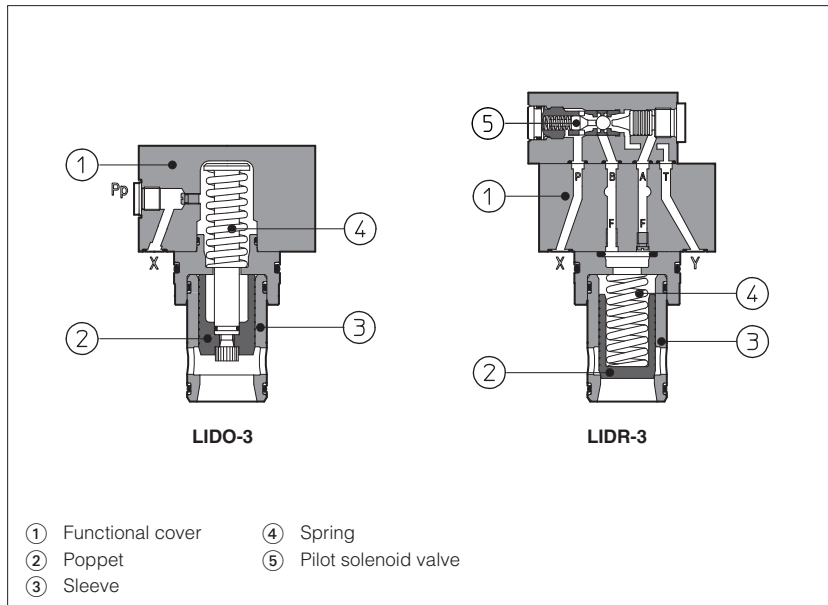


ISO cartridge valves type LID*

Check function, high flow, **Pmax 420 bar**



Directional control valves in ISO cartridge design, specific for check functions. They are made by a functional cover ① and a 2-way **SC LI** slip-in cartridge.

Covers are available with different check functions:

LIDA, normally closed

LIDO, normally open

LIDB, normally closed with shuttle valve for pilot pressure selection

LIDR, normally closed with pilot operated check valve

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

It is made by a poppet ② sliding into a sleeve ③ and kept in normally closed position (open position for type 62 and 63) by the spring ④ available with different cracking pressure values.

Size: **16 to 100** ISO 7368

Max flow up to **9000 l/min** at $\Delta p = 5$ bar

Max pressure up to **420 bar**

1 MODEL CODE OF FUNCTIONAL COVERS - for model code of slip-in cartridge, see section 5, 7

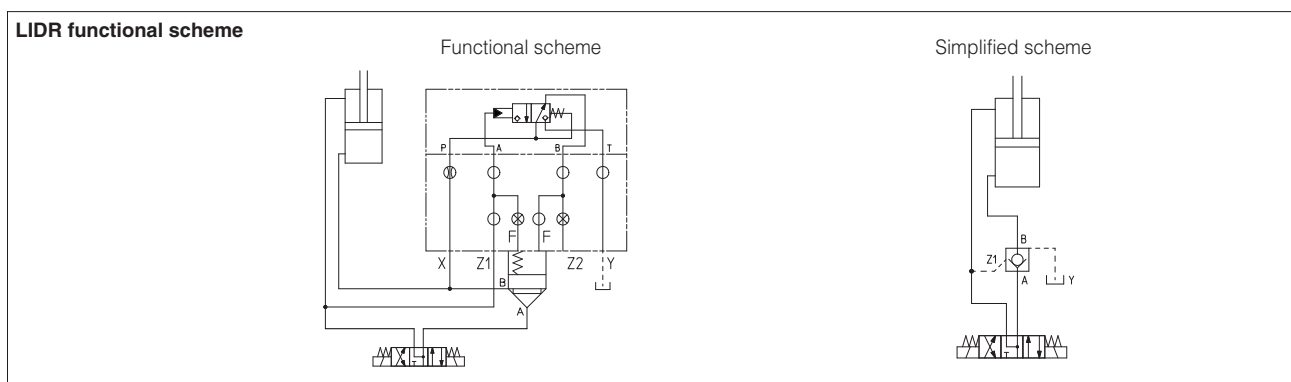
LI	D	A	-	1	/	*	/	**	/	**	/	*
Cover according to ISO 7368												
D = directional function												
Cover configuration see section 2:												
A = normally closed												
O = normally open												
B = normally closed, with shuttle valve for pilot selection												
R = normally closed, with hydraulically operated pilot check valve for bidirectional flow (1)												
Size:												
1 = 16; 4 = 40; 8 = 80 (only for LIDA)												
2 = 25; 5 = 50; 10 = 100 (only for LIDA)												
3 = 32; 6 = 63 (not for LIDO)												
LIDO is available only in sizes 16 to 50												
Series number												
Options: see section 3												
Seals material:												
- = NBR												
PE = FKM												
BT = HNBR												

(1) LIDR functional cover operates as normally closed check valve with pilot control for bidirectional flow - see the below functional scheme as reference.

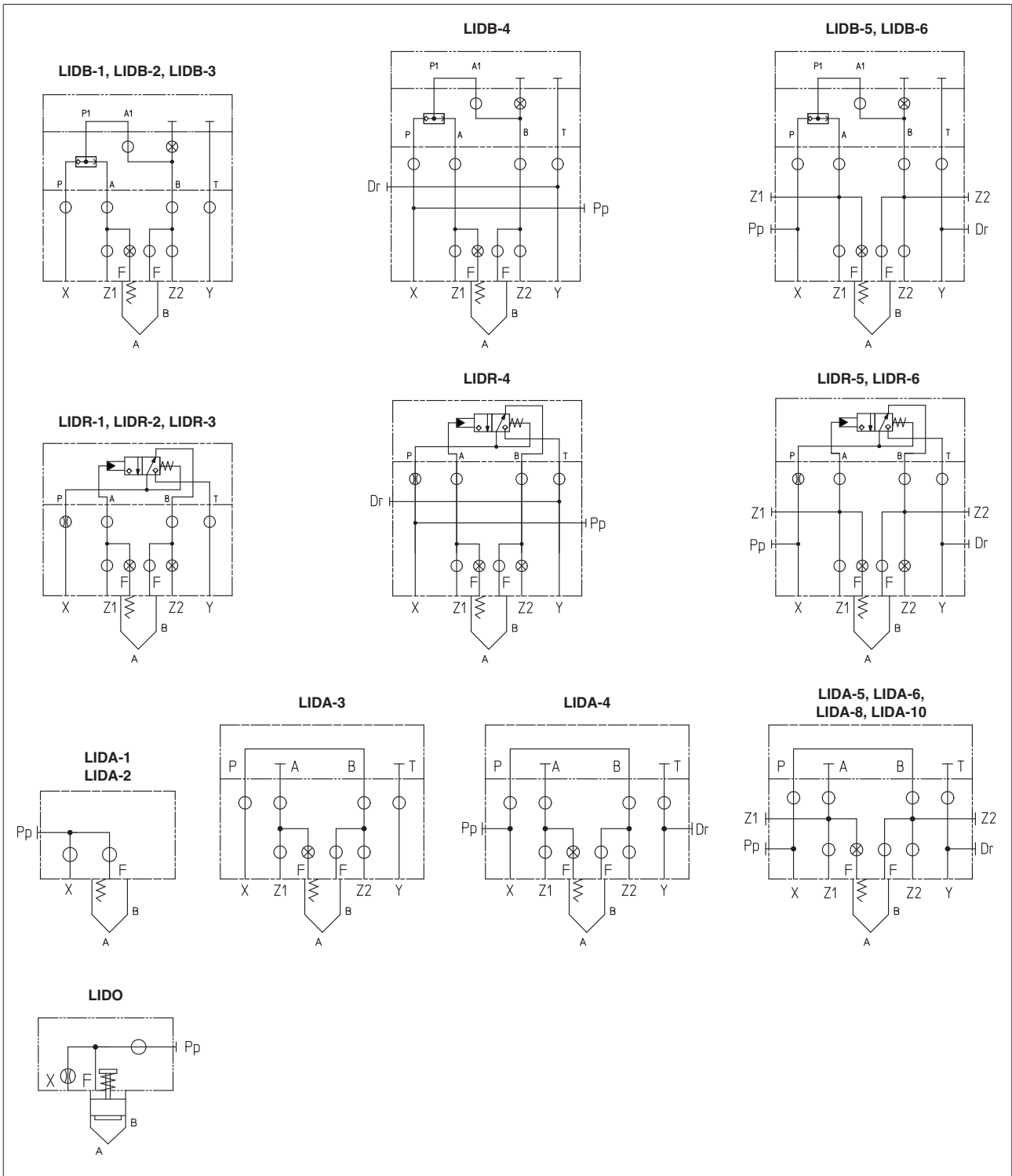
Free flow is normally permitted from A to B and blocked from B to A by the pressure on X pilot port

The flow from B to A is permitted by opening the valve through the pressure on pilot port Z1

Piloting ratio Z1 : X = 1 : 2.75



2 HYDRAULIC SYMBOLS (cover configuration)



3 OPTIONS

For LIDA (sizes 16 and 25), for LIDO (all sizes) LIDB (sizes 40 ÷ 63), LIDR (sizes 40 ÷ 63):

/E = with external attachments Pp and underneath port X supplied plugged;

For LIDA, LIDB, LIDR:

/F = prearranged for coupling to an intermediate element with position detector for safety valves, see tab. EY120.

For all models:

******* = Calibrated plugs different from standard ones reported in section 4. The restrictors configuration (if different from the standard) it must be indicated at the end of the model code:

LIDB	-	4	/E	**	P	06
					Channel where the restrictor has to be provided: P = channel X, port P Z1 = channel Z1 F = channel F Z2 = channel Z2	Size of the throttling hole in tenths of millimeters: 00 = plugged 08 = 0,8 mm 15 = 1,5 mm 05 = 0,5 mm 10 = 1 mm 17 = 1,7 mm 06 = 0,6 mm 12 = 1,2 mm 20 = 2 mm

4 STANDARD ORIFICES CONFIGURATION

Port \ Cover	LIDA-1	LIDO-1	LIDB-1	LIDR-1	LIDA-2	LIDO-2	LIDB-2	LIDR-2	LIDA-3	LIDO-3	LIDB-3	LIDR-3	LIDA-4	LIDO-4	LIDB-4	LIDR-4	LIDA-5	LIDO-5	LIDB-5	LIDR-5	LIDA-6	LIDB-6	LIDR-6	LIDA-8	LIDA-10
	X	M4 -	M4 10A	-	-	M4 -	M6 10A	-	-	-	M6 12A	-	-	-	M6 15F	-	-	-	M6 15F	-	-	-	-	-	-
P	-	-	M6	M6 12A	-	-	M6	M6 12A	M6 15A	-	M6 15A	M6 17A	-	M6	M6 17A	M6 20A	M6 20A	-	M6 20A	M6 20A	M6 20A	M6 20A	M6 20A	M8 20A	M8 25A
Z2	-	-	M4	M4 00F	-	-	M6	M6 00F	M6	-	M6	M6 00F	-	M6	M6 00F	M6 00F	M6 00F	-	M6 00F	M6 00F	M6 00F	M6 00F	M6 00F	M8	-

M4 ÷ M6 = screw size; **10A ÷ 00F** = calibrated orifices diameters in tenths of mm; **A** = short calibrated hole, **F** = long calibrated hole; - = without orifice;

5 MODEL CODE OF SLIP-IN CARTRIDGES type 32, 33, 42, 43 for LIDA, LIDB and LIDR

SC LI	R	-	16	43	1	40	/	*
Cartridge according to ISO 7368								Seals material: - = NBR PE = FKM BT = HNBR
- = standard execution R = sealed poppet execution (poppet type 32 not available for size 100)								
Size , the same of relevant cover: 16 25 32 40 50 63 80 100								Series number
Type of poppet (not for LIDO) 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 , see section 6 : 1, 2, 3, 6

6 TYPE OF POPPET

Type of poppet	32				33				42				43				
Functional sketch (Hydraulic symbol)																	
Typical section																	
Area ratio A:Ap	1:1,1				1:1,5				1:1,1				1:1,5				
Operating pressure	420 bar max																
	Nominal flow at Δp 5 bar (l/min) see diagrams Q/Δp at section 10																
Size 16	270				270				240				240				
Size 25	550				550				500				500				
Size 32	1000				1000				800				800				
Size 40	1700				1700				1400				1400				
Size 50	2500				2500				2200				2200				
Size 63	4000				4000				3300				3300				
Size 80	5500				5500				4000				4000				
Size 100	9000				9000				-				6300				
	Cracking pressure (bar)																
Spring	1	2	3	6	1	2	3	6	1	2	3	6	1	2	3	6	
Size 16	A→B	0.3	1.5	3	5.3	0.6	1.6	2.9	5.1	0.3	1.7	3.3	6.1	0.7	1.9	3.3	5.7
	B→A	3.2	16	30.5	50.3	1.2	3.2	5.8	10	3.6	17.7	34.5	63.4	1.3	3.7	6.5	11.2
Size 25	A→B	0.3	1.5	3	5	0.6	1.4	3	5	0.3	1.7	3.3	6.1	0.7	1.5	3.3	5.8
	B→A	3.1	15.1	30.5	50.3	1.2	2.8	5.9	9.9	3.5	17.1	33.3	61.4	1.3	3	6.5	11.3
Size 32	A→B	0.3	1.5	3	5	0.6	1.6	3	5.4	0.3	1.7	3.7	6.3	0.7	1.8	3.4	6.3
	B→A	3.5	17	34.2	56.7	1.2	3.2	6	10.7	3.9	18.8	41.6	71.1	1.4	3.6	6.9	12.7
Size 40	A→B	0.3	1.5	3	5	0.6	1.5	3	5.5	0.4	1.8	3.5	6.4	0.7	1.8	3.6	7.3
	B→A	2.9	14.7	29.4	48.3	1.2	3	6	11	3.5	17.2	34	62	1.3	3.6	7.2	14.6
Size 50	A→B	0.3	1.5	3	4.3	0.6	1.6	3	4.8	0.4	1.7	3.4	5.2	0.7	1.9	3.4	5.7
	B→A	3.6	16.9	33.8	48.4	1.4	3.6	6.7	10.8	4.2	18.9	38.1	58.9	1.5	4.4	7.7	12.9
Size 63	A→B	0.3	1.5	2.9	4.2	0.6	1.5	2.9	5.8	0.4	1.7	3.4	4.7	0.7	1.8	3.3	6.5
	B→A	3.1	15	29.2	42	1.3	3.3	6.4	12.5	3.6	16.6	33.8	47.2	1.5	4	7.2	14.1
Size 80	A→B	0.3	1.5	3	4.6	0.6	1.5	3	5.3	0.3	1.7	3.3	4.9	0.7	1.8	3.3	5.9
	B→A	3	14.8	29.2	45.2	1.3	3.1	6.3	11.2	3.4	16.6	32.9	48.8	1.4	3.8	7	12.4
Size 100	A→B	0.3	1.5	3		0.6	1.5	3.1	6					0.7	1.9	3.8	7.4
	B→A	3	15	30.5		1.2	3	6.3	12.2					1.5	3.9	7.8	14.9

7 MODEL CODE OF SLIP-IN CARTRIDGES type 52, 62, 63 for LIDA and LIDO

SC LI	-	16	52	1	**	/*
Cartridge according to ISO 7368					Series number	Seals material: - = NBR PE = FKM BT = HNBR
Size , the same of relevant cover: 16 25 32 40 50						
Type of poppet: 52 = normally closed, only for LIDA; 62 = normally open without damping nose, only for LIDO; 63 = normally open with damping nose, only for LIDO						
				Spring cracking pressure: 1 = 0,3 bar for poppet 52; 2 = 1,5 bar for poppet 52; 3 = 3 bar for all poppets 6 = 6 bar for all poppets		

8 TYPICAL FUNCTIONS OF POPPETS

Type of poppet	52		62		63	
Functional sketch (Hydraulic symbol)						
Typical section						
Area ratio A:Ap	1:1,1		1:1,1		1:1,1	
Operating pressure	420 bar max					
Nominal flow at Δp 5 bar (l/min) see diagrams Q/Δp at section 10						
Size 16	160		160		160	
Size 25	400		400		400	
Size 32	600		600		600	
Size 40	1200		1200		1200	
Size 50	1800		1800		1800	
Cracking pressure (bar)						
Spring	1	2	3	6	3	6
Size 16 A→B	0.3	1.5	3	6	Normally open	Normally open
Size 25 A→B	0.3	1.5	3	6		
Size 32 A→B	0.3	1.5	3	6		
Size 40 A→B	0.3	1.5	3	6		
Size 50 A→B	0.3	1.5	3	6		

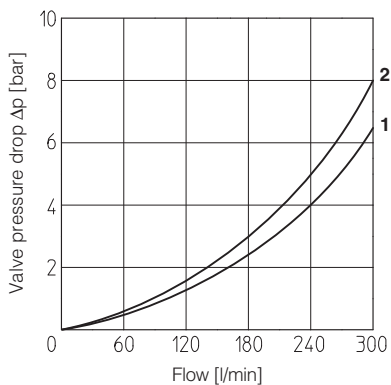
9 MAIN CHARACTERISTICS, SEALS AND HYDRAULIC FLUID

Assembly position / location	Any position		
Subplate surface finishing	Roughness index Ra 0,4 - flatness ratio 0,01/100 (ISO 1101)		
MTTFd values according to EN ISO 13849	150 years, for further details see technical table P007		
Compliance	RoHS Directive 2011/65/EU as last update by 2015/863/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	HFDR, HFDR	ISO 12922
Flame resistant with water	NBR, HNBR	HFC	
Flow direction	As shown in the symbols of table 2		
Functional cover operating pressure	Ports P, A, B, X, Z1, Z2: 420 bar		

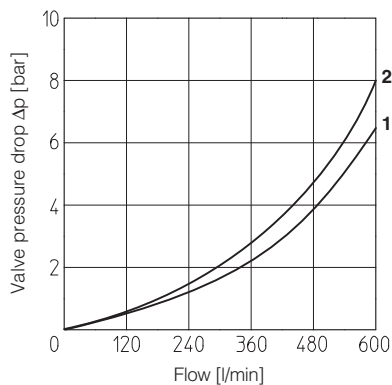
10 Q/ΔP DIAGRAMS based on mineral oil ISO VG 46 at 50°C

10.1 SC LI slip-in cartridges, poppet type 32, 33, 42, 43

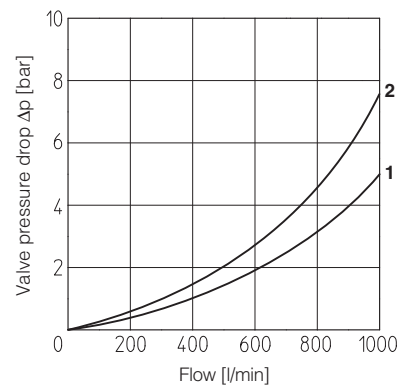
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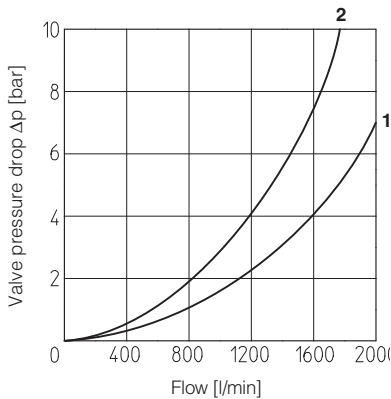
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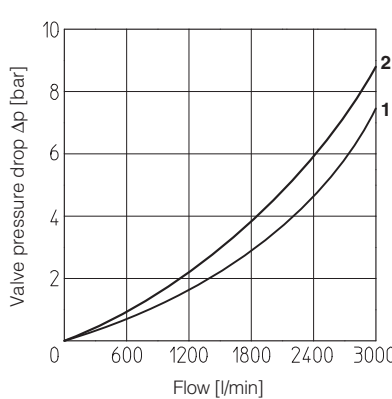
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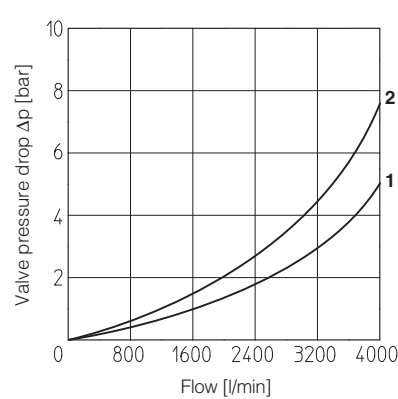
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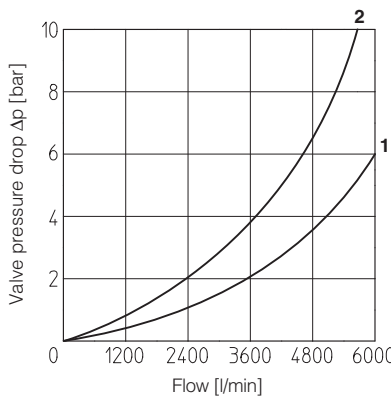
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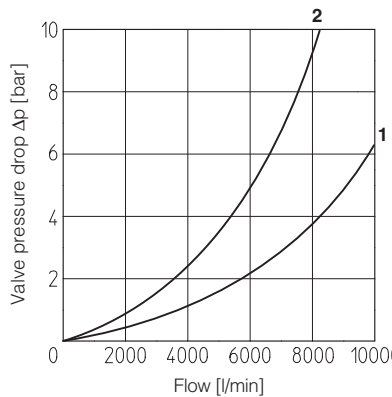
size 63



size 80



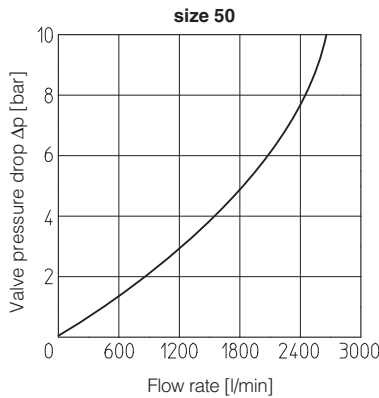
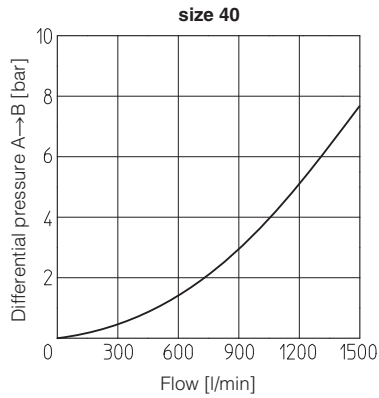
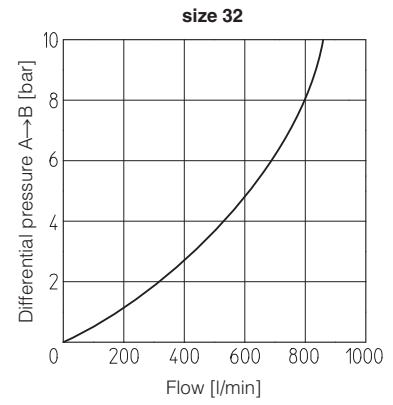
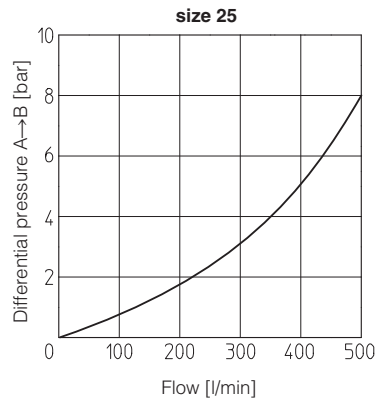
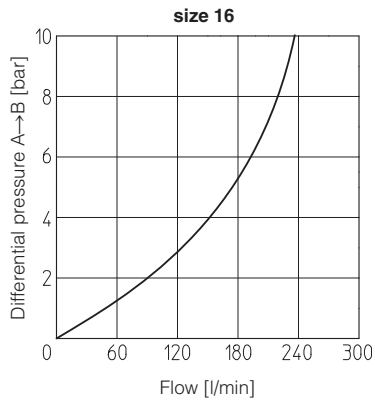
size 100



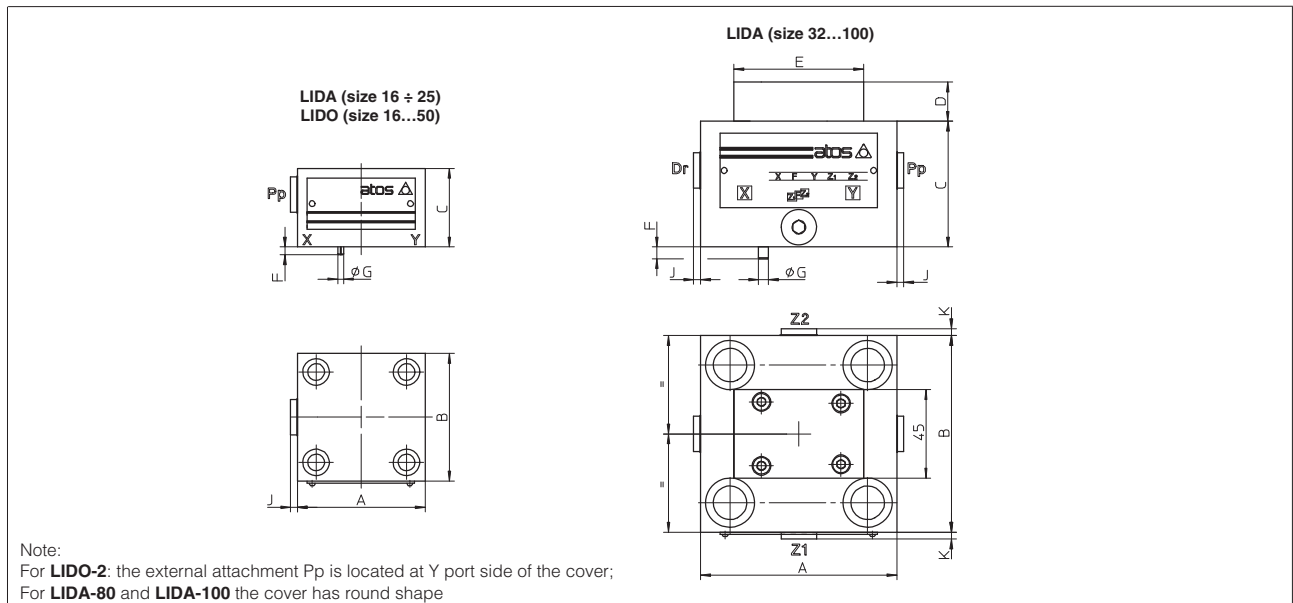
High flow - series 40

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

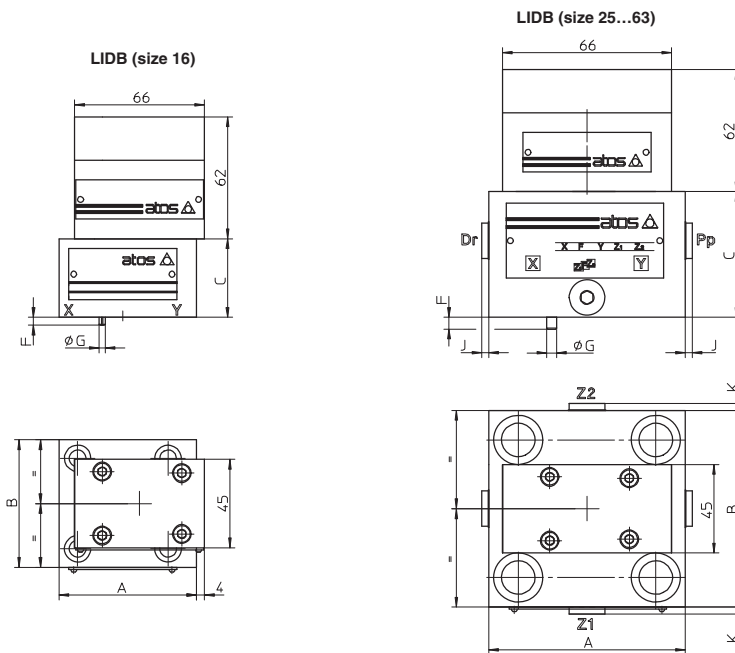
10.2 SC LI slip-in cartridges, poppet type 52, 62, 63



11 COVER DIMENSIONS [mm] - for mounting interface and cavity dimensions, see tech. table P006

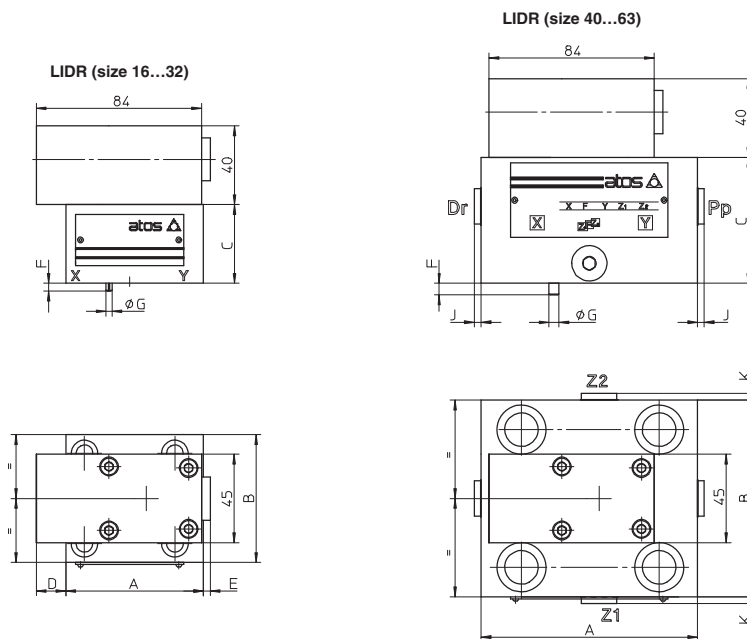


Covers (1)	A	B	C	D	E	F	G	J	K	Port Pp-Dr	Port Z1-Z2	Seals	Fastening bolts DIN 912 class 12.9	Tightening torque [Nm]	Mass [Kg]
LIDA-1 LIDO-1	65	65	40	-	-	4	3	3.5	-	G 1/4"	-	2 OR-108 1 OR-108	N°4 M8x45	35	1.4
LIDA-2 LIDO-2	85	85	40	-	-	6	5	3.5	-	G 1/4"	-	2 OR-108 1 OR-108	N°4 M12x45 N°4 M12x50	125	1.8
LIDA-3 LIDO-3	100	100	50 60	20	66	6	5	- 3.5	-	G 1/4"	-	4 OR-2043 1 OR-2043	N°4 M16x55 N°4 M16x60	300	2.3
LIDA-4 LIDO-4	125	125	60 100	20	66	6	5	3.5	-	G 1/4"	-	4 OR-3043 1 OR-3043	N°4 M20x70 N°4 M20x100	600	6.2
LIDA-5 LIDO-5	140	140	70 110	20	66	4	6	3.5	3.5	G 1/4"	G 1/4"	4 OR-3043 1 OR-3043	N°4 M20x80 N°4 M20x110	600	9.3
LIDA-6	180	180	80	20	66	4	6	3.5	3.5	G 3/8"	G 3/8"	4 OR-3050	N°4 M30x90	2100	17.1
LIDA-8	Ø250	-	80	30	73	6	8	3.5	3.5	G 3/8"	G 3/8"	2 OR-4075	N°4 M24x90	1000	27
LIDA-10	Ø250	-	80	30	73	6	10	3.5	3.5	G 1/2"	G 3/8"	2 OR-4075	N°4 M30x120	2100	54



Note:
For **LIDB-6** the external attachments Pp, Dr, Z1 and Z2 are inverted each others respect to the showed sketch

Covers	A	B	C	F	G	J	K	Port Pp-Dr	Port Z1-Z2	Seals	Fastening bolts DIN 912 class 12.9	Tightening torque [Nm]	Mass [Kg]
LIDB-1	70	65	40	4	3	-	-	-	-	4 OR-108	N°4 M8x45	35	2.2
LIDB-2	85	85	40	6	5	-	-	-	-	4 OR-108	N°4 M12x45	125	2.6
LIDB-3	100	100	50	6	5	-	-	-	-	4 OR-2043	N°4 M16x55	300	3.1
LIDB-4	125	125	60	6	5	3.5	-	G 1/4"	-	4 OR-3043	N°4 M20x70	600	7
LIDB-5	140	140	70	4	6	3.5	3.5	G 1/4"	G 1/4"	4 OR-3043	N°4 M20x80	600	10.1
LIDB-6 (1)	180	180	80	4	6	3.5	3.5	G 3/8"	G 3/8"	4 OR-3050	N°4 M30x90	2100	17.9



Note:
For **LIDR-6** the position of external attachments Pp, Dr, Z1 and Z2 are inverted each others respect to the showed sketch

Covers	A	B	C	D	E	F	G	J	K	Port Pp-Dr	Port Z1-Z2	Seals	Fastening bolts DIN 912 class 12.9	Tightening torque [Nm]	Mass [Kg]
LIDR-1	70	65	40	4	3.5	4	3	-	-	-	-	4 OR-108	N°4 M8x45	35	2.5
LIDR-2	85	85	40	13.5	-	6	5	-	-	-	-	4 OR-108	N°4 M12x45	125	2.9
LIDR-3	100	100	50	6	-	6	5	-	-	-	-	4 OR-2043	N°4 M16x55	300	3.4
LIDR-4	125	125	60	-	-	6	5	3.5	-	G 1/4"	-	4 OR-3043	N°4 M20x70	600	7.3
LIDR-5	140	140	70	-	-	4	6	3.5	3.5	G 1/4"	G 1/4"	4 OR-3043	N°4 M20x80	600	10.4
LIDR-6	180	180	80	-	-	4	6	3.5	3.5	G 3/8"	G 3/8"	4 OR-3050	N°4 M30x90	2100	18.3