KeepMotion eVTOL motors

Applications

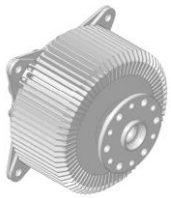
- Ligth aircraft
- Heavy duty propulsion
- Heavy Drones

Description

The eVTOL motor of KeepMotion engines developed for light aeronautical applications, where a high torque/mass ratio is required. Its current design uses forced convection cooling via the motor's propeller, although a water-cooled version is also available to guarantee operation in all conditions. The motor is designed with a redundant architecture, enabling it to be used despite the failure of any of the system's components.

This motors are capable of making from 20 kW to 200 kW output power and can be adapted from 48 V to 800V depending on the power*.

KM190-eVTOL

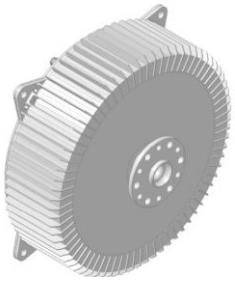


20 – 40 kW

KM280-eVTOL

40 – 80 kW

KM380-eVTOL



80 – 200 kW

Tested solution and custom development

The KMeVTOL motors were designed to support high axial load and varying radial loads for gyroscopic issues.

For specific power of adapted design, KeepMotion is capable of adapting the design to you specific need.

(*) Winding voltage can be studied on request from the customer

▪ Spécification (with forced air cooling)

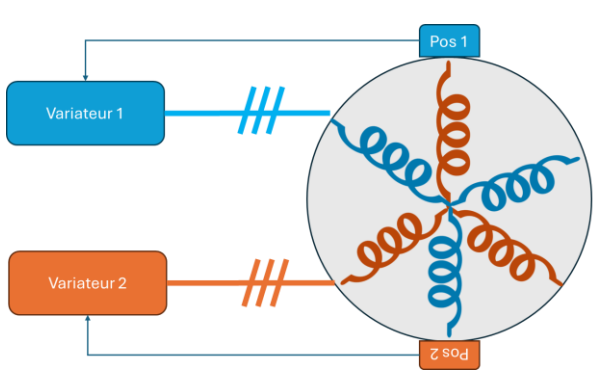
		KM190	KM280	KM380	UNIT
Vn	Nominal speed	2000 - 3500	2000 - 3000	1800 - 2500	RPM
Vm	Max speed	5000	4500	4000	RPM
Cn	Nominal torque	60	200	500	Nm
C peak	Peak torque	100	400	1000	Nm
Np	Number of pôles	20	24	30	
Un	Supply voltage	80 - 800	200-800*	400-800*	V
η	Max efficiency		96**	97**	%

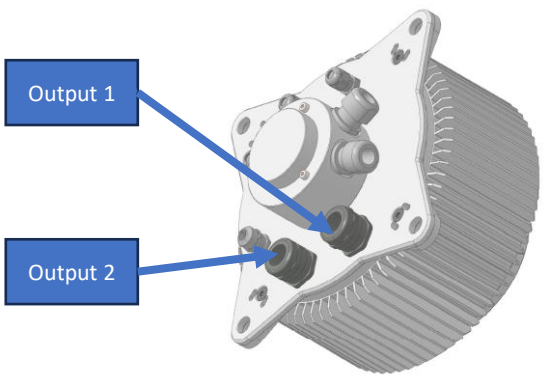
(*) The motor can also be wound at higher and lower voltages. Lower voltages will be studied on a case-by-case basis.
(**) efficiency is calculated excluding bearing friction torque and internal aerolic losses.

	KM190	KM280	KM380	UNIT
Moteur weigth	8	20	40	Kg
Thermal sensor type		P1000***	P1000***	
Number of thermal sensors	2			
Position sensors	Resolver + GMR			
Thermal class	180			°C
Housing material	Aluminium			
Power cable section****	12 - 25	35-50	2x 35-50	mm²

(***) modifiable on request

▪ Architecture

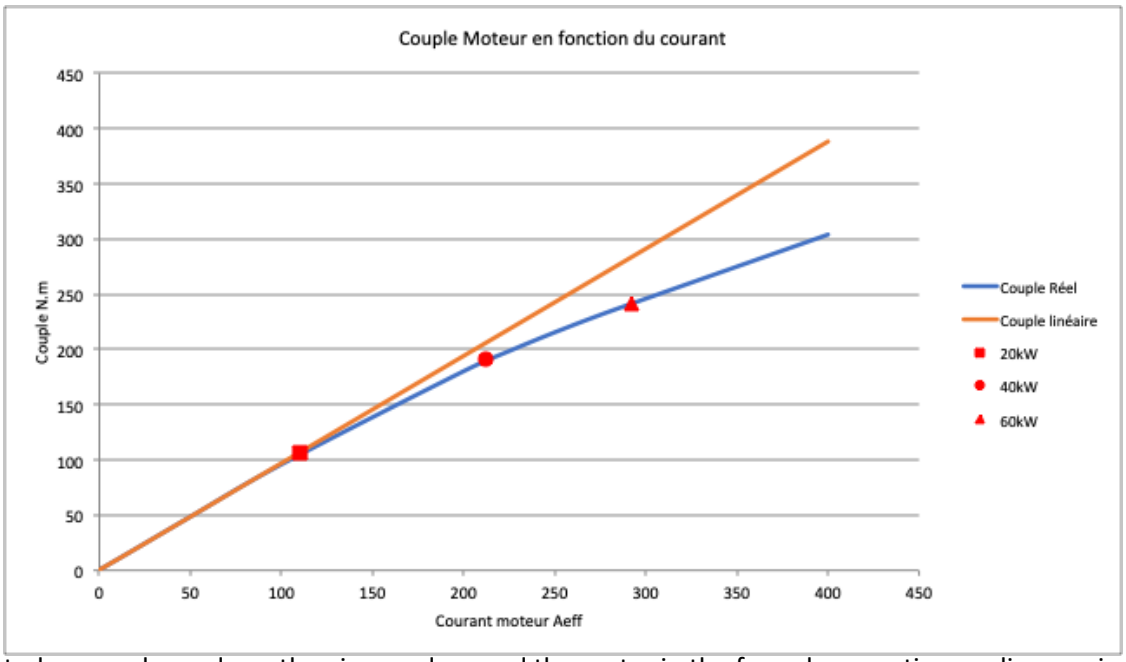




The motors for this applications are designed to be powered by 1 or 2 drives on 2 three-phase windings in the stator. In addition, each drive has a dedicated position sensor in different technologies (1 resolver-type sensor and 1 GMR sensor). In the event of the loss of any element in the chain, it will still be possible to ensure motor rotation.

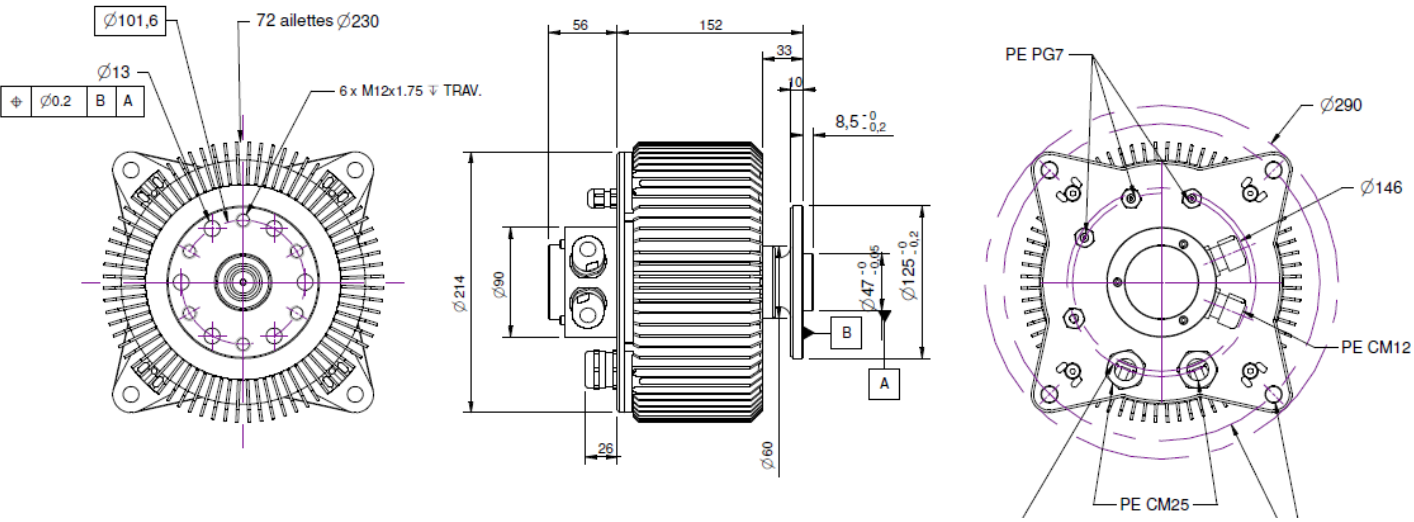
This motor can also be wound as a single three-phase motor with a single inverter, if required.

KM280-eVTOL Torque curve

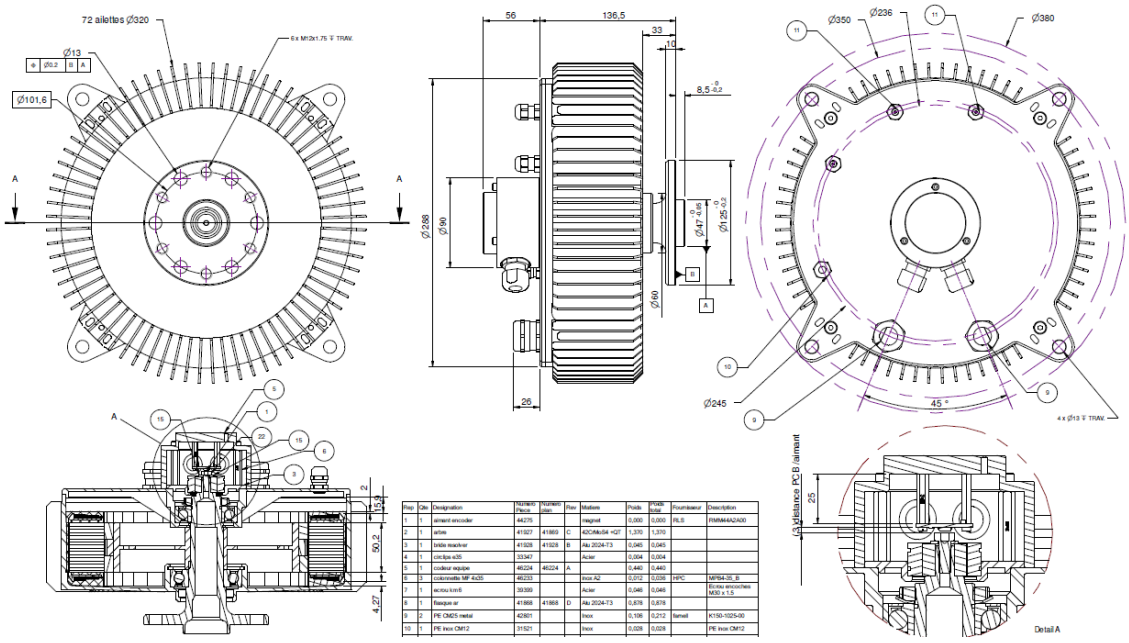


Rated power depends on the air speed around the motor in the forced convection cooling version.

Dimensions and drawings KM190-eVTOL



▪ Dimensions and drawings KM280-eVTOL



Rep	Qte	Designation	Numéro Pièce	Numéro plan	Rev	Matière	Poids	Poids total	Fournisseur	Description
1	1	aimant encoder	44275			magnet	0,000	0,000	RLS	RMM44A2A00
2	1	arbre	41927	41860	C	42CrMo4 +QT	1,370	1,370		
3	1	bride moteur	41928	41328	B	Al 2024-T3	0,045	0,045		
4	1	circlips e35	33347			Acier	0,004	0,004		
5	1	codeur equipe	46224	46224	A		0,440	0,440		
6	3	colonnette MF 4x35	46233			Inox A2	0,012	0,036	HPC	MPB4-35_B
7	1	ecrou km6	39368			Acier	0,046	0,046		Ecrou encoches M30 x 1.5
8	1	flasque ar	41866	41866	D	Al 2024-T3	0,878	0,878		
9	2	PE CM25 metal	42801			Inox	0,106	0,212	Itemell	K150-1025-00
10	1	PE Inox CM12	31521			Inox	0,028	0,028		PE Inox CM12

▪ Dimensions and drawings KM380-eVTOL