

# PLARAD Bolting Systems for Wind Power Plants



**PLARAD**<sup>®</sup>  
Torque & Tension Systems



# THE EXPERTISE TO SOLVE YOUR ASSEMBLY CHALLENGE

We are in the business of solving your problems. Over forty years of success in global markets tells us we are on the right track.

**40 YEARS OF SUCCESS ...  
IN GLOBAL MARKETS**

Our engineers continue this tradition by creating innovative new bolting systems to satisfy your needs.

Being competitive today means facing the challenges of tomorrow.



## SAVE MONEY, TIME AND RESOURCES

Our goal is to identify your needs and develop innovative solutions that save money, time and resources.

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# CHOOSE PLARAD

## INVEST IN THE FUTURE

Wind power has long been a focus of PLARAD expertise. Our specialists have many years of experience in developing and implementing assembly solutions for wind turbine applications.

We call it **fit2gether** – a perfect fit between your requirements and our innovative solutions that directly benefits your bottom line.

## SOLUTIONS SPECIALLY DEVELOPED FOR WIND POWER PLANTS

We work in close collaboration with universities, engineering institutes and customers to create top-quality products tailored to your needs.





## SC

**Ultra-powerful –  
setting new standards of safety and precision!**

- Rugged, durable lightweight aluminium/titanium case
- Patented separate high-pressure safety cylinder
- Precise, fine-splined ratchet system
- Optional Safety Hold system\*
- 360° rotating reaction arm
- Extra heavy duty loosening-shock absorber

210 Nm

65.000 Nm



## VS / HSX

**Ultra-slim –  
unbeatably light and compact!**

- Extremely low-profile light aluminium/titanium case
- Patented separate high-pressure safety cylinder
- Superior working speed
- 360° rotating hose connection
- Precise, fine-splined ratchet system
- Optional Safety Hold system\*

250 Nm

45.000 Nm



## G type

**Torque multipliers –  
bolting made easy, anywhere!**

- No outside energy source needed
- High efficiency for minimum effort
- Built to take the knocks
- Ultra-compact size

170 Nm

8.600 Nm

\* Further information on the Safety Hold system is provided in our individual product leaflets.

# HIGHLIGHTS FOR THE WIND POWER INDUSTRY

## ST / STM



Electric turbo torque tools –  
A new dimension in speed and precision!

- Used in assembly, maintenance and mass production
- Multiposition electronic torque selector
- Light weight
- Unmatched high tightening speed
- Industrial grip and casing
- Vibration-free and low-noise

250 Nm

12.000 Nm

## STA / STAM



Pneumatic turbo torque tools –  
a new dimension in speed and precision!

- For high-risk environments (an **ATEX** certified torque tool is also available)
- Pneumatic valve for fine adjustment
- Low weight
- Unmatched high tightening speed
- No need for electrical power
- Shock-free and low-noise

130 Nm

12.000 Nm

## Bolt Tensioner



Controlled force –  
maximum power at minimum torsion!

- Performance range 130 kN to 6,000 kN
- No torsion and unaffected by friction
- Exact tension preset
- Withstand maximum pressures
- Universally deployable

The products shown represent only a small selection from our extensive product range.  
Ask for more information on the individual products.

Technical data subject to change without notice.

# MULTIFUNCTION POWER PACKS

Three performance classes and up to 3.5 l/m at 800 bar

## FOR THE WIND POWER INDUSTRY

### Display information

Information for the user, e.g. voltage, temperature and pressure.

### Rugged

Strong frame to protect the machine.

### Latest bolting methods

Microcontroller for torque or angle-controlled tightening without tool-mounted sensors.

### VAX technology (fully automated)

Safe to use with fully automated tightening, automatic tool shut-off and completion indicator on remote control.

### Digital remote control

Digital display shows applied pressure.

### Synchro

For tightening multiple bolts in parallel.

### Fully scaleable

For use with two or more large torque tools. Optimum weight in every application.

### Extends up to 2,000 bar

For use with bolt tensioners and other high-pressure hydraulic components up to 2,000 bar.

### Data input/output

Record and print attained torque and other data.



Extra oil tank



Pressure intensifiers



Recording

# ONE POWER PACK – ENDLESS POSSIBILITIES

## THE MODULAR TORQUE SYSTEM

**PLARAD IQ-VX** power packs are an upgradable modular system with a choice of output volumes. The **IQ-VX** series offers basic models in three sizes with differing volume-to-weight ratios.

**IQ-VX** also grows with your needs, with a range of additions including an extra oil tank and pressure intensifiers. All models from the basic **PLARAD IQ-VX** upwards boast an integral microcontroller and a range of operating modes and tightening methods.

## THREE PERFORMANCE CLASSES MEETING EVERY NEED

- IQ-VX 1 - Z** FOR SERVICE AND MAINTENANCE  
Designed for service and maintenance. Compact and lightweight (22 kg)
- IQ-VX 2 - Z** FOR ASSEMBLY  
Designed for windmill assembly.  
Excellent handling and high speed.
- IQ-VX 3,5 - Z** FOR PRODUCTION  
Designed in 400 V for production and high-volume assembly.  
Minimum payback period.



# MAXIMUM RETURN ON INVESTMENT

Time is money, in wind turbine construction just as much as anywhere else. Crane rental and productivity losses in particular need to be kept down by avoiding idle time.

Our fully automated **IQ-VAX** high-performance power packs cut assembly times by tightening fasteners without manual intervention.

	Conventional hydraulic power pack	IQ-VAX hydraulic power pack
Miscellaneous (gearbox etc.)	1 hour	½ hour
Rotor shaft	2 hours	1½ hours
Nacelle	3 hours	2 hours
Tower segments	6 hours	3 hours
Foundation	4 hours	2 hours
<b>TOTAL</b>	<b>16 hours</b>	<b>9 hours</b>




Calculations based on averages and illustrative amounts. Figures may vary considerably depending on the project

# SYNCHRONOUS TIGHTENING

## ...FOR PERFECT, EVEN TIGHTENING OF FLANGE BOLTS IN NO TIME.

Every wind power plant contains hundreds of bolts. The seamless running of these plants is thus heavily dependent on the quality and stability of the bolt connections.

To guarantee a high connection quality, a flange should be tightened evenly. To do this, conventional systems require processes consisting of several stages. Gaping and leakage could only be counteracted by repeatedly tightening the bolts crosswise.

For a given flange containing 20 bolts, it was necessary to reposition the torque tool 99 times! Time and effort were being wasted unnecessarily.

Our Synchro function allows the use of several tools simultaneously, allowing processes to occur at two, four or even more points at the same time. This gives you a perfect and permanently reliable joint in the shortest time.



# VERIFIED QUALITY FOR OUR CUSTOMERS

Our working relationships are always founded on a top-quality product. Ongoing development and decades of experience keep us always a step ahead of the competition. In many cases, our expertise is verified with internationally recognized certification.



## ... ALWAYS A STEP AHEAD OF THE COMPETITION

Among other things, this includes **DIN ISO 9001:2000** certification of systematic quality management.

The global certifier **Germanischer Lloyd** supports us in certification.

The acclaimed **German National Metrology Institute (PTB)** provides us with support in product and acceptance testing.

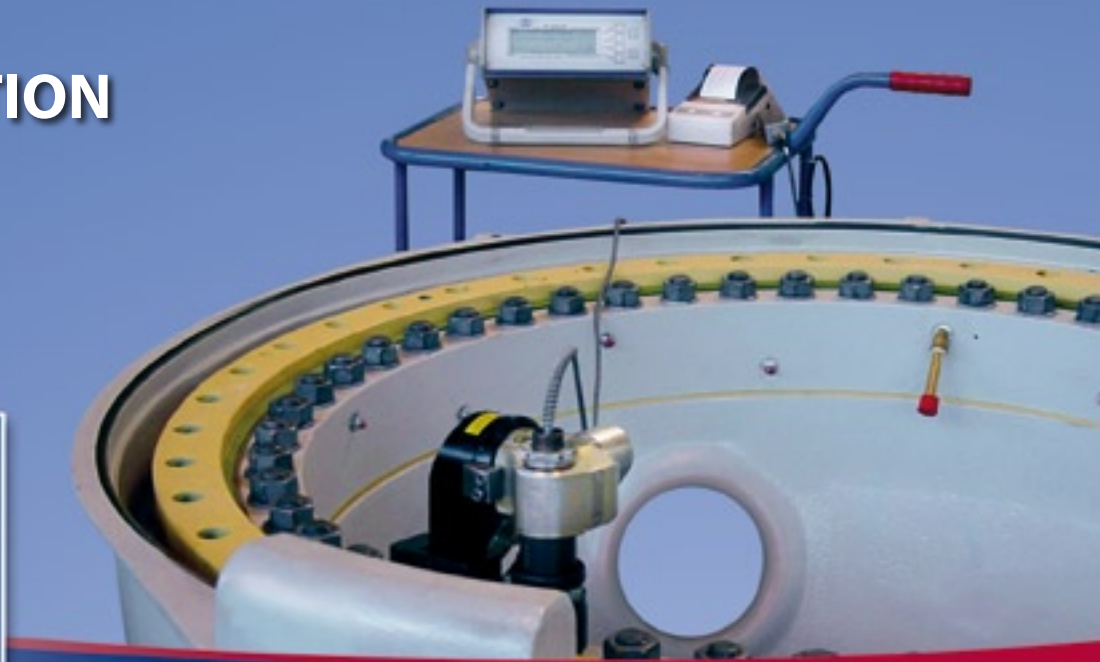


# PLARAD BOLTING TECHNOLOGY: INDISPENSABLE

## ... IN PRODUCTION

e.g.

- Towers
- Nacelles
- Tower flanges
- Axle tubes
- Generators
- Stator holders
- Turbine heads



## ... IN ASSEMBLY AND SERVICE



# *fit***2***gether*

**Fit2gether:** You and **PLARAD** products from Maschinenfabrik Wagner are the perfect fit.

Together we join components, tighten fasteners, master engineering challenges and find the most cost-effective solution to match your needs. Our products go hand in hand with full service.

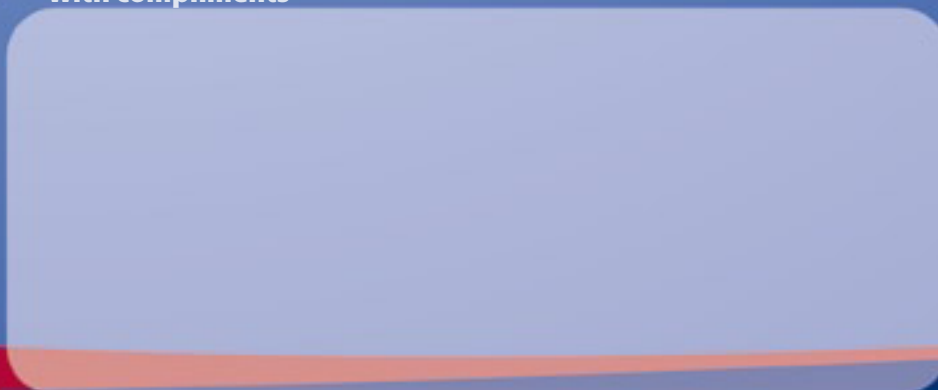
When you buy **PLARAD**, you are entering into a long-term partnership focused exclusively around your needs.

**Fit2gether** is professional knowledge and expertise in bolting.

We meet your needs.

**Fit2gether** – your partnership with **PLARAD**.

With compliments



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**株式会社 日本プララド**

ボルト締結システム総合メーカー <http://www.plarad.net/>

〒651-2404 兵庫県神戸市西区岩岡町古郷255-6  
TEL 078-967-3556 FAX 078-967-3567