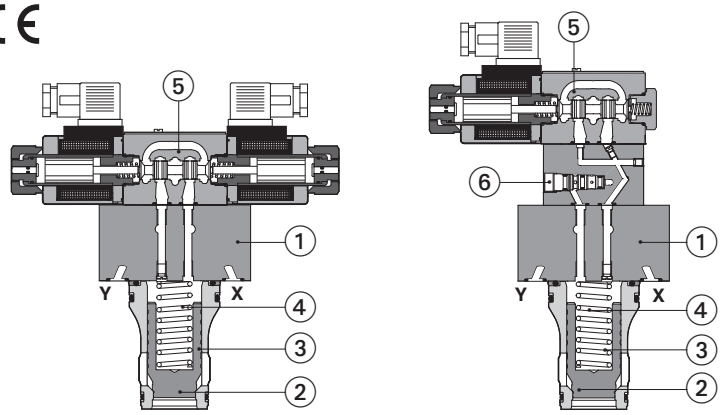
ISO cartridge valves type LIDEW* and LIDBH*

directional control, high flow, **Pmax 420 bar**



LIDEW4-3-E **LIDBH1A-3-E**

① Functional cover
② Poppet
③ Sleeve
④ Spring
⑤ Pilot slenoid valve
⑥ Shuttle valve

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

LI	D	EW	1	-	3	/	*	-	E	X	24DC	**	/	*	*

LI: Cover according to ISO 7368

D = directional function

EW = with or whithout pilot solenoid valve
BH = as EW plus shuttle valve for pilot selection

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

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

Options, see section 3

Pilot solenoid valve (1)
for size 1 to 6: **I** = DHI, **Pmax 350 bar**
E = DHE, **Pmax 350 bar**
EP = DHEP, **Pmax 420 bar**
for size 8 and 10: **E** = DKE, **Pmax 350 bar**
EP = DKEP, **Pmax 420 bar**

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**)

Voltage code see section 8

Series number

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

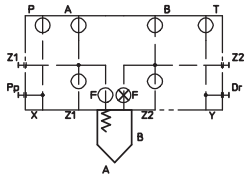
Optional different setting of calibrated plugs in the pilot channels, see sections 3, 4

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

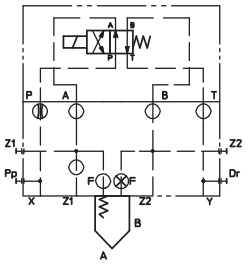
DHI tech. table E010
DHE tech. table E015
DHEP tech. table TE030
DKE tech. table E025
DKEP tech. table TE030

2 HYDRAULIC SYMBOLS (cover configuration)

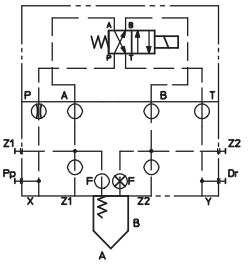
LIDEW



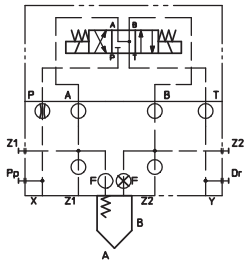
LIDEW-*



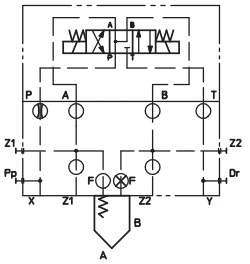
LIDEW1-*



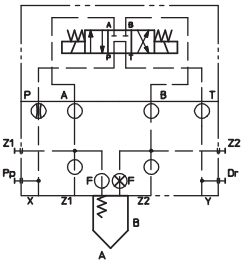
LIDEW2-*



LIDEW4-*

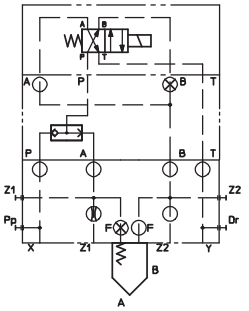


LIDEW5-*

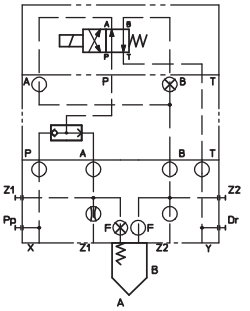


LIDEW6-*

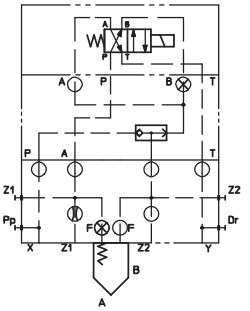
LIDBH



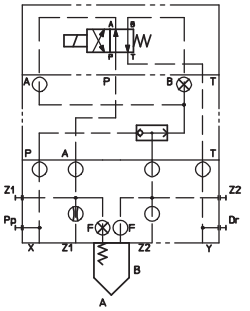
LIDBH1A-*



LIDBH1C-*



LIDBH2A-*



LIDBH2C-*

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 **Z1** = channel Z1 **F** = channel F **Z2** = channel Z2

06
Size of the throttling hole in teths 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

Cover / Port	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 LIDBH*-8	LIDEW*-10 LIDBH*-10
Z1 (only for LIDBH*-*)	M4 12A	M4 12A	M6 15A	M6 17A	M6 20A	M6 20A	M8 20A	M8 20A
P	M6 12A	M6 12A	M6 15A	M6 17A	M6 20A	M6 20A	M8 20A	M8 25A

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

5 MODEL CODE OF SLIP-IN CARTRIDGES

SC LI	-	16	43	1	40	/	*

Cartridge according to ISO 7368

Size, the same of relevant cover:

16 25 32 40 50 63 80 100

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

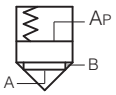
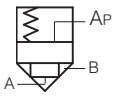
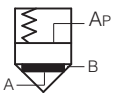
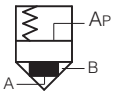
Series number

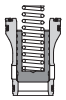
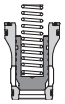
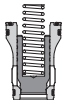
Seals material:
- = NBR
PE = FKM
BT = HNBR

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

6 TYPE OF POPPET

Type of poppet	**32**	**33**	**42**	**43**
Functional sketch (Hydraulic symbol)				

Operating pressure		**420 bar max**			
Nominal flow at Δp 5bar (l/min) see diagrams Q/Δp at section 9	Size **16**	270	270	240	240
	25	550	550	500	500
	32	1000	1000	800	800
	40	1700	1700	1400	1400
	50	2500	2500	2200	2200
	63	4000	4000	3300	3300
	80	5500	5500	4000	4000
	100	9000	9000	-	6300
Typical section					
Area ratio A:Ap		**1:1,1**	**1:1,5**	**1:1,1**	**1:1,5**
Cracking pressure A→B	Spring **1**	0,3 bar	0,6 bar	0,3 bar	0,6 bar
	2	1,5 bar	-	1,5 bar	-
	3	3 bar	2,5 bar	3 bar	2,5 bar
	6	5,5 bar	5,5 bar	5,5 bar	5,5 bar
Cracking pressure B→A	Spring **1**	3 bar	1,2 bar	3 bar	1,2 bar
	2	12,8 bar	-	12,8 bar	-
	3	32,5 bar	6 bar	32,5 bar	6 bar
	6	54,5 bar	11 bar	54,5 bar	11 bar

7 MAIN CHARACTERISTCS, 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)		
MTTFd 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, HVLPD	DIN 51524
Flame resistant without water		FKM	HFDU, HFDR	ISO 12922
Flame resistant with water		NBR, HNBR	HFC	
Flow direction		From A→B or B→A		
Functional cover operating pressure	Pilot valve **I**	Ports A, B, X, Z1, Z2: **350** bar	Port Y: **120** bar	
	Pilot valve **E**	Ports A, B, X, Z1, Z2: **350** bar	Port Y: **210** bar for DC version; **160** bar for AC version	
	Pilot valve **EP**	Ports A, B, X, Z1, Z2: **420** bar	Port Y: **210** bar for DC version; **160** bar for AC version	

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 Due to the occuring 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 8
Supply voltage tolerance	± 10%
Certification	**cURus** North American Standard

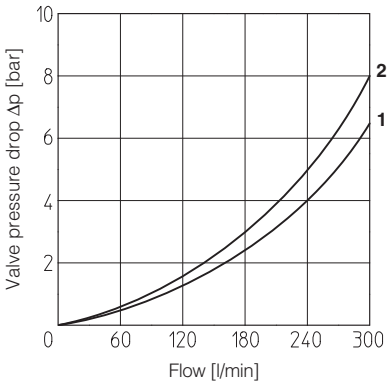
8 ELECTRIC FEATURES

Solenoid valve type	External supply nominal voltage ± 10% (1)		**Voltage code**	Type of connector	Power consumption (3)	Code of spare coil DHI	Colour of coil label DHI	Code of spare coil DHE, DHEP
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	COE-12DC COE-24DC COE-110DC COE-220DC
	AC	110/50 AC (2) 115/60 AC 120/60 AC 230/50 AC (2) 230/60 AC	**110/50/60 AC** **115/60 AC** (5) **120/60 AC** (6) **230/50/60 AC** **230/60 AC**	666 or 667	60 VA (DHI) 58 VA (DHEP) (4)	COI-110/50/60AC - COI-120/60AC COI-230/50/60AC COI-230/60AC	yellow - white light blue silver	COE-110/50/60AC COE-115/60AC - COE-230/50/60AC COE-230/60AC
DKE DKEP	12 DC 14 DC 24 DC 28 DC 110 DC 220 DC 110/50/60 AC (2) 230/50/60 AC (2) 115/60 AC 230/60 AC 110/50/60 AC 230/50/60 AC		**12 DC** **14 DC** **24 DC** **28 DC** **110 DC** **220 DC** **110/50/60 AC** **230/50/60 AC** **115/60 AC** **230/60 AC** **110 DC** **220DC**	666 or 667	36 W	CAE-12DC CAE-14DC CAE-24DC CAE-28DC CAE-110DC CAE-220DC	-	
					100 VA (7)	CAE-110/50/60AC CAE-120/60AC	-	
					130 VA (7)	CAE-230/50/60AC CAE-230/60AC		
				669	36 W	CAE-110DC CAE-220DC		

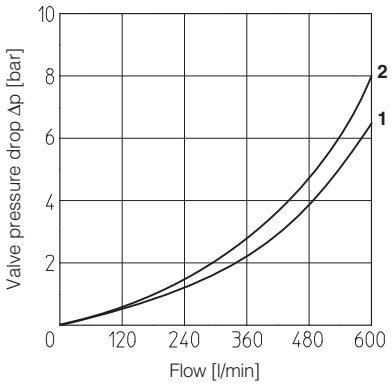
(1) For other supply voltages available on request see technical tables E010, E015, E025, TE030.
(2) Coil can be supplied also with 60 Hz of voltage frequency: in this case the performances are reduced by 10 ÷ 15%. The power consumption is 55 VA (DHI), 58 VA (DHE, DHEP) and 90 VA (DKE, DKEP)
(3) Average 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.

9 **Q/Δp DIAGRAMS** based on mineral oil ISO VG 46 at 50 °C

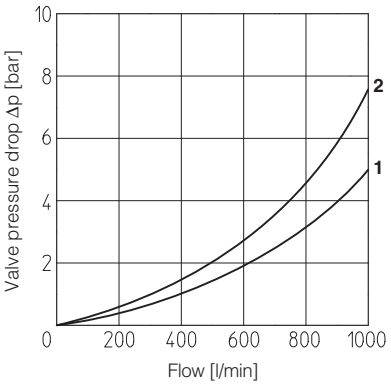
size 16



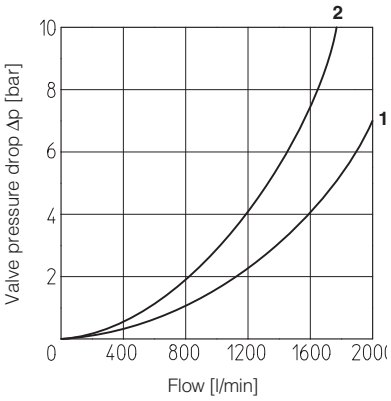
size 25



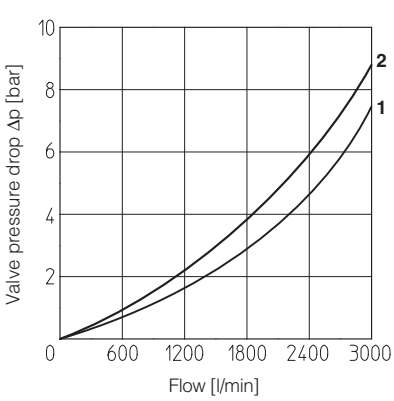
size 32



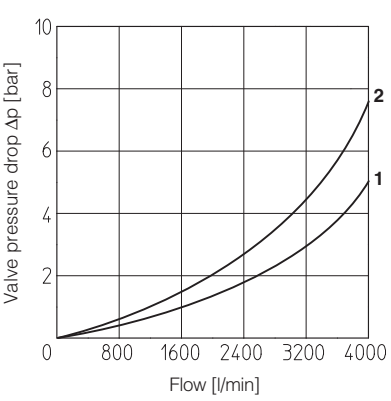
size 40



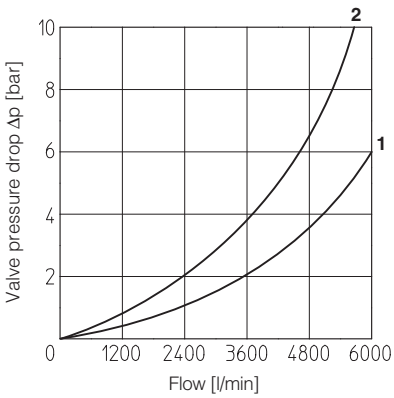
size 50



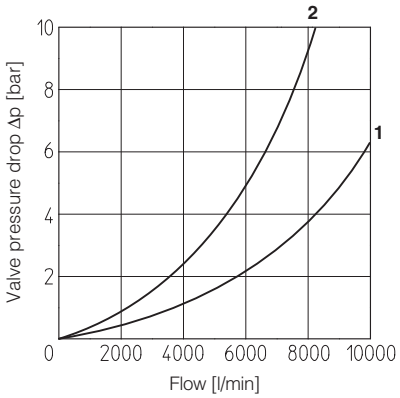
size 63



size 80



size 100

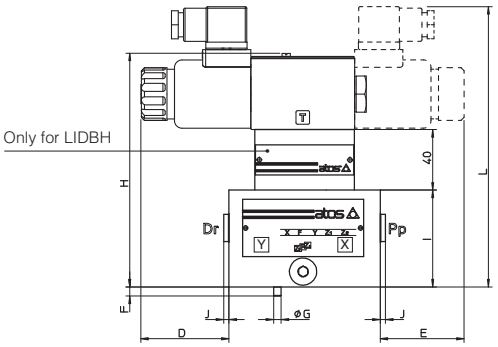


1 = poppet type 32 and 33
2 = poppet type 42 and 43

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

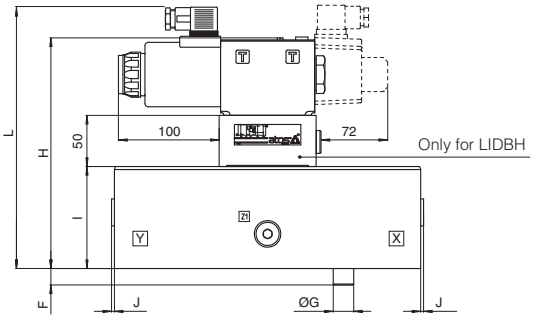
Size 16 ÷ 63

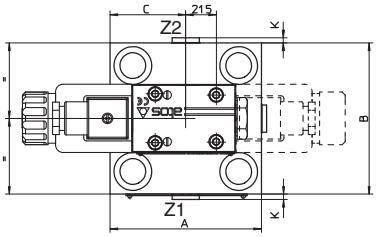
Drawing of size 50
dotted line: example of double solenoid version

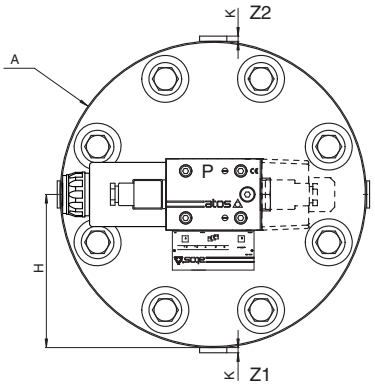


Size 80 and 100

dotted line: example of AC solenoid verison







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;

Size (1)	A	B	C	D max	E max	F	G	H max **LIDEW**	H max **LIDBH**	I	L max	J	K	Ports Pp-Dr	Ports Z_1-Z_2	Seals	Fastening bolts	Tightening torque [Nm]	Mass [Kg]
16	70	65	29	83,5	70,5	4	3	90,5	130,5	40	125	-	-	-	-	4 OR-108	Nr. 4 M8x45	35	2,6 ÷ 3
25	85	85	42,5	69,5	69,5	6	5	90,5	130,5	40	125	-	-	-	-	4 OR-108	Nr. 4 M12x45	125	3 ÷ 3,4
32	100	100	50	62,5	42,5	6	5	100,5	140,5	50	135	-	-	-	-	4 OR-2043	Nr. 4 M16x55	300	3,5 ÷ 4
40	125	125	62,5	49,5	49,5	6	5	110,5	150,5	60	145	3,5	-	G 1/4	-	4 OR-3043	Nr. 4 M20x70	600	6,4 ÷ 6,9
50	140	140	70	42	42	4	6	120,5	160,5	70	155	3,5	3,5	G 1/4	G 1/4	4 OR-3043	Nr. 4 M20x80	600	9,5 ÷ 10
63	180	180	90	22	22	4	6	130,5	170,5	80	165	3,5	3,5	G 3/8	G 3/8	4 OR-3050	Nr. 4 M30x90	2100	17,3÷17,7
80	Ø250	-	125	-	-	6	8	152,5	202,5	80	187	3,5	3,5	G 3/8	G 3/8	4 OR-4075	Nr. 8 M24x90	1000	27,1÷27,7
100	Ø300	-	150	-	-	8	10	182,5	222,5	100	217	3,5	3,5	G 1/2	G 1/2	4 OR-4093	Nr. 8 M30x120	2100	53÷54

Overall dimensions refer to the pilot valves with connectors type 666