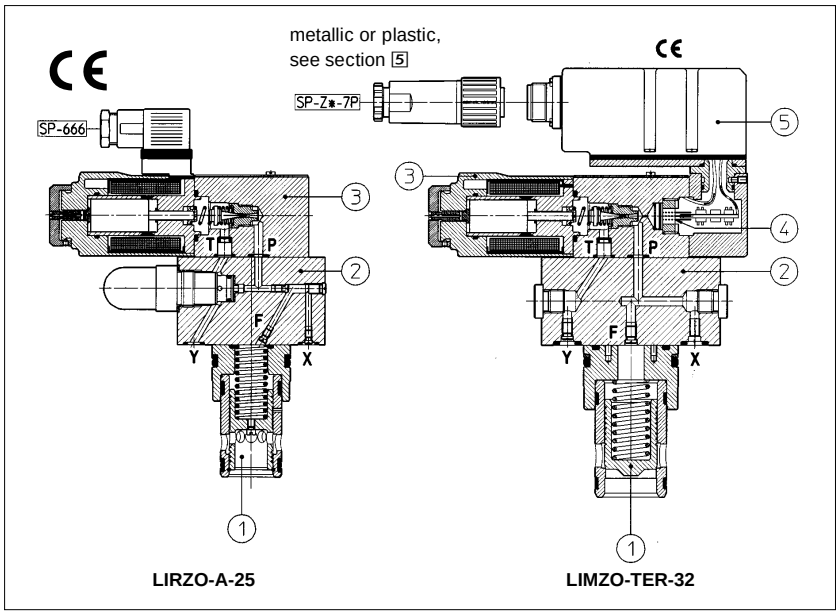
Atos spa
21018 Sesto Calende, Italy - Fax 0331 920005

Proportional pressure cartridge valves type LI*ZO

nominal sizes NG 16 ÷ NG 63



LIRZO-A-25 **LIMZO-TER-32**

LICZO (compensator), LIMZO (relief) and LIRZO (reducing) are 2-way proportional pressure cartridge valves. They are composed by a 2-way cartridge ① housed in a recess of standard ISO/DIN dimensions and by a closing cover ② with a piloting proportional pressure relief valve type RZMO ③, see tab. F007.

They operate in association with electronic drivers, (integral or Eurocard type), see table 7 which supply the proportional valve with correct current signal to align pressure valve regulation to the reference signal.

They are available in different options:
- ZO-A suitable for open or closed loop applications
- ZO-TER with integral pressure transducer plus electronics .

The ZO-TER versions are equipped with integral pressure transducer ④ and electronics ⑤, for closed loop controls. This eliminates hysteresis and the regulation linearity errors and ensure fine functionality plus valve-to-valve interchangeability
Size: NG16, 25, 32, 40, 50, 63.
Flow: up to 3000 l/min.
Max pressure: 315 bar.

1 MODEL CODE FOR COVERS

LIMZO – TER – 3 / 210 / * ** / *

Proportional cartridge valves
LICZO= pressure compensator
LIMZO= pressure relief
LIRZO= pressure reducing

A = for open or closed loop application
TER = with integral electronics and pressure transducer

Size:
1 = NG16; **2** = NG25; **3** = NG32
4 = NG40; **5** = NG50 (only for LICZO, LIMZO)
6 = NG63; (only for LIMZO)

Max regulated pressure:
100 = 100 bar
210 = 210 bar
315 = 315 bar

Options:
P = with integral mechanical pressure limiter (standard for size 1 and 2)
only for -A versions
6= with 6 Vdc coil instead of standard 12 Vdc coil
18= with 18 Vdc coil instead of standard 12 Vdc coil
only for -TER versions;
I = current reference signal 4÷20 mA
M = monitor output

Design number

Synthetic fluids
WG = water-glycol
PE = phospate ester

2 MODEL CODE FOR CARTRIDGES - see notes at section 6

SC LI – 25 31 2 ** / *

SC LI: cartridge according to ISO 7368

Size: the same of relative cover

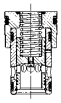
Type of cartridge, see section 3 for functions
31 = for LIMZO and LICZO
36 = for LICZO
37 = for LIRZO

Spring cracking pressure:
2 = 1,5 bar for poppet 31
3 = 3 bar and **6** = 6 bar for poppet 31 and 36
4 = 4 bar and **7** = 7 bar for poppet 37

Design number

Synthetic fluids
WG = water-glycol
PE = phospate ester

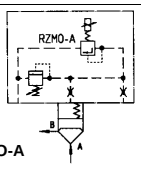
3 TYPICAL FUNCTIONS OF CARTRIDGES

Type	Functional sketch (hydraulic symbol)	Typical section	Area ratio (1)
31			1:1
36			1:1
37			1:1

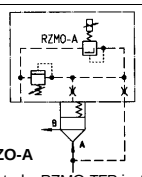
(1) It is the ratio of the area on which the main pressure of the circuit is applied to the area on which the pilot pressure is applied.

4 HYDRAULIC CHARACTERISTICS (1) - see notes at section 6

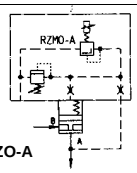
Hydraulic symbols



LICZO-A



LIMZO-A



LIRZO-A

In -TER versions on the cover is mounted a RZMO-TER instead of RZMO-A: see tab. F007 for symbol

Valve model	LICZO-A					LICZO-TER (2)					LIMZO-A						LIMZO-TER (2)						LIRZO-A			LIRZO-TER (2)		
Valve size	16	25	32	40	50	16	25	32	40	50	16	25	32	40	50	63	16	25	32	40	50	63	16	25	32	16	25	32
Max flow [l/min]	200	400	750	1000	2000	200	400	750	1000	2000	200	400	750	1000	2000	3000	200	400	750	1000	2000	3000	160	320	600	160	320	600
Min regulated pressure at port A [bar]	9	8,5	8	13	15	9	8,5	8	13	15	7	7	7	10,5	12	12	7	7	7	10,5	12	12	7					
Max regulated pressure at port A [bar]	100; 210; 315										100; 210; 315												100; 210; 315					
Response time [ms] 0 - 100% signal variation *	100-400					80-300					100-450						80-350						100-220			80-170		
Hysteresis [% of the regulated max pressure]	≤ 1,5					≤ 0,5					≤ 1,5						≤ 0,5						≤ 1,5			≤ 0,5		

* depending on installation

5 MAIN CHARACTERISTICS OF PROPORTIONAL PRESSURE CARTRIDGE VALVES TYPE LI*ZO

Assembly position		Any position
Ambient temperature		From -20°C to +70°C for -A version / 0°C to + 50°C for -TE version
Fluid		Hydraulic oil as per DIN 51524 . . . 535; for other fluids see section [1]
Recommended viscosity		15 ÷100 mm²/s at 40°C (ISO VG 15 ÷100)
Fluid contamination class		ISO 18/15, achieved with in line filters of 10 μm and $\beta_{10} \geq 75$ (recommended)
Fluid temperature		T ≤ 80°C, if T ≥ 60°C select /PE seals
Coil resistance R at 20°C		3 ÷ 3.3 Ω for standard 12 V_{DC} coil; 2 ÷ 2,2 Ω for 6 V_{DC} coil; 13 ÷ 13,4 Ω for 18 V_{DC} coil
Max solenoid current		2,6 A for standard 12 V_{DC} coil; 3,25 A for 6 V_{DC} coil; 1,5 A for 18 V_{DC} coil
Max. power		40 Watt
Relative duty factor		Continuous rating (ED = 100%)
Type of connector	for -A versions	Type SP-666 (plastic - black); 3 pins, cable clamp PG11, cable max. Ø 10 mm
	for -TER versions	Type SP-ZM-7P (metallic); 7 pins, cable clamp PG11, cable max Ø 10 mm Type SP-ZH-7P (plastic); 7 pins, cable clamp PG11, cable max Ø 10 mm **to be ordered separately**
Connectors features		SP-666: DIN 43650 - ISO 4400; IP 65 (DIN 40050); VDE 0110C; SP-ZM-7P; according to MIL-C-5015G; IP 66 (DIN 40050); SP-ZH-7P: mounting dimensions according to MIL-C-5015G; IP 67 (DIN 40050)

6 NOTES TO TABLES [4] AND [5]

1) Typical characteristics in table [4] refer to valves coupled with Atos electronic regulators and operation with ISO VG 36 mineral oil at 50°C.
2) The integral closed loop control of -TER type valves is affected by the stiffness of the hydraulic circuit: the greater the stiffness of the circuit is, the better the perfomances are. Please contact our technical office in case of circuits with accumulators and/or with great fluid volumes and/or with long hoses.
On request are available LI*ZO-TR models directly derived from -TER versions with integral pressure transducer but without integral electronics. When -TR valves are used in pressure closed loop control coupled with Atos electronic drivers, performances are the same of corresponding valves -TER.

7 ELECTRONIC DRIVERS

Valve operation is optimized in association with Atos electronic drivers, which have factory preset electronic calibration.

Models	Valve model	Execution (1)	Max power consumption (2)	Driver response	Reference signals (3)	Ramps (4)	Special functions (5)	Alarm (6)
E-MI-AC-01F	LI*ZO-A	I	40W	normal	C, (A)	YES	NO	NO
E-BM-AC-01F		B	50W	fast	C	YES	NO	NO
E-RP-AC-01F		S	50W	fast	C, (A)	YES	NO	NO
E-ME-AC-01F		E	50W	fast	C, (A)	YES	ENABLE	NO
E-RI-TE-01H	LI*ZO-TER	X	50W	high performance	C, (A)	NO	MONIT. (option /M)	YES

NOTES
(1) Execution, Format/connection
I = plug DIN 43650-IP65, VDE 0110 direct on solenoid
B = fast plug in standard undecal base housing, relay type
S = sealed box with cable clamp binding screw type
E = Eurocard 100x160 mm (plug in unit DIN 41494)
X = sealed box on the valve;IP65 - DIN 40050
(2) Power supply at 24 V_{DC} ± 10%
(3) Reference signals:
A (option/I)= 4÷20 mA
0÷20 mA (only for E-MI)
C = 0÷10 V_{DC} or
0÷5 V_{DC} (not available for E-RI)
(4) Ramps options, i.e. control of rapidity on rise and fall of supply current and consequently of hydraulic parameters
(5) Enable: to allow driver operation only with an electric enabling signal. Monitor (option /M): value of regulated pressure (0÷10 V_{DC})
(6) Options to monitor anomalous operative conditions of the driver

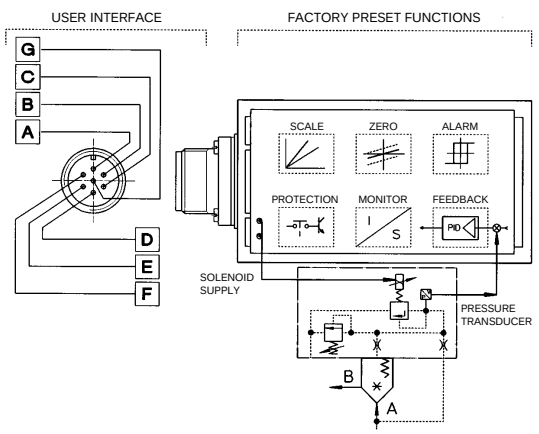
8 E-RI-TE-01H ELECTRONIC DRIVER INTEGRAL IN LI*ZO-TER VALVES

The electronic box has a socket connector with 7 male pins arranged to receive the power supply and the reference signal (input) and to supply (output) the status signals, see also the technical table G200 for more characteristics. The female plug connector (metallic or plastic) type SP-Z*-7P may be supplied separately on request. Electrical connections to reference generators must be made using shielded cables: the sheat must be connected to the power supply zero **on the generator side**. The power supply must be properly stabilized or rectified and filtered.

Format	Sealed box on the valve
	Protection: IP65-DIN 40050
	Insulation: VDE0110
Electromagnetic compatiblity (EMC)	Emission: EN 50081-2
	Immunity: EN 50082-2
Input signal impedence	Voltage signal : Ri ≥ 50 KΩ
	Current signal (option /I): Ri ≥ 316 Ω
Cable for plug connector SP-Z*-7P	LiYCY 7 x 0,75 mm² for 20m max lenght 7 x 1 mm² for 40m max lenght

PIN	SIGNAL DESCRIPTION	TECHNICAL SPECIFICATION
A	Power supply 24 V_{DC}	Nominal: + 24 V_{DC}
B	Power supply zero	Filtered and rectified: Vrms = 21 ÷ 33 (ripple max 2 Vpp)
C	Signal zero	Reference 0 V_{DC}
D	Input signal +	0 ÷ 10 V_{DC} (4 ÷ 20 mA for option /I)
E	Input signal -	
F	Fault signal	Alarm = 0 V_{DC}; Normal working = 24 V_{DC}
	Regulated pressure for option /M	0 ÷ 100% ↔ 0 ÷ 10 V_{DC} (Rout = 10 KΩ)
G	Safety lead to earth terminal	Connect only when the power supply is not conform to VDE 0551 (CEI 14/6)

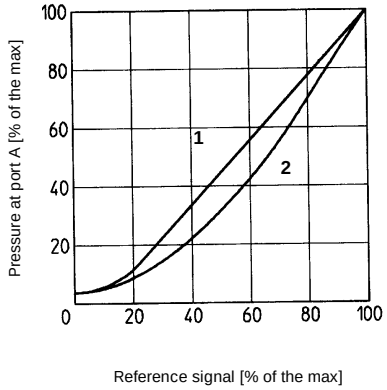
Note: electrical signals (e.g. actual - feedback signals) taken via valve electronics must not be used to switch off the machine safety functions. This is in accordance with the regolations to the European standard (Safety requirements of fluid technology systems and components - hydraulics)

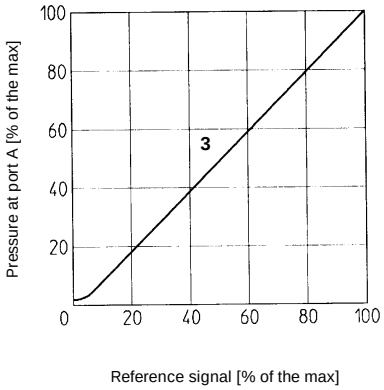


9 DIAGRAMS OF LICZO/LIMZO

9.1 Regulation diagrams

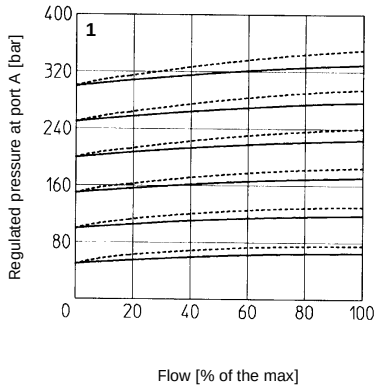
1 = LIMZO-A
2 = LICZO-A
3= LICZO-TER, LIMZO-TER

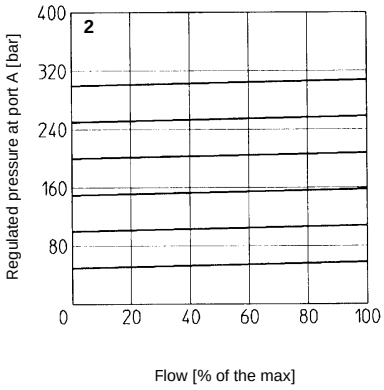




9.2 Operating diagrams

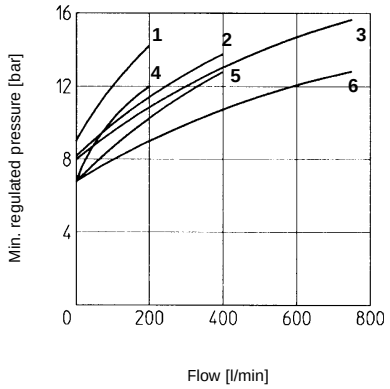
1 = LICZO-A, LIMZO-A
2 = LICZO-TER, LIMZO-TER

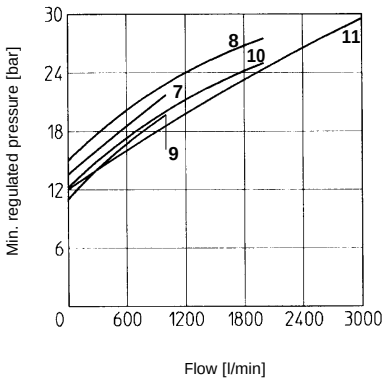




9.3

1 = LICZO-*-1
2 = LICZO-*-2
3 = LICZO-*-3
4 = LIMZO-*-1
5 = LIMZO-*-2
6 = LIMZO-*-3
7 = LICZO-*-4
8 = LICZO-*-5
9 = LIMZO-*-4
10 = LIMZO-*-5
11 = LIMZO-*-6





10 INSTALLATION AND SET-UP

10.1 Warning

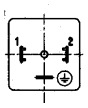
- Do not connect or disconnect electric plugs before switching-off power.

10.2 Set-up

- fix the valve on the manifold block by means of fastening bolts shown in section 12 and wire electrically. To fix the valves size 16 and 25, it is necessary to remove the piloting pressure RZMO which must be mounted only when the cover is fixed.
- in the LI*ZO-TER valves, the electronics on piloting valve RZMO, can be rotated after having unlocked the grub screw Ⓚ. The grub screw Ⓚ must be locked before using the valve.
- for LI*ZO-A valves execute the following regulations on the electronic driver:
  - BIAS to obtain correspondance between zero reference signal to the lowest value of regulated pressure;
  - SCALE to obtain the desired correspondance between reference signal and valve regulation.

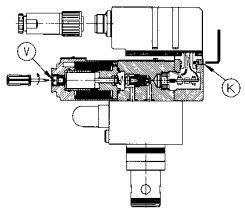
  In the LI*ZO-TER valves the integrated electronic is already pre-set and doesn't need further adjustment.
- bleed off the valve unloosening with a screwdriver the air bleed screw Ⓥ on the extremity of the solenoid. The presence of air in the valve causes irregularities of functioning.
- the valve is ready to work.

ELECTRICAL WIRING FOR -A VERSIONS



PIN	
1	COIL LEAD
2	COIL LEAD
⏚	EARTH CONDUCTOR

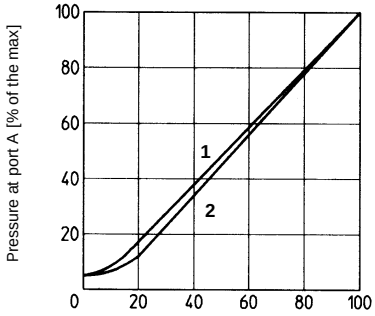
For -TER versions , see section 6



11 DIAGRAMS OF LIRZO

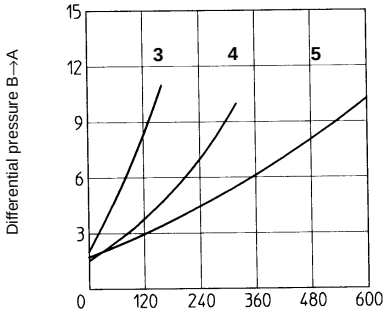
11.1 Regulation diagrams

1 = LIRZO-TER
2 = LIRZO-A



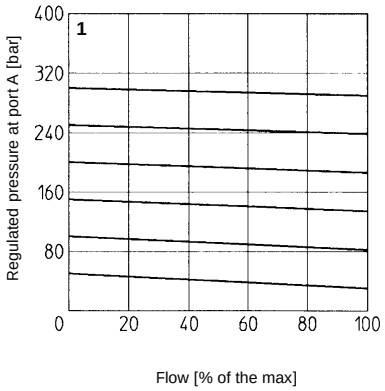
11.2

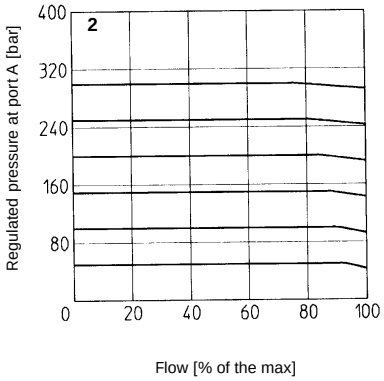
3 = LIRZO-*-1
4 = LIRZO-*-2
5 = LIRZO-*-3



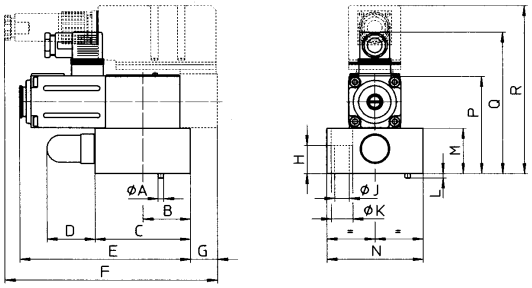
11.3 Operating diagrams

1 = LIRZO-A
2 = LIRZO-TER





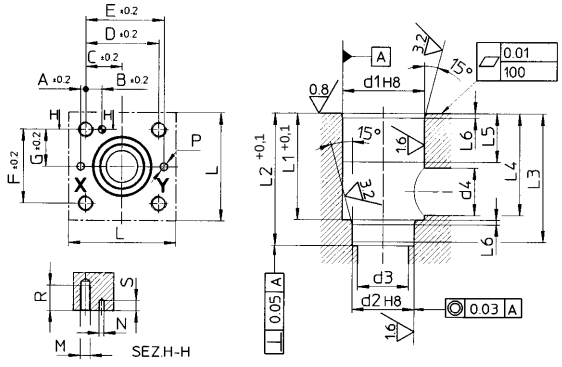
12 COVER DIMENSIONS [mm]



	Ø A	B	C	D	E	F	G	H	Ø J	Ø K	L	M	N	P	Q	R	Fastening bolts
NG 16	3	32,5	80	32,5	154,5	188,5	21,25	29	8,5	13,5	4	40	65	86	125	148,5	n° 4 M8x55
NG 25	5	42,5	85	32,5	151,5	188,5	24	25	13	19	6	40	85	86	125	148,5	n° 4 M12x60
NG 32	5	50	100	30,5**	159	188,5	16,5	30	17	25	6	50	100	96	135*	158,5*	n° 4 M16x55
NG 40	5	62,5	125	18**	171,5	188,5	4	39	21	31	6	60	125	106	145*	168,5*	n° 4 M20x70
NG 50	6	70	140	10,5*	179	192	—	49	21	31	4	70	140	116	155*	178,5*	n° 4 M20x80
NG 63	6	90	180	—	199	212	—	45	31	46	4	80	180	126	165*	188,5*	n° 4 M30x90

* The overall height is increased by 30 mm for /P option
** Only for /P option

13 COVER INTERFACE AND RECESS DIMENSIONS [mm]



	A	B	C	D	E	F	G	L min	M	Ø N	Ø P max	R	S max
NG 16	2	12,5	23	46	48	46	23	65	M8	4	4	22	8
NG 25	4	13	29	58	62	58	29	85	M12	6	6	30	8
NG 32	6	18	35	70	76	70	35	102	M16	6	8	38	8
NG 40	7,5	19,5	42,5	85	92,5	85	42,5	125	M20	6	10	46	8
NG 50	8	20	50	100	108	100	50	140	M20	8	10	46	8
NG 63	12,5	24,5	62,5	125	137,5	125	62,5	180	M30	8	12	66	8

	Ø d1	Ø d2	Ø d3 max	Ø d4 max	L1	L2	L3	L4 max	L5	L6
NG 16	32	25	16	22,5	43	56	54	42,5	20	2
NG 25	45	34	25	27	58	72	70	57	30	2,5
NG 32	60	45	32	38,5	70	85	83	68,5	30	2,5
NG 40	75	55	40	54,5	87	105	102	84,5	30	3
NG 50	90	68	50	62,5	100	122	117	97,5	35	3
NG 63	120	90	63	87	130	155	150	127	40	4