

WIND TURBINES

perma Lubrication systems in use

perma FUTURA PLUS

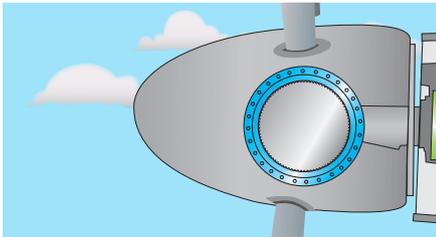
- Activation without special tools
- Easy disposal - no battery
- Tamper-proof



Wind turbines and wind energy plants are a permanent part of energy supply. It is therefore all the more important for turbines to operate efficiently. One crucial aspect is the optimal function and maintenance of the single components to ensure proper alignment of the turbine and blades, force transmission and power generation. Different sensors, drives and machine elements perform this task. perma offers special lubrication systems with the right lubricant for these drives and machine elements.

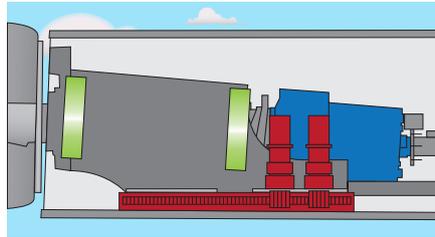
Lubrication points

1 | BLADE BEARING & BLADE GEAR TEETH



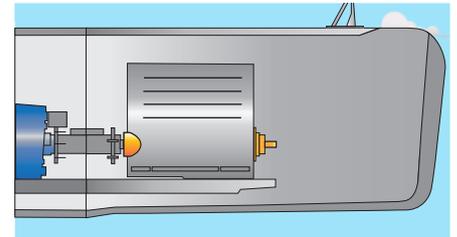
- **Pitch-control**
Blade bearing
- **Aligning**
Blade gear teeth

2 | MAIN BEARING & TURBINE ALIGNMENT



- **Force transmission**
Main bearing
- **Wind direction tracking**
Yaw bearing, yaw gear teeth

3 | POWER GENERATION

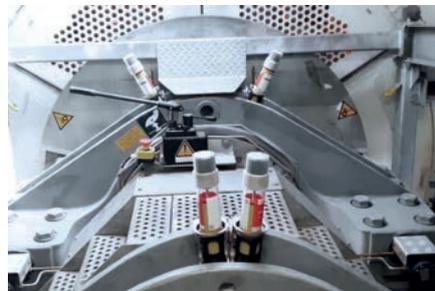


- **Generator**
Generator bearing

Application examples



Blade bearing lubrication



Lubrication of main bearing



Automatic relubrication of generator bearing

perma FUTURA PLUS



Drive
**Electrochemical reaction
via gas generator**

Discharge period
1, 3, 6 or 12 months

Lubricant volume
120 cm³

Operating temperature
0 °C to +40 °C

Pressure build-up
Up to 4 bar

Standard & special lubricants
Greases up to NLGI 2 / Oils

perma STAR VARIO | perma STAR VARIO BLUETOOTH



Drive – reusable
**Electromechanical drive
with Battery pack STAR VARIO**

Discharge period
**1, 2, 3 ... 12 months
1, 2, 3 ... 26 weeks
STAR LC 60: + 15, 18, 21, 24 months
STAR LC 500: max. 6 months**

Lubricant volume
60 cm³, 120 cm³, 250 cm³, 500 cm³

Operating temperature*
-40 °C to +60 °C**

Continuous pressure build-up
7.5 bar

Protection class
IP 67 / IP 65

Standard & special lubricants
Greases up to NLGI 2 / Oils

perma STAR CONTROL



Drive – reusable
**Electromechanical drive
with external power supply:
9–30 V DC, I_{max} 0.5 A**

Discharge period
**Time-controlled (TIME)
Impulse-controlled (IMPULSE)**

Lubricant volume
60 cm³, 120 cm³, 250 cm³, 500 cm³

Operating temperature
-40 °C to +60 °C**

Continuous pressure build-up
6 bar

Protection class
IP 65

Standard & special lubricants
Greases up to NLGI 2 / Oils

perma ULTRA



Drive – reusable
**Electromechanical drive with
Battery pack ULTRA**

Discharge period
**1, 2, 3 ... 12 months
1, 2, 3 ... 26 weeks**

Lubricant volume
500 cm³, 750 cm³, 1,000 cm³

Operating temperature*
-40 °C to +60 °C**

Continuous pressure build-up
Up to 50 bar

Protection class
IP 67 / IP 65

Standard & special lubricants
Greases up to NLGI 2

*To achieve functionality below -20° C / -4° F, Battery pack / Battery housing STAR VARIO | ULTRA low temperature (lithium) must be used.

**Only to be used with suitable low temperature lubricants!



Scan the QR code for more information
about perma lubrication systems

