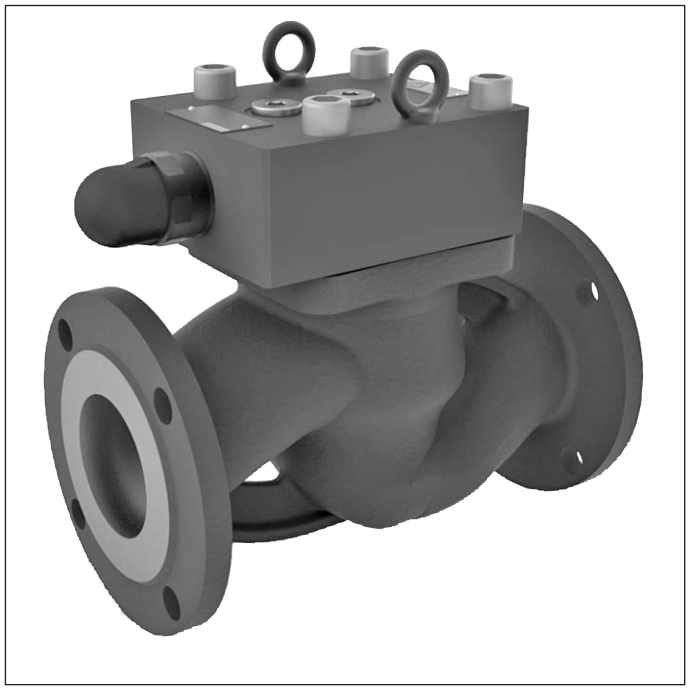
Pressure relief valve, pilot operated

Type L–DB

RE 25788
Edition: 2015-04



- Size 40 ... 300
- Component series 3X
- Maximum operating pressure 25 bar
- Maximum flow 50,000 l/min

Features

- For flange connection
- As cartridge valve
- Flange connection according to DIN EN 1092-2 type 21
- 2 pressure ratings
- Adjustment type for pressure adjustment:
  Bushing with hexagon and protective cap

Contents

Ordering code

01	02	03	04	05		06		07	08	09	10	11
L–DB				**2**	**–**	**3X**	**/**					*****

01	Pressure relief valve	**L–DB**

02	Pipeline installation	**no code**
	Cartridge valve (only sizes 50 ... 200)	**F**

03	Size 40	**40**
	Size 50	**50**
	Size 65	**65**
	Size 80	**80**
	Size 100	**100**
	Size 125	**125**
	Size 150	**150**
	Size 200	**200**
	Size 250	**250**
	Size 300	**300**

04	Flange connection according to DIN EN 1092-2 type 21	**F**
	Cartridge valve	**no code**

Adjustment type

05	Bushing with hexagon and protective cap	**2**

06	Component series 30 ... 39 (30 ... 39: unchanged installation and connection dimensions)	**3X**

Set pressure

07	Up to 16 bar	**16**
	Up to 25 bar (only sizes 80, 100 and 150)	**25**

Pilot oil guide

08	Internal pilot oil supply, external pilot oil return	**Y**
	External pilot oil supply, external pilot oil return	**XY**

09	Standard version	**no code**
	Valve for minimum cracking pressure	**U**

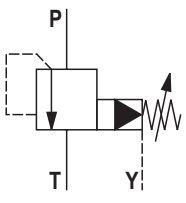
Seal material

10	NBR seals	**no code**
	FKM seals	**V**
	Observe compatibility of seals with hydraulic fluid used! (Other seals upon request)	

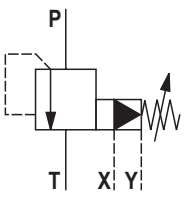
11	Further details in the plain text	*****

Symbols

Type L–DB...**Y**...



Type L–DB...**XY**...



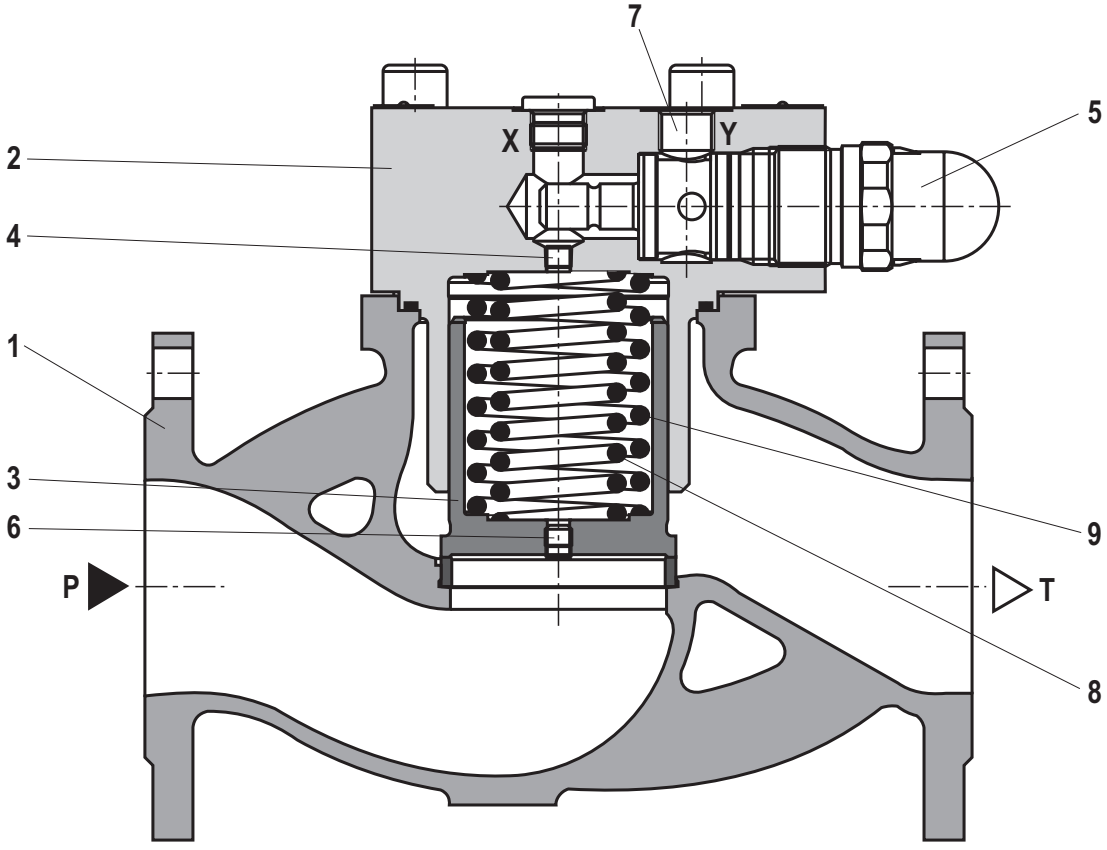
Function, section

Pressure valves of type L–DB are pilot operated pressure relief valves for a low preload pressure. They are suitable for high flow rates.
The valves are basically comprised of a pipeline installation housing unit (1), main piston guide (2), to hold the pilot control valve (5) and main spool (3).

Type L–DB
The pressure built up in channel P acts on the main spool (3) and is available via the nozzles (4) and (6) at the pilot control valve (5) simultaneously. If the pressure in channel P exceeds the value set at pilot control valve (5), the valve opens and the pilot oil drains directly into channel Y (7). The main spool (3) moves upward against the springs (8) and (9) and connects channel P to channel T, for as long as the pressure is above the value set on the pilot control valve.

With version “U”, the main spool (3) is held shut only by means of the outer spring (9). By relieving the control port, lower circulation pressure can be achieved.

Type L–DBF
The functionality of the “L–DBF” version is basically the same as the functionality of type L–DB. However, the valve is designed as a cartridge valve without pipe casing (1).



Technical data
(For applications outside these parameters, please consult us!)

General											
Size		40	50	65	80	100	125	150	200	250	300
Weight	kg	11	15	26	32	50	75	100	180	300	475
Installation position		any									
Ambient temperature range	°C	–30 ... +80 (NBR seals) –15 ... +80 (FKM seals)									

Hydraulic												
Maximum operating pressure	▶ Port P, X	bar	16			16, 25		16	16, 25	16		
	▶ Port T	bar	16			16, 25		16	16, 25	16		
Maximum counter pressure	▶ Port Y	bar	16			16, 25		16	16, 25	16		
Maximum flow		l/min	1000	1500	2700	3600	6000	7000	13000	24000	35000	50000
Hydraulic fluid			See table below									
Hydraulic fluid temperature range		°C	–30 ... +80 (NBR seals) –15 ... +80 (FKM seals)									
Viscosity range		mm^2/s	10 ... 800									
Maximum admissible degree of contamination of the hydraulic fluid cleanliness class according to ISO 4406 (c)			Class 20/18/15 [1]									

Hydraulic fluid		**Classification**	**Suitable sealing materials**	**Standards**	**Data sheet**
Mineral oils		HL, HLP	NBR, FKM	DIN 51524	90220
Bio-degradable [2]	▶ Insoluble in water	HETG	FKM	ISO 15380	90221
		HEES	FKM		
	▶ Soluble in water	HEPG	FKM	ISO 15380	
Flame-resistant [2]	▶ Water free	HFDU	FKM	ISO 12922	90222
	▶ Contains water	HFC (Fuchs Hydrotherm 46M, Petrofer Ultra Safe 620)	NBR	ISO 12922	90223

☞ **Important information on hydraulic fluids:**
- ▶ For more information and data about the use of other hydraulic fluids, refer to data sheets above or contact us!
- ▶ There may be limitations regarding the technical valve data (temperature, pressure range, life cycle, maintenance intervals, etc.)!
- ▶ The flash point of the hydraulic fluid used must be 40 K higher than the maximum valve surface temperature.
- ▶ **Flame-resistant – contains water**:
  - – Life cycle as compared to operation with mineral oil HL, HLP 30 to 100%

[1] The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents faults and at the same time increases the life cycle of the components.
For the selection of the filters see www.boschrexroth.com/filter.

[2] Only version “L–DBF”

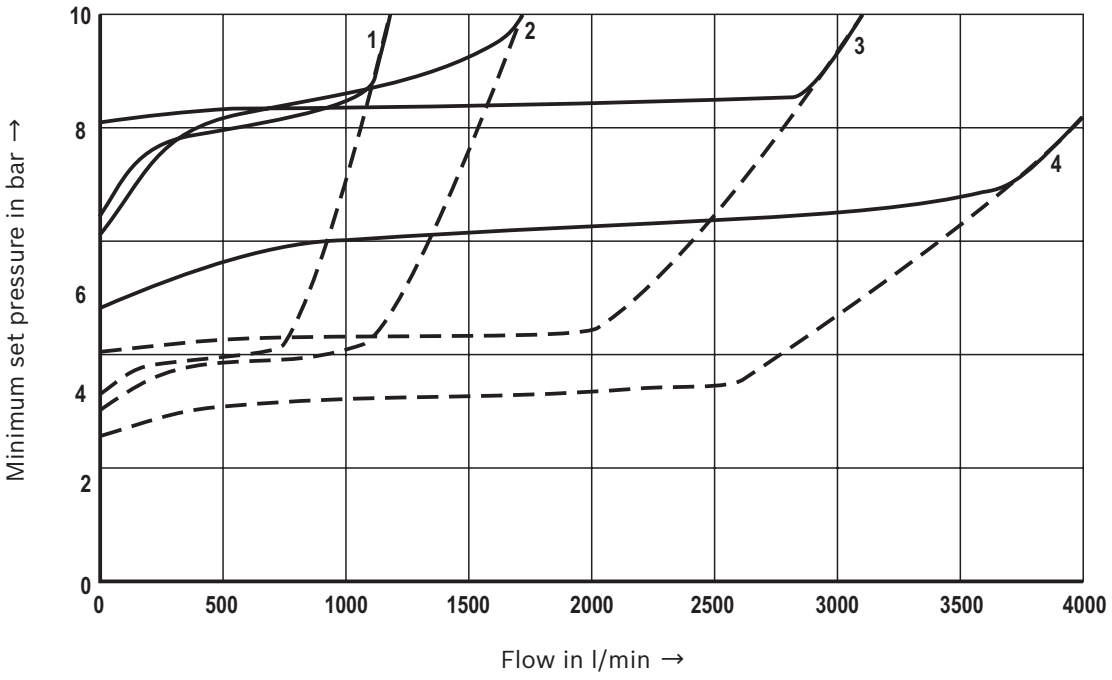
☞ **Notice:**
The maximum operating pressure is added up from the set pressure and counter pressure!

Characteristic curves

(simulated with HLP46, ϑ_{Oil} = 40 ± 5 °C)

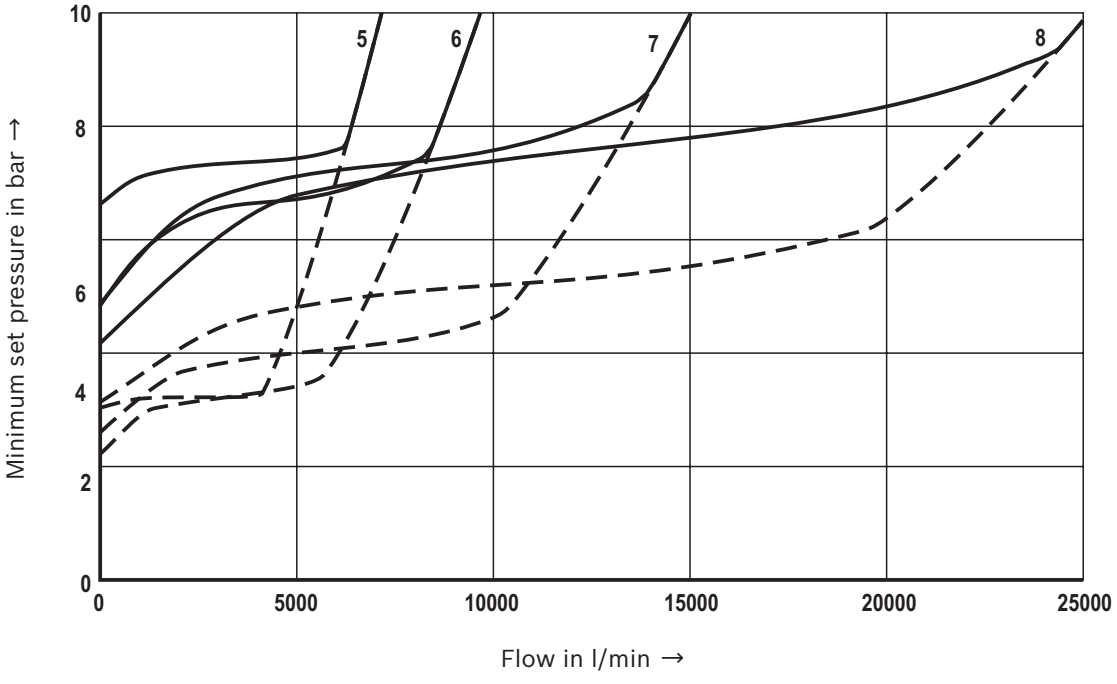
Minimum set pressure depending on the flow

Size 40 ... 80



1 Size 40
2 Size 50
3 Size 65
4 Size 80

Size 100 ... 200



5 Size 100
6 Size 125
7 Size 150
8 Size 200

Standard version

Model “U”

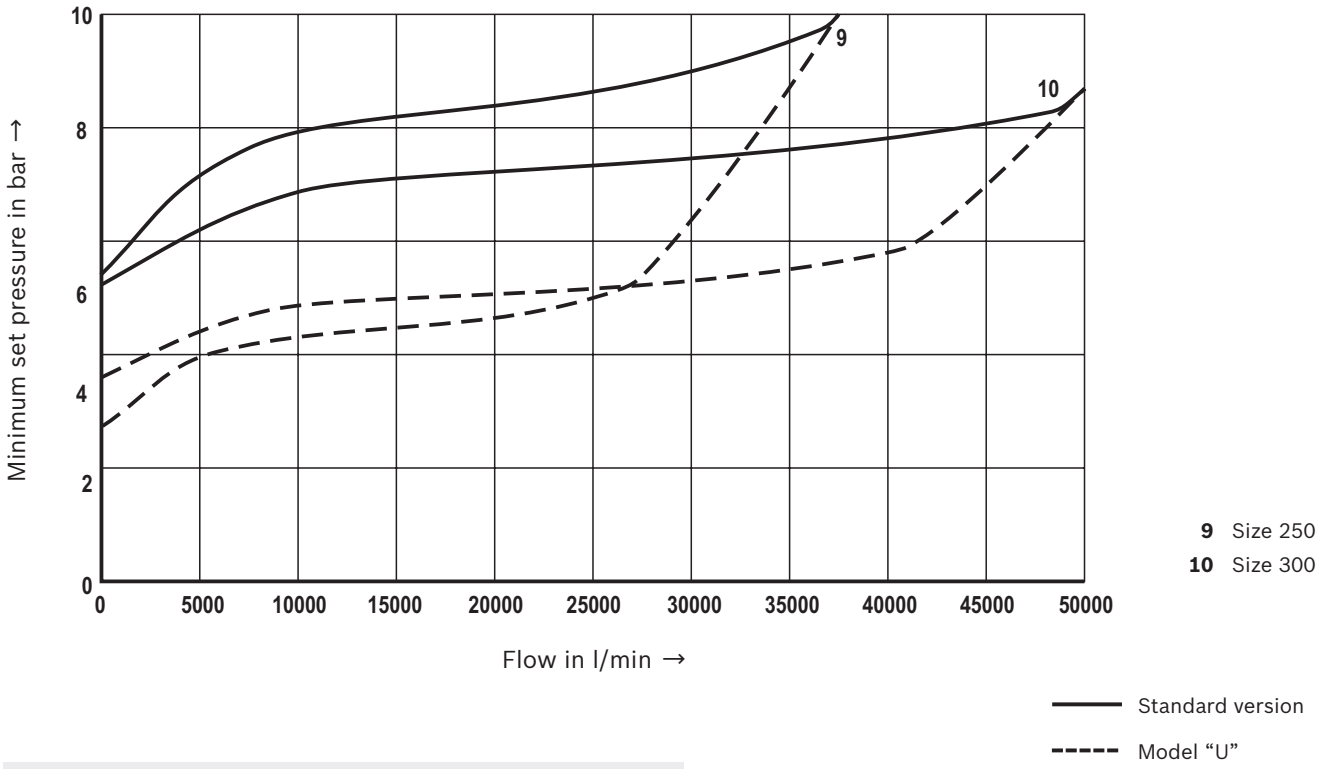
☞ **Notice:**
The characteristic curves were simulated using **external, depressurized pilot oil return**.

Characteristic curves

(simulated with HLP46, ϑ_{Oil} = 40 ± 5 °C)

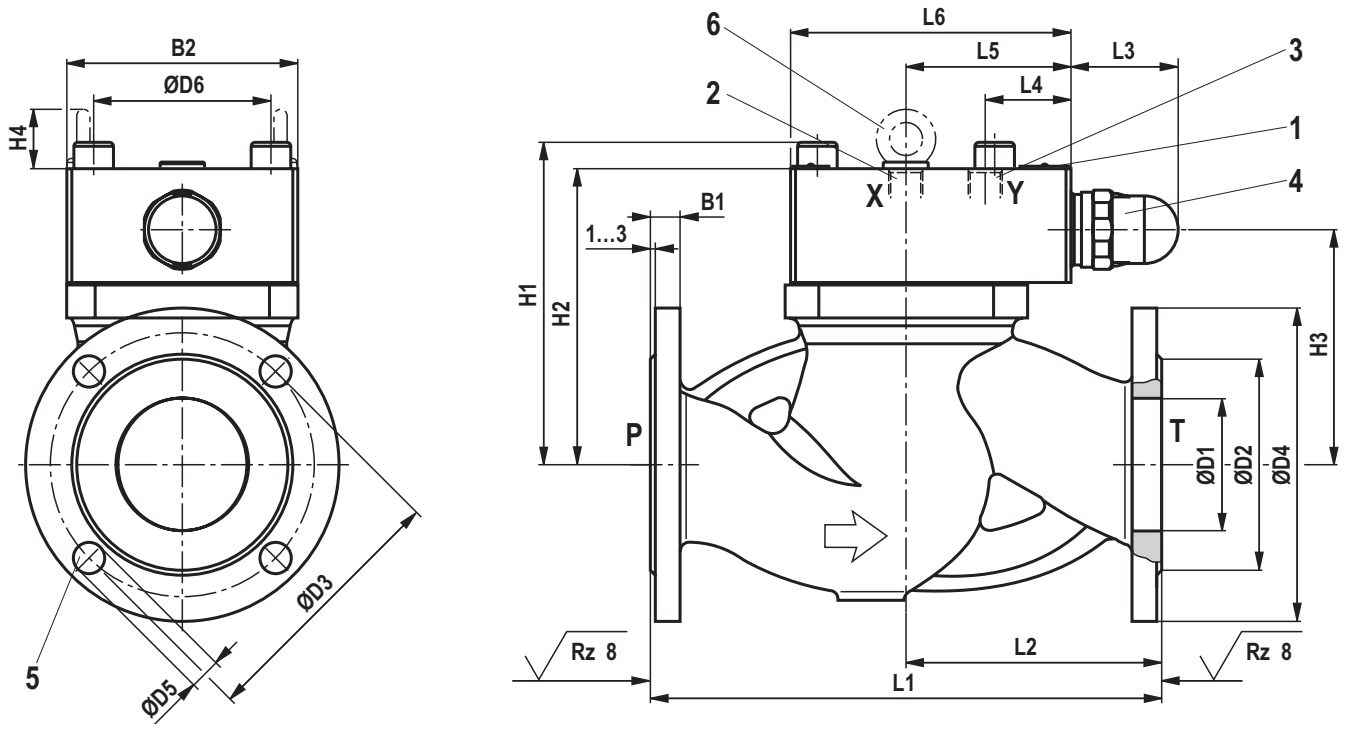
Minimum set pressure depending on the flow

Sizes 250 and 300



☞ **Notice:**
The characteristic curves were simulated using **external, depressurized pilot oil return**.

Dimensions: Pipeline installation “L–DB”
(dimensions in mm)



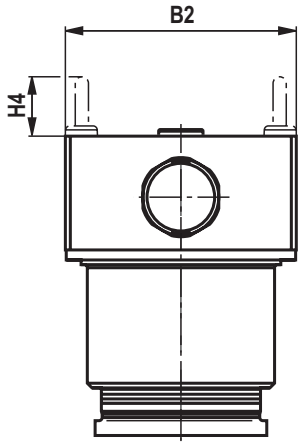
Size	L1	L2	L3	L4	L5	L6	H1	H2	H3	H4	B1	B2	ØD1	ØD2	ØD3	ØD4	ØD5	ØD6
40	198±2	99	68	42.5	77.5	117	139	127	97.5	–	13	95	40	84	110	150	19	Ø96
50	228±2	114	68	42.5	75	125	147	135	105.5	36	15	100	50	99	125	165	19	Ø110
65	288±3	144	65	52	92	155	183	167	130	36	15	125	65	118	145	185	19	Ø134
80 1)	308±3	154	65	52	100	170	195.5	179.5	142.5	36	17	140	80	132	160	200	19	Ø152
80 2)	308±3	154	65	52	100	170	195.5	179.5	142.5	36	14	140	80	132	160	200	19	Ø152
100 1)	348±3	174	65	52	111	191	220	200	163	36	19	160	100	156	180	220	19	Ø182
100 2)	348±3	174	65	52	111	191	220	200	163	36	14	160	100	156	190	235	23	Ø182
125	398±3	199	67	50.5	122.5	Ø245	247.5	227.5	190.5	53	21	–	125	184	210	250	19	Ø215
150 1)	478±3	239	65	53	138	Ø276	265	245	208	53	21	–	150	211	240	285	23	Ø245
150 2)	478±3	239	65	53	138	Ø276	265	245	208	53	14	–	150	211	250	300	28	Ø245
200	598±4	299	65	59	170	Ø340	314	294	257	53	25	–	200	266	295	340	23	Ø305
250	728±4	364	57	67	205	Ø410	357	333	296	62	27	–	250	319	355	405	28	Ø370
300	848±5	424	50	73.5	237.5	Ø475	398	374	337	62	26	–	300	370	410	460	28	Ø435

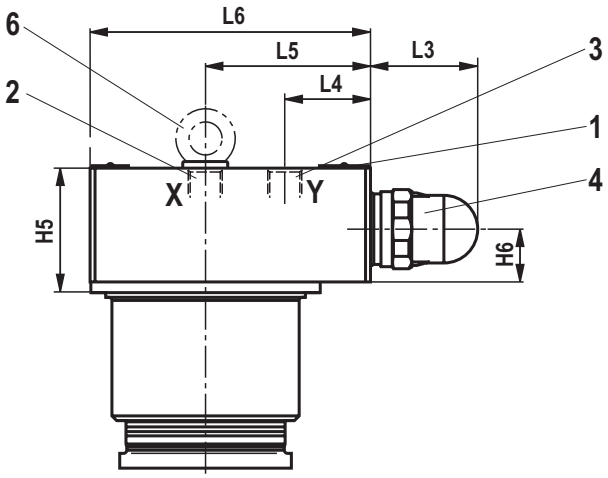
1) Version “16”
2) Version “25”

☞ **Notice:**
The dimensions are nominal dimensions which are subject to tolerances.

Item explanations and valve mounting screws see page 10.

Dimensions: Cartridge valve “L–DBF”
(dimensions in mm)



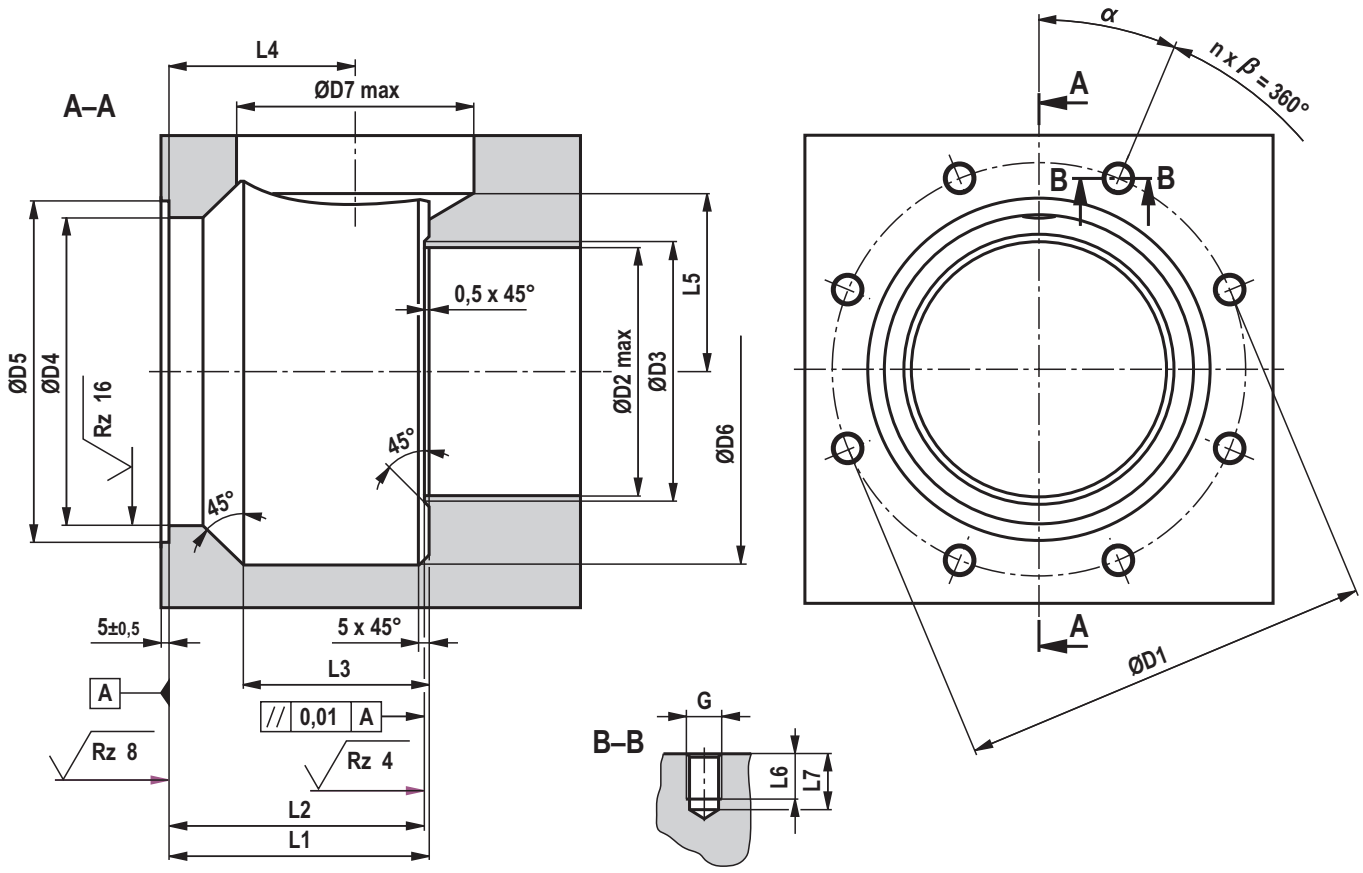


Size	L3	L4	L5	L6	H4	H5	H6	B2
50	68	42.5	75	125	36	60.5	24.5	100
65	65	52	92	155	36	75.5	32	125
80	65	52	100	170	36	76	32	140
100	65	52	111	191	36	76	32	160
125	67	50.5	122.5	Ø245	53	82	38	–
150	65	53	138	Ø276	53	79	35	–
200	65	59	170	Ø340	53	82	37	–

Item explanations and valve mounting screws see page 10.

☞ **Notice:**
The dimensions are nominal dimensions which are subject to tolerances.

Installation bore
(dimensions in mm)



Size	L1	L2	L3	L4	L5	L6	L7	ØD1	ØD2	ØD3	ØD4	ØD5	ØD6	ØD7	G	α	β	n
50	67.5	65.5	50	40.5	35	15	23	110	50	57	73	89	86	50	M12	45°	90°	4
65	83.5	81.5	60	55.5	45	20	29	134	65	75	89	105	105	65	M16	45°	90°	4
80	94.5	92.5	65	65.5	55	20	29	152	80	95	104	120	130	80	M16	45°	90°	4
100	114.5	112.5	76	75.5	67	30	38	182	100	109	128	148	160	100	M20	45°	90°	4
125	135	133	100	100.5	90	27	34	215	125	135	156	176	200	125	M20	30°	60°	6
150	153.5	151.5	110	110.5	105	27	34	245	150	160	183	203	230	150	M20	22.5°	45°	8
200	197	193	130	155.5	155	27	34	305	200	220	235	265	320	200	M20	15°	30°	12

Standards:

Workpiece edges	DIN ISO 13715
Form and position tolerance	DIN EN ISO 1101
General tolerance for metal-cutting procedures	DIN ISO 2768-mK
Tolerance	DIN ISO 8015
Surface composition	DIN EN ISO 1302

Item explanations and valve mounting screws see page 10.

☞ **Notice:**
The dimensions are nominal dimensions which are subject to tolerances.

Dimensions

1 Name plate (location can vary according to size)
2 X ports for pilot oil supply, external
3 Y ports for pilot oil return, external
4 Adjustment type “2”
5 Valve mounting bores
6 Ring bolt (2 pcs. if > size 50)

Valve mounting screws

▶ **Type L–DB** (not included)

Size	Quantity	Hexagon screw [1]	Hexagon nut		M_A in Nm [2]
40	4	Hexagon screw ISO 4018 - M16 - 4.6	HEXAGON NUT	ISO4032-M16	63
50	4	Hexagon screw ISO 4018 - M16 - 4.6	HEXAGON NUT	ISO4032-M16	63
65	4	Hexagon screw ISO 4018 - M16 - 4.6	HEXAGON NUT	ISO4032-M16	63
80	8	Hexagon screw ISO 4018 - M16 - 4.6	HEXAGON NUT	ISO4032-M16	63
100 [3]	8	Hexagon screw ISO 4018 - M16 - 4.6	HEXAGON NUT	ISO4032-M16	63
100 [4]	8	Hexagon screw ISO 4018 - M20 - 4.6	HEXAGON NUT	ISO4032-M20	123
125	8	Hexagon screw ISO 4018 - M16 - 4.6	HEXAGON NUT	ISO4032-M16	63
150 [3]	8	Hexagon screw ISO 4018 - M20 - 4.6	HEXAGON NUT	ISO4032-M20	123
150 [4]	8	Hexagon screw ISO 4018 - M24 - 4.6	HEXAGON NUT	ISO4032-M24	213
200	12	Hexagon screw ISO 4018 - M20 - 4.6	HEXAGON NUT	ISO4032-M20	123
250	12	Hexagon screw ISO 4018 - M24 - 4.6	HEXAGON NUT	ISO4032-M24	213
300	12	Hexagon screw ISO 4018 - M24 - 4.6	HEXAGON NUT	ISO4032-M24	213

▶ **Type L–DBF** (included)

Size	Mounting				Assembly aids (> size 80) [5]	
	Quantity	Hexagon socket head cap screw	Material no.	M_A in Nm [2]	Hexagon socket head cap screw	Material no.
40	4	ISO 4762 - M12 x 70 - 10.9-flZn-240h-L	R913000515	35		
50	4	ISO 4762 - M12 x 70 - 10.9-flZn-240h-L	R913000515	35		
65	4	ISO 4762 - M16 x 90 - 10.9-flZn-240h-L	R913000544	85		
80	4	ISO 4762 - M16 x 90 - 10.9-flZn-240h-L	R913000544	85	ISO 4762 - M16 x 120 - 8.8	R916445155
100	4	ISO 4762 - M20 x 100 - 10.9-flZn-240h-L	R913000386	165	ISO 4762 - M20 x 140 - 8.8	R916445188
125	6	ISO 4762 - M20 x 100 - 10.9-flZn-240h-L	R913000386	165	ISO 4762 - M20 x 160 - 8.8	R916445189
150	8	ISO 4762 - M20 x 100 - 10.9-flZn-240h-L	R913000386	165	ISO 4762 - M20 x 160 - 8.8	R916445189
200	12	ISO 4762 - M20 x 100 - 10.9-flZn-240h-L	R913000386	165	ISO 4762 - M20 x 140 - 8.8	R916445188
250	12	ISO 4762 - M24 x 100 - 10.9-flZn-240h-L	R913000407	285	ISO 4762 - M24 x 190 - 8.8	R916309987
300	14	ISO 4762 - M24 x 100 - 10.9-flZn-240h-L	R913000407	285	ISO 4762 - M24 x 220 - 8.8	R916445211

[1] DIN EN 1092-2 must be observed regarding the selection and layout.
[2] Tightening torques were calculated using hexagon socket head cap screws ISO 4762 (galvanized).
Friction coefficient μ_{total} = 0.09 to 0.14
[3] Version “16”
[4] Version “25”
[5] 2 pieces each

☞ **Notice:**
The tightening torques stated are guidelines when using screws with the specified friction coefficients and when using a manual torque wrench (tolerance ± 10%).

Further information

▶ Pressure relief valve, direct operated	Data sheet 25402
▶ Mineral-oil-based hydraulic fluids	Data sheet 90220
▶ Environmentally compatible hydraulic fluids	Data sheet 90221
▶ Flame-resistant, water-free hydraulic fluids	Data sheet 90222
▶ Flame-resistant hydraulic fluids - contains water (HFAE, HFAS, HFB, HFC)	Data sheet 90223
▶ Hexagon socket head cap screws metric/UNC	Data sheet 08936
▶ Hydraulic valves for industrial applications	Operating instructions 07600-B
▶ General product information on hydraulic products	Data sheet 07008
▶ Assembly, commissioning and maintenance of industrial valves	Data sheet 07300
▶ Selection of the filters	www.boschrexroth.com/filter

Notes

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