Pitch Control

Experience a new level of reliability, availability and simplicity with the Mita Pitch System.
Mita-Teknik - A Proven Partner

Precise, safe and reliable performance is essential to ensure a profitable wind turbine operation. With more than 50,000 Control Systems and more than 3,000 Pitch Systems in operation worldwide, Mita-Teknik is your proven technology partner. The Mita Pitch System is the latest Pitch System developments by Mita-Teknik. We introduce an optimized Pitch System generation based on knowhow and best practice from previous Pitch System generations. The Mita Pitch System, being an integrated part of the wind turbine Safety System, is designed to effectively minimize O&M costs, reduce downtime and improve productivity.

A New Standard

The Mita Pitch System is a turnkey solution that fits any 3-bladed wind turbine model up to 10 MW. The Mita Pitch System provides a high degree of availability and reliability, while ensuring safe operation of the wind turbine. The highly robust system has been extensively tested, and it comes with a design life of 30 years.

A complete Mita Pitch System is comprised of the following parts:

- 1 x Mita Hub Unit
- 3 x Mita Blade Units
- 3 x Mita Servo Motors
- 3 x Mita Energy Storage
- 3 x Sensor Sets
- 1 x Customized set of mounting brackets
- 1 x Customized set of cables

Additionally, a Service Box is available for onsite manual operation.

Key Benefits:

- **Proven Pitch Control** - cost competitive, well-proven and certified system.
- **30 Years Design Life** - highly robust system.
- **Rugged Design** - IP65 units with seawater resistant housings.
- **Durability** - designed for extreme climate variations and high altitude.
- **Excellent Engineering** - top-shelf components only and thorough test procedures.
- **Open System** - open for development and integration of own software in the Hub Controller.
- **Open Solution** - turnkey or kit-set solutions.
- **High Availability** - high reliability, fast commissioning, self-test on-the-fly and simple maintenance procedures.
- **Performance Optimization** - including Pitch Performance Optimization services.
- **Extended Warranty** - 5 years warranty starting from the day of commissioning.
- **Full Support** - remote and onsite support by qualified Mita-Teknik engineers.
- **Compliance** - GB/T 25386 and NB/T 31018.
# Mita Pitch System

## Mita Pitch Hub Unit
- Input voltage: 3 x 400 Vac + N + PE
- Frequency: 50/60 Hz
- Operation temperature: -30°C to +60°C
- Transportation/storage temperature: -40°C to +70°C
- Degree of protection: IP65

The Mita Hub Unit is available in four ratings:
- Output: 3 x 47 A RMS
- Output: 3 x 76 A RMS
- Output: 3 x 102 A RMS
- Output: 3 x 128 A RMS

## Mita Hub Unit
- The Mita Hub Unit is the central connection point for distributing power, safety and communication in the hub. The enclosure of the unit is designed to be placed centrally in the hub, or next to the blade units. The unit is equipped with main fuses for each of the Blade units, and a Hub Controller (WP100 Platform), which centralizes the Pitch control of all three blades and the communication with the WTC. The Hub Unit comes in a rugged seawater-resistant aluminum housing that allows the unit to withstand fluctuations in temperature, humidity, and salty air. The protection class is IP65, and the unit is suitable for use in both on- and offshore wind turbines.

The Mita Hub Unit is configured to meet the specific requirements of the Pitch System and hub.

## Mita Pitch Blade Unit
- Output voltage: 0-400 Vac
- Output frequency: 0-300 Hz
- Operation temperature: -30°C to +60°C
- Transportation/storage temperature: -40°C to +70°C
- Degree of protection: IP65

The Mita Blade Unit is available in four ratings:
- Output nominal current: 45 A RMS
- Output nominal current: 74 A RMS
- Output nominal current: 100 A RMS
- Output nominal current: 126 A RMS

## Mita Blade Unit
- The Mita Pitch System consists of three separate and independent Mita Blade Units, working as an integrated part of the wind turbine Safety System. This design allows each of the Mita Pitch Blade Units to activate the Safety System in case any unsafe condition develops within the Pitch System.

Available in several variants with different power performances, the Blade Unit can be combined with Servo Motors of different sizes, allowing a variety of combinations. The Mita Blade Unit is mounted inside the hub near each blade root and is designed to withstand the severe conditions of that specific environment. The Blade Unit comes in a rugged seawater-resistant aluminum housing that allows the unit to withstand fluctuations in temperature, humidity, and salty air. The protection class is IP65, and the unit is suitable for use in both on- and offshore wind turbines.

## Mita Pitch Energy Storage
- Rated voltage: 480 Vdc
- Max. voltage: 510 Vdc
- Operation temperature: -30°C to +60°C
- Transportation/storage temperature: -40°C to +70°C
- Degree of protection: IP65

The Energy Storage is available in four ratings:
- 480 V 1.9F
- 480 V 3.1F
- 480 V 3.8F
- 480 V 4.2F

## Mita Energy Storage
- The Mita Energy Storage delivers the power and energy to the Mita Pitch System during grid fault (LVRT) and grid drop. The Mita Energy Storage is designed to deliver the required amount of energy and power for safe operation of the Mita Pitch System in all conditions. The optimum Energy Storage variant is selected to deliver the required power and energy during LVRT and a following grid drop – and to store the regenerated energy from the Pitch Servo Motors.

Long life of the Mita Energy Storage is ensured by using high quality ultracapacitor cells with +0 to +20% capacitance, integrated voltage balancing of each of the ultracapacitor cells, preheating, temperature control and Smart Energy Storage Management. Preheating ensures high performance with low ESR and high current capability at low temperatures.

The Energy Storage Unit comes in a rugged seawater-resistant aluminum housing that allows the unit to withstand fluctuations in temperature, humidity, and salty air. The protection class is IP65, and the unit is suitable for use in both on- and offshore wind turbines.

## Mita Pitch Motor
- Rated voltage: 3 x 400 Vac
- Operation temperature: -30°C to +60°C
- Transportation/storage temperature: -40°C to +70°C
- Protection class: IP65
- Paint finish: C4/C5
- Bearings: sealed and greased for life
- Cable connection: pluggable
- Temperature sensor: PT100/KTY
- Closed loop control: encoder/resolver
- Brake: safe holding brake
- Cooling: natural/forced ventilation

The Pitch Motors are delivered in several ratings:
- Nominal speed: 1400 to 2800 rpm
- Nominal power: 7.5 to 30 kW
- Peak torque (3s): 150 to 600 Nm

## Mita Pitch Motor
- The Mita Servo Motor program includes 3-phase asynchronous and synchronous PM motors that are designed as a plug-and-play solution with pluggable cable connections and predefined optimized parameter settings for the Mita Pitch System. The Mita Servo Motor has integrated temperature sensor, holding brake, encoder/resolver and optional forced ventilation fan.

The holding brake is failsafe and ensures reliable operation in harsh operation and standstill (typhoon) conditions. The holding brake release timing and wear condition is controlled and monitored by the Mita Blade Unit using overextension, reduced holding current and intelligent sensing. The Servo Motors are designed for frequency converter operation with isolated and sealed bearings.

The Servo Motor program includes Servo Motors that match both on- and offshore requirements, speed and torque requirements, as well as variants to fit the Pitch gearbox flange and shaft tolerances.
The Mita Pitch System is designed to prevent expensive downtime and costly maintenance. Only a small number of wear parts are used, which is crucial to attaining the long design life of the system, reducing failures at component level, and lowering the overall maintenance costs. This way, the Mita Pitch System guarantees you the highest value of investment.

Mita Pitch System customers benefit from a modularized Pitch System based on various standardized sizes of Hub Units, Blade Units, brushless PM Servo Motors, Asynchronous Servo Motors and Energy Storages based on either ultracapacitors or long life VRLA batteries.

The Hub Units can be configured with options from a long list of standardized options, and can finally be supplemented with customized software for integration with any 3rd party wind turbine control system, or any special feature required to meet specific demands in the wind turbine hub.

With predetermined parameter sets and a simplified workflow, we guarantee smooth installation, commissioning and maintenance with limited downtime and higher availability.

Whatever you choose a turnkey- or kit-set solution, Mita-Teknik is your dedicated electrical pitch technology partner. This includes Pitch Performance Optimization Services ensuring optimal wind turbine operation.

The Mita Pitch System is designed for the harsh environment in the rotating hub of on- and offshore wind turbines. The Mita Pitch System performs effortlessly in wide temperature ranges from -30°C to +60°C, continuous vibrations and forces induced during constant rotation and emergency stops.

The Mita Pitch System is based on an innovative design with integrated drives.

The Mita-Teknik Load & Control engineers offer simulation of your wind turbine with all IEC61400 load cases, to ensure the Pitch System meets the performance requirements in all relevant situations, and at the same time is not oversized.

A simulation report list all required peak, average and aggregated values to select the optimum units for the Pitch System solution.

Without the traditional “cabinet in cabinet” approach, we are able to maximize the system reliability, avoiding high ambient temperatures inside the cabinet.

Remote monitoring, configuration, troubleshooting and software updates allows easy service access and minimal maintenance. Further, all forecasts of maintenance tasks are based on actual wear and the integrated CMS possibilities are capturing and storing all operational data. Operation and control of the Mita Pitch System is possible via your mobile-, tablet- or PC browser via a graphical and user-friendly desktop.
Pitch to Perfection

High Reliability and Availability

Along with safety, reliability and availability are essential requirements to ensure optimal wind turbine operation. The Mita Pitch System is designed to maximize availability and performance of your wind turbines, while applying minimum loads to the structure.

› **High Availability** - high reliability, fast commissioning, self-test on-the-fly and simple maintenance procedures.

› **High Reliability** - reduced components count and high level of integration into the Blade Units.

The Mita Pitch System pitches the rotor blades collectively (CPC) or individually (IPC) to maintain pitch angle and rotor speed at optimum, and keep the rotor speed within the design limits. For maximum safety, blades are pitched to feathering position - automatically and autonomously in case of Safety System activation.

The Pitch System continuously monitors the communication from the wind turbine controller, and the health of all system components, including Mita Servo Motor and Mita Energy Storage, and it ensures the wind turbine is stopped in case the wind turbine control system should fail to keep the turbine operation within the design limits. In case of grid fault and/or grid drop, the Mita Pitch System is powered from the Energy Storage.

APQP4Wind

The Mita Pitch System is developed, tested and manufactured according to the APQP4Wind standard, and all parts come with an extended warranty starting from the day of commissioning.
We Make Wind Competitive