

COMMUNICATION HUB FOR THE WIND ENERGY INDUSTRY

# WindEnergy

NETWORK

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## SPOTLIGHT ON NORWAY

EARLY INDUSTRY  
GAME-CHANGER

## TORQUE & TENSIONING

THE RIGHT TOOLS  
FOR THE JOB

CONDITION  
MONITORING  
INDUSTRY NECESSITY

WEATHER  
FORECASTING  
SERVICES

CONFIDENT PROJECT  
PLANNING

Image courtesy of:  
HR Wallingford Ltd



EvoTorque2 fitted with the new right-angled gearbox



# TOTAL TORQUE CONTROL AND TRACEABILITY

## Torqueing is fundamentally the measured application of rotational force to a threaded fastener

When the torque is under or over the manufacturer's specification, it can cause considerable damage to the turbine structure. One key technical implication of over or under torque is the potential for vibrations in the turbine... which presents a real risk of catastrophic failure.

Furthermore, when triggering electric multipliers on pre-tightened bolts, a dangerous over-torque can occur due to the slow response time of controllers, high motor start currents and high motor inertias. In some instances, this over-torque can be in the region of 100 percent.

### SOLUTION

A tool that can tighten bolts accurately to the required torque, audit pre-tightened bolts and then record this data, does exist. Norbar's EvoTorque 2, enables users to torque bolts accurately and reliably and generates a record to confirm the fact, providing complete traceability for operations & maintenance teams and their clients.

In response to customer feedback the company has introduced EvoTorque2, which adds data memory and transfer capabilities and audit mode to the features of the original EvoTorque tool. It is capable of incredible control in tough conditions – where bolts have not previously been tightened it will deliver torque values with an accuracy of ±3 percent. Where torque is re-applied to a pre-tightened bolt results are within ±5 percent of set torque.

### TESTING

In a retightening test, the EvoTorque2 demonstrated a clear advantage whereby, when triggered 18 consecutive times on an already tightened bolt, it achieved total accumulated over-torque of around 15 - 20 percent of the set torque; depending on the hardness of the joint. So many consecutive applications using traditional electric tools would likely result in tool or bolt failure. This tool makes the need for final torqueing with a hydraulic wrench unnecessary.

The output of most electric motors reduces as the motor temperature increases with use, resulting in less accurate torque values. The accuracy will not change as a result of ambient temperature or motor temperature, thus enabling numerous joints to be tightened consecutively with trusted results assured.



### ONSITE

Power on windfarm sites is usually provided by small generators with long cable runs, this raises concerns about the quality of the power supply. Consequently, most electric tools will either not run or their torque output becomes erratic.

The EvoTorque2 tool is largely immune from the effects of voltage fluctuation due to its motor controller technology; the tool will either run accurately or indicate that the voltage is outside of tolerance.

### NEW TRACEABILITY AND CONTROL BENEFITS

Every torque and angle value that EvoTorque2 applies can be recorded with a corresponding date and time stamp. The tool's memory can store up to 3,000 such readings. These can be downloaded to a PC either by



USB cable or transferred wirelessly via Bluetooth Smart.

Modes of operation include Torque, Torque & Angle and Audit. The first two enable users to select torque only

or a combined torque & angle target respectively.

### INDEPENDENT TESTS

Moreover, in independent tests and calibrations conducted across a number of Spanish windfarm sites; EvoTorque2 achieved the OK/PAA/APPROVAL standard; making it the only electric multiplier permitted for use to perform final torque on a number of windfarm sites.

The tool also features a third party verified sound pressure which does not exceed 70 dB (A) and a vibration level of 0.304 m/s<sup>2</sup> which significantly reduces any possibility of medical or health and safety related issues such as hearing loss or White Finger, during use.

### EVOTORQUE RANGE

EvoTorque2 is available in 110V and 230V versions and crucially is weather sealed to IP44. The ranges cover requirements from 100 N-m to 7,000 N-m. The product can be serviced and calibrated locally through an expanding network of international Norbar distributors who have a great deal of wind industry experience.

Norbar

### FEATURES & BENEFITS

- » Up to 12 user IDs can be downloaded and results stored against individual users, a helpful control where tools are shared across multiple users, e.g. different shifts
- » Work IDs, which have specific targets (torque, or torque & angle), can be set up - e.g. for a specific nacelle or base bolt. Up to 20 work IDs can be put in a work group and up to five work groups can be set up too
- » Targets can also be grouped together under a single heading. This is useful for multi-stage tightening of flanges. This enables audits of not just the bolts of a single tower to be easily conducted, but of all the towers in a windfarm and even across multiple farms
- » Users can now set a final torque target for a Snug Torque & Angle Target, i.e. Snug + Angle Target & Final Torque Target. This facilitates checking that bolts are not cross threaded
- » Operation Direction – this has been designed to ensure users can undo any bolts they tighten
- » Turn Angle option ensures that a bolt must rotate through a given angle when tightening. This prevents the same bolt being tightened multiple times when working on a series of bolts
- » A two-stage tightening process has been incorporated to speed up long rundowns for bolt tightening
- » EvoTorque2 now has a usage counter so it is possible to see how many times the tool has been used since the usage was last reset
- » There are two different lock levels, which restricts operator adjustment of the tool. Level 1 allows selection of pre-installed targets, whilst Level 2 only allows the tool to be used on its current setting
- » The tool now has extended ASCII mode capabilities so can be integrated into third party control systems

