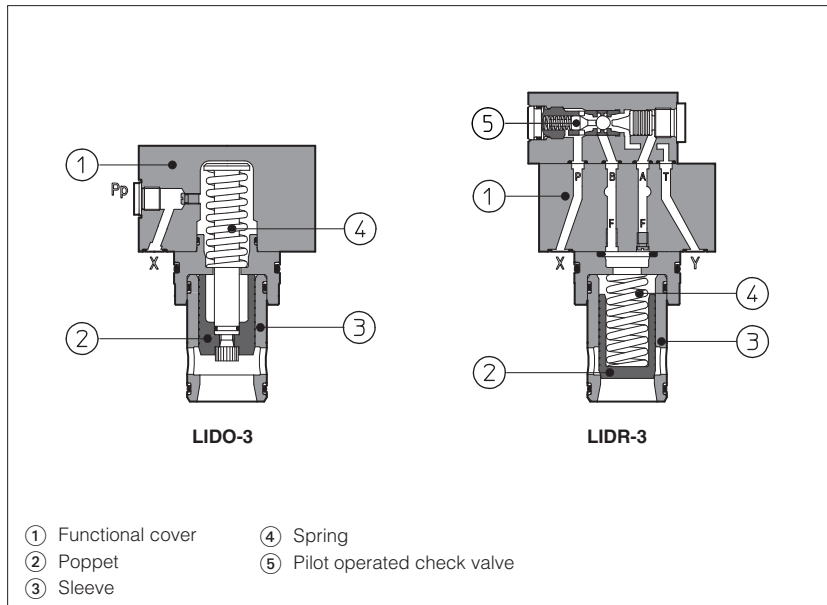


ISO cartridge valves type LID*

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

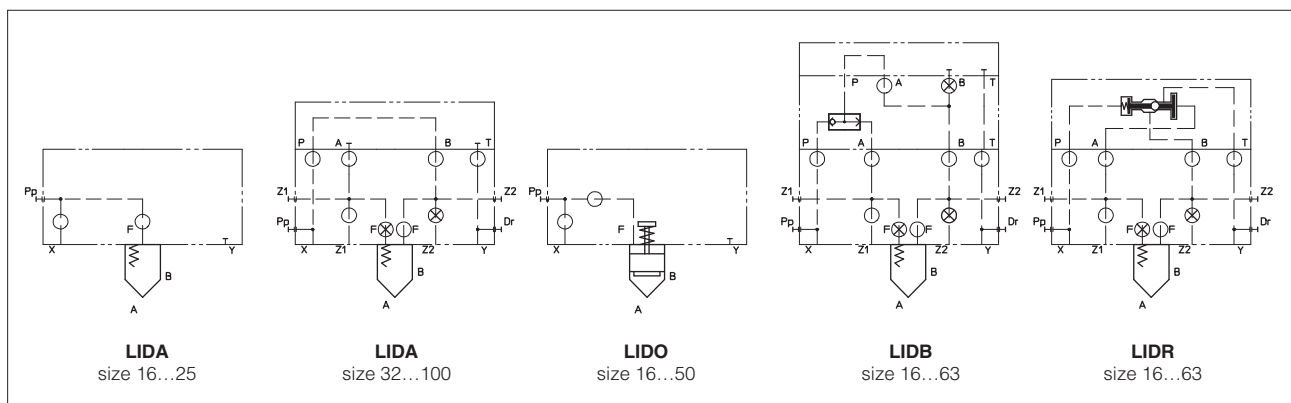
Max flow up to **9000 l/min** at $\Delta p = 5$ bar

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							Optional different setting of calibrated plugs in the pilot channels, see section ③, ④	
D = directional function								
Cover configuration see section ②: A = normally closed; O = normally open; B = with shuttle valve for pilot selection; R = with hydraulically operated pilot check valve;								
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								

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: 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	Cover										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	-	v	-	-	-	M4	-	-	-	M6	-	-	-	M6	-	-	-	M6	-	-	-	-	-	-	-
P	-	-	-	M6	-	-	-	M6	-	-	-	M6	-	-	-	M6	-	-	-	M6	-	-	M6	-	-
Z2	-	-	-	M4	-	-	-	M6	-	-	-	M6	-	-	-	M6	-	-	-	M6	-	-	M6	-	-
	-	-	-	100F	-	-	-	300F	-	-	-	300F	-	-	-	300F	-	-	-	300F	-	-	300F	-	-

M4 ÷ M6 = screw size **10A ÷ 300F** = calibrated orifices diameters in tenths of mm; **A** = short calibrated hole, **F** = long calibrated hole

5 MODEL CODE OF SLIP-IN CARTRIDGES

SC LI	-	16	43	1	40	*
Cartridge according to ISO 7368						Seals material: - = NBR PE = FKM BT = HNBR
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: 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	Size 16: 270	270	240	240
at Δp 5bar (l/min)	Size 25: 550	550	500	500
see diagrams Q/Δp	Size 32: 1000	1000	800	800
at section 10	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
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 MODEL CODE OF SLIP-IN CARTRIDGES type 52, 62, 63 for LIDA and LIDO

SC LI	-	16	52	1	**	/*
Cartridge according to ISO 7368						Seals material: - = NBR PE = FKM BT = HNBR
Size, the same of relevant cover: 16 25 32 40 50				Series number		
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 = 5,5 bar for all poppets		

8 TYPICAL FUNCTIONS OF POPPETS

Type of poppet	52	62	63
Operating pressure	420 bar		
Nominal flow Size 16 at Δp 5bar (l/min)	25	160	400
see diagrams Q/ Δp at section 10	32	400	600
	40	1200	1800
	50	1800	1800
Functional sketch (Hydraulic symbol)			
Typical section			
Area ratio A:AP	1 : 1,1	1 : 1,1	1 : 1,1
Cracking pressure A→B (1)	Spring 1 0,3 bar 2 1,5 bar 3 3 bar 6 6 bar	-	-

(1) Depending on the spring cracking pressure and the area ratio of the poppet

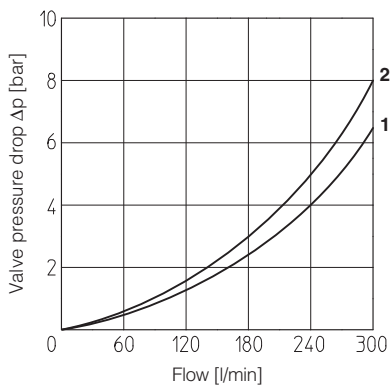
9 MAIN CHARACTERISTICS, SEALS AND HYDRAULIC FLUID

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 2015/65/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	HFJU, 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		

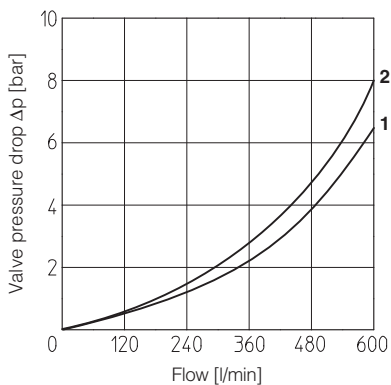
10 Q/ΔP DIAGRAMS based on mineral oil ISO VG 46 at 50°C

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

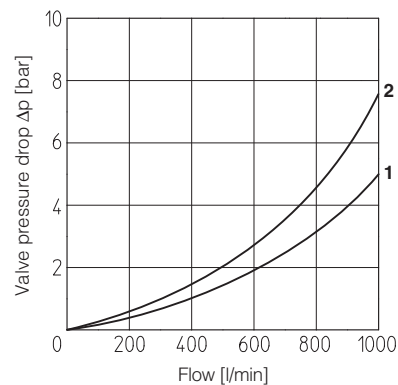
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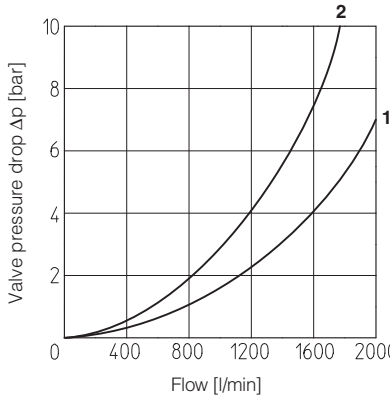
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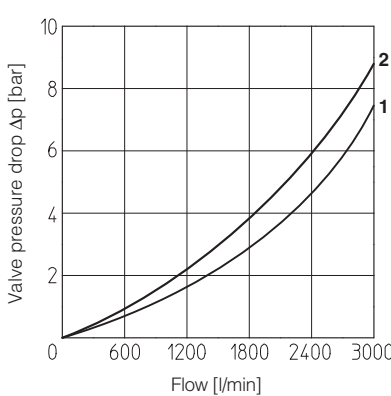
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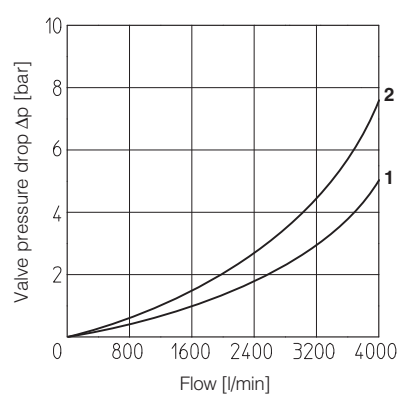
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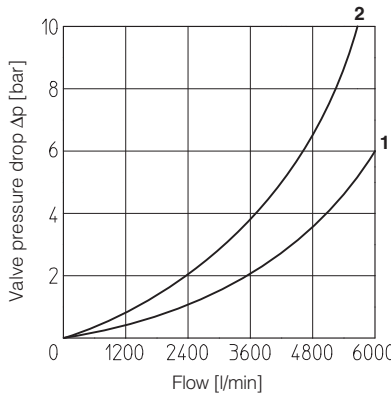
size 50



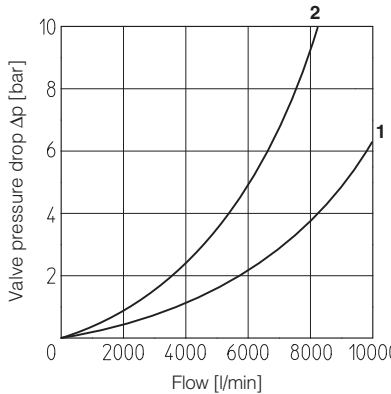
size 63



size 80



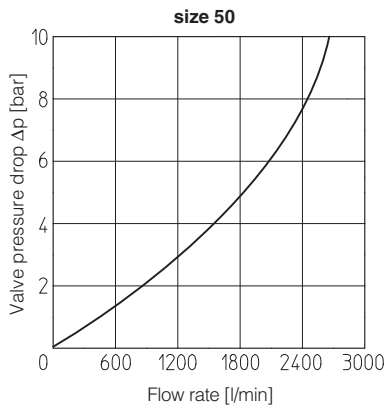
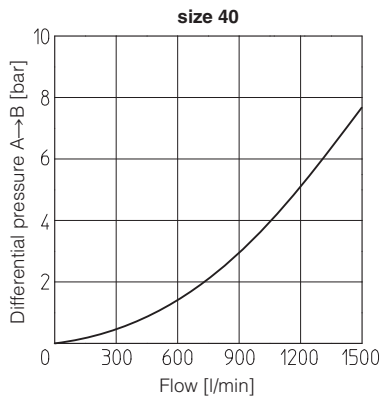
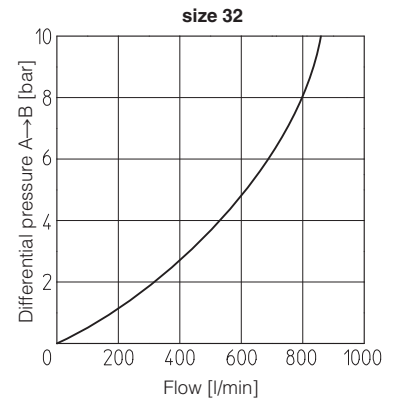
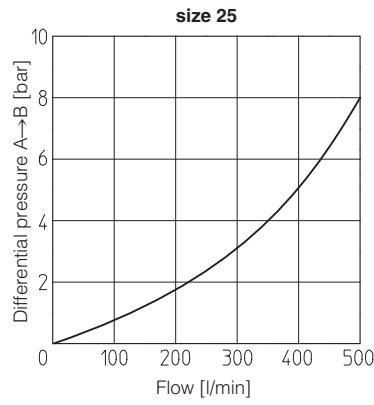
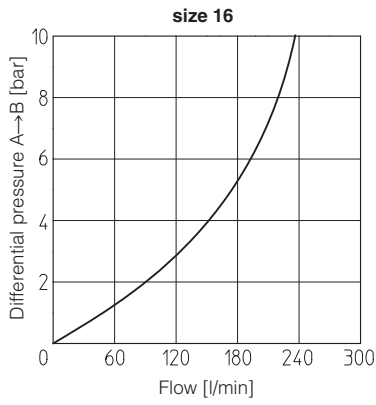
size 100



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

LIDA

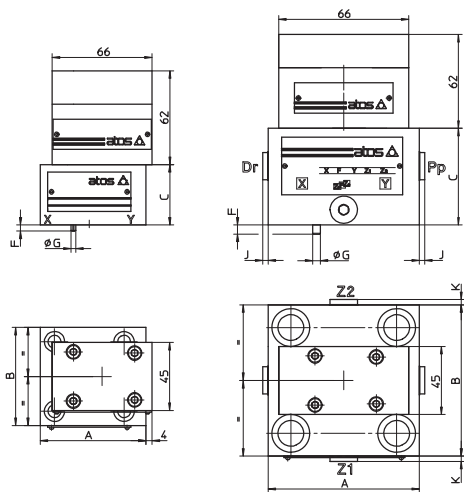
Covers (1)	A	B	C	D	E	F	G	K	J	Port Pp-Dr	Port Z1-Z2	Seals	Fastening bolts (3)	Tightening torque [Nm]	Mass [Kg]
LIDA-1 LIDO-1	65	65	40	-	-	4	3	-	3,5	G 1/4	-	2 OR-108 1 OR-108 (2)	Nr. 4 M8x45	35	1,4
LIDA-2 LIDO-2	85	85	40	-	-	6	5	-	3,5	G 1/4	-	2 OR-108 1 OR-108 (2)	Nr. 4 M12x45 (4)	125	1,8
LIDA-3 LIDO-3	100	100	50 60 (2)	20	66	6	5	-	3,5	G 1/4	-	4 OR-2043 1 OR-2043 (2)	Nr. 4 M16x55 (5)	300	2,3
LIDA-4 LIDO-4	125	125	60 100	20	66	6	5	-	3,5 3,5	G 1/4	-	4 OR-3043 1 OR-3043	Nr. 4 M20x70 (6)	600	6,2
LIDA-5 LIDO-5	140	140	70 110 (2)	20	66	4	6	3,5	3,5	G 1/4	G 1/4	4 OR-3043 1 OR-3043 (2)	Nr. 4 M20x80 (7)	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	Nr. 4 M30x90	2100	17,1
LIDA-8	Ø 250	-	80	30	73	6	8	3,5	3,5	G 3/8	G 3/8	4 OR-4075	Nr. 8 M24x90	1000	27
LIDA-10	Ø 300	-	150	30	73	8	10	3,5	3,5	G 1/2	G 1/2	4 OR-4093	Nr. 8 M30x120	2100	54

**LIDA (size 16 ÷ 25)
LIDO (size 16...50)**

LIDA (size 32...100)
Note: for LIDA-80 and LIDA-100 the cover has round shape

(1) For LIDO-2: the external attachment Pp is located at Y port side of the cover;
 (2) Only for LIDO;
 (3) Hexagon socket head screw according to DIN 912 class 12.9
 (4) M12x50 for LIDO-2;
 (5) M16x60 for LIDO-3;
 (6) M20x100 for LIDO-4;
 (7) M20x110 for LIDO-5;

LIDB



LIDB (size 16)

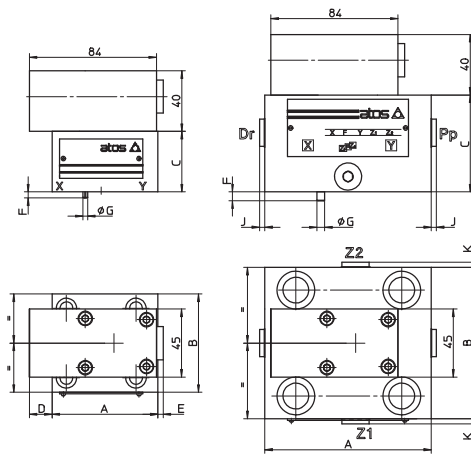
LIDB (size 25...63)

Covers	A	B	C	F	G	J	K	Port Pp-Dr	Port Z1-Z2	Seals	Fastening bolts (2)	Tightening torque [Nm]	Mass [Kg]
LIDB-1	70	65	40	4	3	-	-	-	-	4 OR-108	Nr. 4 M8x45	35	2,2
LIDB-2	85	85	40	6	5	-	-	-	-	4 OR-108	Nr. 4 M12x45	125	2,6
LIDB-3	100	100	50	6	5	-	-	-	-	4 OR-2043	Nr. 4 M16x55	300	3,1
LIDB-4	125	125	60	6	5	3,5	-	G 1/4	-	4 OR-3043	Nr. 4 M20x70	600	7
LIDB-5	140	140	70	4	6	3,5	3,5	G 1/4	G 1/4	4 OR-3043	Nr. 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	Nr. 4 M30x90	2100	17,9

(1) The position of external attachments Pp, Dr, Z1 and Z2 are inverted each others respect to the showed sketch

(2) Hexagon socket head screw according to DIN 912 class 12.9

LIDR



LIDR (size 16...32)

LIDR (size 40...63)

Covers	A	B	C	D	E	F	G	J	K	Port Pp-Dr	Port Z1-Z2	Seals	Fastening bolts (2)	Tightening torque [Nm]	Mass [Kg]
LIDR-1	70	65	40	4	3,5	4	3	-	-	-	-	4 OR-108	Nr. 4 M8x45	35	2,5
LIDR-2	85	85	40	13,5	-	6	5	-	-	-	-	4 OR-108	Nr. 4 M12x45	125	2,9
LIDR-3	100	100	50	6	-	6	5	-	-	-	-	4 OR-2043	Nr. 4 M16x55	300	3,4
LIDR-4	125	125	60	-	-	6	5	3,5	-	G 1/4	-	4 OR-3043	Nr. 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	Nr. 4 M20x80	600	10,4
LIDR-6 (1)	180	180	80	-	-	4	6	3,5	3,5	G 3/8	G 3/8	4 OR-3050	Nr. 4 M30x90	2100	18,3

(1) The position of external attachments Pp, Dr, Z1 and Z2 are inverted each others respect to the showed sketch

(2) Hexagon socket head screw according to DIN 912 class 12.9