range of spool variations allows the system designer to select a valve to suit the requirements of the application. The subplates for mounting the valve are also available in either a side ported or bottom ported single mount version or multiple station manifold versions.

The solenoid coils are all DC windings. The AC versions have rectifiers in the Hirschmann plugs to convert the AC to DC.



Q max: 60 l/min

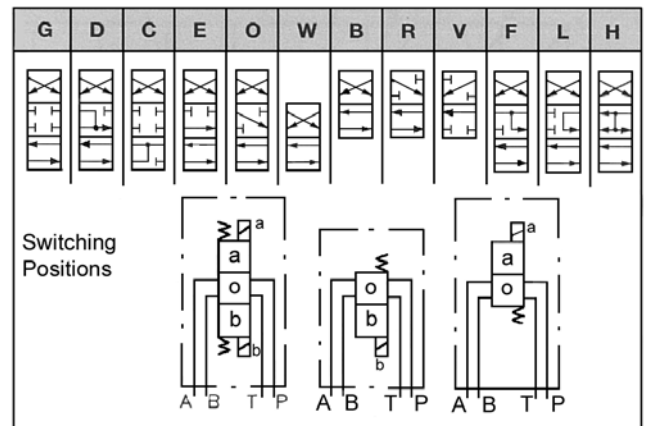
P max: 350 bar P, A, B ports
210 bar T port

Design: wet armature design with easily replaceable coils

Current: AC & DC options

Voltage: 12, 24 V DC,
110, 230 V AC

Basic type	Voltage and Current	Coding
SWPN 2	12VDC	G12
	24VDC	G24
	110VAC	WG110
	230VAC	WG230



Order Example

To the basic SWPN 2, add the spool required and the voltage and current type to get the valve part number.

SWPN 2-H-G24

CETOP3 valve with a "H" spool and with 24VDC input power.

SWPN 2-L-WG230

CETOP3 valve with a "L" spool and with 230V AC input power.

Subplates & Manifolds

Subplates in aluminium and steel are available to mount the CETOP3 valves, with either side ports or a combination of side and bottom ports. A bolt kit incorporating 4 socket head cap screws is also available to suit the valve. In addition, blanking plates to seal a subplate or manifold when the valve is removed are also available.

Manifold blocks in steel or aluminium are available on request in both series and parallel design. Sandwich plates with relief, throttle and check functions are available.

Part No.	Description
SSPC3B	Aluminium subplate, P & T ports on bottom, A & B ports on the side
SSPC3B-S	Steel subplate, P & T ports on bottom, A & B ports on the side
SSPC3S	Aluminium subplate, all ports side entry
SSPC3S-S	Steel subplate, all ports side entry
SBPC3S	Aluminium blanking plate
SBKC3	Bolt kit, cap screws, M5 x 30mm x 4 pieces

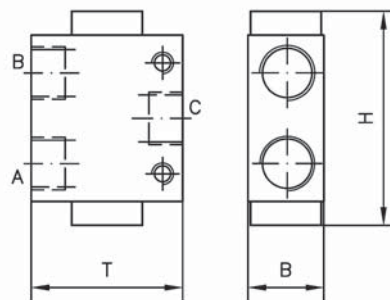
Flow Dividers type TQ and TV

The flow dividers type TQ divide (collect) total flow entering (exiting) port C. The distribution is independent of working pressure at ports A and B, and may be divided equally or unequally in predetermined portions. The flow divider type TV features priority division, i.e. variable flow entering port C is divided where partial flow QA, through port A, is kept constant and the residual flow, QB, exits port B. As soon as one actuator's movement is stopped the flow to the other is either reduced to a minimal flow (type TQ) or completely reduced to leakage flow (type TV). It is possible to overcome this design feature by creating flow via a pressure limiting valve.

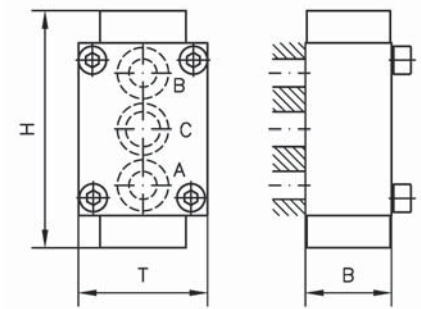
Nomenclature:	Flow dividers with or without priority division
Design:	Individual valve for pipe mounting or manifold mounting
Adjustability:	Non-adjustable
P_{max}*	300 ... 350 bar
Q_{max}*	7.5 ... 200 lpm (nom. total flow)



Dimensions
Type TQ...

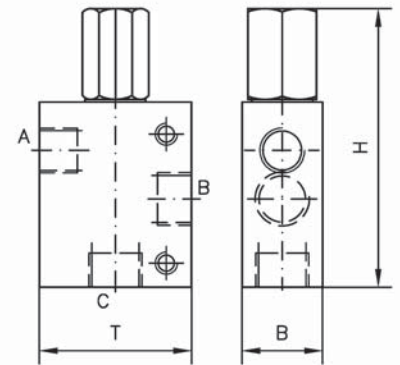


Type TQ.P



Basic type	H	B	T	m (kg)
TQ 2..	79	30	50	0.6
TQ 3..	85	30	60	0.6 ... 0.7
TQ 3P	79	30	50	0.7
TQ 4..	110	40	60	1.5
TQ 4P	110	40	60	1.6
TQ 5..	134	50	80	3
TQ 5P	134	50	80	3.1
TV 3	109	30	60	1.0
TV 3P	106	35	50	1.0

Type TV3..



Basic types and general parameters

Basic type and size	Flow Q _{max} (lpm)	Oper. pressure p _{max} (bar)	Tapped ports (BSPP) 1)			Symbol	
			A	B	C	Pipe mounting	Manifold mounting
TQ 2..	7.5 ... 70	350	G 1/4, G 3/8	G 1/4, G 3/8	G 3/8	TQ	TQ.P
TQ 3..	7.5 ... 70	350	G 3/8, G 1/2	G 3/8, G 1/2	G 1/2		
TQ 3P	7.5 ... 70	350	---	---	---		
TQ 4..	80 ... 120	350	G 1/2	G 1/2	G 3/4		
TQ 4P	80 ... 120	350	---	---	---		
TQ 5..	140 ... 200	350	G 3/4	G 3/4	G 1		
TQ 5P	140 ... 200	350	---	---	---		
TV 3..	60	300	G 3/8	G 1/2	G 1/2		
TV 3P	60	300	---	---	---		

1) For pipe mounting versions only

Further Information

- Flow divider (flow distributor) type TQ D 7381
- Flow divider type TV D 7394

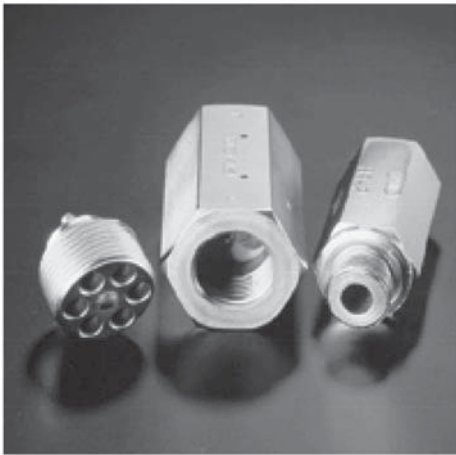
Line rupture safety valves type LB

The line rupture safety valves type LB are check valves. They are available as screw-in valves or with housing for in-line installation. The line rupture safety valves are best installed directly on the actuator (cylinder) which is to be safeguarded. This will prevent an uncontrollable, accelerated movement (drop) of a loaded cylinder when the hydraulic back-pressure is lost as a result of a rupture of the pressurized line or pipe connection.

When the flow through the valve increases above the pre-set limit, the flow forces will exceed the opposing spring force and the valve will block the flow immediately. The valve element in these valves is a shim.

There are two different versions available. One valve design completely blocks the flow when actuated, whereas the other one allows a minimum flow (via an orifice) to slowly drop the load.

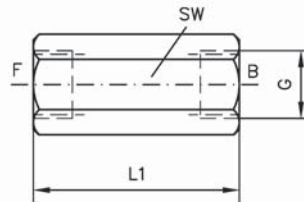
Nomenclature:	Line rupture safety valve
Design:	Screw-in valve with housing for in-line installation
Adjustability:	Tool adjustable
p_{max}:	500 bar
Q_{max}:	4 ... 160 lpm



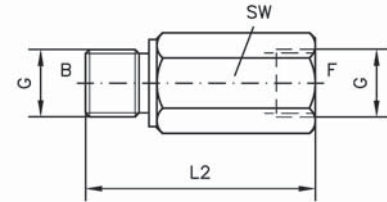
Dimensions
Screw-in valve type LB..C



Valve with housing type LB..G



Valve with housing type LB..F



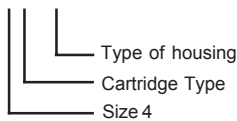
Further Information

D 6990

Refer:

Order Examples

LB4C(G)-40



Set to 40 l/min

1) Version with housing

Basic type	L	L1	L2	G (BSPP)	SW	m (g) 1)
LB 1 (C, G, F)	17.5	48	50	G 1/4 (A)	a/f 19	6 / 70
LB 2 (C, G, F)	21	52	58	G 3/8 (A)	a/f 22	12 / 100
LB 3 (C, G, F)	25	60	65	G 1/2 (A)	a/f 27	21 / 170
LB 4 (C, G, F)	30.5	72	78	G 3/4 (A)	a/f 36	45 / 375

Basic types and general parameters

Basic type and size	Flow Q_{max} (lpm)	Pressure p_{max} (bar)	Connection thread (BSPP)	Symbol
LB 1	4 ... 25	500	G 1/4 (A)	Simplified
LB 2	6.3 ... 50		G 3/8 (A)	
LB 3	16 ... 80		G 1/2 (A)	Detailed
LB 4	25 ... 160		G 3/4 (A)	
				with add. by-pass

Available orifice diameters 0.5 / 0.8 / 1.0 / 1.2 / 1.5 / 2.0
depending on type and size