2-Way Spool Type Pressure Reducing Valve (DMO) ISO 7368
NB 16 – NB 50

General Description
2-way pressure reducing valves are used to reduce a variable input pressure (primary pressure at B) to a lower, constant output pressure (secondary pressure at A).

The reduced pressure can be set using a pressure relief valve on the valve cover. Depending on configuration, this valve can also function as a pressure compensator.

The preferred mode of mounting is the manifold block which, depending on the hydraulic circuit for the specific application, can be equipped with several interconnected valves.

The valves are available as “normally open” or “normally closed” versions.

Benefits
• Maximum operating pressure: 350 bar
• Improved flow characteristics compared to series B
• Can be used with standard series D covers (RM or 1W)
• Available in multiple configurations

Sizes
• NB 16
• NB 25
• NB 32
• NB 40
• NB 50
Operating Principle

A DMO type pressure reducing valve is a spool type valve without an effective surface in port B. The effective surfaces in port C and in operational port A are of equal size (surface ratio 1:1). The flow direction is from B to A.

As port B is pressurized, oil will flow from B to A. As the pressure in port A approaches the set pressure value of the limiting valve, the spool will move towards the closed position throttling the oil flow. As the pressure in port A exceeds the set pressure value, the spool will close port A and the oil flow will be interrupted.

Depending on the hydraulic circuit and the adaptation of suitable standard covers; a DMO type valve can also be used, for example, in flow-control functions as a pressure compensator.

### Specification

<table>
<thead>
<tr>
<th>General data</th>
<th>Value</th>
<th>Unit</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Mode of Construction</td>
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<td>2-Way Spool Type Pressure Reducing Valve</td>
</tr>
<tr>
<td>Type</td>
<td>-</td>
<td>-</td>
<td>DMO (Manual Pressure Adjustment)</td>
</tr>
<tr>
<td>Design</td>
<td>-</td>
<td>-</td>
<td>Cartridge Valve</td>
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<tr>
<td>Mounting style</td>
<td>-</td>
<td>-</td>
<td>Manifold Cartridge Mounting</td>
</tr>
<tr>
<td>Nominal size NB</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>32</td>
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<tr>
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<td>40</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>50</td>
<td></td>
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</tr>
<tr>
<td>Mounting dimensions</td>
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<td>-</td>
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<tr>
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<td></td>
<td></td>
<td>BB-08-2-A</td>
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<td>BC-09-2-A</td>
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<td>BD-10-2-A</td>
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<td>BE-11-2-A</td>
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<td>Mounting position</td>
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<td>Flow Direction</td>
<td></td>
<td></td>
<td>B ➔ A</td>
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<tr>
<td>Operating pressure max.</td>
<td>35</td>
<td>MPa</td>
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<tr>
<td>Ambient temperature range min.</td>
<td>-30</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>+80</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Seals* for hydraulic fluids</td>
<td>-</td>
<td>-</td>
<td>FKM+PU ➔ M-DMO, hydraulic fluids on mineral oil basis</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>FKM ➔ V-DMO, hydraulic fluids on mineral oil basis, HFD-hydraulic fluids</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>NBR ➔ N-DMO, hydraulic fluids on mineral oil basis, HFC-hydraulic fluids</td>
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<tr>
<td>Hydraulic fluid temperature range</td>
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<td>°C</td>
<td>-30 to +80</td>
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<td></td>
<td>NBR</td>
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<td></td>
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<td>-10 to +80</td>
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<tr>
<td>Viscosity range min.</td>
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<td>mm²/s</td>
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<tr>
<td>Viscosity range max.</td>
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<td>mm²/s</td>
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<tr>
<td>Operating viscosity</td>
<td>15 to 45</td>
<td>mm²/s</td>
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<tr>
<td>Cleanliness to ISO-Code max.</td>
<td>ISO 4406 (C) class 20/18/15</td>
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</tr>
</tbody>
</table>

* PU: Polyurethane; FKM: Fluorosilicone rubber (Viton®); NBR Nitrile rubber (Buna N); Other hydraulic fluids on request
Basic Configuration Of A Pressure Reducer / Compensator

Basic Configuration

(1) Pressure reducing valve
- Standard RM cover
- Pilot oil supplied over port X
- Pilot oil tap on port A
- Without sandwich cover (max 3 bar spring)
- NB 16 to NB 40

(2) Pressure reducing valve
- Standard RM cover
- Pilot oil supplied over port X
- Pilot oil tap on port A
- With sandwich cover for 8 bar spring
- NB 16 to NB 40 (NB 50 with 3 bar spring)

(3) Pressure reducing valve
- Standard 1W cover
- Pilot oil supplied over 2-way flow controller
- Pilot oil tap on port B
- Y port connected to tank
- NB 16 to NB 50
- Higher flow rates possible compared to configurations (1) and (2)

(4) Pressure compensator valve (upon request)
- Standard RM cover
- Pilot oil supplied over 2-way flow controller
- Pilot oil tap on port B
- Y port as pressure load tap downstream of the throttle valve
- NB 16 to NB 40 (NB 50 with sandwich cover)
Characteristic Curves
Conditions: system pressure 350 bar, oil temperature 40 °C, oil viscosity 32 cSt
(Blue = performance limit with 3 bar spring, Red = performance limit with 8 bar spring)

Characteristic Curves Using 3 Bar And/Or 8 Bar Springs

NB16

NB25

NB32

NB40

NB50
Characteristic Curves
Conditions: system pressure 350 bar, oil temperature 40 °C, oil viscosity 32 cSt
(Red = performance limit with 0.5 bar spring)
## Dimensions

<table>
<thead>
<tr>
<th></th>
<th>NB 16</th>
<th>NB 25</th>
<th>NB 32</th>
<th>NB 40</th>
<th>NB 50</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1 [mm]</td>
<td>82</td>
<td>87</td>
<td>92</td>
<td>106</td>
<td>166²</td>
</tr>
<tr>
<td>H2 [mm]</td>
<td>35</td>
<td>40</td>
<td>45</td>
<td>60</td>
<td>120²</td>
</tr>
<tr>
<td>H3 [mm]</td>
<td>23</td>
<td>22</td>
<td>26</td>
<td>39</td>
<td>99³</td>
</tr>
<tr>
<td>H4 [mm]</td>
<td>-</td>
<td>-</td>
<td>27</td>
<td>30</td>
<td>90³</td>
</tr>
<tr>
<td>H5 [mm]</td>
<td>47</td>
<td>52</td>
<td>57</td>
<td>72</td>
<td>182³</td>
</tr>
<tr>
<td>B1 [mm]</td>
<td>80¹</td>
<td>85</td>
<td>102</td>
<td>125</td>
<td>140</td>
</tr>
<tr>
<td>B2 [mm]</td>
<td>65</td>
<td>85</td>
<td>102</td>
<td>125</td>
<td>140</td>
</tr>
<tr>
<td>L1 [mm]</td>
<td>9,5</td>
<td>13,5</td>
<td>16</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>L2 [mm]</td>
<td>9,5</td>
<td>13,5</td>
<td>16</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>L3 [mm]</td>
<td>7</td>
<td>23,5</td>
<td>32</td>
<td>43,5</td>
<td>51</td>
</tr>
<tr>
<td>L4 [mm]</td>
<td>16,25</td>
<td>26,25</td>
<td>34,65</td>
<td>46,25</td>
<td>53,75</td>
</tr>
<tr>
<td>L5 [mm]</td>
<td>-</td>
<td>-</td>
<td>3,5</td>
<td>4,5</td>
<td>4,5</td>
</tr>
<tr>
<td>Plugs MX</td>
<td>-</td>
<td>-</td>
<td>G 1/8&quot;</td>
<td>G 1/4&quot;</td>
<td>G 1/4&quot;</td>
</tr>
<tr>
<td>Mounting Screws</td>
<td>M8x35</td>
<td>M12x40</td>
<td>M16x50</td>
<td>M20x70</td>
<td>M20x130</td>
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<tr>
<td>Tightening Torque [Nm]</td>
<td>30</td>
<td>100</td>
<td>300</td>
<td>550</td>
<td>550</td>
</tr>
<tr>
<td>Weight [kg]</td>
<td>2,9</td>
<td>3,9</td>
<td>5,5</td>
<td>9,6</td>
<td>20,7</td>
</tr>
</tbody>
</table>

¹ Dimension B1 is larger than specified by ISO 7368
² NB50 delivered standard with sandwich cover (H1=166 mm)
³ For NB50 with 0,5 bar spring subtract 60 mm from dimension given
Options

Option: Sandwich cover for 8 bar spring NB16...NB40 (NB50 using max. 3 bar spring)

Option: 2-way flow control (NB06) using a sandwich plate (weight 1,25 kg)
Alternative configurations for pilot valves that do not use port A.

It is recommended that pilot valves with no connection to port A be used in combination with a sandwich plate (P connected to A).

**Standard:**
Moog DB pilot valve + RM cover

**Alternative:**
DB pilot valve + sandwich cover + RM cover

Valve configurations using a flow control sandwich plate, regardless of pilot valve; do not require any special sandwich plates.

**Option:** Sandwich cover (NB06) with connections from P and A (weight 0.7 kg)
Ordering Information

Order Example

2/2-Way pressure reducing valve, NB 32, manual pressure adjustment, normally open

M-DMOE32DL6MX2B/A10:P12

M: seal material
FKM + PU

L: spring 3 bar

M: function “normally open”

A10: orifice 1,0 in port A of the cover
P12: orifice 1,2 in port P of the cover

B: spring pilot valve 0 - 70 bar

2: adjustment method 2
Allen head screw with jam nut

X: pilot oil supply
X and Y through mounting surface

Options
example: A10 = 1,0 orifice in port A of cover
example: B12 = 1,2 orifice in port B of cover
EP: Pressure setting (adjustment 8 only)
MC: With flow control valve sandwich cover

Spring pilot valve
B: 70 bar
E: 175 bar
G: 245 bar
K: 350 bar

Function
M: normally open
N: normally closed

X: pilot oil supply
X and Y through mounting surface

Seal material
M: FPM/FKM + PUR

Valve type
D: Pressure valve

Valve function
KO: Pressure compensator, manual adjust
MO: Pressure reducing valve, manual adjust

Mounting
E: Manifold mounting

Size
16: NB16
25: NB25
32: NB32
40: NG40
50: NG50

Serial number
D

Series
6: Cavity according to ISO 7368
### Order Numbers

**Pressure reducing valve with 3 or 8 bar spring (RM cover)**

Function: normally open; Adjustment method 2, Spring pilot valve 350 bar, Seals PUR/FKM

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Size</th>
<th>Spring</th>
<th>ZWD*</th>
<th>Type code</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>3 bar</td>
<td>-</td>
<td></td>
<td>M-DMOE16DL6MX2K</td>
</tr>
<tr>
<td>8 bar</td>
<td>x</td>
<td></td>
<td></td>
<td>M-DMOE16DW6MX2K</td>
</tr>
<tr>
<td>25</td>
<td>3 bar</td>
<td>-</td>
<td></td>
<td>M-DMOE25DL6MX2K</td>
</tr>
<tr>
<td>8 bar</td>
<td>x</td>
<td></td>
<td></td>
<td>M-DMOE25DW6MX2K</td>
</tr>
<tr>
<td>32</td>
<td>3 bar</td>
<td>-</td>
<td></td>
<td>M-DMOE32DL6MX2K</td>
</tr>
<tr>
<td>8 bar</td>
<td>x</td>
<td></td>
<td></td>
<td>M-DMOE32DW6MX2K</td>
</tr>
<tr>
<td>40</td>
<td>3 bar</td>
<td>-</td>
<td></td>
<td>M-DMOE40DL6MX2K</td>
</tr>
<tr>
<td>8 bar</td>
<td>x</td>
<td></td>
<td></td>
<td>M-DMOE40DW6MX2K</td>
</tr>
<tr>
<td>50</td>
<td>3 bar</td>
<td>x</td>
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<td>M-DMOE50DL6MX2K</td>
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<tr>
<td>8 bar</td>
<td>-</td>
<td></td>
<td></td>
<td>not available</td>
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</table>

*ZWD = sandwich cover required

**Pressure reducing valve with sandwich cover flow control valve (1W cover)**

Function: normally open; Adjustment method 2, Spring pilot valve 350 bar, Seals PUR/FKM

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Size</th>
<th>Spring</th>
<th>ZWD*</th>
<th>Type code</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>0,5 bar</td>
<td>-</td>
<td></td>
<td>M-DMOE16DR6MX2K/MC_</td>
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<tr>
<td>25</td>
<td>0,5 bar</td>
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<td>M-DMOE25DR6MX2K/MC_</td>
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<tr>
<td>32</td>
<td>0,5 bar</td>
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<td>M-DMOE32DR6MX2K/MC_</td>
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<tr>
<td>40</td>
<td>0,5 bar</td>
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<td>M-DMOE40DR6MX2K/MC_</td>
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<tr>
<td>50</td>
<td>0,5 bar</td>
<td>-</td>
<td></td>
<td>M-DMOE50DR6MX2K/MC_</td>
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</tbody>
</table>

* no sandwich cover required for these valve types
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