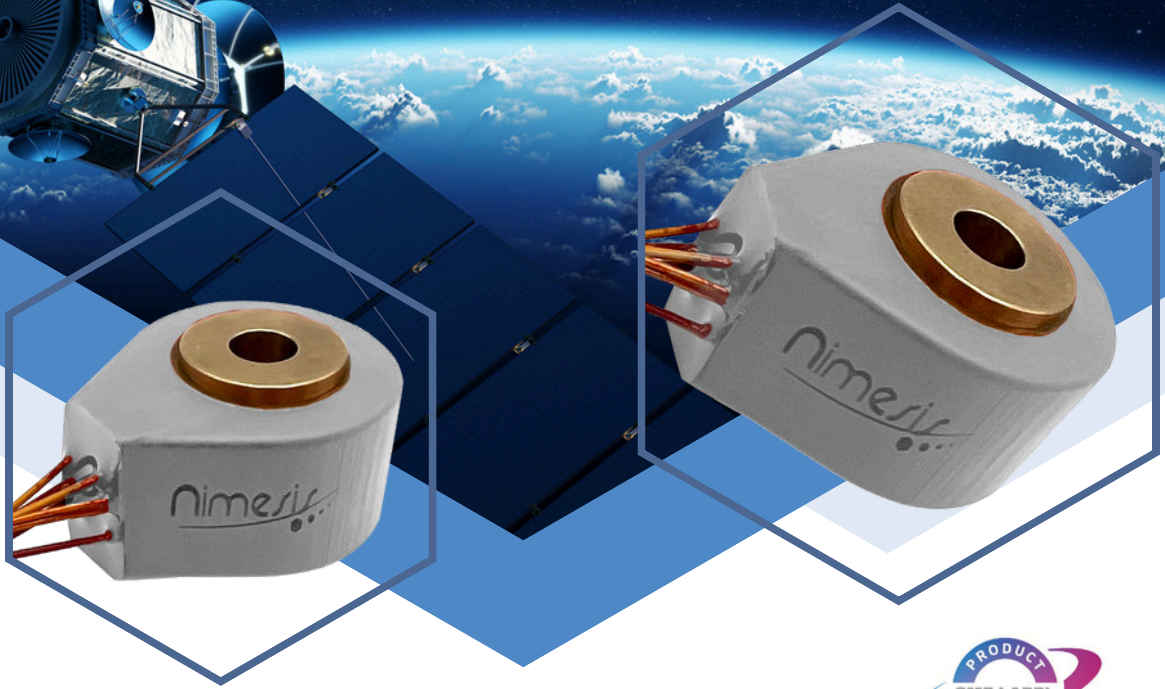




TRL9



... cnes ...

LAUNCH LOCK DEVICE

HIGH-PERFORMANCE SMART ACTUATOR
FOR SPACE APPLICATIONS

✓ High Temperature | ✓ Miniaturization | ✓ Lightweight

✓ Robust | ✓ Compact | ✓ ITAR Free | ✓ Reliable



info@nimesis.com

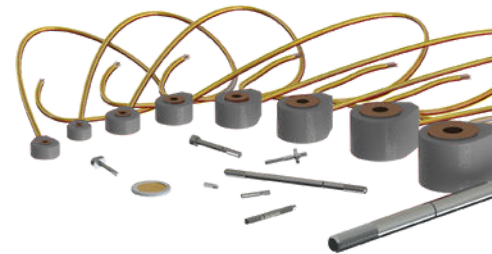


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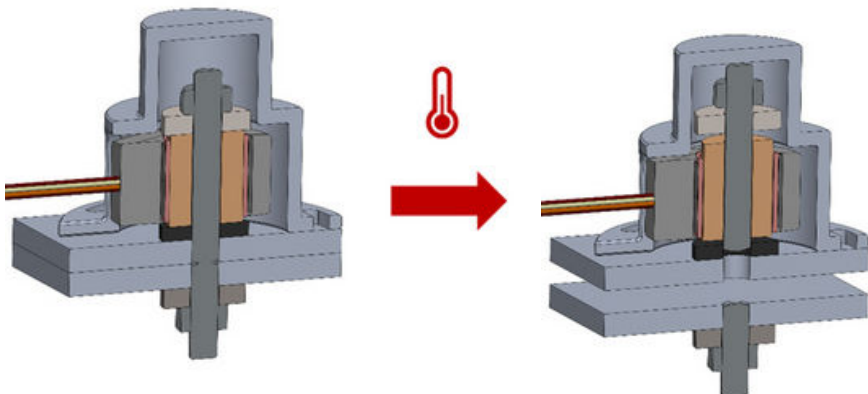


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MECHANICAL DATA



ACTUATION SCHEME



MECHANICAL

OVERVIEW

- Compatible with HDRM (Hold Down Release Mechanisms)
- Triggering time: 30 to 300 sec
- Triggering temperature: 150°C
- In Orbit operational temperature range: from -120°C to +120°C
- Preload up to 60 kN

FEATURES

- SMA component (Shape Memory Alloy)
- Redundant heater
- 2 temperature sensors Pt1000 (EM or QM)
- Customizable fastener

	qualified		qualified		assessed		assessed	
	TRHT02	TRHT03	TRHT04	TRHT05	TRHT06	TRHT08	TRHT10	TRHT12
TRL level	TRL 9	TRL 9	TRL 9	TRL 8	TRL 8	TRL 8	TRL 7	TRL 7
Material	CN-250X	CN-250X	CN-250X	CN-250X	CN-250X	CN-250X	CN-250X	CN-250X
Screw size	M2	M3	M4	M5	M6	M8	M10	M12
Max. axial preload (N)*	1265	3165	5482	8973	12659	23237	37002	53954
Fracture load (N)	1800	4600	8100	13200	18700	34400	54800	79900
Outer diameter (mm)	16,4	19,2	21,8	24,7	28,3	33,9	39,6	45,5
Elongation (mm)	0,82	0,90	1,13	1,39	1,71	2,20	2,74	3,33
Armed length (mm)	9,22	10,10	12,67	15,51	19,14	24,65	30,66	37,27
Fired length	10,04	11,00	13,80	16,90	20,85	26,85	33,40	40,60
Weight (g)**	4	8	14	22	37	80	164	271

* Obtaining maximum preload on Triggy :
 100% max preload: tensioner tool (PURE)
 75% of max. preload: tie-rod with hexagonal nozzle
 50% of max preload: torque tightening on nut

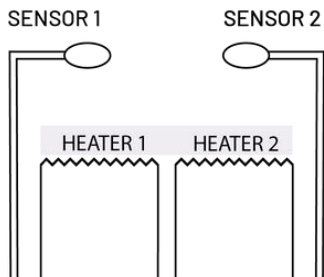
** Only the actuator, without cables

ELECTRICAL DATA

ELECTRICAL

	TRHT02 0004		TRHT02 0008		TRHT03 0008		TRHT03 0016		TRHT04 0008		TRHT04 0012		TRHT04 0016		TRHT04 0028	
Power range (W)	4,6 - 7,3		4,8 - 7,7		8,9 - 14,2		8,9 - 14,2		16,1 - 25,6		17,4 - 34,8		15,6 - 24,8		8,1 - 35,4	
Voltage range (V)	3,5 - 4,2		7 - 8,4		7 - 8,4		14 - 16,8		7 - 8,4		11 - 12,5		14 - 16,8		22 - 37	
Current range (A)	1,31 - 1,74		0,69 - 0,92		1,28 - 1,69		0,64 - 0,85		2,3 - 3,04		1,58 - 2,78		1,11 - 1,47		0,38 - 0,98	

	TRHT05 0016		TRHT05 0028		TRHT06 0028		TRHT06 0100		TRHT08 0028		TRHT08 0100		TRHT10 0028		TRHT10 0100		TRHT12 0028		TRHT12 0100	
(W)	27,1 - 43,2		13,6 - 42,5		20,7 - 64,7		53,4 - 72,1		39,2 - 122,6		78,2 - 105,5		62,4 - 195		132,2 - 178,5		92,2 - 288,2		198,3 - 267,7	
(V)	14 - 16,8		22 - 37		22 - 37		95 - 105		22 - 37		95 - 105		22 - 37		95 - 105		22 - 37		95-105	
(A)	1,94 - 2,57		0,62 - 1,15		0,94 - 1,75		0,56 - 0,69		1,78 - 3,31		0,82 - 1		2,84 - 5,27		1,39 - 1,7		4,19 - 7,79		2,09-2,55	



HEATER 1 & 2 : similar ;
SENSORS 1 & 2: similar

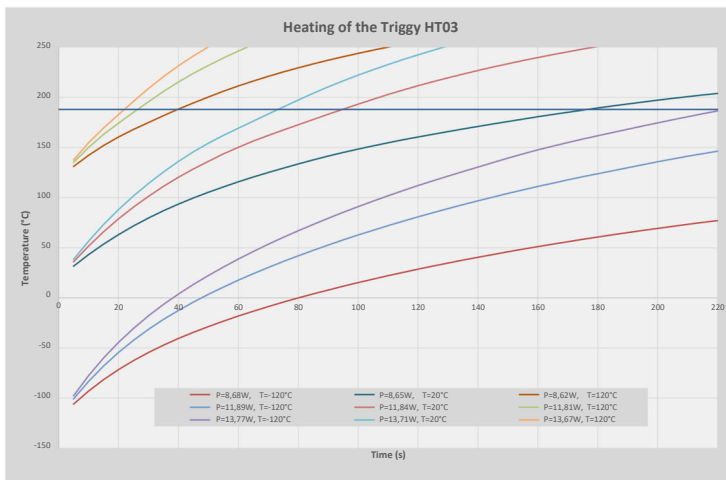


Option: Connector fitting

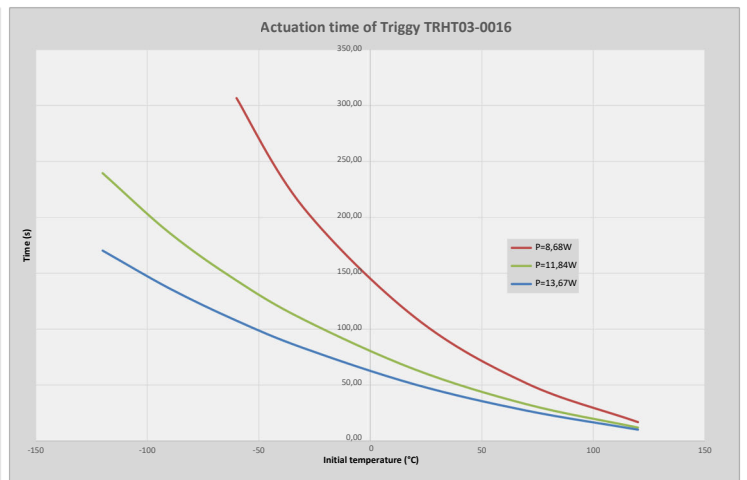
			TRHT12-0028	
			TRHT10-0028	
			TRHT08-0028	TRHT12-0100
	TRHT04-0008	TRHT05-0016	TRHT06-0028	TRHT10-0100
	TRHT03-0008	TRHT04-0016	TRHT05-0028	TRHT08-0100
TRHT02-0004	TRHT02-0008	TRHT03-0016	TRHT04-0028	TRHT06-0100
3,5 - 4,2V	7 - 8,4V	14 - 16,8V	22 - 37V	90 - 110V

TRIGGERING

Actuation time of Triggy HT03

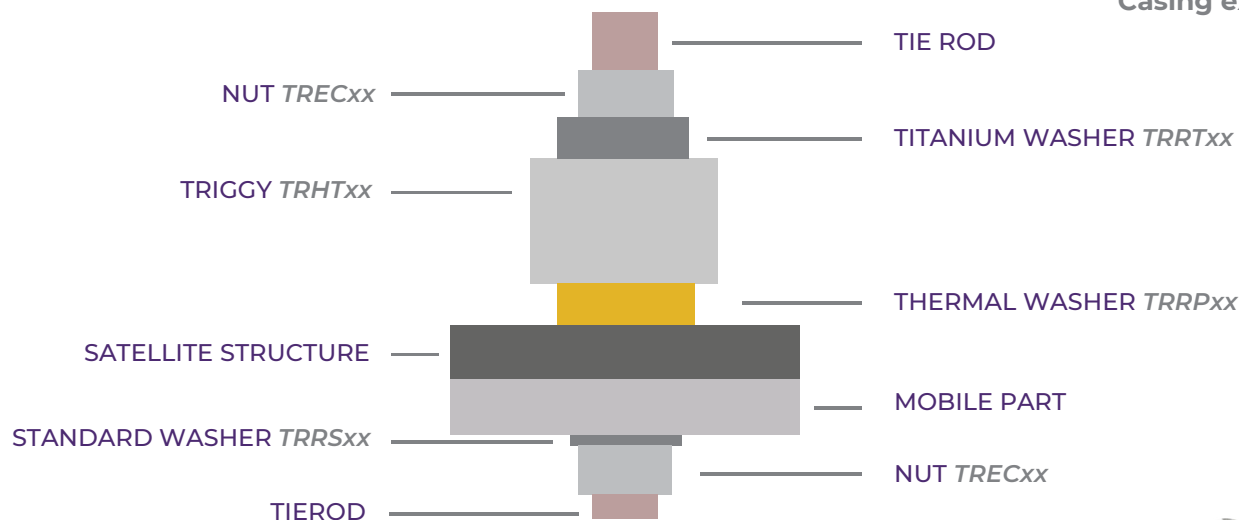


Heating of the Triggy HT03



TRIGGY ACCESSORIES

TYPICAL INTEGRATION



Casing example

FASTENER / TIE ROD

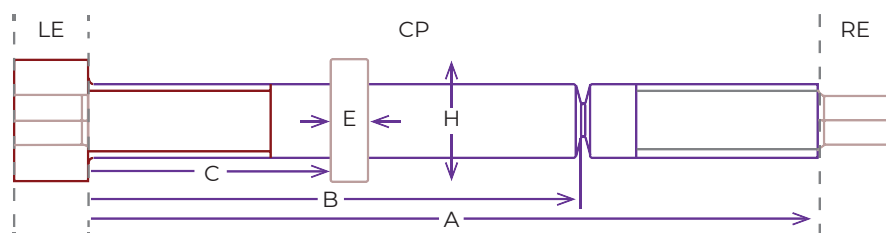
Configure your own fastener/tie rod
 Maximum length: 20 times the tie rod's diameter
 Ex: for a M2 fastener, max length is 40mm

Option: Tie rod instrumentation

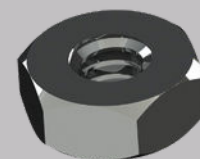


Stainless Steel 15-5 PH

- High preload
- E: 196 GPa
- Re: 1300 Mpa
- CTE: 11.10-6k-1



NUT



REF	MATERIAL	SIZE	THICKNESS (mm)	WIDTH (mm)	MASS (g)	COMPATIBLE WITH
TREC02	SS 15-5PH	M2	1,6	14	0,15	HT02
TREC03	SS 15-5PH	M3	2,4	5,5	0,40	HT03
TREC04	SS 15-5PH	M4	3,2	7	0,85	HT04
TREC05	SS 15-5PH	M5	4,7	8	1,39	HT05
TREC06	SS 15-5PH	M6	5,2	10	2,63	HT06
TREC08	SS 15-5PH	M8	6,8	13	5,80	HT08
TREC10	SS 15-5PH	M10	8,4	16	10,83	HT10
TREC12	SS 15-5PH	M12	10,8	18	15,82	HT12

according to ISO4032
 more references available on demand

THERMAL WASHER



REF	MATERIAL	THICKNESS (mm)	OD (mm)	ID (mm)	MASS (g)	COMPATIBLE WITH
TRRP02	PI TECASINT 4011	1	6,3	2,2	0,04	HT02
TRRP03	PI TECASINT 4011	1	9,6	3,2	0,08	HT03
TRRP04	PI TECASINT 4011	1	12,7	4,3	0,15	HT04
TRRP05	PI TECASINT 4011	1	16,3	5,3	0,24	HT05
TRRP06	PI TECASINT 4011	3	19	6,4	0,98	HT06
TRRP08	PI TECASINT 4011	3	25,4	8,4	1,76	HT08
TRRP10	PI TECASINT 4011	3	32,7	10,5	2,94	HT10
TRRP12	PI TECASINT 4011	3	39,7	13	4,31	HT12

more references available on demand

TITANIUM WASHER

REF	MATERIAL	THICKNESS (mm)	OD (mm)	ID (mm)	MASS (g)	COMPATIBLE WITH
TRRT02	Ta6V Grade 5	2	6,3	2,2	0,24	HT02
TRRT03	Ta6V Grade 5	2	9,6	3,2	0,57	HT03
TRRT04	Ta6V Grade 5	3	12,7	4,3	1,49	HT04
TRRT05	Ta6V Grade 5	4	16,3	5,3	3,30	HT05
TRRT06	Ta6V Grade 5	4	19,0	6,4	4,44	HT06
TRRT08	Ta6V Grade 5	4	22,0	8,4	5,74	HT08
TRRT10	Ta6V Grade 5	5	32,7	10,5	16,65	HT10
TRRT12	Ta6V Grade 5	5	39,7	13	24,42	HT12

more references available on demand

STANDARD WASHER

REF	MATERIAL	THICKNESS (mm)	OD (mm)	ID (mm)	MASS (g)	COMPATIBLE WITH
TRRS02	Stainless Steel 15-5PH	0,5	7	2,2	0,08	HT02
TRRS03	Stainless Steel 15-5PH	0,8	12	3,2	0,37	HT03
TRRS04	Stainless Steel 15-5PH	0,8	14	4,3	0,49	HT04
TRRS05	Stainless Steel 15-5PH	1	16	5,3	0,79	HT05
TRRS06	Stainless Steel 15-5PH	1,2	18	6,4	1,18	HT06
TRRS08	Stainless Steel 15-5PH	1,5	22	8,4	2,15	HT08
TRRS10	Stainless Steel 15-5PH	2	27	10,5	4,30	HT10
TRRS12	Stainless Steel 15-5PH	2,5	31,75	13	7,28	HT12

more references available on demand

TRIGGY TOOLS

RESET TOOL

- To load SMA and arm Triggy
- Transportable
- No electrical power
- 2 sizes for Triggy family



RTTR05 tool

REF	MAXIMUM LOAD (Kn)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	MASS (Kg)	COMPATIBLE WITH
RTTR05	45	0,55	0,35	0,25	10	HT02/HT03/HT04/HT05(HT06 on demand)
RTTR30	295	0,55	0,35	0,25	15	HT06/HT08/HT10/HT12

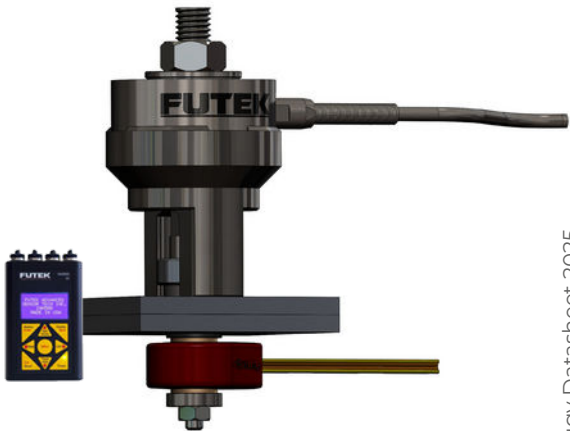
TENSIONER TOOL

- To preload fastener and Triggy
- Transportable
- 4 sizes for Triggy family
- Plug-in or battery powered version

REF	MAXIMUM LOAD (Kn)	DIAMETER (m)	HEIGHT (m)	COMPATIBLE WITH
PURE30	4,5	0,03	0,045	HT02/HT03
PURE35	22,6	0,04	0,07	HT04/HT05
PURE40	45,3	0,055	0,09	HT06/HT08
PURE50	90,7	0,08	0,13	HT10/HT12



PURE35



PURE35 with Triggy TRHT04

