

# Bosch Rexroth LC16DB20D7X/ pressure-control logic cartridge insert

Manufacturer: Bosch Rexroth  
Manufacturer part number / published order designation: R900912546  
Published model: LC16DB20D7X/

## 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.

## 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                                                                                                  |
| 4-6            | 4-6            | ISO 7368 receiving cavity dimensions and installation interface; Exact LCDB construction key, spring classes and individual insert ratings; LCDB size 16 pressure-flow curves for the actual insert form; reference pilot/cover test arrangement is not included hardware |
| 12             | 7              | Published preferred material-number/model rows; exact current identity independently checked by SPC                                                                                                                                                                       |

**RE 21 050/02.03**

Replaces: 02.99

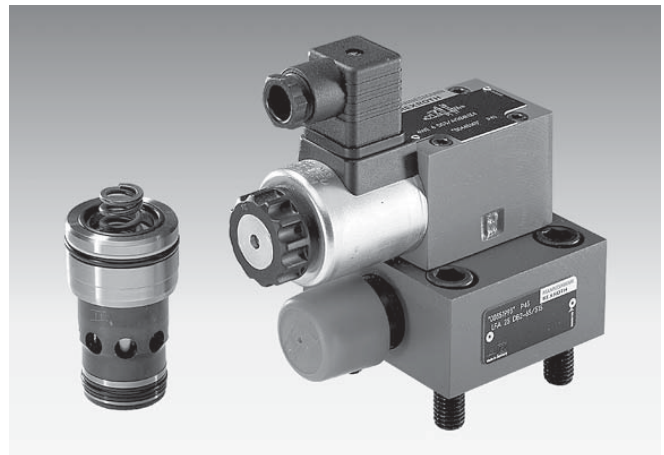
**2-way cartridge valves; pressure functions**  
**Cartridge valves type LC...**  
**Control covers type LFA...**

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.

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## Overview of contents

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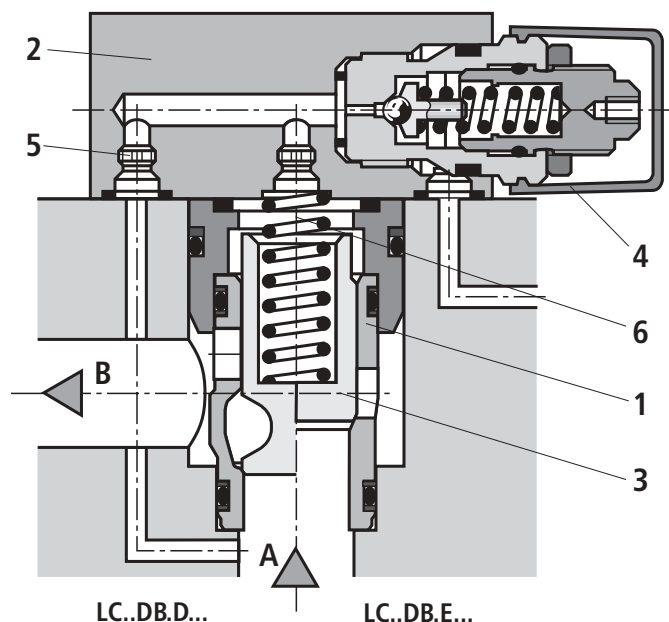
## Function, section, symbols

### 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.

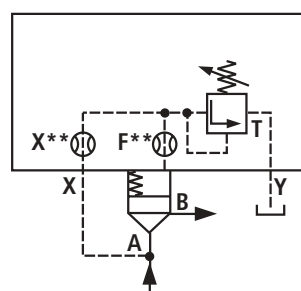


### Pressure relief function

#### 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

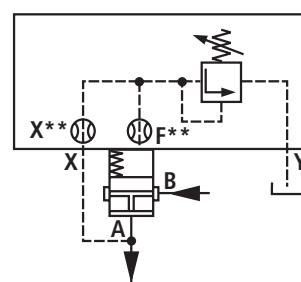
**a) Normally open:**      **Control cover type LFA..DB...**  
                                  **Cartridge valve type LC..DR...**

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.

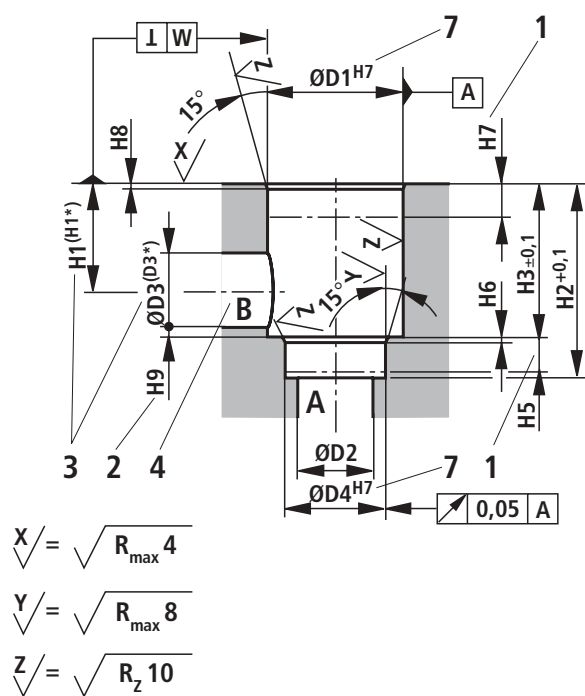
On reaching the set pressure, the spool closes and reduces the pressure at port A in relation to the pressure-flow characteristics.



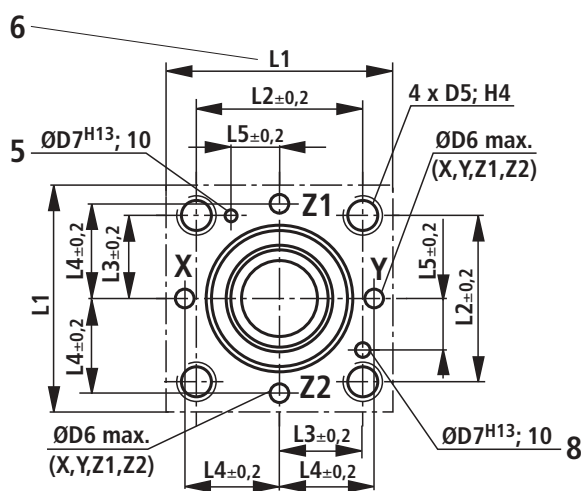
E.g.

Type LFA..DB...

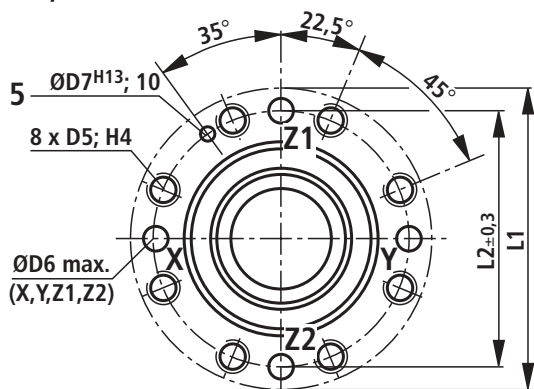
Type LC..DR40...



## NS 16 to 63



## NS 80, 100



| NS                 | 16    | 25   | 32  | 40   | 50   | 63   | 80      | 100     |
|--------------------|-------|------|-----|------|------|------|---------|---------|
| ØD1 <sup>H7</sup>  | 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 <sup>H7</sup>  | 25    | 34   | 45  | 55   | 68   | 90   | 110     | 135     |
| ØD5                | M8    | M12  | M16 | M20  | M20  | M30  | M24     | M30     |
| ØD6 <sup>1)</sup>  | 4     | 6    | 8   | 10   | 10   | 12   | 16      | 20      |
| ØD7 <sup>H13</sup> | 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)

## Pressure relief function

### Ordering details: pressure relief cartridge valve (without control cover)

|                                                 |             | LC                 |  | DB |  |  |  |  |                                                                                                                                                                                                                          |
|-------------------------------------------------|-------------|--------------------|--|----|--|--|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal size 16                                 | (Series 7X) | = 16               |  |    |  |  |  |  | <b>No code =</b><br><b>V</b><br>NBR seals<br>FKM seals<br>(other seals on request)<br><b>⚠ Attention!</b><br>The compatibility of the seals and pressure fluid has to be taken into account!                             |
| Nominal size 25                                 |             | = 25               |  |    |  |  |  |  |                                                                                                                                                                                                                          |
| Nominal size 32                                 |             | = 32               |  |    |  |  |  |  |                                                                                                                                                                                                                          |
| Nominal size 40                                 |             | = 40               |  |    |  |  |  |  |                                                                                                                                                                                                                          |
| Nominal size 50                                 |             | = 50               |  |    |  |  |  |  |                                                                                                                                                                                                                          |
| Nominal size 63                                 | (Series 6X) | = 63               |  |    |  |  |  |  | <b>7X =</b> (NS 16 to 63) Series 70 to 79<br>(70 to 79: unchanged installation and connection dimensions)<br><b>6X =</b> (NS 80 and 100) Series 60 to 69<br>(60 to 69: unchanged installation and connection dimensions) |
| Nominal size 80                                 |             | = 80               |  |    |  |  |  |  |                                                                                                                                                                                                                          |
| Nominal size 100                                |             | = 100              |  |    |  |  |  |  |                                                                                                                                                                                                                          |
| Opening pressure approx. 0 bar (without spring) |             | = 00               |  |    |  |  |  |  |                                                                                                                                                                                                                          |
| Opening pressure approx. 2 bar                  |             | = 20               |  |    |  |  |  |  |                                                                                                                                                                                                                          |
| Opening pressure approx. 3 bar                  |             | = 30 <sup>1)</sup> |  |    |  |  |  |  |                                                                                                                                                                                                                          |
| Opening pressure approx. 4 bar                  |             | = 40               |  |    |  |  |  |  |                                                                                                                                                                                                                          |
| Opening pressure approx. 5 bar                  |             | = 50 <sup>2)</sup> |  |    |  |  |  |  |                                                                                                                                                                                                                          |
| Opening pressure approx. 8 bar                  |             | = 80 <sup>3)</sup> |  |    |  |  |  |  |                                                                                                                                                                                                                          |

<sup>1)</sup> Opening pressure 3.0 bar only with NS16 for fitting a pilot operated pressure relief valve type DBC . -5X/...SO187 (see catalogue sheet RE 25 802)

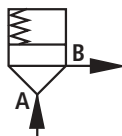
<sup>2)</sup> Only with NS 16, 25 and 32

<sup>3)</sup> Special installation space is required (see page 12)

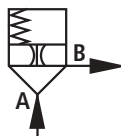
**Preferred; types, see page 12, are readily available!**

### Symbols: cartridge valves (for versions see ordering details)

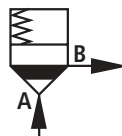
Poppet valve **without** orifice  
Version „E“



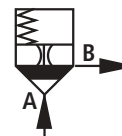
Poppet valve **with** orifice  
Version „A“



Spool poppet valve **without** orifice  
Version „D“



Spool poppet valve **with** orifice  
Version „B“



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

|                                                                                                         |                                                                                                                                                                                                                                                                                          |                                                          |
|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| Pressure fluid                                                                                          | Mineral oil (HL, HLP) to DIN 51 524 <sup>1)</sup> ;<br>Fast bio-degradable pressure fluids to<br>VDMA 24 568 (also see RE 90 221); HETG (rape seed oil) <sup>1)</sup> ;<br>HEPG (polyglycols) <sup>2)</sup> ; HEES (synthetic ester) <sup>2)</sup> ;<br>Other pressure fluids on request |                                                          |
| <sup>1)</sup> Suitable for NBR <b>and</b> FKM seals<br><sup>2)</sup> <b>Only</b> suitable for FKM seals |                                                                                                                                                                                                                                                                                          |                                                          |
| Pressure fluid temperature range                                                                        | °C                                                                                                                                                                                                                                                                                       | – 30 to + 80 for NBR seals<br>– 20 to + 80 for FKM seals |
| Viscosity range                                                                                         | mm <sup>2</sup> /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 <sup>3)</sup>                                                                                                                                                                        |                                                          |

#### 2-way cartridge valve

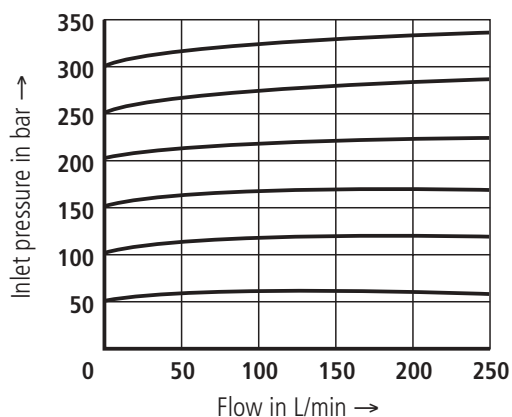
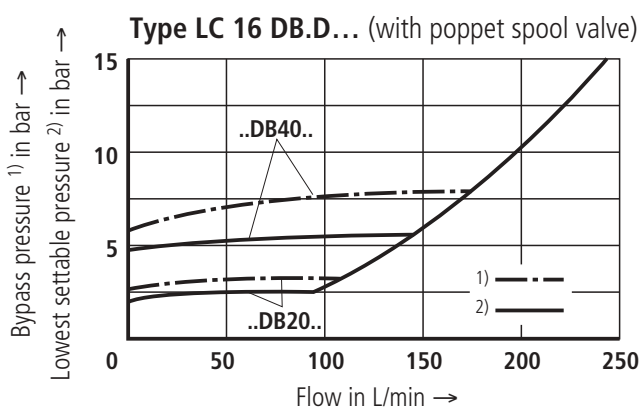
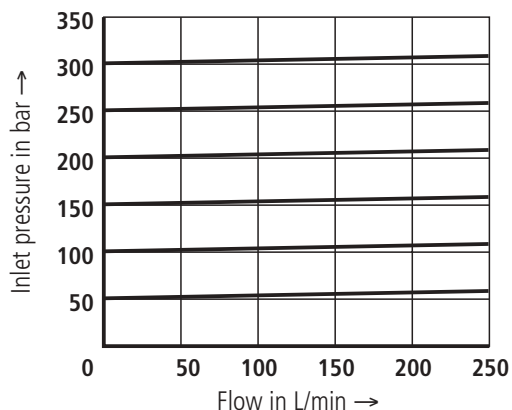
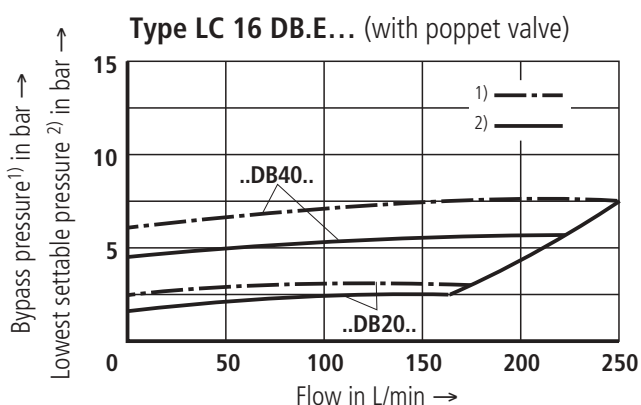
|                                            |       |     |     |     |      |      |      |      |      |
|--------------------------------------------|-------|-----|-----|-----|------|------|------|------|------|
| Maximum operating pressure – Ports A and B | bar   | 420 |     |     |      |      |      |      |      |
| Maximum flow (recommended)                 | NS    | 16  | 25  | 32  | 40   | 50   | 63   | 80   | 100  |
| – Poppet valve cartridges „E“ and „A“      | L/min | 300 | 450 | 600 | 1000 | 1600 | 2500 | 4500 | 7000 |
| – Spool valve cartridges „D“ and „B“       | L/min | 175 | 300 | 450 | 700  | 1400 | 1750 | 3200 | 4900 |

<sup>3)</sup> 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.

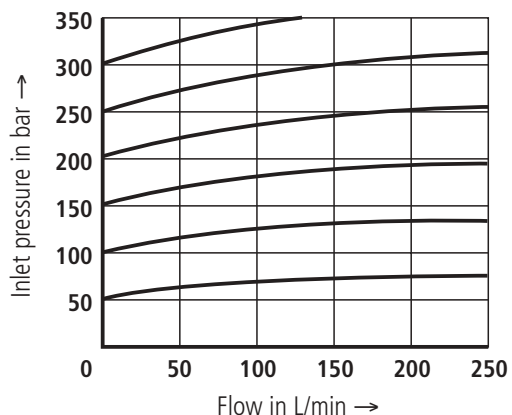
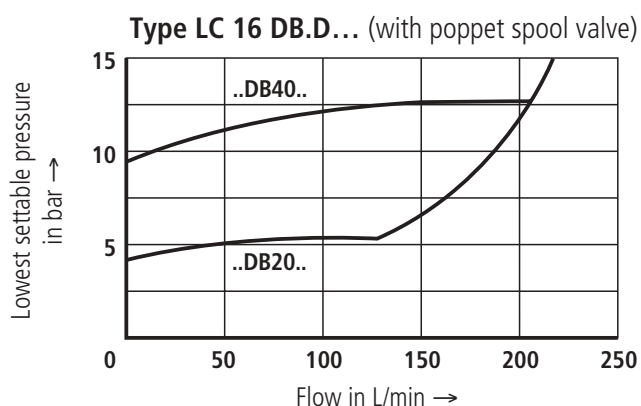
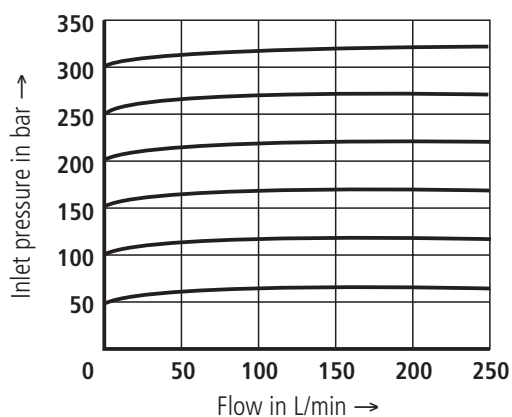
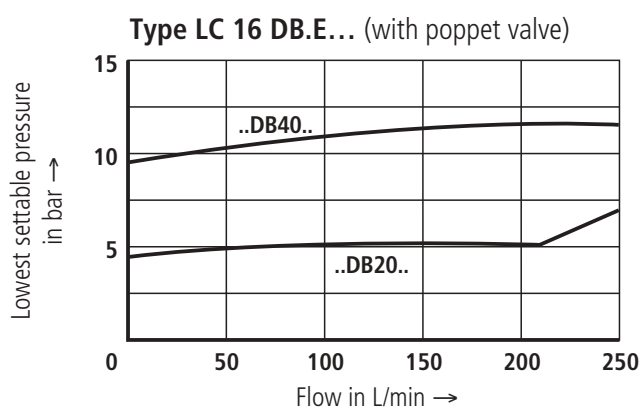
## Characteristic curves: NS 16 (measured with HLP 46; $\vartheta_{oil} = 40\text{ °C} \pm 5\text{ °C}$ )

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 16 DB... and type LFA 16 DBW...



### Electrical proportional pressure adjustment, type LFA 16 DBE...



## Seal kits for cartridge valves type LC...

| Nominal size | Material No. |            |
|--------------|--------------|------------|
|              | NBR seals    | FKM seals  |
| <b>16</b>    | R900313104   | R900313107 |
| <b>25</b>    | R900313105   | R900313108 |
| <b>32</b>    | R900313106   | R900313109 |
| <b>40</b>    | R900873022   | R900873025 |

| Nominal size | Material No. |            |
|--------------|--------------|------------|
|              | NBR seals    | FKM seals  |
| <b>50</b>    | R900873023   | R900873026 |
| <b>63</b>    | R900873024   | R900873027 |
| <b>80</b>    | R900314058   | R900314067 |
| <b>100</b>   | R900314059   | R900314068 |

## Compression springs for cartridge valves type LC...

| NS        | Spring dimensions in mm | Opening pressure in bar | Material No. |
|-----------|-------------------------|-------------------------|--------------|
| <b>16</b> | 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 <sup>1)</sup>       | R900082073   |
| <b>25</b> | 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 <sup>1)</sup>       | R900082072   |
| <b>32</b> | 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 <sup>1)</sup>       | R900082071   |

| NS         | Spring dimensions in mm | Opening pressure in bar | Material No. |
|------------|-------------------------|-------------------------|--------------|
| <b>40</b>  | 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 <sup>1)</sup>       | R900206671   |
| <b>50</b>  | 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 <sup>1)</sup>       | R900206680   |
| <b>63</b>  | 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 <sup>1)</sup>       | R900206689   |
| <b>80</b>  | 48.5/8 x 138/7.5        | 2.0                     | R900012353   |
|            | 49/8 x 152.5/7.5        | 4.0                     | R900024113   |
| <b>100</b> | 52.3/9.5 x 176/9.5      | 2.0                     | R900012385   |
|            | 52.3/9.5 x 195.5/9.5    | 4.0                     | R900024483   |

<sup>1)</sup> 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/        | <b>R900912532</b> |
| LC 16 DB40D7X/        | <b>R900912547</b> |
| LC 40 DB40E7X/        | <b>R900927969</b> |
| LC 40 DB40D7X/        | <b>R900938014</b> |
| LC 50 DB40E7X/        | <b>R900938041</b> |
| LC 50 DB40D7X/        | <b>R900938040</b> |
| LC 63 DB40E7X/        | <b>R900938070</b> |
| LC 63 DB40D7X/        | <b>R900938069</b> |

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

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