



AEL8 Series Electric Linear Actuator

Description

The AEL8 Series linear electric actuators are a cost effective range of linear electric process actuators, with diagnostics, only suitable for the modulation of Spirax Group valves. The AEL8 Series actuators must not be used for any other purpose. Full nomenclature details can be found on page 7 of this document.

Simple to select and commission, the AEL8 series is especially suited to process point of use applications within the steam ecosystem where robustness and reliability are key requirements. The AEL8 Series is compatible with the complete Spira-trol™ 2-port and 3-port ranges.

The AEL8 Series linear electric actuators utilise a fully electronic set up and operation of the actuator with no mechanical switches or manual intervention required. The direct measurement of valve position, stroke and force guarantee optimised process control, and all actuators have internal anti-rotation for improved actuator rigidity.

Diagnostics

The AEL8 series actuator provides actuator diagnostics through 3 functions:

- Non-intrusive health check hand wheel
- Self-diagnostic LED
- (Optional) Fault relay

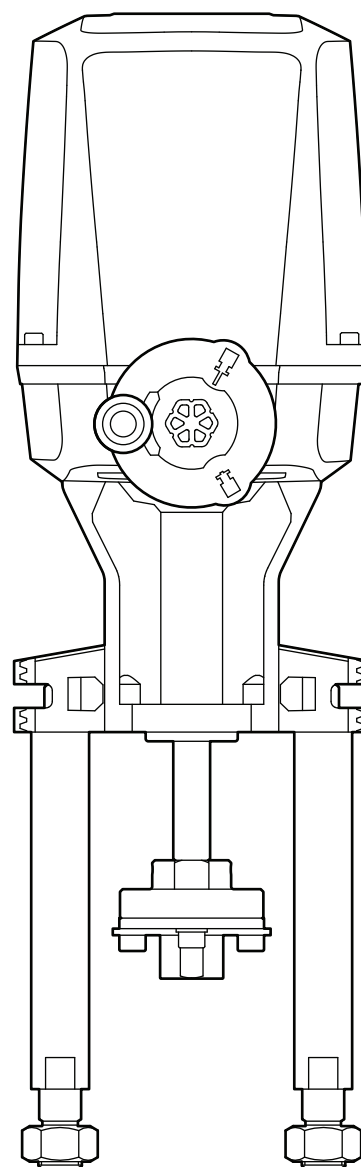
Typical applications

The AEL8 series actuators are used for the modulation of Spirax Group valves in closed-loop and open-loop control systems.

Typical applications for the AEL8 Series actuator include:

- Temperature control
- Pressure control
- Flow control
- Level control

For boiler feed water applications please refer to the AEL7 (TI-P713-02)



Available types

The AEL8 electric linear actuators are simple to select with only 2 different power supply variants:

- 90...264 Vac wide range input
- 24 Vac/24 Vdc Dual voltage

The standard version is configurable for modulated input signal (4-20mA or 0(2)-10V). The actuator has a position override function. A 24V input can be used to drive the actuator to either end stop (e.g. as a result of independent high-limit)

All actuators offer 0(2) - 10 V or 4 - 20 mA position feedback. Also available are auxiliary limit switches and anti-condensation heater.

These actuators can be used with the following valves, in conjunction with an appropriate valve adaptor and mounting flange.

2 - Port	DN15 - DN100 (½" - 4")	Spira-trol™ L, K series control valves
3 - Port	DN15 - DN200 (½" - 8")	Spira-trol™ Q series control valves

Standards and approvals

This equipment is  marked and conforms to the following:

Electrical safety 2014/35/EU (Low Voltage Directive)	2006/42/EC (Machinery Directive)
	The Supply of Machinery (Safety) Regulations 2008
	2014/35/EU (Low Voltage Directive)
	The Electrical Equipment (Safety) Regulations 2016
	2014/30/EU (Electromagnetic compatibility Directive)
Operational safety	The Electromagnetic Compatibility Regulations 2016
	EN 61010-1:2010+A1:2019
	EN IEC 61010-2-202:2021
Operational requirements	EN ISO 12100:2010
	EN15714-2 (Electric actuators for industrial valves - Basic requirements)
	Modulating actuator Class C acc. to DIN EN ISO 22153
Electromagnetic compatibility	EN 61800-3:2004/A1:2012

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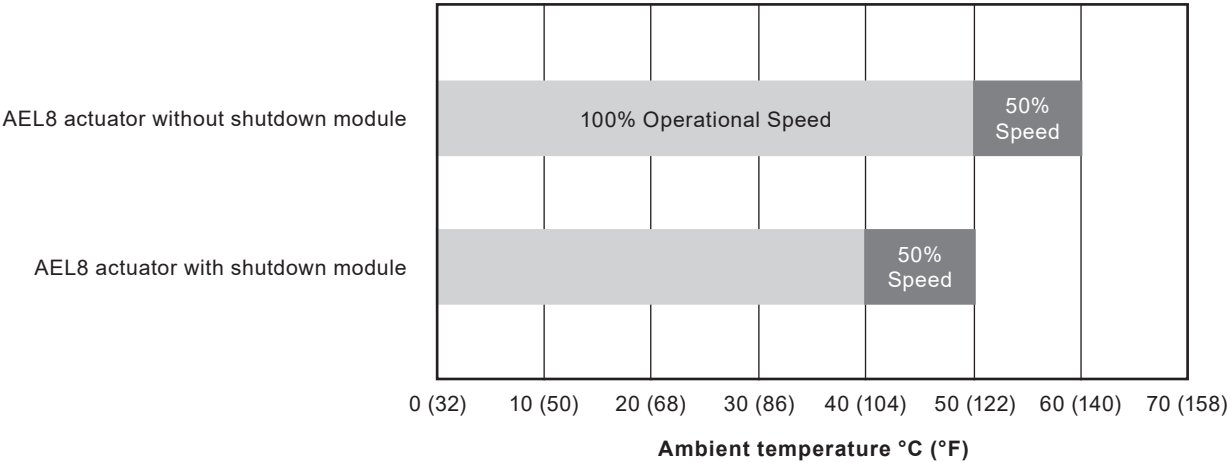
AEL8 Technical specification

Actuator model	AEL82	AEL83	AEL84	AEL85	AEL86	AEL87
Thrust	2 kN (450 lbf)	4.5 kN (1000 lbf)	6 kN (1500 lbf)	8 kN (1800 lbf)	12 kN (2700 lbf)	15 kN (3300 lbf)
	30% load					
Medium Speed	1.6 mm/s (0.07 in/s)	1.6 mm/s (0.07 in/s)	1.2 mm/s (0.05 in/s)	1.0 mm/s (0.04 in/s)	1.4 mm/s (0.06 in/s)	0.9 mm/s (0.03 in/s)
High Speed	n/a	4.5 mm/s (0.18 in/s)	3.6 mm/s (0.14 in/s)	3.0 mm/s (0.12 in/s)	3.0 mm/s (0.12 in/s)	2.0 mm/s (0.08 in/s)
	Full load speed					
Medium Speed	1.3 mm/s (0.05 in/s)	1.3 mm/s (0.05 in/s)	1.0 mm/s (0.04 in/s)	0.7 mm/s (0.03 in/s)	1.0 mm/s (0.04 in/s)	1.0 mm/s (0.04 in/s)
High Speed	n/a	3.6 mm/s (0.14 in/s)	2.8 mm/s (0.11 in/s)	2.0 mm/s (0.08 in/s)	2.0 mm/s (0.08 in/s)	1.4 mm/s (0.06 in/s)

AEL8 Technical specification (continued)

Max. Stroke	2⅜"			3"		
Actuator model	AEL82	AEL83	AEL84	AEL85	AEL86	AEL87
Mains Voltage/frequency	90...264 Vac, 47...63 Hz or 24 Vac/dc					
	Permissible fluctuation of mains voltage ±10 % Permissible fluctuation of mains frequency ± 5 % (further voltages on request) 24 Vdc and Shutdown module: permissible fluctuation of mains voltage –6 %/+10 %					
Operating mode according to IEC 34-1	S2 – 15 min, S4 – 30 % ED 1200 c/h, S1 – 100 %					
Motor Protection	Electronic shutdown in case of over temperature					
Electrical connection Cross section	Power supply: Spring terminal max 2.5 mm² (12 AWG), Signal: Spring terminal max. 2.5 mm² (12 AWG)					
End position switch-off	Electronically selectable torque or travel for both directions					
Control input	Analog: 0/2 – 10 V: input impedance >100 kOhm, 0/4 – 20 mA: input impedance 50 Ohm Control inputs 24 Vdc: galvanically isolated Ri = 3300 Ohm (I < 10 mA) OPEN, CLOSE					
Position feedback	Analog 0 – 10 V, 0/4 – 20 mA, load max. 500 Ohm Position measurement via non-contact displacement sensor					
Message signals	Collective fault 24 Vdc, I max. 50 mA, galvanically isolated Option: I/O module with 4x 24 Vdc, I max 50 mA, galvanically isolated from mains supply, OPEN, CLOSE, intermediate positions, UNI-OUT (collective fault)					
Configuration	Setting via remote input Initialization/Reset zero point Setting via DIP switch Input signal/Output signal Rising signal/Falling signal Operating mode Programming keys Speed, thrust Shutdown mode, operating parameters					
Positioning accuracy	< 0,5 % of total stroke					
Mounting position	Any orientation except vertically below the pipe					
Installation height	≤ 2000 m above sea level					
Lubricant	Gear grease: Klüber Microlube GL261					
Humidity	Up to 95 % relative humidity (Anti-condensation heater required)					
Lifetime	Spirax-Sarco linear actuators meet or exceed the lifetime requirements of EN 15714-2 (C).					
Ambient temperature	See graph on next page					
Media temperature	-20 °C ... +300 °C (-4 °F ... +572 °F)					
Enclosure rating	IP 65					
Enclosure Matl.	Thermoplastic					
Manual override	Hand Wheel					
Conduit entries	3 x blanking plugs (M20x1.5)					
Thread Adaptor	M8			M12		
	AEL8 Actuator options					
I/O Module	4 x 24 V-230 Vac/dc output relays @ 0.5A Max.					
Heater	90-264 Vac/24 Vac/dc					
Shutdown Module	Super capacitor (Factory fit only)					

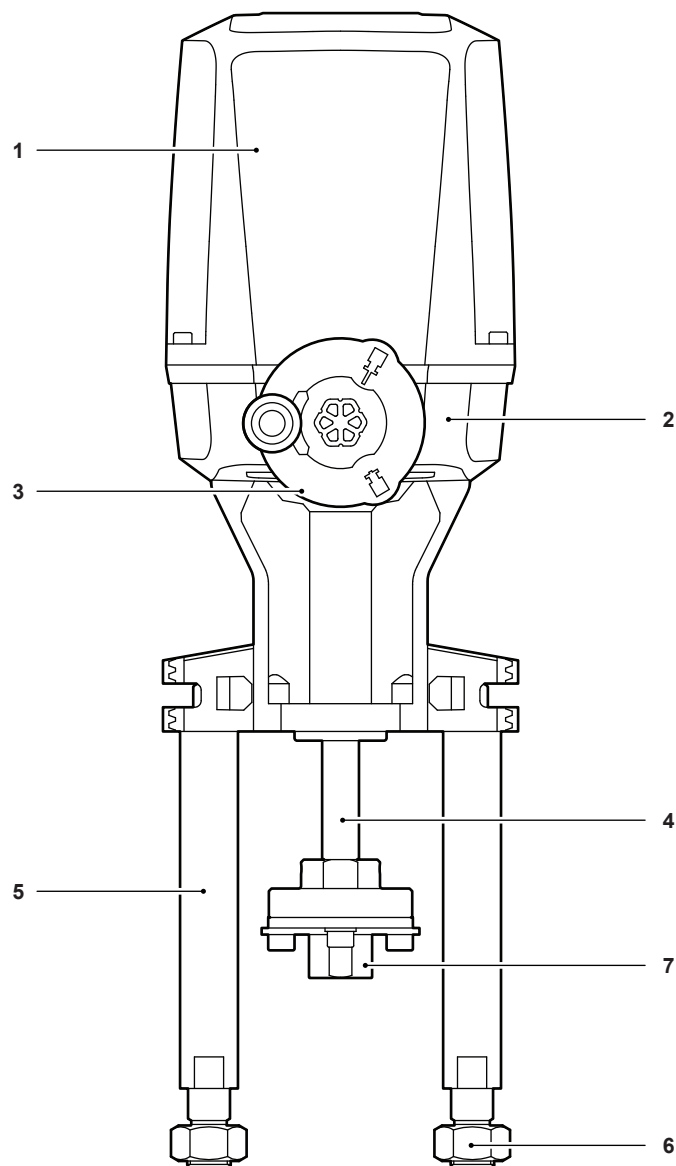
Maximum ambient temperature of installation



Note:
AEL8 actuator without shutdown module: Ambient temperatures between 50 °C - 60 °C will cause the actuator to operate at 50% specified speed (yellow hand wheel light will be shown) to help prolong the life of the actuator.

AEL8 actuator with shutdown module: Maximum ambient temperature must not exceed 50 °C.

Materials



No.	Part	Materials	Surface Finish
1	Cover	Polycarbonate	None
2	Housing	AlSi7Mg0.3 (LM25), seawater resistant	Anodised
3	Hand wheel ¹	Aluminium	None
		Polycarbonate	None
4	Actuator spindle	Carbon steel	None
5	Actuator pillar	Stainless steel	None
6	Pillar nut	Carbon steel	Galvanic zinc plated
7	Thread adaptor	Carbon steel	None

¹ Clear polycarbonate for Health check LED.

AEL8 valve adapter and mounting flange selection - Spira-trol™ K & L

Actuator	Thrust	DN15-50 (½" - 2")			DN65-100 (2½" - 4")		
		Flange	Thread	Adapter	Flange	Thread	Adaptor
AEL82	2.0 kN (450 lbf)	EL5970	M8	AEL8 x M8 ¹	EL5971	M12	Integral
AEL83	4.5 kN (1000 lbf)						
AEL84	6.0 kN (1500 lbf)						
AEL85	8.0 kN (1800 lbf)						
AEL86	12.0 kN (2700 lbf)						
AEL87	15.0 kN (3300 lbf)						

¹ Included in the standard scope of supply AEL82 to AEL85

AEL8 valve adapter and mounting flange selection - Spira-trol™ QL

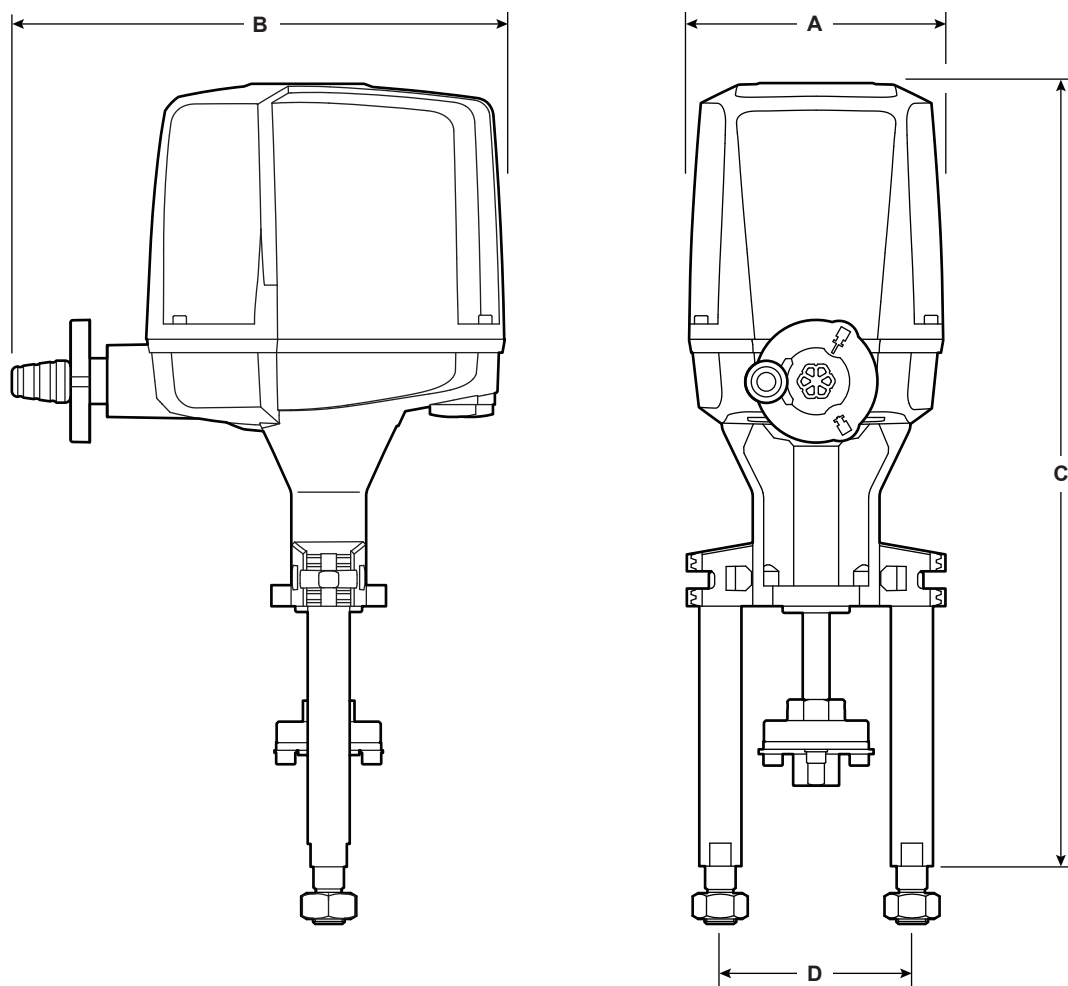
Actuator	Thrust	DN15-50 (½" - 2")			DN65-100 (2½" - 4")			DN125-200 (5" to 8")		
		Flange	Thread	Adapter	Flange	Thread	Adaptor	Flange	Thread	Adaptor
AEL82	2.0 kN (450 lbf)	EL5970	M8	AEL8 x M8 ¹	EL5971	M12	Integral			
AEL83	4.5 kN (1000 lbf)									
AEL84	6.0 kN (1500 lbf)									
AEL85	8.0 kN (1800 lbf)									
AEL86	12.0 kN (2700 lbf)							EL5974	M18 x 1.5	AEL8XQ18 + AEL8Q125
AEL87	15.0 kN (3300 lbf)									

¹ Included in the standard scope of supply AEL82 to AEL85

AEL8 accessories

Actuator Type	Thrust	Voltage	I/O Module	Positioner	Heater
AEL8	2 - 6 kN (450 - 1500 lbf)	230 Vac	AEL8981	AEL8961	AEL8954
		110 Vac			
		24 Vac			AEL8596
		24 Vdc			
	8 - 15 kN (1800 - 3300 lbf)	230 Vac			AEL8954
		110 Vac			
		24 Vac			AEL8965
		24 Vdc			

Dimensions/weights (approximate) in inches (mm) and lbs (kg)



Actuator	Thrust	Dimensions (mm)					Weight (kg)
		A	B	C	D Pillar Centre	E Cover removal space	
AEL82	2.0 kN	133	259	410	100	140	6.0
AEL83	4.5 kN						
AEL84	6.0 kN						
AEL85	8.0 kN	161	345	523	100	205	11.0
AEL86	12.0 kN						
AEL87	15.0 kN						

Actuator	Thrust	Dimensions (inches)					Weight (lb)
		A	B	C	D Pillar Centre	E Cover removal space	
AEL82	450 lbf	5.25	10.2	16.15	3.94	5.5	13.25
AEL83	1000 lbf						
AEL84	1500 lbf						
AEL85	1800 lbf	6.35	13.6	20.6	3.94	8.1	24.25
AEL86	2700 lbf						
AEL87	3300 lbf						

Safety information, installation and maintenance

Full details for the safe installation, commissioning and removal of the AEL8 Series actuator can be found in IM-P714-02 for AEL8 versions

Installation and wiring note

The valve should be installed in the horizontal line. The position of the actuator will depend on the type of valve to which it is fitted and the temperature of the media. However, it is not recommended that the actuators be fitted directly below the valve or in a wet environment.

Disposal

This product is recyclable. No ecological hazard is anticipated with the disposal of this product, providing due care is taken.

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AEL8 Series nomenclature

Product Name	A	= Actuator		A
	E	= Electric		E
	L	= Linear		L
	8	= Model		8
Thrust (kN)	2	= 2.0 kN (450 lbf)		2
	3	= 4.5 kN (1000 lbf)		
	4	= 6.0 kN (1500 lbf)		
	5	= 8.0 kN (1800 lbf)		
	6	= 12.0 kN (2700 lbf)		
	7	= 15.0 kN (3300 lbf)		
Stroke (mm)	2	= 60 mm (2 $\frac{3}{8}$ ")		2
	3	= 80 mm (3")		
Speed @ 30%	2	= Medium 0.8-1.9 mm/s (0.03-0.07 in/s)		2
	3	= High 2.0+ mm/s (0.08 in/s)		
Supply Voltage	1	= 90....264 Vac wide range input		3
	3	= 24 Vac/24 Vdc		
Control signal	P	= Modulating (0)4-20 mA / 0(2)-10 V Positioner		P
Failure Mode	X	= None		S
	S	= Super-Capacitor Non-retrofit option		
Options	X	= None		X
	O	= I/O Module		
	E	= EasiHeat M12		

Ordering example

A	E	L	8	2	2	2	3	P	S	X
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Selection example

Control Valve	DN20 KE43 HTSUSS
Kvs	6.3
Connection	PN40
Operating ΔP	30 bar
Electrical Supply	24 Vdc
Control Input Signal	4-20 mA
Position Feedback	4-20 mA
End-position Feedback	VFC

Information source		
Minimum Thrust required	2 kN	Differential Pressure Tables (Class IV) Metal Seated (T & S)
Maximum ΔP	64.6 bar g	
Mounting Flange	EL5970	AEL8 Valve Adapter and Mounting Flange Selection - Spira-trol™ K & L
Stem Adapter	AEL8XM8	
Positioner	Integral	AEL8 Technical Specification
Position Feedback	Positioner function	AEL8 Technical Specification
End-position Feedback	I/O module	AEL8 Assessories (Positioner)