LINEAR ELECTRIC ACTUATORS
Type EL

EL12, EL20, EL45, EL80, EL120,EL250

DESCRIPTION

Electric linear actuators EL series for modulating and open-close duty of control and process technology to operate control valves.
The self-locking stem/stem nut is driven by an electric motor via a gearing. Load and limit switches define the stops for the end positions.

MAIN FEATURES

- Valve protection against excessive force due to load-dependent seating.
- Comfortable manual operation when disengaging the actuator motor.
- Mounting to valve made via yoke or mounting flange DIN 3358. The design enables easy connection to all types of valves. Standard version Is suitable for Adcatrol valves.
- Generating a defined closing force in the end position leads to constantly tight shut-off of the valve.
- A robust metal cover protects efficiently against external contamination and manipulation.
- The actuators are in enclosure protection IP 65 (EL12 IP43) and are designed for rugged industrial use.
- Stall proof synchronous motors (or brake motors for higher positioning forces) ensure highest positioning accuracy.
- Mechanical stroke indication via anti-rotation bar.
- Exact, backlash-free measurement of actual valve stroke by direct coupling to the valve stem.
- Universally usable actuators due to control via 3-point-step controllers, analogue input signals (0…10 V, 0 (4)…20 mA), or fieldbus systems.
- Easy supplement to actuator with optional devices due to modular design.
- Limit switches, easily adjustable, for stroke limitation (not necessary for Adcatrol valves) or as signal for intermediate positions.
- Integrated, adjustable stroke setting to nominal stroke over the complete stroke range (without exchanging pinions, …).

TECHNICAL DATA

Type	EL12	EL20	EL45	EL45.1	EL45.2
Positioning force kN	1,2	2,0	4,5		
Positioning speed [1] mm/min (mm/s)	8 (0,14)	15 (0,25)	17 (0,28)	25 (0,4)	50 (0,8)
Power consumption (230 V) A	4	6,6	28	28	32
Nominal current (230 V) A	0,017	0,029	0,135	0,135	0.160
Type of motor [3]	syn	syn	syn	syn	syn
Motor protection [4]	B	B	B	B	B
Max. stroke mm	35 mm	75 (standard 55mm)			
Supply voltages [2]	24 V / 115 V / 230 V / 400 V 50/60 Hz, 24 V DC				
Type of duty acc. to IEC 34-1	S1 – 100%		S4 – 30% c.d.f. 600 c/h		
Cable entry	3 x M16 x 1,5	2 x M16x1.5 and 1 dummy plug M16x1.5			
Electrical connection	Inside terminal board, terminal configuration according to electrical connection wiring diagram				
Switch off in end position	2 load-dependent switches, max. 250 V AC, rating for resistive load, max. 5 A, for inductive load, max. 3 A				
Mounting position	as desired, however downward position not possible				
Ambient temperature	–20 °C to +60 °C				
Lubricant for gearing	Klüber Mickrolube GL 261 grease				
Position indicator	by anti-rotation bar				
Manual adjustment	crank handle	by means of lateral hand wheel			
Enclosure protection acc. to EN 60529	IP 43	IP 65			
Trapezoidal thread	Tr 8 x 1,5	Tr 14 x 3			
Connection type	EN ISO 5210 F05 (also refer to options)				
Weight kg	2,1	8,0			

Type	EL80	EL80.1	EL80.2	EL120	EL120.1	EL120.2
Positioning force kN	8,0			12		
Positioning speed [1] mm/min (mm/s)	13,5 (0,2)	25 (0,4)	50 (0,8)	13,5 (0,2)	25 (0,4)	50 (0,8)
Power consumption (230 V) A	25	34	152	25	34	152
Nominal current (230 V) A	0,11	0,15	0,78	0.11	0.15	0.78
Type of motor [3]	syn	syn	asyn	syn	syn	asyn
Motor protection [4]	B	B	T	B	B	T
Max. stroke mm	80					
Supply voltages [2]	24 V / 115 V / 230 V / 400 V 50/60 Hz, 24 V DC					
Type of duty acc. to IEC 34-1	S4 – 30% c.d.f. 600 c/h					
Cable entry	2 x M16x1.5 and 1 dummy plug M16x1.5					
Electrical connection	Inside terminal board, terminal configuration according to electrical connection diagram					
Switch off in end position	2 load-dependent switches, max. 250 V AC, rating for resistive load, max. 5 A, for inductive load, max. 3 A					
Mounting position	as desired, however downward position not possible					
Ambient temperature	–20 °C to +60 °C					
Lubricant for gearing	Klüber Microlube GL 261 grease					
Position indicator	by anti-rotation bar					
Manual adjustment	by means of lateral hand wheel					
Enclosure protection according to EN 60529	IP 65					
Trapezoidal thread	Tr 20 x 4					
Connection type	DIN 3210 G0 (also refer to options)					
Weight kg	13,0					

Type	-	-	-	-	EL250.1	EL250.2
Positioning force kN	-			25		
Positioning speed [1] mm/min (mm/s)	-	-	-	-	25 (0,4)	50 (0,8)
Power consumption (230 V) A	-	-	-	-	157	218
Nominal current (230 V) A	-	-	-	-	0.73	1.0
Type of motor [3]	-	-	-	-	asyn	asyn
Motor protection [4]	-	-	-	-	T	T
Max. stroke mm	100					
Supply voltages [2]	115 V / 230 V 50/60 Hz, 24 V DC					
Type of duty acc. to IEC 34-1	S4 – 30% c.d.f. 600 c/h					
Cable entry	2 x M20x1.5 and 1 dummy plug M20x1.5					
Electrical connection	Inside terminal board, terminal configuration according to electrical connection diagram					
Switch off in end position	2 load-dependent switches, max. 250 V AC, rating for resistive load, max. 5 A, for inductive load, max. 3 A					
Mounting position	as desired, however downward position not possible					
Ambient temperature	–20 °C to +60 °C					
Lubricant for gearing	Klüber Microlube GL 261 grease					
Position indicator	by anti-rotation bar					
Manual adjustment	by means of lateral hand wheel					
60529	IP 65					
Trapezoidal thread	Tr 26 x 5					
Connection type	DIN 3210 G0 (also refer to options)					
Weight kg	19,0					

1) at 60 Hz, the positioning speeds and input power increase by 20%
2) other supply voltages on request

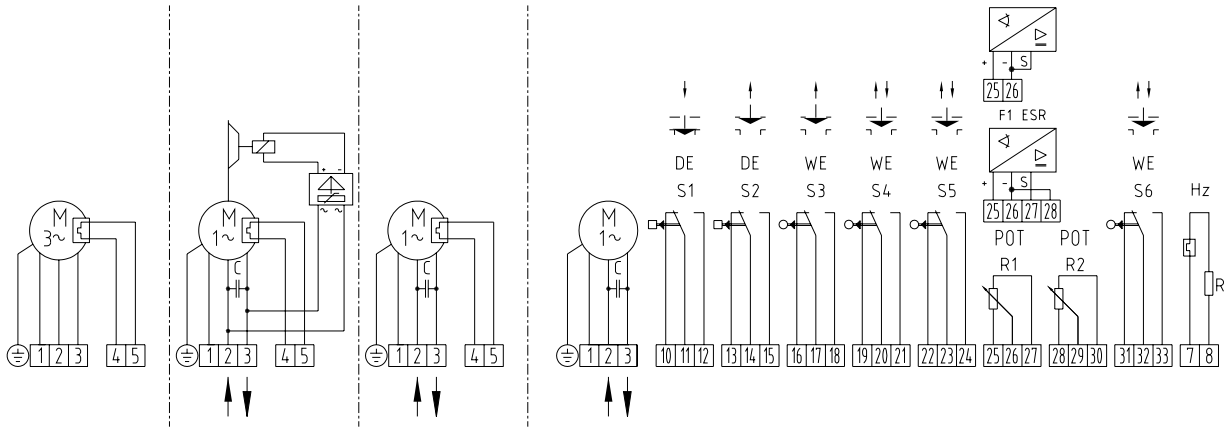
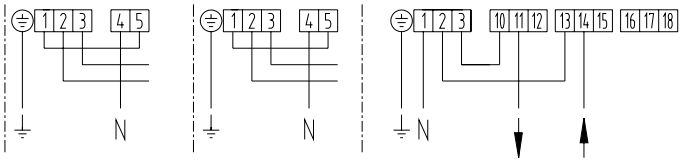
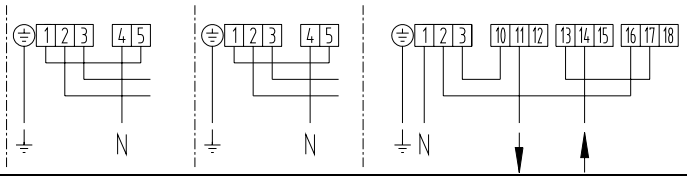
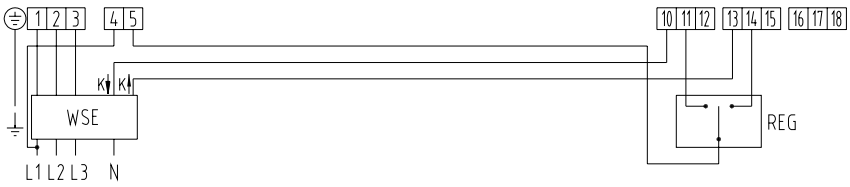
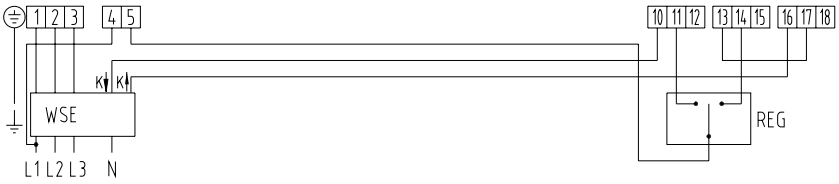
3) syn synchronous motor
asyn asynchronous motor
4) B stallproof motor
T thermoswitch for temperature monitoring

ACCESSORIES AND OPTIONS

Accessories for actuators		
	Yoke for adaptation to valves refer to dimension sheet.	STALA/ FLA
	Mounting flange with central attachment Mxx refer to dimension sheet (thrust rod must be secured against revolving).	ZFLA
	Compact plug 10/24 poles with additional housing at actuator Voltages ≤ 500 V.	KS
	Special finish coating for use in the tropics "tropics coating".	LA-TR
	Version with bellows at thrust rod (for EL20, EL45, EL80, EL120).	A-FAB

Options for actuators		
	Additional limit switches for signalling end positions or intermediate positions, freely adjustable, max. 250 V AC, rating for resistive load max. 5 A, for inductive load max. 3 A, max. 2 switches for EL20 and EL45, max. 4 switches for EL80 and EL120.	WE
	Additional limit switches for signalling end positions or intermediate positions, freely adjustable, with gold-plated contacts for low voltage, max. 30 V AC, rating for resistive load max. 0.1 A, max. 2 switches for EL20 and EL45, max. 4 switches for EL80 and EL120.	WE-G
	Potentiometer 100/130/200/500/1000/5000 Ohms or 10 kOhms Linearity error ≤ 0.5 %, max. 1.5 W, contact current 30 mA max. 2 pieces	POT
	Electronic position feedback 2-/3-/4-wire system Inductive travel measuring, output 0 (4)…20 mA Connection 24 V DC	ESR
	Positioning electronics for actuator control Input 0…10 V, 0 (4)…20 mA, output 0…10 V, 0 (4)…20 mA Supply voltage 24, 115, 230 V 50/60 Hz	PEL
	Heating resistor with thermoswitch against moisture with automatic temperature regulation, max. 15 Watts Supply voltage 24, 115, 230 V 50/60 Hz	HZ/WP

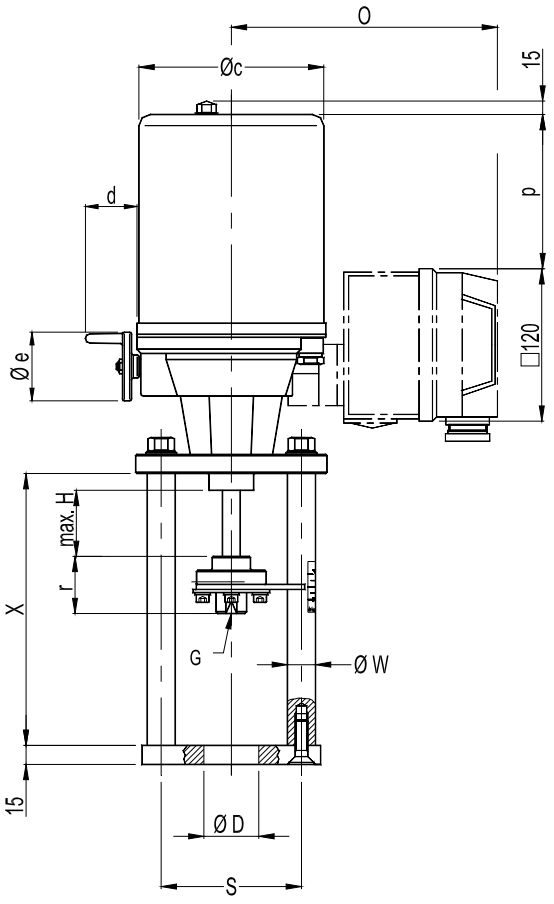
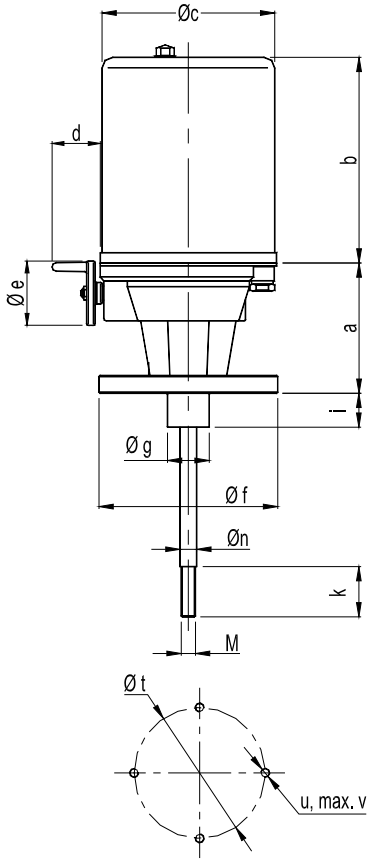
ELECTRICAL CONNECTION

3 ~ asynchronous motor with brake and thermoswitch	1 ~ asynchronous motor with brake and thermoswitch	Synchronous motor with thermoswitch	synchronous motor	Basic wiring diagram including options
				
				Switch off in end postion via two load-dependant switches to control e.g. three-way mixing valves.
				Switch off in end position via a load-dependent switch and a limit switch to control e.g. full-way valves without upper stop. Monitoring blocking in OPEN direction.
				Control of three-phase actuators with thermoswitch. Switch off in end position via two load-dependant switches to control e.g. three-way mixing valves. For motors without thermoswitch, the wiring to terminal 4 and 5 is not applicable.
				Control of three-phase actuators with thermoswitch. Switch off in end position via a load-dependent switch and a limit switch to control e.g. full-way valves without upper stop. Monitoring blocking in OPEN direction. For motors without thermoswitch, the wiring to terminal 4 and 5 is not applicable.

WE	Limit switch
HZ	Heater with thermoswitch
POT	Potentiometer
ESR	Electronic position feedback
PEL	Positioning electronics
WSE	External reversing contactor unit
REG	Process controller

DIMENSIONS

EL20 - EL45- EL80 – EL120

Mounting with yoke – for Adcatrol valves	Mounting according to EN ISO 5210 G0
	

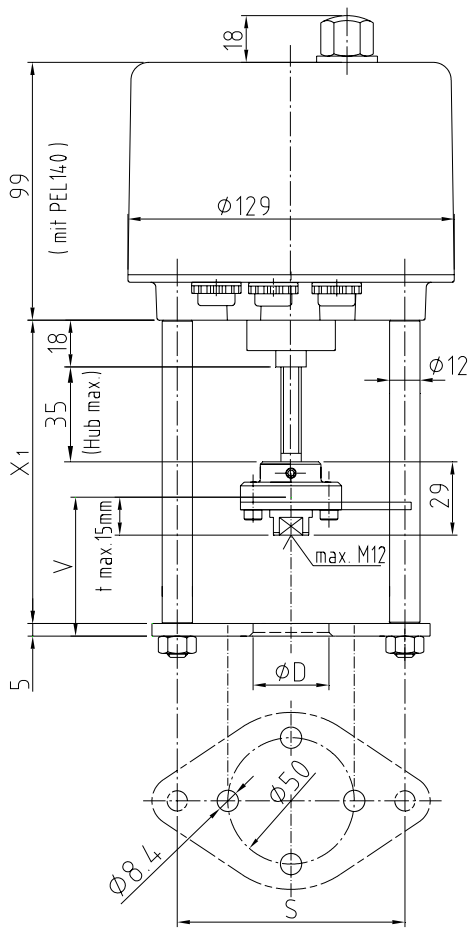
Type	EL20- EL45	EL80 - EL120	EL250
a	94.5	130	190
b	173	197	226
Ø c	145	188	216
d	42	69	70
Ø e	54	100	100
Ø f	74	130	130
Ø g	35 f8	60	60
i	3	26	3
k		16	22
n	14	20	26
Ø t	50	102	102
u	M6	M10	M10
v			
H	Stroke actuators (see technical data)		

Type	EL20 - EL45	EL80 - EL120	EL250
o	210	220	240
p	115	179	164
r	45	45	51
Ø w	22	22	22
M		M16x1,5	M20x1,5
max. G	M20	M20	M20
Ø D	Ø 40, Ø 45	Ø 40, Ø 45	Ø 45, 65
G	M10	M10	M16
S	110 (100)	110 (100)	125
X	190 - 228		235

DIMENSIONS

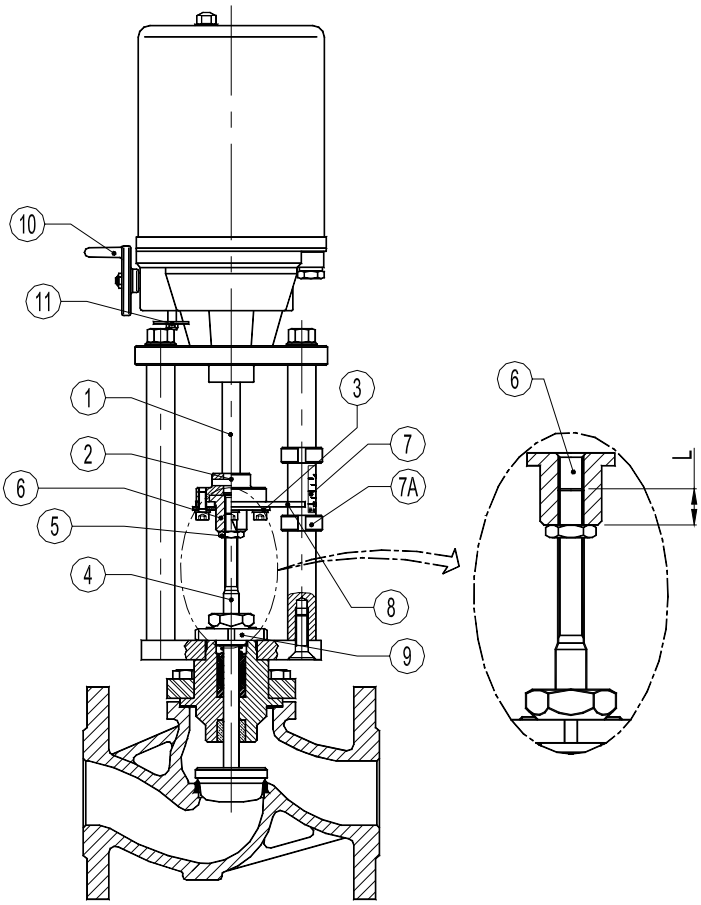
EL12

Mounting with yoke – for Adcatrol valves



Type	EL 12
Ø D	40
S	100
X1	160
X2	55

COMBINATION WITH A CONTROL VALVE (short instruction)



On delivery the driving rod (1) is driven out to the bottom end limit (anti-rotation flange at bottom mark).
Further procedure :
-Insert valve stem (4) into the valve all the way to limit stop
-Move the driving rod (1) up by rotating the hand wheel anti-clockwise by about 20 mm (see manual operation).
-Lift the actuator and yoke over the valve stem , place onto the top of the valve and secure using the mounting nut (9)
-Unscrew the locking plate (3) and the anti-rotation flange (8) in succession from the coupling flange (2) and allow to fall over the stem.
-Remove the threaded socket (6) from the coupling flange and screw it onto the stem according to dimension L from table 1.
-Drive out the rod by rotating the hand wheel clockwise until the threaded socket (6) stops in the coupling flange (2).
Screw the anti-rotation flange (8) and the locking plate (3) onto the coupling flange
-Tighten the stem with the nut (5) against the threaded socket.
- When mounting pay attention that the valve plug is not pressed onto the seat and is not turned.
For electrical connections please report to IMI EL20.00

MANUAL OPERATION

The manual adjustment must not be disengaged or engaged while the motors is running.
Execute the manual adjustment only with motor being at standstill , hereto:
-With the left hand press the disengaging rod (11) with plate in direction of the outgoing driving rod toward the bottom
-Simultaneously turn the handwheel (10) with the right hand until the coupling-in has sensible been executed
-To actuate the linear actuator now turn the handwheel, hold the disengaging rod with the plate in engaged position
Turning crank handle to the right (clockwise), the driving rod moves out of the actuator
Turning crank handle to the left (anti-clockwise), the driving rod moves into the actuator
(The linear actuator is automatically switched back to motoric operation, as soon as the disengaging rod will be released).

(L) Dimensions in mm												
Valve Type	DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200
EV16G	18	18	18	13	12	14	25	25	19	-	-	-
EV40S	18	18	18	13	12	14	25	25	19	-	-	-

Table1

Actuator selection for two way valves type EV16G, EV25G and EV40S

Actuator Type	Differential pressure (bar)											
	DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200
EL12	38	20	12	6,5	3,5	1,8	-	-	-	-	-	-
EL20	40	40	28	16	9,9	5,8	3	1,7	0,6	-	-	-
EL45	40	40	40	40	29,8	18,5	10,5	6,6	3,8	-	-	-
EL80	40	40	40	40	40	36,4	21	13,6	8,2	-	-	-
EL120	-	-	-	-	40	40	33,1	21,6	13,3	8,3	5,6	3
EL250	-	-	-	-	-	-	40	40	30,2	19,1	12,1	5,5

Remarks: V-rings stem packing.

Actuator selection for three way valves type EV253G and EV403S

Actuator Type	Differential pressure (bar)											
	DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200
EL12	25	22	13,2	7,1	3,8	1,9	-	-	-	-	-	-
EL20	25	25	25	17,3	10,8	6,6	3,4	2	1,1	-	-	-
EL45	-	-	-	25	25	19,8	11,6	7,3	3,8	2,4	1,5	-
EL80	-	-	-	-	25	25	23,1	14,8	8.9	5,5	3,6	-
EL120	-	-	-	-	25	25	25	23,1	14,5	9,1	6,1	-
EL250	-	-	-	-	-	-	-	-	-	-	-	-