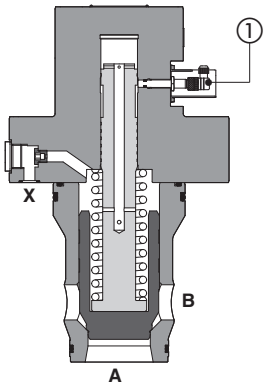
Safety cartridge valves with poppet position monitoring

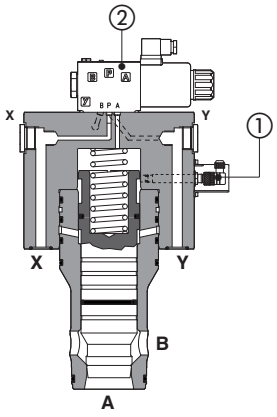
ISO standard, on-off, poppet type, conforming to Machine Directive 2006/42/EC - certified by TÜV

Available only on request

CE SAFETY CERTIFIED



LIDA-100433/FI



LIDASH-80433/FI

① Inductive proximity sensor **FI**

② Solenoid pilot valve

Safety cartridge valves with **FI** inductive proximity for poppet position monitoring, **CE** marked and certified by **TÜV,** in accordance with safety requirements of Machine Directive 2006/42/EC.

Following models are available:

LIDA: safety valve with integral cover design.

LIDASH: active pilot operated safety valve with solenoid pilot.
The active piloting permits to open and close the poppet independently to the pressure acting in A & B user lines.
These valves are normally used to cut off the hydraulic power line in case of emergency condition, thus avoiding dangerous movements of the machines actuators.

Certification
The **TÜV** certificate can be downloaded from www.atos.com, catalog on line, technical information section.

1 RANGE OF VALVE'S MODELS

Valve code	ISO 7368 size	Description	Max flow [l/min] at Δp 5 bar	Max pressure [bar]
LIDA /FI	63, 80, 100	safety cartridges valve	3300, 4000, 6300	420
LIDASH /FI-E	63, 80	active safety cartridges valve with soenoid pilot	2400, 3000	350
LIDASH /FI-EP	63, 80	active safety cartridges valve with soenoid pilot	2400, 3000	420

Notes:
FI = inductive proximity sensor, providing both NO (normally open) and NC (normally closed) contacts to be wired on the electric connector.
See section 10 for sensor characteristics

2 MODEL CODE OF LIDA /FI SAFETY VALVES (integral design cover)

LIDA	-	63	43	3	/	FI	**	/	*

Safety cartridge valve according to ISO 7368

Size ISO 7368:
63; **80**; **100**

poppet type:
43 = with damping nose, area ratio 1:1,5

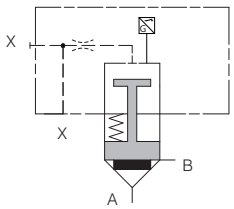
spring cracking pressure:
3 = 3 bar

Poppet position monitor:
FI = inductive proximity sensor

Series number

Seals material:
omit for NBR (mineral oil & water glycol)
PE = FKM

2.1 HYDRAULIC SYMBOLS



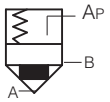
LIDA-43/FI**

3 MAIN CHARACTERISTICS OF LIDA /FI

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 Machine Directive 2006/42/EC. -EC type-examination certificate for safety components **(1)** -ISO 13849 category 1, PLC in high demand mode CE to Low Voltage Directive 2014/35/EU and Machine Directive 2006/42/EC. RoHS Directive 2011/65/EU as last update by 2015/65/EU REACH Regulation (EC) n°1907/2006
Ambient temperature	**Standard** = -30°C ÷ +70°C, **/PE** option = -20°C ÷ +70°C
Flow direction	A→B or B→A
Operating pressure	A, B, X = **420 bar**;

(1) The type-examination certificate can be download from www.atos.com

3.1 Poppet characteristics of LIDA /FI

Valve type		**LIDA**
Poppet type		43
Functional sketch (Hydraulic symbol)		
Operating pressure	[bar]	**420**
Nominal flow at Δp 5 bar (l/min) see diagrams Q/Δp at section 13	Size **63**	3300
	80	4000
	100	6300
Area ratio A:Ap		**1:1,5**
Cracking pressure A→B, spring 3	[bar]	**3**
Cracking pressure B→A, spring 3	[bar]	**6**

4 MODEL CODE OF LIDAS ACTIVE SAFETY - with solenoid pilot

LIDASH	-	63	43	3	/	FI	-	E	X	24DC	**	/	*

Active safety cartridges, according to ISO 7368 with pilot solenoid valve

Size ISO 7368:
63; **80**

Poppet type:
43 = with damping nose

Spring cracking pressure
3 = 3 bar

Poppet position monitor:
FI = inductive proximity sensor (double contact)

Pilot solenoid valve
E = DKE Pmax **350 bar**
EP = DKEP Pmax **420 bar**

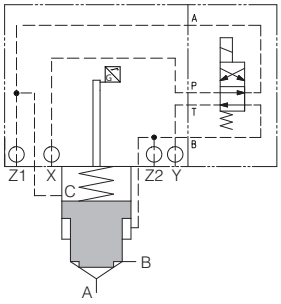
X = without connector, to be order separately see section 9

voltage code, see section 8

Series number

Seals material: omit for NBR (mineral oil & water glycol)
PE = FKM

4.1 HYDRAULIC SYMBOLS



LIDASH-*/FI

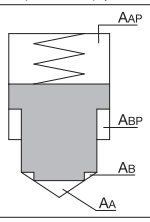
5 MAIN CHARACTERISTICS OF LIDASH

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		75 years, for further details see technical table P007	
Compliance		CE to Machine Directive 2006/42/EC. -EC type-examination certificate for safety components **(1)** -ISO 13849 category 1, PLC in high demand mode CE to Low Voltage Directive 2014/35/EU and Machine Directive 2006/42/EC. RoHS Directive 2011/65/EU as last update by 2015/65/EU REACH Regulation (EC) n°1907/2006	
Ambient temperature		**Standard** = -30°C ÷ +70°C, **/PE** option = -20°C ÷ +70°C	
Flow direction		A→B or B→A	
Operating pressure	**A, B, X, Z1, Z2**	LIDASH-E = **350** bar;	LIDASH-EP = **420** bar
	Y	LIDASH-E, -EP (DC) = **210** bar;	LIDASH-E, -EP(AC) = **160** bar;

(1) The type-examination certificate can be download from www.atos.com

5.1 Poppet areas of LIDASH /FI

Size	**63**	**80**
Maximum flow at Δp = 5 bar [l/min]	2400	3000
Poppet characteristics		
A_A [cm²]	30,19	35,68
A_B (% of A_A)	46,34	49,75
A_{BP} (% of A_A)	30,74	28,40
A_{AP} (% of A_A)	177,00	178,20
A_A / (A_A + A_B) poppet ratio	0,68	
A_{AP} / (A_A + A_B) piloting ratio	1,2	1,19



Poppet areas

A_A = main flow (side A)
A_B = main flow (side B)
A_{AP} = piloting area (close)
A_{BP} = piloting area (open)

Thanks to the areas ratio $A_{AP}/(A_A+A_B)$, the valve closing is always ensured with a piloting pressure (X port) equal to the line pressure (A or B line).

6 COILS CHARACTERISTICS

Insulation class	Pilot valve **E**, **EP: H** (180°C) for DC coils **F** (155°C) for 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

7 SEALS AND HYDRAULIC FLUID - for other fluids not included in below table, consult our technical office

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		
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	HL, HLP, HLPD, HVLP, HVLPD	DIN 51524
Flame resistant without water	FKM	HFDU, HFDR	ISO 12922
Flame resistant with water	NBR	HFC	

8 ELECTRIC FEATURES - coils for LIDASH pilot valve

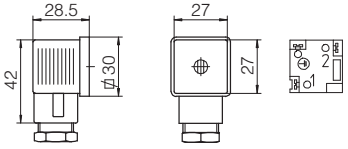
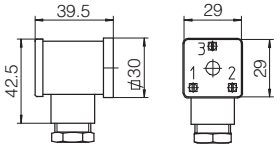
External supply nominal voltage ± 10%	**Voltage code**	Type of connector	Power consumption (2)	Code of spare coil **DKE, DKEP**
12 DC	**12 DC**	666 or 667	36 W	CAE-12DC
14 DC	**14 DC**			CAE-14DC
24 DC	**24 DC**			CAE-24DC
28 DC	**28 DC**			CAE-28DC
110 DC	**110 DC**			CAE-110DC
220 DC	**220 DC**			CAE-220DC
110/50/60 AC	**110/50/60 AC**		85 VA (3)	CAE-110/50/60AC (1)
230/50/60 AC	**230/50/60 AC**			CAE-230/50/60AC (1)
115/60 AC	**115/60 AC**			CAE-115/60AC
230/60 AC	**230/60 AC**			CAE-230/60AC
110/50/60 AC	**110 DC**	669	36 W	CAE-110DC
230/50/60 AC	**220 DC**			CAE-220DC

(1) In case of 60 Hz voltage frequency the performances are reduced by 10÷15% and the power consumption is 90 VA.

(2) Average values based on tests performed at nominal hydraulic condition and ambient/coil temperature of 20°C.

(3) When solenoid is energized, the inrush current is approx 3 times the holding current. Inrush current values correspond to a power consumption of about 320 VA.

9 COILS ELECTRIC CONNECTORS - for LIDASH pilot valves - according to DIN 43650 (to be ordered separately)

666, 667 (for AC or DC supply)	**669** (for AC supply)	**CONNECTOR WIRING**	
		**666, 667** 1 = Positive ⊕ 2 = Negative ⊖ ⊕ = Coil ground	**669** 1,2= Supply voltage VAC 3 = Coil ground
		SUPPLY VOLTAGES	
		666	**667** / **669**
		All voltages	24 AC or DC 110 AC or DC 220 AC or DC 110/50 AC 110/60 AC 230/50 AC 230/60 AC

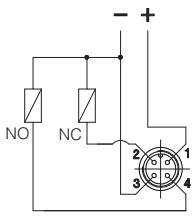
10 TECHNICAL CHARACTERISTICS OF /FI INDUCTIVE PROXIMITY SENSOR

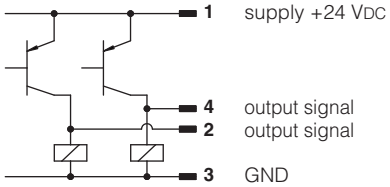
Valve type		**LIDA, LIDASH**
Type of switch		**/FI** proximity sensor
Supply voltage	[V]	10÷30
Ripple max	[%]	≤ 20
Max current	[mA]	200
Max peak pressure	[bar]	500
Mechanical life		virtually infinite
Switch logic		PNP

11 CONNECTING SCHEME OF FI INDUCTIVE PROXIMITY SENSOR

LIDA*/FI, LIDASH*/FI

Connector type **ZBE-06**
IP65

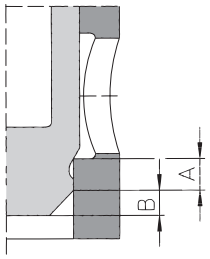




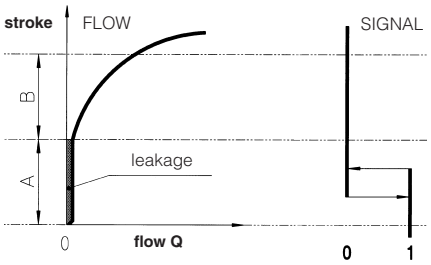
Notes:
- FI sensor's connector is always supplied with the valve
- The /FI sensor is not provided with a protective earth connection

12 STATUS OF OUTPUT SIGNALS

A: overlapping stroke
B: damping stroke



According the criteria of safety specifications, the poppet position signal must change its status inside the overlapping stroke (before the effective valve opening).



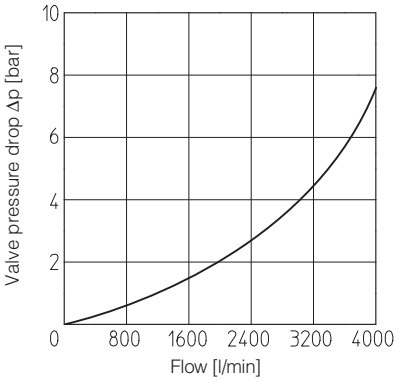
WARNING: the inobservance of following prescriptions invalidates the certification and may represent a risk for personnel injury

Safety valves must be installed and commissioned only by qualified personnel.
Safety valves must not be disassembled.
The inductive proximity FI or the inductive position switch FV can be adjusted only by the valve's manufacturer or Atos authorized service centers.
Valve's components cannot be interchanged.
The valves must operate without switching shocks and spool vibrations.

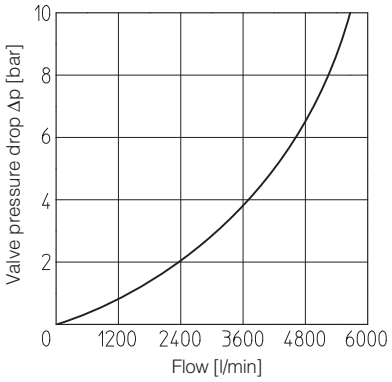
13 **Q/Δp DIAGRAMS** based on mineral oil ISO VG 46 at 50 °C

13.1 Q/Δp DIAGRAMS of LIDA/FI

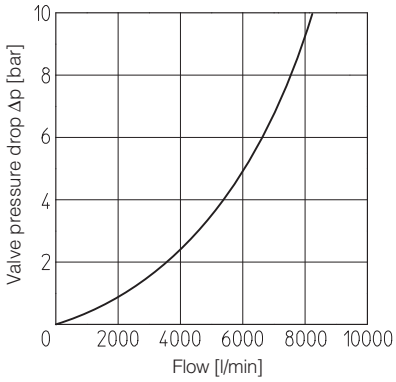
SIZE 63



SIZE 80

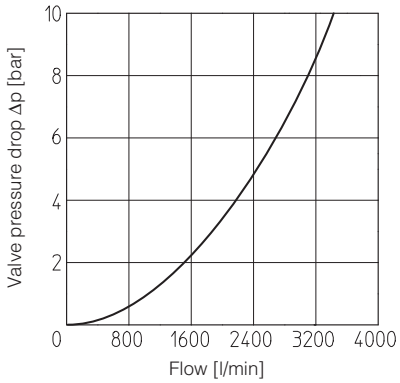


SIZE 100

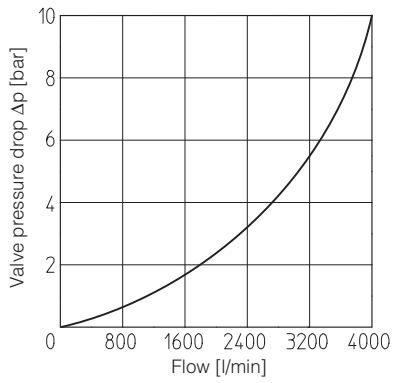


13.2 Q/Δp DIAGRAMS OF LIDASH/FI

SIZE 63



SIZE 80

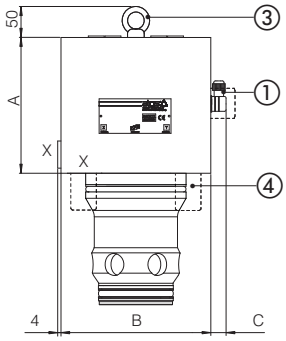


14 FASTENING BOLTS AND SEALS

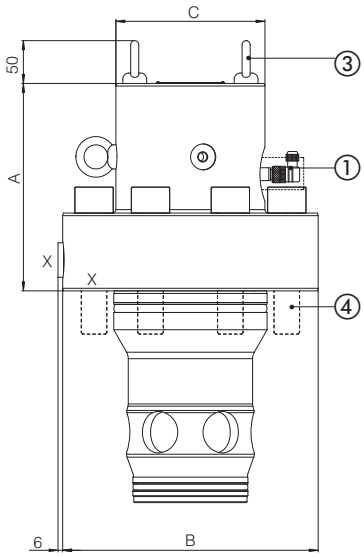
Size	Fastening bolts		Tinghtening torque [N/m]	Seal	
	LIDA	LIDASH		LIDA	LIDASH
63	n°4 M30X120	n°4 M30X120	2100	n°1 OR-3050	n°4 OR-3050
80	n°8 M24X110	n°4 M24X100	1000	n°1 OR-4075	n°4 OR-4106
100	n°8 M30X140	-	2100	n°1 OR-4087	-

15 INSTALLATION DIMENSIONS [mm]

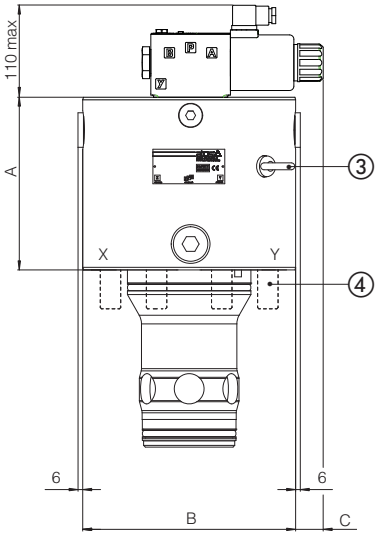
LIDA-63*/FI

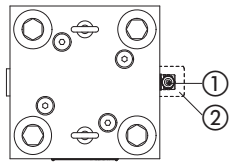


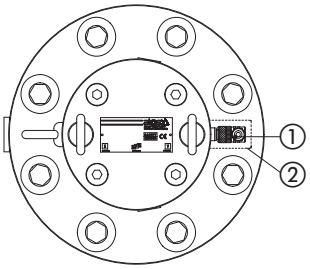
LIDA-80*/FI
LIDA-100*/FI

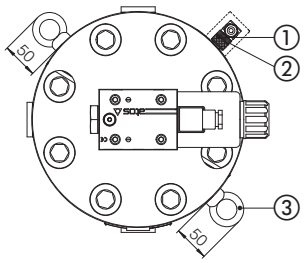


LIDASH-*/Fi









① Connector ZBE-06 for /FI inductive proximity sensor (supplied with the valve)

② Sensor protection

③ Eyebolts for valve leafting (supplied with the valve)

④ Fastening bolts (not supplied with the valve)

Note: for cover interface and cavity dimensions ISO 7368, see table P006

Size	**LIDA** [mm]			**LIDASH** [mm]			**Mass** [Kg]	
	A	**B**	**C**	**A**	**B**	**C**	**LIDA**	**LIDASH**
63	160	180x180	34	192	180x180	65	41	51
80	200	Ø250	160	200	Ø250	15	60	80
100	240	Ø300	175	-	-	-	120	-