Check valves

2.5 Check valve type RK, RB, RC, RE and ER

Check valves are a type of non-return valve. They block the oil flow in one direction and open in the opposite direction. In the closed state they have zero leakage.
The check valve type RK, RB, RC and RE can be screwed-in, type ER can be plugged-in. The spring-loaded ball check valve type RK, RB and ER is very robust and insensitive to soiling. The spring-loaded plate valve type RC can be screwed-in in any direction and is particularly suitable for fast switching sequences. Type RE is a plate valve without a spring.
Type ER can be integrated directly in valves for manifold mounting. As such an additional intermediate plate is not necessary for the check valve function. Type RE is suitable for isolating pressurising loads or as a foot valve for a pump suctuion linde.

Features and benefits:

- Operating pressures
- Easily machined mounting holes
- Sturdy
- Type RK, RB also available with different pre-load pressures

Intended applications:

- General hydraulic systems
- Hydraulic pre-loading

Nomen-clature:	Check valve
Design:	Insert valve Plug-in valve Combination with housing for pipe connection
p_{max}:	700 bar
Q_{max}:	620 lpm

Design and order coding example

RC 2 - E

Design with housing For pipe connection (E, F, G), type RK, RB and RC

Basic type, size Plug-in check valve
Type RK, RB, size 0 ... 7
Type RC, size 1 ... 3
Type RE, size 0 ... 4
Type RE, ER (check valve insert), size 0 to 4

Additional versions:

- Type RK with increased open-up pressure
- Type ER, stainless (size 01 ... 31)
- Type RK, RB, RC and RE with metric thread
- Type RK, RB with UNF thread

Function

RK
Ball seated valves

RB

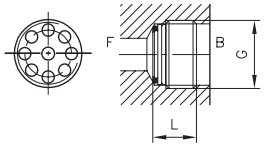
ER

RC
Shim type valves

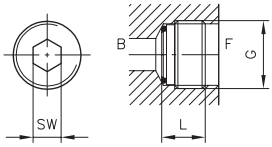
RE

General parameters and dimensions

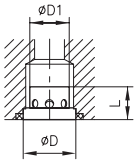
RK ..



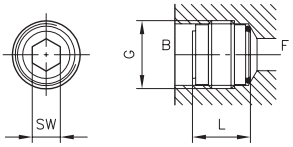
RB..



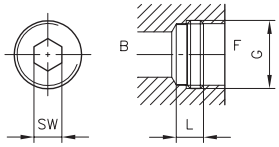
ER ..



RC ..



RE ..



	Q_{max} [lpm]	p_{max} [bar]	Ports	Dimensions [mm]		m [g]
				L	SW	
RK 0/RB 0	10	700	G 1/8 A, 7/16-20 UNF	7.2/7.9	SW 5	5
RK 1/RB 1	20	700	G 1/4 A, 9/16-18 UNF	9/10.3	SW 7	5
RK 2/RB 2	50	700	G 3/8 A, 9/16-18 UNF	11.2/11.7	SW 6	15
RK 3/RB 3	80	500	G 1/2 A, 9/16-18 UNF	13.5/13.2	SW 8	15/20
RK 4/RB 4	120	500	G 3/4 A, 9/16-18 UNF	17.5/17.5	SW 12	35/40
RK 5	240	500	G 1 A	22	-	85
RK 6	400	420	G 1 1/4 A	27.5	-	135
RK 7	620	420	G 1 1/2 A	35	-	280
RC 1	20	700	G 1/4 A	13	SW 4	6
RC 2	35	700	G 3/8 A	15	SW 5	13
RC 3	60	500	G 1/2 A	18	SW 8	24
RE 0	12	500	G 1/8 A	5	SW 4	2
RE 1	25	500	G 1/4 A	6	SW 5	4
RE 2	40	500	G 3/8 A	7	SW 8	6
RE 3	70	450	G 1/2 A	7.5	SW 10	10
RE 4	120	400	G 3/4 A	9	SW 12	18
				L	**D/D1**	**m[g]**
ER 0	6	500	G 1/8 A	5.6	6.1/4.6	0.5
ER 1	12	500	G 1/4 A	5.6	8.6/6.5	1
ER 2	30	500	G 3/8 A	8	14/10.5	5
ER 3	65	500	G 1/2 A	10	17/13	9
ER 4	120	400	G 3/4 A	17.5	28/21	40

Associated technical data sheets:

- Check valve type ER and EK: D 7325
- Check valve type RE: D 7555 R
- Check valves, type RC: D 6969 R
- Check valve type RK and RB: D 7445

Similar products:

- Check valves type CRK, CRB: Page 234
- Check valves type B: Page 236
- Restrictor check valves type EB, BE, BC: Page 218

Check valves

2.5 Check valve type CRK and CRB

Check valves are a type of non-return valve. They block the oil flow in one direction and open in the opposite direction. In the closed state they have zero leakage.

Features and benefits:

- Screw-in valves

Intended applications:

- General hydraulic systems

Nomen-clature:	Check valve
Design:	Screw-in valve
p_{max}:	500 bar
Q_{max}:	80 l/min

Design and order coding example

CRK 2 - 1/4

Individual connection block for pipe connection

Basic type Check valves type CRK and CRB, size 1 to 3

- With/without tapped plug
- With/without tapped blockage/plug combination

Function

CRK

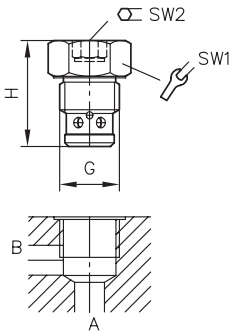
CRK

CRB

CRB

General parameters and dimensions

CRK, CRB



	Q_{max} [lpm]	p_{max} [bar]	Ports	Dimensions			m [g]
			G	H [mm]	SW 1	SW = a/f 2	
CRK 1 / CRB 1	30	500	M 16 x 1.5	31	SW 22	SW 8	70
CRK 2 / CRB 2	50		M 20 x 1.5	35	SW 24	SW 10	110
CRK 3	80		M 24 x 1.5	38	SW 30	SW 12	125

Associated technical data sheets:

- Check valve type CRK, CRB and CRH: D 7712

Similar products:

- Check valves RK, RB, RC, RE, ER: Page 232

Check valves

2.5 Check valve type B

Check valves are a type of non-return valve. They block the oil flow in one direction and open in the opposite direction. In the closed state they have zero leakage.
The check valve type B is available in different housing forms and is suitable for direct in-line installation.
The check valve type B is suitable for usage as a foot valve for a pump suction line due to the low opening pressure.

Features and benefits:

- Flow up to 160 l/min
- Pipe installation

Intended applications:

- General hydraulic systems

Nomen-clature:	Check valve
Design:	Individual valve for in-line installation
p_{max}:	500 bar
Q_{max}:	160 lpm

Design and order coding example

B 1 - 2

Basic type, with housing, size Check valve type B, version with housing 1 to 3, size 1 to 7

Additional versions:

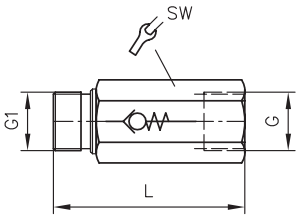
- Open-up pressure 3 bar

Function

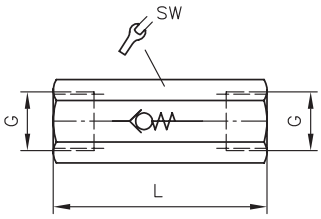
B

General parameters and dimensions

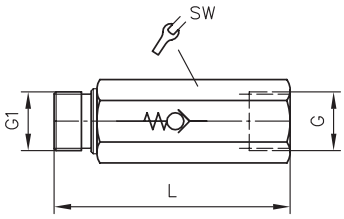
B 1



B 2



B 3



Basic type	Size	Q_{max} [lpm]	p_{max} [bar]	Ports		Dimensions		m [kg]
				G	G1	L [mm]	SW = a/f	
B 1 **B 2** **B 3**	-1	15	500	G 1/4	G 1/4 A	50 ... 60	SW 19	0.11
	-2	20		G 3/8	G 3/8 A	58 ... 67	SW 24	0.16
	-3	30		G 1/2	G 1/2 A	60 ... 66	SW 27	0.19
	-4	45		G 3/4	G 3/4 A	70 ... 78	SW 36	0.36
	-5	75		G 1	G 1 A	94 ... 114	SW 41	0.65
	-6	120		G 1 1/4	G 1 1/4 A	110 ... 130	SW 55	1.3
	-7	160		G 1 1/2	G 1 1/2 A	115 ... 136	SW 60	1.5

Associated technical data sheets:

- Check valves, type B: D 1191

Similar products:

- Check valves type RK, RB, RC, RE, ER: Page 232

Check valves

2.5 Releasable check valve type CRH and RHC

Check valves with hydraulic release are a type of check valve. They block one or both hydraulic consumer lines or are used as a hydraulically actuated drain or circulation valve. Check valve type CRH and RHC has zero leakage when closed.
It can be screwed-in and can be integrated into control blocks. The necessary mounting holes are straightforward to make.
Check valve type CRH and RHC is available with hydraulic release. Hydraulic release suppresses relief surges that can occur at high pressure and with a large consumer volume.

Features and benefits:

- Screw-in valve
- Pressures up to 700 bar
- Flows up to 200 l/min
- Sturdy

Intended applications:

- Industrial hydraulics
- Construction machines

Nomen-clature:	Check valve with hydraulic release
Design:	Valve insert Screw-in valve
Actuation:	Hydraulic
p_{max}:	700 bar
Q_{max}:	200 l/min

Design and order coding example

CRH 3 V

Function Without pre-release (-)
With pre-release (V)

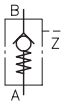
Basic type, size Releasable check valve
type CRH, size 1 to 3 and
type RHC, size 1 to 6

Additional versions:

- With higher pilot ratio (approx. 4.5 : 1)
- With sealed tapped journal and control piston
- Wth hydraulic relieve of the control piston (type RHCE)

Function

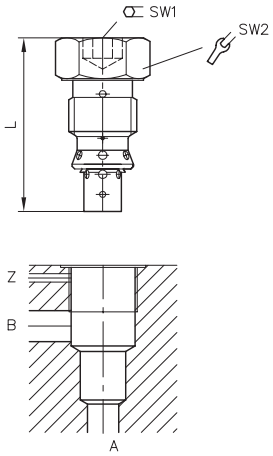
CRH, RHC



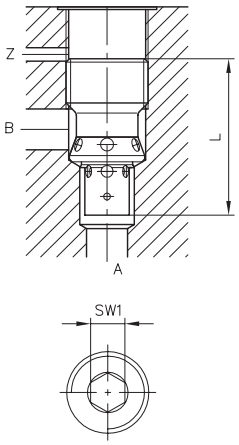
CRH

General parameters and dimensions

CRH



RHC



	Q_{max} [lpm]	p_{max} [bar]	Release ratio	Ports (BSPP)	Dimensions			m [g]
			p_a / p_z		L [mm]	SW = a/f 1	SW = a/f 2	
CRH 1	30	500	2.6	M 16 x 1.5	47	SW 8	SW 22	60
CRH 2	50	500	2.6	M 20 x 1.5	53	SW 10	SW 24	90
CRH 3	80	500	2.5	M 24 x 1.5	61	SW 12	SW 30	150
RHC 1	15	700	2.6	M 16 x 1.5	32	SW 6	-	20
RHC 2	25	700	2.6	M 20 x 1.5	37.5	SW 8	-	40
RHC 3	55	700	2.5	M 24 x 1.5	47	SW 10	-	70
RHC 4	100	500	2.5	M 30 x 1.5	56	SW 12	-	140
RHC 5	150	500	2.8	M 36 x 1.5	67.5	SW 14	-	250
RHC 6	200	500	2.5	M 42 x 1.5	97	SW 19	-	500

Associated technical data sheets:
Releasable check valves

- Check valve type CRK, CRB and CRH: D 7712
- Releasable check valve type RHC and RHCE: D 7165

Similar products:

- Type HRP: Page 240
- Type RH: Page 242

Check valves

2.5 Releasable check valve type RH and DRH

Check valves with hydraulic release are a type of check valve. They block one or both hydraulic consumer lines or are used as a hydraulically actuated drain or circulation valve. In the closed state the check valve type RH and DRH has zero leakage. The type DRH is a twin check valve for double-acting consumers.
The check valve type RH and DRH is available with a hydraulic release. Hydraulic release suppresses relief surges that can occur at high pressure and with a large consumer volume.

Features and benefits:
- Pressures up to bar
- with hydraulic release for smooth switching

Intended applications:
- Blocking of leak-free hydraulic cylinders
- Return flow relief
- Hydraulically actuated drain or circulation valve

Nomenclature:	**Check valve with hydraulic release or twin check valve**
Design:	**Individual valve for** ▪ **Pipe connection** ▪ **Manifold mounting**
Adjustment:	**Hydraulic**
p_{max}:	**700 bar**
Q_{max}:	**160 l/min**

Design and order coding example

RH 3 **V**

Function Without pre-release (-)
With pre-release (V)

Basic type, size Releasable check valve RH, size 1 to 5

DRH 3 LSS **- 30** **/100**

Pre-charge pressure [bar]

Pressure setting [bar]

Basic type, size, function Releasable double check valve DRH, size 1 to 5

Additional versions:
- With pre-release (one or both sides)
- With shock valves (for hydraulic motors)
- With safety valve preventing slow pressure rises
- With leakage port preventing unintended open-up when pressure migrated from the control side
- Manifold mounting version (type DRH3P)

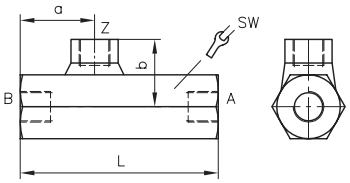
Function

RH

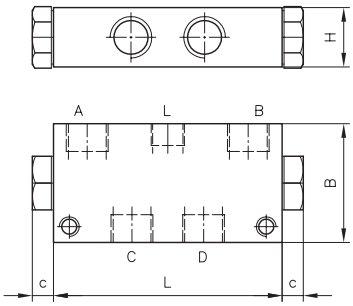
DRH

General parameters and dimensions

RH..



DRH..



	Q_{max} [lpm]	p_{max} [bar]	Release ratio $p_{A(B)}/p_Z$	Ports		Dimensions [mm]				m [kg]
				A, B, C, D	Z	L	a	b	SW = a/f	
RH 1	15	700	2.7	G 1/4	G 1/4	84	31.5	27	SW 24	0.4
RH 2	35	700	3	G 3/8		90	32	28.5	SW 27	0.4
RH 3	55	500	2.4	G 1/2		100	36.5	31	SW 32	0.6
RH 4	100	500	2.4	G 3/4		126	45	35.5	SW 41	1.3
RH 5	160	500	3	G 1		143	52	38	SW 46	1.8
						L	B	H	c	
DRH 1	16	500	2.5	G 1/4	-	70	45	20	8	0.5
DRH 2	30	500		G 3/8		89	60	30	10	1.2
DRH 3	60	500		G 1/2		115	60	30	13	1.6
DRH 4	90	400		G 3/4		150	70	40	15.5	2.9
DRH 5	140	400		G 1		195	80	50	17	5.5

Associated technical data sheets:

- Releasable check valve type RH: D 6105
- Releasable twin check valve type DRH: D 6110

Similar products:

- Releasable check valve type RHV: D 3056
- Type CRH and RHC: Page 234
- Type HRP: Page 240

Check valves

2.5 Check valve and pre-fill valve type F

Check valves and pre-fill valves are a type of non-return valve. Check valves block the oil flow in one direction and open in the other direction. Pre-fill valves are check valves with hydraulic release. They are used, e.g. in top ram presses for suction and emptying the press cylinder on rapid closing and opening.

The check valve and pre-fill valve type F is a spring-loaded disk valve and has zero leakage in the closed state. The valve is attached directly to the cylinder and clamped between the base of the cylinder and the welding-neck flange. Alternatively the valve is installed in the line between the front faces of the welding-neck flanges.

The valves type F25 - F80 are available with hydraulic release. Hydraulic release suppresses relief surges that can occur at high pressure and with a large consumer volume.

Features and benefits:

- Wafer design
- Extremely large flows, up to 7000 l/min

Intended applications:

- Press control systems
- Injection moulding machines

Nomen-clature:	Check valve Check valve with hydraulic release (pre-fill valve)
Design:	Intermediate section between pipe flanges
Actuation:	Hydraulic
p_{max}:	400 bar
Q_{max}:	7000 l/min

Design and order coding example

F25

Basic type, size Check valve type F, size 25 to 200

F81B-36 **V**

Additional versions: Without pre-release (-)
With pre-release (V), size 25 to 80

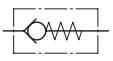
Basic type, size Pre-fill valves type F, size 25 to 200

Additional functions

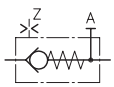
- With holes in the mounting flange (B)

Function

Check valve

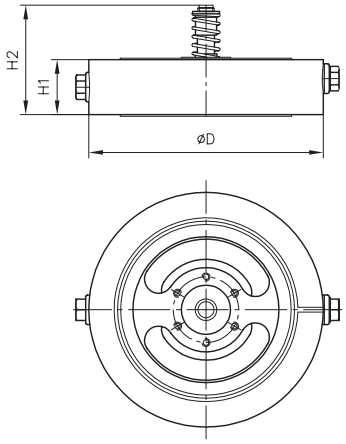


Pre-fill valve

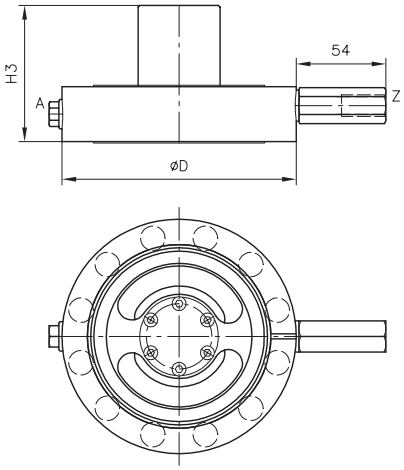


General parameters and dimensions

Check valve



Pre-fill valve



		Q_{max} [lpm]	p_{max} [bar]	Release ratio	Dimensions [mm]				m [kg]	
Check valve	**Pre-fill valve**			p_A / p_Z	**D**	**H1**	**H2**	**H3**	**Check valve**	**Pre-fill valve**
F 25	**F 25-12**	100	400	4.3	83	26	36	43	1	1.1
F 32	**F 32-16**	160		3.6	93	27	45	55	1	1.2
F 40	**F 40-20**	250		3.9	108	28	48.5	60	1.4	1.7
F 50	**F 50-25**	400		4.2	128	29	59	72	2	2.4
F 63	**F 63-30**	630		4.2	143	33.5	69	83	2.8	3.4
	F 64 B-30	760		4,2	143	33,5	69	83	2,8	3,4
F 80	**F 80-36**	1000		4.5	169	38.5	83	97.5	4.4	5.2
	F 81 B-36	1200		4,5	169	38,5	83	97,5	4,4	5,2
F 100	**F 100-45**	1600		4.3	212	44	97	118	9.9	11.7
	F 101 B-45	1920		4,3	212	44	97	118	9,9	11,7
F 125	**F 125-60**	2500		4.3	248	51	127	155	15.8	19.6
	F 126 B-60	3000		4.3	248	65	-	175	-	19.7
F 160	**F 160-76**	4000		4.3	310	70	182	233	43	50
	F 161 B-76	4800		4.3	310	85	-	245	-	44
F 200	**F 200-100**	7000	320	4.0	420	150	250	300	114	120

Associated technical data sheets:

- Check valve and pre-fill valve type F: D 6960

Check valves

2.5 Shuttle valve type WV and WVC

Shuttle valves are a type of check valve. They have two inlets and one outlet. As soon as a pressure signal is present on at least one of the two inlets, an outlet signal is generated. The inlet with the higher pressure is automatically connected to the outlet. The other inlet with lower pressure is blocked by a ball (OR operator).
The shuttle valve type WV is integrated in a T-fitting for pipe connection. The type WVC is a screw-in valve. The shuttle valves can withstand pressures up to 700 bar and have low flow resistances.
They can be used for transmitting control pressures or control and operating volumetric flows.

Features and benefits:

- Pressures up to 700 bar
- Insert and housing versions

Intended applications:

- In load-sensing systems
- Construction and construction materials machinery
- Cranes and lifting equipment
- Road vehicle
- General mobile hydraulics

Nomen-clature:	Shuttle valve
Design:	Individual valve for pipe mounting Valve insert Screw-in valve
p_{max}:	700 bar
Q_{max}:	160 l/min

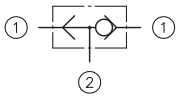
Design and order coding example

WV 10 - S

Design
- High pressure version (S)
- Low pressure version (L)

Basic type, size
Type WV for pipe connection, size 6 to 18
Type WVC and WVH as screw-in valve, size 1
Type WVE as screw-in valve, size 11

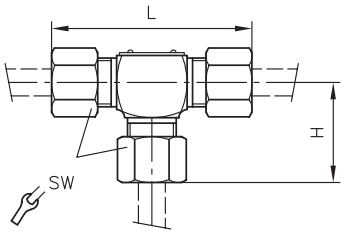
Function



1 Inlet
2 Outlet

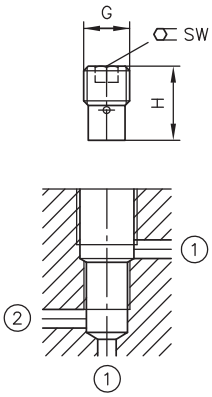
General parameters and dimensions

WV

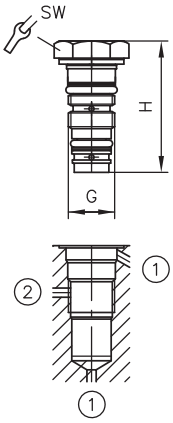


1 Inlet
2 Outlet

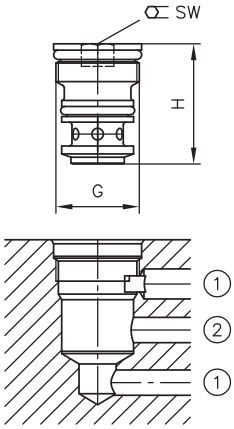
WVC



WVH



WVE



	Q_{max} [lpm]	p_{max} [bar]	External pipe Æ [mm]	Mounting thread	Dimensions [mm]			m [g]
				G	L	H	SW = a/f	
WV 6 - S	6	700	6	--	62	31	17	120
WV 8 - S	15		8		64	32	19	170
WV 10 - S	25	500	10		68	34	22	225
WV 12 - S	40		12		76	38	24	290
WV 14 - S	60		14		80	40	27	320
WV 16 - S	100		16		86	43	30	390
WV 18 - L	150	315	18		80	40	32	340
WVC 1	6		--	M 10 x 1	--	16	5	7
WVH 1	3	700	--	M 10 x 1	--	28.5	14	10
WVE 11	25	500	--	M 18 x 1	--	26	10	20

Associated technical data sheets:

- Shuttle valve type WV and WVC: D 7016

Similar products:

- Shuttle valves type WVH: **Sk 7962**
- Shuttle valves type WVE: **Sk 7088 050**