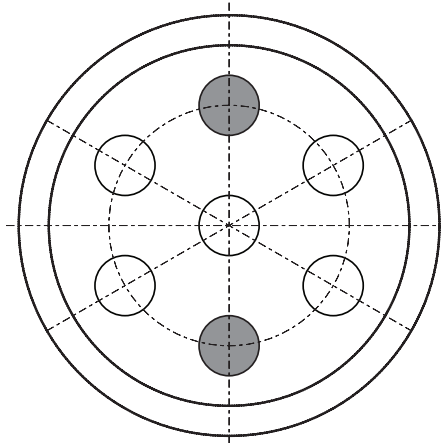


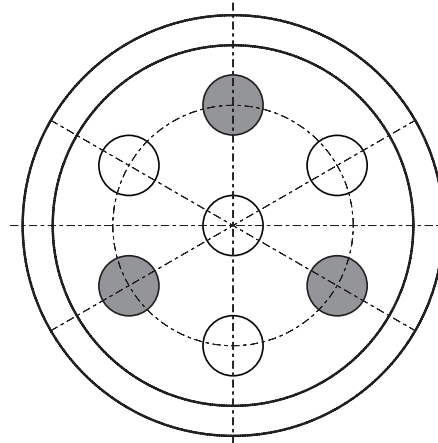
Data sheet

Sheet No.: A4.201 Rev.A
Date: November 2009

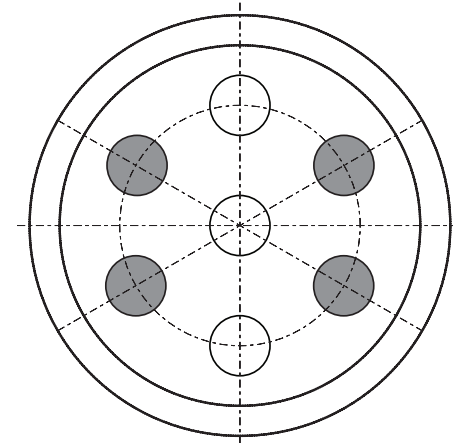
INSTALLATION OF SPRINGS OF P-SERIES ACTUATOR



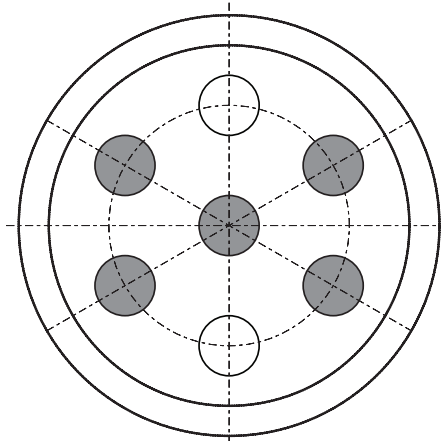
4 SPRINGS



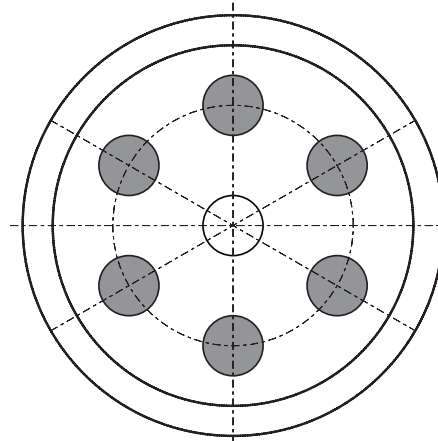
6 SPRINGS



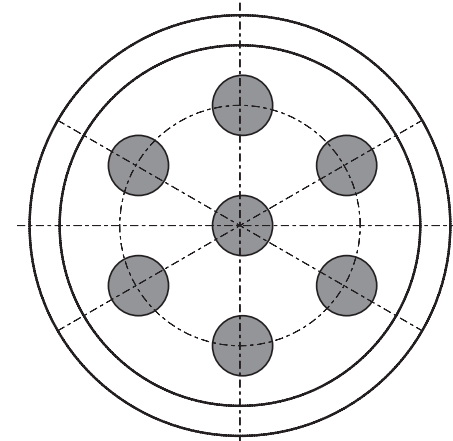
8 SPRINGS



10 SPRINGS



12 SPRINGS



14 SPRINGS



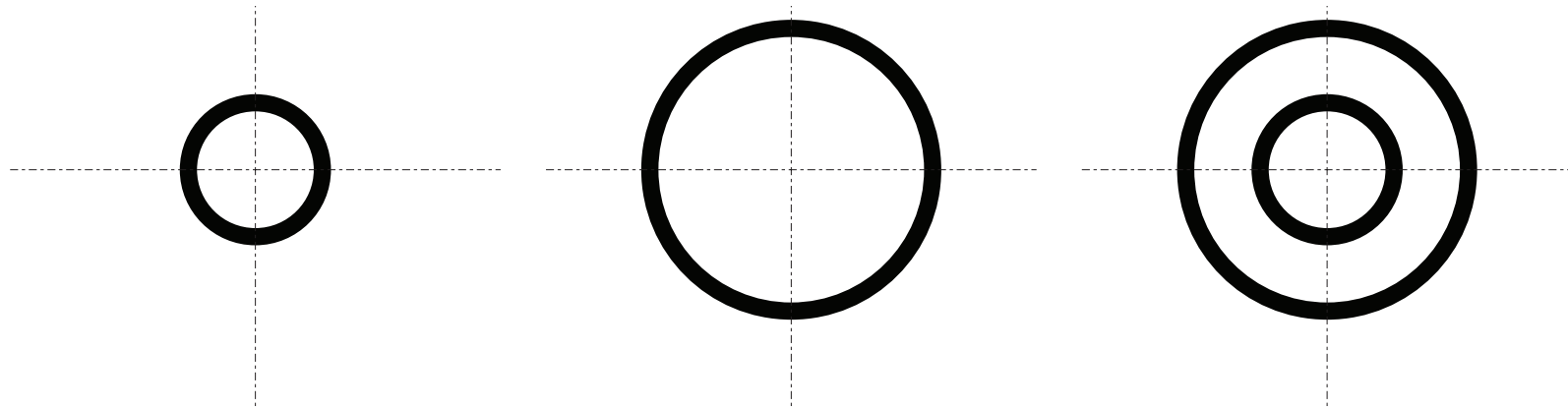
Data sheet

Sheet No.: A4.202 Rev.A

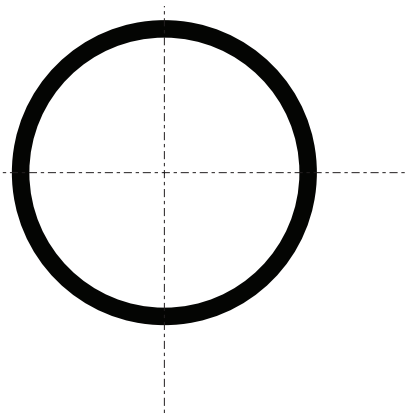
Date: November 2009

INSTALLATION OF SPRINGS OF E-SERIES ACTUATOR

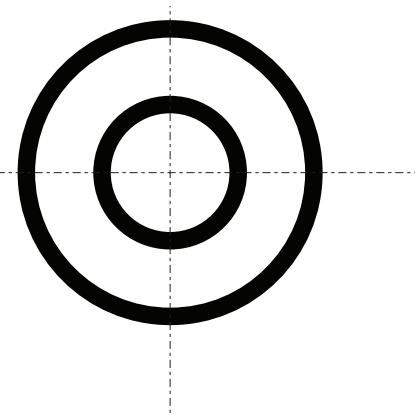
E



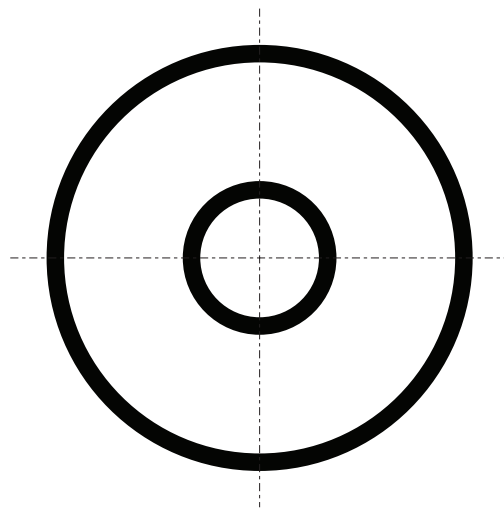
SPRING SET No. 1
inner spring



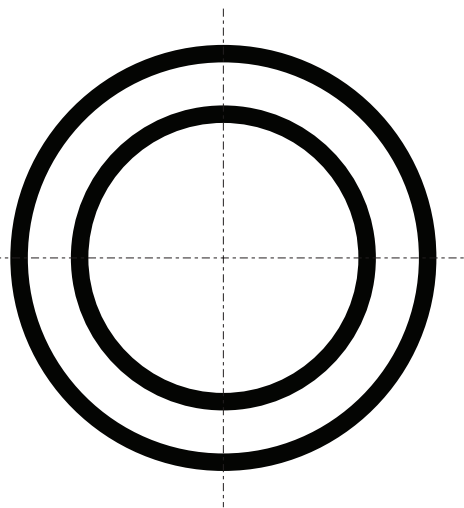
SPRING SET No. 2
mid spring



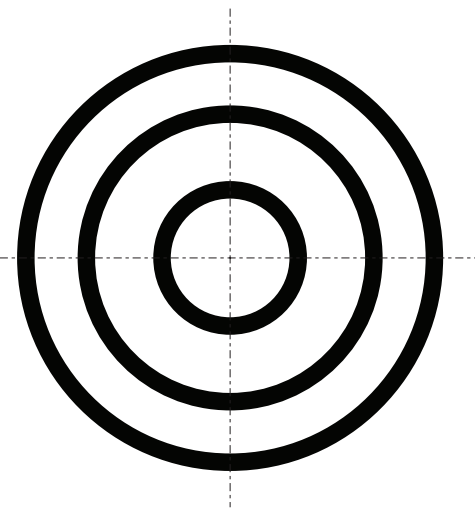
SPRING SET No. 3
inner spring
mid spring



SPRING SET No. 4
inner spring
outer spring



SPRING SET No. 5
mid spring
outer spring



SPRING SET No. 6
inner spring
mid spring
outer spring

Data sheet

Sheet No.: A4.204.01 Rev.B

Date: April 2011

EL-O-MATIC STANDARD CORROSION PROTECTION SYSTEM

Description

The corrosion protection system of standard EL-O-Matic E&P series pneumatic actuators consist of the following treatments or materials:

1 De-greasing

All aluminum parts are de-greased before the powder coating is applied by washing with an alkaline solution to assure the best bonding between the aluminum surface and the coating.

2 Powder coating

- Polyester non-TGIC based powder coating for exterior use.
- The powder coating is applied cold using automatic electrostatic spray equipment and is cured at minimum 190°C (374°F) offering excellent anti color fade and weather resistance.
- The powder coating thickness is 1.5 mm (37 microns) minimum, and 2 mm (50 microns) average.
- Good resistance against most chemical bases, acids, solvents, alkalis and oils at normal temperatures.
- Excellent exterior mechanical durability.
- The coating has passed a salt spray test according to ASTM B117 for 500 hours. The powder coating is virtually solvent free, and therefore environmentally friendly.

3 High grade & hard anodized aluminum pinion

Actuators with high grade & hard anodized aluminum pinions, passed a 500 hours salt spray test. Optional stainless steel pinions are available for a higher corrosion resistance.

4 Stainless steel or Deltatone® treated external steel parts

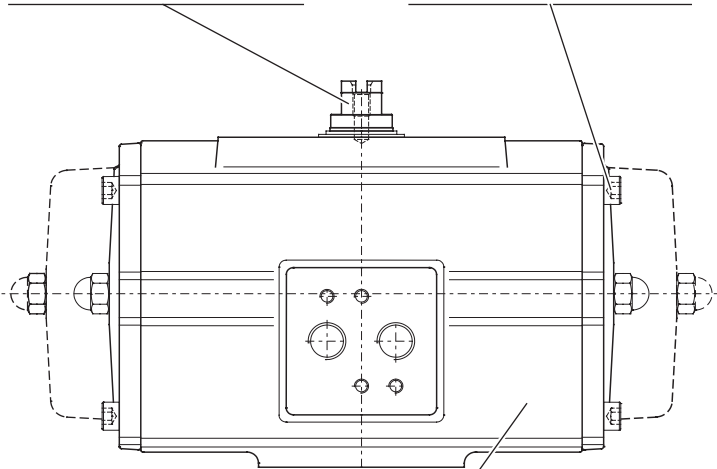
External parts are stainless steel or steel alloy with a Deltatone® treatment.

Technical data:

Coating	: Polyester non-TGIC based powder coating
Salt spray test	: DIN 50021 / ASTM B117: 500h
Color	: Yellow (RAL 1007)
Materials	: Housing : Aluminum alloy
	: Pinion : High grade aluminum alloy, hard anodized (Option : Stainless steel)
	: Fasteners : Stainless steel or alloy steel with Deltatone® treatment
	: Tagplate : Stainless steel
Application	: Standard EL-O-MATIC E & P series pneumatic actuators For Non-Standard actuators, see data sheet A4.204.05
Option	: CSR coating for excellent corrosion resistance See data sheet A4.204.02

**High grade aluminum alloy,
hard anodized**
(Option : Stainless steel)

Stainless steel fasteners



Powder coating:

Polyester non-TGIC based powder coating for exterior use.

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Data sheet

Sheet No.: A4.204.02 Rev.B

Date: June 2009

EL-O-MATIC ACTUATOR WITH CSR COATING

CSR

Description

EL-O-MATIC CSR-actuators have an excellent corrosion resistance in environments where the actuator is in contact with chemicals like caustic soda. The CSR coating itself is resistant to at least 1000 hours of salt spray test exposure. Together with the excellent mechanical properties, the CSR coating is "the" solution for very harsh environments.

CSR actuator housing and caps are completely coated (inside and out) with a ceramic filled fluoropolymer based epoxy resin, impregnated by a temperature of 240°C into the aluminum surface.

Approximately 40% of the coating is impregnated into the aluminum, 60% stays on the surface of the component as a seal.

Technical data

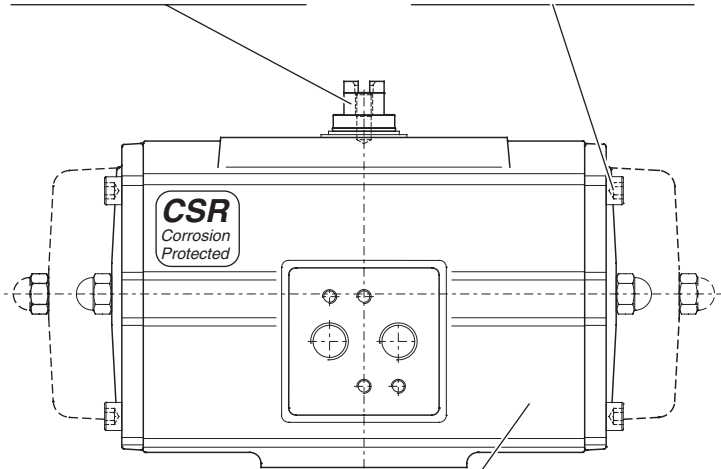
Coating	: Ceramic filled fluoropolymer based epoxy resin
Layer thickness	: 20 microns
Salt spray test	: DIN 50021 / ASTM B117: 1000 hours
Max. temperature	: -4° to 176°F (20° to + 80°C)
Materials	: Housing : Aluminum alloy
	: Shaft : Aluminum hard anodized
	: (Option : Stainless steel)
	: Fasteners : Stainless steel
	: Tagplate : Stainless steel
Application	: Optional on all EL-O-MATIC actuators

Chemical resistances

Resistance to various inorganic chemicals, organic chemicals, gasolines, oils, detergents, etc. is generally good to excellent, but also depends on temperature and/or concentration. More detailed information available at data sheet A4.204.021

Hard anodized aluminum
(Option : Stainless steel)

Stainless steel fasteners



Coating:
20 microns Ceramic filled epoxy resin

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Data sheet

Sheet No.: A4.204.021 Rev.A

Date: November 2009

CHEMICAL RESISTANCE LIST FOR CSR COATING

CSR

Inorganic chemicals

1	Ammonium hydroxide (10%)	2
1	Calcium chloride (~50%)	3
3	Chlorine	1
3	Chromic acid	1
3	Hydrofluoric acid (50%)	1
1	Caustic potash solution (10%)	3
1	Sodium hypochlorite (saturated)	2
1	Caustic soda solution (10%)	1
1	Caustic soda solution (saturated)	2
1	Phosphoric acid (10%)	1
1	Phosphoric acid (50%)	1

Organic chemicals

3	Acetone	1	Glycerine
3	Acetonitrile	1	Hexane
3	Aniline	1	Isooctane
2	Benzene	1	Isopropanol
1	n-Butanol	1	Methanol
3	Butyl acetate	3	Methylene chloride
3	Chlorobenzene	3	Methyl ethyl ketone
3	Chloroforme	3	N,N-Dimethylformamide
3	o-Chlorophenol	3	N-Methylpyrrolidon
1	Cyclohexane	1	Oxalic acid
3	Cyclohexanone	1	Perchloroethylene
3	1,2-Dichloroethane	1	Petroleum ether
2	Diethyl ether	3	Phenol
2	Dioxane	1	Carbon bisulphide
1	Glacial acetic acid	1	Turpentine
1	Ethanol	2	Tetrachloroethane
3	Ethyl acetate	2	1,1,1-Trichloroethane
1	Ethylene glycol	1	Tetrachloromethane
1	Formaldehyde	3	Trichloroethylene
2	Freon 11	2	Toluene
2	Freon 22	1	Xylene
1	Excellent		
2	Limited resistance; it is recommended to perform field tests under the specified conditions.		
3	Not recommended		

Fuels/lubricants

1	Two-star petrol (50°C)
1	Four-star petrol (50°C)
1	Fuel M 15 (50°C)
1	Diesel oil
1	Kerosene
1 to 2	Hypoid bevel gear oil Shell Spirax HD 90 (150°C)
1	Transmission oil Shell Spirax MA 80 (150°C)

Chemicals

1	Automatic transmission fluid Shell Dextra 11D 20-137 (150°C)
1	Engine oil, mineral, Mihag 1500-40 (150°C)
1	Engine oil, synthetic, Mobil SHC 10 W-40
3	Brake fluid Hydraulan DOT 4
1	Roller bearing grease DIN 51 825

Technical detergents

2	Genkeene
2	1,1,1- Trichloroethane
2	Triklone A
2	Perchloroethylene

Miscellaneous fluids

1	Glysantin (BASF)/water
1	Plasticizer DOP
1	Suds
1	Washing-up liquids
1	Household detergents
1	Linseed oil
1	Milk
1	Soapsuds
1	Silicone oils

Note: This list has been composed with great care. However, EL-O-MATIC cannot be held responsible, either for any errors in this list or for their consequences. Because of continued testing this list is subject to change without notice.



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Data sheet

Sheet No.: A4.204.05 Rev.A

Date: November 2009

CORROSION PROTECTION SYSTEM FOR NON-STANDARD EL-O-MATIC ACTUATORS

Description

The corrosion protection system of Non standard EL-O-Matic E&P series pneumatic actuators consist of the following treatments or materials:

1 De-greasing

All aluminum parts are de-greased before the powder coating is applied by washing with an alkaline solution to assure the best bonding between the aluminum surface and the coating.

2 Primer coat

One coat of Selemix 7-413 ; This is a two component chemical resistant epoxy primer coating, $\pm 40 \mu\text{m}$ thick.

3 Finish coat

One coat of PPG Industrial Line Direct; This is a two component polyurethane coating, $\pm 40 \mu\text{m}$ thick.

This coating system has been successfully tested to the salt spray test as described by ASTM B 117, duration 500 hours.

4 High grade & anodized aluminum pinion

Actuators with high grade & anodized aluminum pinions, passed a 500 hours salt spray test. Optional stainless steel pinions are available for a higher corrosion resistance.

5 Stainless steel or Deltatone® treated external steel parts

External parts are stainless steel or steel alloy with a Deltatone® treatment.

Technical data:

Coating : Two component polyurethane coating

Salt spray test : DIN 50021 / ASTM B117: 500 hours

Max. temperature : -20°C to $+80^{\circ}\text{C}$

Materials : Housing : Aluminum alloy

: Pinion : High grade aluminum alloy (Option : Stainless steel)

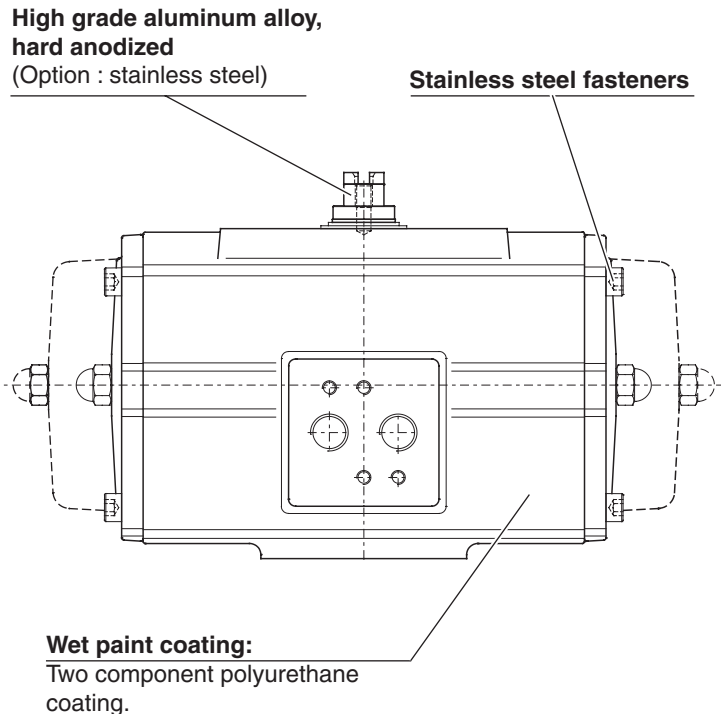
: Fasteners : Stainless steel or alloy steel with Deltatone® treatment

: Tagplate : Stainless steel

Application : Non-standard EL-O-MATIC E&P series pneumatic actuators

Option : CSR coating for excellent corrosion resistance (2000 hr saltspray test)

For info on CSR Coating see datasheet A4.204.02



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