The integrated and modular EnVentus powertrain design includes a main shaft, main bearing housing, a two-stage planetary gearbox, and a permanent magnet generator. (Courtesy: ZF Wind Power)

MANUFACTURING

Vestas, ZF Wind Power launch serially produced powertrain

ZF Wind Power and Vestas recently launched the world's first serially produced EnVentus powertrain onto the wind market. The unique platform design is the result of intensive teamwork between both parties and is an answer to the development of next generation wind technology, lowering the levelized cost of energy. Furthermore, it illustrates both partners' competencies and the importance of this strategic partnership.

With a contribution of more than 85 percent of renewable electricity by 2050, renewables will be the largest driver for change in the global energy transition according to the International Renewable Energy Agency IRENA (Global Energy Transformation Study 2019). Wind remains a competitive energy source and will collaborate with other main renewable energy sources.

ZF Wind Power and Vestas bundled forces to anticipate the growth trajectory of renewable energy. After a dedicated period of development and enthusiastic teamwork, both parties are proud to release an integrated and modular powertrain design that includes a main shaft, a main bearing housing, a two-stage planetary gearbox, and a permanent magnet generator. The EnVentus powertrain guarantees an output of up to 6 MW and is developed and tested at the facilities of ZF Wind Power in Lommel.

"With this strategic partnership, both partners leverage their respective advantages in engineering, innovation, and market experience, while jointly producing high-reliable and cost competitive wind-turbine technology for the fast-growing wind market," said Tommy Rahbek Nielsen, COO of Vestas.

Customers all over the world will benefit from more flexible solutions and a wide range of customized turbine variants due to its modular design, competitive lifecycle costs, and a high-quality design, which allows a fast integration in the customer development roadmap addressing new market segments.

As a result of its constant dedication to new technological innovations, ZF Wind Power built the powertrain

that is the first of its kind in the global wind industry.

"Its innovative, modular design, and intelligent concept manifests ZF's position as a global leader in the development of next generation wind turbine gearbox technology," said Mitja Schulz, head of ZF Wind Power.

MORE INFO www.zf.com

CONSTRUCTION

DemoSATH floating platform work set to begin

Leading global infrastructure operator Ferrovial has been selected for the manufacturing and assembly of the SATH floating platform in the DemoSATH project lead by Saitec Offshore Technologies in collaboration with RWE Renewables.

The construction package will last 14 months and covers site preparation, concrete precasting, procurement of steel bulkheads, and assembly of the floater along with management of the supply chain.

The award of the construction contract is a significant milestone for the project and kicks off the on-site works in the already granted area of the Port of Bilbao (northern Spain). Work will start in November 2020 under strict health and safety rules to protect against COVID-19 and will create about 60 local jobs during the peak of the project.

In February 2020, RWE Renewables and Saitec Offshore Technologies announced they were joining forces to test a floating platform for wind turbines off the Basque Coast. The DemoSATH project will deploy the first multi-megawatt floating offshore wind turbine connected to the Spanish grid. RWE Renewables will finance part of the project costs and contribute its extensive experience as the second largest player in offshore wind globally, gaining access to the resulting findings in return.

The SATH Technology floater is based on a twin hull, made of modularly prefabricated and subsequently braced concrete elements. It can align itself around a single point of mooring depending to the wind and wave direction.

"Our ambition is to rapidly advance toward commercial production," said David Carrascosa, chief technology officer of Saitec Offshore Technologies. "DemoSATH is therefore not only proving the technical feasibility of the SATH technology but is also demonstrating how these structures can be mass produced. Ferrovial is the perfect partner to rely on and to ensure we meet our objectives."

"We are pleased to see that the DemoSATH project is entering the manufacturing phase now and making good progress towards offshore installation in 2022," said Sven Utermöhlen, chief operating officer, Wind Offshore Global of RWE Renewables GmbH. "We see great potential for floating wind farms worldwide, especially in countries with deeper coastal waters where this opens up attractive opportunities. As part of this large-scale demonstration project, we are gaining experience with an innovative concrete-based platform technology that will help us to position ourselves in this growth market."

"This is Ferrovial's first floating offshore wind project, and it represents a great opportunity to add value to the project, based on our experience in marine construction and landmark pre-stressed concrete structures," said Alberto Val, Ferrovial construction manager in Basque Country. "Moreover, this project has a large innova-

In February 2020, RWE Renewables and Saitec Offshore Technologies announced they were joining forces to test a floating platform for wind turbines off the Basque Coast. (Courtesy: Saitec)

tion component, not only because of the materials but also because of the manufacturing and assembly processes that it will develop."

For the prototype, the structure and the 2-MW wind turbine will be assembled in the port of Bilbao. The base of the structure will be about 30 meters wide and 64 meters long. The platform, including the turbine, will be towed to its anchorage point in a test field (BIMEP) two miles off the coast at a depth of 85 meters. Hybrid mooring lines, composed by chains and fiber anchored to the seabed will hold the floating body in position. The unit is expected to go into operation early 2022. The power generated by DemoSATH will provide enough annual electricity to meet the power needs for 2,000 homes and will prevent emissions of more than 5,100 tons of CO2 into the atmosphere.

The objective of the project is to collect data and gain real-life knowledge from the construction, operation, and maintenance of the unit. DemoSATH will test the offshore behavior of the platform, in addition to the construction procedure to be used in the future for mass production.

The various sections of the floater will be first precast and then assembled in order to prove the efficiency of the industrial fabrication conceived by Saitec Offshore Technologies for upcoming commercial wind-farm developments.

SATH technology will also demonstrate its capacity as a local content enabler, largely due to the use of concrete as main construction material. The DemoSATH project will spend 90 percent of its construction budget with the local supply chain (less than 50 kilometers from the site.)

MORE INFO saitec-offshore.com

INNOVATION

Robotic automation of data cleaning optimizes operations

When it comes to wind park operations, data is invaluable — indeed, it is utterly critical to a healthy business. The general consensus in the industry, however, is that that 80 percent of the employee time spent on wind-farm data is used in cleaning it up, while only 20 percent is spent on actual analysis and optimization.

SCADA International has now addressed this challenge with the launch of Robotic Data Intelligence, a patented new software solution that automatically cleans, organizes, and reports wind-farm data. By doing so, the innovative software ensures the data enhancement that underlies operational optimization.

"Gathering and cleaning data are two of the most difficult and time-consuming tasks in operating a wind park," said Thomas Bagger, CEO of SCADA International. "Nevertheless, they are vital elements of a successful operation. But while high-quality data supports good decision-making, poor or missing data can mean missed opportunities and lost income."

The new software was designed to complement OneView® SCADA software and its well-known data-collection features. While OneView® SCADA retrieves data and provides precise calculations of up and downtime, production losses, and availability, Robotic Data Intelligence organizes and qualifies that data. And that makes it possible to dedicate more time on analysis and optimization and less on validation.

"The reason wind-park operators use so much time to systemize the data they've gathered is that unfortunately, errors in event sequences are not unusual," said Bo Lovmand, SCADA International's R&D director. "For instance, a reset can mean anywhere from a couple of minutes to several months of incorrect calculations. With this new software solution, such errors will be discovered immediately — and automatically. Robotic Data Intelligence gathers data from several sources, cleans it by weeding out incorrect and duplicate data, and formats it all in accurate, easy-to-understand summaries."

The new software was developed in consultation with a group of experts who specialize in different types of wind turbines. In that way, SCADA International has ensured the best overview of operating situations, regardless of the makeup of a particular wind turbine fleet.

Bagger notes Robotic Data Intelligence is undergoing further develop-

SCADA International has launched Robotic Data Intelligence, a patented new software solution that automatically cleans, organizes, and reports wind-farm data. (Courtesy: Scada International)

ment in order to make it possible to customize advanced reporting systems.

"One of our chief goals is to improve transparency in calculating turbine availability, both operational and contractual," he said. "By doing that, we'll make it possible for wind-park operators to develop optimization strategies that utilize existing equipment and free up more time to find solutions instead of identifying problems."

MORE INFO scada-international.com

INNOVATION

GRTC improves its Golden Spiral Turbine

Fort Myers, Florida-based Golden Ratio Turbine Concepts, LLC (GRTC), a Golden Ratio rotary concept developer, has completed wind testing of its latest Golden Spiral Wind Turbine prototype model. The new vertical axis wind turbine (VAWT) model is a derivative of the previous prototype that recently proved the design's spiral concept.

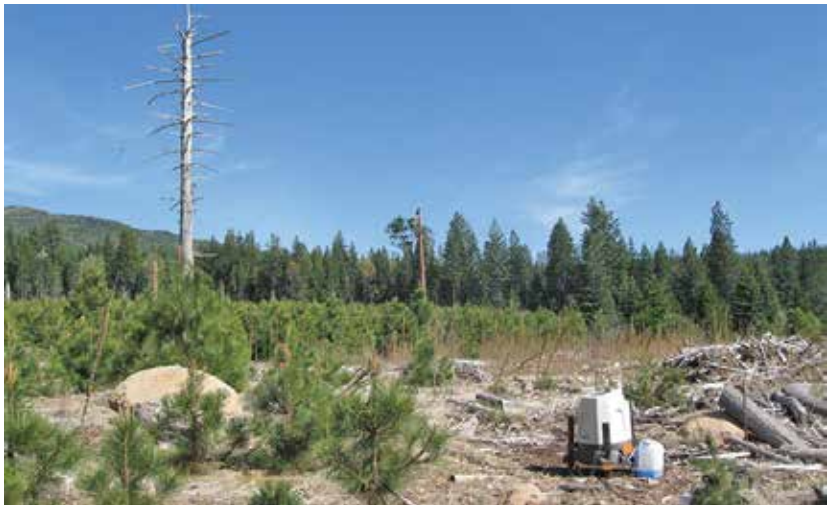
GRTC released information stating that the new Golden Spiral VAWT prototype has improved performance over the previous version due to its newer rotary spiral wing mold design and its lighter and stronger internal rotor construction method.

Inventor and founder of GRTC James Walker said the new spiral wing design and lighter weight served to enhance the rotor's low wind-speed efficiency, resulting in 15 percent higher power outputs than the previous model at 10 ms (22 mph). This new rotor and the previous rotor sweep the same area and were both mounted on the same test bed PMG generator platform in order to gather precise comparison data.

Walker said the new Golden Spiral VAWT model begins charging batteries between 8 and 9 mph and operates smoothly and silently over the entire range of wind speeds tested. The VAWT's new Golden Spiral wing, along with the Golden Ratio proportions and geometry of the design, produces a wind-energy machine that embodies the essence of tropical cyclones. These spiral elements and proportional features serve to create a natural wind engine of compound unity that reacts immediately to sudden gusts or shifts in wind direction and then converts them into rotational force. This ability to collect all the wind energy is not available to the conventional horizontal axis wind turbine (HAWT) common in the industry.

Those HAWTs need smooth and steady air flow over their blades and do not react well to changes in wind speed or direction. Likewise, certain VAWT devices experience shuddering and vibration moments when encountering shifts and gusts. Generally, both those HAWT and certain VAWT devices create substantial noise, whereas GRTC's Golden Spiral VAWT is virtually silent. Furthermore, the GRTC spiral rotor has more torque than those radial rotors.

GRTC is now offering partnership and alliance opportunities to parent companies that can provide small



An independent study confirms ZX 300 wind Lidar accuracy in all classes of complex terrain. (Courtesy: ZX Lidars)

wind-turbine manufacturing and marketing skills. Walker is confident there is a good market for his patented technology and now that the concept has been successfully proven, it is a good time for a larger entity to make an agreement and further develop the turbines under the parameters set forth in the inventor's patent.

MORE INFO www.goldenratioturbine concepts.com

INNOVATION

ZX Lidars excels at wind measurements in complex terrain

The Consortium for the Advancement of Remote Sensing (CFARS) recently released its survey of Remote Sensing Devices operating in complex flow, including the WindCube (Leosphere, a Vaisala company), Triton Sonic Wind Profiler (Vaisala), and ZX 300 (ZX Lidars).

Ground-based Lidars and Sodars employ a variety of beam probing or scan patterns by which the horizontal wind speed, vertical wind speed, and wind direction are derived — all assume homogeneous flow conditions within the scan/beam volume. In contrast, traditional meteorological masts equipped with cup anemometers provide a single measurement at the installation point of the sensor. In complex flow, often caused by terrain and fixed objects, the assumption of homogeneous flow conditions within the measurement volume introduces differences between Lidar and cup anemometer. In situations like this, a flow conversion technique can be applied.

CFARS have compared the various techniques adopted when using a WindCube, Triton, and ZX 300 remote sensor and presented an analysis of the accuracy of each device pre- and post-conversion/correction of data to account for the complex flow.

Across a broad range of cases previously published by ZX Lidars and Meteodyn incorporating 13 different wind-project locations, data presented confirmed that CFD conversion of ZX 300 data in non-homogeneous flow conditions produced excellent agreement with collocated anemometry. As a result, the data can be considered as finance-grade in situation.

With regards to the range of terrain classes as defined by [Bingöl et al., 2009], ZX 300 was also shown to perform to high levels of accuracy in all conditions including even highly complex sites.

ZX 300 performance in complex flow is achieved by its 50 line-of-sight measurements in just one-second. From this baseline performance, the use of additional complex flow tools available from a range of service providers including WindSim, Meteodyn, and Natural Power are able to optimize the performance of ZX 300 further, delivering results that are traceable and auditable with a published conversion process.

ZX Lidars has continued to collaborate in this application. Following a successful development and validation program by computational wind engineering company ZephyScience and independent wind consultancy Deutsche WindGuard, a further data conversion technique 'ZX CFR' (Complex Flow Resolver) has now also demonstrated results to known and acceptable uncertainties allowing ZX Lidar systems to be deployed standalone in complex terrain and deliver wind speed and wind direction measurements that can be included within Energy Yield Assessments (EYAs) and Site Suitability Assessments (SA). Full details of ZX CFR were expected to be released in November.

MORE INFO www.zxlidars.com

INNOVATION

Siemens introduces circuit breaker for renewable market

Siemens recently introduced the type SDV-R™ non-arc-resistant and type SDV-R-AR™ arc-resistant medium-voltage outdoor distribution circuit breakers designed specifically for renewable energy applications, such as wind-power generation. These newest members of the long-standing and highly reliable Siemens SDV distribution circuit breaker family now provide fast switching to ground — ultimately saving money and space through an environmentally friendly solution.

The integral fast-acting grounding switch, which is mechanically inter-

locked with the SDV-R circuit breakers, helps limit transient voltage excursions (inherent to collection systems) to very low levels during switching operations. This feature offers wind-power producers an alternative to large, expensive grounding transformers with cable connections that take up significant space and pose environmental risks associated with oil leaks.

To provide additional personal protection in the event of an internal arcing fault, the SDV-R-AR circuit breakers have been qualified to carry a type 2B accessibility rating in accordance with the latest ANSI/IEEE C37.20.7 standard. This is the same qualification approach implemented in the innovative type SDV7-AR circuit breakers for the purpose of providing enhanced personal protection.

MORE INFO www.usa.siemens.com/sdv

MAINTENANCE

A2Z Drone Delivery launches flagship Rapid Delivery System

A2Z Drone Delivery, LLC, developer of a patented tethered freefall drone delivery mechanism, recently launched its flagship product, the RDS1 (Rapid Delivery System), which maintains a safe hover of up to 150 feet (45.71 meters) while its delivery mechanism controls the payload's freefall for a safe and accurate touchdown.

Offered as a modular add-on system or as a ready-to-fly platform based on the DJI® Matrice 600 Pro, the RDS1 is designed for payloads up to 2 kg (4.4 lbs.).

With a range of up to 3.5 km (2.17 miles), the RDS1 is ideal for rapid deployment of time-sensitive first aid and life-saving medical supplies, or to deliver material to destinations where landing the drone is problematic such as a tossing ship or dense forest.

The RDS1 addresses some of the consumer-protection concerns with drone delivery. By delivering payloads from a safe hover altitude, the RDS1 protects recipients from spinning UAV propellers, while mitigating privacy concerns of low-flying drones and abating intrusive rotor noise. The RDS1's patented freefall delivery mechanism reduces time-on-station to ensure onboard power can be put to use in other ways.

The RDS1 addresses some of the consumer-protection concerns with drone delivery. (Courtesy: A2Z Drone Delivery)

Built on the familiar DJI flight control interface, the A2Z Drone Delivery app combines manual control system operations with an onboard sensor array to manage the package's freefall and gently stop its descent just above the ground.

Rated at 100 pounds tensile strength, the RDS1's Kevlar® tether and elastic fabric pouch can be reeled back up for reuse or to retrieve materials from personnel on the ground.

"Our rapid delivery system is ideal for situations where a drone cannot safely approach close proximity to its delivery location such as delivering radios or medical supplies to a search and rescue team in a forest or as a more efficient option to deliver and retrieve port documents from awaiting cargo ships," said Aaron Zhang, founder of A2Z Drone Delivery, LLC. "While other drone delivery platforms are designed to hover close to the ground, our tethered free-fall delivery technique enables efficient and accurate placement without the UAV approaching people, structures, or other obstructions like trees and wires."

RDS1 FEATURES

The company's proprietary delivery mechanism incorporates a Lidar sensing system that streams continuous data to the onboard firmware, which controls the payload's rapid descent. Additional integrated features include:

- Payload status detection: Monitors payload throughout flight and delivery, enabling eventual beyond-visual-line-of-sight (BVLOS) missions.
- Pre-flight weight check: Ensures the flight platform is not overloaded and controls payload deceleration.
- Rapid descent calculation: Automatically determines when to slow the payload freefall at the proper distance from the ground.
- Manual delivery control: Intelligent onboard systems provide safeguards while allowing pilots to manually control tethered payload delivery and retrieval.
- Emergency payload abandonment: Allows the pilot to quickly detach the drone from its payload amid flight emergencies.
- Transverse tether winding: Ensures the tether is tightly woven on the reel to maximize capacity and prevent knotting.
- Passive payload lock: Safeguards against payload loss or tether slippage in case of unforeseen power fluctuations and eliminates the need for additional payload housing.

"As we bring this first iteration of

our unique rapid delivery system to market, we're eager to work with our customers to adapt the system to meet their unique mission demands and set our product roadmap to suit their needs," Zhang said. "We have already initiated development of a 'tap-and-go' payload auto-release mechanism to remotely deposit the payload without an awaiting recipient, and while our flexible payload pouches can already accommodate diverse demands, our design team is nimble enough to adapt the delivery system to just about any payload the flight platform can support."

MORE INFO www.a2zdronedelivery.com/rds1

MAINTENANCE

Clir: Portfolio-wide benchmarking crucial to tracking defects

Clir Renewables, a leading provider of performance assessment software for renewable energy, recently called on asset owners to benchmark the performance of their renewable energy equipment at portfolio, rather than project, scales.

While a number of high-profile manufacturers have recently announced losses owing to the repair and replacement of turbines with blade or tower defects, very few of these serial faults are made public until they affect the manufacturers' balance sheet. Therefore, in order for asset owners to understand what issues might be recurring, a lack of transparency around "big picture" operational data must be addressed.

Clir argues that in the absence of industry-wide transparency on serial defects, owners need to use their asset and project data to build a portfolio-wide understanding of asset health and act on issues before they affect performance or result in failure.

Today's turbines are four times as large as the average assets installed in the wind power boom of the 1980s, with the next generation of turbines set to reach new heights offshore. However, as complex, highly innovative new technology is rolled out across the globe, major unknowns around asset performance in specific environments remain. As such, recurring issues are often only recognized and addressed many years later.

"Often, serial defects do not surface until the asset has been operational for more than 10 years; however, if operational and performance data from new turbines was freely shared between the manufacturer, the owner, and the operator, defects common to certain models could be identified and addressed early," said Gareth Brown, chief executive officer, Clir Renewables.

"At Clir, we are taking three key steps to overcoming the issue of missing data on serial defects," he said. "Firstly, by facilitating owner-to-owner collaboration on specific issues. This gives our clients the ability to either jointly tackle an issue or learn from each other's first-hand experience. Secondly, by building a knowledge base of known issues that have been identified through our supported asset base and complemented by decades of in-house domain expertise. Lastly, by arming clients with the right information during turbine-supply-agreement or service-and-maintenance-agreement negotiations to ensure the most favorable terms are in place should defects occur."

"Unfortunately, this level of information sharing is not the norm," Brown said. "However, by analyzing turbine data holistically from Day 1 of operations, benchmarking performance against every other turbine of that model in the owner's portfolio and against Clir's supported portfolio as a whole, common issues — serial or otherwise — can be tackled before they impact operations."

Recently, Clir announced that more than 5GW of renewable energy assets have been signed up to the firm's platform over the last year.

MORE INFO www.clir.eco

MAINTENANCE

Stronghold introduces tool-tethering kits to stop dropped objects

Stronghold® by PSG, the dropped objects prevention brand of Pure Safety Group (PSG), recently introduced its all-in-one tool tether kits for use by workers at height.

The kits include a full suite of products, available in three neatly bundled designs exclusively for specific trades, to prevent tool drops from at-height work locations, onto people and infrastructure below.

The kits feature Stronghold's innovative tethers that connect tools to wrists, belts, and other anchors to eliminate drop hazards. Coils, bungees, and swiveling premium tethers that prevent tangles while handling tools while working, no matter which tool attachment is used, are featured in the kits.

Other kit items include drill boots, tape measure sleeves, webbing with D-rings, tether cinch loops, vibrant orange tool tether attachment tape, anti-vibration tool tether shackles, wire core swivel screw gates, synching wrist straps, and PPE caddy glove holders. The kits incorporate the new ANSI/ISEA 121-2018 for Dropped Objects Prevention Solutions wherever the standard applies and are aimed at eliminating the guesswork of purchasing proper tool tethering supplies. Three Stronghold tool tether kits are available covering more than 15 different common industry trades:

- **99-11-0125:** Is designed for steel and ironworkers to accommodate their common tools, such as hammers, pliers, levels, spud wrenches, combination wrenches, tape measures, squares, clamps, and cordless tools. 99-11-0125 is also useful for millwrights, boilermakers, riggers, welders, pipefitters, and concrete workers and is ANSI-compliant with applicable noted exceptions.
- **99-11-0126:** Designed for scaffold workers, is ANSI-compliant with applicable noted exceptions, for common

tools used on scaffolding, including hammers, scaffold ratchets, combination wrenches, and tape measures. 99-11-0126 is also suited for insulators, material handlers, warehouse workers, and glaziers.

99-11-0127: Is made for use in general construction and is ANSI-compliant with applicable noted exceptions, to accommodate common tools used by construction workers, such as hammers, wrenches, screwdrivers, levels, pliers, tape measures, and cordless tools. 99-11-0127 is also appropriate for carpenters, electricians, instrument fitters, and technicians.

"After closely studying the work patterns and behaviors, challenges, and opportunities of a wide variety of workers at height, we've bundled together their most commonly-used tools, customized for their specific duties, to make it quick and easy to prevent drops," said Mathew Moreau, product manager of dropped tools and FME at Pure Safety Group (PSG) and chair of the International Safety Equipment Association (ISEA) Standards Committee for Dropped Objects Solutions.

"We're hoping to reduce the 278 deaths and 52,700 injuries a year, in the U.S. alone, caused by dropped objects. By providing kits by trade, we can help professionals safely work while being productive."

MORE INFO www.puresafetygroup.com

The Industrial MRO Pro Tool Set comes with more than 500 tools specifically selected for the industrial maintenance, repair, and operation industries. (Courtesy: Snap-on Industrial)

MAINTENANCE

MRO Tool Set includes 500 specific tools

All the maintenance, repair, and operations (MRO) tools you need housed in a right-sized roll cab are now available for order with a single part number from Snap-on Industrial.

The Industrial MRO Pro Tool Set comes with more than 500 tools specifically selected for the industrial maintenance, repair, and operation industries. Snap-on Industrial teamed up with MRO industry professionals to design this all-in-one set, which includes the tools you need as a professional technician to perform your work safely and efficiently.

The set includes a variety of hand, power, structure, torque, inspection, and safety tools including:

- Ratchets.
- Wrenches.
- Flank Drive® sockets.
- Flex sockets.
- Pliers.
- Reversible wire twisters.
- Impact ratchets.
- Drills.

All the tools are housed in an Algona, Iowa-manufactured 54-inch, 11-Drawer Double-Bank Master Series Roll Cab, which comes with foam cutouts for tools for visual tool control, an added safety feature provided by this set.

The roll cab's extra-wide drawers feature four bottom stiffeners to support a full load of tools without sagging. Sets can be ordered with access control to provide the roll cab with a higher level of security.

ROLL CAB WITH FOAM

- ITKPLUSRAY (red)
- ITKPLUSBAY (black)
- ITKPLUSBLAY (blue)

ROLL CAB WITH FOAM AND ACCESS CONTROL

- ITKPLUSRAC (red)
- ITKPLUSBAC (black)
- ITKPLUSBLAC (blue)

The Industrial MRO Pro Tool Set comes with free shipping if ordered before December 31, 2020.

MORE INFO www.snapon.com