



FREQCON

ATECH
ANTRIEBSTECHNIK

Performed with emotion

Sicherheit • Zuverlässigkeit • Verfügbarkeit

Safety • Reliability • Availability



Built by intelligence

Pitch systems for wind power turbines.

Version
2012/2013



Pitch systems for wind power turbines



Trail of strength.

As each country searches for renewable energy sources, and reducing their carbon dioxide emissions, wind energy prevails as one of the most trusted and viable solutions. Wind turbines are in use today all over the world, and continue to provide clean and reliable energy to the end user.

Renewable. Reliable. Unparalleled.

Our pitch systems are based on a low voltage technique. We use maintenance-free, temperature independent capacitors, which apply the appropriate amount of power to the pitch-control in the event of power failure. With **more than 1 Mio.** load cycles of the powercaps and the high quality standard of our industrial series components, our pitch systems are maintenance-free for the entire life of the wind-power-plant.

The redundancy of our systems is guaranteed for an optimal and safe working environment. Our product already adheres to standards that will affect the wind turbine market in the future.

Progressive Design.

The multi-redundancy of our systems is guarantor for an optimal and safe working of your plants. Our standard today corresponds already to the requirements form tomorrow. We think into the future and improve our systems everytime anew.



Safety by experience

Always close to the wind.

The following facts speak in their favor for a ZAPI/ATECH low-voltage-pitch system:

NEW FACTS

- certification according to GL2010 with PLd / SIL 2 on request
- experience in off-shore capable systems

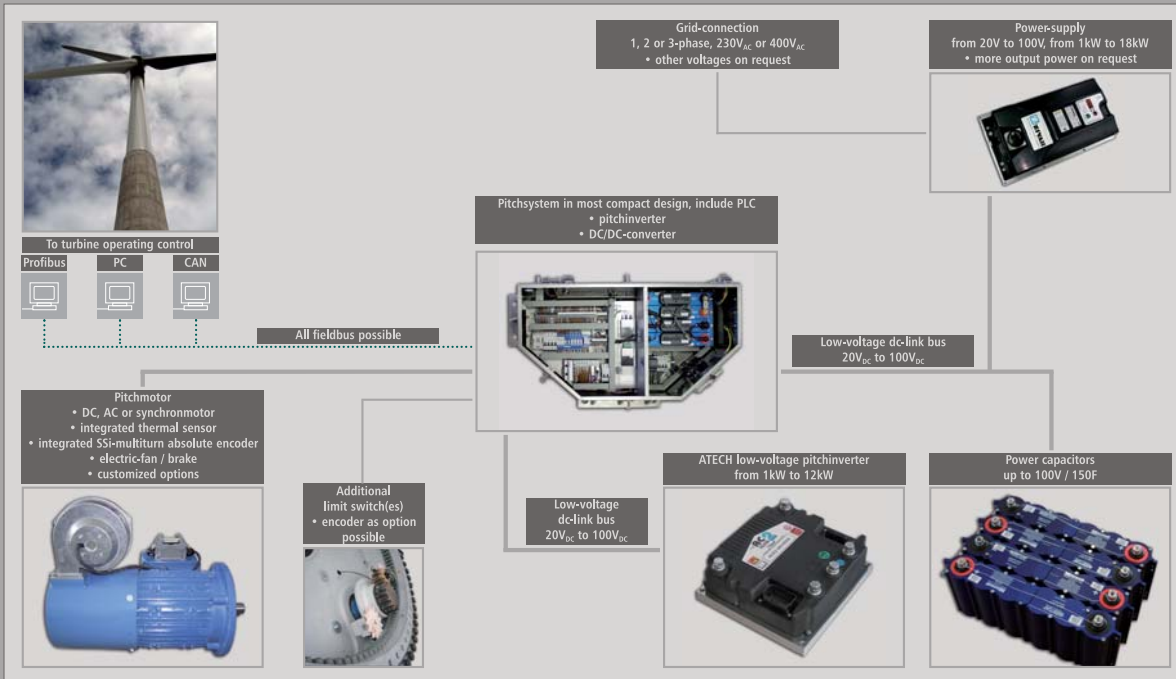
STANDARDS

- design and production for prototypes
- experience in design
- efficient use of space while maintaining high power density
- high quality industrial components
- the use of high volume production components yields cost savings to the end customer
- parts are readily available
- continual improvement manufacturing process ensures the highest quality
- high flexibility by modular conception

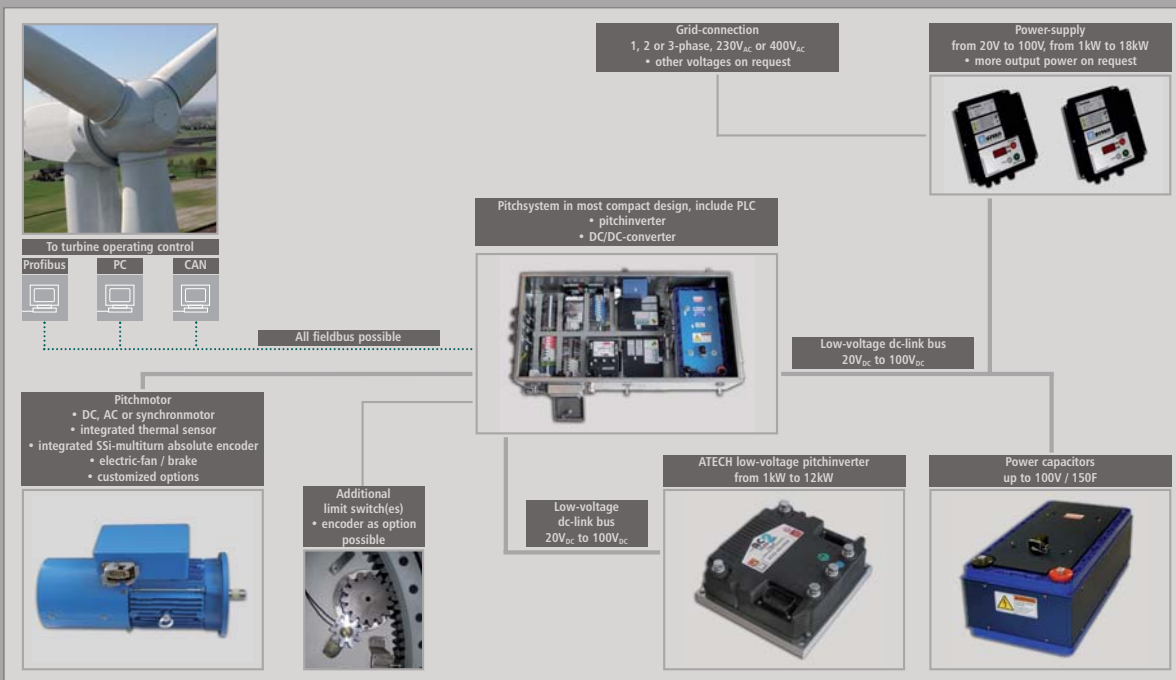
- highest safeguarding against failure achieved through redundancy systems
- compatible with wind turbines from 1 - 6 megawatts or more
- customized solutions possible
- wide product range allows for compatibility to many different turbine sizes
- maintenance-free energy storage and components
- UL registered components
- customized SW for PLC will be developed by FREQCON
- simple and effective energy storage (powercaps, batteries)
- compatible with all motor technologies
- highly efficient system yields cost savings to the customer
- thousands of our low-voltage pitch systems are working today around the world



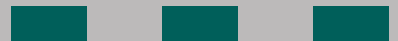
Example of pitch system assemblies



Low-voltage Pitch system 1,5 MW



Low-voltage Pitch system 2,5 MW

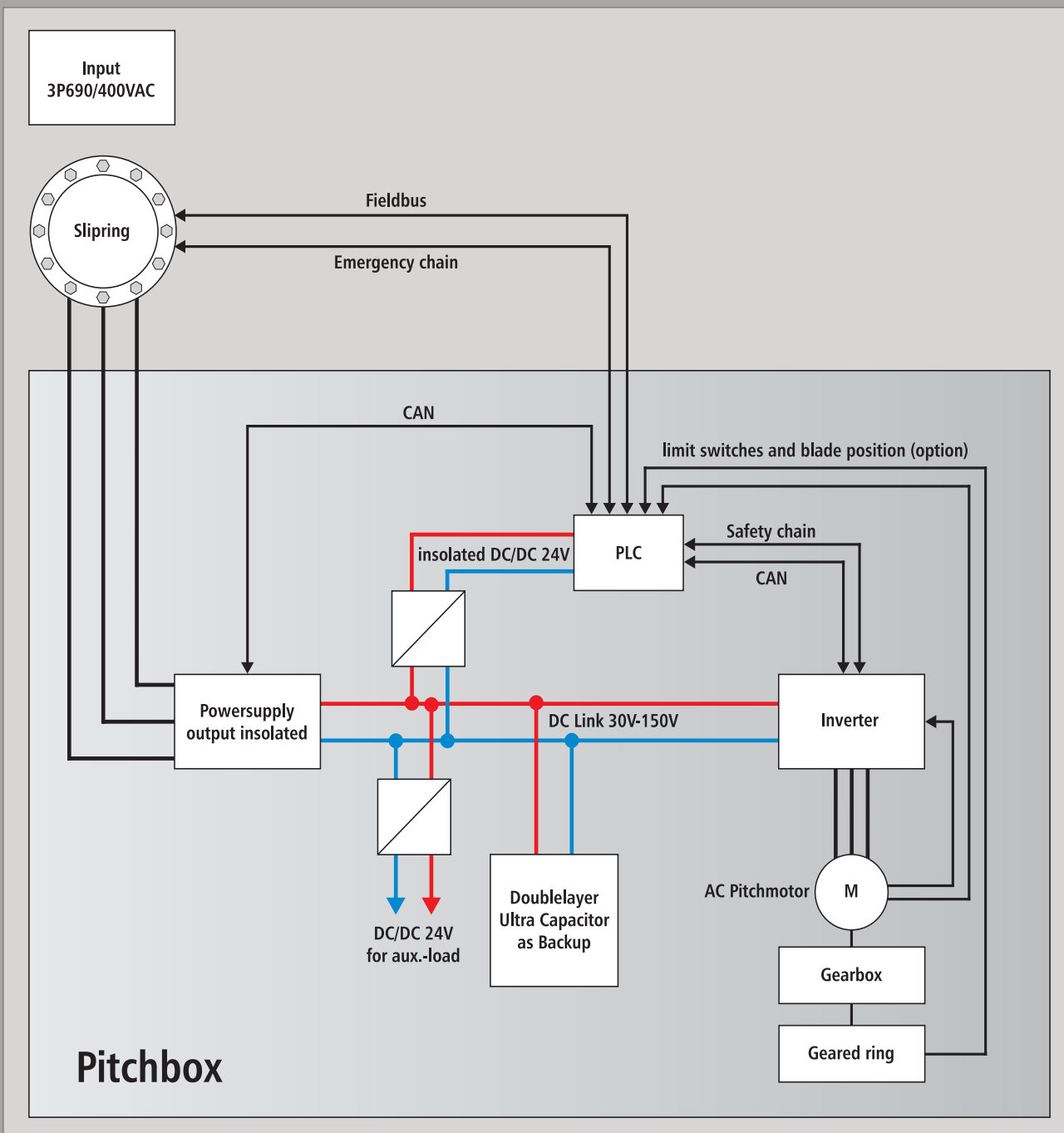


Technical specifications (component examples)

Controller	Pitch system 30V	Pitch system 45-60V	Pitch system 75V	Pitch system 90-100V	Pitch system 135V	Pitch system 145V	Pitch system 160-190V
ACE-0							
ACE-2							
AC-2							
ACE-3							
ACE-5							
	<0,5MW Turbine	1,0-1,5MW Turbine	2,0-2,5MW Turbine	3,0-4,0MW Turbine	5,0MW Turbine	6,0MW Turbine	>6,0MW Turbine
Power supply	Pitch system 30V	Pitch system 45-60V	Pitch system 75V	Pitch system 90-100V	Pitch system 135V	Pitch system 145V	Pitch system 160-190V
SG6							
NG3 or SG6							
NG3 or 2 x SG6							
NG7 or 3 x SG6							
NG7, NG9 or 2 x NG9							
	<0,5MW Turbine	1,0-1,5MW Turbine	2,0-2,5MW Turbine	3,0-4,0MW Turbine	5,0MW Turbine	6,0MW Turbine	>6,0MW Turbine
Pitchmotor	Pitch system 30V	Pitch system 45-60V	Pitch system 75V	Pitch system 90-100V	Pitch system 135V	Pitch system 145V	Pitch system 160-190V
1,5kW							
4,5kW							
6-8kW							
8-10kW							
14-28kW							
	<0,5MW Turbine	1,0-1,5MW Turbine	2,0-2,5MW Turbine	3,0-4,0MW Turbine	5,0MW Turbine	6,0MW Turbine	>6,0MW Turbine

Example of pitch system structure

only one pitchbox in schematic





Together close to the wind



ATECH Antriebstechnik

We are one of the leading companies in development and finishing of battery-electric powered industrial vehicles, of airport tarmac and many other fields. Since over 25 years we are well-established in the growing market and internationally approved as a qualified business partner. Our know-how assures the success in business of our clients.

FREQCON

Freqcon develops and distributes electric equipment and software for purposes of producing renewable energy. Freqcon is for many years an associate partner of ATECH and develops Pitch PLC SW for ATECH Pitch systems. This SW is customized and independent of the PLC manufacturer.

ZAPI Group

ZAPI group presently employs over 350 direct people in its own 13.000 square meter production facility located on a 70.000 square meter lot in Poviglio, Reggio Emilia.

ZAPI was founded in 1975 by the president Giannino Zanichelli and it has always focused its activity on development, innovation and design/manufacturing of electronic controllers of high quality.

Today, ZAPI is known for its advanced and sophisticated controller technology that places ZAPI between the world-wide leaders in high frequency motor controllers for battery powered machines.

ZIVAN, opened in 1985 as a branch of the ZAPI Group, have become experts in every kind of battery/supercap charging, monitoring and care. Since 1980, when the Patent "Righi-Zanichelli" of the first high frequency controlled battery charger was registered, ZIVAN has reached high levels of quality and reliability recognized and rewarded with a worldwide success which is constantly rising.

BEST MOTOR s.r.l. was established in 1990 by technicians of consolidated experience in the electrical and mechanical fields. The factory has quickly increased its production capacity, thus achieving a range of more than 1.000 different models, also thanks to constant research and development through advanced technologies and technical assistance for special motors conceived according to customers' specifications.



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