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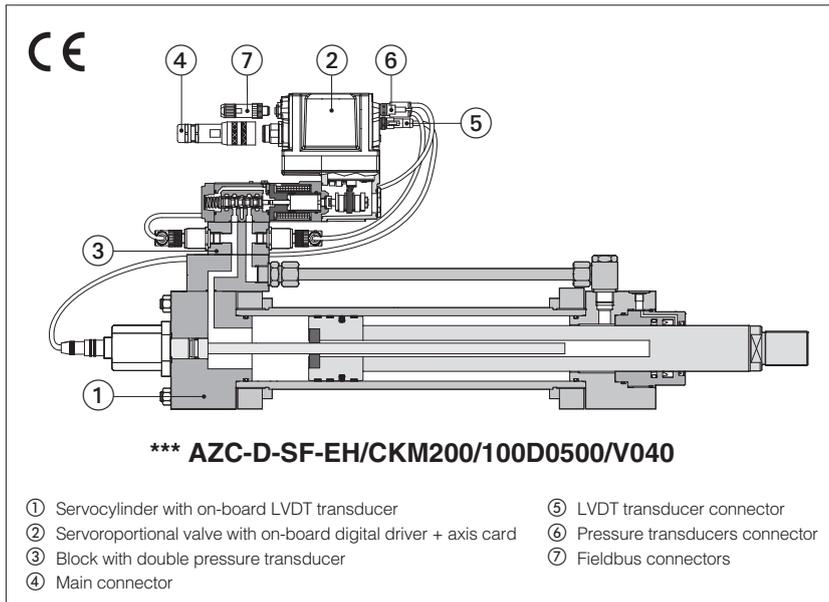
Table **FS700-1/E**

Digital electrohydraulic servoactuators

servocylinder plus servoproportional directional with on-board driver & axis card

*** AZC-D-SF-EH/CKM200/100D0500/V040

① Servocylinder with on-board LVDT transducer
② Servoroportional valve with on-board digital driver + axis card
③ Block with double pressure transducer
④ Main connector
⑤ LVDT transducer connector
⑥ Pressure transducers connector
⑦ Fieldbus connectors

AZC

Digital electrohydraulic servoactuators are stand-alone units performing closed loop position controls.

The complete motion control cycle can be operated by external signals (from machine PLC) or programmed internally to the controller.

Alternate force control added to the basic position one with pressure transducers or load cell factory pre-assembled and wired. The servoacuators are composed by a servocylinder with position transducer, servoproportional valve with on-board driver plus axis card, factory assembled and tested.

They can be provided with optional fieldbus interfaces for functional parameters setting, reference signals and real time diagnostics. The USB interface is always present for connection to Atos PC software which allows to easily customize the AZC configuration to the specific application requirements.

1 MODEL CODE

***	AZC	M	-	D	-	SF	-	EH	/	CK	M	200	/	100	D	0500	/	V0	40

Design number

Digital electrohydraulic servoactuator for linear axis position control

Cycle Generation type:
- **-** = none
- **I** = injection
- **M** = mold
- **P** = parison
- **S** = synchronism
- **X** = positioning
- **9** = customized

Position transducer type:
- **A** = analog
- **D** = digital

Alternated P/Q controls:
- **SN** = none
- **SF** = with on-board double pressure transducer
- **SL** = with on-board load cell transducer
- **XL** = with remote load cell transducer

Fieldbus interfaces, USB port always present:
- **NP** = Not present
- **BC** = CANopen
- **BP** = PROFIBUS DP
- **EH** = EtherCAT
- **EW** = POWERLINK
- **EI** = EtherNet/IP
- **EP** = PROFINET RT/IRT

Servocylinder Type, tech table **B310**:
- **CN** = ISO 6020-1, Pmax 250 bar - tech table **B180**
- **CK** = ISO 6020-2, Pmax 250 bar - tech table **B137**
- **CH** = ISO 6020-3, Pmax 250 bar - tech table **B160**
- **CC** = ISO 6022,   Pmax 320bar   - tech table **B241**

Servoproportional valve configuration, zero spool overlap:
- **40** = with fail safe, sleeve execution, direct (tech table **FS610**)
- **60** = without fail safe, sleeve execution, direct (tech table **FS610**) or piloted (tech table **FS630**)
- **70** = spring central position, direct (tech table **FS620**) or piloted (tech table **FS630**)

Servoproportional valve size with axis controller:
- **V0** = direct, size 06
- **V1** = direct or piloted, size 10
- **V2** = piloted size 16
- **V4** = piloted size 25 or size 27

Stroke [mm]

Rod:
- **S** = single rod
- **D** = double rod

Rod diameter [mm]

Bore diameter [mm]

Cylinder position transducer type, see section 6 :

Analog (only for AZC-A)
- **P** = potentiometer, max stroke 900mm
- **F** = analog magnetosonic, max stroke 2500mm
- **N** = analog magnetostrictive, max stroke 4000mm
- **T** = LVDT, max stroke 16mm
- **L** = LVDT, max stroke 30mm
- **V** = inductive, max stroke 900mm

Digital (only for AZC-D)
- **M** = SSI magnetosonic, max stroke 900mm

Analog or Digital
- **9** = special
- **X** = remoted

2 MAIN CHARACTERISTICS

Assembly position	Any position
Ambient temperature range	standard execution = -20°C ÷ +60°C
Storage temperature range	Standard execution = -20°C ÷ +70°C
Protection degree to EN60529	IP66 / IP67
Duty factor	Continuous rating (ED=100%)
Recommended fluid temperature	-20°C ÷ +60°C, with HFC hydraulic fluids = -20°C ÷ +50°C
Recommended viscosity	20 ÷ 100 mm²/s - max allowed range 15 ÷ 380 mm²/s

Max fluid contamination level	normal operation	ISO4406 class 18/16/13 NAS1638 class 7	see also filter section at www.atos.com or KTF catalog
	longer life	ISO4406 class 16/14/11 NAS1638 class 5	

| Hydraulic fluid	Classification	Ref. Standard
Mineral oils	HL, HLP, HLPD, HVLP, HVLPD	DIN 51524
Flame resistant without water	HFDU, HFDR	ISO 12922
Flame resistant with water	HFC	

3 AXIS CONTROLLER

Digital servoproportionals direct or pilot operated include valve with on-board digital driver plus axis card to perform the position closed loop of hydraulic actuator. Axis controllers are operated by an external or internally generated reference position signal.
For detailed information about integral axis controller see tech tables **FS610**, **FS620**, **FS630**.

4 ALTERNATED P/Q CONTROLS

SF and **SL** controls add the alternated force closed loop control to the actuator standard position control.
A dedicated algorithm alternates pressure (force) depending on the actual hydraulic system conditions.
For detailed information about SF, SL controls, see tech table **FS500**.

SF	SL
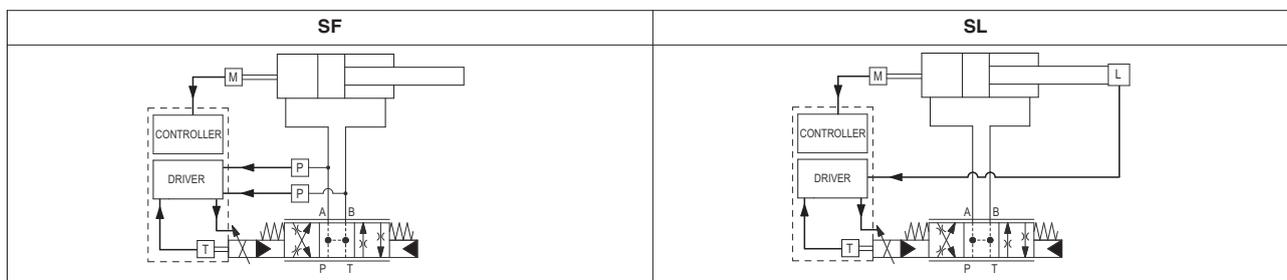
T	valve spool transducer	M	actuator position transducer	P	pressure transducer	L	load cell

5 FIELDBUS

Fieldbus allows the direct communication of the servoactuator with machine control unit for digital reference signal, diagnostics and settings of functional parameters. Analog reference signal remain available on the main connector for quick commissioning and maintenance.
For detailed information about fieldbus features and specification see tech table **GS510**.

6 ACTUATOR TRANSDUCER CHARACTERISTICS

6.1 Position transducers

The accuracy of the position control is strongly dependent to the selected position transducer. Four different transducer interfaces are available on the controllers, depending to the system requirements: potentiometer or analog signal (A execution), SSI or Encoder (D execution).
Transducers with digital interface allow high resolution and accurate measures, that combined with fieldbus communication grants highest performances.
Transducers with analog interface grant simple and cost effective solutions.

6.2 Pressure/force transducers

The accuracy of the force control is strongly dependent to the selected force transducer. Alternated force controls require to install pressure transducers or load cell to measure the actual pressure/force values.
Pressure transducers allow easy system integration and cost effective solution for alternated position/force controls (see tech table **GS465** for pressure transducers details). Load cell transducers allow the user to get high accuracy and precise regulations for alternated position/force control.
The characteristics of the remote pressure/force transducers must be always selected to match the application requirements and to obtain the best performances: transducer nominal range should be at least 115%÷120% of the maximum regulated pressure/force.

6.3 Transducers characteristics & interfaces - following values are just for reference, for details please consult the transducer's datasheet

	Position				Pressure/Force
Execution	A		D		SF, SL
Input type	Potentiometer	Analog	SSI **(3)**	Incremental Encoder	Analog
Power supply **(1)**	±10 VDC	+24 VDC	+5 VDC / +24 VDC	+5 VDC / +24 VDC	+24 VDC
Controller Interface	±10V	0 ÷ 10V 4 ÷ 20 mA	Serial SSI binary/gray	TTL 5Vpp - 150 KHz	±10 VDC 4 ÷ 20 mA
Max speed	0,5 m/s	1 m/s	2 m/s	2 m/s	-
Max Resolution	< 0.4 % FS	< 0.2 % FS	1 µm	1 µm (@ 0.15 m/s)	< 0.4 % FS
Linearity error **(2)**	± 0.1% FS	< ±0.03% FS	< ± 0.01 % FS	< ± 0.001 % FS	< ±0.25% FS
Repeatability **(2)**	± 0.05% FS	< ± 0.005% FS	< ± 0.001 % FS	< ± 0.001 % FS	< ±0.1% FS

(1) power supply provided by digital controller   **(2)** percentage of total stroke   **(3)** Balluff BTL7 with SSI interface is not supported

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