

TRL 9

LAUNCH LOCK DEVICE

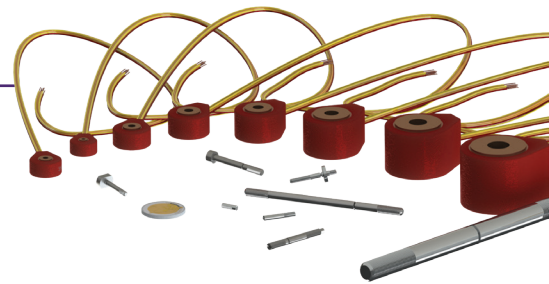
HIGH-PERFORMANCE SMART ACTUATOR
FOR SPACE APPLICATIONS

✓ High Temperature | ✓ Miniaturization | ✓ Lightweight

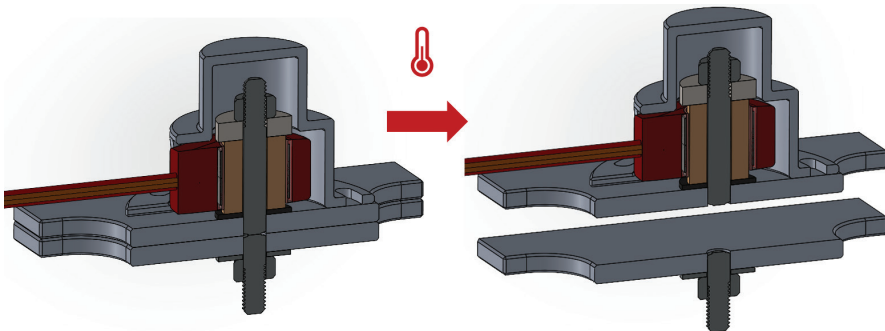
✓ Robust | ✓ Compact | ✓ Itar Free | ✓ Reliable



MECHANICAL DATA



ACTUATION SCHEME



* Maximum axial preload can only be obtained with tensioner tool

** Only the actuator, without wires

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 (COTS or ESCC)
- Customizable fastener

MECHANICAL

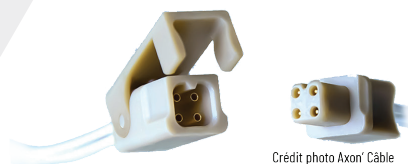
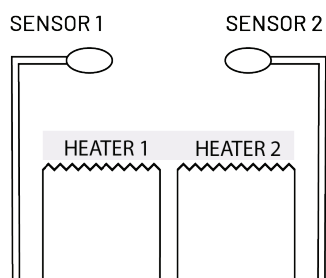
	TRHT02		TRHT03		qualified		TRHT04		TRHT05	TRHT06	TRHT08	assessed	TRHT10	TRHT12
TRL level					TRL 8/9								TRL 7	TRL 7
Material	CN-250X	CN-250X	CN-250X	CN-250X	CN-250X	CN-250X	CN-250X	CN-250X	CN-250X	CN-250X	CN-250X	CN-250X	CN-250X	CN-250X
Screw size	M2	M3	M4	M5	M6	M8	M10	M12						
Max. axial preload (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						

ELECTRICAL DATA

ELECTRICAL

	TRHT02 0004	TRHT02 0008	TRHT03 0008	TRHT03 0016	TRHT04 0008	TRHT04 0016	TRHT04 0028	TRHT05 0016	TRHT05 0028
Power range (W)	4,6 - 7,3	4,8 - 7,7	8,9 - 14,2 7	8,9 - 14,2 14	16,1 - 25,6	15,6 - 24,8	8,1 - 35,4	27,1 - 43,2	13,6 - 42,5
Voltage range (V)	3,5 - 4,2	7 - 8,4	- 8,4	- 16,8	7 - 8,4	14 - 16,8	22 - 37	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	1,11 - 1,47	0,38 - 0,98	1,94 - 2,57	0,62 - 1,15

	TRHT06 0028	TRHT06 0100	TRHT08 0028	TRHT08 0100	TRHT10 0028	TRHT10 0100	TRHT12 0028	TRHT12 0100
Power range (W)	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
Voltage range (V)	22 - 37	95 - 105	22 - 37	95 - 105	22 - 37	95 - 105	22 - 37	95-105
Current range (A)	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



Option: Connector fitting

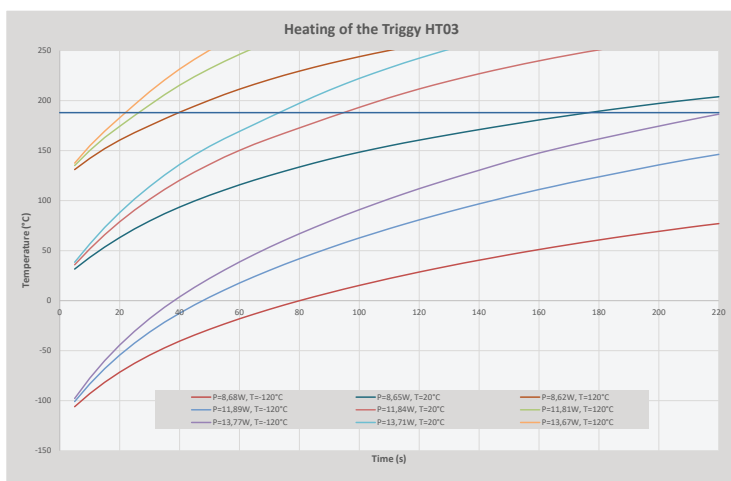
HEATER 1 & 2 : similar ;
SENSORS 1 & 2 : similar

Crédit photo Axon' Câble

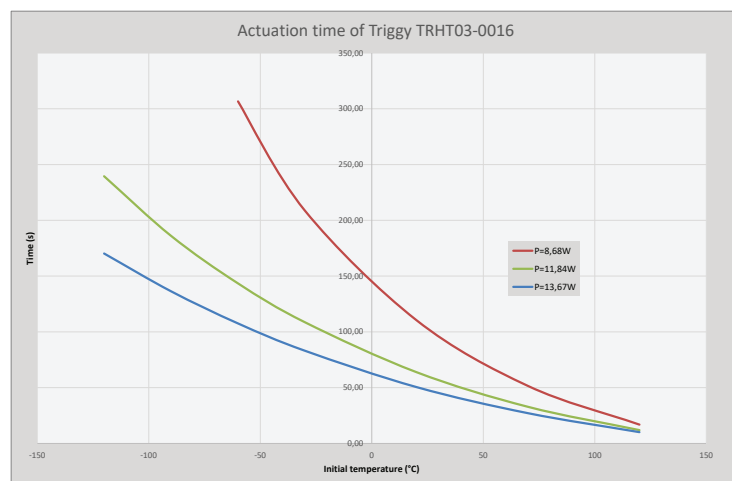
			TRHT12-0028	
			TRHT10-0028	
			TRHT08-0028	TRHT12-0100
	TRHT04-0008	TRHT05-0016	TRHT06-0028	TRHT10-0100
	TRHT03-0008	TRHT04-0016	TRHT05-0028	TRHT08-0100
TRHT02-0004	TRHT02-0008	TRHT03-0016	TRHT04-0028	TRHT06-0100
3,5 - 4,2V	7 - 8,4V	14 - 16,8V	22 - 37V	90 - 110V

TRIGGERING

Actuation time of Triggy HT03

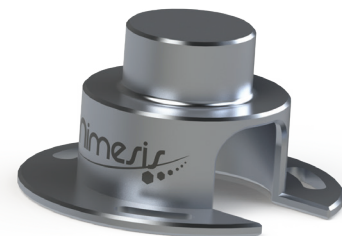
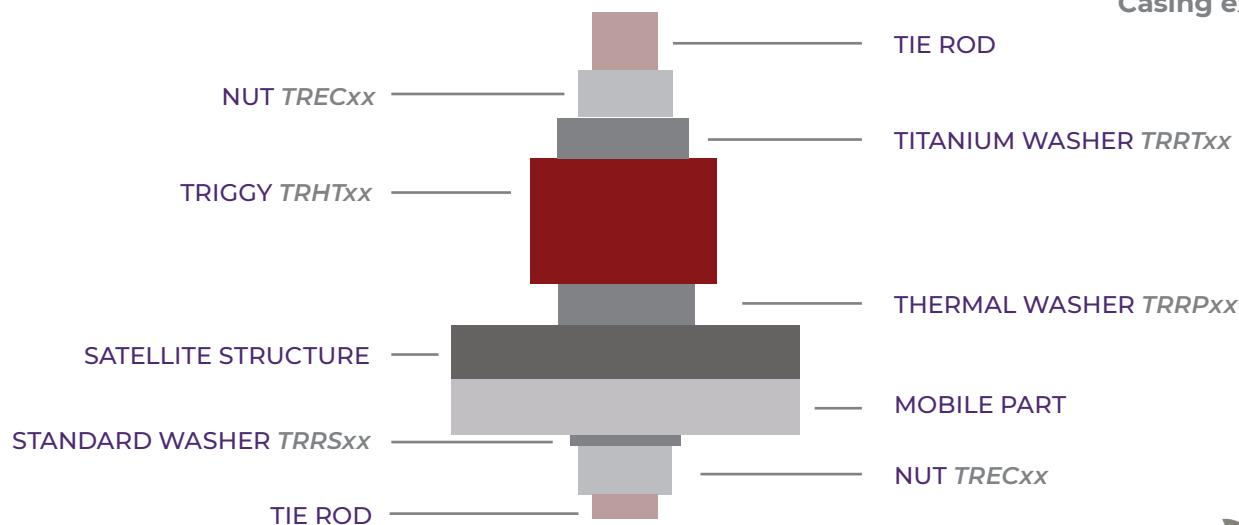


Heating of the Triggy HT03



TRIGGY ACCESSORIES

TYPICAL INTEGRATION



Casing example

FASTENER / TIE ROD

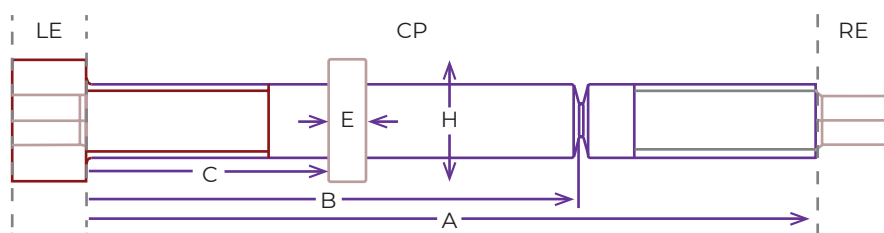
Configure your own fastener/tie rod
Maximum length: 20 times the tie rod's diameter
Ex: for a M2 fastener, max length is 40mm

Option: Tie rod instrumentation

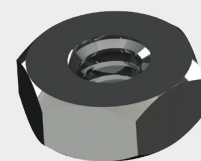


Stainless Steel 15-5 PH

- High preload
- E: 196 GPa
- Re: 1300 Mpa
- CTE: 11.10^{-6}K^{-1}

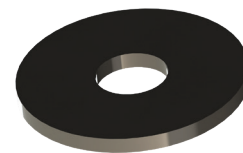


NUT



REF	MATERIAL	SIZE	THICKNESS (mm)	WIDTH (mm)	MASS (g)	COMPATIBLE WITH
TREC02	SS 15-5PH	M2	1,6	4	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	Duratron® CU60PBI	1	6,3	2,2	0,04	HT02
TRRP03	Duratron® CU60PBI	1	9,6	3,2	0,08	HT03
TRRP04	Duratron® CU60PBI	1	12,7	4,3	0,15	HT04
TRRP05	Duratron® CU60PBI	1	16,3	5,3	0,24	HT05
TRRP06	Duratron® CU60PBI	3	19	6,4	0,98	HT06
TRRP08	Duratron® CU60PBI	3	25,4	8,4	1,76	HT08
TRRP10	Duratron® CU60PBI	3	32,7	10,5	2,94	HT10
TRRP12	Duratron® CU60PBI	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 Triggys
- Transportable
- No electrical power
- 3 sizes for Triggys family



RTTR05 tool

RTTR01 tool



REF	MAXIMUM LOAD (Kn)	LENGTH (m)	WIDTH (m)	HEIGHT (m)	MASS (Kg)	COMPATIBLE WITH
RTTR01	5	0,18	0,12	0,18	3	HT02
RTTR05	45	0,55	0,35	0,25	10	HT02/HT03/HT04/HT05
RTTR30	295	0,55	0,35	0,25	15	HT06/HT08/HT10/HT12

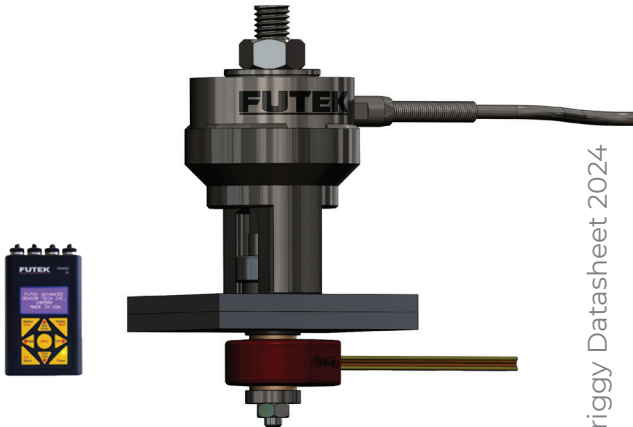
TENSIONER TOOL

- To preload fastener and Triggys
- Transportable
- Battery powered
- 4 sizes for Triggys family

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 Triggys TRHT04

