

Certificate of Conformity No.: 28716269

Manufacturer: GT Attuatori S.r.l.
Viale Europa, 17
I-20090 Cusago (MI)

Specifications: IEC 61508-1÷7:2010

Product: Pneumatic rack & pinion spring return actuator

Type: Series GTX, GTK, GTW, RCR

RESULT:

As per the TÜV Rheinland Italia Report No. FS 28716269 Rev. 0, we declare that the product meets the below requirements:

IEC 61508: 2010, part 1 to 7

Functional Safety of electrical/electronic/programmable electronic safety related systems; Type A, Low Demand Mode, HFT=0

Safety Action	Actuator Class	λ_D [1/h]	$\lambda_{DD(PS)}$ [1/h]	Systematic Capability
Close / Open	A 15 Nm < Torque < 64 Nm	4,85E-09	4,41E-09	3
Close / Open	B 64 Nm < Torque < 344 Nm	4,94E-09	4,50E-09	3
Close / Open	C 344 Nm < Torque < 7860 Nm	5,14E-09	4,68E-09	3

The above values are compatible with SIL 3.

The requirements of minimum hardware fault tolerance (HFT) according to par. 11.4.3 of IEC 61511-1 have to be observed.

The product can be used up to SIL 2 without external diagnostics.

For further details, see what written in the Safety Manual.

Expiry date: 2019-09-30

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Location **Milan**
Date **2016-09-07**

Diego Sirtori
Business Stream Manager



Attachment 1 to
Certificate of Conformity No.: 28716269

Manufacturer: GT Attuatori S.r.l.
 Viale Europa, 17
 I-20090 Cusago (MI)

Specifications: IEC 61508-1÷7:2010

Product: Pneumatic rack & pinion spring return actuator

Type: Series GTX, GTK, GTW, RCR – Class A

		Test Interval Frequency (months)				
		6	12	24	36	48
Partial Stroke frequency (months)	1	2,77E-06	3,83E-06	5,95E-06	8,08E-06	1,02E-05
	2	4,36E-06	5,42E-06	7,55E-06	9,67E-06	1,18E-05
	3	5,95E-06	7,02E-06	9,14E-06	1,13E-05	1,34E-05
	6		1,18E-05	1,39E-05	1,60E-05	1,82E-05
	9				2,08E-05	
	12			2,35E-05	2,56E-05	2,77E-05

PFD_{AVG} values according to IEC 61508 for different values of TI and TI_{PS}

Test Interval Frequency (months)				
6	12	24	36	48
1,07E-05	2,13E-05	4,26E-05	6,38E-05	8,50E-05

PFD_{AVG} values according to IEC 61508 for different values of TI (no Partial Stroke Test)

NOTES:

- The above values of PFD_{AVG} are calculated for MRT=24 h and Proof Test Coverage=100%. For other values of MRT, TI, TI_{PS} and/or non-perfect Proof Test, the PFD_{AVG} values must be re-calculated.
- The PFD_{AVG} values including Partial Stroke Test are calculated considering the use of a commercial automatic Partial Stroking Test System: for further details, see the Safety Manual.

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Manufacturer: GT Attuatori S.r.l.
 Viale Europa, 17
 I-20090 Cusago (MI)

Specifications: IEC 61508-1÷7:2010

Product: Pneumatic rack & pinion spring return actuator

Type: Series GTX, GTK, GTW, RCR – Class B

		Test Interval Frequency (months)				
		6	12	24	36	48
Partial Stroke frequency (months)	1	2,83E-06	3,91E-06	6,07E-06	8,24E-06	1,04E-05
	2	4,45E-06	5,53E-06	7,70E-06	9,86E-06	1,20E-05
	3	6,07E-06	7,16E-06	9,32E-06	1,15E-05	1,37E-05
	6		1,20E-05	1,42E-05	1,64E-05	1,85E-05
	9				2,12E-05	
	12			2,39E-05	2,61E-05	2,83E-05

PFD_{AVG} values according to IEC 61508 for different values of TI and TI_{PS}

Test Interval Frequency (months)				
6	12	24	36	48
1,09E-05	2,18E-05	4,34E-05	6,51E-05	8,67E-05

PFD_{AVG} values according to IEC 61508 for different values of TI (no Partial Stroke Test)

NOTES:

- The above values of PFD_{AVG} are calculated for MRT=24 h and Proof Test Coverage=100%. For other values of MRT, TI, TI_{PS} and/or non-perfect Proof Test, the PFD_{AVG} values must be re-calculated.
- The PFD_{AVG} values including Partial Stroke Test are calculated considering the use of a commercial automatic Partial Stroking Test System: for further details, see the Safety Manual.

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Attachment 3 to

Certificate of Conformity No.: 28716269



Manufacturer: GT Attuatori S.r.l.
 Viale Europa, 17
 I-20090 Cusago (MI)

Specifications: IEC 61508-1÷7:2010

Product: Pneumatic rack & pinion spring return actuator

Type: Series GTX, GTK, GTW, RCR – Class C

		Test Interval Frequency (months)				
		6	12	24	36	48
Partial Stroke frequency (months)	1	2,94E-06	4,06E-06	6,31E-06	8,57E-06	1,08E-05
	2	4,63E-06	5,75E-06	8,00E-06	1,03E-05	1,25E-05
	3	6,31E-06	7,44E-06	9,69E-06	1,19E-05	1,42E-05
	6		1,25E-05	1,48E-05	1,70E-05	1,93E-05
	9				2,21E-05	
	12			2,49E-05	2,71E-05	2,94E-05

PFD_{AVG} values according to IEC 61508 for different values of TI and TI_{PS}

Test Interval Frequency (months)				
6	12	24	36	48
1,14E-05	2,26E-05	4,51E-05	6,77E-05	9,02E-05

PFD_{AVG} values according to IEC 61508 for different values of TI (no Partial Stroke Test)

NOTES:

- The above values of PFD_{AVG} are calculated for MRT=24 h and Proof Test Coverage=100%. For other values of MRT, TI, TI_{PS} and/or non-perfect Proof Test, the PFD_{AVG} values must be re-calculated.
- The PFD_{AVG} values including Partial Stroke Test are calculated considering the use of a commercial automatic Partial Stroking Test System: for further details, see the Safety Manual.

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