

INTELLIGENT LINEAR ELECTRIC ACTUATORS ELS (2,3 kN to 25 kN)



DESCRIPTION

The ADCATrol ELS series intelligent linear electric actuators are designed for operation of control valves in modulating and on/off services in process engineering and industrial applications. The actuator is equipped as standard with positioner and active feedback function, automatic commissioning as well as comprehensive diagnostic functions.

The ELS is optionally available with super capacitors for fail-safe operation, returning to its respective fail-safe position in case of power failure/interruption.

MAIN FEATURES

Modular retrofittable design.

Automatic commissioning with the press of one button.

115 V AC, 230 V AC 50/60 Hz and 24 V AC/DC supply voltages.

Manual operation with handwheel.

IP 65 protection (IP 67 on request).

Mounting to valves made via yoke or mounting flange DIN 3358, enabling easy connection to all types of valves. Standard version is suitable for ADCATrol valves.

Sturdy metal main frame for mainboard and accessories.

Mechanical stroke indication via anti-rotation bar.

Friction clutch for easy and tool-free adaptation to the valve stroke.

Universally usable actuators due to control via 3-point-step controllers and analog input signals (0(2) to 10 V, 0(4) to 20 mA).

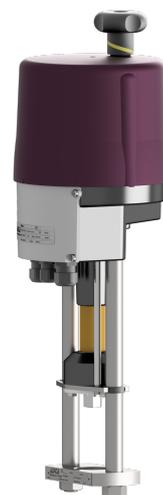
OPTIONS AND

- ACCESSORIES:**
- Additional limit switches.
 - Electric fail-safe with super capacitors.
 - Local control to enable manual operation through the use of buttons and on site diagnosis without needing a PC.
 - Profibus DP and Modbus RTU communication.
 - Heating resistor.
 - IP 67 metal cover.
 - Silicone free version.

USE: Actuation of ADCATrol control valves, or others on request.

AVAILABLE

MODELS: ELS20, ELS20.1, ELS45, ELS45.1, ELS80, ELS100, ELS100.1, ELS140, ELS200 and ELS250.



TECHNICAL DATA

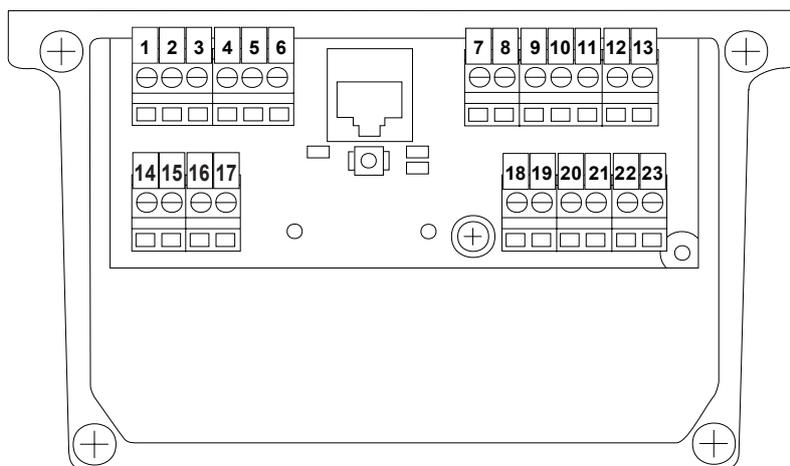
| MODEL | ELS20 | ELS20.1 | ELS45 | ELS45.1 | ELS80 |
|----------------------------------|--|-------------|------------------|-------------|-----------------------------|
| Maximum thrust a) | 2,3 kN | | 4,5 kN | | 8 kN |
| Operating speed b) | 0,45 to 0,9 mm/s | 1 to 2 mm/s | 0,45 to 0,9 mm/s | 2 to 4 mm/s | 0,3 to 0,7 mm/s |
| Power consumption – 230 V c) | 13 W | 38 W | 19 W | 57 W | 38 W |
| Rated current – 230 V | 0,07 A | 0,22 A | 0,11 A | 0,33 A | 0,22 A |
| Maximum current – 230 V | 0,1 A | 0,29 A | 0,14 A | 0,43 A | 0,29 A |
| Maximum stroke | 50 mm | | | | 50 mm (65 mm on request) |
| Supply voltages | 115 V AC / 230 V AC / 360 to 575 V AC 3~ / 24 V AC/DC | | | | |
| Supply frequency | 50 Hz / 60 Hz / continuous | | | | |
| Type of duty acc. to IEC 60034-1 | S2 30 min, S4 50% ED @ 25 °C | | | | |
| Cable entry | 2 x M20 x 1,5 and 1 x M16 x 1,5 | | | | |
| Electrical connection | Terminal configuration according to the electric connection wiring diagram inside the actuator cover | | | | |
| Internal fault monitoring | Torque, position set value, active position value, position, power supply, temperature of electronic board, etc. | | | | |
| Diagnostics function | Stores cumulated operation data (motor and total running time, number of motor starts) and data sets of current values (set value, feedback value, torque, temperature and error messages) | | | | |
| Analog position input | Selectable between 0(4) to 20 mA and 0(2) to 10 V; Adjustable split-range operation | | | | |
| Positioner function | Dead-band ajustable between 0.5 - 5% of set value range | | | | |
| Break away torque | Adjustable up to 150 % torque for up to 2,5 seconds to break away a valve in the end positions | | | | |
| Automatic commissioning | Recognition of the end position(s) and autoscaling of set value and feedback according to the valve stroke | | | | |
| Mounting position | As desired, except downward position | | | | |
| Ambient temperature | - 20 °C to 60 °C | | | | |
| Over-voltage category | II | | | | |
| Position indicator | By anti-rotation bar | | | | |
| Manual adjustment | Handwheel | | | | |
| Type of protection | IP 65 (IP 67 on request) | | | | |

| MODEL | ELS100 | ELS100.1 | ELS140 | ELS200 | ELS250 |
|----------------------------------|--|------------------|------------------|-----------------|--------|
| Maximum thrust a) | 10 kN | | 14 kN | 20 kN | 25 kN |
| Operating speed b) | 0,2 to 0,35 mm/s | 0,85 to 1,7 mm/s | 0,65 to 1,3 mm/s | 0,2 to 0,4 mm/s | |
| Power consumption – 230 V c) | 32 W | 78 W | 88 W | 81 W | 88 W |
| Rated current – 230 V | 0,18 A | 0,42 A | 0,48 A | 0,44 A | 0,48 A |
| Maximum current – 230 V | 0,24 A | 0,55 A | 0,62 A | 0,57 A | 0,62 A |
| Maximum stroke | 50 mm (65 mm on request) | | 65 mm | 95 mm | |
| Supply voltages | 115 V AC / 230 V AC / 360 to 575 V AC 3~ / 24 V AC/DC | | | | |
| Supply frequency | 50 Hz / 60 Hz / continuous | | | | |
| Type of duty acc. to IEC 60034-1 | S2 30 min, S4 50% ED @ 25 °C | | | | |
| Cable entry | 2 x M20 x 1,5 and 1 x M16 x 1,5 | | | 3 x M20 x 1,5 | |
| Electrical connection | Terminal configuration according to the electric connection wiring diagram inside the actuator cover | | | | |
| Internal fault monitoring | Torque, position set value, active position value, position, power supply, temperature of electronic board, etc. | | | | |
| Diagnostics function | Stores cumulated operation data (motor and total running time, number of motor starts) and data sets of current values (set value, feedback value, torque, temperature and error messages) | | | | |
| Analog position input | Selectable between 0(4) to 20 mA and 0(2) to 10 V; Adjustable split-range operation | | | | |
| Positioner function | Dead-band ajustable between 0.5 - 5% of set value range | | | | |
| Break away torque | Adjustable up to 150 % torque for up to 2,5 seconds to break away a valve in the end positions | | | | |
| Automatic commissioning | Recognition of the end position(s) and autoscaling of set value and feedback according to the valve stroke | | | | |
| Mounting position | As desired, except downward position | | | | |
| Ambient temperature | - 20 °C to 60 °C | | | | |
| Over-voltage category | II | | | | |
| Position indicator | By anti-rotation bar | | | | |
| Manual adjustment | Handwheel | | | | |
| Type of protection | IP 65 (IP 67 on request) | | | | |

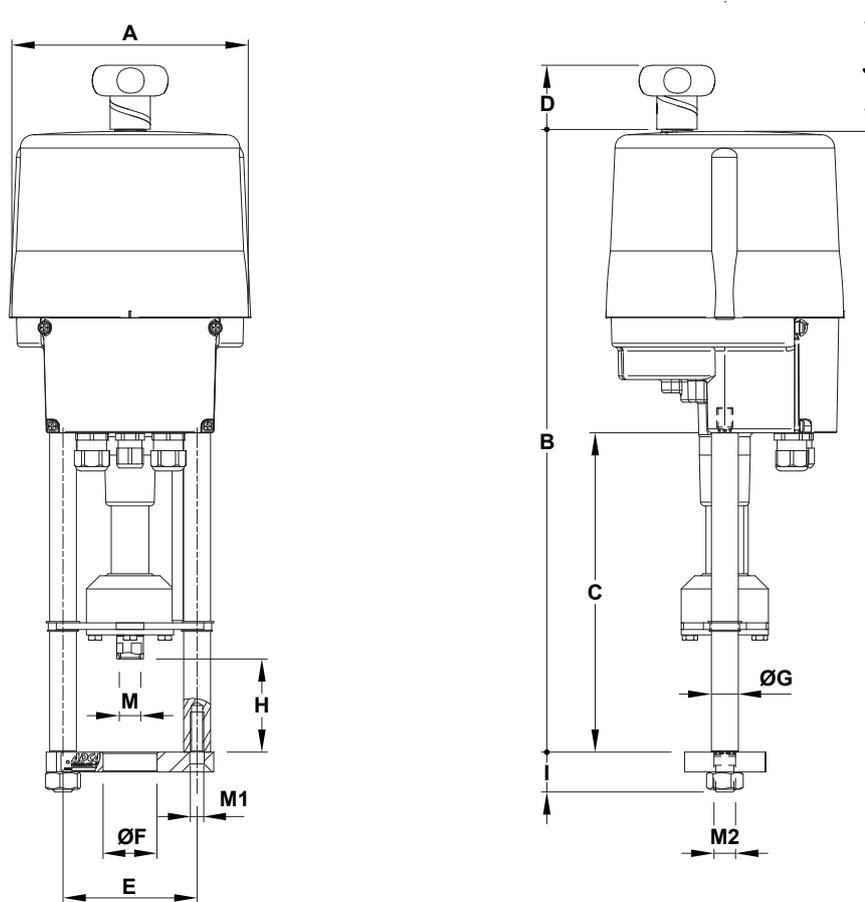
a) Permissible average modulating thrust over the entire travel is 50% of the maximum thrust. b) Adjustable speed. At 60 Hz, the operating speed and input power increase by 20%. c) At maximum thrust. Data may vary depending on accessories.

| OPTIONS AND ACCESSORIES | |
|-------------------------|---|
| DESIGNATION | DESCRIPTION |
| 2WE | Two additional limit switches for signaling end positions or intermediate positions, freely adjustable, with silver-plated contacts, 0,1 A to 10 A @ 230 V AC/DC |
| 2WE-G | Two additional limit switches for signaling end positions or intermediate positions, freely adjustable, with gold-plated contacts for low voltage, 0,1 mA to 100 mA @ 30V DC/AC |
| FSCP | Fail-safe function with emergency power supply via super capacitors. Fail-safe position can be freely defined. Remark: Not retrofittable. |
| LCS | Illuminated display which allows visualization of the actuator status, including a lockable selector to switch between modes: automatic, manual process (on/off) , stop and parameter menu. Control buttons for manual movement, menu operations, display of diagnostics and adjustment of parameters. Remark: Not retrofittable. |
| LCS-USB | USB data cable to enable the communication between the actuator and a PC via a communication software. |
| HR | Heating resistor. Supply voltage 12 to 36 V AC/DC or 110 to 250 V AC/DC. |
| BZS | High durability bronze spindle parts. Remark: Only for actuators with 2,3 to 4,5 kN. Already included for standard actuators in case of higher thrusts. Not retrofittable. |
| IP67 | Higher IP 67 enclosure protection with metal cover. |
| DTPB | Profibus DP communication interface. Including transmission of nominal and actual valve position (mm or %), report of monitoring and diagnostic data. Remark: Not retrofittable. |
| DTMB | Modbus RTU communication interface. Including transmission of nominal and actual valve position (mm or %), report of monitoring and diagnostic data. Remark: Not retrofittable. |

ELECTRICAL CONNECTIONS



| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | RJ45 |
|-----------------|---------------------------|-----|---------------|----------------|-----|---------------------------|--------------|----------------------|------------------|------------|-------------------|-------------------|-------------------------------|---------------|----------------|-----|-------------------------------|----|----|----|--------------------------|--------------------------|----------|
| +0(2) to 10 V | +0(4) to 20 mA | GND | +0(2) to 10 V | +0(4) to 20 mA | GND | 24 V DC | Maximum load | L/ + open | N/ - | L/ + close | L/ + (24 V AC/DC) | N/ - (24 V AC/DC) | 24 V DC / 100 mA | +0(2) to 10 V | +0(4) to 20 mA | GND | | | | | (see name plate) L/ + | (see name plate) N/ - | PC comm. |
| Set value input | Active position feed back | | | | | Monitor relay (volt-free) | | Binary input signals | Fail safe signal | | | Supply | Actual value (process sensor) | | | | Position switches (volt-free) | | | | Power supply | | |



| DIMENSIONS (mm) | | | | | | | | | | | | | | |
|-----------------|-----|-----------|-----------|----|-----------|--------------|----|----|----|-----|-----------------|-----|-----|--------------|
| MODEL | ØA | B | C | D | E | ØF | ØG | H | I | J | M * | M1 | M2 | WGT. ** (kg) |
| ELS20 / ELS45 | 180 | 453 / 480 | 175 / 202 | 50 | 100 | 40 | 20 | 70 | 30 | 100 | M10 / M12 | M12 | M16 | 4,5 |
| ELS80 / ELS100 | 180 | 490 / 520 | 210 / 240 | 50 | 100 | 40 / 45 / 65 | 20 | 70 | 30 | 100 | M10 / M12 / M16 | M12 | M16 | 7,2 |
| ELS140 | 180 | 563 / 583 | 250 / 270 | 52 | 100 / 132 | 45 / 65 | 20 | 70 | 30 | 120 | M10 / M12 / M16 | M12 | M16 | 8 |
| ELS200 / ELS250 | 250 | 720 | 450 | - | 155 | 45 / 65 / 80 | 32 | 78 | 45 | 230 | M16 / M27 | - | M20 | 23 |

* Depending on valve stem thread. Can be coarse or fine thread.

** Approximate weight without accessories and lower yoke flange.

Remark: Stem coupling, yoke dimensions, design and weight may vary depending on the ADCATrol control valve model. Consult the manufacturer.

| ORDERING CODES ELS | | | | | | | | | | | |
|--|-----|----|---|---|---|---|---|---|---|----|----|
| Group designation | ELS | 20 | 1 | X | X | 5 | X | X | X | A1 | |
| ELS series intelligent linear electric actuator | ELS | | | | | | | | | | |
| Actuator model | | | | | | | | | | | |
| ELS20 | | 20 | | | | | | | | | |
| See table below for other actuator model codes | | | | | | | | | | | |
| Supply voltage | | | | | | | | | | | |
| 230 V AC 50/60 Hz | | | 1 | | | | | | | | |
| 115 V AC 50/60 Hz | | | 2 | | | | | | | | |
| 360 to 575 V AC 3~ 50/60 Hz | | | 5 | | | | | | | | |
| 24 V AC/DC | | | 6 | | | | | | | | |
| Limit switches | | | | | | | | | | | |
| Without additional limit switches | | | | | X | | | | | | |
| Two additional limit switches 2WE | | | | | W | | | | | | |
| Two additional limit switches with gold-plated contacts 2WE-G | | | | | G | | | | | | |
| Fail-safe function | | | | | | | | | | | |
| Without emergency fail-safe function (fail in place) | | | | | | X | | | | | |
| FSCP emergency fail-safe function via super capacitors | | | | | | C | | | | | |
| Type of protection | | | | | | | | | | | |
| With standard IP 65 enclosure protection | | | | | | 5 | | | | | |
| Higher IP 67 enclosure protection with metal cover | | | | | | 7 | | | | | |
| Communication | | | | | | | | | | | |
| 0(4) to 20 mA, 0(2) to 10 V | | | | | | | X | | | | |
| DTMB Modbus RTU interface | | | | | | | M | | | | |
| DTPB Profibus DP interface | | | | | | | P | | | | |
| Display | | | | | | | | | | | |
| Without display | | | | | | | | X | | | |
| With LCS display | | | | | | | | | D | | |
| Other options | | | | | | | | | | | |
| Without other options | | | | | | | | | | X | |
| BZS bronze spindle parts (only for actuators with 1 to 4,5 kN) | | | | | | | | | | | Z |
| Yoke design and coupling | | | | | | | | | | | |
| ADCATrol V16/2, V25/2 and V303 series (1/2" to 2" – DN 15 to DN 50) | | | | | | | | | | | A1 |
| ADCAPure V926H, V926A (1/2" to 21/2") and V928 series (DN 15 to DN 50) | | | | | | | | | | | A3 |
| ADCATrol V16/2 series (21/2" to 4" – DN 65 to DN 100) | | | | | | | | | | | B1 |
| ADCATrol V25/2 and V303 series (21/2" to 4" – DN 65 to DN 100) | | | | | | | | | | | B2 |
| ADCAPure V926H (3" and 4") and V928 series (DN 65 to DN 100) | | | | | | | | | | | B3 |
| ADCATrol V25/2 series (5" to 6" – DN 125 to DN 150) | | | | | | | | | | | C2 |
| ADCATrol V25/2 series (8" – DN 200) | | | | | | | | | | | D2 |
| Other ADCATrol valves a) | | | | | | | | | | | XX |
| Special construction / Additional options | | | | | | | | | | | |
| A full description must to be provided and validated in case of a non-standard construction. | | | | | | | | | | | E |

a) Exact model and size must be specified – consult the manufacturer.

Remark: Options and accessories not mentioned in the ordering codes table must be requested separately, e.g.: ELS201XX5XXA1 fitted with HR heating resistor.

How to size: For selection of suitable actuator to use with ADCATrol control valves, consult IS PV15.10 – Maximum permissible pressure drops for ADCATrol control valves – or consult the manufacturer.

| ACTUATOR MODEL | | | | | | | | | | |
|----------------|-------|---------|-------|---------|-------|--------|----------|--------|--------|--------|
| MODEL | ELS20 | ELS20.1 | ELS45 | ELS45.1 | ELS80 | ELS100 | ELS100.1 | ELS140 | ELS200 | ELS250 |
| Code | 20 | 21 | 40 | 41 | 60 | 70 | 71 | 74 | 80 | 82 |