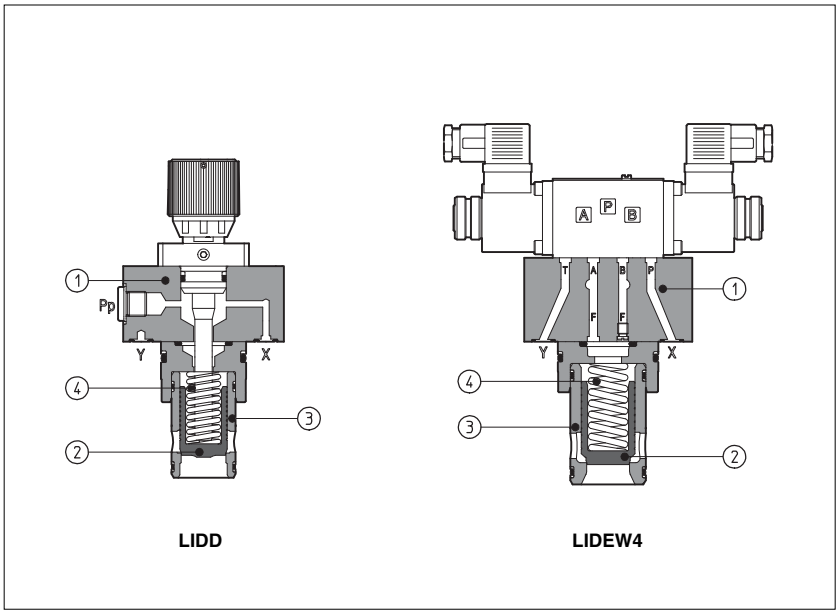
Basics for 2 way cartridge valves type LI

ISO 7368 size from 16 to 100



LIDD **LIDEW4**

Modular cartridge valves realize pressure, flow, directional and check controls and are 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 an hydraulically piloted poppet ② sliding into a drilled sleeve ③; spring ④ keep the poppet closed in resting position.

Poppet is hydraulically piloted by means of internal connections in the cover (X, F, Z1, Z2, Y). External pilot line can operate directly or by means of solenoid valve or pressure relief valves housed in the cover.

Many different covers are available, each providing a different function to realize a complete range of valves and allow the development of any electrohydraulic circuit for the control of machines and systems, see section 4, 5, 6, 7.

Poppets may have different geometrical shapes and area ratios as described in section 8, to optimize pressure, flow and directional controls.

These valves are available in standard sizes 16 to 100 according to ISO 7368 (DIN 24342).

Flow up to 8000 l/min at Δp = 6 bar, pressure up to 350 bar.

Atos also realizes integrated electrohydraulic blocks customized to the application by combining ISO components and cartridge valves within compact functional manifolds.

Proportional cartridge valves are also available, see tab. F300 to F340.

1 MODEL CODE FOR COVERS

LI **MHA** **-2** **/210** **-** **IX 24DC** ****** **/*** **X****

Cover according to ISO 7368

Function and type of control see section 4, 5, 6, 7.

Size:
1 = 16 **3** = 32 **5** = 50 **8** = 80
2 = 25 **4** = 40 **6** = 63 **10** = 100

Pressure range control (only for LIM*, LIRA, LICM):
50 = 6 ÷ 50 bar;
100 = 8 ÷ 100 bar;
210 = 10 ÷ 210 bar;
350 = 15 ÷ 350 bar;

Pilot solenoid valve options:
-IX = solenoid OI for AC and DC supply
Supply voltage, see table E010 (till to size 6)
-EX = solenoid AE for AC and DC supply
Supply voltage, see table E025 (for size 8 and 10)

Series number

Synthetic fluid:
WG = water glycol
PE = phosphate ester

Special orifices setting

2 MODEL CODE FOR CARTRIDGES

SC LI **-** **25** **31** **2** ****** **/***

Cartridge according to ISO 7368

Size, the same of relevant cover:
16 = 16 **40** = 40 **80** = 80
25 = 25 **50** = 50 **100** = 100
32 = 32 **63** = 63
see section 8

Type of poppet: see section 8

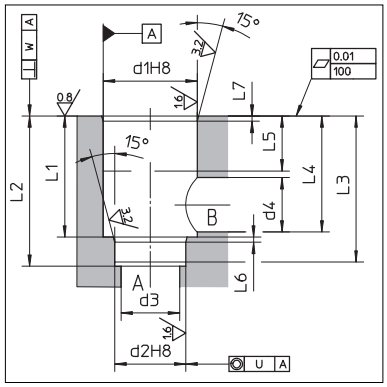
Spring cracking pressure, see the specific valve tables for the available cracking pressure:
1 = 0,3 bar **4** = 4 bar
2 = 1,5 bar **6** = 5,5 bar
3 = 3 bar **7** = 7 bar

Series number

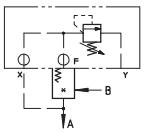
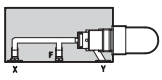
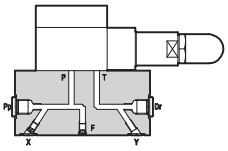
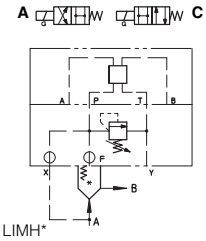
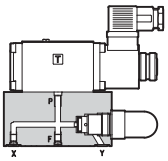
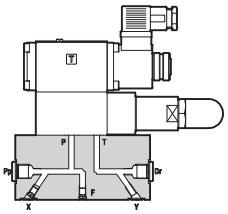
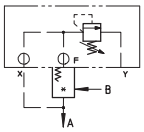
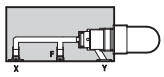
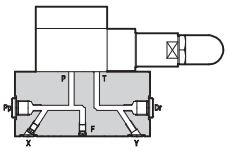
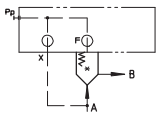
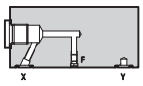
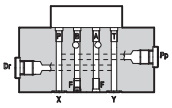
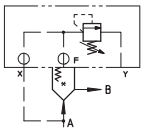
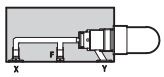
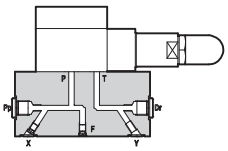
Synthetic fluid:
WG = water glycol
PE = phosphate ester

3 HYDRAULIC CHARACTERISTICS AND RECESS DIMENSIONS

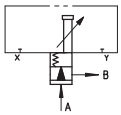
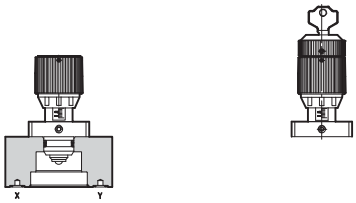
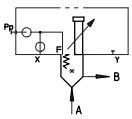
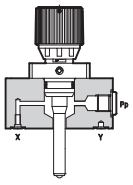
Sizes	Qmax [l/min] Δp = 6 bar				Recess dimensions [mm]												
	Pressure control	Flow control	Direction control	Check function	ø d1	ø d2	ø d3 max	ø d4 max	L1	L2	L3	L4 max	L5	L6	L7	U	W
16	160/200	60/180	130/180	130/180	32	25	16	22,5	$43^{+0,1}_{0}$	$56^{+0,1}_{0}$	54	42,5	20	2	2	0,03	0,05
25	270/400	300/430	300/430	300/430	45	34	25	27	$58^{+0,1}_{0}$	$72^{+0,1}_{0}$	70	57	30	2,5	2,5	0,03	0,05
32	540/670	480/670	480/670	480/670	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	840/1200	940/1400	940/1400	940/1400	75	55	40	54,5	$87^{+0,1}_{0}$	$105^{+0,1}_{0}$	102	84,5	30	3	3	0,05	0,1
50	2200	1500/2200	1500/2200	1500/2200	90	68	50	62,5	$100^{+0,1}_{0}$	$122^{+0,1}_{0}$	117	97,5	35	3	3	0,05	0,1
63	3500	2200/3500	2200/3500	2200/3500	120	90	63	87	$130^{+0,1}_{0}$	$155^{+0,1}_{0}$	150	127	40	4	4	0,05	0,2
80	5400	-	4000/5600	4000/5600	145	110	80	100	$175^{+0,2}_{0}$	$205^{+0,2}_{0}$	200	170,5	40	5	5	0,05	0,2
100		-	8000	8000	180	135	100	120	210	245	239	205,5	50	5	5	0,05	0,2



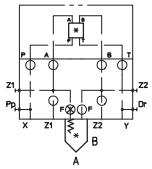
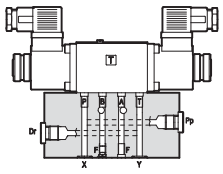
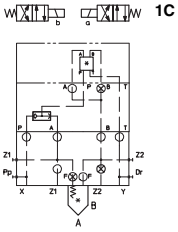
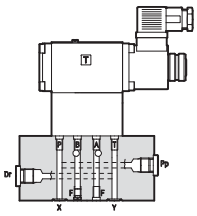
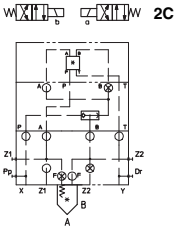
4 **TYPICAL FUNCTIONS OF COVERS - PRESSURE CONTROL, see table H010**

Function and type of control	Size	Hydraulic sketch	Cover size 6 ÷ 32	Cover size 40 ÷ 80	Cartridges
Pressure relief control with manual setting **LIMM**	16 25 32 40 50 63 80				SC LI-**31* size 16... 80 SC LI-**34* size 16 SC LI-**35* size 16...50
Pressure relief control with solenoid valve for venting **LIMHA** = unloading when solenoid is de-energized **LIMHC** = unloading when solenoid is energized	16 25 32 40 50 63 80	 LIMH*			SC LI-**31* size 16...80 SC LI-**34* size16 SC LI-**35* size16...50
Pressure reducing control with manual setting. Open in resting position **LIRA**	16 25 32 40				SC LI-**37* size 16...40
Pressure compensator to be coupled with flow control valves **LIC**	16 25 32 40 50 63 80				SC LI-**31* size 16...80 SC LI-**36* size 16...80
Pressure compensator with mechanical max pressure regulation to be coupled with flow control valves. **LICM**	16 25 32 40 50 63 80				SC LI-**31* size 16...80 SC LI-**36* size 16...80

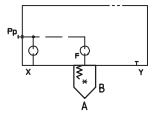
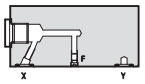
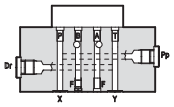
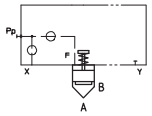
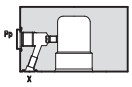
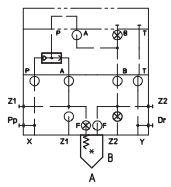
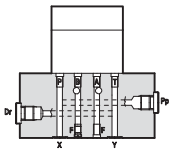
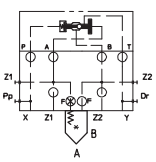
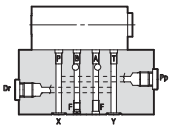
5 **TYPICAL FUNCTIONS OF COVERS - FLOW CONTROL, see table H020**

Function and type of control	Size	Hydraulic sketch	Cover size 16 ÷ 63	Cartridges
Flow control with manual setting **LIQV** They can be coupled with LIC or LICM valves with poppet type 31, 36 or 37 for compensated flow control	16 25			SC LI-**290 size 16 SC LI-**490 size 16, 25
Flow control with stroke limiter **LIDD**	16 25 32 40 50 63			SC LI-**32* SC LI-**33* size 16...63 SC LI-**42* SC LI-**43* size 16...63

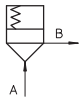
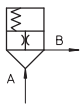
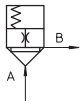
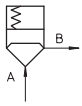
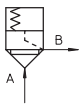
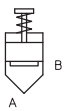
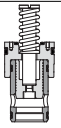
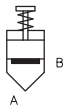
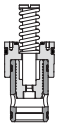
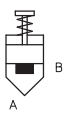
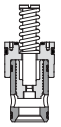
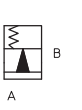
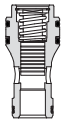
6 TYPICAL FUNCTIONS OF COVERS - DIRECTIONAL CONTROL, see table H030

Function and type of control	Size	Hydraulic sketch	Cover size 16 ÷ 100	Cartridges
Direct operated directional control valve with solenoid valve for pilot selection **LIDEW***	16 25 32 40 50 63 80 100			SC LI-**32* SC LI-**33* size 16 ... 100 SC LI-**42* size 16 ... 80 SC LI-**43* size 16 ... 100
Direct operated directional control valve with solenoid valve and shuttle valve for pilot selection **LIDBH1A** = open when solenoid is de-energized **LIDBH1C** = closed when solenoid is de-energized	16 25 32 40 50 63 80 100	**1A**  **1C**		SC LI-**32* SC LI-**33* size 16 ... 100 SC LI-**42* size 16 ... 80 SC LI-**43* size 16 ... 100
Direct operated directional control valve with solenoid and shuttle valve for pilot selection **LIDBH2A** = when solenoid is de-energized only connections X F **LIDBH2C** = when solenoid is de-energized only connections Z1 F	16 25 32 40 50 63 80 100	**2A**  **2C**		SC LI-**32* SC LI-**33* size 16 ... 100 SC LI-**42* size 16 ... 80 SC LI-**43* size 16 ... 100

7 TYPICAL FUNCTIONS OF COVERS - CHECK FUNCTION, see table H040

Function and type of control	Size	Hydraulic sketch	Cover size 16 ÷ 25	Cover size 32 ÷ 80	Cartridges
Direct operated check valve normally closed **LIDA**	16 25 32 40 50 63 80				SC LI-**32* SC LI-**33* size 16 ... 80 SC LI-**42* SC LI-**43* size 16 ... 80 SC LI-**52* size 16 ... 50
Direct operated check valve normally open **LIDO**	16 25 32 50				SC LI-**62* SC LI-**63* size 16, 25, 32, 50
Direct operated check valve with shuttle valve for pilot selection **LIDB**	16 25 32 40 50 63				SC LI-**32* SC LI-**33* size 16 ... 63 SC LI-**42* SC LI-**43* size 16 ... 63
Direct operated check valve with hydraulically operated pilot check valve **LIDR**	16 25 32 40 50 63				SC LI-**32* SC LI-**33* size 16 ... 63 SC LI-**42* SC LI-**43* size 16 ... 63

8 TYPICAL FUNCTIONS OF CARTRIDGES

Type \ Size	SC LI-16	SC LI-25	SC LI-32	SC LI-40	SC LI-50	SC LI-63	SC LI-80	SC LI-100	Functional sketch (hydraulic symbol)	Typical section	Area ratio (1)	Function
31	●	●	●	●	●	●	●	–			1 : 1	Poppet type LIMM, LIMHA, LIMHC, LIC, LICM
32	●	●	●	●	●	●	●	●			1 : 1,1	Poppet type LIDA, LIDD, LIDB, LIDBH**, LIDEW*
33	●	●	●	●	●	●	●	●			1 : 2 for size 16, 25 1 : 1,6 for size 32 ÷ 100	Poppet type LIDA, LIDD, LIDB, LIDBH**, LIDEW*
34	●	❍	❍	–	–	–	–	–			1 : 1	Poppet type LIMM, LIMHA, LIMHC
35	●	●	●	●	●	–	–	–			1 : 1,1	Poppet type LIMM, LIMHA, LIMHC
36	●	●	●	●	●	●	●	–			1 : 1	Spool type LIC, LICM
37	●	●	●	●	–	–	–	–			1 : 1	Spool type LIRA
42	●	●	●	●	●	●	●	–			1 : 1,1	Poppet type with dumping nose LIDA, LIDD, LIDB, LIDBH**, LIDEW*
43	●	●	●	●	●	●	●	●			1 : 2 for size 16, 25 1 : 1,6 for size 32 ÷100	Poppet type with dumping nose LIDA, LIDD, LIDB, LIDBH**, LIDEW*
52	●	●	●	●	●	–	–	–			1 : 1,1	Poppet type LIDA
62	●	●	●	❍	●	–	–	–			1 : 1,1	Poppet type LIDO
63	●	●	●	❍	●	–	–	–			1 : 1,1	Poppet type with dumping nose LIDO
69	–	●	●	●	●	–	–	–			1 : 1,6	Poppet type with dumping nose LIDO
290 **490**	● ●	– ●	– –	– –	– –	– –	– –	– –			1 : 1	Spool type LIQV

● normally available from stock
❍ on request
– not available

(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. For example "1:2" means: 1 = area on which the main pressure of the circuit is applied; 2 = area on which the pilot pressure is applied.