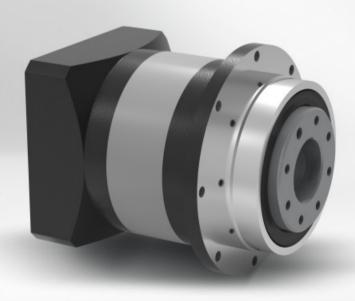


# SPH

Powerful. Precision. Reliable

Servo Planetary Gearbox

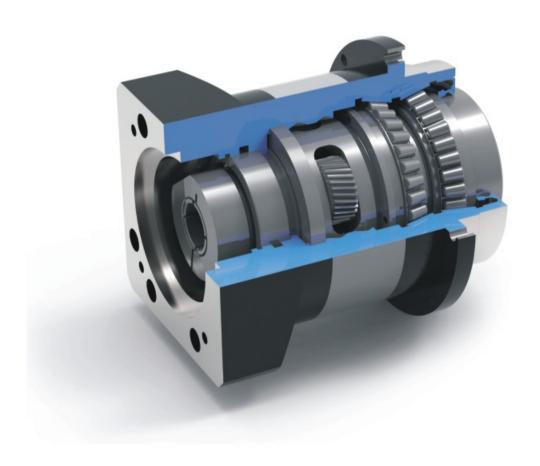
Valued Gearbox Solution





#### **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.

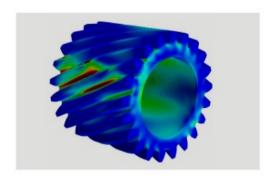




#### The Powerful Cantilever Planetary Carrier

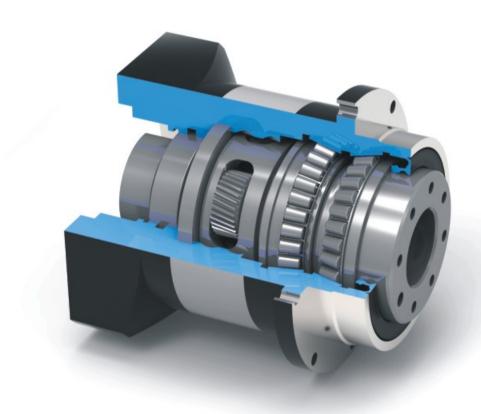
The powerful cantilever planetary carrier provide great mechanical support for planetary gears, thus the complete gearbox can reach high level stability. Synthetic grease lubrication allows maintenance free for gearbox whole service life.





#### **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.





#### 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.



## SPH070 1-stage

						1-si	tage	er vo		
Ratio	i		3	4	5	6	7	8	9	10
Nominal Output Torque		Nm	35	42	44	40	40	38	36	32
Nominal Output Torque		in.lb	310	372	389	354	354	336	319	283
Emergency Stop Torque	T <sub>29lot</sub>	Nm	70	84	88	80	80	76	72	64
Enlergency Stop Forque	29/60	in.lb	620	743	779	708	708	673	637	566
Maximum Acceleration Torque	T <sub>28</sub>	Nm	63	75.6	79.2	72	72	68.4	64.8	57.6
Waximum Acceleration Torque	28	in.lb	558	669	701	637	637	605	574	510
Maximum Torque	T 200	Nm	70	84	88	80	80	76	72	64
Maximum Torque	7 20	in.lb	620	743	779	708	708	673	637	566
Permitted Average Input Speed	n <sub>IN</sub>	rpm				40	000			
Maximum Input Speed	n <sub>1Mex</sub>	rpm			270	60	000		201 10	9
Mean No Load Running Torque	T <sub>012</sub>	Nm	0.3	0.27	0.25	0.25	0.25	0.25	0.25	0.25
Mean No Load Naming Torque	012	in.lb	2.66	2.39	2.21	2.21	2.21	2.21	2.21	2.21
Maximum Torsional Backlash	j,	arcmin				<	8			
Torsional Rigidity	C <sub>121</sub>	Nm/arcmin	3	3	3	3	3	3	3	3
Torsional rigidity	O <sub>121</sub>	in.lb/arcmin	26.55	26.55	26.55	26.55	26.55	26.55	26.55	26.55
Maximum Radial Load	F <sub>2AMas</sub>	N				20	000			
Waxiiriaiii Kadiai Eoad	2AMas	lb,				449	9.60			
Maximum Axial Load	F <sub>20Max</sub>	N				16	000			
Waxiiriui ii Axiai Load	* 20Max	lb <sub>i</sub>				359	9.68			
Max. Tilting Moment	M <sub>2KHes</sub>	Nm				8	0			
max. Fitting mornorit	2KHhix	in.lb				708	3.06			
Mass Moment of Inertia	j <sub>1</sub>	kgcm²	0.135	0.093	0.078	0.070	0.069	0.065	0.065	0.065
Operating Noise Level	L	dB(A)				<	58			
Efficiency at Full loading	η	%				9	7			
Operating Temperature		℃				- 25	to +90			
Operating remperature		F				-13 to	+194			
Lubrication						Synthetic Lubr	ication Grease	6		
Mouting Position						Any Dir	rections			
Protection Class						IP	65			
Service lifetime	Lh	h			3	20,000(Continu	ous Operation	)		
Weight	m	kg				)	2			
TVO:grit		lb <sub>m</sub>				4.	41			



# SPH070 2-stages

1						2-si	tages	a, s		
Ratio	i		12	15	16	20	25	32	40	64
Naminal Octobrill		Nm	37	37	44	44	44	44	44	38
Nominal Output Torque		in.lb	327	327	389	389	389	389	389	336
Faranca Otas Tarana	_	Nm	74	74	88	88	88	88	88	76
Emergency Stop Torque	T <sub>2Not</sub>	in.lb	655	655	779	779	779	779	779	673
Maximum Acceleration Torque	T <sub>28</sub>	Nm	66.6	66.6	79.2	79.2	79.2	79.2	79.2	68.4
Maximum Acceleration Torque	1 28	in.lb	589	589	701	701	701	701	701	605
Maximum Torque	T <sub>20</sub>	Nm	74	74	88	88	88	88	88	76
Waximum Torque	7 20	in.lb	655	655	779	779	779	779	779	673
Permitted Average Input Speed	n <sub>1N</sub>	rpm				40	000			
Maximum Input Speed	n <sub>1Miss</sub>	rpm				60	100			
Mean No Load Running Torque	T <sub>012</sub>	Nm	0.27	0.25	0.27	0.25	0.25	0.25	0.25	0.25
mount to Load Naming Torquo	* 012	in.lb	2.39	2.21	2.39	2.21	2.21	2.21	2.21	2.21
Maximum Torsional Backlash	j,	arcmin				≤	10			
Torsional Rigidity	C <sub>121</sub>	Nm/arcmin	3	3	3	3	3	3	3	3
, and a state of the state of t	0121	in.lb/arcmin	26.55	26.55	26.55	26.55	26.55	26.55	26.55	26.55
Maximum Radial Load	F <sub>2AMex</sub>	N				20	000			
maximum Nadai Edad	- Zwas	lb <sub>r</sub>				449	9.60			
Maximum Axial Load	F <sub>20Max</sub>	N				16	000			
Trigramment Francisco	2 datas	lb <sub>i</sub>				359	9.68			
Max. Tilting Moment	M <sub>2KMax</sub>	Nm				8	10			
	21.55	in.lb				708	3.06			
Mass Moment of Inertia	j,	kgcm²	0.105	0.095	0.088	0.075	0.075	0.064	0.064	0.064
Operating Noise Level	L	dB(A)				<	58			
Efficiency at Full loading	η	%				g	95			
Operating Temperature		rc				- 25	to +90			
oporating remporation		F				-13 to	+194			
Lubrication						Synthetic Lubr	rication Grease	rs		
Mouting Position						Any Di	rections			
Protection Class						IP	65			
Service lifetime	Ln	h				20,000(Continu	ous Operation	)		
Weight	m	kg				2	.5			
		lb <sub>m</sub>				5.	51			



## SPH070 3-stages

		1				3-s	tages				
Ratio	i		80	100	125	160	200	256	320	512	
Naminal Output Targua		Nm	45	45	45	45	45	45	45	38	
Nominal Output Torque		in.lb	398	398	398	398	398	398	398	336	
Francisco Chan Tarress	_	Nm	90	90	90	90	90	90	90	76	
Emergency Stop Torque	T <sub>29hot</sub>	in.lb	797	797	797	797	797	797	797	673	
Maximum Acceleration Torque	T	Nm	81	81	81	81	81	81	81	68.4	
Maximum Acceleration Torque	T <sub>28</sub>	in.lb	717	717	717	717	717	717	717	605	
Maximum Torque	T 20	Nm	90	90	90	90	90	90	90	76	
Maximum Forque	7 20	in.lb	797	797	797	797	797	797	797	673	
Permitted Average Input Speed	n <sub>IN</sub>	rpm				40	100				
Maximum Input Speed	n <sub>1Max</sub>	rpm			100	60	100		557		
Mean No Load Running Torque	T <sub>012</sub>	Nm	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	
Mean No Load Running Torque	012	in.lb	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	
Maximum Torsional Backlash	j,	arcmin				<	12				
Torsional Rigidity	C <sub>121</sub>	Nm/arcmin	3	3	3	3	3	3	3	3	
Torsional regidity	O <sub>121</sub>	in.lb/arcmin	26.55	26.55	26.55	26.55	26.55	26.55	26.55	26.55	
Maximum Radial Load	F <sub>2AMas</sub>	N				20	000				
Maximum Nadiai Eoad	* 2AMas	lb <sub>r</sub>				449	9.60				
Maximum Axial Load	F <sub>20Max</sub>	N				16	000				
THANTIATT MAIN EVEN	- ZUMB	lb <sub>r</sub>				359	9.68				
Max. Tilting Moment	M <sub>2KHes</sub>	Nm				8	0				
	270000	in.lb				708	3.06				
Mass Moment of Inertia	j <sub>1</sub>	kgcm²	0.075	0.064	0.064	0.064	0.064	0.064	0.064	0.064	
Operating Noise Level	L <sub>PA</sub>	dB(A)				<	58				
Efficiency at Full loading	η	%				ę	13				
Operating Temperature		C				- 25	to +90				
o por anni g		F				-13 to	+194				
Lubrication			Synthetic Lubrication Grease								
Mouting Position						Any Di	Directions				
Protection Class						IP	65				
Service lifetime	Lh	h				20,000(Continu	ous Operation	)			
Weight	m	kg					3				
	1500	lb <sub>m</sub>				6.	61				



# SPH090 1-stage

3						1-s	tage			
Ratio	i		3	4	5	6	7	8	9	10
Naminal Outrat Tarress		Nm	100	110	115	105	100	95	90	81
Nominal Output Torque		in.lb	885	974	1018	929	885	841	797	717
Emergency Step Termin	-	Nm	200	220	230	210	200	190	180	162
Emergency Stop Torque	T <sub>2Not</sub>	in.lb	1770	1947	2036	1859	1770	1682	1593	1434
Maximum Acceleration Torque	T	Nm	180	198	207	189	180	171	162	145.8
Maximum Acceleration Torque	T <sub>28</sub>	in.lb	1593	1752	1832	1673	1593	1513	1434	1290
Maximum Torque	T <sub>20</sub>	Nm	200	220	230	210	200	190	180	162
waximum rorque	7 20	in.lb	1770	1947	2036	1859	1770	1682	1593	1434
Permitted Average Input Speed	n <sub>1N</sub>	rpm				30	000			
Maximum Input Speed	n <sub>1Mix</sub>	rpm			8.1	60	000		- 10	
Mean No Load Running Torque	T <sub>012</sub>	Nm	0.46	0.41	0.39	0.35	0.35	0.35	0.35	0.35
mean 140 Load Naming Torque	7 012	in.lb	4.07	3.63	3.45	3.10	3.10	3.10	3.10	3.10
Maximum Torsional Backlash	j <sub>t</sub>	arcmin				=	8			
Torsional Rigidity	C <sub>121</sub>	Nm/arcmin	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
10101011011111111111	0121	in.lb/arcmin	42.48	42.48	42.48	42.48	42.48	42.48	42.48	42.48
Maximum Radial Load	F <sub>24Max</sub>	N				40	000			
Maximum Radial Load	* ZAMBS	lb <sub>r</sub>				899	9.20			
Maximum Axial Load	F <sub>20Max</sub>	N				30	100			
The arrivative access	2000	lb <sub>r</sub>				674	1.40			
Max. Tilting Moment	M <sub>2KMex</sub>	Nm				2	00			
	20,000	in.lb				177	0.14			
Mass Moment of Inertia	j <sub>1</sub>	kgcm²	0.770	0.520	0.450	0.420	0.400	0.390	0.390	0.390
Operating Noise Level	L <sub>PA</sub>	dB(A)				<	60			
Efficiency at Full loading	η	%				ç	7			
Operating Temperature		T				- 25	to +90			
- 1 and 1 amparated a		F				-13 to	+194			
Lubrication						Synthetic Lubr	rication Grease	rs		
Mouting Position						Any Di	rections			
Protection Class						IP	65			
Service lifetime	Ln	h				20,000(Continu	ous Operation	)		
Weight	m	kg				5	.5			
	10000	lb <sub>m</sub>				12	.13			

## SPH090 2-stages

						2-s	tages			
Ratio	i		12	15	16	20	25	32	40	64
New lead Outs AT-		Nm	100	100	110	110	110	110	110	95
Nominal Output Torque		in.lb	885	885	974	974	974	974	974	841
Emanage Oten Terror	_	Nm	200	200	220	220	220	220	220	190
Emergency Stop Torque	T <sub>29hot</sub>	in.lb	1770	1770	1947	1947	1947	1947	1947	1682
Maximum Acceleration Torque	T <sub>28</sub>	Nm	180	180	198	198	198	198	198	171
Maximum Acceleration Torque	1 28	in.lb	1593	1593	1752	1752	1752	1752	1752	1513
Maximum Torque	T 20	Nm	200	200	220	220	220	220	220	190
Maximum Torque	7 20	in.lb	1770	1770	1947	1947	1947	1947	1947	1682
Permitted Average Input Speed	n <sub>IN</sub>	rpm				30	000			
Maximum Input Speed	n <sub>1Mex</sub>	rpm			100	60	100	80. 00		
Mean No Load Running Torque	T <sub>012</sub>	Nm	0.41	0.39	0.41	0.39	0.39	0.35	0.35	0.35
Mean No Edad Norming Forque	012	in.lb	3.63	3.45	3.63	3.45	3.45	3.10	3.10	3.10
Maximum Torsional Backlash	j,	arcmin				<	10			
Torsional Rigidity	C <sub>121</sub>	Nm/arcmin	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Torsional regidity	O <sub>121</sub>	in.lb/arcmin	42.48	42.48	42.48	42.48	42.48	42.48	42.48	42.48
Maximum Radial Load	F <sub>2AMas</sub>	N				40	100			
Waximum Nadiai Eoad	* 2AMas	lb,				899	9.20			
Maximum Axial Load	F <sub>20Max</sub>	N				30	100			
That is the second	2000	lb <sub>r</sub>				674	1.40			
Max. Tilting Moment	M <sub>2KHes</sub>	Nm				2	00			
	270000	in.lb				177	0.14	,		
Mass Moment of Inertia	j <sub>1</sub>	kgcm²	0.670	0.510	0.500	0.440	0.440	0.390	0.390	0.390
Operating Noise Level	L <sub>PA</sub>	dB(A)				<	60			
Efficiency at Full loading	η	%				ę	95			
Operating Temperature		°C				- 25	to +90			
approxima ramporation		F				-13 to	+194			
Lubrication						Synthetic Lubr	ication Grease			
Mouting Position						Any Di	rections			
Protection Class						IP	65			
Service lifetime	Lh	h				20,000(Continu	ous Operation	n)		
Weight	m	kg				6	.5			
		lb <sub>m</sub>				14	.33			



# SPH090 3-stages

1						3-si	tages			
Ratio	i		80	100	125	160	200	256	320	512
Naminal Octobrill		Nm	120	120	120	120	120	120	120	95
Nominal Output Torque		in.lb	1062	1062	1062	1062	1062	1062	1062	841
Farancia Otas Tarria	_	Nm	240	240	240	240	240	240	240	190
Emergency Stop Torque	T <sub>2Not</sub>	in.lb	2124	2124	2124	2124	2124	2124	2124	1682
Maximum Acceleration Torque	T	Nm	216	216	216	216	216	216	216	171
Maximum Acceleration Torque	T <sub>28</sub>	in.lb	1912	1912	1912	1912	1912	1912	1912	1513
Maximum Torque	T <sub>20</sub>	Nm	240	240	240	240	240	240	240	190
Waximum Torque	7 20	in.lb	2124	2124	2124	2124	2124	2124	2124	1682
Permitted Average Input Speed	n <sub>in</sub>	rpm				30	000			
Maximum Input Speed	n <sub>1Mix</sub>	rpm				60	100			
Mean No Load Running Torque	T <sub>012</sub>	Nm	0.39	0.39	0.39	0.35	0.35	0.35	0.35	0.35
mount to Load Naming Torquo	* 012	in.lb	3.45	3.45	3.45	3.10	3.10	3.10	3.10	3.10
Maximum Torsional Backlash	j,	arcmin				\$	12			
Torsional Rigidity	C <sub>121</sub>	Nm/arcmin	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Toroionar rigidity	0121	in.lb/arcmin	42.48	42.48	42.48	42.48	42.48	42.48	42.48	42.48
Maximum Radial Load	F <sub>24Max</sub>	N				40	000			
Maximum Radial Load	* ZAMBS	lb <sub>r</sub>				899	9.20			
Maximum Axial Load	F <sub>20Max</sub>	N				30	100			
Trigramment Francisco	2000	lb <sub>i</sub>				674	1.40			
Max. Tilting Moment	M <sub>2KMex</sub>	Nm				2	00			
	20,000	in.lb				177	0.14			
Mass Moment of Inertia	j <sub>1</sub>	kgcm²	0.500	0.440	0.700	0.390	0.390	0.390	0.390	0.390
Operating Noise Level	Lpa	dB(A)				<	60			
Efficiency at Full loading	η	%				g	13			
Operating Temperature		T				- 25	to +90			
oporating remporation		F				-13 to	+194			
Lubrication						Synthetic Lubr	rication Grease	rs		
Mouting Position						Any Di	rections			
Protection Class						IP	65			
Service lifetime	L,	h				20,000(Continu	ous Operation	)		
Weight	m	kg				7	.5			
		lb <sub>m</sub>				16	.53			



## SPH120 1-stage

						1-s	tage	Sr sv		
Ratio	i		3	4	5	6	7	8	9	10
New lead Outs at Taxana		Nm	190	240	245	240	235	210	200	196
Nominal Output Torque		in.lb	1682	2124	2168	2124	2080	1859	1770	1735
Consessed Otton Torrison	_	Nm	380	480	490	480	470	420	400	392
Emergency Stop Torque	T <sub>29hot</sub>	in.lb	3363	4248	4337	4248	4160	3717	3540	3469
Maximum Acceleration Torque	т	Nm	342	432	441	432	423	378	360	352.8
Maximum Acceleration Torque	T <sub>28</sub>	in.lb	3027	3824	3903	3824	3744	3346	3186	3123
Maximum Torque	T 20	Nm	380	480	490	480	470	420	400	392
Maximum Torque	7 20	in.lb	3363	4248	4337	4248	4160	3717	3540	3469
Permitted Average Input Speed	n <sub>1N</sub>	rpm				30	100			
Maximum Input Speed	n <sub>1Mex</sub>	rpm			200	60	100	80. 00	201 23	9
Mean No Load Running Torque	T <sub>012</sub>	Nm	1.05	0.95	0.91	0.88	0.88	0.88	0.88	0.88
Mean No Load Numing Forque	012	in.lb	9.29	8.41	8.05	7.79	7.79	7.79	7.79	7.79
Maximum Torsional Backlash	j,	arcmin				<	8			
Torsional Rigidity	C <sub>121</sub>	Nm/arcmin	10	10	10	10	10	10	10	10
Torsional regions	O <sub>121</sub>	in.lb/arcmin	88.51	88.51	88.51	88.51	88.51	88.51	88.51	88.51
Maximum Radial Load	F <sub>2AMas</sub>	N				78	000			
Waximum Nadiai Load	* ZAMES	lb,				175	3.44			
Maximum Axial Load	F <sub>20Mex</sub>	N				70	100			
THOSE TOTAL	- ZUMB	lb <sub>r</sub>				157	3.60			
Max. Tilting Moment	M <sub>2KMax</sub>	Nm				4	00			
	270110	in.lb				354	0.28	,		
Mass Moment of Inertia	j <sub>1</sub>	kgcm²	2.630	1.790	1.530	1.500	1.400	1.320	1.320	1.320
Operating Noise Level	Lpa	dB(A)				<	62			
Efficiency at Full loading	η	%				Ş	7			
Operating Temperature		°C				- 25	to +90			
aporating ramparation		F				-13 to	+194			
Lubrication						Synthetic Lubr	ication Grease			
Mouting Position						Any Di	rections			
Protection Class						IP	65			
Service lifetime	Lh	h				20,000(Continu	ous Operation	n)		
Weight	m	kg				1	0			
	15/70	lb <sub>m</sub>				22	.05			



# SPH120 2-stages

						2-s	tages			
Ratio	i		12	15	16	20	25	32	40	64
Naminal Outset Tarres		Nm	210	210	230	230	255	255	250	210
Nominal Output Torque		in.lb	1859	1859	2036	2036	2257	2257	2213	1859
Emergency Stop Torque	т.	Nm	420	420	460	460	510	510	500	420
Emergency Stop Torque	T <sub>2Not</sub>	in.lb	3717	3717	4071	4071	4514	4514	4425	3717
Maximum Acceleration Torque	T <sub>28</sub>	Nm	378	378	414	414	459	459	450	378
maximum Acceleration Torque	2 2/5	in.lb	3346	3346	3664	3664	4062	4062	3983	3346
Maximum Torque	T <sub>20</sub>	Nm	420	420	460	460	510	510	500	420
The All Torquo	- 29	in.lb	3717	3717	4071	4071	4514	4514	4425	3717
Permitted Average Input Speed	n <sub>1N</sub>	rpm				30	100			
Maximum Input Speed	n <sub>1Max</sub>	rpm				60	000			
Mean No Load Running Torque	T 012	Nm	0.95	0.91	0.95	0.91	0.91	0.88	0.88	0.88
mounto godd Hammig Forquo	- 012	in.lb	8.41	8.05	8.41	8.05	8.05	7.79	7.79	7.79
Maximum Torsional Backlash	jı	arcmin				<	10			
Torsional Rigidity	C <sub>121</sub>	Nm/arcmin	10	10	10	10	10	10	10	10
, or	0121	in.lb/arcmin	88.51	88.51	88.51	88.51	88.51	88.51	88.51	88.51
Maximum Radial Load	F <sub>2AMex</sub>	N				78	300			
		lb <sub>r</sub>				175	3.44			
Maximum Axial Load	F <sub>20Max</sub>	N				70	000			
		lb <sub>i</sub>				157	3.60			
Max. Tilting Moment	M <sub>2KMax</sub>	Nm				4	00			
•	27,550	in.lb				354	0.28			
Mass Moment of Inertia	j <sub>1</sub>	kgcm²	1.630	1.670	1.750	1.530	1.490	1.320	1.320	1.320
Operating Noise Level	L	dB(A)				<	62			
Efficiency at Full loading	η	%				ç	95			
Operating Temperature		T				- 25	to +90			
oporating romporatoro		F				-13 to	+194			
Lubrication						Synthetic Lubi	ication Grease	r:		
Mouting Position						Any Di	rections			
Protection Class						IP	65			
Service lifetime	Ln	h			0	20,000(Continu	ous Operation	)		
Weight	m	kg				12	2.5			
TVOIGHT	III	lb <sub>m</sub>				27	.56			



## SPH120 3-stages

						3-si	ages			
Ratio	i		80	100	125	160	200	256	320	512
Newley I Oaks A Trees		Nm	255	255	255	255	255	255	255	210
Nominal Output Torque		in.lb	2257	2257	2257	2257	2257	2257	2257	1859
Francisco Chan Tarress	_	Nm	510	510	510	510	510	510	510	420
Emergency Stop Torque	T <sub>2Not</sub>	in.lb	4514	4514	4514	4514	4514	4514	4514	3717
Maximum Acceleration Torque	T <sub>28</sub>	Nm	459	459	459	459	459	459	459	378
Maximum Acceleration Torque	1 28	in.lb	4062	4062	4062	4062	4062	4062	4062	3346
Maximum Torque	T <sub>20</sub>	Nm	510	510	510	510	510	510	510	420
Maximum Forque	* 2a	in.lb	4514	4514	4514	4514	4514	4514	4514	3717
Permitted Average Input Speed	n <sub>1N</sub>	rpm				30	00			
Maximum Input Speed	n <sub>1Max</sub>	rpm			100	60	00		201 10	
Mean No Load Running Torque	T <sub>012</sub>	Nm	0.91	0.91	0.91	0.88	0.88	0.88	0.88	0.88
mean no coac reming rorque	012	in.lb	8.05	8.05	8.05	7.79	7.79	7.79	7.79	7.79
Maximum Torsional Backlash	jı	arcmin				<	12			
Torsional Rigidity	C <sub>121</sub>	Nm/arcmin	10	10	10	10	10	10	10	10
Torona rugiany	0121	in.lb/arcmin	88.51	88.51	88.51	88.51	88.51	88.51	88.51	88.51
Maximum Radial Load	F <sub>2AMas</sub>	N				78	00			
THORITICAL EGG	- 24988	lb <sub>r</sub>				175	3.44			
Maximum Axial Load	F <sub>20Mex</sub>	N				70	00			
The state of the s	2000	lb <sub>r</sub>				157	3.60			
Max. Tilting Moment	M <sub>2KSMex</sub>	Nm				40	00			
	270880	in.lb				354	0.28			
Mass Moment of Inertia	j <sub>1</sub>	kgcm²	1.530	1.490	2.570	1.300	1.300	1.300	1.300	1.300
Operating Noise Level	L <sub>PA</sub>	dB(A)				<	62			
Efficiency at Full loading	η	%				9	3			
Operating Temperature		°C				- 25	o +90			
oporating romporation		F				-13 to	+194			
Lubrication			Synthetic Lubrication Grease							
Mouting Position			Any Directions							
Protection Class			IP 65							
Service lifetime	L	h			1	20,000(Continu	ous Operation	)		
Weight	m	kg				15	5.3			
orgin		lb <sub>m</sub>				33	.73			



# SPH160 1-stage

3						1-si	tage			
Ratio	i		3	4	5	6	7	8	9	10
New York Orthodox		Nm	440	544	585	500	480	450	415	400
Nominal Output Torque		in.lb	3894	4815	5178	4425	4248	3983	3673	3540
Francisco Chan Tarrica	-	Nm	880	1088	1170	1000	960	900	830	800
Emergency Stop Torque	T <sub>2Not</sub>	in.lb	7789	9630	10355	8851	8497	7966	7346	7081
Maximum Acceleration Torque	т	Nm	792	979.2	1053	900	864	810	747	720
Maximum Acceleration Torque	T <sub>28</sub>	in.lb	7010	8667	9320	7966	7647	7169	6611	6373
Maximum Torque	T <sub>20</sub>	Nm	880	1088	1170	1000	960	900	830	800
Maximum rorque	7 20	in.lb	7789	9630	10355	8851	8497	7966	7346	7081
Permitted Average Input Speed	n <sub>IN</sub>	rpm				30	000			
Maximum Input Speed	n <sub>1Mix</sub>	rpm				60	100			
Mean No Load Running Torque	T <sub>012</sub>	Nm	2.6	2.5	2.4	2.4	2.4	2.4	2.4	2.4
Wear 140 Load 14d ming 10 que	7 012	in.lb	23.01	22.13	21.24	21.24	21.24	21.24	21.24	21.24
Maximum Torsional Backlash	j <sub>t</sub>	arcmin				<	8			
Torsional Rigidity	C <sub>121</sub>	Nm/arcmin	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
Torsional rigidity	Otza	in.lb/arcmin	254.02	254.02	254.02	254.02	254.02	254.02	254.02	254.02
Maximum Radial Load	F <sub>24Max</sub>	N				10	000			
Waximum Radial Edad	* ZAMBS	lb <sub>r</sub>				224	8.00			
Maximum Axial Load	F <sub>20Max</sub>	N				80	000			
Therefore the second	2000	lb <sub>i</sub>				179	8.40			
Max. Tilting Moment	M <sub>2KMex</sub>	Nm				8	50			
	20,000	in.lb				752	3.10			
Mass Moment of Inertia	j <sub>1</sub>	kgcm²	12.100	7.750	6.000	5.520	5.100	3.740	3.620	3.620
Operating Noise Level	L <sub>PA</sub>	dB(A)				<	68			
Efficiency at Full loading	η	%				g	7			
Operating Temperature		rc				- 25	to +90			
operating tomporation		F				-13 to	+194			
Lubrication						Synthetic Lubr	rication Grease	rs		
Mouting Position						Any Di	rections			
Protection Class						IP	65			
Service lifetime	Lh	h				20,000(Continu	ous Operation	)		
Weight	m	kg				2	2			
	5832	lb <sub>m</sub>				48	.50			



## SPH160 2-stages

						2-s	tages	Si Si		
Ratio	i		12	15	16	20	25	32	40	64
Naminal Outsut Tarrus		Nm	450	450	450	564	608	608	608	450
Nominal Output Torque		in.lb	3983	3983	3983	4992	5381	5381	5381	3983
Emarganou Stan Targua	_	Nm	900	900	900	1128	1216	1216	1216	900
Emergency Stop Torque	T <sub>29hot</sub>	in.lb	7966	7966	7966	9984	10762	10762	10762	7966
Maximum Acceleration Torque	T	Nm	810	810	810	1015.2	1094.4	1094.4	1094.4	810
Maximum Acceleration Torque	T <sub>28</sub>	in.lb	7169	7169	7169	8985	9686	9686	9686	7169
Maximum Torque	T 20	Nm	900	900	900	1128	1216	1216	1216	900
Maximum Torque	/ 20	in.lb	7966	7966	7966	9984	10762	10762	10762	7966
Permitted Average Input Speed	n <sub>IN</sub>	rpm				30	100			
Maximum Input Speed	n <sub>1Max</sub>	rpm			200	60	100	80. 00		
Mean No Load Running Torque	T <sub>012</sub>	Nm	2.5	2.4	2.5	2.4	2.4	2.4	2.4	2.4
Mean No Load Numing Forque	012	in.lb	22.13	21.24	22.13	21.24	21.24	21.24	21.24	21.24
Maximum Torsional Backlash	j,	arcmin				<	10			
Torsional Rigidity	C <sub>121</sub>	Nm/arcmin	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
Torsional regions	O <sub>121</sub>	in.lb/arcmin	254.02	254.02	254.02	254.02	254.02	254.02	254.02	254.02
Maximum Radial Load	F <sub>2AMas</sub>	N				10	000			
Waxii Tadai Load	* ZAMES	lb <sub>i</sub>				224	8.00			
Maximum Axial Load	F <sub>20Max</sub>	N				80	100			
THURST FAIR SOUND	- ZUMB	lb <sub>r</sub>				179	8.40			
Max. Tilting Moment	M <sub>2KMax</sub>	Nm				8	50			
	270000	in.lb				752	3.10	,		
Mass Moment of Inertia	j <sub>1</sub>	kgcm <sup>2</sup>	10.100	8.100	7.470	6.650	5.810	6.340	5.360	4.080
Operating Noise Level	L <sub>PA</sub>	dB(A)				<	68			
Efficiency at Full loading	η	%				ę	95			
Operating Temperature		°C				- 25	to +90			
aparating ramparating		F				-13 to	+194			
Lubrication						Synthetic Lubr	ication Grease			
Mouting Position						Any Di	rections			
Protection Class						IP	65			
Service lifetime	Lh	h				20,000(Continu	ous Operation	n)		
Weight	m	kg				2	5			
	1500	lb <sub>m</sub>				55	.12			



# SPH160 3-stages

						3-si	tages			
Ratio	i		80	100	125	160	200	256	320	512
New lead Outside Tours		Nm	580	580	580	580	608	608	580	450
Nominal Output Torque		in.lb	5133	5133	5133	5133	5381	5381	5133	3983
5	_	Nm	1160	1160	1160	1160	1216	1216	1160	900
Emergency Stop Torque	T <sub>2Not</sub>	in.lb	10267	10267	10267	10267	10762	10762	10267	7966
Mariana Annalandia Tanan	-	Nm	1044	1044	1044	1044	1094.4	1094.4	1044	810
Maximum Acceleration Torque	T <sub>28</sub>	in.lb	9240	9240	9240	9240	9686	9686	9240	7169
Mayina na Tarana	_	Nm	1160	1160	1160	1160	1216	1216	1160	900
Maximum Torque	T <sub>20</sub>	in.lb	10267	10267	10267	10267	10762	10762	10267	7966
Permitted Average Input Speed	n <sub>iN</sub>	rpm				30	00			
Maximum Input Speed	n <sub>1Max</sub>	rpm			v	60	00			
Mana Na Land Dumina Tarris	-	Nm	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Mean No Load Running Torque	T <sub>012</sub>	in.lb	21.24	21.24	21.24	21.24	21.24	21.24	21.24	21.24
Maximum Torsional Backlash	jı	arcmin				\$	12			
Taraianal Dialdit.	_	Nm/arcmin	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
Torsional Rigidity	Ctan	in.lb/arcmin	254.02	254.02	254.02	254.02	254.02	254.02	254.02	254.02
Mariana Ballala ad	_	N				10	000			
Maximum Radial Load	F <sub>2AMes</sub>	lb <sub>r</sub>				224	8.00			
Mandanian Ardall and	-	N				80	00			
Maximum Axial Load	F <sub>2QMax</sub>	lb <sub>i</sub>				179	8.40			
May Tilting Mamont	.,	Nm				8	50			
Max. Tilting Moment	M <sub>2KMex</sub>	in.lb				752	3.10			
Mass Moment of Inertia	j,	kgcm²	7.400	7.300	7.300	6.500	6.500	6.500	6.500	6.500
Operating Noise Level	L	dB(A)				<	68			
Efficiency at Full loading	η	%				S	3			
Operating Temperature		r				- 25	to +90			
Operating Temperature		F				-13 to	+194			
Lubrication						Synthetic Lubr	ication Grease	E		
Mouting Position						Any Di	ections			
Protection Class						IP	65			
Service lifetime	Ln	h				20,000(Continu	ous Operation	)		
Weight	m	kg				2	8			
weight	m	lb <sub>m</sub>				61	.73			



## SPH205 1-stage

		. 1	1-stage									
Ratio	i		3	4	5	6	7	8	9	10		
Naminal Output Targue		Nm	600	1050	1000	800	800	800	710	710		
Nominal Output Torque		in.lb	5310	9293	8851	7081	7081	7081	6284	6284		
Emergency Step Torque	_	Nm	1200	2100	2000	1600	1600	1600	1420	1420		
Emergency Stop Torque	T <sub>29lot</sub>	in.lb	10621	18586	17701	14161	14161	14161	12568	12568		
Maximum Appalantian Targus	_	Nm	1080	1890	1800	1440	1440	1440	1278	1278		
Maximum Acceleration Torque	T <sub>28</sub>	in.lb	9559	16728	15931	12745	12745	12745	11311	11311		
Mavimum Taraua	т.	Nm	1200	2100	2000	1600	1600	1600	1420	1420		
Maximum Torque	T <sub>20</sub>	in.lb	10621	18586	17701	14161	14161	14161	12568	12568		
Permitted Average Input Speed	ed Average Input Speed n <sub>IN</sub> rpm					20	00					
Maximum Input Speed	n <sub>1Max</sub>	rpm	4000									
Mean No Load Running Torque	7	Nm	3.5	3.4	3.2	3.2	3.2	3.2	3.2	3.2		
Mean No Load Running Torque	T <sub>012</sub>	in.lb	30.98	30.09	28.32	28.32	28.32	28.32	28.32	28.32		
Maximum Torsional Backlash	j,	arcmin	≤ 8									
Torsional Pigidity	C <sub>121</sub>	Nm/arcmin	120	120	120	120	120	120	120	120		
Torsional Rigidity		in.lb/arcmin	1062.08	1062.08	1062.08	1062.08	1062.08	1062.08	1062.08	1062.08		
	F <sub>2AMas</sub>	N	16000									
Maximum Radial Load	□ 2AMas	lb,				359	6.80					
Marianum Arial Load	F <sub>20Max</sub>	N	13000									
Maximum Axial Load		lb <sub>i</sub>	2922.40									
Max. Tilting Moment	M <sub>2KStax</sub>	Nm	1280									
wax. Hung women		in.lb	11328.90									
Mass Moment of Inertia	j <sub>1</sub>	kgcm <sup>2</sup>	28.980	23.670	22.750	22.480	22.480	22.590	22.590	22.550		
Operating Noise Level	L <sub>PA</sub>	dB(A)				<	70					
Efficiency at Full loading	η	%	97									
Operating Temperature		°C	℃ - 25 to +90									
Operating remperature		F				-13 to	+194					
Lubrication			Synthetic Lubrication Grease									
Mouting Position			Any Directions									
Protection Class			IP 65									
Service lifetime	Lh	h	20,000(Continuous Operation)									
Weight	m	kg				3	7					
Weight	III	lb <sub>m</sub>				81	.57					



# SPH205 2-stages

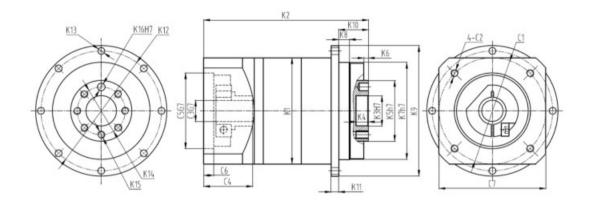
			2-stages										
Ratio	i		12	15	16	20	25	32	40	64			
Namical O. taut Taurus		Nm	1050	650	1050	1000	1000	1050	1000	800			
Nominal Output Torque		in.lb	9293	5753	9293	8851	8851	9293	8851	7081			
5		Nm	2100	1300	2100	2000	2000	2100	2000	1600			
Emergency Stop Torque	T <sub>2Not</sub>	in.lb	18586	11506	18586	17701	17701	18586	17701	14161			
Maximum Appelaration Torque	-	Nm	1890	1170	1890	1800	1800	1890	1800	1440			
Maximum Acceleration Torque	T <sub>28</sub>	in.lb	16728	10355	16728	15931	15931	16728	15931	12745			
Maximum Torque	7	Nm	2100	1300	2100	2000	2000	2100	2000	1600			
waximum rorque	T <sub>2v</sub>	in.lb	18586	11506	18586	17701	17701	18586	17701	14161			
Permitted Average Input Speed	n <sub>1N</sub>	rpm				20	00						
Maximum Input Speed	n <sub>1Max</sub>	rpm	4000										
Mean No Load Running Torque	т	Nm	3.4	3.2	3.4	3.2	3.2	3.2	3.2	3.2			
Weari No Load Rulling Torque	T <sub>012</sub>	in.lb	30.09	28.32	30.09	28.32	28.32	28.32	28.32	28.32			
Maximum Torsional Backlash	j,	arcmin				<	10						
Taraianal Dialdit	C <sub>121</sub>	Nm/arcmin	120	120	120	120	120	120	120	120			
Torsional Rigidity		in.lb/arcmin	1062.08	1062.08	1062.08	1062.08	1062.08	1062.08	1062.08	1062.08			
Maximum Radial Load	F <sub>24Max</sub>	N	16000										
		lb <sub>r</sub>	3596.80										
Maximum Axial Load	F <sub>20Max</sub>	N	13000										
Maximum Axiai Load	* 2QMax	lb <sub>i</sub>				292	2.40						
Max. Tilting Moment	M <sub>2KMex</sub>	Nm	1280										
Max. Titting Mornerit	2VI 2Kildux	in.lb	11328.90										
Mass Moment of Inertia	j,	kgcm²	18.980	16.980	7.540	7.420	7.540	7.140	7.140	7.540			
Operating Noise Level	L	dB(A)				<	70						
Efficiency at Full loading	η	%				ç	5						
Operating Temperature		°C	- 25 to +90										
Operating remperature		F				-13 to	+194						
Lubrication						Synthetic Lubr	ication Grease	rs					
Mouting Position						Any Di	ections						
Protection Class			IP 65										
Service lifetime	Ln	h	20,000(Continuous Operation)										
Weight		kg	42										
weight	m	lb <sub>m</sub>				92	.59						



## SPH205 3-stages

						3-si	tages	S. 60	ari e			
Ratio	ä		80	100	125	160	200	256	320	512		
Naminal Outsut Tarrus		Nm	1000	1000	1000	1000	1000	1000	1000	800		
Nominal Output Torque		in.lb	8851	8851	8851	8851	8851	8851	8851	7081		
Emanage Oten Terror	_	Nm	2000	2000	2000	2000	2000	2000	2000	1600		
Emergency Stop Torque	T <sub>29hot</sub>	in.lb	17701	17701	17701	17701	17701	17701	17701	14161		
Maximum Acceleration Torque	T	Nm	1800	1800	1800	1800	1800	1800	1800	1440		
Maximum Acceleration Torque	T <sub>28</sub>	in.lb	15931	15931	15931	15931	15931	15931	15931	12745		
Maximum Torque	T 20	Nm	2000	2000	2000	2000	2000	2000	2000	1600		
Maximum Forque	7 20	in.lb	17701	17701	17701	17701	17701	17701	17701	14161		
Permitted Average Input Speed	n <sub>1N</sub>	rpm	2000									
Maximum Input Speed	n <sub>1Mex</sub>	rpm		4000								
Mean No Load Running Torque	T <sub>012</sub>	Nm	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2		
mean no coac renning rorque	012	in.lb	28.32	28.32	28.32	28.32	28.32	28.32	28.32	28.32		
Maximum Torsional Backlash	j,	arcmin	≤ 12									
Torsional Rigidity	C <sub>121</sub>	Nm/arcmin	120	120	120	120	120	120	120	120		
	O <sub>121</sub>	in.lb/arcmin	1062.08	1062.08	1062.08	1062.08	1062.08	1062.08	1062.08	1062.08		
Maximum Radial Load	F <sub>2AMas</sub>	N	16000									
Maximum Nadiai Edad	* ZAMES	lb,				359	6.80					
Maximum Axial Load	F <sub>20Mex</sub>	N	13000									
Manifelli / Mai Evad	- ZUMB	lb <sub>r</sub>				292	2.40					
Max. Tilting Moment	M <sub>2KSMux</sub>	Nm	1280									
	270110	in.lb	11328.90									
Mass Moment of Inertia	j <sub>1</sub>	kgcm <sup>2</sup>	7.540	7.420	7.420	7.140	7.140	7.140	7.140	7.140		
Operating Noise Level	Lpa	dB(A)				<	70					
Efficiency at Full loading	η	%				9	13					
Operating Temperature		℃	- 25 to +90									
oporating romporation		F				-13 to	+194					
Lubrication					13	Synthetic Lubr	ication Grease	r.				
Mouting Position			Any Directions									
Protection Class			IP 65									
Service lifetime	Lh	h	20,000(Continuous Operation)									
Weight	m	kg	48									
	- 111	lb <sub>m</sub>				105	5.82					





Model		SPH070		SPH090				SPH120			SPH160		SPH205			
Stage	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	
K1	Φ70		Ф97		Ф 193.2			Ф160			Ф210					
IX.I		Ф2.76		Ф3.82			Φ7.61			Φ6.30			Ф8.27			
K2	88	111.7	135.4	120	148.5	179.8	141	185	203	196	257	318	235	297	358	
INE	3.47	4.40	5.33	4.73	5.85	7.08	5.56	7.29	8.00	7.72	10.13	12.53	9.26	11.70	14.11	
кз		Ф20		Ф31.5			Φ40			Ф50			Ф80			
	Ф0.79		Φ1.24				Φ1.58			Φ1.97		Ф3.15				
K4		8 12			12				12			22.5				
12.5		0.32		0.47			0.47				0.47			0.89		
K5		Φ40			Ф63			Φ80			Ф100			Ф160		
		Ф1.58			Ф2.48			Φ3.15			Ф3.94			Φ6.30		
K6		3		2	6			6			6			6		
1.2%		0.12			0.24			0.24			0.24			0.24		
K7		Φ64			Ф90		Φ110				Ф 140			Ф200		
		Ф2.52		Ф3.55			Ф4.33			Φ5.52			Φ7.88			
К8		7 10				10			14.6			15				
		0.28		0.39			0.39			0.58			0.59			
K9		Ф86 Ф118			Φ145			Ф179			Ф247					
		Φ3.39 19.5		Φ4.65 30			Φ5.71 29			Φ7.05			Φ9.73 56			
K10		0.77		1.18			1.14			38 1.50			2.21			
		5		15	8			1.14		1.50			12			
K11		0.20		0.32		0.39			0.39			0.47				
7		Φ79		Φ109		Φ135			Φ168			Ф233				
K12		Φ79		Φ4.30		Ф5.32			Φ6.62			Ф9.18				
K13	Ψ3.11 8-Φ4.5			8-Φ5.5		8-Φ5.5			12-Φ6.6				12-Ф9			
1110		Ф31.5		Φ50		Ф63			Φ80			Ф125				
K14		Ф1.24		Ф1.97			Ф2.48			Φ3.15			Ф4.93			
K15		7-M5X8		7-M6X12		11-M6X15			11-M8X18			11-M10X17				
K16		Φ5X6		Ф6Х7		Ф6Х7			Φ8X8			Φ10X10				
		Φ70			Φ90		Φ	145	Φ90	Φ2	200	Ф145	Ф215	Ф2	00	
C1		Ф2.76			Ф3.54		Φ.5	5.71	Ф3.55	Φ7	.87	Φ5.71	Ф8.46	Φ7.	.87	
C2		M5X12			M6X15		M8	X20	M6X15	M12	2X25	M8X20	M12X25	M12	X25	
60		Ф14			Ф19		Φ	24	Ф19	Ф	35	Ф24	Φ42	Ф3	15	
C3		Φ0.55 Φ0.75		Φ(	).94	Ф0.75	Ф1	.38	Ф0.94	Ф1.65	Ф1.	38				
C4		32.1		41.6		6	1.3	41.6	8	2	61.3	82.5	82	2		
04		1.26		1.64		2.	42	1.64	3.23 2.42		3.25	3.2	:3			
C5		Ф50		Φ70		Ф110 Ф70		Φ70	Ф114.3 Ф110		Ф180 Ф114.3		4.3			
03		Ф1.97		Ф2.76		Ф4.33		Ф2.76	Ф	4.5	Ф4.33	Φ7.09	Φ4	.5		
C6		6.5		6.5		8		6.5		В	8	8	8			
		0.26		0.26		0.32 0.20		0.26	0.32 0.32		0.32 0.32		2			
C7		70		97		1:	20	89	1	75	120	190	17	5		
0,	2.76				3.82			73	3.51	6.90 4.73			7.49	6.9	0	

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

#### Technical Memo

