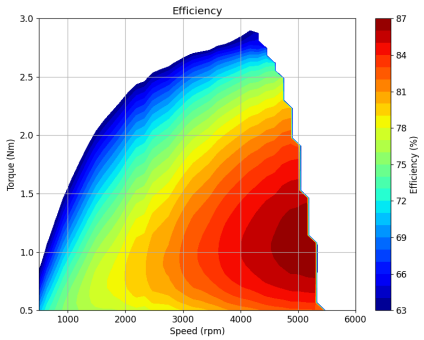
X60-Kv120

The X60 is the world's safest and most powerful UAV motor, designed specifically for 30kg industrial hexacopters and octocopters with 12S batteries and 28" or 30" propellers. Designed with IP-55 rating, 1000h lifetime and the ability to land the drone safely in the unlikely event of motor failure, even at an ambient temperature of 40 degrees Celsius and 42V, the X60 is the natural choice for safety critical missions.

The motor consists of a slotless stator featuring Alva Industries' patented FiberPrinted™ winding, and an inrunner Halbach PM rotor providing a mass- and energy efficient solution.

X60	Efficiency map
	

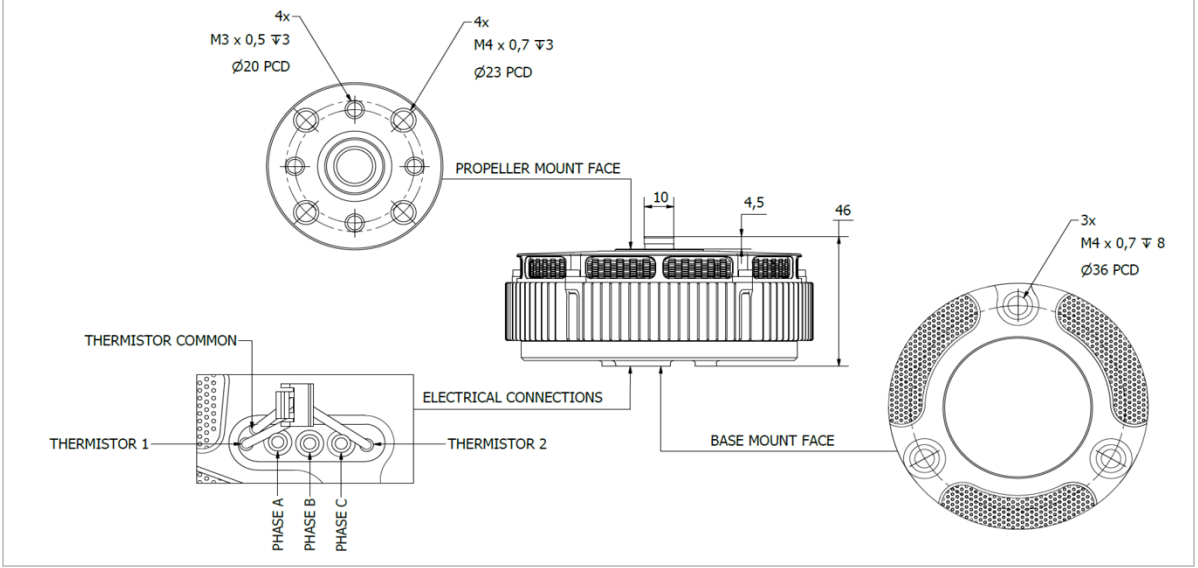
Simulated values at 44 V, 25 kHz switching and 20 C ambient.

System data		
MTOW - Octocopter (Co-axial setup)	30 kg	
MTOW - Hexacopter	30 kg	
MTOW - Quadcopter	20 kg	
Propeller	Alva-Mejzlik 30"	
Nominal voltage*	44 V (12S)	
** Winding connections can be modified upon request to accommodate other system voltages and propellers.*		

Motor data		
Motor type	Three-phase slotless BLDC inrunner	
Ambient operating temp	Min: -15°C.Max: +40°C	
IP rating	IP-55	Protected against dust and rain
Design Life	1000h	
Winding connection	Wye	
Stator/Rotor Poles	34	
Voltage Constant*	8.18 V/kRPM	Peak line-line back-EMF
Speed Constant(Kv)*	122.2 rpm/V	
Torque Constant*	95.0 mNm/A_{RMS}	Sinusoidal current (FOC drive)
No-load speed	5427 RPM	
No-load current	455 mA_{RMS}	Sinusoidal current (FOC drive)
Line-to-line Inductance	9.16 µH	
Line-to-line Resistance*	153.9 mΩ	
P/N	103214	
**Provided values are based on simulation, under assumption of 20 C magnet and winding temperature. Actual values depend on operating conditions and load cycle.*		

Mechanical Data		
Outer Diameter	103 mm	
Axial Length	46 mm	
Motor Mass (Excl. cables)	394 g	

Drawing



System performance		
Alva-Mejzlik 30" propeller – Single (ALTUS Uno)		
Hover thrust	5 kg	8.6 g/W
Max continuous thrust	8.2 kg	6.5 g/W
Max thrust	11.8 kg	5.3 g/W

Alva-Mejzlik 30" propeller – Co-axial (ALTUS Duo)		
Hover thrust	7.5 kg	7.7 g/W
Max continuous thrust	13.5 kg	5.6 g/W
Max thrust	19.5 kg	4.6 g/W

At 20°C &44VDC.

ALTUS X60 Uno - 28"							
X60-Kv120			Alva-Mejzlik 28"			Single	
@44VDC & 20°C							
Duty cycle (%)	Thrust (g)	Torque (Nm)	Speed (RPM)	Battery current (A)	Power (W)	Efficiency (g/W)	
40.0	2253	0.71	2003	4.6	207.4	10.9	Continuous
45.0	2815	0.89	2228	6.3	281.6	10.0	
50.0	3439	1.10	2453	8.4	372.9	9.2	
55.0	4096	1.31	2667	10.8	478.2	8.6	
60.0	4789	1.53	2875	13.6	601.9	8.0	
65.0	5530	1.77	3080	16.9	748.7	7.4	
70.0	6264	2.00	3270	20.6	914.1	6.9	
75.0	6996	2.23	3448	24.7	1098	6.4	
80.0	7766	2.48	3625	29.3	1301	6.0	
85.0	8586	2.74	3804	34.2	1518	5.7	Transient
90.0	9467	3.03	3986	39.8	1766	5.4	
95.0	10337	3.31	4158	45.6	2023	5.1	
100.0	11137	3.56	4309	51.4	2280	4.9	

ALTUS X60 Duo - 28"							
X60-Kv120			Alva-Mejzlik 28"			Co-axial	
@44VDC & 20°C							
Duty cycle (%)	Thrust (g)	Torque (Nm)	Speed (RPM)	Battery current (A)	Power (W)	Efficiency (g/W)	
40.0	3639	0.71	2003	8.9	393.4	9.2	Continuous
45.0	4552	0.89	2228	12.0	532.5	8.5	
50.0	5562	1.10	2453	15.9	703.8	7.9	
55.0	6642	1.31	2667	20.4	905.4	7.3	
60.0	7779	1.53	2875	25.6	1137	6.8	
65.0	8987	1.77	3080	31.8	1412	6.4	
70.0	10221	2.00	3270	38.9	1728	5.9	
75.0	11450	2.23	3448	46.8	2080	5.5	
80.0	12737	2.48	3625	55.8	2478	5.1	
85.0	14058	2.74	3804	65.3	2898	4.9	Transient
90.0	15511	3.03	3986	76.0	3372	4.6	
95.0	16945	3.31	4158	87.0	3863	4.4	
100.0	18274	3.56	4309	98.0	4350	4.2	
Co-axial performance is highly dependent on setup and operation conditions, data provided should only be used as reference values							

ALTUS X60 Uno – 30"							
X60-Kv120			Alva-Mejzlik 30"			Single	
@44VDC & 20°C							
Duty cycle (%)	Thrust (g)	Torque (Nm)	Speed (RPM)	Battery current (A)	Power (W)	Efficiency (g/W)	
40.0	2251	0.69	2008	4.525	200.9	11.2	Continuous
45.0	2851	0.85	2241	6.135	272.4	10.5	
50.0	3501	1.04	2466	7.978	354.2	9.9	
55.0	4218	1.24	2689	10.29	456.9	9.2	
60.0	4965	1.45	2901	13.03	578.3	8.6	
65.0	5749	1.68	3105	16.15	717.0	8.0	
70.0	6577	1.92	3305	19.66	872.7	7.5	
75.0	7388	2.15	3489	23.68	1051	7.0	
80.0	8205	2.39	3663	28.31	1257	6.5	
85.0	9091	2.65	3842	33.16	1472	6.2	Transient
90.0	10040	2.93	4024	38.54	1711	5.9	
95.0	10973	3.21	4193	44.40	1971	5.6	
100.0	11848	3.48	4346	49.97	2219	5.3	

ALTUS X60 Duo – 30"							
X60-Kv120			Alva-Mejzlik 30"			Co-axial	
@44VDC & 20°C							
Duty cycle (%)	Thrust (g)	Torque (Nm)	Speed (RPM)	Battery current (A)	Power (W)	Efficiency (g/W)	
40.0	3636	0.69	2008	8.6	380.9	9.5	Continuous
45.0	4611	0.85	2241	11.6	514.7	9.0	
50.0	5668	1.04	2466	15.1	669.1	8.5	
55.0	6828	1.24	2689	19.4	860.9	7.9	
60.0	8061	1.45	2901	24.6	1090	7.4	
65.0	9349	1.68	3105	30.4	1350	6.9	
70.0	10720	1.92	3305	37.2	1650	6.5	
75.0	12074	2.15	3489	44.8	1991	6.1	
80.0	13459	2.39	3663	53.8	2387	5.6	
85.0	14903	2.65	3842	63.3	2811	5.3	Transient
90.0	16443	2.93	4024	73.5	3264	5.0	
95.0	17985	3.21	4193	84.6	3757	4.8	
100.0	19440	3.48	4346	95.6	4246	4.6	
Co-axial performance is highly dependent on setup and operation conditions, data provided should only be used as reference values							

X60-Kv120	Mejzlik 26x8.7	Single

@44VDC & 20°C

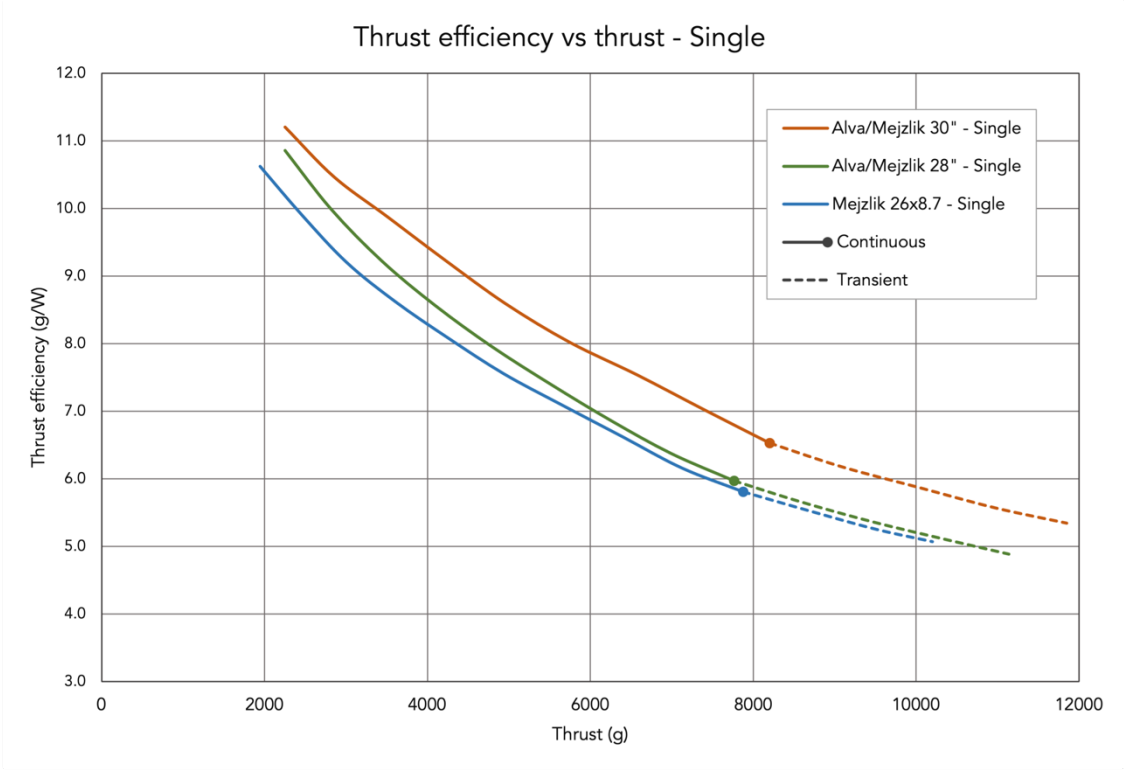
Duty cycle (%)	Thrust (g)	Torque (Nm)	Speed (RPM)	Battery current (A)	Power (W)	Efficiency (g/W)	
40.0	1948	0.61	2027	4.1	183.3	10.6	Continuous
45.0	2459	0.77	2265	5.6	248.2	9.9	
50.0	3010	0.94	2493	7.4	327.2	9.2	
55.0	3608	1.12	2717	9.4	418.6	8.6	
60.0	4264	1.33	2942	11.9	527.9	8.1	
65.0	4940	1.54	3155	14.7	654.0	7.6	
70.0	5645	1.75	3361	17.9	795.6	7.1	
75.0	6393	1.98	3566	21.7	965.3	6.6	
80.0	7120	2.21	3753	26.0	1156	6.2	
85.0	7876	2.44	3938	30.6	1356	5.8	
90.0	8676	2.69	4123	35.3	1569	5.5	Transient
95.0	9502	2.94	4305	40.7	1808	5.3	
100.0	10199	3.16	4452	45.3	2012	5.1	

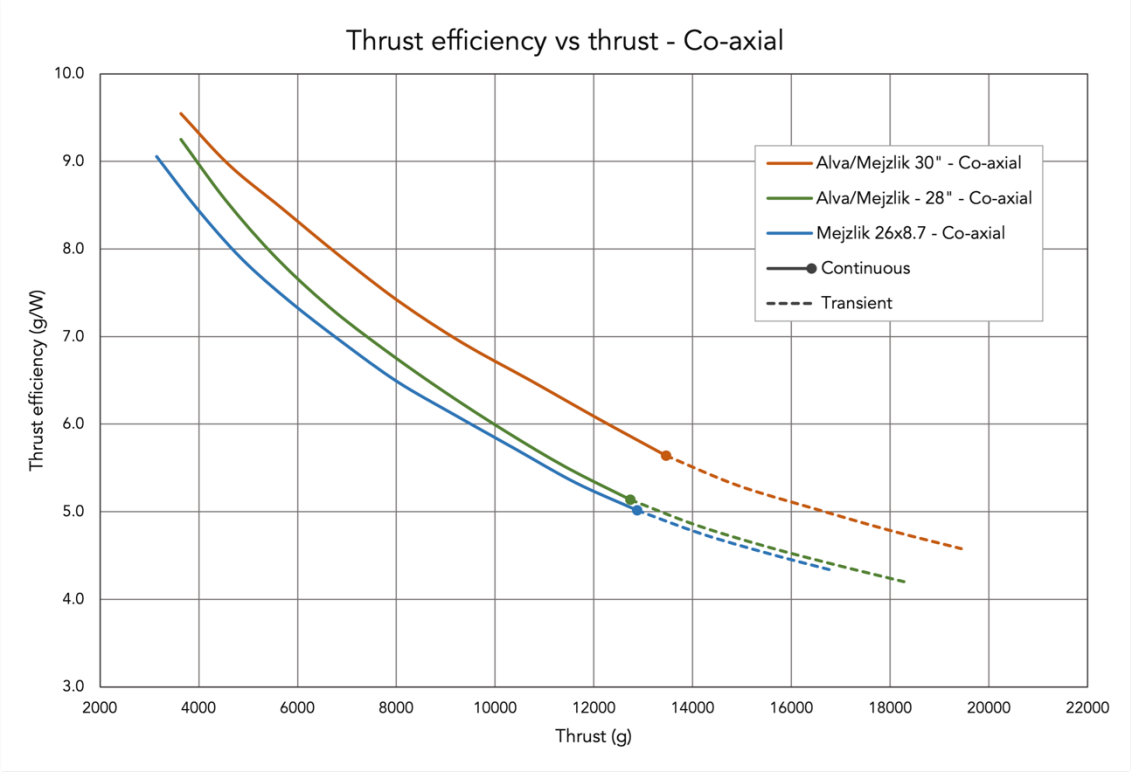
X60-Kv120	Mejzlik 26x8.7	Co-axial

@44VDC & 20°C

Duty cycle (%)	Thrust (g)	Torque (Nm)	Speed (RPM)	Battery current (A)	Power (W)	Efficiency (g/W)	
40.0	3142	0.61	2027	7.8	347.1	9.1	Continuous
45.0	3971	0.77	2265	10.6	469.7	8.5	
50.0	4867	0.94	2493	13.9	617.0	7.9	
55.0	5840	1.12	2717	17.8	789.1	7.4	
60.0	6899	1.33	2942	22.4	994	6.9	
65.0	8016	1.54	3155	27.8	1236	6.5	
70.0	9176	1.75	3361	33.8	1502	6.1	
75.0	10398	1.98	3566	40.9	1817	5.7	
80.0	11629	2.21	3753	49.1	2180	5.3	
85.0	12879	2.44	3938	57.8	2567	5.0	
90.0	14187	2.69	4123	67.3	2989	4.7	Transient
95.0	15549	2.94	4305	77.5	3440	4.5	
100.0	16759	3.16	4452	87.0	3862	4.3	

Co-axial performance is highly dependent on setup and operation conditions, data provided should only be used as reference values





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