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Variable Transmission Ratio

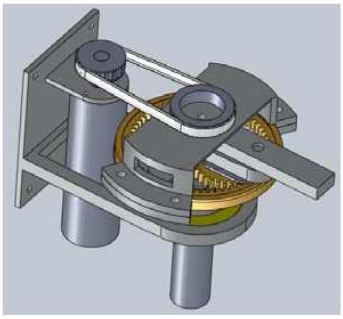
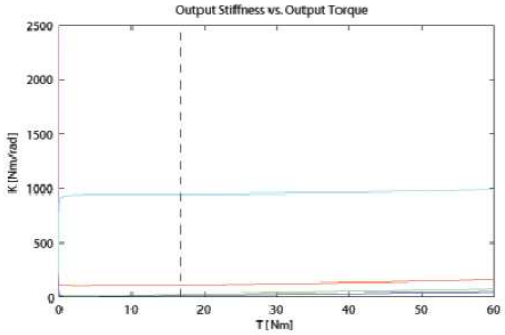
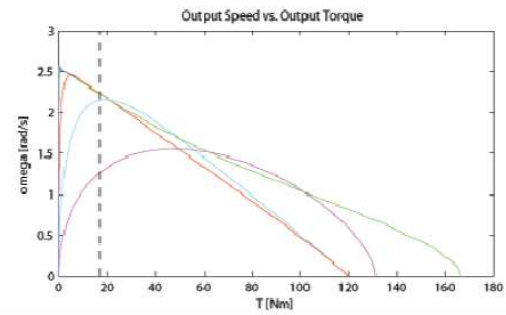


Fig.2
Mechanical interface drawings

Operating Data				
#	(quantity)		(unit)	(value)
Mechanical				
1	Continuous Output Power		[W]	37
2	Nominal Torque		[Nm]	16.8
3	Nominal Speed		[rad/s]	2.2
4	Nominal Stiffness Variation Time	with no load	[s]	0.4
5		with nominal torque	[s]	0.5
6	Peak (Maximum) Torque		[Nm]	60
7	Maximum Speed		[rad/s]	2.6
8	Maximum Stiffness		[Nm/rad]	inf
9	Minimum Stiffness		[Nm/rad]	0
10	Maximum Elastic Energy		[J]	1.6
11	Maximum Torque Hysteresis		[%]	n/a
12	Maximum deflection	with max. stiffness	[°]	0
13		with min. stiffness	[°]	n/a
14	Active Rotation Angle		[°]	± 60
15	Angular Resolution		[°]	n/a
16	Weight		[Kg]	2
Electrical				





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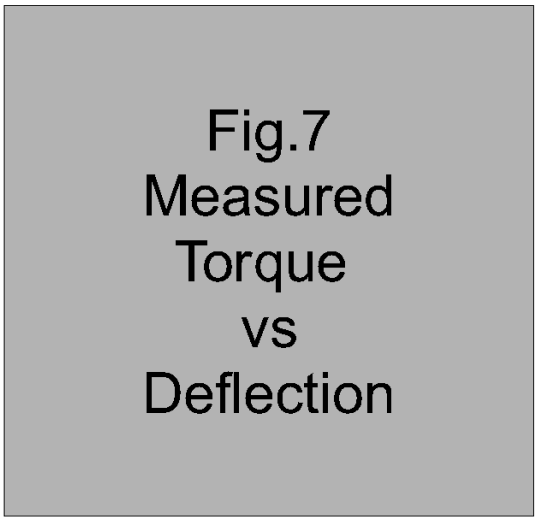
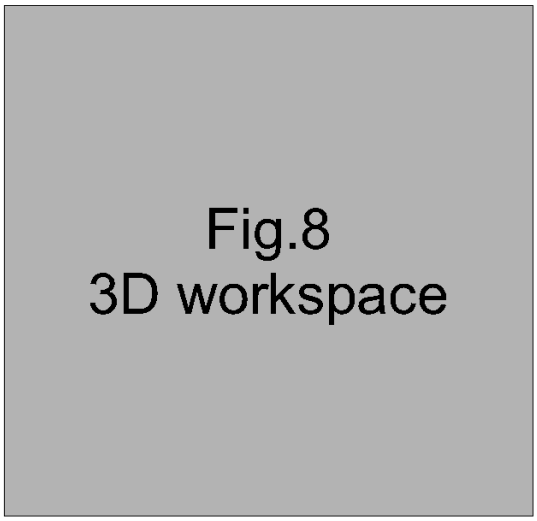
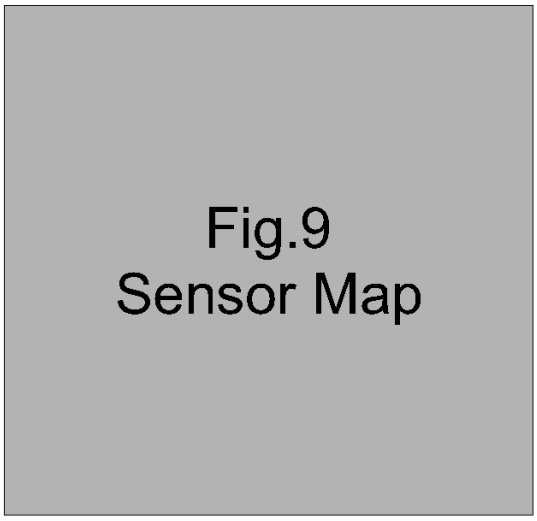
Additional Characteristics





Additional sensors data			
#	(quantity)	(unit)	(value)
a0	**Sensor a**		
a1	Resolution	[yyy]	xxx
a2	Range	[yyy]	xxx
a3	I/O protocol	[yyy]	xxx
ax	(specific sensor properties)	[yyy]	xxx
b0	**Sensor b**		
bx	(specific sensor properties)	[yyy]	xxx
by	(specific sensor properties)	[yyy]	xxx
bz	(specific sensor properties)	[yyy]	xxx
n0	**Sensor n**		
...	...	...	...



This space is left blank for any integrative information
at the compiler's discretion. Examples may include:

- additional system images
- max. structural load values
- accessories
- software details

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Model

Fig.10a Actuator Internals Layout	Fig.10b Actuator Internals Working Principle

Mathematical model

101	Recoil Point Function	$x_e = q_2$
102	Energy Function	$H = \frac{1}{2}\frac{(L-q_1)^2}{q_1^2} k L^2 \sin^2(x-q_2)$
103	Output Torque Function	$\tau = \frac{-k}{2}\frac{(L-q_1)^2}{q_1^2} L^2 \sin(2(x-q_2))$
104	Output Stiffness Function	$\sigma = k L^2 \frac{(L-q_1)^2}{q_1^2} \cos(2(x-q_2))$
105	Spring Torque Function	$e_S = \frac{(L-q_1)}{q_1} k L \sin(x-q_2)$
106	Springs to Motors Transmission Ratio	$A = \begin{bmatrix} \frac{-L^2}{q_1^2}\cdot\sin(x-q_2) \\ \frac{-(L-q_1)}{q_1} L\cos(x-q_2) \end{bmatrix}^T$
107	Springs to Output Transmission Ratio	$B = \frac{(L-q_1)}{q_1} L\cos(x-q_2)$