ISO cartridge valves type LIDEW* and LIDBH*
directional control, high flow, P_{max} 420 bar

Directional control valves in ISO cartridge design, used to intercept or to permit the flow passage according to the selected pilot control. They are made by a functional cover and a 2-way SC LI slip-in cartridge.

**LIDEW**: functional cover with or without pilot solenoid valve for cartridge operation, available in different configurations depending to the function to be performed.

**LIDBH** as LIDEW plus shuttle valve for pilot pressure selection.

The SC LI slip-in cartridge is available with different poppet shape to optimize the control, see section 6.

It is made by a poppet sliding into a sleeve and kept in normally closed position by the spring available with different cracking pressure values.

Size: 16 to 100 ISO 7368
Max flow up to 9000 l/min at Δp = 5 bar
Max pressure up to 420 bar

<table>
<thead>
<tr>
<th>MODEL CODE OF FUNCTIONAL COVERS</th>
<th>- for model code of slip-in cartridge, see section 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cover according to ISO 7368</strong></td>
<td></td>
</tr>
<tr>
<td>D = directional function</td>
<td></td>
</tr>
<tr>
<td>EW = with or without pilot solenoid valve</td>
<td></td>
</tr>
<tr>
<td>BH = as EW plus shuttle valve for pilot selection</td>
<td></td>
</tr>
</tbody>
</table>

**Cover configuration** see section 9
LIDEW: - (without pilot valve)
LIDBH: 1, 2, 4, 5, 6
LIDBH: 1A, 1C, 2A, 2C

<table>
<thead>
<tr>
<th>Size:</th>
<th>1 = 16</th>
<th>2 = 25</th>
<th>3 = 32</th>
<th>4 = 40</th>
<th>5 = 50</th>
<th>6 = 63</th>
<th>8 = 80</th>
<th>10 = 100</th>
</tr>
</thead>
</table>

**Options, see section 3**

(1) for solenoid valve’s characteristics, see following technical tables:

- **DHI** tech. table E010
- **DHE** tech. table E015
- **DHEP** tech. table TE030
- **DKE** tech. table E025
- **DKEP** tech. table TE030

![Diagram of ISO cartridge valves LIDEW and LIDBH](image)
HYDRAULIC SYMBOLS (cover configuration)

3 OPTIONS
For LIDEW*, LIDBH* covers (sizes 40…100):
/E = with external attachments Pp and underneath port X supplied plugged;
For all the models:
/B = cartridge piloted via port “B” of solenoid pilot valve;
/F = prearranged for coupling to an intermediate element with poppet position detector for safety function. See tab. EY120.
/WP = prolonged manual override protected by rubber cap for solenoid pilot valve. See table K150.
*** = Calibrated plugs different from standard ones reported in section 7. The restrictors configuration (if different from the standard) must be indicated at the end of the model code:

LIDEW2 - 1 */ EX 24DC ** P

Channel where the orifice has to be provided:
P = channel X, port P
F = channel F
Z1 = channel Z1
Z2 = channel Z2

06
Size of the throttling hole in tenths of millimeters:
05 = 0,5 mm 10 = 1 mm 17 = 1,7 mm
06 = 0,6 mm 12 = 1,2 mm 20 = 2 mm
08 = 0,8 mm 15 = 1,5 mm

4 STANDARD ORIFICES CONFIGURATION

<table>
<thead>
<tr>
<th>Port (only for LIDBH*-)</th>
<th>M4</th>
<th>M6</th>
<th>M6</th>
<th>M6</th>
<th>M6</th>
<th>M6</th>
<th>M6</th>
<th>M8</th>
<th>M8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z1</td>
<td>12A</td>
<td>12A</td>
<td>15A</td>
<td>17A</td>
<td>20A</td>
<td>20A</td>
<td>20A</td>
<td>20A</td>
<td>25A</td>
</tr>
</tbody>
</table>

M4 ÷ M8 = screw size; 12A ÷ 20A = calibrated orifices diameter in tenths of mm; A = short calibrated hole
**MODEL CODE OF SLIP-IN CARTRIDGES**

<table>
<thead>
<tr>
<th>Cartridge according to ISO 7368</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC LI 16 43 40 1 40</td>
</tr>
</tbody>
</table>

**Size, the same of relevant cover:**
- 16
- 25
- 32
- 40
- 50
- 63
- 80
- 100

**Model code**
- 16 43

**Type of poppet**
- 32, 33 (size 16 to 100) = without damping nose
- 42 (size 16 to 80) = as 32 but with damping nose
- 43 (size 16 to 100) = as 33 but with damping nose

**Spring cracking pressure**
- 1 = 0.3 bar for poppet 32, 42
- 2 = 1.5 bar for poppet 32, 42
- 3 = 3 bar for all poppets
- 4 = 0.6 bar for poppet 33, 43
- 5 = 5.5 bar for all poppets

**Seals material**
- = NBR
- PE = FKM
- BT = HNBR

---

**TYPE OF POPPET**

<table>
<thead>
<tr>
<th>Type of poppet</th>
<th>32</th>
<th>33</th>
<th>42</th>
<th>43</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional sketch (Hydraulic symbol)</td>
<td><img src="image" alt="Functional sketch" /></td>
<td><img src="image" alt="Functional sketch" /></td>
<td><img src="image" alt="Functional sketch" /></td>
<td><img src="image" alt="Functional sketch" /></td>
</tr>
</tbody>
</table>

**Operating pressure**

<table>
<thead>
<tr>
<th>Size</th>
<th>Nominal flow at Δp 5bar (l/min)</th>
<th>See diagrams Q/Δp at section [1]</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>270</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>550</td>
<td>550</td>
</tr>
<tr>
<td>32</td>
<td>1000</td>
<td>1000</td>
</tr>
<tr>
<td>40</td>
<td>1700</td>
<td>1700</td>
</tr>
<tr>
<td>50</td>
<td>2500</td>
<td>2500</td>
</tr>
<tr>
<td>63</td>
<td>4000</td>
<td>4000</td>
</tr>
<tr>
<td>80</td>
<td>5500</td>
<td>5500</td>
</tr>
<tr>
<td>100</td>
<td>9000</td>
<td>9000</td>
</tr>
</tbody>
</table>

**Area ratio A:Ap**
- 32: 1:1.1
- 33: 1:1.5
- 42: 1:1.1
- 43: 1:1.5

**Cracking pressure A→B**
- Spring 1:
  - 1: 0.3 bar
  - 2: 1.5 bar
  - 3: 3 bar
  - 6: 6 bar

**Cracking pressure B→A**
- Spring 1:
  - 1: 0.3 bar
  - 2: 12.8 bar
  - 3: 32.5 bar
  - 6: 59.4 bar

**Nominal flow at Δp 5bar (l/min)**
- 16: 270
- 25: 550
- 32: 1000
- 40: 1700
- 50: 2500
- 63: 4000
- 80: 5500
- 100: 9000

**Typical section**
- Size 16: ![Typical section](image)
- Size 25: ![Typical section](image)
- Size 32: ![Typical section](image)
- Size 40: ![Typical section](image)
- Size 50: ![Typical section](image)
- Size 63: ![Typical section](image)
- Size 80: ![Typical section](image)
- Size 100: ![Typical section](image)

**Area ratio A:Ap**

- 1:1.1
- 1:1.5
- 1:1.1
- 1:1.5

**Cracking pressure A→B**

- Spring 1:
  - 1: 0.3 bar
  - 2: 1.5 bar
  - 3: 3 bar
  - 6: 6 bar

**Cracking pressure B→A**

- Spring 1:
  - 1: 0.3 bar
  - 2: 12.8 bar
  - 3: 32.5 bar
  - 6: 59.4 bar

**Nominal flow at Δp 5bar (l/min)**

- 16: 270
- 25: 550
- 32: 1000
- 40: 1700
- 50: 2500
- 63: 4000
- 80: 5500
- 100: 9000

**Typical section**

- Size 16: ![Typical section](image)
- Size 25: ![Typical section](image)
- Size 32: ![Typical section](image)
- Size 40: ![Typical section](image)
- Size 50: ![Typical section](image)
- Size 63: ![Typical section](image)
- Size 80: ![Typical section](image)
- Size 100: ![Typical section](image)
7 MAIN CHARACTERISTICS, SEALS AND HYDRAULIC FLUIDS - for other fluids not included in below table, consult our technical office

Assembly position / location  Any position
Subplate surface finishing Roughness index Ra 0.4 - flatness ratio 0.01/100 (ISO 1101)
MTFd values according to EN ISO 13849 150 years, for further details see technical table P007

Compliance CE to Low Voltage Directive 2014/35/EU
RoHS Directive 2011/65/EU as last update by 2015/65/EU
REACH Regulation (EC) n°1907/2006

Ambient temperature Standard execution = -30°C + 70°C
/PE option = -20°C + 70°C
/FT option = -40°C + 70°C

Seals, recommended fluid temperature NBR seals (standard) = -20°C + 80°C, with HFC hydraulic fluids = -30°C + 50°C
FKM seals (/PE option) = -20°C + 80°C
HNBR seals (/FT option) = -40°C + 60°C, with HFC hydraulic fluids = -40°C + 50°C

Recommended viscosity 15÷100 mm²/s - max allowed range 2.8 ÷ 500 mm²/s

Max fluid contamination level ISO4406 class 20/18/15 NAS1638 class 9, see also filter section at www.atos.com or KTF catalog

7.1 Coils characteristics

Insulation class Pilot valve E, EP: H (180°C) for DC coils  F (155°C) for AC coils
Pilot valve I, H (180°C) for DC or AC coils

Protection degree to DIN EN 60529 IP 65 (with connectors 666, 667, 669 correctly assembled)

Relative duty factor 100%
Supply voltage and frequency See electric feature #)
Supply voltage tolerance ± 10%
Certification cURus  North American Standard

8 ELECTRIC FEATURES

<table>
<thead>
<tr>
<th>Solenoid valve type</th>
<th>External supply nominal voltage ± 10%  (1)</th>
<th>Voltage code</th>
<th>Type of connector</th>
<th>Power consumption (3)</th>
<th>Code of spare coil DHI</th>
<th>Colour of coil label DHI</th>
<th>Code of spare coil DHE, DHEP</th>
</tr>
</thead>
<tbody>
<tr>
<td>DHI</td>
<td>12 LC</td>
<td>12 DC</td>
<td>or 666</td>
<td>33 W (DHI)</td>
<td>COU-12DC</td>
<td>green</td>
<td>COE-12DC</td>
</tr>
<tr>
<td>DKE</td>
<td>12 DC</td>
<td>12 DC</td>
<td>or 666</td>
<td>30 W (DHEP)</td>
<td>COU-220DC</td>
<td>black</td>
<td>COE-220DC</td>
</tr>
<tr>
<td>DHEP</td>
<td>12 DC</td>
<td>12 DC</td>
<td>or 666</td>
<td>60 VA (DHL)</td>
<td>COI-110/50/60AC</td>
<td>yellow</td>
<td>COE-110/50/60AC</td>
</tr>
<tr>
<td></td>
<td>24 DC</td>
<td>24 DC</td>
<td>or 666</td>
<td>58 VA (DHEP)</td>
<td>COI-230/50/60AC</td>
<td>white</td>
<td>COE-230/50/60AC</td>
</tr>
<tr>
<td></td>
<td>110 DC</td>
<td>110 DC</td>
<td>or 666</td>
<td>6 VA (DHL)</td>
<td>COI-115/60/AC</td>
<td>light blue</td>
<td>COE-115/60/AC</td>
</tr>
<tr>
<td></td>
<td>220 DC</td>
<td>220 DC</td>
<td>or 666</td>
<td>12 VA (DHL)</td>
<td>COI-230/50/60AC</td>
<td>silver</td>
<td>COE-230/50/60AC</td>
</tr>
<tr>
<td>DKE</td>
<td>12 DC</td>
<td>12 DC</td>
<td>or 666</td>
<td>36 W</td>
<td>CAE-12DC</td>
<td>-</td>
<td>CAE-12DC</td>
</tr>
<tr>
<td></td>
<td>14 DC</td>
<td>14 DC</td>
<td>or 666</td>
<td>30 W</td>
<td>CAE-24DC</td>
<td>-</td>
<td>CAE-24DC</td>
</tr>
<tr>
<td></td>
<td>28 DC</td>
<td>28 DC</td>
<td>or 666</td>
<td>28 VA (DHEP)</td>
<td>CAE-28DC</td>
<td>-</td>
<td>CAE-28DC</td>
</tr>
<tr>
<td></td>
<td>110 DC</td>
<td>110 DC</td>
<td>or 666</td>
<td>58 VA (DHEP)</td>
<td>CAE-110DC</td>
<td>-</td>
<td>CAE-110DC</td>
</tr>
<tr>
<td></td>
<td>220 DC</td>
<td>220 DC</td>
<td>or 666</td>
<td>58 VA (DHEP)</td>
<td>CAE-220DC</td>
<td>-</td>
<td>CAE-220DC</td>
</tr>
<tr>
<td>DKE</td>
<td>110/50/60 AC (2)</td>
<td>100 VA (7)</td>
<td>-</td>
<td>CAE-110/50/60AC</td>
<td>CAE-120/60AC</td>
<td>-</td>
<td>CAE-120/60AC</td>
</tr>
<tr>
<td></td>
<td>120/60 AC (2)</td>
<td>130 VA (7)</td>
<td>-</td>
<td>CAE-120/60AC</td>
<td>CAE-230/50/60AC</td>
<td>-</td>
<td>CAE-230/50/60AC</td>
</tr>
<tr>
<td></td>
<td>110/50/60 AC (2)</td>
<td>669</td>
<td>36 W</td>
<td>-</td>
<td>CAE-110/50/60AC</td>
<td>-</td>
<td>CAE-120/60AC</td>
</tr>
<tr>
<td></td>
<td>230/50/60 AC (2)</td>
<td></td>
<td></td>
<td></td>
<td>CAE-230/50/60AC</td>
<td>-</td>
<td>CAE-230/50/60AC</td>
</tr>
<tr>
<td></td>
<td>110/50/60 AC (2)</td>
<td></td>
<td></td>
<td></td>
<td>CAE-230/50/60AC</td>
<td>-</td>
<td>CAE-230/50/60AC</td>
</tr>
<tr>
<td></td>
<td>230/50/60 AC (2)</td>
<td></td>
<td></td>
<td></td>
<td>CAE-230/50/60AC</td>
<td>-</td>
<td>CAE-230/50/60AC</td>
</tr>
</tbody>
</table>

(1)For other supply voltages available on request see technical tables E010, E015, E025, TE030.
(2)Coil can be supplied also with 60 Hz of voltage frequency: in this case the performances are reduced by 10 + 15%. The power consumption is 55 VA (DHI), 58 VA (DHE, DHEP) and 90 VA (DKE, DKEP).
(3)Average values based on tests performed at nominal hydraulic condition and ambient/coil temperature of 20°C.
(4)When solenoid is energized, the inrush current is approx 3 times the holding current. Inrush current values correspond to a power consumption of about 150 VA.
(5)Only for DHE, DHEP
(6)Only for DHI
(7)When solenoid is energized, the inrush current is approx 3 times the holding current.
Valve pressure drop \( \Delta p \) [bar] vs. Flow [l/min]

- **Size 16**
- **Size 25**
- **Size 32**
- **Size 40**
- **Size 50**
- **Size 63**
- **Size 80**
- **Size 100**

1 = poppet type 32 and 33
2 = poppet type 42 and 43

Q/\( \Delta p \) DIAGRAMS based on mineral oil ISO VG 46 at 50 °C
Size 16 ÷ 63
Drawing of size 50
dotted line: example of double solenoid version

Size 80 and 100
dotted line: example of AC solenoid version

Notes referred to the below table:
(1) LIDEW1*, LIDBH*A: solenoid at side of port Y of cover;
LIDEW2*, LIDBH*C: solenoid at side of port X of cover;

Overall dimensions refer to the pilot valves with connectors type 666.