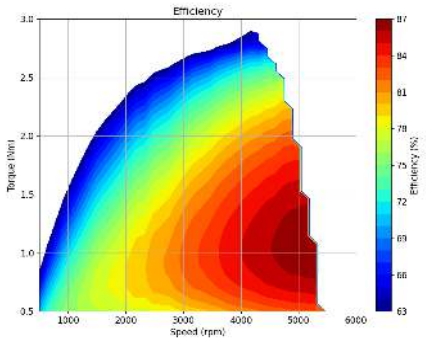
X60-Kv120

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
	

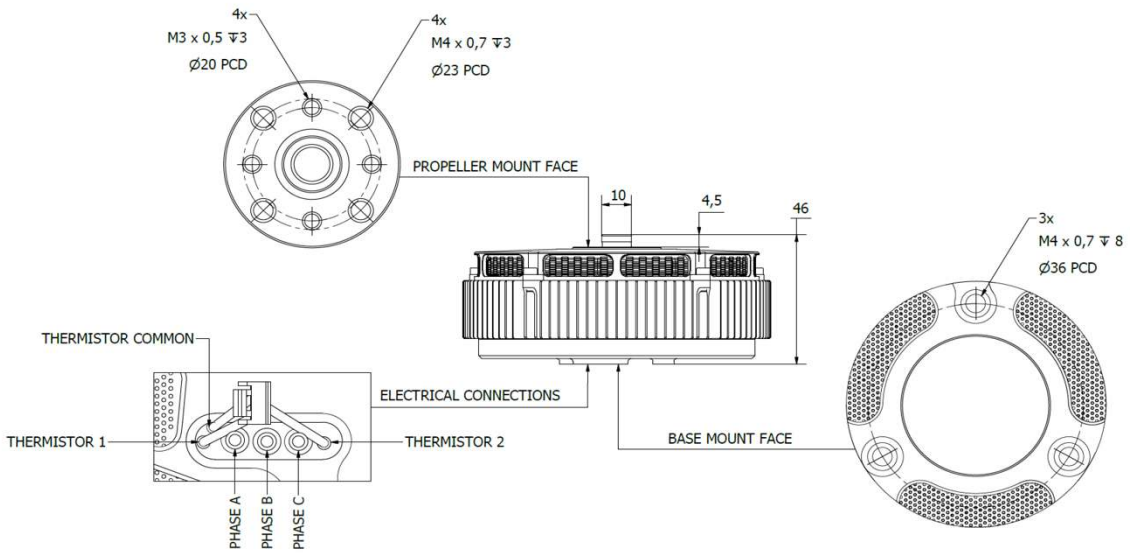
Simulated values at 44 V, 25 kHz switching and 20 C ambient.

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*	8.02 V/kRPM	Peak line-line back-EMF
Speed Constant(Kv)*	124.7 rpm/V	
Torque Constant*	93.2 mNm/A_{RMS}	Sinusoidal current (FOC drive)
No-load speed	5536 RPM	
No-load current	542.5 mA_{RMS}	Sinusoidal current (FOC drive)
Line-to-line Inductance	9.05 µH	
Line-to-line Resistance*	154.2 mΩ	
P/N	104306	
**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)	403 g	

Drawing



System performance		
Alva-Mejzlik 30" propeller – Single (ALTUS X60 Uno)		
Hover thrust	5 kg	8.2 g/W
Continuous thrust	7.4 kg	6.4 g/W
Peak thrust	11.6 kg	4.8 g/W

Alva-Mejzlik 30" propeller – Co-axial (ALTUS X60 Duo)		
Hover thrust	7.5 kg	7.4 g/W
Max continuous thrust	12.2 kg	5.5 g/W
Max thrust	19.2 kg	4.0 g/W

At 20°C &44VDC.

ALTUS X60 Uno - 28"							
X60-Kv120		Alva-Mejzlik 28"			Single		
@44.4VDC & 20°C							
Duty cycle (%)	Thrust (g)	Torque (Nm)	Speed (RPM)	Battery current (A)	Power (W)	Efficiency (g/W)	
40	2293	0.73	2019	4.5	198	11.6	Continuous
45	2844	0.90	2239	6.1	270	10.5	
50	3457	1.10	2459	8.1	359	9.6	
55	4111	1.31	2672	10.4	464	8.9	
60	4789	1.53	2875	13.2	585	8.2	
65	5496	1.75	3071	16.3	724	7.6	
70	6213	1.98	3257	19.8	879	7.1	
75	6913	2.21	3428	23.6	1049	6.6	
80	7586	2.42	3584	27.7	1231	6.2	
85	8225	2.63	3726	32.2	1428	5.8	Transient
90	8787	2.81	3846	36.7	1630	5.4	
95	9467	3.03	3985	41.8	1856	5.1	
100	10115	3.23	4114	46.5	2063	4.9	

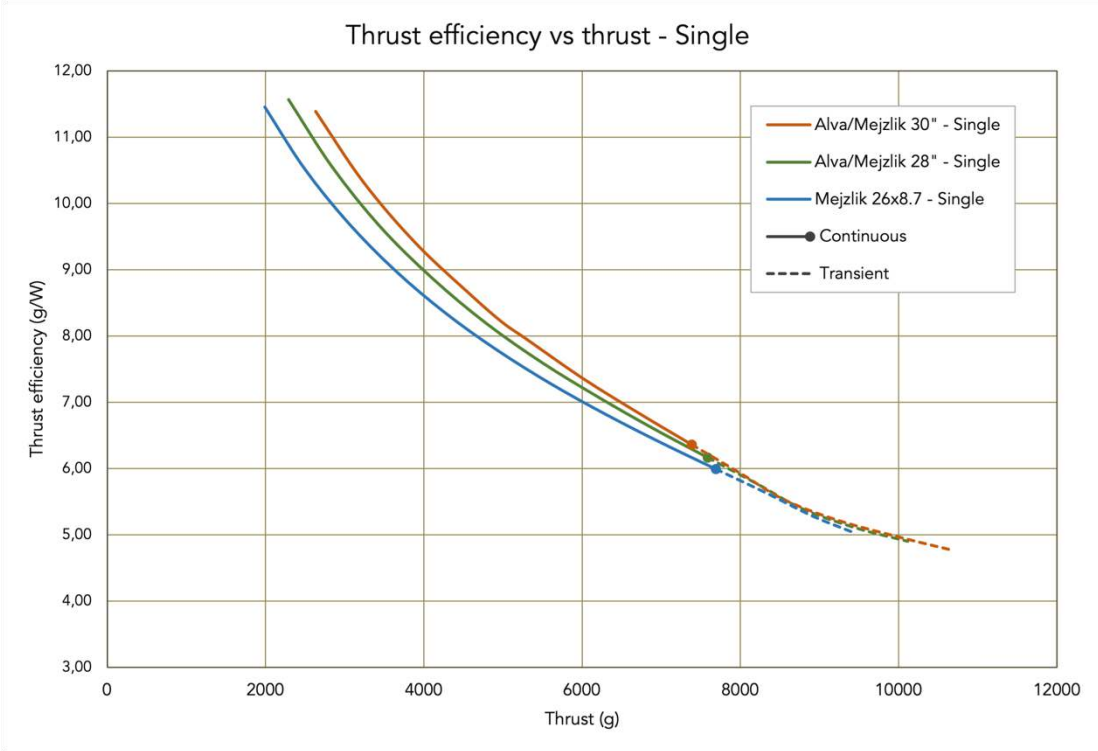
ALTUS X60 Duo - 28"							
X60-Kv120		Alva-Mejzlik 28"			Co-axial		
@44.4VDC & 20°C							
Duty cycle (%)	Thrust (g)	Torque (Nm)	Speed (RPM)	Battery current (A)	Power (W)	Efficiency (g/W)	
40	3706	0.7	2019	8.4	374	9.9	Continuous
45	4604	0.9	2239	11.5	509	9.0	
50	5601	1.1	2459	15.2	677	8.3	
55	6670	1.3	2672	19.7	876	7.6	
60	7789	1.5	2875	24.9	1106	7.0	
65	8952	1.8	3071	30.8	1370	6.5	
70	10143	2.0	3257	37.5	1667	6.1	
75	11324	2.2	3428	44.9	1995	5.7	
80	12468	2.4	3584	52.9	2349	5.3	
85	13562	2.6	3726	61.5	2731	5.0	Transient
90	14562	2.8	3846	70.6	3134	4.6	
95	15626	3.0	3985	80.3	3565	4.4	
100	16638	3.2	4114	89.1	3954	4.2	
Co-axial performance is highly dependent on setup and operation conditions, data provided should only be used as reference values							

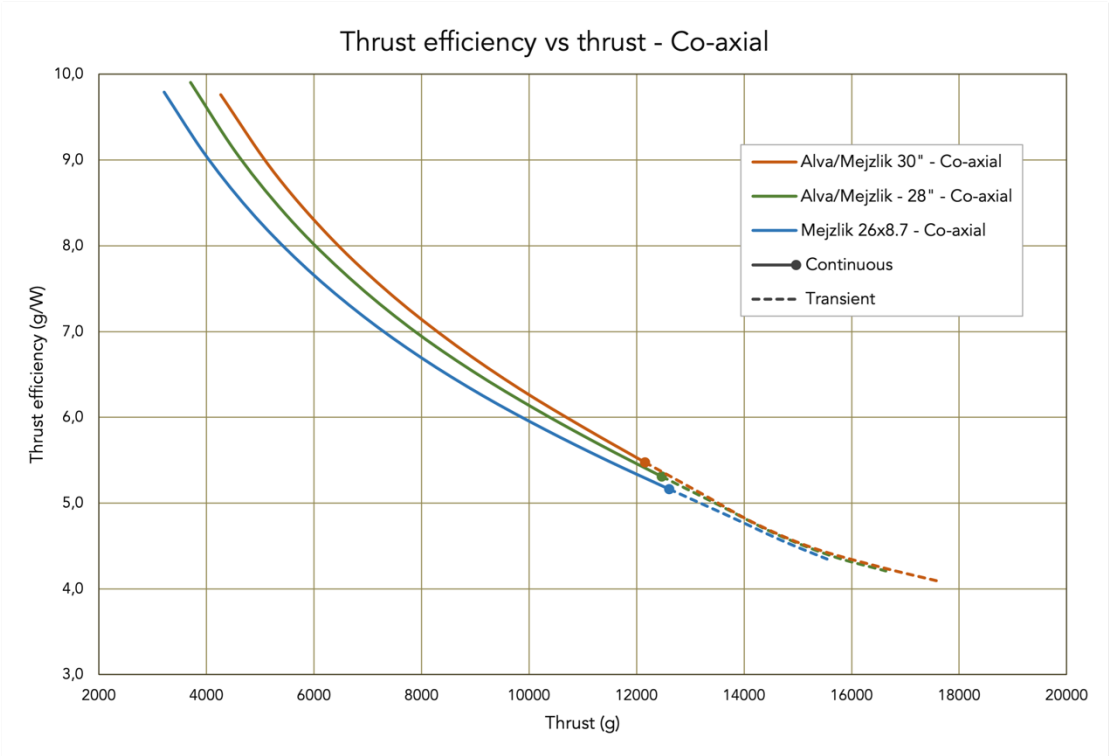
ALTUS X60 Uno – 30"							
X60-Kv120		Alva-Mejzlik 30"			Single		
@44.4VDC & 20°C							
Duty cycle (%)	Thrust (g)	Torque (Nm)	Speed (RPM)	Battery current (A)	Power (W)	Efficiency (g/W)	
40	2635	0.86	1981	5.2	231	11.4	Continuous
45	3238	1.06	2193	7.1	314	10.3	
50	3898	1.28	2404	9.3	415	9.4	
55	4584	1.51	2604	12.0	531	8.6	
60	5297	1.75	2797	15.0	666	8.0	
65	6008	1.98	2976	18.4	816	7.4	
70	6718	2.22	3145	22.1	983	6.8	
75	7388	2.44	3296	26.2	1162	6.4	
80	8007	2.64	3430	30.4	1351	5.9	
85	8556	2.82	3544	34.9	1548	5.5	Transient
90	9245	3.05	3682	39.9	1773	5.2	
95	10054	3.32	3838	45.7	2031	5.0	
100	10694	3.53	3957	50.6	2245	4.8	

ALTUS X60 Duo – 30"							
X60-Kv120		Alva-Mejzlik 30"			Co-axial		
@44.4VDC & 20°C							
Duty cycle (%)	Thrust (g)	Torque (Nm)	Speed (RPM)	Battery current (A)	Power (W)	Efficiency (g/W)	
40	4266	0.86	1981	9.8	437	9.8	Continuous
45	5249	1.06	2193	13.3	592	8.9	
50	6328	1.28	2404	17.6	783	8.1	
55	7455	1.51	2604	22.6	1004	7.4	
60	8633	1.75	2797	28.4	1262	6.8	
65	9823	1.98	2976	34.9	1551	6.3	
70	11010	2.22	3145	42.1	1871	5.9	
75	12158	2.44	3296	50.0	2221	5.5	
80	13228	2.64	3430	58.4	2591	5.1	Transient
85	14198	2.82	3544	67.1	2980	4.8	
90	15271	3.05	3682	76.8	3410	4.5	
95	16548	3.32	3838	87.7	3893	4.3	
100	17625	3.53	3957	97.1	4313	4.1	
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	
@44.4VDC & 20°C							
Throttle (µs)	Thrust (g)	Torque (Nm)	Speed (RPM)	Battery current (A)	Power (W)	Efficiency (g/W)	
40	1991	0.63	2048	3.9	173.8	11.5	Continuous
45	2486	0.78	2276	5.3	236.0	10.5	
50	3036	0.95	2503	7.0	312.4	9.7	
55	3634	1.13	2726	9.1	404.2	9.0	
60	4270	1.33	2943	11.5	511.5	8.3	
65	4929	1.53	3151	14.3	633.3	7.8	
70	5618	1.74	3353	17.4	773.0	7.3	
75	6319	1.96	3546	20.9	929.0	6.8	
80	7009	2.17	3725	24.7	1099	6.4	
85	7692	2.38	3893	28.9	1285	6.0	
90	8330	2.58	4043	33.3	1480	5.6	Transient
95	8908	2.76	4174	38.0	1686	5.3	
100	9401	2.91	4282	42.0	1863	5.0	

X60-Kv120			Mejzlik 26x8.7			Co-axial	
@44.4VDC & 20°C							
Duty cycle (%)	Thrust (g)	Torque (Nm)	Speed (RPM)	Battery current (A)	Power (W)	Efficiency (g/W)	
40	3214	0.63	2048	7.4	328	9.8	Continuous
45	4017	0.78	2276	10.0	445	9.0	
50	4914	0.95	2503	13.3	590	8.3	
55	5885	1.13	2726	17.2	762	7.7	
60	6924	1.33	2943	21.7	965	7.2	
65	8009	1.53	3151	27.0	1197	6.7	
70	9139	1.74	3353	32.9	1461	6.3	
75	10302	1.96	3546	39.6	1759	5.9	
80	11462	2.17	3725	47.0	2085	5.5	
85	12609	2.38	3893	55.0	2442	5.2	
90	13710	2.58	4043	63.6	2826	4.9	Transient
95	14722	2.76	4174	72.7	3229	4.6	
100	15540	2.91	4282	80.5	3574	4.3	
Co-axial performance is highly dependent on setup and operation conditions, data provided should only be used as reference values							





Contact Details
Alva Industries A/S
Fossegrenda 1
7038 Trondheim, Norway
+47 969 43 427
sales@alvaindustries.com | www.alvaindustries.com