

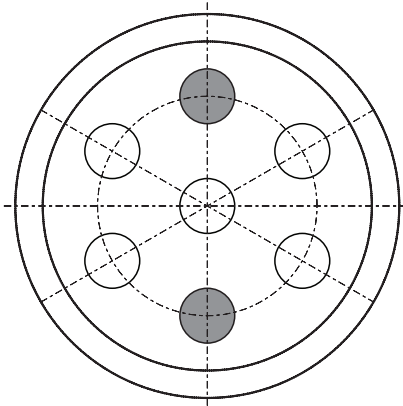
Data sheet

Sheet No.: 4.201 Rev. A

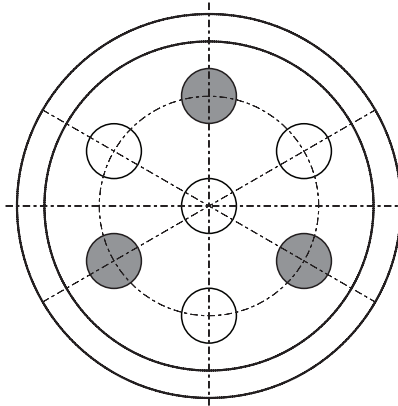
Date: November 2009

INSTALLATION OF SPRINGS OF P-SERIES ACTUATOR

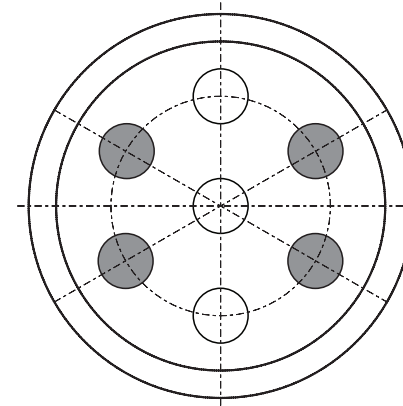
P



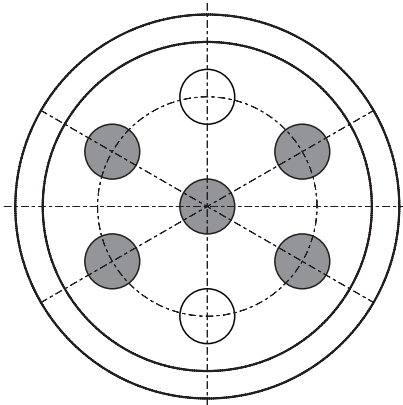
4 SPRINGS



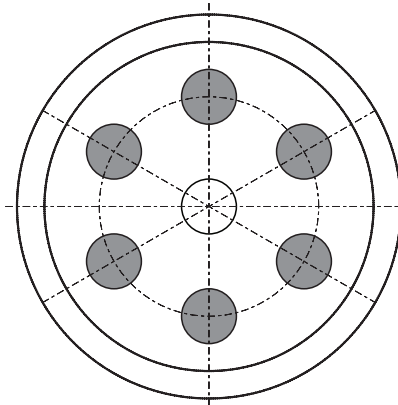
6 SPRINGS



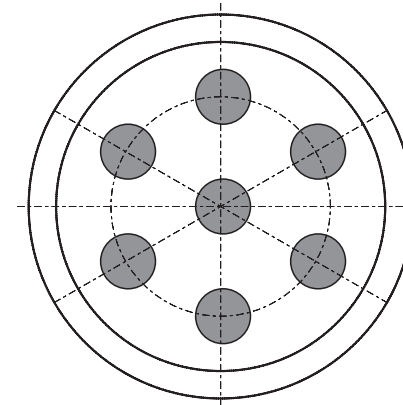
8 SPRINGS



10 SPRINGS



12 SPRINGS



14 SPRINGS



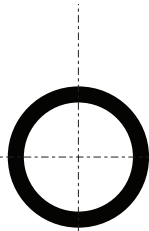
Data sheet

Sheet No.: 4.202 Rev. A

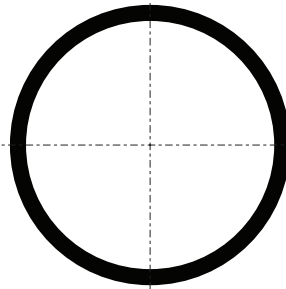
Date: November 2009

INSTALLATION OF SPRINGS OF E-SERIES ACTUATOR

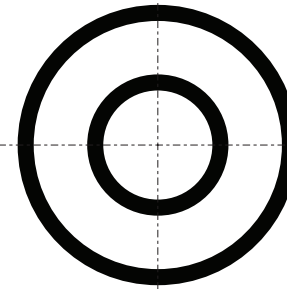
E



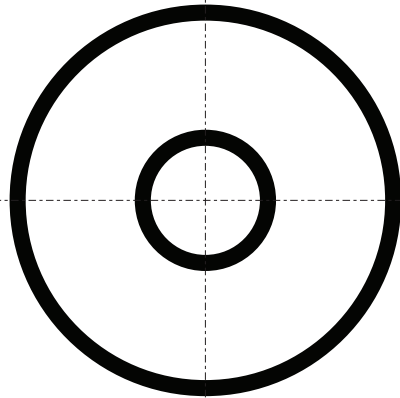
SPRING SET No. 1
inner spring



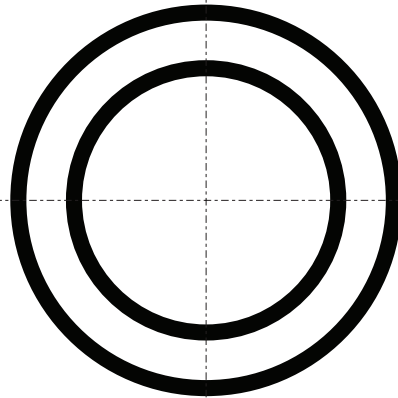
SPRING SET No. 2
mid spring



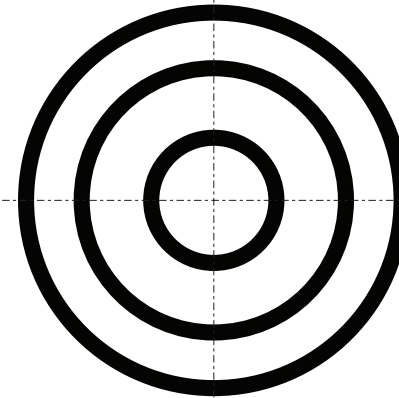
SPRING SET No. 3
inner spring
mid spring



SPRING SET No. 4
inner spring
outer spring



SPRING SET No. 5
mid spring
outer spring



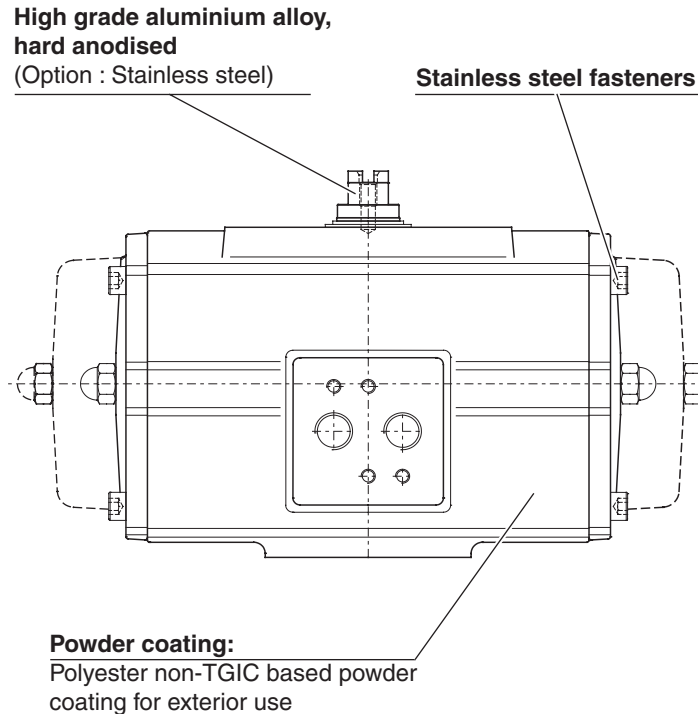
SPRING SET No. 6
inner spring
mid spring
outer spring

Data sheet

Sheet No.: 4.204.01 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 Pre-treatment

All aluminium parts get a chromate treatment prior to painting. This chromate pre-treatment takes care of a perfect bonding of the paint layer to the aluminium housing and gives additional corrosion protection to the bore of the housing.

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 80µm (3.15 mils) minimum, and 160µm (6.3 mils) maximum.
 - 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 anodised aluminium pinion

Actuators with high grade & hard anodised aluminium 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: 500 hours
Color	: Yellow (RAL 1007)
Materials	: Housing : Aluminium alloy
	: Pinion : High grade aluminium alloy, hard anodised (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 4.204.05
Option	: CSR coating for excellent corrosion resistance See data sheet 4.204.02

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Data sheet

Sheet No.: 4.204.02 Rev. A
Date: November 2009

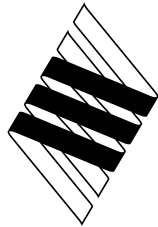
EL-O-MATIC ACTUATOR WITH CSR COATING

CSR

Hard anodised aluminium

(Option : Stainless steel)

Stainless steel fasteners



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Coating:

20 microns Ceramic filled epoxy resin

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 aluminium surface.

Approximately 40% of the coating is impregnated into the aluminium, 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	: -20° to + 80°C
Materials	: Housing : Aluminium alloy
	: Shaft : Aluminium hard anodised
	: (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 4.204.021

Note:

This product is only intended for use in large-scale fixed installations excluded from the scope of Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS 2).

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Data sheet

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Date: November 2009

CHEMICAL RESISTANCE LIST FOR CSR COATING

CSR

Inorganic chemicals

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

Organic chemicals

3	Acetone
3	Acetonitrile
3	Aniline
2	Benzene
1	n-Butanol
3	Butyl acetate
3	Chlorobenzene
3	Chloroforme
3	o-Chlorophenol
1	Cyclohexane
3	Cyclohexanone
3	1,2-Dichloroethane
2	Diethyl ether
2	Dioxane
1	Glacial acetic acid
1	Ethanol
3	Ethyl acetate
1	Ethylene glycol
1	Formaldehyde
2	Freon 11
2	Freon 22

- | | |
|---|--|
| 1 | Excellent |
| 2 | Limited resistance; it is recommended to perform field tests under the specified conditions. |
| 3 | Not recommended |

2	Nitric acid (10%)
3	Nitric acid (50%)
1	Hydrochloric acid (10%)
1	Hydrochloric acid (concentrated)
1	Sulphuric acid (50%)
3	Sulphuric acid (concentrated)
2	Sulphur dioxide
1	Sulphur hexafluoride
2	Nitric oxide
1	Hydrogen peroxide (100%)

1	Glycerine
1	Hexane
1	Isooctane
1	Isopropanol
1	Methanol
3	Methylene chloride
3	Methyl ethyl ketone
3	N.N-Dimethylformamide
3	N-Methylpyrrolidon
1	Oxalic acid
1	Perchloroethylene
1	Petroleum ether
3	Phenol
1	Carbon bisulphide
1	Turpentine
2	Tetrachloroethane
2	1,1,1-Trichloroethane
1	Tetrachloroethane
3	Trichloroethylene
2	Toluene
1	Xylene

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 Hydraulant 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

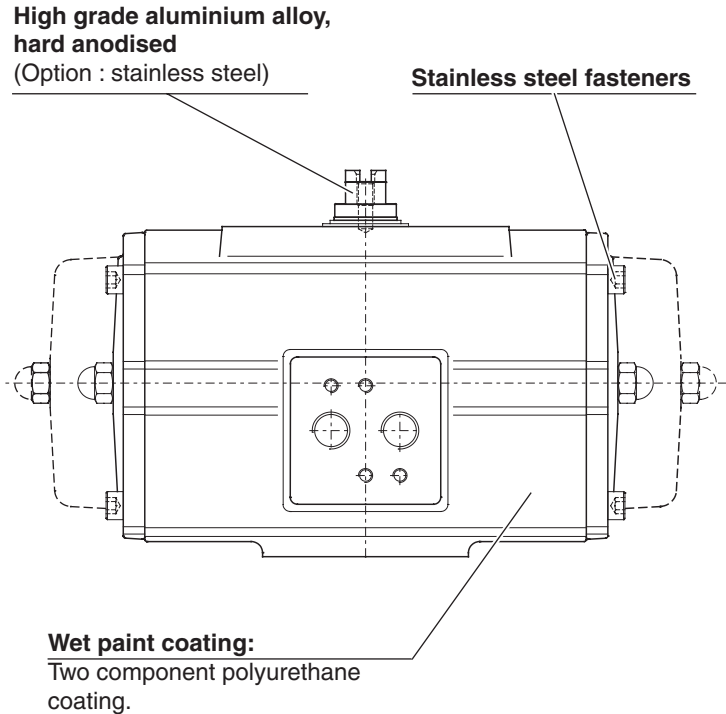
Note: This list has been composed with great care. However, EL-O-MATIC cannot be held responsible, either for any errors in this list or for their consequences. Because of continued testing this list is subject to change without notice.



Data sheet

Sheet No.: 4.204.05 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 aluminium parts are de-greased before the powder coating is applied by washing with an alkaline solution to assure the best bonding between the aluminium 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 & anodised aluminium pinion

Actuators with high grade & anodised aluminium 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° to $+80^{\circ}\text{C}$
Materials	: Housing : Aluminium alloy
	: Pinion : High grade aluminium 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 (1000 hr salt spray test) For info on CSR Coating see datasheet 4.204.02

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