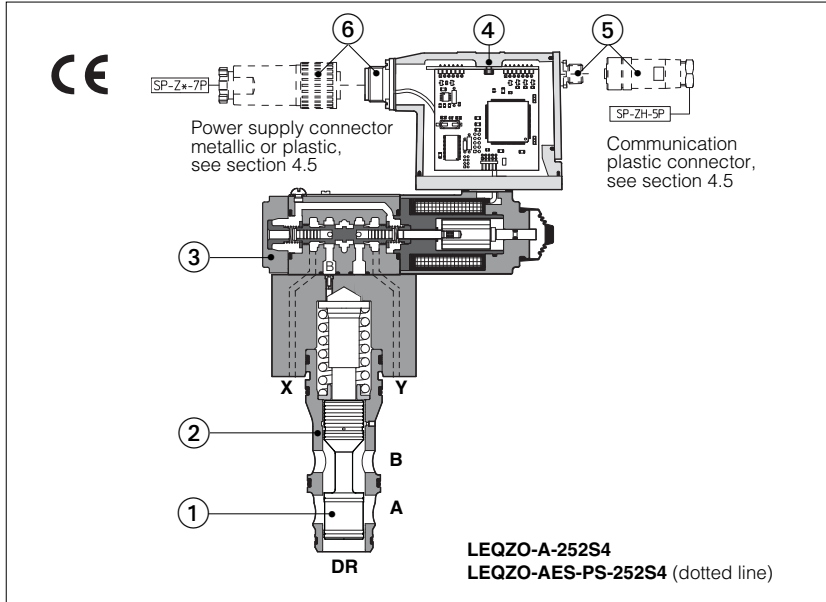


# Proportional throttle cartridges type LEQZO-A\*, 2-way

without transducer, nominal sizes 16, 25 and 32



LEQZO-A\* are 2-way proportional cartridge valves, designed for mounting in manifold blocks and provide proportional flow control according to the electronic reference signal.

They operate in association with electronic drivers, see table 8 which supply the proportional valve with proper current to align valve regulation to the reference signal supplied to the electronic driver.

They are available in different executions:

- -A, without position transducer;
- -AE, -AES as -A plus analogue (AE) or digital (AES) integral electronics.

The regulation is operated by means of a spool 1 sliding into a cartridge 2 piloted by the proportional pressure reducing valve type DHRZO 3.

The integral electronics 4 ensures factory presetting, fine functionality plus valve-to-valve interchangeability and simplified wiring and installation.

Following communication interfaces 5 are available for the digital -AES execution:

- -PS, RS232 serial communication interface. The valve reference signal is provided with analogue commands via the 7 (or 12) pins connector 6.
  - -BC, CANbus interface
  - -BP, PROFIBUS-DP interface
- In the -BC and -BP options the valve reference signal is provided via fieldbus; during start up or maintenance, the valves can be operated with analogue signals via the 7 (or 12) pins connector 6.

- Reduced response times
- Accurate flow regulation with good repeatability
- Sizes: 16, 25 and 32.
- Max flow up to 350 l/min with differential pressure  $\Delta p = 5$  bar, see section 2.
- Max pressure: 250 bar.

## 1 MODEL CODE

<b>LEQZO - AES - PS - 25</b>		<b>2</b>	<b>S4 / *</b>	<b>**</b>	<b>/*</b>
Flow control valve					Synthetic fluids: <b>WG</b> = water-glycol <b>PE</b> = phosphate ester
<b>A</b> = without position transducer <b>AE</b> = as A plus integral electronics <b>AES</b> = as A plus integral digital electronics				Options: <b>for -A execution:</b> <b>6</b> = with 6 VDC coil instead of standard 12 VDC coil <b>18</b> = with 18 VDC coil instead of standard 12 VDC coil <b>for -AE execution:</b> <b>I</b> = current reference (4÷20 mA) <b>Q</b> = with enable signal, without signal zero <b>for -AES execution:</b> <b>Z</b> = double power supply, enable and fault (12 pins connector)	Series number
Communication interface (only for AES) <b>PS</b> = RS232 serial <b>BC</b> = CANbus <b>BP</b> = PROFIBUS-DP				Regulation characteristic: <b>S4</b> = progressive <b>L4</b> = linear	
Size: <b>16</b> <b>25</b> <b>32</b>					
<b>2</b> = 2 way					

## 2 HYDRAULIC CHARACTERISTICS (based on mineral oil ISO VG 46 at 50 °C)

Hydraulic symbols	LEQZO-A	LEQZO-AE, LEQZO-AES	
Model	<b>LEQZO-A, LEQZO-AE, LEQZO-AES</b>		
Size	16	25	32
Max regulated flow at $\Delta p = 5$ bar	140	230	350
at $\Delta p = 10$ bar	200	320	490
Max pressure (2)	250		
Response time 0 ÷ 100% step signal (1)	75		
Hysteresis	≤ 5%		
Repeatability	± 1%		

Above performance data refer to valves coupled with Atos electronic drivers, see section 8.

1) Response time to step signal (0%→100%) are measured from 10% and 90% of step values with piloting pressure 140 bar and are strictly referred to valve regulation.

2) Minimum piloting pressure is 20 bar.

### 3 MAIN CHARACTERISTICS OF PROPORTIONAL THROTTLE CARTRIDGES TYPE LEQZO-A\*

Assembly position	Any position
Subplate surface finishing	Roughness index, $\sqrt{0.4}$ flatness ratio 0,01/100 (ISO 1101)
Ambient temperature	-20°C ÷ +70°C for -A execution; -20°C ÷ +60°C for -AE and -AES executions
Fluid	Hydraulic oil as per DIN 51524 ... 535 for other fluids see section I
Recommended viscosity	15 ÷ 100 mm <sup>2</sup> /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	-20°C +60°C (standard and /WG seals) -20°C +80°C (/PE seals)

#### 3.1 Coils characteristics

	with 12 V <sub>dc</sub> coil	with 6 V <sub>dc</sub> coil	with 18 V <sub>dc</sub> coil
Coil resistance R at 20°C	3 ÷ 3,3 Ω	2 ÷ 2,2 Ω	13 ÷ 13,4 Ω
Max. solenoid current	1,6 A	2,2 A	0,9 A
Max. power	40 Watt		
Protection degree (CEI EN-60529)	IP65 for -A execution; IP67 for -AE and -AES executions (see sect. 4.5)		
Relative duty factor	Continuous rating (ED=100%)		

### 4 INTEGRAL ELECTRONICS OPTIONS AND WIRING

#### 4.1 Option /I

It provides the 4÷20 mA current reference signal instead of the standard 0÷10 V. It is normally used in case of long distance between the machine control unit and the valve or where the reference signal can be affected by electrical noise. In case of breakage of the reference signal cable, the valve functioning is disabled.

#### 4.2 Option /Q

Safety option providing the possibility to enable or disable the valve functioning without cutting the power supply.

#### 4.3 Option /Z

Safety option, specifically introduced for -BC and -BP communication interfaces, provides two separated electric power supplies for the digital electronic circuits and for the solenoid power supply stage. The Enable and Fault signals are also available. The option /Z allows to interrupt the valve functioning by cutting the solenoid power supply (e.g. for emergency, as provided by the European Norms EN954-1 for components with safety class 2), but keeping energized the digital electronic circuits, thus avoiding fault conditions of the machine fieldbus controller.

For the electrical wiring of -AES, electronics with option /Z (12 pins connector), see tab. G115.

#### 4.4 Integral electronics wiring

For the electric wiring shielded cables must be provided: the shield must be connected to the power supply zero **on the generator side**, see tab. F003

POWER SUPPLY CONNECTOR				
PIN	SIGNAL DESCRIPTION	-AE, -AES	-AE/I	-AE/Q
A	Power supply 24 V <sub>dc</sub>	Stabilized: +24V <sub>dc</sub>		
B	Power supply zero	Filtered and rectified: V <sub>rms</sub> = 21 ÷ 33 (ripple max 2V <sub>pp</sub> )		
C	Signal zero	Reference 0 V <sub>dc</sub>	Reference 0 V <sub>dc</sub>	Enabling input normal working 9 ÷ 24 V <sub>dc</sub>
D	Input signal +	0 ÷ 10 V <sub>dc</sub>	4 ÷ 20 mA	0 ÷ 10 V
E	Input signal -			
F	Monitor driving current	0 ÷ 5 V <sub>dc</sub> 1V = 1A (referred to pin C)		0 ÷ 5 V <sub>dc</sub> 1V = 1A (referred to pin B)
G	Earth	Connect only when the power supply is not conform to VDE 0551 (CEI 14/6)		

COMMUNICATION CONNECTORS (for -AES)				
Communication options	-PS (RS232) male connector	-BC (CAN Bus) male connector	-BP (PROFIBUS-DP) female connector (reverse key)	
Pin number Signal description	1	NC Not Connected	CAN_SHLD Shield	+5V Termination voltage
	2	NC Not Connected	NC Not Connected	LINE -A Bus line (high)
	3	RS_GND Signal zero data line	CAN_GND Signal zero data line	DGND Signal zero data line / termination voltage
	4	RS_RX Valves receiving data line	CAN_H Bus line (high)	LINE-B Bus line (low)
	5	RS_TX Valves transmitting data line	CAN_L Bus line (low)	SHIELD Shield

#### Note:

- electrical signals (e.g. actual - feedback signals) acquired via valve electronics must not be used to switch off the machine safety functions. This is in accordance with the European standards (Safety requirements of fluid technology systems and components - hydraulics, EN-892).
- installation notes with basic information for commissioning and start-up, are always supplied with relevant components, together with the specific technical tables.

#### 4.5 Model codes of power supply and communication connectors

VALVE VERSION	-A	-AE, -AES		-AES/Z	-RS232 (-PS) OR CANBUS (-BC)	PROFIBUS (-BP)
CONNECTOR CODE	SP-666	SP-ZH-7P (1)	SP-ZM-7P (1)	SP-ZH-12P (1)	SP-ZH-5P (1)	SP-ZH-5P/BP (1)
CONNECTOR CODE	IP65	IP67	IP67	IP65	IP67	IP67

(1) to be ordered separately

### 5 PROGRAMMING DEVICES

The functional parameters of the digital valves, as the bias, scale, ramp and linearization of the regulation characteristic, can be easily set and optimized with graphic interface by using the following software programming devices suitable for standard PC:

**KIT-E-SW-PS** for electronics with RS232 interface (option -PS)

**KIT-E-SW-BC** for electronics with CANbus interface (option -BC)

**KIT-E-SW-BP** for electronics with PROFIBUS-DP interface (option -BP)

see tab. G500 for complete information about the programming device kits and for the PC minimum requirements.

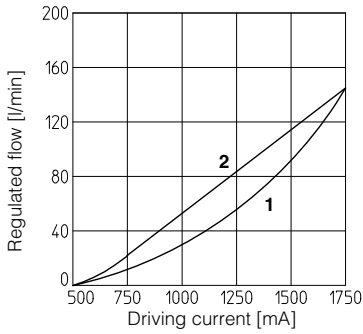
Only for the -BC and -BP communication options, the functional parameters can be alternatively set via fieldbus through the machine control unit, using the standard communication protocol implemented by Atos.

The protocol operating instructions to be implemented in the standard protocols (DS301V4.02, DSP408 for CANbus and DPVO for PROFIBUS-DP) are described in the user manuals MAN-S-BC (for -BC option) and MAN-S-BP (for -BP option) supplied with the relevant programming device kits.

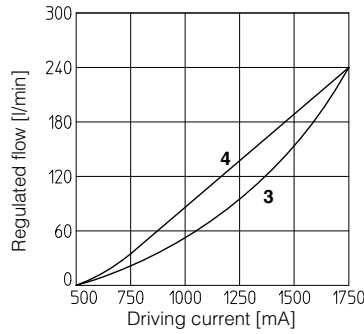
**The above programming devices have to be ordered separately.**

**6 DIAGRAMS** (based on mineral oil ISO VG 46 at 50°C)

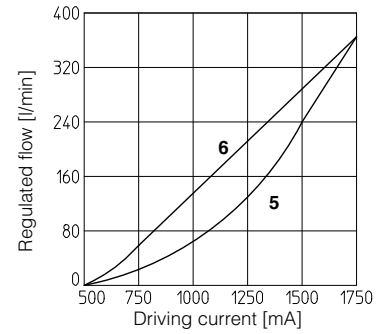
**6.1 Regulation diagrams measured at  $\Delta p$  5 bar**



**1** = LEQZO-A\*-162S4  
**2** = LEQZO-A\*-162L4



**3** = LEQZO-A\*-252S4  
**4** = LEQZO-A\*-252L4



**5** = LEQZO-A\*-322S4  
**6** = LEQZO-A\*-322L4

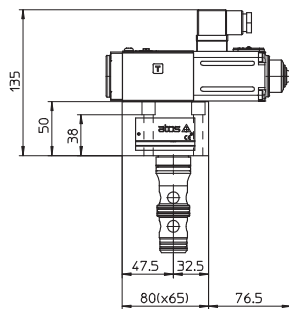
**Notes:** 1) with 18 V<sub>DC</sub> coil the driving current is half of standard 12 V<sub>DC</sub> coil  
 2) For the valves with digital electronics, the regulation characteristic can be modified by setting the internal software parameters, see tab. G500.

**7 DIMENSIONS [mm]**

Fastening bolts:  
 N°4 M8x50 class 12.9  
 Tightening torque = 35 Nm

**LEQZO-A-16**

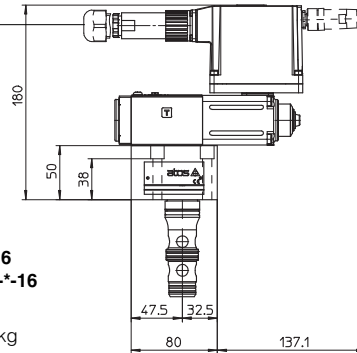
Mass: 3,9 kg



option **Z**

**LEQZO-AE-16**  
**LEQZO-AES\*-16**  
 (dotted line)

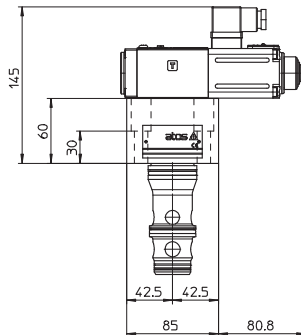
Mass: 4,5 kg



Fastening bolts:  
 N°4 M12x50 class 12.9  
 Tightening torque = 125 Nm

**LEQZO-A-25**

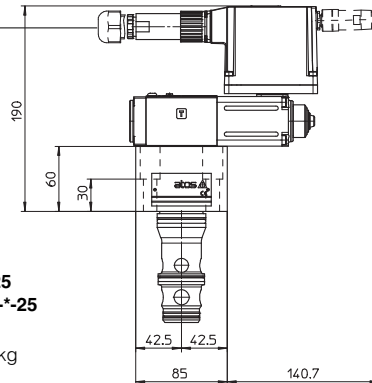
Mass: 5,8 kg



option **Z**

**LEQZO-AE-25**  
**LEQZO-AES\*-25**  
 (dotted line)

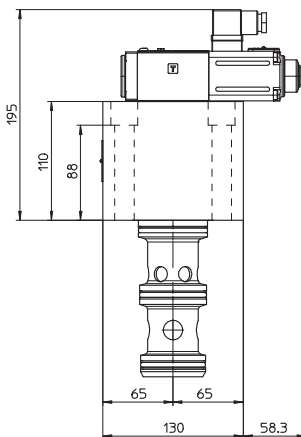
Mass: 6,4 kg



Fastening bolts:  
 N°4 M16x120 class 12.9  
 Tightening torque = 300 Nm

**LEQZO-A-32**

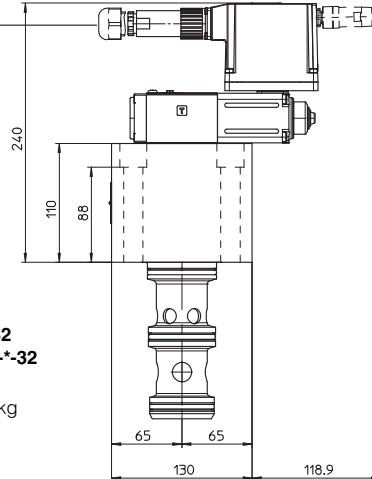
Mass: 6,5 kg



option **Z**

**LEQZO-AE-32**  
**LEQZO-AES\*-32**  
 (dotted line)

Mass: 7,1 kg



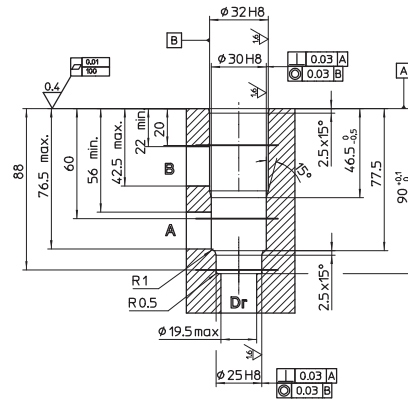
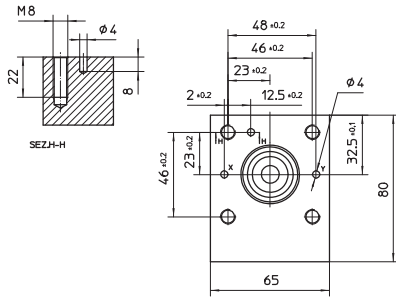
**8 ELECTRONIC DRIVERS FOR LEQZO-A\***

Valve model	<b>-A</b>				<b>-AE</b>	<b>-AES</b>
Drivers model	E-MI-AC-01F	E-BM-AC-01F	E-ME-AC-01F	E-RP-AC-01F	E-RI-AE	E-RI-AES
Data sheet	G010	G025	G035	G100	G110	G115

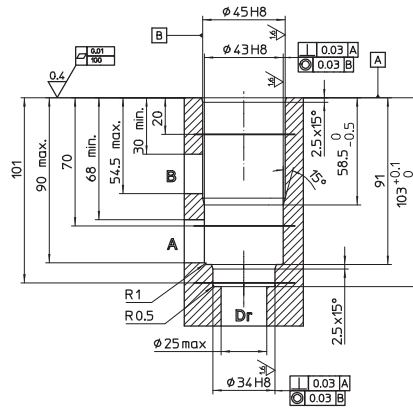
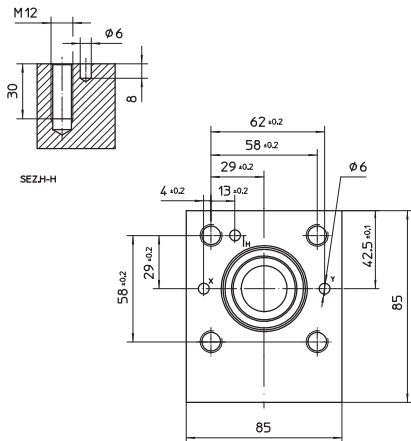
For complete information about the drivers characteristics and relevant options, see the technical data sheet specified in the table.

**9 COVER INTERFACE AND RECESS DIMENSIONS FOR LEQZO [mm]**

**size 16**



**size 25**



**size 32**

