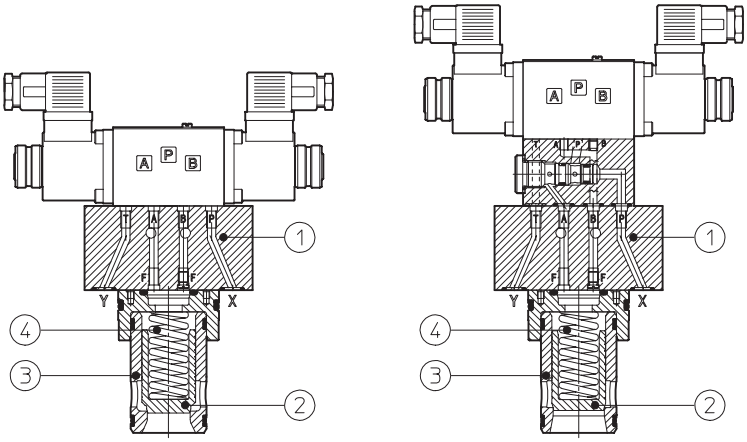
Atos spa
21018 Sesto Calende, Italy - Fax 0331 920005

Cartridge valves type LID*

Directional control, ISO 7368 sizes 16 ÷ 80



LIDEW4-3-I **LIDBH1A-3-I**

LID* are directional control valves composed by a 2-way cartridge housed in a recess of standard dimensions and by a closing functional element ① called "cover".

The cartridge is composed by a poppet ② hydraulically piloted by means of internal connections in the cover (X, Z1, Z2, F, Y) and sliding into a drilled sleeve ③.

The flow is inhibited or permitted according to a proper pilot control; cracking pressure value depends on poppet spring ④.

These valves are available in standard sizes 16 to 63 according to ISO 7368 (DIN 24342).

Flow up to 5600 l/min at Δp = 6 bar.
Pressure up to 350 bar.

1 MODEL CODE FOR COVERS

LI **D** **EW** **-** **1** **/*** **-I** **X** **24DC** ****** **/*** *****

Cover according to ISO 7368

D = direct operated valve

EW** = with solenoid valve for pilot selection;
BH** = as EW* but with shuttle valve for pilot selection.
See section 2 for configurations;

Size:
1 = 16; **4** = 40; **8** = 80 (only for LIDEW);
2 = 25; **5** = 50;
3 = 32; **6** = 63;

Options, see section 6

For model code of poppet, see section 3

Solenoid of pilot valve: **-I** = solenoid OI for AC and DC supply, see note in section 6 for other available solenoids

X = without connector
See section 8 for available connectors, to be ordered separately

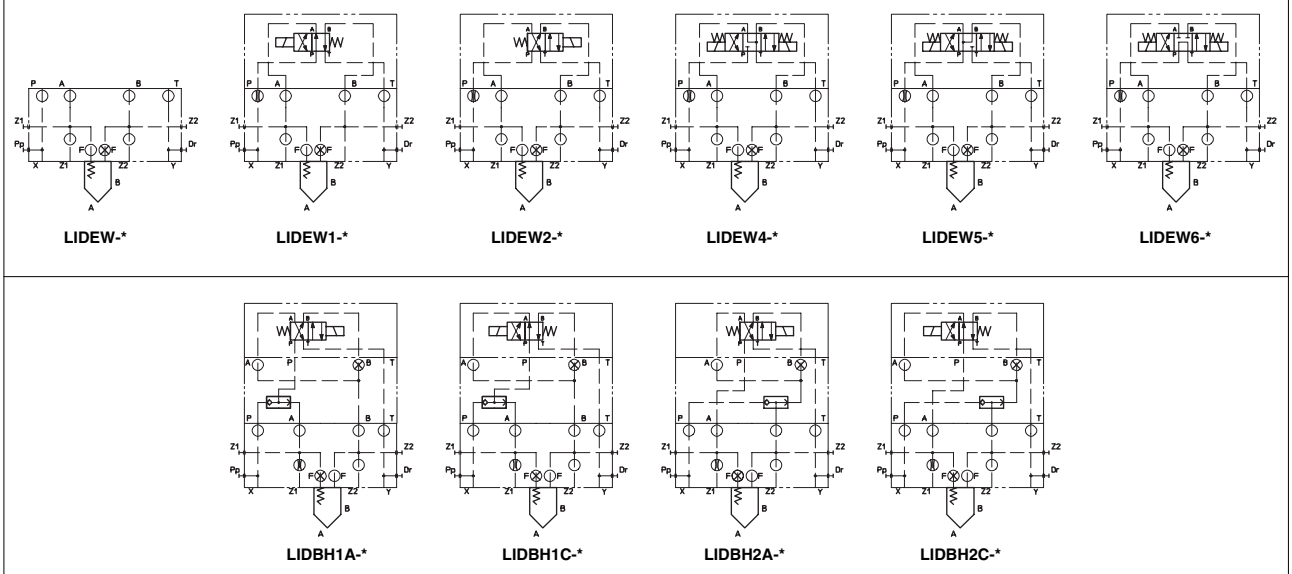
Supply voltage, see section 8
00 = valve without coils (ony for OI solenoid)

Design number

Syntethic fluids:
WG = water-glycol
PE = phosphate ester

Optional different provision or setting of the calibrated plugs in the pilot channels, see section 6

2 HYDRAULIC SYMBOLS



LIDEW-* **LIDEW1-*** **LIDEW2-*** **LIDEW4-*** **LIDEW5-*** **LIDEW6-***

LIDBH1A-* **LIDBH1C-*** **LIDBH2A-*** **LIDBH2C-***

2 HYDRAULIC CHARACTERISTICS

Covers, see section 1	LIDEW*, LIDBH*																											
Poppet, see section 3, 4	32							33							42							43						
Size	16	25	32	40	50	63	80	16	25	32	40	50	63	80	16	25	32	40	50	63	80	16	25	32	40	50	63	80
Max flow at Δp = 6 bar [l/min]	180	430	670	1400	2200	3500	5600	160	330	530	1100	1700	2600	4000	170	380	560	1300	2000	2800	4800	130	300	480	940	1500	2000	3500
Max pressure [bar]	350 bar at port A, B, X, Z1, Z2; 70 bar at port Y																											

3 MODEL CODE FOR POPPETS, see section 4 for function

SC LI – 16 43 1 ** /*

Cartridge according to ISO 7368

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

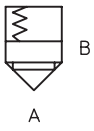
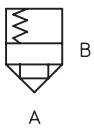
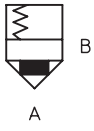
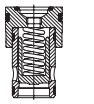
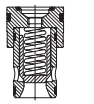
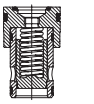
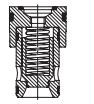
Type of poppet, see section 2 for maximum flow
32, 33 (size 16…80)
42, 43 (size 16…80) = as 32, 33 but with dumping nose

Spring cracking pressure:
1 = 0,3 bar for poppet 32, 42;
1 = 0,6 bar for poppet 33, 43;
2 = 1,5 bar for poppet 32, 42;
3 = 3 bar for all poppets
6 = 5,5 bar for all poppets

Design number

Syntethic fluids:
WG = water-glycol
PE = phosphate ester

4 TYPICAL FUNCTIONS OF POPPETS

Code of poppet	32	33		42	43	
Functional sketch (Hydraulic symbol)						
Typical section						
Area ratio (1)	1:1,1	1:2 for size 16, 25	1:1,6 for size 32 ÷ 80	1:1,1	1:2 for size 16, 25	1 : 1,6 for size 32 ÷ 80
Opening pressure A→B (2)	0,3 bar (spring 1) 1,5 bar (spring 2) 3 bar (spring 3) 6 bar (spring 6)	0,5 bar (spring 1) - 2,5 bar (spring 3) 6 bar (spring 6)	0,4 bar (spring 1) - 2,1 bar (spring 3) 4,3 bar (spring 6)	0,3 bar (spring 1) 1,3 bar (spring 2) 3,2 bar (spring 3) 6 bar (spring 6)	0,5 bar (spring 1) - 2,7 bar (spring 3) 6 bar (spring 6)	0,4 bar (spring 1) - 2,5 bar (spring 3) 4,9 bar (spring 6)
Opening pressure B→A (2)	3 bar (spring 1) 12,8 bar (spring 2) 32,5 bar (spring 3) 59,4 bar (spring 6)	0,5 bar (spring 1) - 2,5 bar (spring 3) 6 bar (spring 6)	0,7 bar (spring 1) - 3,7 bar (spring 3) 7,5 bar (spring 6)	3 bar (spring 1) 12,8 bar (spring 2) 32,5 bar (spring 3) 59,4 bar (spring 6)	0,5 bar (spring 1) - 2,4 bar (spring 3) 6 bar (spring 6)	0,7 bar (spring 1) - 3,7 bar (spring 3) 7,5 bar (spring 6)

(1) It is the ratio of the area on which the main pressure of the circuit is applied to the area on which the pilot pressure is applied
(2) Depending on the spring cracking pressure and the area ratio of the poppet

5 MAIN CHARACTERISTICS OF MODULAR DIRECTIONAL CONTROL CARTRIDGE VALVES TYPE LID*

Assembly position / location	Any position
Subplate surface finishing	Roughness index $\sqrt{}^{04}$, flatness ratio 0,01/100 (ISO 1101)
Ambient temperature	-20 °C to + 70 °C
Fluid	Hydraulic oil as per DIN 51524 . . . 535; for other fluids see section 1
Recommended viscosity	15 ÷ 100 mm²/s at 40°C (ISO VG 15 ÷ 100)
Fluid contamination class	ISO 19/16, achieved with in line filters at 25 µm and $\beta_{25} \geq 75$ (recommended)
Fluid temperature	-20°C +60°C (standard and /WG seals) -20°C +80°C (/PE seals)

5.1 Coils characteristics

Insulation class	H (180°C) Due to the occuring surface temperatures of the solenoid coils, the European standards EN563 and EN982 must be taken into account
Connector protection degree	IP 65
Relative duty factor	100%
Supply voltage and frequency	See electric feature 6
Supply voltage tolerance	± 10%

6 OPTIONS

For LIDEW*, LIDBH* covers (sizes 40…80):
/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. E110.
/WP = prolonged manual override protected by rubber cap (only for OI solenoid). See table K150.
*** = Calibrated plugs different from standard ones. All covers are equipped with restrictors in the pilot channels according to the standard arrangement which is preset for each varian (see section 12). They can be exchanged with others for particular use. When ordering covers equipped with restrictors that are different from the standard ones it must be indicated at the end of the model code:

LIDEW1 - 1 /EB -IX 24DC ** /WG X 06

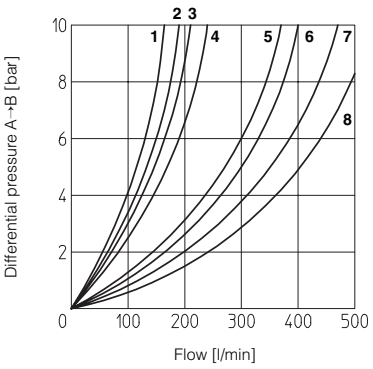
Channel where the restrictor have to be provided:
X = channel X **Z1** = channel Z1
F = channel F **Z2** = channel Z2

Size of the throttling hole in ten of millimiters:
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

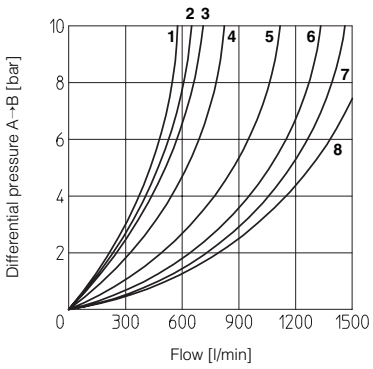
Note:
OI solenoid pilot valve can be provided with the following handwheel(see table K150).
SP-WPD/H = manual override with detent, to be ordered separately.

Covers type LID* can be also equipped with the following pilot solenoid valve:
-OO = solenoid OO for DC supply (see table E010 and K500 for technical characteristics et coil and relevant connectors)
-AO = explosion-proof solenoid according to ATEX Norm (see table E120 for technical characteristics)
-AO/UL = explosion-proof solenoid according to UL Norm (see table E125 for technical characteristics)
-WO = intrinsically safe solenoid according to ATEX Norm (see table E130 for technical characteristics)

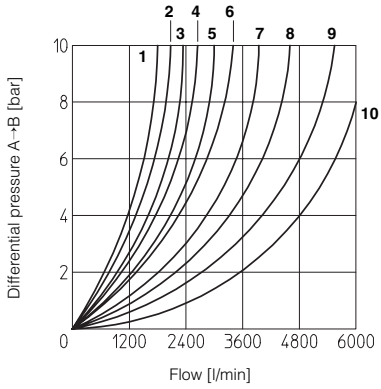
7 DIAGRAMS OF POPPETS



1 = SC LI-1643
2 = SC LI-1633
3 = SC LI-1642
4 = SC LI-1632
5 = SC LI-2543
6 = SC LI-2533
7 = SC LI-2542
8 = SC LI-2532



1 = SC LI-3243
2 = SC LI-3233
3 = SC LI-3242
4 = SC LI-3232
5 = SC LI-4043
6 = SC LI-4033
7 = SC LI-4042
8 = SC LI-4032



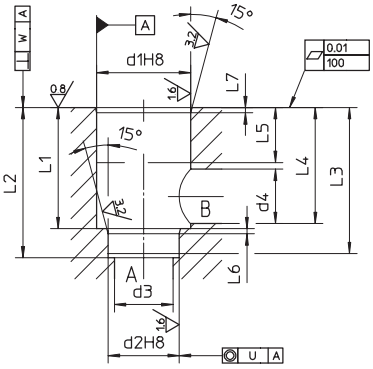
1 = SC LI-5043
2 = SC LI-5033
3 = SC LI-5042
4 = SC LI-5032
SC LI-6343
5 = SC LI-6333
6 = SC LI-6342
7 = SC LI-6332
-8043
8 = SC LI-8033
9 = SC LI-8042
10 = SC LI-8032

8 ELECTRIC FEATURES

Type of solenoid	External supply nominal voltage ± 10% (1)		Type of connector (3)	Power consumption (4)	Code of spare coil	Colour of coil label
OI	DIRECT CURRENT	6 DC 12 DC 24 DC 48 DC	SP-666 or SP-667	33 W	SP-COU-6DC /80 SP-COU-12DC /80 SP-COU-24DC /80 SP-COU-48DC /80	brown green red silver
	ALTERNATE CURRENT	110/50 AC (2) 120/60 AC 230/50 AC (2) 230/60 AC	SP-666 or SP-667	60 VA (5)	SP-COI-110/50/60AC /80 SP-COI-120/60AC /80 SP-COI-230/50/60AC /80 SP-COI-230/60AC /80	yellow white light blue silver

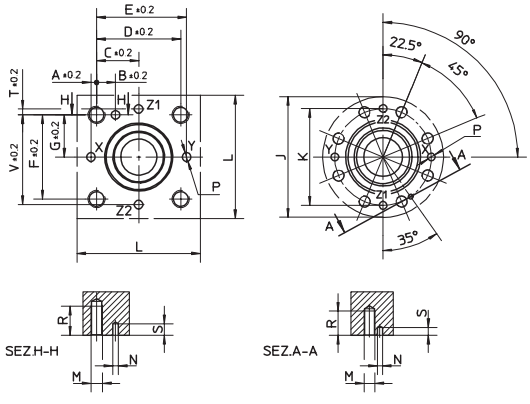
(1) For other supply voltages available on request, see technical table E010.
(2) Coil can be supplied also with 60 Hz of voltage frequency: in this case the performances are reduced by 10 ÷ 15% and the power consumption is 55 VA.
(3) Connectors according to DIN46350: see table E010 and K500 for characteristics.
(4) Average values based on tests performed at nominal hydraulic condition and ambient/coil temperature of 20°C.
(5) 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.

9 RECESS DIMENSIONS [mm]



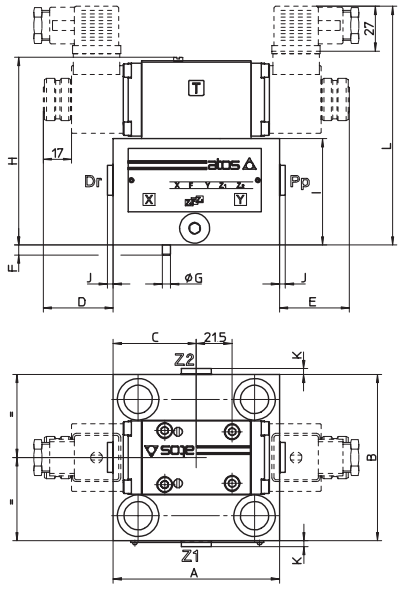
Sizes	Ø d1	Ø d2	Ø d3 max	Ø d4 max	L1	L2	L3	L4 max	L5	L6	L7	U	W
16	32	25	16	22,5	$43^{+0,1}_{0}$	$56^{+0,1}_{0}$	54	42,5	20	2	2	0,03	0,05
25	45	34	25	27	$58^{+0,1}_{0}$	$72^{+0,1}_{0}$	70	57	30	2,5	2,5	0,03	0,05
32	60	45	32	38,5	$70^{+0,1}_{0}$	$85^{+0,1}_{0}$	83	68,5	30	2,5	2,5	0,03	0,1
40	75	55	40	54,5	$87^{+0,1}_{0}$	$105^{+0,1}_{0}$	102	84,5	30	3	3	0,05	0,1
50	90	68	50	62,5	$100^{+0,1}_{0}$	$122^{+0,1}_{0}$	117	97,5	35	3	3	0,05	0,1
63	120	90	63	87	$130^{+0,1}_{0}$	$155^{+0,1}_{0}$	150	127	40	4	4	0,05	0,2
80	145	110	80	130,5	$175^{+0,2}_{0}$	$205^{+0,2}_{0}$	200	170,5	40	5	5	0,05	0,2

10 COVER INTERFACE DIMENSIONS [mm]



Sizes	A	B	C	D	E	F	G	J min	K	L min	M	ØN	ØP max	R	S max	T	V
16	2	12,5	23	46	48	46	23	-	-	65	M8	4	4	22	8	2	48
25	4	13	29	58	62	58	29	-	-	85	M12	6	6	30	8	4	62
32	6	18	35	70	76	70	35	-	-	102	M16	6	8	38	8	6	76
40	7,5	19,5	42,5	85	92,5	85	42,5	-	-	125	M20	6	10	46	8	7,5	92,5
50	8	20	50	100	108	100	50	-	-	140	M20	8	10	46	8	8	108
63	12,5	24,5	62,5	125	137,5	125	62,5	-	-	180	M30	8	12	66	8	12,5	137,5
80	-	-	-	-	-	-	-	250	200	-	M24	10	16	54	8	-	-

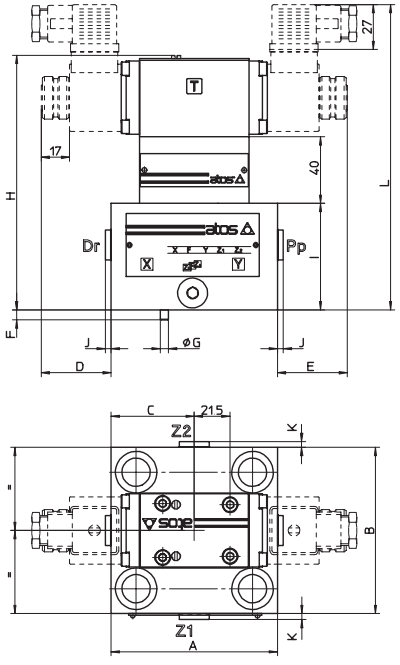
11 COVER DIMENSIONS [mm]



LIDEW*-*-IX

Covers (1)	A	B	C	D	E	F	G	H	I	L	J	K	Ports Pp-Dr	Ports Z_1-Z_2	Seals	Fastening bolts (3)	Tightening torque [Nm]	Weight [Kg]
LIDEW*-1-IN	70	65	29	63,5	50,5	4	3	89	40	119	-	-	-	-	4 OR 108	Nr. 4 M8x45	41,6	2,6 ÷ 3
LIDEW*-2-IN	85	85	42,5	49,5	49,5	6	5	89	40	119	-	-	-	-	4 OR 108	Nr. 4 M12x45	143	3 ÷ 3,4
LIDEW*-3-IN	100	100	50	42,5	42,5	6	5	99	50	129	-	-	-	-	4 OR 2043	Nr. 4 M16x55	346	3,5 ÷ 4
LIDEW*-4-IN	125	125	62,5	29,5	29,5	6	5	109	60	139	3,5	-	G 1/4	-	4 OR 2050	Nr. 4 M20x70	674	6,4 ÷ 6,9
LIDEW*-5-IN	140	140	70	22	22	4	6	119	70	149	3,5	3,5	G 1/4	G 1/4	4 OR 2050	Nr. 4 M20x80	674	9,5 ÷ 10
LIDEW*-6-IN (2)	180	180	90	2	2	4	6	129	80	159	3,5	3,5	G 3/8	G 3/8	4 OR 2056	Nr. 4 M30x90	2.310	17,3÷17,7
LIDEW*-8-IN (2)	Ø 250	-	125	-	-	6	8	161	80	181	3,5	3,5	G 3/8	G 3/8	4 OR 123	Nr. 8 M24x90	1.170	27,1÷27,7

(1) LIDEW1*: solenoid at side of port Y of cover; LIDEW2*: solenoid at side of port X of cover;
(2) The position of external attachments Pp, Dr, Z1 and Z2 are inverted each others respect to the showed sketch
(3) Hexagon socket head screw according to DIN 912-12.9



LIDBH-*-IX**

Covers (1)	A	B	C	D	E	F	G	H	I	L	J	K	Ports Pp-Dr	Ports Z_1-Z_2	Seals	Fastening bolts (3)	Tightening torque [Nm]	Weight [Kg]
LIDBH**-1-IN	70	65	29	63,5	50,5	4	3	129	40	159	-	-	-	-	4 OR 108	Nr. 4 M8x45	41,6	3,6
LIDBH**-2-IN	85	85	42,5	49,5	49,5	6	5	129	40	159	-	-	-	-	4 OR 108	Nr. 4 M12x45	143	4
LIDBH**-3-IN	100	100	50	42,5	42,5	6	5	139	50	169	-	-	-	-	4 OR 2043	Nr. 4 M16x55	346	4,5
LIDBH**-4-IN	125	125	62,5	29,5	29,5	6	5	149	60	179	3,5	-	G 1/4	-	4 OR 2050	Nr. 4 M20x70	674	7,4
LIDBH**-5-IN	140	140	70	22	22	4	6	159	70	189	3,5	3,5	G 1/4	G 1/4	4 OR 2050	Nr. 4 M20x80	674	19,5
LIDBH**-6-IN (2)	180	180	90	2	2	4	6	169	80	199	3,5	3,5	G 3/8	G 3/8	4 OR 2056	Nr. 4 M30x90	2.310	18,3

(1) LIDBH*A: solenoid at side of port X of cover; LIDBH*C: solenoid at side of port Y of cover;
(2) The position of external attachments Pp, Dr, Z1 and Z2 are inverted each others respect to the showed sketch
(3) Hexagon socket head screw according to DIN 912-12.9

Overall dimensions refer to the pilot valves with connectors type SP-666

12 SCREWED ORIFICES IN STANDARD COVER EXECUTION: DIMENSIONS (1)

Port \ Cover	LIDEW*-1	LIDBH*-1	LIDEW*-2	LIDBH*-2	LIDEW*-3	LIDBH*-3	LIDEW*-4	LIDBH*-4	LIDEW*-5	LIDBH*-5	LIDEW*-6	LIDBH*-6	LIDEW*-8
Z1	- -	M4 12A	- -	M4 12A	- -	M6 15A	- -	M6 17A	- -	M6 20A	- -	M6 20A	- -
P	M6 12A	M6 12A	M6 12A	M6 12A	M6 15A	M6 15A	M6 17A	M6 17A	M6 20A	M6 20A	M6 20A	M6 20A	M8 20A

(1) The showed codes define the orifice thread, diameter of the throttling hole in ten of millimiters and the form of throttle sectional area:
A = variable sectional area;
F = constant sectional area