iQRON

Intelligent Return On Nature

SMALL WIND TURBINES

DATA SHEET
IQR 5.0

AT A GLANCE

TYPE

iQron 5.0	5,0 kW small wind turbine
	horizontal axis

DESIGN

Every single part	...is designed by iQron engineers specifically for purpose reaching optimized system performance
	...is designed for an easy to cast & mill manufacturing procedure
	...will be manufactured in serial production leading to low costs

QUALITY

Industrial certified supply chain:	Automotive, Marine
Industrial quality in each single part:	multipole generator,
	24 heat resistant NdFeB magnets (temp. class F),
	multi-cooling design
	self-breaking wings (STALL-reg.)
	long life time material
Elementary basic design:	no commodity parts used
	easy mounting & dismounting

MAINTENANCE

Maintenance-free:	**no tear and wear parts** **fully sealed bearings** **no grease** **no oil**

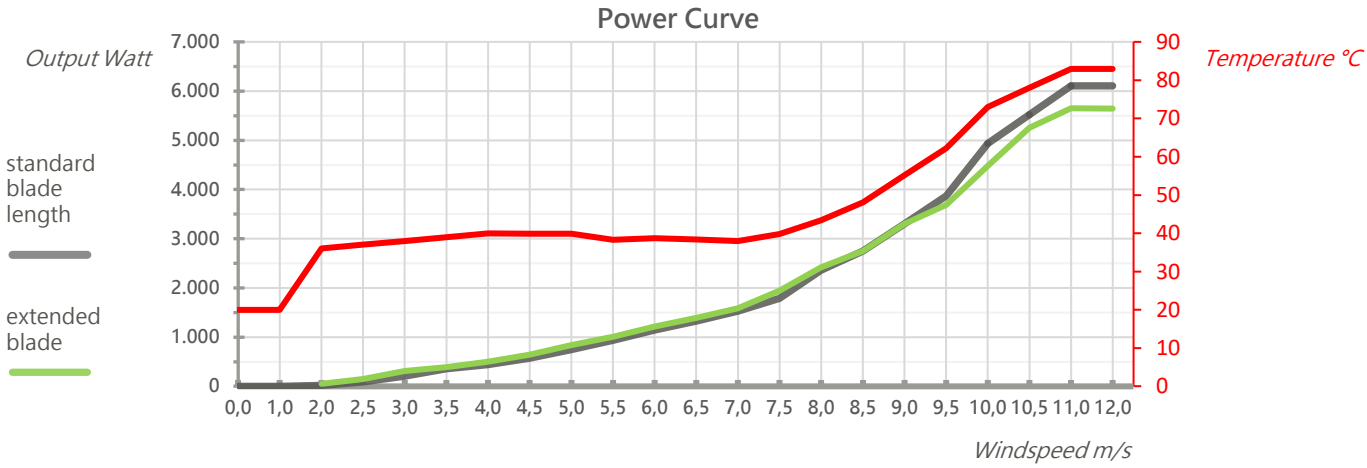
private property (Germany)

5 kW on 12 m single pole

Installation procedure
at private property (Germany)

PERFORMANCE

				blade extension
Windspeed	Revolution	Operating	OUTPUT	OUTPUT
m/s	rpm	Ampere	Watt	Watt
0,0	0	0,0	-	
1,0	0	0,0	-	
2,0	60	0,1	19	50
2,5			89	148
3,0	70	1,0	209	314
3,5	80	1,5	356	393
4,0	90	1,7	442	501
4,5	100	2,0	570	642
5,0	110	2,5	748	841
5,5	120	3,0	939	1.007
6,0	130	3,5	1.145	1.216
6,5			1.324	1.392
7,0	140	4,5	1.530	1.585
7,5	150	5,0	1.785	1.943
8,0	170	6,3	2.363	2.419
8,5	190	7,0	2.751	2.751
9,0	210	8,0	3.304	3.304
9,5	230	9,0	3.870	3.686
10,0	250	11,0	4.939	4.482
10,5	260	12,0	5.520	5.255
11,0	270	13,0	6.110	5.654
12,0	270	13,0	6.110	5.649



GENERAL

iQRON preferes to source pole systems locally, manufactured by suppliers familiar with local building regulatory framework

DIMENSIONS

Recommended minimum height: 7.5m
Highest tower realized so far: 22m

In gerneral, iQRON-delivered poles are suitable for wind load zone 4 (up to 180km/h); stronger structures upon request

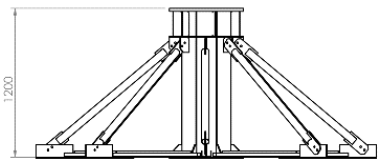
INSTALLATION

iQRON preferes lifting poles for on-ground-assembling of the turbine; hydraulic lifting equipment available upon request

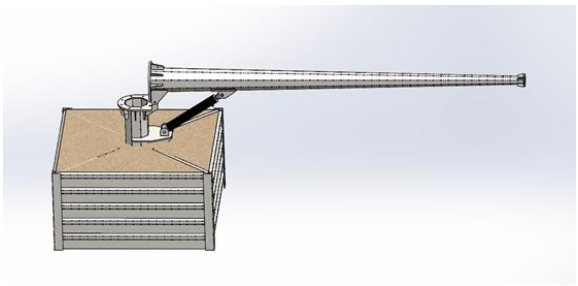
FOUNDATION

1) Concrete foundation

2) Concrete-free foundation: steel structure is fixed into a excavation pit by refilling the extracted material



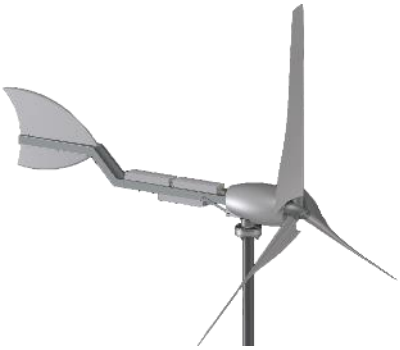
3) Concrete-free foundation: using a planter box refilled with soil



OFF-GRID

WIND CHARGER with bi-directional operation and dumpload 10 kW

Battery System with 24/48/96 V Max. 350 Volt AC, 14 A



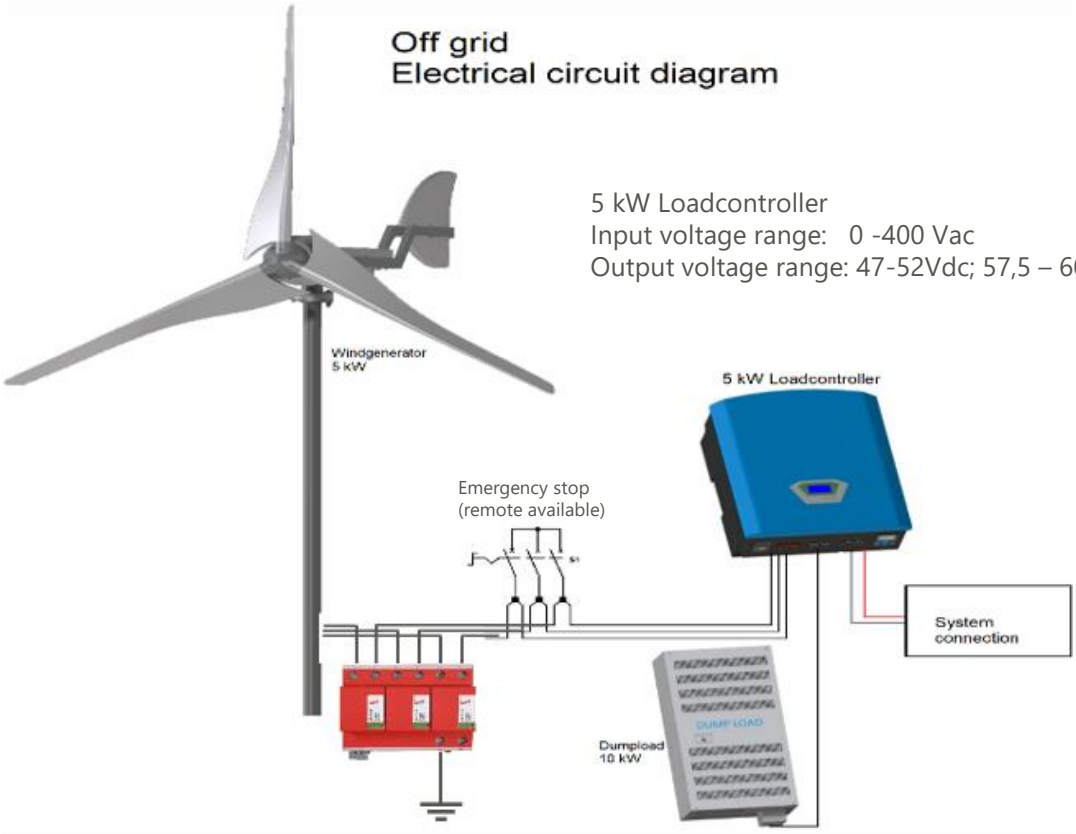
WIND INVERTER 3-phase with dumpload 10 kW

The Grid

ON-GRID

Dump Load

FUSE INSTALLATION SCHEME



5 kW Loadcontroller
Input voltage range: 0 -400 Vac
Output voltage range: 47-52Vdc; 57,5 – 60 VDC; other available

CAUSION

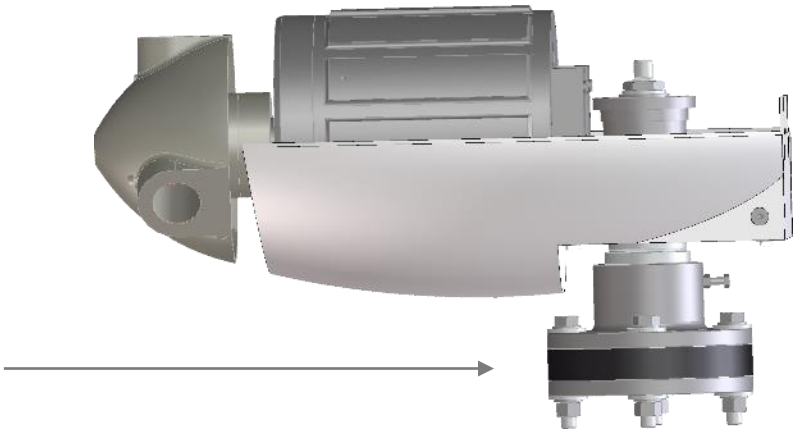
In general, small wind turbines are classified as susceptible to lightning, especially when mounted in exposed positions on masts. In the event of a lightning strike, the charge regulator and all components (battery, consumers) connected to it can be damaged.

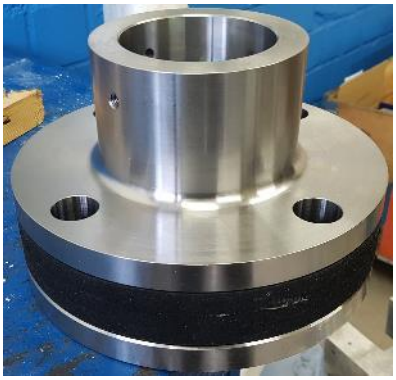
- At the base of the mast, an **electrical grounding must be fixed**. Use appropriate devices for this purpose!
- iQron wind generators are to be protected by **installing fuses to each phase**.
- **Look for your local official spec requirement** for general lighting protection to choose the appropriate fuse equipment.
- Installation service at site has to be rendered only by **lighting protection experts**.

DECOUPLING UNIT

For the installation of the iQron small wind turbine, an application-specific vibration damper system was designed, decoupling the turbine from the mast completely in terms of vibrations.

Through this solution, disruptive noises as well as vibrations into the structure of the mast are damped.



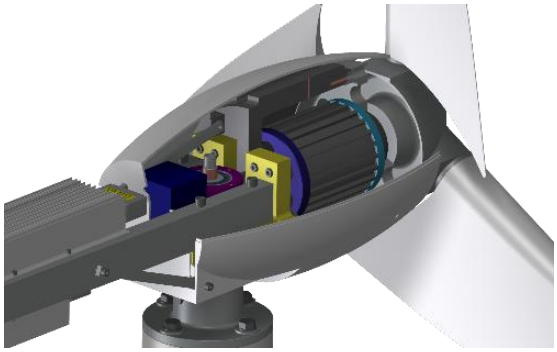


BLADES

BLADE	ON GRID	OFF GRID
Weight	27,6 kg per set (3 pieces)	
Length	2,14 m (optional: extended tube 30 cm per wing for low wind speed application)	
Material	GRP	
Profile	NACA Profile, hollow chamber	
Power Coverage	5 kW	
Diameter	4,67 m (weak wind: 5,27 m)	
Front Surface covered	17,13 m² (weak wind: 21,81 m²)	
Cut-In Windspeed	3 m/s	
Windspeed Nominal	11 m/s	
Windspeed BREAKING-system start	>12 m/s	
Noise (5m distance @ rated rpm)	35 dB(A)	
Revolution Control System	STALL	
Balancing	static and dynamic +/- 5 gramms	
Material	GRP multilayer crosslinked, 8 layers	
Composite	Epoxy	
Surface	Gelcoat white (standard), other colours upon request	
Adaptor extension (opt.)	Aluminium +30 cm	
Retainer	anodized Aluminumshaft integrated in wing	
Mounting	M 10 hexagon socket screw stainless steel A4-80	
Condense Water Protection	drill-hole at the adapter	

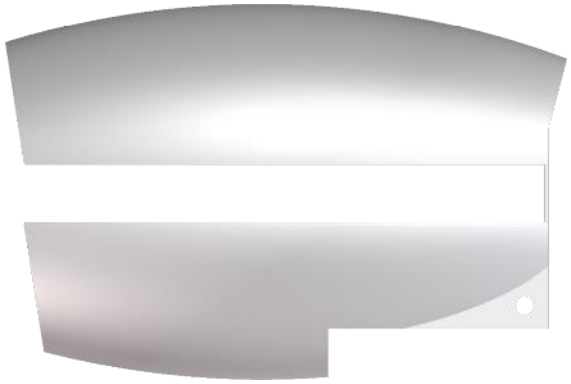
GENERATOR

GENERATOR	ON GRID	OFF GRID
System	3-Phase AC synchronous generator	
Type	S1	
Execution	brushless	
Weight	93,8 kg	
Nominal Output	5.0 kW	
Maximum Output	7.0 kW	
Voltage Start	96 V AC	48 V DC
Nominal Voltage	350 V AC	310 V DC
Open Circuit Voltage max.	0 - 700 V AC	0 - 500 V DC
Current-carrying Capacity	14 A	16 A
Operating Temperature max.	105°C (class A)	
Revolution at start	50 rpm	
Nominal Revolution at full speed	270 rpm	
Controlled maximum Revolution	300 rpm	
Transmission	1:1 / direct drive	
Bearings	superior brand SKF / FAG 4 units	
Weatherproofing	anodized coating	
Cooling #1	air intake in front cover	
Cooling #2	air outtake	
Cooling #3	Cross circulation inside	
Cooling #4	massive Aluminium Housing	
Cooling #5	Cooling Fins	
Condense Water Protection	double drainage hole	
Operating Temperature Range	Minus 40°C to Plus 60°C	
Power Transmission electrical	Brass / Cupper Brush triple	



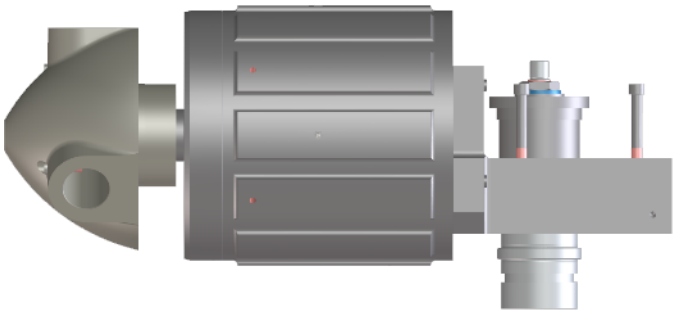
PROTECTION

PROTECTION SYSTEM	ON GRID	OFF GRID
Weather Protection	2-segments with upper and lower housing GRP white	
Safety Class	IP 65	
ELECTRICAL		
Dumpload Control	via Power Electronic	
Overload Protection	Dumpload 10 kW	
MECHANICAL		
Revolution Control	STALL	
EMERGENCY STOP		
Switch	Manual	
Wiring in	AC 3 x 2,5²	
Wiring out	3-core 4,0 mm² above 30 meter, else NYY-O 3 x 2,5	2 x 10²
Option	DC circuit with bridge rectifier	



ROTOR

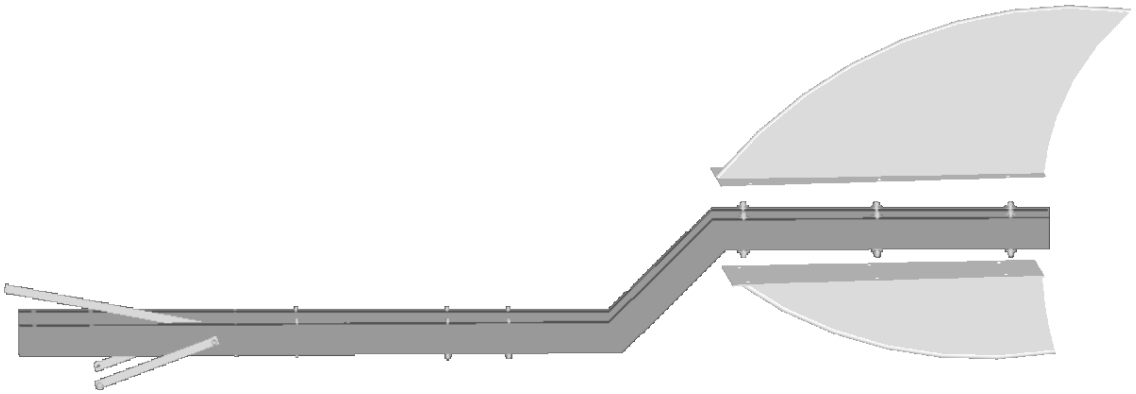
ROTOR AND MAGNETS	ON GRID	OFF GRID
Design	Internal Rotordrive	
Execution	anodized rotor casted	
Number of poles	24	
Magnet Material	NdFeBo N45	
Magnet Temperatur applicable	up to 155 °C	
Flux Ring	Steel C45 Nitrified	
Screws	Stainless Steel A4-80	
Plain Key	2 x (A16x10x45)	
Drive Shaft	AlZn5,5MgCu anodized	
Shaft Ø	55 mm	



WINDING

WINDING PACK	ON GRID	OFF GRID
Wiring	L1, L2, L3	
Execution inside	450 mm x 2,5 ²	
Insulation Class	class (F) - 155°C	
Operating Temperature	Nominal Rating (A) - 105°C	
Insulation Class Lacing	F	
Protective Paint	Waterproof Oven	
Sheet Plate	EN 10027-1	
CONDUCTOR		
Temperature Class	max. 220°C	
Melting Temperature	340°C	
Property	Double Paint Protective	
Insulation Class	F	
VARNISH		
Denotion	Isonel 31J	
DIN	53211	
Thermal Class	155 (F)	
Chemical Structure	modified Polyester	

WIND TAIL	ON GRID	OFF GRID
Weight	30 kg	
Construction	doubleside	
Material steel construction	zincplated rectangular tube	
Yaw Control/Wind Tail	mechanical, modular with upper and lower fin	
Material Wind Tail	GRP double layer, Gelcoated white, Foam filled	
System	mechanical	
Components	2x rods, 2x GFP fin	
Screws and Nuts	Stainless Steel A4-80	

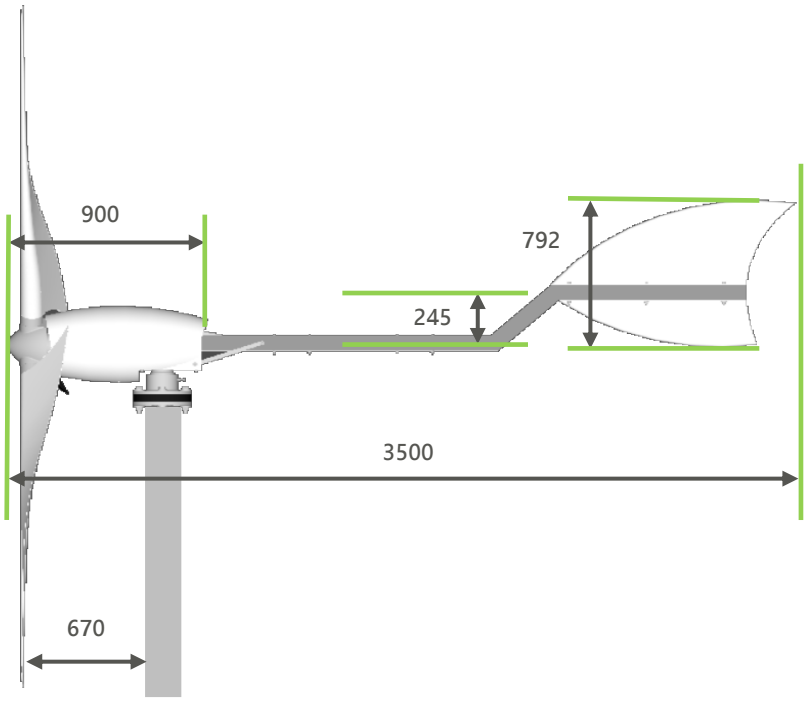


SIZE & WEIGHT

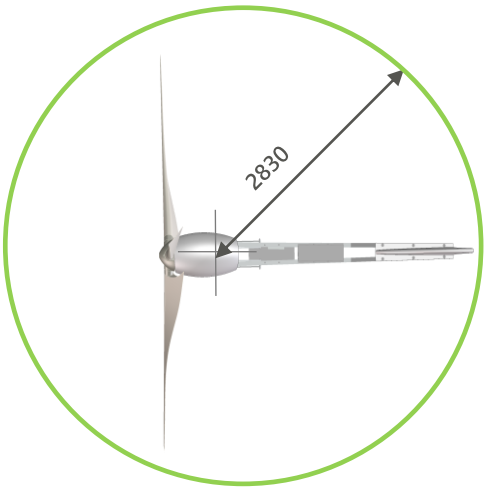
WEIGHT

	227 kg	
ADDITIONAL	19,8 kg	Adapter-Option: Set of 3 extension tubes of 30 cm per wing, applicable for low wind speed areas

DIMENSIONS



OPERATING CIRCLE



VIDEOS

The ease of mounting an iQRON turbine by uplifting with hydraulic stamp	https://youtu.be/W3746hE3yUc
iQRON´s small wind turbine at a telecom site in Crete	https://youtu.be/YHVglSOqhI8
Filling a concrete-free bucket foundation system	https://youtu.be/zEbX2bEiUvg
Uplifting a turbine manually on a concrete-free bucket foundation system	https://youtu.be/CSxSYUeZBf0
Marketing video showing the installation at telecom sites	https://youtu.be/pmPq_qSq2YM

CONTACT & INQUIRIES

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