FESTO

Wind turbine basics: three essential training systems



Pitch Hub
(Hydraulic or Electrical)

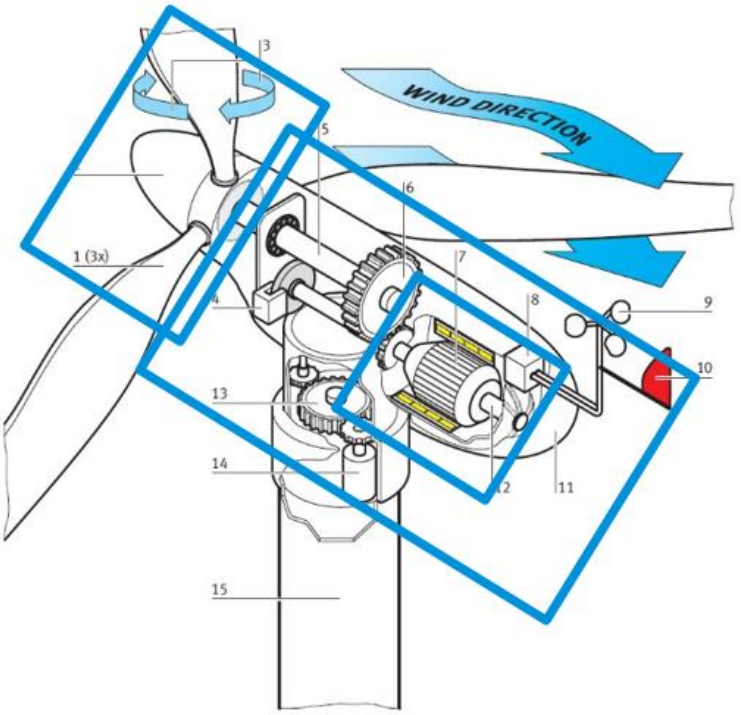


Nacelle



Power Generator
(Add-On to Nacelle)

The systems can be combined to form a complete, realistic training platform!



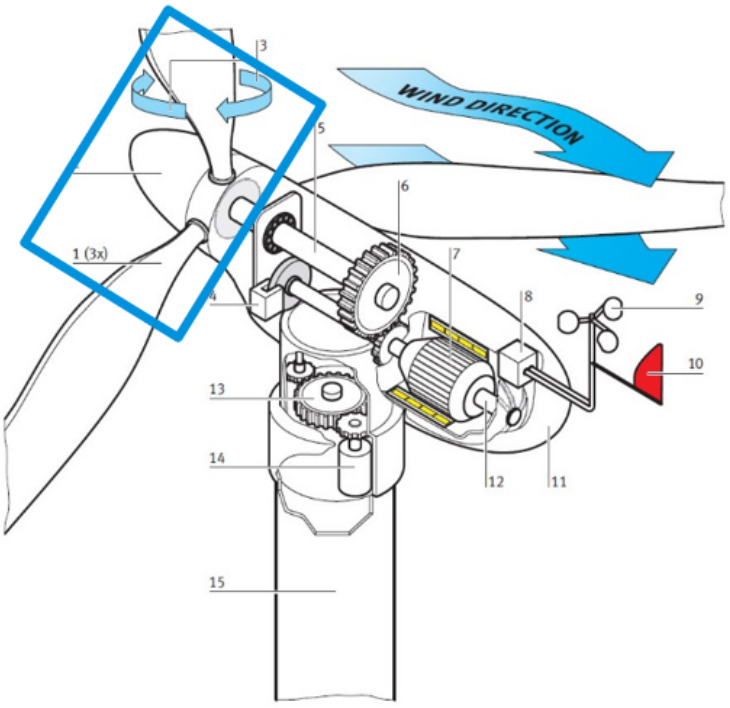
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Wind turbine basics: the pitch hub



Pitch Hub

Housed in the hub that supports the blades, the pitch system is a combination of components that monitor and manipulate blade angles to control rotation speed, as well as the area exposed to the wind.



Pitch hub learning systems

There are two main technologies used to control pitch hubs: electricity and hydraulics.
This is why we offer two types of pitch hubs learning systems:



Electrical Pitch Hub –
Wind Turbine Learning System



Hydraulic Pitch Hub –
Wind Turbine Learning System

Electrical/Hydraulic Pitch Hubs: common characteristics

- Fully-operational learning systems
- Include all the components of a typical commercial hub
- Address blade pitch control and emergency back-up systems using the electrical or hydraulic technologies for pitch control
- The wind is simulated and the system reacts according to a commercial turbine typical behavior

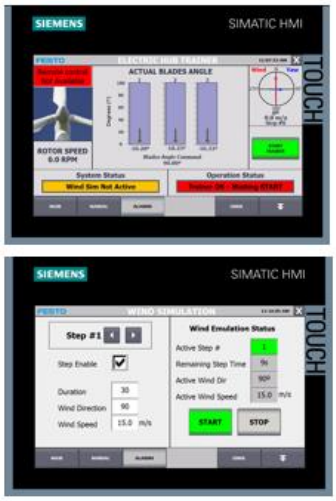


... they are a perfect complement to the Nacelle – Wind Turbine Learning System.

Electrical/Hydraulic Pitch Hubs: common characteristics

- System feature a blade controlled by a PLC, in a scale down design similar to an actual wind turbine blade pitch control system
- UPS inside the electric panel to simulate power failure behavior
- Siemens HMI connected to a PLC
- Faults can be triggered through the HMI





Hydraulic Pitch Hub: specific characteristics

Teach hydraulic control of blade pitch angle

- Hydraulic actuation of the blade movement
- Custom-made hydraulic unit
- Hand pump in case of power failure
- Blade representation inside the slewing ring

