

Project Name: TwinCAT Motion Designer Project1

Customer

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Project Description

TwinCAT Motion Designer Project1

Exclusion

The interpretation of data contained in the report for servo axes is based on the basis data provided by you. Please check if these data are and were complete and correct before taking over of the results. The data have been entered in good faith into our software. For erroneous interpretations which are based on an incorrect or incomplete data base and subsequent product recommendations we cannot accept any liability. The calculated design of servo axes represents a non-binding recommendation. You are obliged to check whether the recommended design is suitable for your intended use.

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1. Bill of Materials

DC Link: DC-link 0

Axis: X-Axis

Order code	qty	Product description
AX8108-0x00-0000	1	One Axis Module 8A, OCT
Motor-Gearbox-Combination	1	The following both positions will be mounted at Beckhoff and delivered as one unit.
AM8551-0G20-0000	1	Servomotor, 400 V AC (max. 480 V AC), $M_0 = 4,89 \text{ Nm}$, $I_0 = 4,75 \text{ A}$, $n_n = 5000 \text{ min}^{-1}$, Smooth Shaft, OCT 18 Bit Multiturn, No Brake
AG2210-+LP090S-MF1-7-xG1-AM805x	1	Planetary Shaft Gearbox, $M_n = 50,00 \text{ Nm}$, $M_b = 100,00 \text{ Nm}$, Backlash $\leq 8,00 \text{ arcmin}$, $i = 7$

Axis: Y-Axis

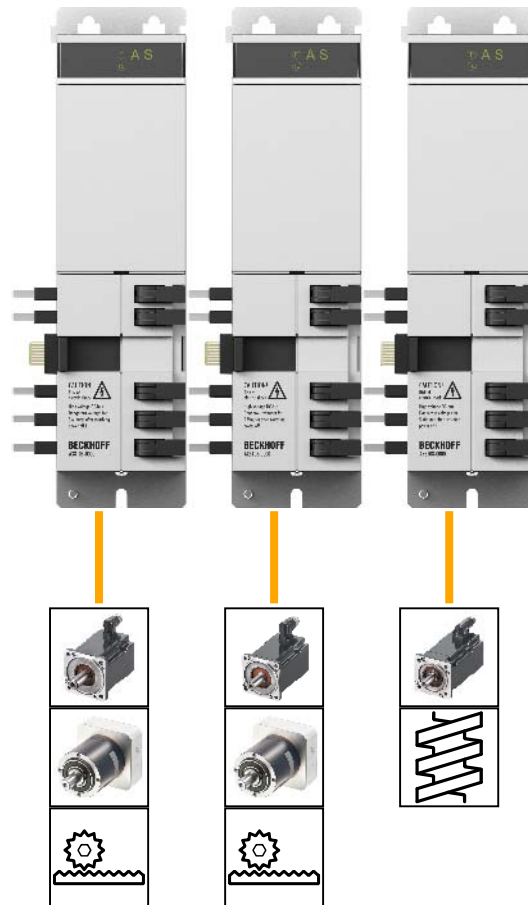
Order code	qty	Product description
AX8108-0100-0000	1	One Axis Module 8A, OCT, TwinSAFE (STO, SS1)
Motor-Gearbox-Combination	1	The following both positions will be mounted at Beckhoff and delivered as one unit.
AM8541-0E20-0000	1	Servomotor, 400 V AC (max. 480 V AC), $M_0 = 2,45 \text{ Nm}$, $I_0 = 3,00 \text{ A}$, $n_n = 6000 \text{ min}^{-1}$, Smooth Shaft, OCT 18 Bit Multiturn, No Brake
AG2210-+LP090S-MF1-7-1G1-AM804x	1	Planetary Shaft Gearbox, $M_n = 50,00 \text{ Nm}$, $M_b = 100,00 \text{ Nm}$, Backlash $\leq 8,00 \text{ arcmin}$, $i = 7$, Feather Key
ZK4800-8023-0050	1	highly flexible, drag-chain suitable cable with 5 million bending cycles, Cable Length $l = 5 \text{ m}$

Axis: Z-Axis

Order code	qty	Product description
AX8108-0100-0000	1	One Axis Module 8A, OCT, TwinSAFE (STO, SS1)
AM8033-1J21-0000	1	Servomotor, 400 V AC (max. 480 V AC), $M_0 = 3,22 \text{ Nm}$, $I_0 = 6,80 \text{ A}$, $n_n = 9000 \text{ min}^{-1}$, Feather Key, OCT 18 Bit Multiturn, Holding Brake

2. DC Link Overview: DC-link 0

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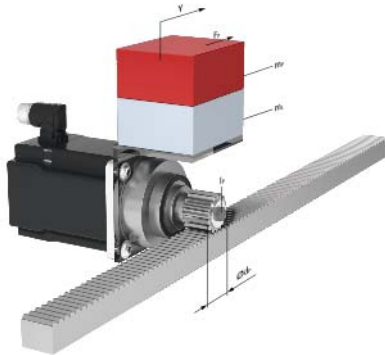
Power supply type: 400 V, 3 phase

Technical Data

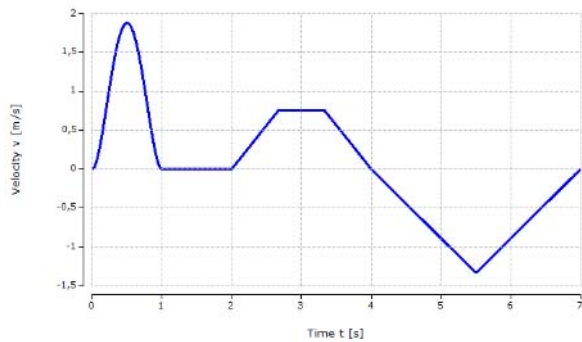
Nominal Data	
Effective Infeed Power	0 W
Maximal Infeed Power	0 W
Effective Braking Power	0 W
Maximal Braking Power	0 W

Application Data	
Effective Needed Infeed Power	262,89 W
Maximal Needed Infeed Power	2506,41 W
Effective Needed Braking Power	67,03 W
Maximal Needed Braking Power	1288,86 W
Brake Resistance Duty Cycle	0,29

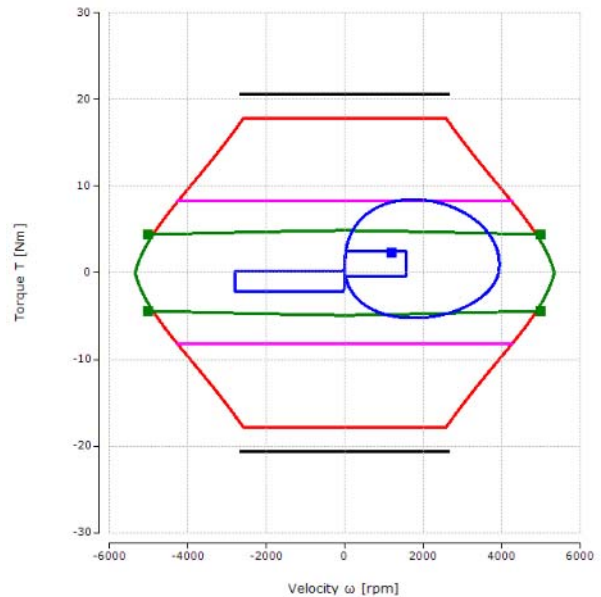
2.1. Axis Overview: X-Axis



Mechanical Data		
Pitch Circle Diameter	$[\varnothing d_p]$	63,66 mm
Pinion Inertia	$[I_p]$	10 kgcm ²
Load Mass	$[m_L]$	200 kg
Friction Coefficient	$[\mu]$	0,10
Efficiency	$[\eta]$	0,90



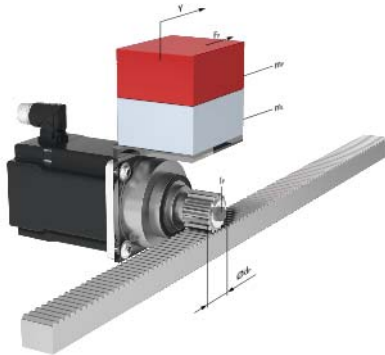
Application Data		
Effective torque	$[T_{eff}]$	2,33 Nm
Max torque	$[T_{max}]$	8,46 Nm
Mean speed	$[\omega_{avg}]$	1200,00 rpm
Max speed	$[\omega_{max}]$	3937,50 rpm
Mean power	$[P_{avg}]$	269,79 W
Max power	$[P_{max}]$	2506,35 W
Mean inertia ratio	$[\lambda_{avg}]$	4,54
Max inertia ratio	$[\lambda_{max}]$	4,54
Overall Gear Ratio	$[i]$	7
Motor Side Inertia	$[I_{mot}]$	1,47 kgcm ²



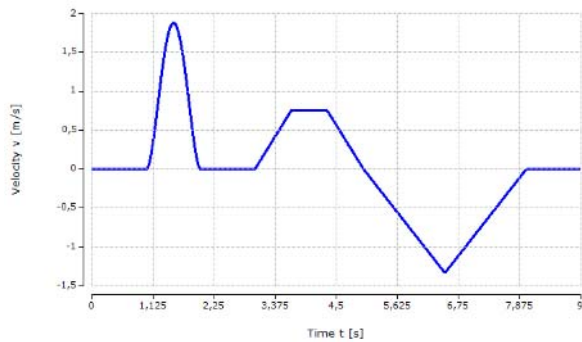
Chosen Components

Order code	Product description
AX8108-0x00-0000	One Axis Module 8A, OCT
AM8551-0G20-0000	Servomotor, 400 V AC (max. 480 V AC), $M_0 = 4,89$ Nm, $I_0 = 4,75$ A, $n_n = 5000$ min ⁻¹ , Smooth Shaft, OCT 18 Bit Multiturn, No Brake
AG2210-+LP090S-MF1-7-xG1-AM805x	Planetary Shaft Gearbox, $M_n = 50,00$ Nm, $M_b = 100,00$ Nm, Backlash $\leq 8,00$ arcmin, $i = 7$

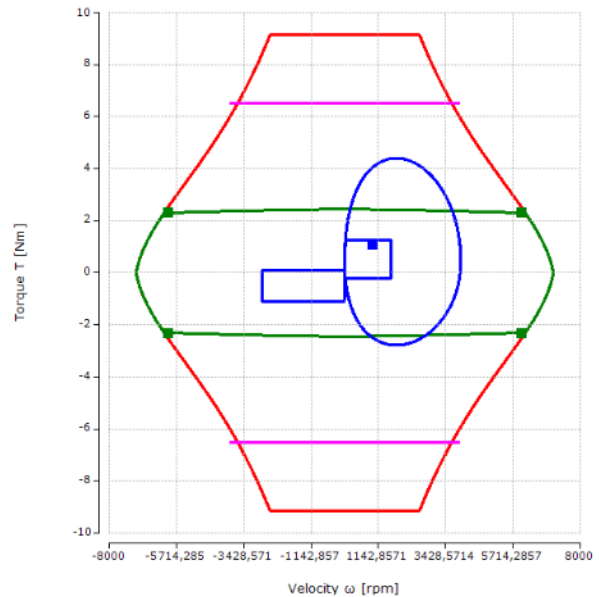
2.2. Axis Overview: Y-Axis



Mechanical Data		
Pitch Circle Diameter	$[\varnothing d_p]$	63,66 mm
Pinion Inertia	$[I_p]$	10 kgcm ²
Load Mass	$[m_L]$	100 kg
Friction Coefficient	$[\mu]$	0,10
Efficiency	$[\eta]$	0,90



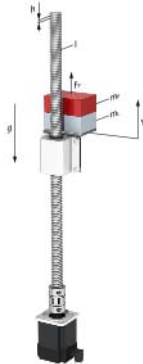
Application Data		
Effective torque	$[T_{eff}]$	1,07 Nm
Max torque	$[T_{max}]$	4,40 Nm
Mean speed	$[\omega_{avg}]$	933,33 rpm
Max speed	$[\omega_{max}]$	3937,50 rpm
Mean power	$[P_{avg}]$	110,59 W
Max power	$[P_{max}]$	1323,90 W
Mean inertia ratio	$[\lambda_{avg}]$	4,24
Max inertia ratio	$[\lambda_{max}]$	4,24
Overall Gear Ratio	$[i]$	7
Motor Side Inertia	$[I_{mot}]$	1,47 kgcm ²



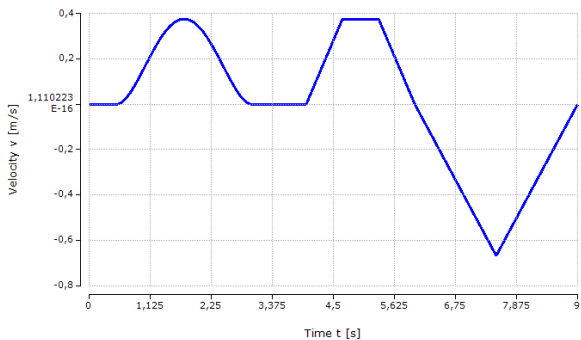
Chosen Components

Order code	Product description
AX8108-0100-0000	One Axis Module 8A, OCT, TwinSAFE (STO, SS1)
AM8541-0E20-0000	Servomotor, 400 V AC (max. 480 V AC), $M_0 = 2,45$ Nm, $I_0 = 3,00$ A, $n_n = 6000$ min ⁻¹ , Smooth Shaft, OCT 18 Bit Multiturn, No Brake
AG2210-+LP090S-MF1-7-1G1-AM804x	Planetary Shaft Gearbox, $M_n = 50,00$ Nm, $M_b = 100,00$ Nm, Backlash $\leq 8,00$ arcmin, $i = 7$, Feather Key

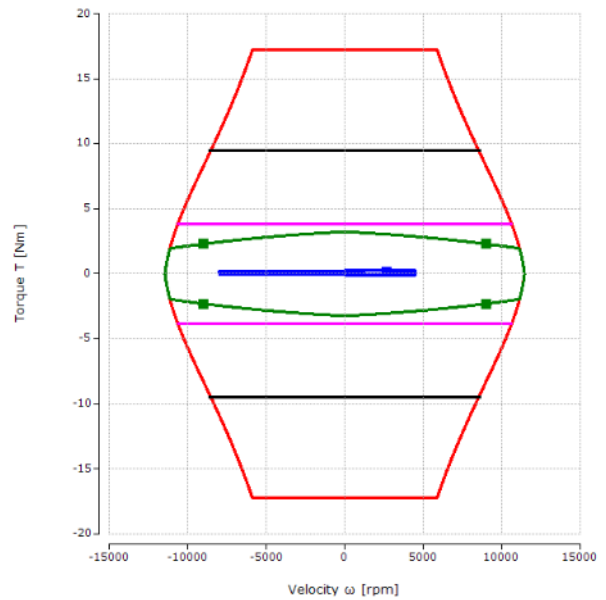
2.3. Axis Overview: Z-Axis



Mechanical Data		
Thread Lead	[h]	5 mm
Inertia Spindle	[I]	1 kgcm ²
Load Mass	[m _L]	10 kg
Friction Coefficient	[μ]	0,10
Efficiency	[η]	0,90
Gravitation	[g]	9,81 m/s ²



Application Data		
Effective torque	[T _{eff}]	0,15 Nm
Max torque	[T _{max}]	0,27 Nm
Mean speed	[ω _{avg}]	2666,66 rpm
Max speed	[ω _{max}]	8000 rpm
Mean power	[P _{avg}]	37,25 W
Max power	[P _{max}]	175,93 W
Mean inertia ratio	[λ _{avg}]	0,73
Max inertia ratio	[λ _{max}]	0,73



Chosen Components

Order code	Product description
AX8108-0100-0000	One Axis Module 8A, OCT, TwinSAFE (STO, SS1)
AM8033-1J21-0000	Servomotor, 400 V AC (max. 480 V AC), M ₀ = 3,22 Nm, I ₀ = 6,80 A, n _n = 9000 min ⁻¹ , Feather Key, OCT 18 Bit Multiturn, Holding Brake