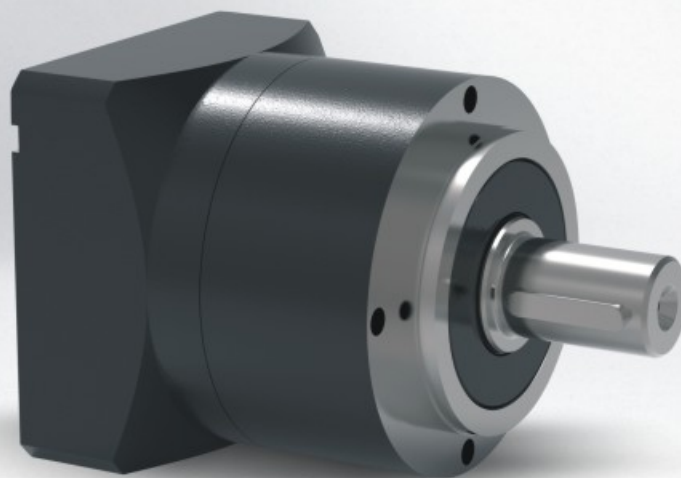


# XA

Powerful. High Precision. Reliable

▶ Servo Planetary Gearbox

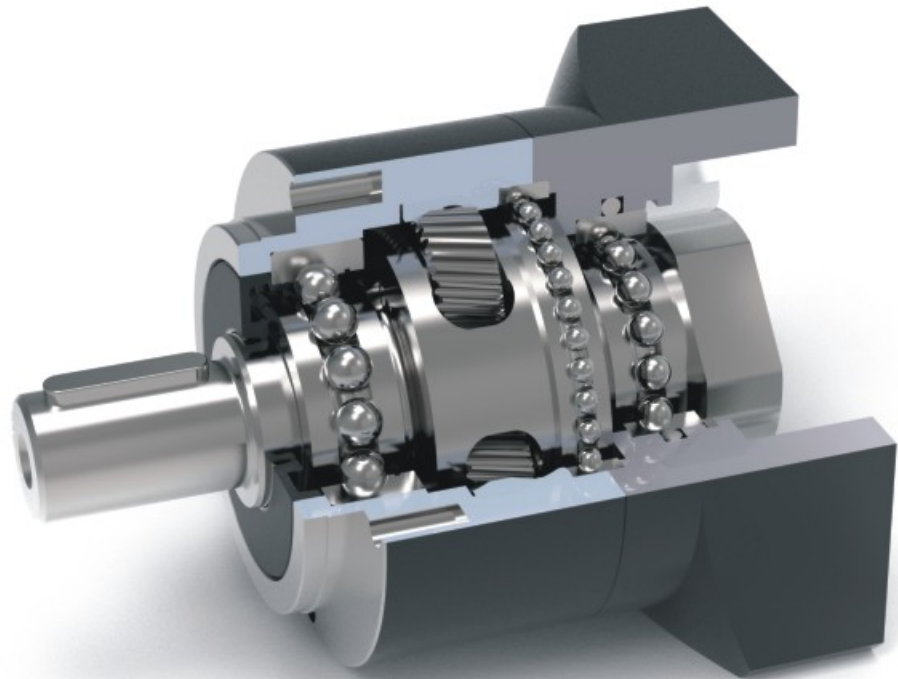
Advanced Gearbox Solution





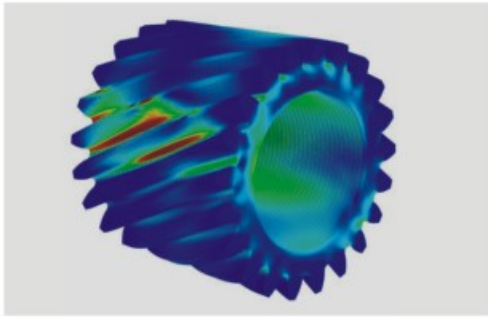
### Helical Gear System Technology

Thanks to the tooth to tooth compact ratio more than 60%.The helical gearing and full needle bearing bring the benefits including higher torque capacity, smooth and lower noise running, decreased backlash and higher efficiency. Integrated housing engineering with super skiving gearing tooling craft.



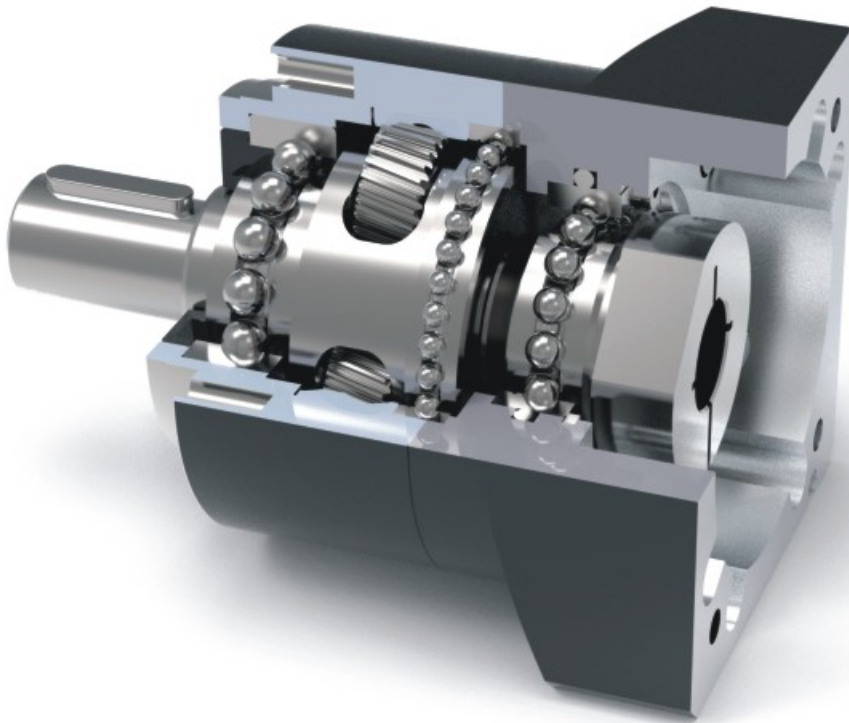
### Master CageSpindle Planetary Carrier

The patented Master CageSpindle integrated planetary carrier support planetary gearbox to increase constructional strength running stability and rigidity significantly. Synthetic grease lubrication allows maintenance free for gearbox whole service life.

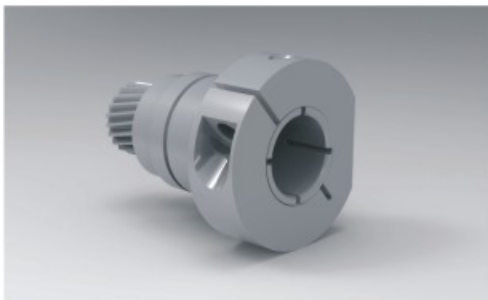


### Super Gear Grinding and Heat Treatment Technology

The global leading gear grinding technology brings the great improvement for the tooth profile optimization, with the high level carburizing and quenching heat treatment technology to reach high precision and gear harden performance.



XA Series Servo Planetary Gearbox



### Dynamic Balance Clamping and Sealing System

For the gearbox input dynamic balance clamping design with perfect concentricity to decrease backlash and increase gearbox operation stability. The ultra sealing system offers grease leakage protection and support gearbox to reach IP65.

## Order Instructions

### Order Code:

**XA — 120 — 02 — 015 — S1 — P0 — Servo Motor**



**XA**

Gearbox Series: XA



**120**

Gearbox Size



**02**

Gearbox Stage



**015**

Gearbox Ratio



**S1**

S1: Output shaft with key  
S2: Output shaft without key



**P0**

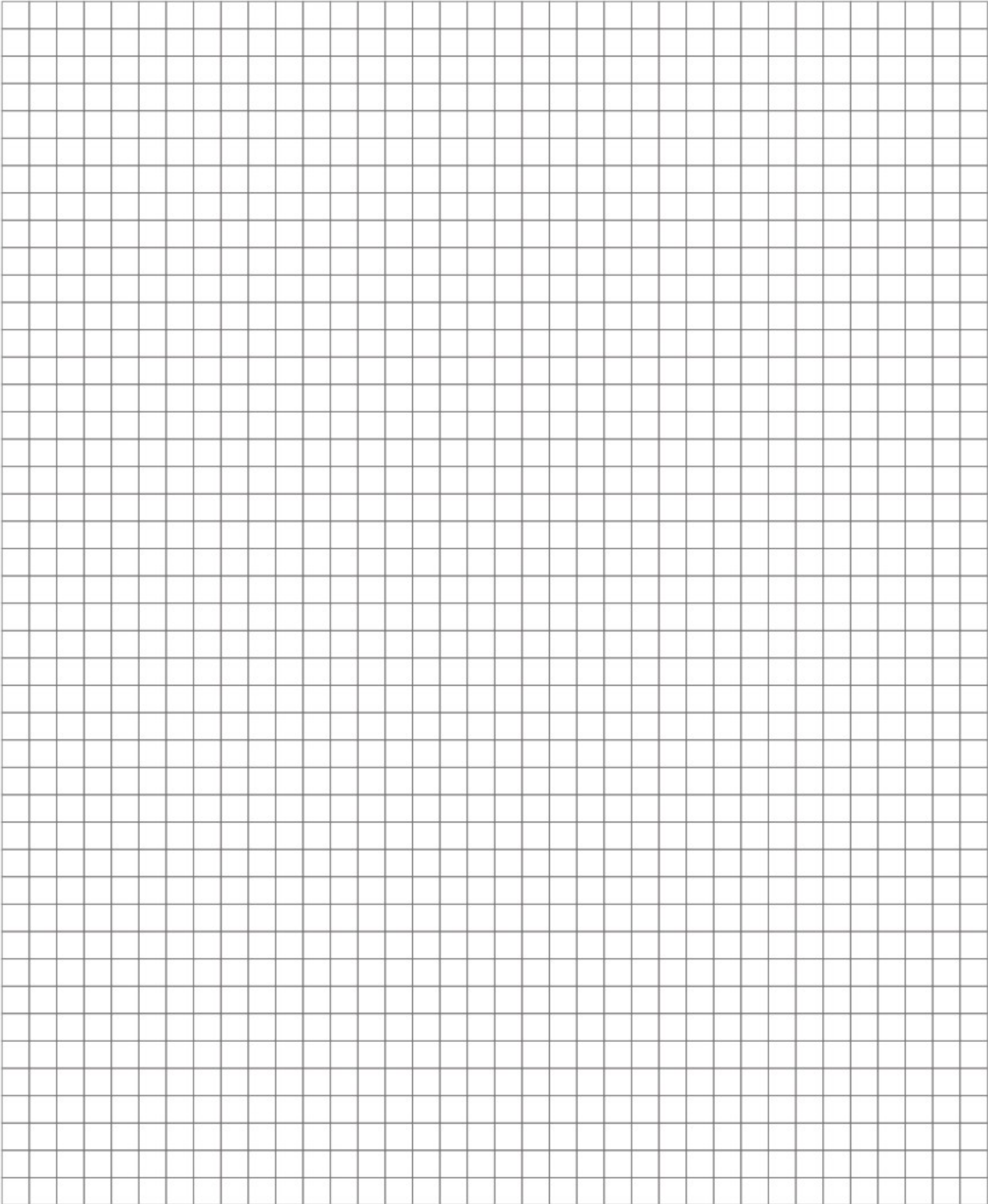
Gearbox Precision



**Servo Motor**

Motor Manufacturer and model

Technical Memo



XA Series Servo Planetary Gearbox

**XA050 1-stage**

		1-stage								
Ratio	i		3	4	5	6	7	8	9	10
Nominal Output Torque		Nm	20	21	21	20	19	18	14	14
		in.lb	177	186	186	177	168	159	124	124
Emergency Stop Torque	$T_{290\max}$	Nm	60	63	63	60	57	54	42	42
		in.lb	531	558	558	531	504	478	372	372
Maximum Acceleration Torque	$T_{2\alpha}$	Nm	36	37.8	37.8	36	34.2	32.4	25.2	25.2
		in.lb	319	335	335	319	303	287	223	223
Maximum Torque	$T_{2\omega}$	Nm	40	42	42	40	38	36	28	28
		in.lb	354	372	372	354	336	319	248	248
Permitted Average Input Speed	$n_{1N}$	rpm	4000							
Maximum Input Speed	$n_{1\max}$	rpm	8000							
Mean No Load Running Torque	$T_{012}$	Nm	0.11	0.1	0.09	0.09	0.08	0.08	0.08	0.08
		in.lb	0.97	0.89	0.80	0.80	0.71	0.71	0.71	0.71
Standard Backlash P1	$j_s$	arcmin	≤6							
Reduced Low Backlash P0	$j_r$	arcmin	≤4							
Torsional Rigidity	$C_{121}$	Nm/arcmin	3							
		in.lb/arcmin	26.55							
Maximum Radial Load	$F_{2\alpha\max}$	N	770							
		lb <sub>f</sub>	173							
Maximum Axial Load	$F_{2\omega\max}$	N	380							
		lb <sub>f</sub>	85							
Max. Tilting Moment	$M_{290\max}$	Nm	19							
		in.lb	168							
Mass Moment of Inertia	$j_1$	kgcm <sup>2</sup>	0.031	0.022	0.019	0.017	0.017	0.017	0.017	0.017
Operating Noise Level	$L_{pA}$	dB(A)	< 56							
Efficiency at Full loading	$\eta$	%	97							
Operating Temperature		°C	-25 to +90							
		F	-13 to +194							
Lubrication			Synthetic Lubrication Grease							
Mouting Position			Any Directions							
Protection Class			IP 65							
Service lifetime	$L_h$	h	20,000(Continuous Operation)							
Weight	$m$	kg	0.6							
		lb <sub>m</sub>	1.3							

## XA050 2-stage

		2-stage														
Ratio	i		15	20	25	30	35	40	45	50	60	70	80	90	100	
Nominal Output Torque		Nm	20	21	21	21	21	21	21	21	20	19	18	14	14	
		in.lb	177	186	186	186	186	186	186	186	186	177	168	159	124	124
Emergency Stop Torque	$T_{2Max}$	Nm	60	63	63	63	63	63	63	63	60	57	54	42	42	
		in.lb	531	558	558	558	558	558	558	558	531	504	478	372	372	
Maximum Acceleration Torque	$T_{2B}$	Nm	36	37.8	37.8	37.8	37.8	37.8	37.8	37.8	36	34.2	32.4	25.2	25.2	
		in.lb	319	335	335	335	335	335	335	335	319	303	287	223	223	
Maximum Torque	$T_{2a}$	Nm	40	42	42	42	42	42	42	42	40	38	36	28	28	
		in.lb	354	372	372	372	372	372	372	372	354	336	319	248	248	
Permitted Average Input Speed	$n_{1N}$	rpm	4000													
Maximum Input Speed	$n_{1Max}$	rpm	8000													
Mean No Load Running Torque	$T_{012}$	Nm	0.1	0.1	0.1	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.08	0.08
		in.lb	0.89	0.89	0.89	0.80	0.80	0.80	0.80	0.80	0.80	0.71	0.71	0.71	0.71	0.71
Standard Backlash P1	$j_1$	arcmin	≤8													
Reduced Low Backlash P0	$j_1$	arcmin	≤6													
Torsional Rigidity	$C_{Q1}$	Nm/arcmin	3													
		in.lb/arcmin	26.55													
Maximum Radial Load	$F_{2AMax}$	N	770													
		lb <sub>f</sub>	173													
Maximum Axial Load	$F_{2OMax}$	N	380													
		lb <sub>f</sub>	85													
Max. Tilting Moment	$M_{2XMax}$	Nm	19													
		in.lb	168													
Mass Moment of Inertia	$J_1$	kgcm <sup>2</sup>	0.027	0.019	0.017	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016
Operating Noise Level	$L_{PA}$	dB(A)	< 56													
Efficiency at Full loading	$\eta$	%	95													
Operating Temperature		°C	-25 to +90													
		F	-13 to +194													
Lubrication			Synthetic Lubrication Grease													
Mouting Position			Any Directions													
Protection Class			IP 65													
Service lifetime	$L_n$	h	20,000(Continuous Operation)													
Weight	$m$	kg	0.9													
		lb <sub>m</sub>	2													

**XA070 1-stage**

			1-stage							
Ratio	i		3	4	5	6	7	8	9	10
Nominal Output Torque		Nm	56	52	52	50	50	45	42	42
		in.lb	496	460	460	443	443	398	372	372
Emergency Stop Torque	$T_{290t}$	Nm	168	156	156	150	150	135	126	126
		in.lb	1487	1381	1381	1328	1328	1195	1115	1115
Maximum Acceleration Torque	$T_{2a}$	Nm	100.8	93.6	93.6	90	90	81	75.6	75.6
		in.lb	892	828	828	797	797	717	669	669
Maximum Torque	$T_{2a}$	Nm	112	104	104	100	100	90	84	84
		in.lb	991	920	920	885	885	797	743	743
Permitted Average Input Speed	$n_{1a}$	rpm	3000							
Maximum Input Speed	$n_{1Max}$	rpm	6000							
Mean No Load Running Torque	$T_{012}$	Nm	0.24	0.2	0.17	0.15	0.15	0.15	0.15	0.15
		in.lb	2.12	1.77	1.50	1.33	1.33	1.33	1.33	1.33
Standard Backlash P1	$j_s$	arcmin	≤5							
Reduced Low Backlash P0	$j_s$	arcmin	≤3							
Ultra Low Backlash PU	$j_s$	arcmin	≤1							
Torsional Rigidity	$C_{121}$	Nm/arcmin	7							
		in.lb/arcmin	61.95							
Maximum Radial Load	$F_{2aMax}$	N	1500							
		lb <sub>r</sub>	337							
Maximum Axial Load	$F_{2cMax}$	N	760							
		lb <sub>a</sub>	171							
Max. Tilting Moment	$M_{290Max}$	Nm	90							
		in.lb	797							
Mass Moment of Inertia	$j_1$	kgcm <sup>2</sup>	0.16	0.14	0.13	0.13	0.13	0.13	0.13	0.13
Operating Noise Level	$L_{pk}$	dB(A)	< 58							
Efficiency at Full loading	$\eta$	%	97							
Operating Temperature		°C	-25 to +90							
		F	-13 to +194							
Lubrication			Synthetic Lubrication Grease							
Mouting Position			Any Directions							
Protection Class			IP 65							
Service lifetime	$L_h$	h	20,000(Continuous Operation)							
Weight	$m$	kg	1.4							
		lb <sub>m</sub>	3.1							



## XA070 2-stage

		2-stage															
Ratio	i		15	20	25	30	32	35	40	45	50	60	70	80	90	100	
Nominal Output Torque		Nm	56	52	52	52	52	52	52	52	52	50	50	45	42	42	
		in.lb	496	460	460	460	460	460	460	460	460	460	443	443	398	372	372
Emergency Stop Torque	$T_{2Max}$	Nm	168	156	156	156	156	156	156	156	156	150	150	135	126	126	
		in.lb	1487	1381	1381	1381	1381	1381	1381	1381	1381	1328	1328	1195	1115	1115	
Maximum Acceleration Torque	$T_{2B}$	Nm	100.8	93.6	93.6	93.6	93.6	93.6	93.6	93.6	93.6	90	90	81	75.6	75.6	
		in.lb	892	828	828	828	828	828	828	828	828	797	797	717	669	669	
Maximum Torque	$T_{2a}$	Nm	112	104	104	104	104	104	104	104	104	100	100	90	84	84	
		in.lb	991	920	920	920	920	920	920	920	920	920	885	885	797	743	743
Permitted Average Input Speed	$n_{1N}$	rpm	3000														
Maximum Input Speed	$n_{1Max}$	rpm	6000														
Mean No Load Running Torque	$T_{012}$	Nm	0.17	0.17	0.17	0.15	0.2	0.15	0.15	0.15	0.17	0.15	0.15	0.15	0.15	0.15	
		in.lb	1.50	1.50	1.50	1.33	1.77	1.33	1.33	1.33	1.50	1.33	1.33	1.33	1.33	1.33	
Standard Backlash P1	$j_i$	arcmin	≤7														
Reduced Low Backlash P0	$j_i$	arcmin	≤5														
Ultra Low Backlash PU	$j_i$	arcmin	≤3														
Torsional Rigidity	$C_{121}$	Nm/arcmin	7														
		in.lb/arcmin	61.95														
Maximum Radial Load	$F_{2aMax}$	N	1500														
		lb <sub>r</sub>	337														
Maximum Axial Load	$F_{2GMax}$	N	760														
		lb <sub>r</sub>	171														
Max. Tilting Moment	$M_{2rMax}$	Nm	90														
		in.lb	797														
Mass Moment of Inertia	$j_1$	kgcm <sup>2</sup>	0.124	0.075	0.075	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	
Operating Noise Level	$L_{PA}$	dB(A)	< 58														
Efficiency at Full loading	$\eta$	%	95														
Operating Temperature		°C	-25 to +90														
		F	-13 to +194														
Lubrication			Synthetic Lubrication Grease														
Mouting Position			Any Directions														
Protection Class			IP 65														
Service lifetime	$L_h$	h	20,000(Continuous Operation)														
Weight	$m$	kg	1.60														
		lb <sub>m</sub>	3.5														

**XA090 1-stage**

			1-stage							
Ratio	i		3	4	5	6	7	8	9	10
Nominal Output Torque		Nm	160	145	155	145	145	142	142	142
		in.lb	1416	1283	1372	1283	1283	1257	1257	1257
Emergency Stop Torque	$T_{290t}$	Nm	480	435	465	435	435	426	426	426
		in.lb	4248	3850	4116	3850	3850	3770	3770	3770
Maximum Acceleration Torque	$T_{2a}$	Nm	288	261	279	261	261	255.6	255.6	255.6
		in.lb	2549	2310	2469	2310	2310	2262	2262	2262
Maximum Torque	$T_{2a}$	Nm	320	290	310	290	290	284	284	284
		in.lb	2832	2567	2744	2567	2567	2514	2514	2514
Permitted Average Input Speed	$n_{1N}$	rpm	3000							
Maximum Input Speed	$n_{1Max}$	rpm	6000							
Mean No Load Running Torque	$T_{012}$	Nm	0.38	0.36	0.31	0.29	0.25	0.25	0.25	0.25
		in.lb	3.36	3.19	2.74	2.57	2.21	2.21	2.21	2.21
Standard Backlash P1	$j_s$	arcmin	≤5							
Reduced Low Backlash P0	$j_s$	arcmin	≤3							
Ultra Low Backlash PU	$j_s$	arcmin	≤1							
Torsional Rigidity	$C_{121}$	Nm/arcmin	14							
		in.lb/arcmin	123.91							
Maximum Radial Load	$F_{2AMax}$	N	3200							
		lb <sub>r</sub>	719							
Maximum Axial Load	$F_{2CMMax}$	N	1600							
		lb <sub>r</sub>	360							
Max. Tilting Moment	$M_{290Max}$	Nm	214							
		in.lb	1894.05							
Mass Moment of Inertia	$j_1$	kgcm <sup>2</sup>	0.61	0.48	0.47	0.47	0.47	0.45	0.44	0.44
Operating Noise Level	$L_{pk}$	dB(A)	< 60							
Efficiency at Full loading	$\eta$	%	97							
Operating Temperature		°C	-25 to +90							
		F	-13 to +194							
Lubrication			Synthetic Lubrication Grease							
Mouting Position			Any Directions							
Protection Class			IP 65							
Service lifetime	$L_h$	h	20,000(Continuous Operation)							
Weight	$m$	kg	3.3							
		lb <sub>m</sub>	7.3							

## XA090 2-stage

		2-stage														
Ratio	i		15	20	25	30	32	35	40	45	50	60	70	80	90	100
Nominal Output Torque		Nm	160	145	155	155	155	155	155	155	155	145	145	142	142	142
		in.lb	1416	1283	1372	1372	1372	1372	1372	1372	1372	1372	1283	1283	1257	1257
Emergency Stop Torque	$T_{2Max}$	Nm	480	435	465	465	465	465	465	465	465	435	435	426	426	426
		in.lb	4248	3850	4116	4116	4116	4116	4116	4116	4116	3850	3850	3770	3770	3770
Maximum Acceleration Torque	$T_{2B}$	Nm	288	261	279	279	279	279	279	279	279	261	261	255.6	255.6	255.6
		in.lb	2549	2310	2469	2469	2469	2469	2469	2469	2469	2310	2310	2262	2262	2262
Maximum Torque	$T_{2a}$	Nm	320	290	310	310	310	310	310	310	310	290	290	284	284	284
		in.lb	2832	2567	2744	2744	2744	2744	2744	2744	2744	2567	2567	2514	2514	2514
Permitted Average Input Speed	$n_{1N}$	rpm	3000													
Maximum Input Speed	$n_{1Max}$	rpm	6000													
Mean No Load Running Torque	$T_{012}$	Nm	0.31	0.31	0.31	0.31	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
		in.lb	2.74	2.74	2.74	2.74	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21
Standard Backlash P1	$j_i$	arcmin	≤7													
Reduced Low Backlash P0	$j_i$	arcmin	≤5													
Ultra Low Backlash PU	$j_i$	arcmin	≤3													
Torsional Rigidity	$C_{121}$	Nm/arcmin	14													
		in.lb/arcmin	123.91													
Maximum Radial Load	$F_{2aMax}$	N	3200													
		lb <sub>f</sub>	719													
Maximum Axial Load	$F_{2GMax}$	N	1600													
		lb <sub>f</sub>	360													
Max. Tilting Moment	$M_{212Max}$	Nm	214													
		in.lb	1894													
Mass Moment of Inertia	$j_1$	kgcm <sup>2</sup>	0.44	0.44	0.44	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39
Operating Noise Level	$L_{PA}$	dB(A)	< 60													
Efficiency at Full loading	$\eta$	%	95													
Operating Temperature		°C	-25 to +90													
		F	-13 to +194													
Lubrication			Synthetic Lubrication Grease													
Mouting Position			Any Directions													
Protection Class			IP 65													
Service lifetime	$L_{10}$	h	20,000(Continuous Operation)													
Weight	$m$	kg	4.50													
		lb <sub>m</sub>	9.9													

**XA120 1-stage**

		1-stage								
Ratio	i		3	4	5	6	7	8	9	10
Nominal Output Torque		Nm	335	300	320	300	300	295	295	295
		in.lb	2965	2655	2832	2655	2655	2611	2611	2611
Emergency Stop Torque	$T_{290t}$	Nm	1005	900	960	900	900	885	885	885
		in.lb	8895	7966	8497	7966	7966	7833	7833	7833
Maximum Acceleration Torque	$T_{20}$	Nm	603	540	576	540	540	531	531	531
		in.lb	5337	4779	5098	4779	4779	4700	4700	4700
Maximum Torque	$T_{20}$	Nm	670	600	640	600	600	590	590	590
		in.lb	5930	5310	5664	5310	5310	5222	5222	5222
Permitted Average Input Speed	$n_{1N}$	rpm	3000							
Maximum Input Speed	$n_{1Max}$	rpm	6000							
Mean No Load Running Torque	$T_{012}$	Nm	1	0.95	0.85	0.81	0.78	0.78	0.78	0.78
		in.lb	8.85	8.41	7.52	7.17	6.90	6.90	6.90	6.90
Standard Backlash P1	$j_s$	arcmin	≤5							
Reduced Low Backlash P0	$j_s$	arcmin	≤3							
Ultra Low Backlash PU	$j_s$	arcmin	≤1							
Torsional Rigidity	$C_{121}$	Nm/arcmin	26							
		in.lb/arcmin	230.12							
Maximum Radial Load	$F_{20Max}$	N	6700							
		lb <sub>r</sub>	1506							
Maximum Axial Load	$F_{20Max}$	N	3300							
		lb <sub>r</sub>	742							
Max. Tilting Moment	$M_{20Max}$	Nm	603							
		in.lb	5337							
Mass Moment of Inertia	$j_1$	kgcm <sup>2</sup>	3.25	2.74	2.71	2.62	2.62	2.62	2.62	2.57
Operating Noise Level	$L_{pk}$	dB(A)	< 63							
Efficiency at Full loading	$\eta$	%	97							
Operating Temperature		°C	-25 to +90							
		F	-13 to +194							
Lubrication			Synthetic Lubrication Grease							
Mouting Position			Any Directions							
Protection Class			IP 65							
Service lifetime	$L_h$	h	20,000(Continuous Operation)							
Weight	$m$	kg	5.5							
		lb <sub>m</sub>	12.1							

## XA120 2-stage

		2-stage														
Ratio	i		15	20	25	30	32	35	40	45	50	60	70	80	90	100
Nominal Output Torque		Nm	335	300	320	320	320	320	320	320	320	300	300	295	295	295
		in.lb	2965	2655	2832	2832	2832	2832	2832	2832	2832	2655	2655	2611	2611	2611
Emergency Stop Torque	$T_{2Max}$	Nm	1005	900	960	960	960	960	960	960	960	900	900	885	885	885
		in.lb	8895	7966	8497	8497	8497	8497	8497	8497	8497	7966	7966	7833	7833	7833
Maximum Acceleration Torque	$T_{2B}$	Nm	603	540	576	576	576	576	576	576	576	540	540	531	531	531
		in.lb	5337	4779	5098	5098	5098	5098	5098	5098	5098	4779	4779	4700	4700	4700
Maximum Torque	$T_{2a}$	Nm	670	600	640	640	640	640	640	640	640	600	600	590	590	590
		in.lb	5930	5310	5664	5664	5664	5664	5664	5664	5664	5310	5310	5222	5222	5222
Permitted Average Input Speed	$n_{1N}$	rpm	3000													
Maximum Input Speed	$n_{1Max}$	rpm	6000													
Mean No Load Running Torque	$T_{012}$	Nm	0.85	0.85	0.85	0.81	0.78	0.78	0.78	0.78	0.78	0.81	0.78	0.78	0.78	0.78
		in.lb	7.52	7.52	7.52	7.17	6.90	6.90	6.90	6.90	6.90	7.17	6.90	6.90	6.90	6.90
Standard Backlash P1	$j_i$	arcmin	≤7													
Reduced Low Backlash P0	$j_i$	arcmin	≤5													
Ultra Low Backlash PU	$j_i$	arcmin	≤3													
Torsional Rigidity	$C_{121}$	Nm/arcmin	26													
		in.lb/arcmin	230.12													
Maximum Radial Load	$F_{2aMax}$	N	6700													
		lb <sub>f</sub>	1506													
Maximum Axial Load	$F_{2GMax}$	N	3300													
		lb <sub>f</sub>	742													
Max. Tilting Moment	$M_{2aMax}$	Nm	603													
		in.lb	5337													
Mass Moment of Inertia	$j_1$	kgcm <sup>2</sup>	2.58	1.5	1.49	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Operating Noise Level	$L_{PA}$	dB(A)	< 63													
Efficiency at Full loading	$\eta$	%	95													
Operating Temperature		°C	-25 to +90													
		F	-13 to +194													
Lubrication			Synthetic Lubrication Grease													
Mouting Position			Any Directions													
Protection Class			IP 65													
Service lifetime	$L_{10}$	h	20,000(Continuous Operation)													
Weight	$m$	kg	8.00													
		lb <sub>m</sub>	17.6													

**XA160 1-stage**

			1-stage							
Ratio	i		3	4	5	6	7	8	9	10
Nominal Output Torque		Nm	630	550	620	600	575	550	510	510
		in.lb	5576	4868	5487	5310	5089	4868	4514	4514
Emergency Stop Torque	$T_{290t}$	Nm	1890	1650	1860	1800	1725	1650	1530	1530
		in.lb	16728	14604	16462	15931	15267	14604	13542	13542
Maximum Acceleration Torque	$T_{2a}$	Nm	1134	990	1116	1080	1035	990	918	918
		in.lb	10037	8762	9877	9559	9160	8762	8125	8125
Maximum Torque	$T_{2a}$	Nm	1260	1100	1240	1200	1150	1100	1020	1020
		in.lb	11152	9736	10975	10621	10178	9736	9028	9028
Permitted Average Input Speed	$n_{1N}$	rpm	3000							
Maximum Input Speed	$n_{1Max}$	rpm	6000							
Mean No Load Running Torque	$T_{012}$	Nm	2.55	2.45	2.3	2.2	2.2	2.2	2.2	2.2
		in.lb	22.57	21.68	20.36	19.47	19.47	19.47	19.47	19.47
Standard Backlash P1	$j_s$	arcmin	≤5							
Reduced Low Backlash P0	$j_s$	arcmin	≤3							
Ultra Low Backlash PU	$j_s$	arcmin	≤1							
Torsional Rigidity	$C_{121}$	Nm/arcmin	52							
		in.lb/arcmin	460.24							
Maximum Radial Load	$F_{2aMax}$	N	9600							
		lb <sub>r</sub>	2158							
Maximum Axial Load	$F_{2cMax}$	N	4800							
		lb <sub>a</sub>	1079							
Max. Tilting Moment	$M_{290Max}$	Nm	1275							
		in.lb	11285							
Mass Moment of Inertia	$j_1$	kgcm <sup>2</sup>	12.31	7.54	7.42	7.25	7.25	7.14	7.14	7.14
Operating Noise Level	$L_{pk}$	dB(A)	< 65							
Efficiency at Full loading	$\eta$	%	97							
Operating Temperature		°C	-25 to +90							
		F	-13 to +194							
Lubrication			Synthetic Lubrication Grease							
Mouting Position			Any Directions							
Protection Class			IP 65							
Service lifetime	$L_h$	h	20,000(Continuous Operation)							
Weight	$m$	kg	20							
		lb <sub>m</sub>	44.1							

## XA160 2-stage

			2-stage													
Ratio	i		15	20	25	30	32	35	40	45	50	60	70	80	90	100
Nominal Output Torque		Nm	630	550	620	620	620	620	620	620	620	600	575	550	510	510
		in.lb	5576	4868	5487	5487	5487	5487	5487	5487	5487	5487	5310	5089	4868	4514
Emergency Stop Torque	$T_{2Max}$	Nm	1890	1650	1860	1860	1860	1860	1860	1860	1860	1800	1725	1650	1530	1530
		in.lb	16728	14604	16462	16462	16462	16462	16462	16462	16462	15931	15267	14604	13542	13542
Maximum Acceleration Torque	$T_{2B}$	Nm	1134	990	1116	1116	1116	1116	1116	1116	1116	1080	1035	990	918	918
		in.lb	10037	8762	9877	9877	9877	9877	9877	9877	9877	9559	9160	8762	8125	8125
Maximum Torque	$T_{2a}$	Nm	1260	1100	1240	1240	1240	1240	1240	1240	1240	1200	1150	1100	1020	1020
		in.lb	11152	9736	10975	10975	10975	10975	10975	10975	10975	10621	10178	9736	9028	9028
Permitted Average Input Speed	$n_{1N}$	rpm	3000													
Maximum Input Speed	$n_{1Max}$	rpm	6000													
Mean No Load Running Torque	$T_{012}$	Nm	2.4	2.4	2.4	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
		in.lb	21.24	21.24	21.24	20.36	20.36	20.36	20.36	20.36	20.36	20.36	20.36	20.36	20.36	20.36
Standard Backlash P1	$j_i$	arcmin	≤7													
Reduced Low Backlash P0	$j_i$	arcmin	≤5													
Ultra Low Backlash PU	$j_i$	arcmin	≤3													
Torsional Rigidity	$C_{121}$	Nm/arcmin	52													
		in.lb/arcmin	460.24													
Maximum Radial Load	$F_{2aMax}$	N	9600													
		lb <sub>r</sub>	2158													
Maximum Axial Load	$F_{2GMax}$	N	4800													
		lb <sub>r</sub>	1079													
Max. Tilting Moment	$M_{2rMax}$	Nm	1275													
		in.lb	11285													
Mass Moment of Inertia	$j_1$	kgcm <sup>2</sup>	12.35	6.65	5.81	6.34	6.34	5.36	4.08	5.36	4.08	7.4	7.4	7.4	7.4	7.4
Operating Noise Level	$L_{PA}$	dB(A)	< 65													
Efficiency at Full loading	$\eta$	%	95													
Operating Temperature		°C	-25 to +90													
		F	-13 to +194													
Lubrication			Synthetic Lubrication Grease													
Mouting Position			Any Directions													
Protection Class			IP 65													
Service lifetime	$L_h$	h	20,000(Continuous Operation)													
Weight	$m$	kg	25.00													
		lb <sub>m</sub>	55.1													

**XA205 1-stage**

			1-stage							
Ratio	i		3	4	5	6	7	8	9	10
Nominal Output Torque		Nm	1220	1170	1170	1100	1100	1060	1060	1060
		in.lb	10798	10355	10355	9736	9736	9382	9382	9382
Emergency Stop Torque	$T_{2Max}$	Nm	3660	3510	3510	3300	3300	3180	3180	3180
		in.lb	32394	31066	31066	29207	29207	28145	28145	28145
Maximum Acceleration Torque	$T_{2a}$	Nm	2196	2106	2106	1980	1980	1908	1908	1908
		in.lb	19436	18640	18640	17524	17524	16887	16887	16887
Maximum Torque	$T_{2a}$	Nm	2440	2340	2340	2200	2200	2120	2120	2120
		in.lb	21596	20711	20711	19472	19472	18763	18763	18763
Permitted Average Input Speed	$n_{1N}$	rpm	3000							
Maximum Input Speed	$n_{1Max}$	rpm	4000							
Mean No Load Running Torque	$T_{012}$	Nm	3.5	3.3	3.15	3	3	3	3	3
		in.lb	30.98	29.21	27.88	26.55	26.55	26.55	26.55	26.55
Standard Backlash P1	$j_s$	arcmin	≤5							
Reduced Low Backlash P0	$j_s$	arcmin	≤3							
Ultra Low Backlash PU	$j_s$	arcmin	≤1							
Torsional Rigidity	$C_{121}$	Nm/arcmin	138							
		in.lb/arcmin	1221.4							
Maximum Radial Load	$F_{2Max}$	N	14000							
		lb <sub>f</sub>	3147							
Maximum Axial Load	$F_{2CMax}$	N	7000							
		lb <sub>f</sub>	1574							
Max. Tilting Moment	$M_{2Max}$	Nm	2013							
		in.lb	17816							
Mass Moment of Inertia	$j_1$	kgcm <sup>2</sup>	28.98	23.67	22.75	22.48	22.48	22.59	22.59	22.55
Operating Noise Level	$L_{pk}$	dB(A)	< 67							
Efficiency at Full loading	$\eta$	%	97							
Operating Temperature		°C	-25 to +90							
		F	-13 to +194							
Lubrication			Synthetic Lubrication Grease							
Mouting Position			Any Directions							
Protection Class			IP 65							
Service lifetime	$L_h$	h	20,000(Continuous Operation)							
Weight	$m$	kg	31							
		lb <sub>m</sub>	68.3							



## XA205 2-stage

		2-stage														
Ratio	i		15	20	25	30	32	35	40	45	50	60	70	80	90	100
Nominal Output Torque		Nm	1220	1170	1170	1170	1170	1170	1170	1170	1170	1100	1100	1060	1060	1060
		in.lb	10798	10355	10355	10355	10355	10355	10355	10355	10355	9736	9736	9382	9382	9382
Emergency Stop Torque	$T_{2Max}$	Nm	3660	3510	3510	3510	3510	3510	3510	3510	3510	3300	3300	3180	3180	3180
		in.lb	32394	31066	31066	31066	31066	31066	31066	31066	31066	29207	29207	28145	28145	28145
Maximum Acceleration Torque	$T_{2B}$	Nm	2196	2106	2106	2106	2106	2106	2106	2106	2106	1980	1980	1908	1908	1908
		in.lb	19436	18640	18640	18640	18640	18640	18640	18640	18640	17524	17524	16887	16887	16887
Maximum Torque	$T_{2a}$	Nm	2440	2340	2340	2340	2340	2340	2340	2340	2340	2200	2200	2120	2120	2120
		in.lb	21596	20711	20711	20711	20711	20711	20711	20711	20711	19472	19472	18763	18763	18763
Permitted Average Input Speed	$n_{1N}$	rpm	3000													
Maximum Input Speed	$n_{1Max}$	rpm	4000													
Mean No Load Running Torque	$T_{012}$	Nm	2.3	2.3	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
		in.lb	20.36	20.36	20.36	19.47	19.47	19.47	19.47	19.47	19.47	19.47	19.47	19.47	19.47	19.47
Standard Backlash P1	$j_i$	arcmin	≤7													
Reduced Low Backlash P0	$j_i$	arcmin	≤5													
Ultra Low Backlash PU	$j_i$	arcmin	≤3													
Torsional Rigidity	$C_{121}$	Nm/arcmin	138													
		in.lb/arcmin	1221.40													
Maximum Radial Load	$F_{2aMax}$	N	14000													
		lb <sub>f</sub>	3147													
Maximum Axial Load	$F_{2GMax}$	N	7000													
		lb <sub>f</sub>	1574													
Max. Tilting Moment	$M_{2aMax}$	Nm	2013													
		in.lb	17816													
Mass Moment of Inertia	$j_1$	kgcm <sup>2</sup>	12.3	7.42	7.54	7.14	7.14	7.14	7.14	7.14	7.14	7.14	7.14	7.14	7.14	7.14
Operating Noise Level	$L_{PA}$	dB(A)	< 67													
Efficiency at Full loading	$\eta$	%	95													
Operating Temperature		°C	-25 to +90													
		F	-13 to +194													
Lubrication			Synthetic Lubrication Grease													
Mouting Position			Any Directions													
Protection Class			IP 65													
Service lifetime	$L_h$	h	20,000(Continuous Operation)													
Weight	$m$	kg	39.00													
		lb <sub>m</sub>	86													

XA Series Servo Planetary Gearbox

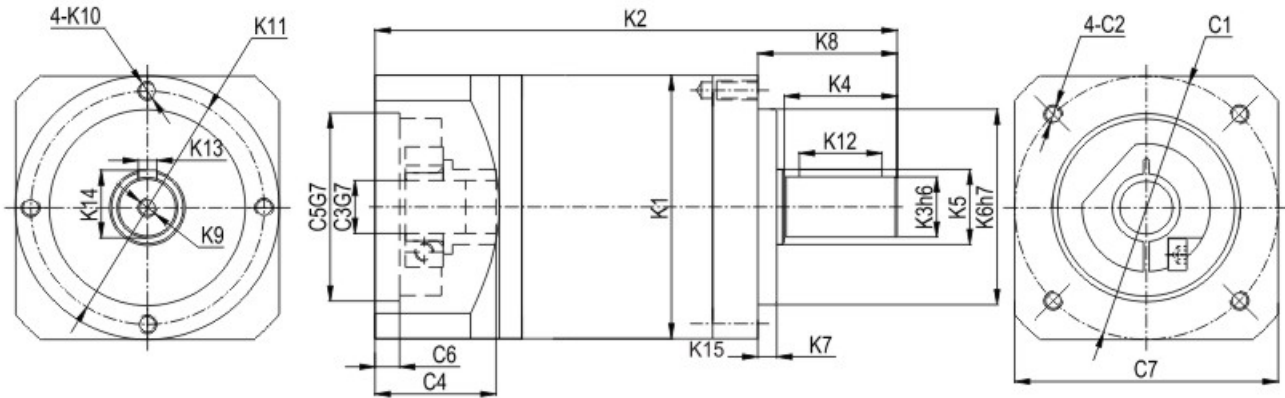
### XA235 1-stage

		1-stage									
Ratio	i		3	4	5	6	7	8	9	10	
Nominal Output Torque		Nm	2050	2000	2000	1900	1900	1800	1800	1800	
		in.lb	18144	17701	17701	16816	16816	15931	15931	15931	
Emergency Stop Torque	$T_{290t}$	Nm	6150	6000	6000	5700	5700	5400	5400	5400	
		in.lb	54432	53104	53104	50449	50449	47794	47794	47794	
Maximum Acceleration Torque	$T_{2a}$	Nm	3690	3600	3600	3420	3420	3240	3240	3240	
		in.lb	32659	31863	31863	30269	30269	28676	28676	28676	
Maximum Torque	$T_{2a}$	Nm	4100	4000	4000	3800	3800	3600	3600	3600	
		in.lb	36288	35403	35403	33633	33633	31863	31863	31863	
Permitted Average Input Speed	$n_{1a}$	rpm	2000								
Maximum Input Speed	$n_{1Max}$	rpm	4000								
Mean No Load Running Torque	$T_{012}$	Nm	5.2	5	4.85	4.67	4.67	4.67	4.67	4.67	
		in.lb	46.02	44.25	42.93	41.33	41.33	41.33	41.33	41.33	
Standard Backlash P1	$j_s$	arcmin	≤5								
Reduced Low Backlash P0	$j_s$	arcmin	≤3								
Ultra Low Backlash PU	$j_s$	arcmin	≤1								
Torsional Rigidity	$C_{121}$	Nm/arcmin	220								
		in.lb/arcmin	1947.2								
Maximum Radial Load	$F_{2aMax}$	N	16000								
		lb <sub>f</sub>	3597								
Maximum Axial Load	$F_{2cMax}$	N	8000								
		lb <sub>f</sub>	1798								
Max. Tilting Moment	$M_{290Max}$	Nm	2676								
		in.lb	23684								
Mass Moment of Inertia	$j_1$	kgcm <sup>2</sup>	69.61	54.37	53.27	50.84	50.84	50.84	50.84	50.56	
Operating Noise Level	$L_{pk}$	dB(A)	< 70								
Efficiency at Full loading	$\eta$	%	97								
Operating Temperature		°C	-25 to +90								
		F	-13 to +194								
Lubrication			Synthetic Lubrication Grease								
Mouting Position			Any Directions								
Protection Class			IP 65								
Service lifetime	$L_h$	h	20,000(Continuous Operation)								
Weight	$m$	kg	53								
		lb <sub>m</sub>	117								

## XA235 2-stage

		2-stage															
Ratio	i		15	20	25	30	32	35	40	45	50	60	70	80	90	100	
Nominal Output Torque		Nm	2050	2000	2000	2000	2000	2000	2000	2000	2000	1900	1900	1800	1800	1800	
		in.lb	18144	17701	17701	17701	17701	17701	17701	17701	17701	16816	16816	15931	15931	15931	
Emergency Stop Torque	$T_{2Max}$	Nm	6150	6000	6000	6000	6000	6000	6000	6000	6000	5700	5700	5400	5400	5400	
		in.lb	54432	53104	53104	53104	53104	53104	53104	53104	53104	50449	50449	47794	47794	47794	
Maximum Acceleration Torque	$T_{2B}$	Nm	3690	3600	3600	3600	3600	3600	3600	3600	3600	3420	3420	3240	3240	3240	
		in.lb	32659	31863	31863	31863	31863	31863	31863	31863	31863	30269	30269	28676	28676	28676	
Maximum Torque	$T_{2a}$	Nm	4100	4000	4000	4000	4000	4000	4000	4000	4000	3800	3800	3600	3600	3600	
		in.lb	36288	35403	35403	35403	35403	35403	35403	35403	35403	33633	33633	31863	31863	31863	
Permitted Average Input Speed	$n_{1N}$	rpm	2000														
Maximum Input Speed	$n_{1Max}$	rpm	4000														
Mean No Load Running Torque	$T_{012}$	Nm	3.15	3.15	3.15	3	3	3	3	3	3	3	3	3	3	3	
		in.lb	27.88	27.88	27.88	26.55	26.55	26.55	26.55	26.55	26.55	26.55	26.55	26.55	26.55	26.55	
Standard Backlash P1	$j_i$	arcmin	≤ 7														
Reduced Low Backlash P0	$j_i$	arcmin	≤ 5														
Ultra Low Backlash PU	$j_i$	arcmin	≤ 3														
Torsional Rigidity	$C_{121}$	Nm/arcmin	220														
		in.lb/arcmin	1947.15														
Maximum Radial Load	$F_{2aMax}$	N	16000														
		lb <sub>f</sub>	3597														
Maximum Axial Load	$F_{2GMax}$	N	8000														
		lb <sub>f</sub>	1798														
Max. Tilting Moment	$M_{2aMax}$	Nm	2676														
		in.lb	23684														
Mass Moment of Inertia	$j_1$	kgcm <sup>2</sup>	28.92	22.75	22.75	22.59	22.59	22.59	22.59	22.59	22.59	22.59	22.59	22.59	22.59	22.59	
Operating Noise Level	$L_{PA}$	dB(A)	< 70														
Efficiency at Full loading	$\eta$	%	95														
Operating Temperature		°C	-25 to +90														
		F	-13 to +194														
Lubrication			Synthetic Lubrication Grease														
Mouting Position			Any Directions														
Protection Class			IP 65														
Service lifetime	$L_h$	h	20,000(Continuous Operation)														
Weight	$m$	kg	66.00														
		lb <sub>m</sub>	145.5														

### XA Dimensions



Model	XA050		XA070		XA090		XA120		XA160		XA205		XA235	
Stage	1	2	1	2	1	2	1	2	1	2	1	2	1	2
K1	50		70		89		120		160		205		235	
	1.969		2.756		3.504		4.724		6.299		8.071		9.252	
K2	88.5	103.5	115	138.7	138	169.3	198	239.8	275.5	336.5	288	348	357.5	402
	3.484	4.075	4.528	5.461	5.433	6.665	7.795	9.441	10.846	13.248	11.339	13.701	14.075	15.827
K3	12		16		22		32		40		55		75	
	0.472		0.630		0.866		1.260		1.575		2.165		2.953	
K4	23		30		36		50		80		82		105	
	0.906		1.181		1.417		1.969		3.150		3.228		4.134	
K5	15		20		30		40		50		60		85	
	0.591		0.787		1.181		1.575		1.969		2.362		3.346	
K6	35		52		68		90		130		160		180	
	1.378		2.047		2.677		3.543		5.118		6.299		7.087	
K7	4		5		10		12		15		20		30	
	0.157		0.197		0.394		0.472		0.591		0.787		1.181	
K8	28		37		48		65		97		105		126	
	1.102		1.457		1.890		2.559		3.819		4.134		4.961	
K9	M3X9		M5X12		M6X16		M10X22		M12X25		M20X40		M20X40	
K10	M4X10		M5X11		M6X15		M8X19		M12X20		M12X22		M16X28	
K11	44		62		80		108		145		184		210	
	1.732		2.441		3.150		4.252		5.709		7.244		8.268	
K12	16		22		28		40		70		70		90	
	0.630		0.866		1.102		1.575		2.756		2.756		3.543	
K13	4		5		6		10		12		16		20	
	0.157		0.197		0.236		0.394		0.472		0.630		0.787	
K14	13.5		18		24.5		35		43		59		79.5	
	0.531		0.709		0.965		1.378		1.693		2.323		3.130	
C1	46		70		90		145		200		215	200	235	215
	1.811		2.756		3.543		5.709		7.874		8.465	7.874	9.252	8.465
C2	M4X10		M5X12		M6X15		M8X20		M12X25		M12X25	M12X25	M12X25	M12X25
C3	8		14		19		24		35		42	35	55	42
	0.315		0.551		0.748		0.945		1.378		1.654	1.378	2.165	1.654
C4	26.1		32.1		41.6		61.3		82		82.5	82	115.5	82.5
	1.028		1.264		1.638		2.413		3.228		3.248	3.228	4.547	3.248
C5	30		50		70		110		114.3		180	114.3	200	180
	1.181		1.969		2.756		4.331		4.500		7.087	4.500	7.874	7.087
C6	5		6.5		6.5		8		8		8	8	8	8
	0.197		0.256		0.256		0.315		0.315		0.315	0.315	0.315	0.315
C7	50		70		89		120		175		190	175	220	190
	1.969		2.756		3.504		4.724		6.890		7.480	6.890	8.661	7.480

The dimensions modified as per the applied motor flanges.

You can get the specific gearbox drawing solution by KDP(Kofon Design Programme) on line from our website: [www.kofon-motion.com](http://www.kofon-motion.com)



Technical Memo

