ISO cartridge valves type LIDEW* and LIDBH*
directional control, high flow, Pmax 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 (1) 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 (2) sliding into a sleeve (3) and kept in normally closed position by the spring (4) 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

1 MODEL CODE OF FUNCTIONAL COVERS - for model code of slip-in cartridge, see section 5

Cover according to ISO 7368

D = directional function

EW = with or without pilot solenoid valve

BH = as EW plus shuttle valve for pilot selection

Seals material:

- NBR
PE FKM
BT HNBR

Series number

Voltage code see section 8

X = without connector

See section 9 for available connectors, to be ordered separately
00 = solenoid valve without coils (for I)
00-AC = AC solenoid valve without coils (for E and EP)
00-DC = DC solenoid valve without coils (for E and EP)

Pilot solenoid valve (1)

for size 1 to 6:

<table>
<thead>
<tr>
<th>Size</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = 16</td>
<td>I = DHI, Pmax 350 bar</td>
</tr>
<tr>
<td>2 = 25</td>
<td>E = DHE, Pmax 350 bar</td>
</tr>
<tr>
<td>3 = 32</td>
<td>EP = DHEP, Pmax 420 bar</td>
</tr>
<tr>
<td>4 = 40</td>
<td></td>
</tr>
<tr>
<td>5 = 50</td>
<td></td>
</tr>
<tr>
<td>6 = 63</td>
<td></td>
</tr>
<tr>
<td>8 = 80</td>
<td></td>
</tr>
<tr>
<td>10 = 100</td>
<td></td>
</tr>
</tbody>
</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
2 HYDRAULIC SYMBOLS (cover configuration)

### OPTIONS
For LIDEW*, LIDBH* covers (sizes 40…100):
- **E** = with external attachments Pp and underneath port X supplied plugged;
- **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.

#### STANDARDS ORIFICES CONFIGURATION

| Port | Cover | LIDEW-1 | LIDEW-2 | LIDEW-3 | LIDEW-4 | LIDEW-5 | LIDEW-6 | LIDEW-7 | LIDEW-8 | LIDEW-9 | LIDBH-1 | LIDBH-2 | LIDBH-3 | LIDBH-4 | LIDBH-5 | LIDBH-6 | LIDBH-7 | LIDBH-8 | LIDBH-9 | LIDBH-10 |
|------|-------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Z1   | M4    | M4      | M6      | M6      | M6      | M6      | M6      | M6      | M6      | M6      | M8      | M8      | M8      | M8      | M8      | M8      | M8      | M8      | M8      | M8      |
| P    | 12A   | 12A     | 15A     | 17A     | 20A     | 20A     | 20A     | 20A     | 20A     | 20A     | 20A     | 20A     | 20A     | 20A     | 20A     | 25A     | 20A     | 20A     | 20A     | 20A     |

**M4 ÷ M8** = screw size; **12A ÷ 20A** = calibrated orifices diameter in tenths of mm; **A** = short calibrated hole.

---

**[Diagram of hydraulic symbols and options]**

---

**[Table showing standard orifices configuration]**

---

**[Legend for symbols and options]**
### 5 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</td>
</tr>
</tbody>
</table>

Size, the same of relevant cover:

<table>
<thead>
<tr>
<th>16</th>
<th>25</th>
<th>32</th>
<th>40</th>
<th>50</th>
<th>63</th>
<th>80</th>
<th>100</th>
</tr>
</thead>
</table>

**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

### 6 TYPE OF POPPET

**Functional sketch**

( Hydraulic symbol )

<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>Operating pressure</td>
<td>420 bar max</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal flow at (\Delta p = 5) bar (l/min)</td>
<td>Size 16</td>
<td>270</td>
<td>270</td>
<td>240</td>
</tr>
<tr>
<td>25</td>
<td>550</td>
<td>550</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>32</td>
<td>1000</td>
<td>1000</td>
<td>800</td>
<td>800</td>
</tr>
<tr>
<td>40</td>
<td>1700</td>
<td>1700</td>
<td>1400</td>
<td>1400</td>
</tr>
<tr>
<td>50</td>
<td>2500</td>
<td>2500</td>
<td>2200</td>
<td>2200</td>
</tr>
<tr>
<td>63</td>
<td>4000</td>
<td>4000</td>
<td>3300</td>
<td>3300</td>
</tr>
<tr>
<td>80</td>
<td>5500</td>
<td>5500</td>
<td>4000</td>
<td>4000</td>
</tr>
<tr>
<td>100</td>
<td>9000</td>
<td>9000</td>
<td>-</td>
<td>6300</td>
</tr>
</tbody>
</table>

**Cracking pressure**

- **A\(\rightarrow\)B**
  - **1** = 0.3 bar for poppet 32, 42
  - **2** = 1.5 bar for poppet 32, 42
  - **3** = 3 bar for all poppets
  - **6** = 5.5 bar for all poppets

- **B\(\rightarrow\)A**
  - **1** = 3 bar for all poppets
  - **2** = 12.8 bar
  - **3** = 32.5 bar
  - **6** = 54.5 bar

**Area ratio**

- **A\(\rightarrow\)Ap**
  - **1** = 1:1.1
  - **2** = 1:1.5
  - **3** = 1:1.1
  - **6** = 1:1.5

**Seals material**

- **\(-\)** = NBR
- **PE** = FKM
- **BT** = HNBR

**Series number**

<table>
<thead>
<tr>
<th>40</th>
<th>/</th>
<th>*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40</td>
<td>*</td>
</tr>
</tbody>
</table>

**Platte pressure**

- **1** = 0.3 bar for poppet 32, 42
- **2** = 1.5 bar for poppet 32, 42
- **3** = 3 bar for all poppets
- **6** = 5.5 bar for all poppets
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)

MT/Fd 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
/BT option = -40°C + 70°C

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

Hydraulic fluid
Suitable seals type
Classification
Ref. Standard

Mineral oils
NBR, FKM, HNBR
HL, HLP, HLPD, HVLP, HVLDP
DIN 51524

Flame resistant without water
FKM
HFDU, HFDR

Flame resistant with water
NBR, HNBR
HFC
ISO 12922

Flow direction
From A→B or B→A

7.1 Coils characteristics

Insulation class
Pilot valve E, EP: H (180°C) for DC coils  F (155°C) for AC coils
Pilot valve b, H (180°C) for DC or AC coils
Due to the occurring surface temperatures of the solenoid coils, the European standards EN ISO 13732-1 and EN ISO 4413 must be taken into account.

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 B)

Supply voltage tolerance
± 10%

Certification
cURus  North American Standard

8 ELECTRIC FEATURES

Solenoid valve type
External supply nominal voltage ± 10% (1)

Voltage code
Type of connector
Power consumption (3)
Code of spare coil
DHI
DHE
DHEP

DC
12 DC
24 DC
110 DC
220 DC
12 DC
24 DC
110 DC
220 DC
666 or 667
33 W (DHI)
30 W (DHEP)
COU-12DC
COU-24DC
COU-110DC
COU-220DC
green red black black

AC
110/50 AC (2)
115/60 AC
120/60 AC
230/50 AC (2)
230/60 AC
110/50AC (6)
115/60AC (5)
120/60AC (6)
230/50AC (6)
230/60AC (6)
666 or 667
60 VA (DHI)
58 VA (DHEP)
COI-110/50/60AC
COI-120/60AC
COI-230/50/60AC
COI-230/60AC
yellow white light blue silver

DHE
DHEP

DKE
DKEP

12 DC
14 DC
24 DC
28 DC
110 DC
220 DC
12 DC
14 DC
24 DC
28 DC
110 DC
220 DC
110/50/60 AC (2)
115/60 AC
230/60 AC
110/50/60 AC
115/60 AC
230/60 AC
666 or 667
36 W
CAE-12DC
CAE-14DC
CAE-24DC
CAE-28DC
CAE-110DC
CAE-220DC

DHI

COE-110/50/60AC
COE-115/60AC
COE-230/50/60AC
COE-230/60AC

100 VA (7)
130 VA (7)

(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

Diagram 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;

<table>
<thead>
<tr>
<th>Size (1)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D max</th>
<th>E max</th>
<th>F</th>
<th>G</th>
<th>H max LIDEW</th>
<th>H max LIDBH</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>Ports Pp-Dr</th>
<th>Ports Z1-Z2</th>
<th>Seals</th>
<th>Fastening bolts</th>
<th>Tightening torque [Nm]</th>
<th>Mass [Kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>70</td>
<td>65</td>
<td>29</td>
<td>83,5</td>
<td>70,5</td>
<td>4</td>
<td>3</td>
<td>90,5</td>
<td>130,5</td>
<td>40</td>
<td>125</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>4 OR-108</td>
<td>Nr. 4 M8x45</td>
<td>35</td>
<td>2,6 + 3</td>
</tr>
<tr>
<td>25</td>
<td>85</td>
<td>85</td>
<td>42,5</td>
<td>69,5</td>
<td>69,5</td>
<td>5</td>
<td>4</td>
<td>90,5</td>
<td>130,5</td>
<td>40</td>
<td>125</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>4 OR-108</td>
<td>Nr. 4 M12x45</td>
<td>125</td>
<td>3 + 3,4</td>
</tr>
<tr>
<td>32</td>
<td>100</td>
<td>100</td>
<td>50</td>
<td>62,5</td>
<td>42,5</td>
<td>6</td>
<td>5</td>
<td>100,5</td>
<td>140,5</td>
<td>50</td>
<td>135</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>4 OR-2043</td>
<td>Nr. 4 M16x55</td>
<td>300</td>
<td>3,5 + 4</td>
</tr>
<tr>
<td>40</td>
<td>125</td>
<td>125</td>
<td>62,5</td>
<td>49,5</td>
<td>49,5</td>
<td>6</td>
<td>5</td>
<td>110,5</td>
<td>150,5</td>
<td>60</td>
<td>145</td>
<td>3,5</td>
<td>G 1/4</td>
<td>-</td>
<td>4 OR-3043</td>
<td>Nr. 4 M20x70</td>
<td>600</td>
<td>6,4 + 6,9</td>
</tr>
<tr>
<td>50</td>
<td>140</td>
<td>140</td>
<td>70</td>
<td>42</td>
<td>42</td>
<td>6</td>
<td>7</td>
<td>120,5</td>
<td>160,5</td>
<td>70</td>
<td>155</td>
<td>3,5</td>
<td>G 1/4</td>
<td>3,5</td>
<td>G 1/4</td>
<td>4 OR-3043</td>
<td>Nr. 4 M20x80</td>
<td>600</td>
</tr>
<tr>
<td>63</td>
<td>180</td>
<td>180</td>
<td>90</td>
<td>22</td>
<td>22</td>
<td>6</td>
<td>8</td>
<td>130,5</td>
<td>170,5</td>
<td>80</td>
<td>165</td>
<td>3,5</td>
<td>G 3/8</td>
<td>3,5</td>
<td>G 3/8</td>
<td>4 OR-3050</td>
<td>Nr. 4 M30x90</td>
<td>2100</td>
</tr>
<tr>
<td>80</td>
<td>Ø250</td>
<td>-</td>
<td>125</td>
<td>-</td>
<td>-</td>
<td>8</td>
<td>152,5</td>
<td>202,5</td>
<td>80</td>
<td>187</td>
<td>3,5</td>
<td>G 3/8</td>
<td>3,5</td>
<td>G 3/8</td>
<td>4 OR-4075</td>
<td>Nr. 8 M24x90</td>
<td>1000</td>
<td>27,1-27,7</td>
</tr>
<tr>
<td>100</td>
<td>Ø320</td>
<td>-</td>
<td>150</td>
<td>-</td>
<td>-</td>
<td>10</td>
<td>182,5</td>
<td>222,5</td>
<td>100</td>
<td>217</td>
<td>3,5</td>
<td>G 1/2</td>
<td>3,5</td>
<td>G 1/2</td>
<td>4 OR-4093</td>
<td>Nr. 8 M32x120</td>
<td>2100</td>
<td>53 + 54</td>
</tr>
</tbody>
</table>

Overall dimensions refer to the pilot valves with connectors type 666