

Bosch Rexroth LFA50DB2-7X/315 manual pressure pilot control cover

Manufacturer: Bosch Rexroth

Manufacturer part number / published order designation: R900938163

Published model: LFA50DB2-7X/315

About this compilation

Prepared by Hydmaster from selected manufacturer documentation. Original technical pages follow without cropped drawings, rewritten data or altered units. This cover and index are Hydmaster editorial material, not a manufacturer-issued exact-execution datasheet.

Coverage: selected pages relevant to the identified size and configuration. Other options or neighbouring models retained on an original page apply only where explicitly identified.

Execution notes and conditions

Actual assembly pressure setting, pilot-orifice tuning and current delivery availability are not inferred.

Only the individual factory component is identified; no insert/cover combination or complete valve is created.

No scalar maximum complete-assembly pressure, delivered pilot setting, electrical voltage or optional directional-valve rating is inferred.

Source-page index

Source page numbers below are physical pages of each complete original PDF. The original printed page labels and technical content remain unchanged. Compiled page numbers count this cover/index.

Source A: Bosch Rexroth Pressure Logic Lc Lfa Re21050 2003

Original pages	Compiled pages	Relevant content
1-2	2-3	Manufacturer pressure-function component overview and compiled edition; Component functions and distinction between pressure relief and normally-open pressure reduction
4	4	ISO 7368 receiving cavity dimensions and installation interface
10	5	Size 50 LCDB with DB/DBW reference pressure-flow curves and oil/drain test conditions; no main insert is included
12-14	6-8	Published preferred material-number/model rows; exact current identity independently checked by SPC; Manual DB/DBW pressure-pilot cover function and applicable component interfaces; Separate control-cover, pressure-pilot and optional unloading-valve pressure limits
16-17	9-10	Pilot arrangement and standard reference orifice context; Cover mounting screws, sealing and installation reference
19	11	DB cover correct sizes 40-63 dimensional panel

RE 21 050/02.03

Replaces: 02.99

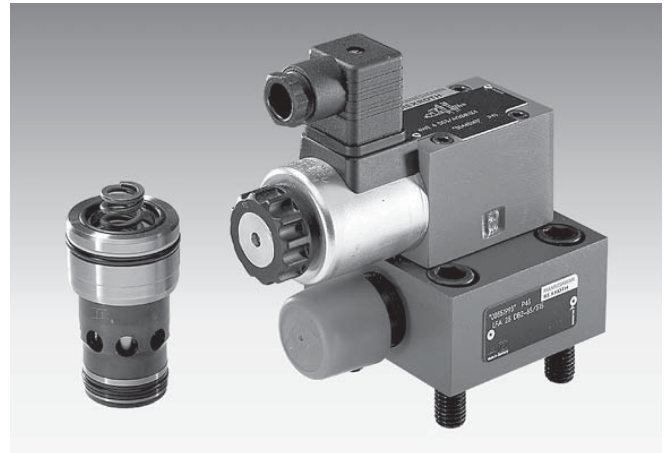
2-way cartridge valves; pressure functions
Cartridge valves type LC...
Control covers type LFA...

Nominal sizes 16 to 100

Series 6X; 7X

Maximum operating pressure 420 bar

Maximum flow 7000 L/min



H/A/D 5593

Cartridge valve type LC 25 DB40E-7X
Control cover type LFA 25 DBW2-7X/315 with manual pressure
adjustment, electrical unloading with built-on directional valve.

Overview of contents

Contents	Page	Contents	Page
Function, section, symbols		Ordering details, symbols and unit dimensions:	
– General	2	– Type DB	18 to 20
– Pressure relief function	2	– Types DBW; DBS	21 to 25
– Pressure reducing function	2 to 3	– Type DBWD	26 to 28
– Pressure sequencing function	3	– Type DBU2	29 to 32
– Cavity and porting pattern	4	– Type DBU3D	33 to 37
Pressure relief function:		– Type DBE	38
– Cartridge valve type LC . DB...:		– Type DBEM	39 to 42
• Ordering details	5	Pressure reducing function:	
• Symbols	5	– Cartridge valve type LC . DR...:	
• Technical data	5	• Ordering details	43
• Characteristic curves	6 to 11	• Symbol	43
• Seal kits	12	• Technical data	43
• Compression springs	12	• Characteristic curves	44 to 46
• Preferred types	12	• Seal kits	47
– Control cover type LFA . DB...:		• Compression springs	47
• Ordering details (general)	13 to 14	– Control cover type LFA . DR...:	
• Technical data	14	• Ordering details (general)	48
• Pilot valves	15	• Symbol	48
• Symbols (basic symbols)	16	• Technical data	49
• R-rings for pilot oil connections	17	• Pilot valve	49
• Seal kits	17	• Symbols (basic symbols)	50
• Fixing screws	17		
• Orifice dimensions	17		

Continued on page 2



© 2003

by Bosch Rexroth AG, Industrial Hydraulics, D-97813 Lohr am Main

All rights reserved. No part of this document may be reproduced or stored, processed, duplicated or circulated using electronic systems, in any form or by any means, without the prior written authorisation of Bosch Rexroth AG. In the event of contravention of the above provisions, the contravening party is obliged to pay compensation.

Overview of contents

Contents	Page	Contents	Page
• R-rings for the pilot oil connections • Fixing screws • General dimensions	51 51 52	Pressure sequencing function: – Control cover type LFA . DZ...: • Ordering details (general) • Symbols (basic symbols) • Technical data • R-rings for the pilot oil connections • Seal kits • Fixing screws • Orifice dimensions	61 61 62 62 63 63 63
Ordering details, symbols and unit dimensions:		Ordering details, symbols and unit dimensions:	
– Type DR	53 to 54	– Type DZ	64 to 65
– Type DRW	55 to 56	– Type DZW	66 to 67
– Types DREV; DREZ	57 to 58		
– Types DREVV; DREWZ			

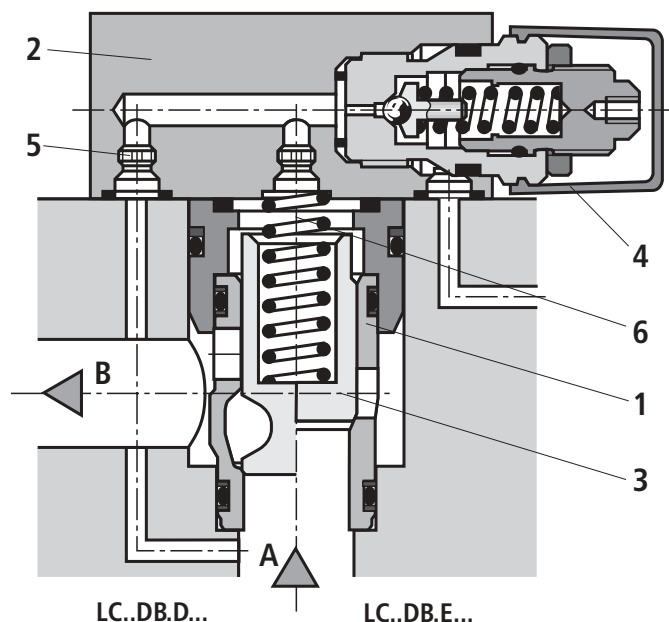
Function, section, symbols

General

The 2-way cartridge valves for pressure control functions are pilot operated poppet or spool valves. The main component designed as a cartridge valve (1) is inserted into a cavity which is standardised to DIN ISO 7368 and is sealed by the control cover (2).

The pilot valve (4) for either manual or electrical proportional pressure control is integrated into the control cover (2) or mounted onto the control cover (2) as a pilot valve with interface connections to DIN 24 340.

By combining the cartridge valve with the control covers different pressure functions can be realised.

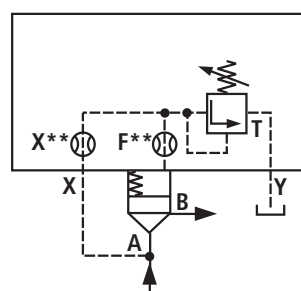


Pressure relief function

Control cover type LFA..DB...

Cartridge valve type LC..DB...

The cartridge valve (1) for the pressure relief function (type LC . DB...) is a poppet valve without an area differential (no effective area at port B). The pressure acting at port A is fed via the pilot supply orifice (5) to the spring side (6) of the element. At pressures below the setting of pilot valve (4) the forces on spool (3) are balanced and the spool remains closed due to the spring force. On reaching the set pressure, spool (3) opens and limits the pressure at port A in relation to the pressure-flow characteristics.



Type LFA..DB...

Type LC..DB...

Pressure reducing function

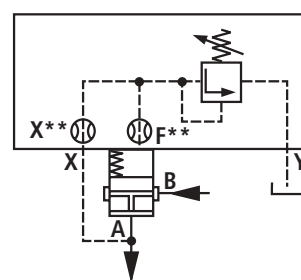
a) Normally open: Control cover type LFA..DB...
Cartridge valve type LC..DR...

The cartridge valve for the pressure reducing function is a spool valve without an area differential (no effective area at port B).

The same types of cover are used as pilot valves that are used for the pressure relief functions (type LFA..DB...).

The pressure acting at port A is fed to the spring side of the spool via the pilot oil supply orifice. Below the performance limit and pressure set at the pilot valve, the spool is pressure-balanced and is held open by the spring force, so that oil is free to flow from port B to port A.

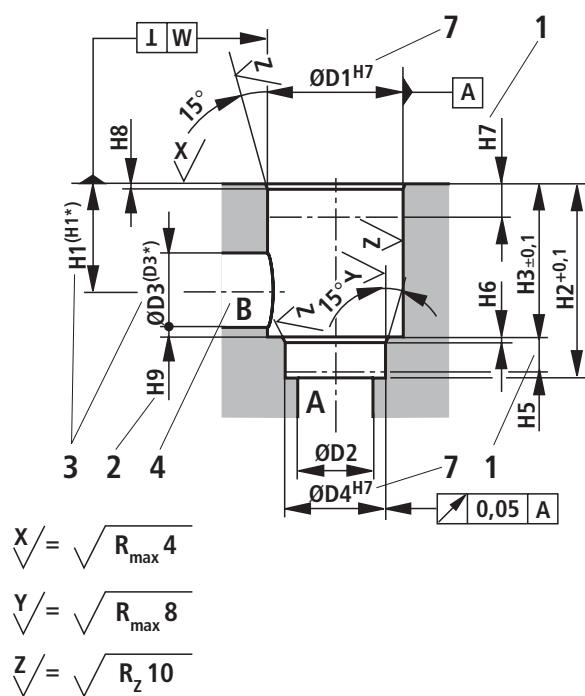
On reaching the set pressure, the spool closes and reduces the pressure at port A in relation to the pressure-flow characteristics.



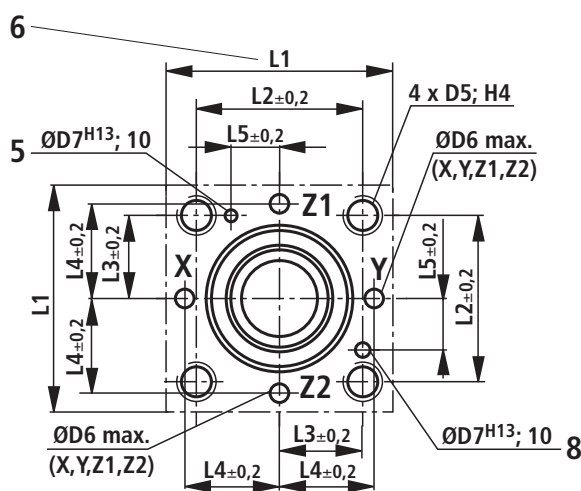
E.g.

Type LFA..DB...

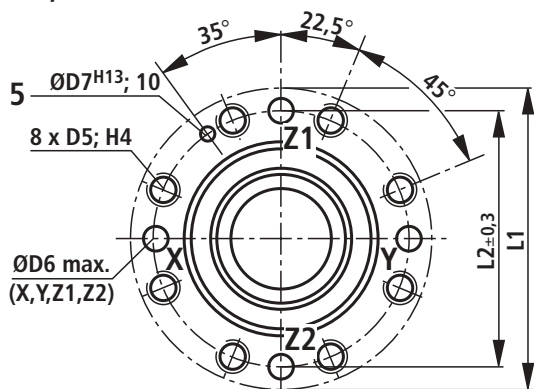
Type LC..DR40...



NS 16 to 63



NS 80, 100



NS	16	25	32	40	50	63	80	100
ØD1 ^{H7}	32	45	60	75	90	120	145	180
ØD2	16	25	32	40	50	63	80	100
ØD3	16	25	32	40	50	63	80	100
(ØD3*)	25	32	40	50	63	80	100	125
ØD4 ^{H7}	25	34	45	55	68	90	110	135
ØD5	M8	M12	M16	M20	M20	M30	M24	M30
ØD6 ¹⁾	4	6	8	10	10	12	16	20
ØD7 ^{H13}	4	6	6	6	8	8	10	10
H1	34	44	52	64	72	95	130	155
(H1*)	29.5	40.5	48	59	65.5	86.5	120	142
H2	56	72	85	105	122	155	205	245
H3	43	58	70	87	100	130	175±0.2	210±0.2
H4	20	25	35	45	45	65	50	63
H5	11	12	13	15	17	20	25	29
H6	2	2.5	2.5	3	3	4	5	5
H7	20	30	30	30	35	40	40	50
H8	2	2.5	2.5	3	4	4	5	5
H9	0.5	1	1.5	2.5	2.5	3	4.5	4.5
L1	65/80	85	102	125	140	180	Ø250	Ø300
L2	46	58	70	85	100	125	Ø200	Ø245
L3	23	29	35	42.5	50	62.5	—	—
L4	25	33	41	50	58	75	—	—
L5	10.5	16	17	23	30	38	—	—
W	0.05	0.05	0.1	0.1	0.1	0.2	0.2	0.2

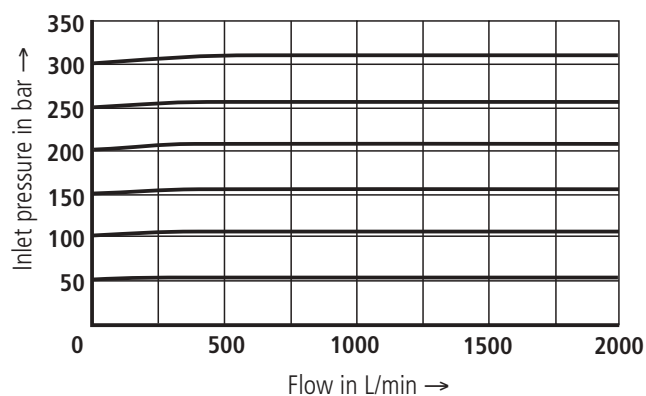
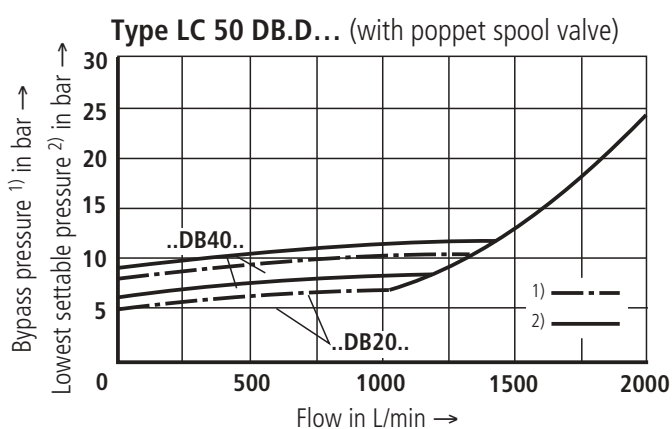
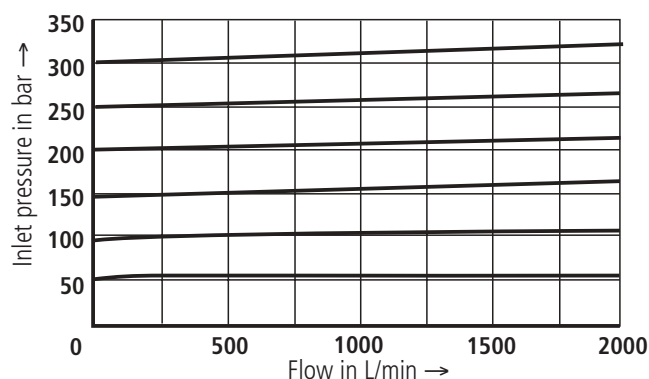
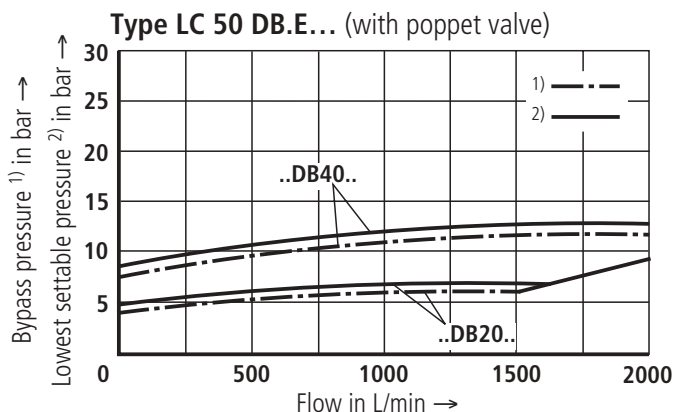
1) Max. dim.

- 1 Depth of fit
- 2 Reference dimension
- 3 For diameters of port B other than ØD3 or (ØD3*), the distance from the cover mounting surface to the centre of this hole must be calculated.
- 4 Port B may be moved about the central axis of port A. Care must however be taken to ensure that the fixing holes and control holes are not damaged.
- 5 Drilling for location pin (cover location pin fitted to DIN 24 342)
- 6 **Note on NS 16 porting pattern:**
Length L1 (axis x-y drilling) is 80 mm.
- 7 For Ø ≤ 45 mm → fit H8 is permitted!
- 8 Drilling for locating pin with functions as a main pressure relief valve (cover locating pin has to be appropriately relocated during assembly)

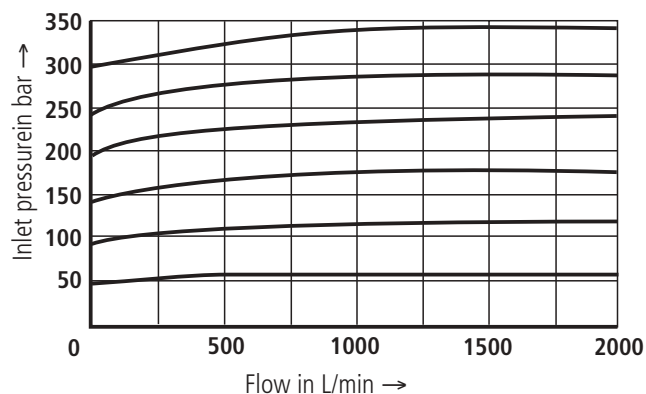
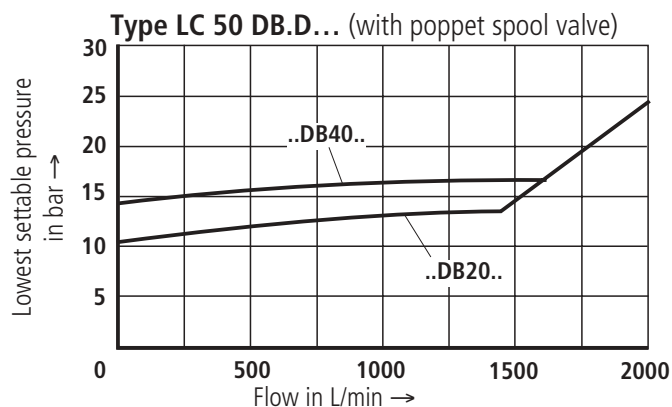
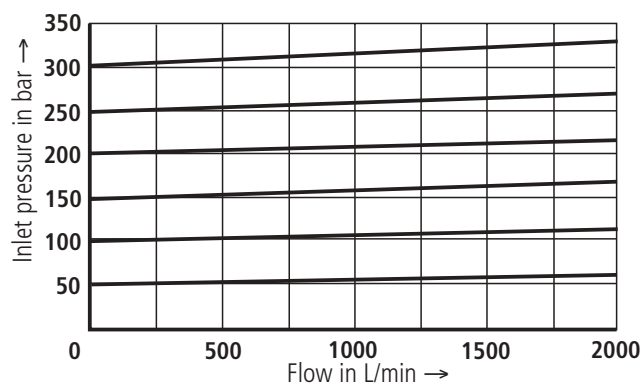
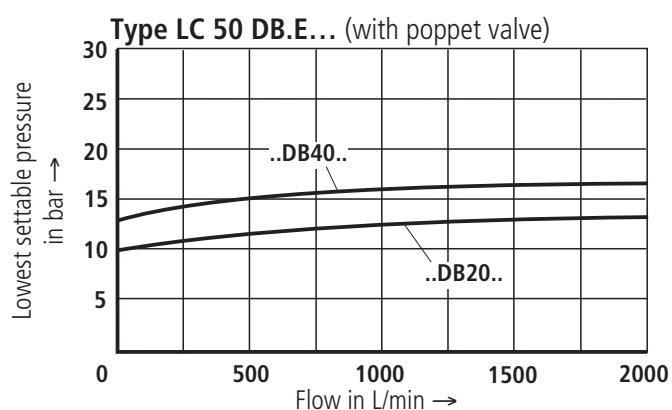
Characteristic curves: NS 50 (measured with HLP 46; $\vartheta_{oil} = 40\text{ °C} \pm 5\text{ °C}$)

The characteristic curves were measured with an external pilot oil drain at zero pressure. With an internal pilot oil drain the inlet pressure is increased by the pressure being applied at port B.

Manual pressure adjustment, type LFA 50 DB... and type LFA 50 DBW...



Electrical proportional pressure adjustment, type LFA 50 DBE...



Seal kits for cartridge valves type LC...

Nominal size	Material No.	
	NBR seals	FKM seals
16	R900313104	R900313107
25	R900313105	R900313108
32	R900313106	R900313109
40	R900873022	R900873025

Nominal size	Material No.	
	NBR seals	FKM seals
50	R900873023	R900873026
63	R900873024	R900873027
80	R900314058	R900314067
100	R900314059	R900314068

Compression springs for cartridge valves type LC...

NS	Spring dimensions in mm	Opening pressure in bar	Material No.
16	10.2/1.3 x 40.5/8.0	2.0	R900062747
	10.0/1.6 x 38.2/9.0	3.0	R900062753
	9.8/1.7 x 38.0/9.0	4.0	R900062754
	9.7/1.9 x 35.7/8.5	5.0	R900062757
	9.2/2.4 x 60.5/14.5	8.0 ¹⁾	R900082073
25	15.3/2.25 x 55.0/8.0	2.0	R900062762
	14.9/2.7 x 53.4/8.5	3.0	R900062764
	14.7/2.8 x 53.5/8.5	4.0	R900062820
	14.6/3.0 x 52.5/8.5	5.0	R900062819
	14.1/3.5 x 78.5/12.0	8.0 ¹⁾	R900082072
32	19.6/2.8 x 69.5/7.5	2.0	R900062813
	19.2/3.2 x 71.0/8.5	3.0	R900062783
	19.1/3.4 x 72.0/9.5	4.0	R900062810
	19.1/3.5 x 72.8/9.0	5.0	R900062805
	18.5/4.0 x 109/14.5	8.0 ¹⁾	R900082071

NS	Spring dimensions in mm	Opening pressure in bar	Material No.
40	25.9/4.25 x 63.0/6.0	2.0	R900206675
	25.7/4.5 x 68.5/6.0	4.0	R900206673
	24.8/5.3 x 105.0/10.0	8.0 ¹⁾	R900206671
50	33.2/5.0 x 82.0/5.5	2.0	R900206684
	32.8/5.3 x 92.0/6.5	4.0	R900206681
	31.7/6.5 x 137.0/10.5	8.0 ¹⁾	R900206680
63	40.6/6.5 x 108.0/7.0	2.0	R900206690
	40.7/6.5 x 127.5/7.5	4.0	R900206692
	38.6/8.5 x 183.5/11.5	8.0 ¹⁾	R900206689
80	48.5/8 x 138/7.5	2.0	R900012353
	49/8 x 152.5/7.5	4.0	R900024113
100	52.3/9.5 x 176/9.5	2.0	R900012385
	52.3/9.5 x 195.5/9.5	4.0	R900024483

¹⁾ These springs require an additional installation length.
When using standard control covers an additional sandwich plate type LFA..D22... must be used.



Exception:

Control cover type "D" can be replaced by type LFA..D8-../F (no sandwich plate required).

Preferred types (readily available)

Typ LC (Einbauventil)	Material-Nummer
LC 16 DB40E7X/	R900912532
LC 16 DB40D7X/	R900912547
LC 40 DB40E7X/	R900927969
LC 40 DB40D7X/	R900938014
LC 50 DB40E7X/	R900938041
LC 50 DB40D7X/	R900938040
LC 63 DB40E7X/	R900938070
LC 63 DB40D7X/	R900938069

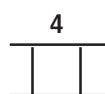
Typ LFA (Steuerdeckel)	Material-Nummer
LFA 16 DB2-7X/315	R900912757
LFA 32 DB2-7X/315	R900912768
LFA 40 DB2-7X/315	R900927972
LFA 50 DB2-7X/315	R900938163
LFA 63 DB2-7X/315	R900938230
LFA 16 DBW2-7X/315	R900912805
LFA 25 DBW2-7X/315	R900912810
LFA 32 DBW2-7X/315	R900912815
LFA 40 DBW2-7X/315	R900938096
LFA 50 DBW2-7X/315	R900938191
LFA 63 DBW2-7X/315	R900938238

Further preferred types and standard components are shown in the EPS (standard price list).

General notes on the ordering details for control covers

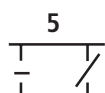
123456789														
LFA				— /		A...	B...							
						DB max	DB1	DB2						
•= Available														
Nominal size								Type ¹⁾	Adjustment type	Series	Pressure stage in bar for nominal sizes 16 to 3240 to 100		Seal material	Page
16	25	32	40	50	63	80	100							
•	•	•	•	•	•					7X				
						•	•			6X				
•	•	•	•	•	•	•	•	DB			025	025	For ordering details, see pages giving details of the individual cover variations	18 to 20
								DBW			050	050		21 to 25
•	•	•	•	•	•	•	•	DBS			100	100		21 to 25
			•	•	•	•	•	DBWD			200	200		26 to 28
•	•	•	•	•	•	•	•	DBU2A			315	315		29 to 32
•	•	•	•	•	•	•	•	DBU2B			420	400		29 to 32
•	•	•	•	•	•	•	•	DBU3D				025; 050; 100; 200; 315; 400		33 to 37
•	•	•	•	•	•			DBE						38
•	•	•	•	•	•	•	•	DBEM				025; 050; 100; 200; 315; 420		025; 050; 100; 200; 315; 400

¹⁾ For functions, see selection table on page 15



Adjustment types for pressure relief valves

- 1 = Rotary knob
- 2 = Hexagon with protective cap
- 3 = Lockable rotary knob with scale (H-key to automotive industry standards)
- 4 = Rotary knob with scale, not lockable

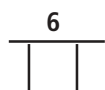


Series

7X = Series 70 to 79 and

6X = Series 60 to 69

(unchanged installation and connection dimensions)



Pressure stages

Dependent on the nominal size and permissible working pressure of the pilot valve. For further details see ordering details for the control cover.

Preferred types and standard components can be found in the EPS (Standard Price List).



Pressure data for DB1, only required for types DBU2 and DBU3D



Pressure data for DB2, only required for type DBU3D

Ordering example for type DBU3D
.../315* A 100 B 200 (DB max /DB1/DB2)

*DB max. always first

The control covers are always fitted with a, optimised on our test rig, standard orifice. Orifice details are therefore not required in the type code. Deviating operating conditions could make it necessary to match the orifice size. The orifices are of the threaded type.

Orifice as shown within the main symbol



General notes on the ordering details for control covers: pilot control valve (max. operating pressure)

Pilot control valve		Control cover		Max. operating pressure in bar Y, T			Included in type code	Has to be specially ordered
Type	Catalogue sheet No.	NS	Type	X	For pressure control	Static		
DBD. 2 K2X/... ¹⁾	On request	16 to 32	DB, DBW, DBWD,	420	Zero pressure (up to ≈ 2 bar)	315	•	
DBD. 6 K1X/... ²⁾	25 402	40 to 63	DBU2., DBU3D,	400		315	•	
DBD. 10 K1X/... ²⁾	25 402	80, 100	DBEM, DBS	400		315	•	
.WE 6 ...	23 178	16 to 63	DBW, DBWD,	350		210 (=); 160 (~)		•
.WE 10 ...	23 327	80, 100	DBU2., DBU3D	315		210 (=); 160 (~)		•
M-3SEW 6 ...	22 058	16 to 63	DBW, DBS	420		100		•
M-3SED 6 ...	22 049	16 to 63	DBW, DBS	315		X-40		•
M-3SEW 10 ...	22 075	80, 100	DBW, DBS	420		100		•
M-3SED 10 ...	22 045	80, 100	DBW, DBS	315		X-40		•
DBET-5X/.G24-1 ³⁾	29 165	16 to 32	DBE, DBEM	350		100		•
DBET-5X/.G24...	29 165	40	DBE, DBEM	350		100		•
DBET-5X/.YG24-1 ³⁾	On request	50 to 100	DBE, DBEM	350		100		•
DBETR...	On request	16 to 100	auf Anfrage					

¹⁾ Possible pressure stages: 25, 50, 100, 200, 315, 420

²⁾ Possible pressure stages: 25, 50, 100, 200, 315, 400

³⁾ Possible pressure stages: 50, 100, 200, 315, 350
1 = G 1/4 threaded connection T; special poppet



Note:

By combining a 2-way cartridge valve with a pilot control valve, various valve functions can be obtained.

The following components may be considered with porting pattern form A6 (up to NS 63) and form A10 (NS 80 to 100) DIN 24 340.

Valve fixing screws are included within the control cover scope of supply.

Fixing screws: S.H.C.S. to DIN 912-10.9

Pilot control valve Type	Dimensions	Tightening torque in Nm	Pilot control valve Type	Dimensions	Tightening torque in Nm
M-3SEW 6 ...	M5 x 45	8.9	.WE 6 ...	M5 x 50	8.9
M-3SEW 10 ...	M6 x 40	15.5	.WE 10 ...	M6 x 40	15.5
M-3SED 6 ...	M5 x 50	8.9	DBET ...	M5 x 30	8.9
M-3SED 10 ...	M6 x 40	15.5			

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

Maximum operating pressure	bar	420 ⚠ Attention: p_{max} Take the pilot control valve into account!
Pressure fluid ¹⁾ Suitable for NBR and FKM seals ²⁾ Only suitable for FKM seals		Mineral oil (HL, HLP) to DIN 51 524 ¹⁾ ; Fast bio-degradable pressure fluids to VDMA 24 568 (also see RE 90 221); HETG (rape seed oil) ¹⁾ ; HEPG (polyglycols) ²⁾ ; HEES (synthetic ester) ²⁾ ; Other pressure fluids on request
Pressure fluid temperature range	°C	– 30 to + 80 for NBR seals – 20 to + 80 for FKM seals
Viscosity range	mm ² /s	2.8 to 380
Cleanliness class to ISO code		Maximum permissible degree of contamination of the pressure fluid is to ISO 4406 (C) class 20/18/15 ³⁾

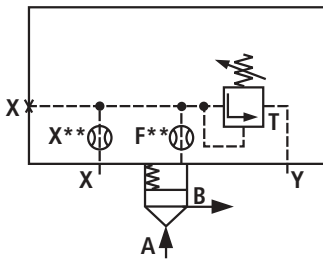
³⁾ The cleanliness class stated for the components must be adhered too in hydraulic systems. Effective filtration prevents faults from occurring and at the same time increases the component service life.
For the selection of filters see catalogue sheets RE 50 070, RE 50 076 and RE 50 081.

Symbol overview (basic symbols), pressure relief function

Valid symbols are shown in the following type descriptions !

①

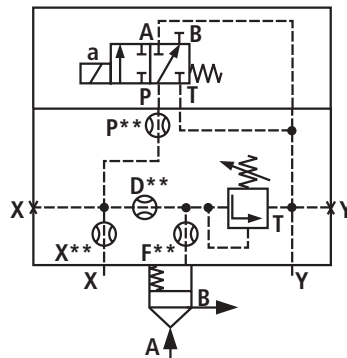
LFA..DB.-../..NS16 to 100



See pages 18 to 20

②

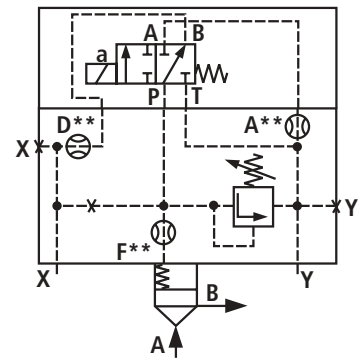
LFA..DBW.-../..NS16 to 32



See pages 21, 22

③

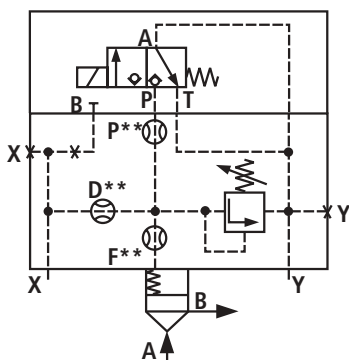
LFA..DBW.-../..NS40 to 100



See pages 21 to 25

④

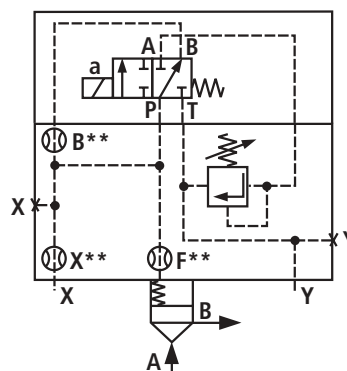
LFA..DBS.-../..NS40 to 100



See pages 21 to 25

⑤

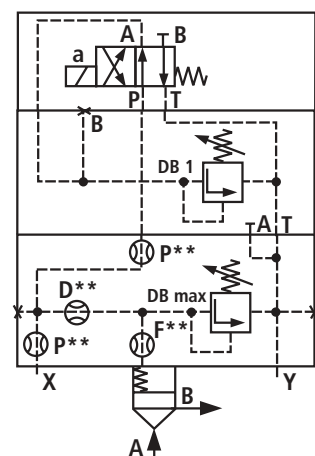
LFA..DBWD.-../..NS16 to 100



See pages 26 to 28

⑥

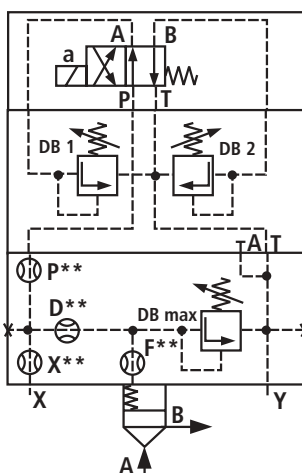
LFA..DBU2A.-../..NS16 to 100



See pages 29 to 32

⑦

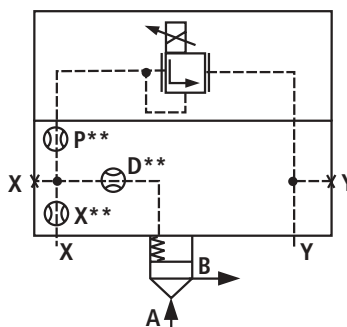
LFA..DBU3D.-../..NS16 to 100



See pages 33 to 37

⑧

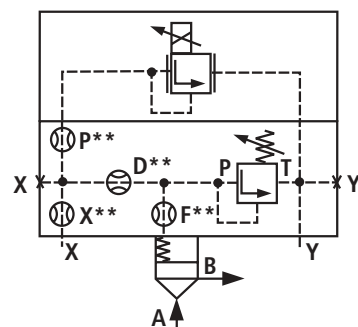
LFA..DBE.-../..NS16 to 63



See page 38

⑨

LFA..DBEM.-../..NS16 to 100



See pages 39 to 42

R-rings dimensions for ports X, Y (included within the scope of supply)

NS	Dimensions mm	Material No.	
		NBR	FKM
16	8.41 x 1.40 x 1.78	R900025407	R900025408
25	9.81 x 1.50 x 1.78	R900017453	R900017610
32	11.18 x 1.60 x 1.78	R900017455	R900017611
40, 50	13.00 x 2.30 x 2.62	R900017457	R900017617
63	18.72 x 2.62 x 2.62	R900024445	R900024446
80	26.57 x 3.53 x 3.53	R900017466	R900017630
100	34.52 x 3.53 x 3.53	R900017472	R900017633

Seal kits for control cover type LFA..

Seal kit for LFA...	Material No.							
	NS 16		NS 25		NS 32		NS 40	
	NBR	FKM	NBR	FKM	NBR	FKM	NBR	FKM
..DB..; DBW..; ..DBS.. ..DBWD..; ..DBEM..	R900313955	R900313956	R900313957	R900313958	R900313802	R900313803	R900313722	R900313723
..DBU2..; ..DBU3..	R900313709	R900313710	R900313711	R900313712	R900313713	R900313714	R900885152	R900313716
DBE..	R900313701	R900313702	R900313703	R900313704	R900313705	R900313706	R900313707	R900313708

Seal kit for LFA...	Material No.							
	NS 50		NS 63		NS 80		NS 100	
	NBR	FKM	NBR	FKM	NBR	FKM	NBR	FKM
..DB..; DBW..; ..DBS.. ..DBWD..;	R900895786	R900313725	R900313726	R900313727	R900310533		R900313054	
..DBU2..; ..DBU3..	R900313717	R900313718	R900313719	R900313720	R900312090			
..DBE..	R900313897	R900313898	R900313899	R900313700				
..DBEM..	R900313893	R900313894	R900313895	R900313896	R900311930		R900312219	

Fixing screws (included within the scope of supply)

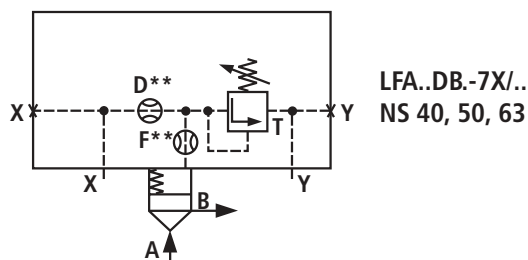
S.H.C.S. to DIN 912-10.9

NS	Qty.	Dimensions	Tightening torque in Nm
16	4	M 8 x 45	32
25	4	M 12 x 50	110
32	4	M 16 x 60	270
40	4	M 20 x 70	520
50	4	M 20 x 80	520
63	4	M 30 x 100	1800
80	8	M 24 x 120	900
100	8	M 30 x 120	1800

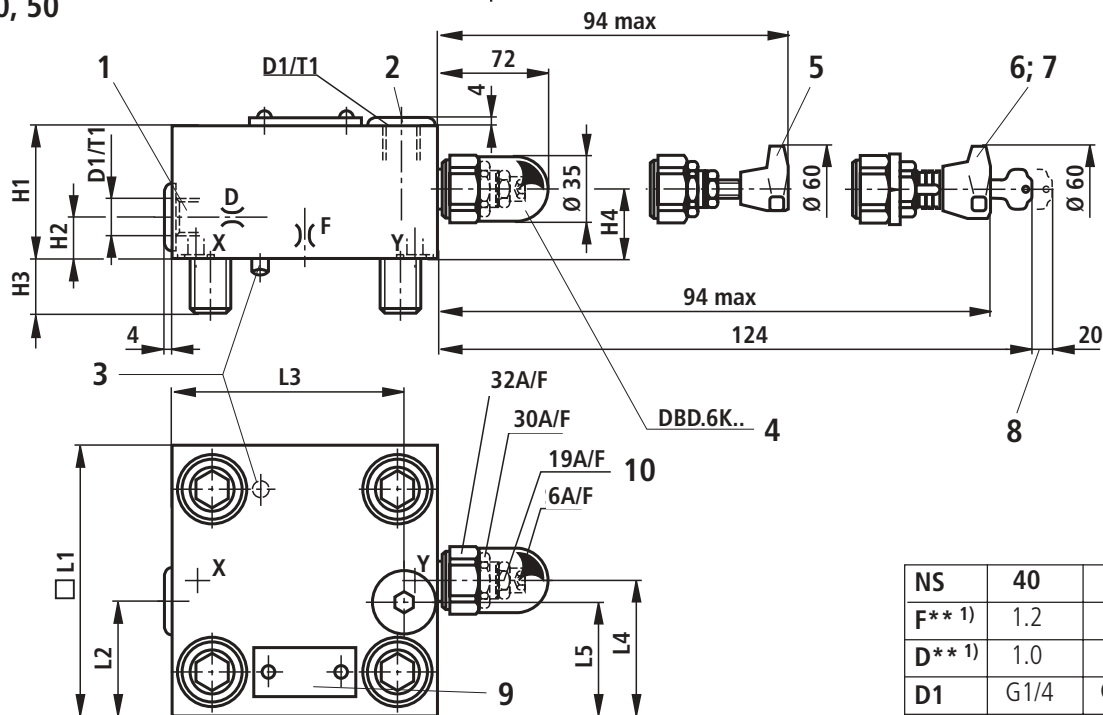
Orifice thread size

D orifices for type ..DBE.. NS 25 to 63	M8 x 1 tapered
Orifices for NS 80, 100	M8 x 1 tapered (A**, B**, P**, D**) or G 1/4 (X**, F**)
Other built-in orifices	M6 tapered

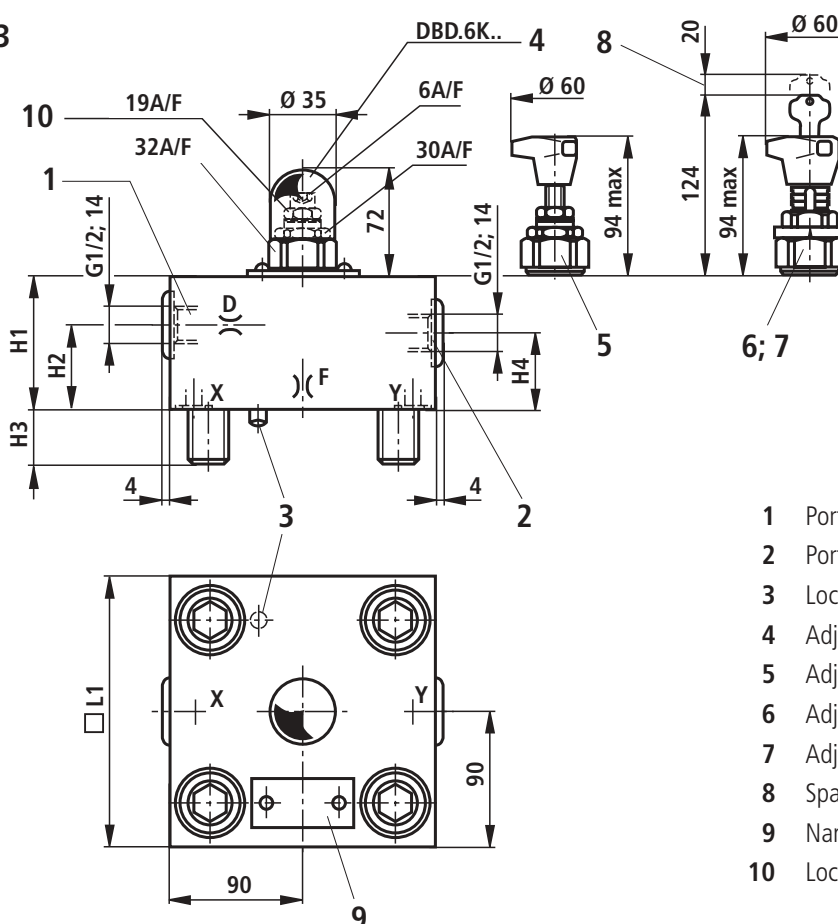
Control cover with manual pressure adjustment



NS 40, 50



NS 63



NS	40	50	63
F** 1)	1.2	1.5	2.0
D** 1)	1.0	2.0	2.5
D1	G1/4	G1/2	
H1	60	68	82
H2	28	19.5	30
H3	32	34	50
H4	27	35	45.5
□ L1	125	140	180
L2	69	80	
L3	89	105	
L4	76	84	
L5	60	70	
T1	12	14	

** Orifice Ø

1) Orifice M6 tapered

- 1 Port X optionally as a threaded port
- 2 Port Y optionally as a threaded port
- 3 Locating pin
- 4 Adjustment "2"
- 5 Adjustment "1"
- 6 Adjustment "3"
- 7 Adjustment "4"
- 8 Space required to remove the key
- 9 Name plate
- 10 Locknut