HYDAC INTERNATIONAL

Components, Systems and Service for Wind Turbines.

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HYDAC Headquarters Germany

HYDAC USA

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HYDAC Denmark

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HYDAC Spain

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HYDAC Brazil

Your Professional Partner for Wind Turbines.

With over 7,500 employees worldwide, HYDAC is one of the leading suppliers of fluid technology, hydraulic and electronic equipment.

We help our customers develop wind energy systems from concept to completion. Our knowledge and application experience are your assets.

HYDAC products can be found in thousands of wind turbines worldwide:
Complete systems and filtration concepts for lubrication and hydraulics as well as cooling systems for gear oils and generators.

Global yet local.

With over 45 overseas subsidiaries, and more than 500 sales and service partners, HYDAC is your reliable partner worldwide.

System solutions. One supplier. One contact.

Wherever you need us, we are there to help you find the most effective solution.

For every application – from components to a complete system.

Worldwide specifications and approvals.

HYDAC Headquarters in Sulzbach/Saar

AGMA STANDARD

We take care of:

- **Condition monitoring of oil cleanliness and oil ageing in hydraulic and lubrication oils**
- **Electronic measurement of pressure, temperature, position and flow rate**
- **Cooling and filter systems for wind turbines**
- **Measures to extend service life and optimize operational safety through high-quality filtration systems**
- **Hydraulic systems and components for safety and yaw brakes**
- **Pitch control**
- **In-plant technology: Test rigs / test room equipment for gearbox, rotor bearing, cylinders, accumulators ...**
- **Secure and gentle mounting of cables**

Fluid Condition Monitoring

Sensors for permanent measurement of oil cleanliness class, wear particles, water saturation level and oil ageing in hydraulic systems. By monitoring the gearbox and bearing lubrication, wear and tear can be detected at an early stage and damage can be avoided.

ContaminationSensor CS 1000


MetallicContaminationSensor
MCS 1000 Series


AquaSensor AS 1000


HYDACLab®
Oil condition sensor


Electronic clogging
indicator type GW


GSM Module CSI-F-10


GSM Module CSI-F-10

ContaminationSensor
Module Comfort CSM-C
Portable plug-and-work module to measure solid contamination and water saturation (optional) in hydraulic and lubrication fluids containing a high proportion of air bubbles.
For temporary or permanent installation.

HYDAC Measuring Technology

HYDAC offers sensors for measuring

- Pressure
- Temperature
- Position
- Flow
- Filter contamination and
- Fluid level.


Pressure transmitter HDA 4000
(monitoring of yaw brake)

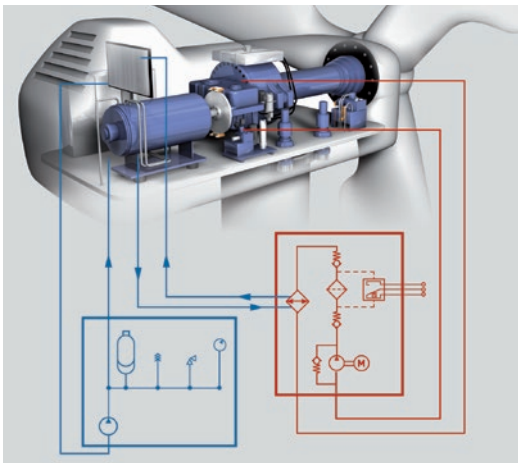

Pressure switch EDS 3000
(monitoring of lube oil)


Temperature switch ETS 3000
(monitoring of cooling circuit)


Linear position sensor HLT 1000 /
HLT 2000 (monitoring of pitch adjustment)

Cooling and Filter Systems

- System advice and design
  (also for extreme climate zones, CCV and HCV)
- Gearbox lubrication
- Gearbox cooling
- Generator cooling
- Combined cooling of the gearbox and generator
- Inverter cooling



Gear oil is cooled using plate heat exchanger,
which is supplied with a water / glycol mixture
also used to cool the generator.
Heat is then dissipated via a heat exchanger.

Courtesy WINERGY

Cooling system: Gearbox (oil / air cooler version)

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Gearbox cooling: Motor pump unit with filtration

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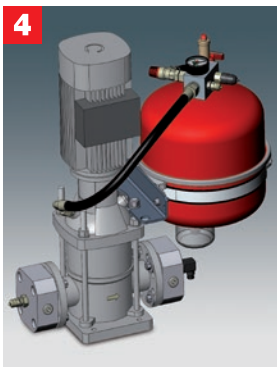

Generator / inverter cooling: Water-glycol circuit

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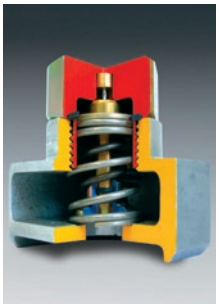
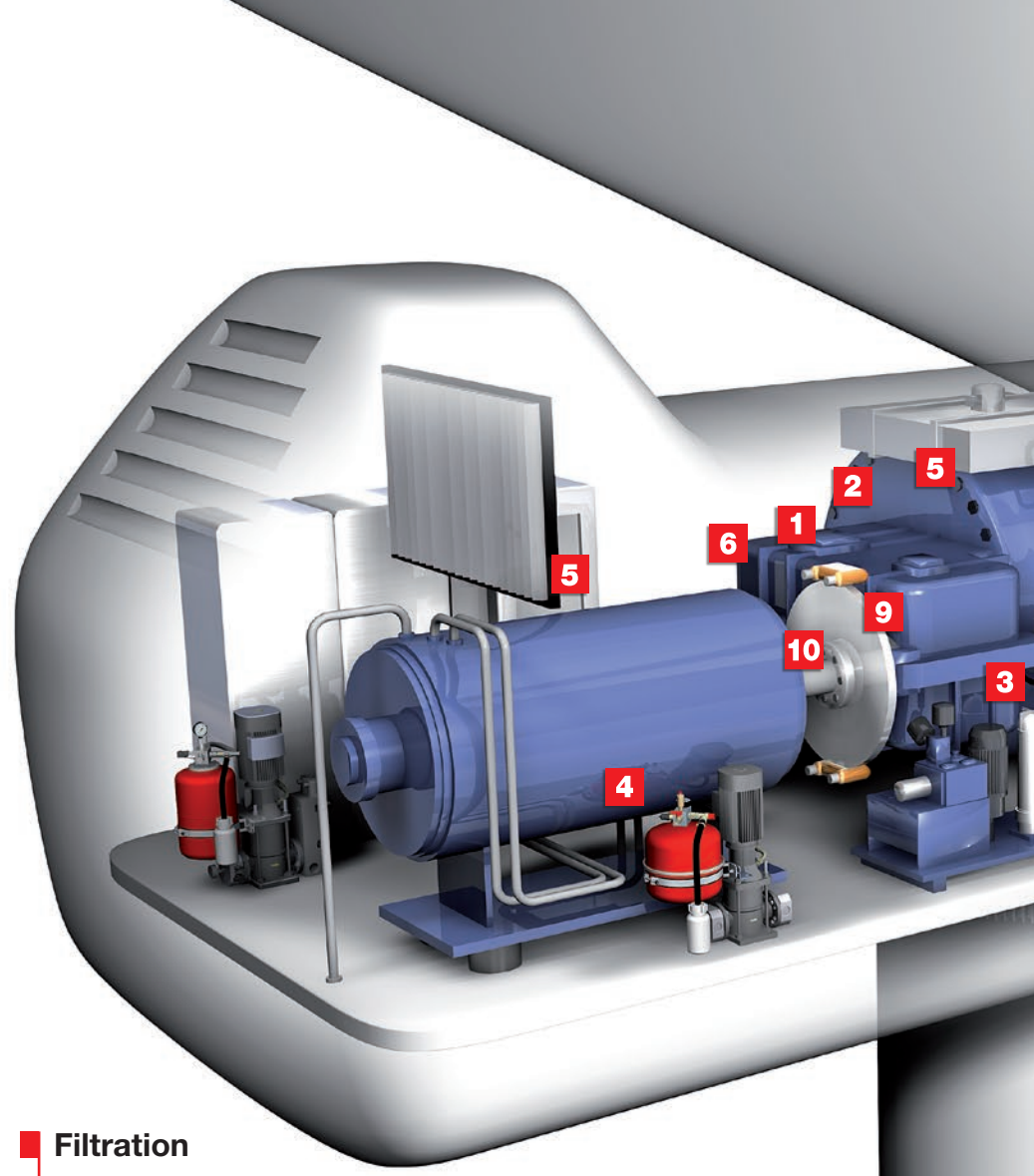
Gearbox / Generator cooling:
Flow rate: < 350 l/min
Pressure: < 16 bar dynamic
Medium: Oil or water / glycol



Integrated pressure and thermally-controlled bypass valve on the cooler



Filtration

Many years' experience in gear oil
and hydraulic oil filtration in wind turbines.
In compliance with wind power standard
AGMA 6006 we develop optimized systems for:

AGMA STANDARD

- Main filter (integrated in the lubrication system)
- Offline filters
- Breather filters and dryers

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OffLine Filter Pressure OLFP
Compact offline filter with high pressure stability

Filtration for hydraulic and lubrication oils

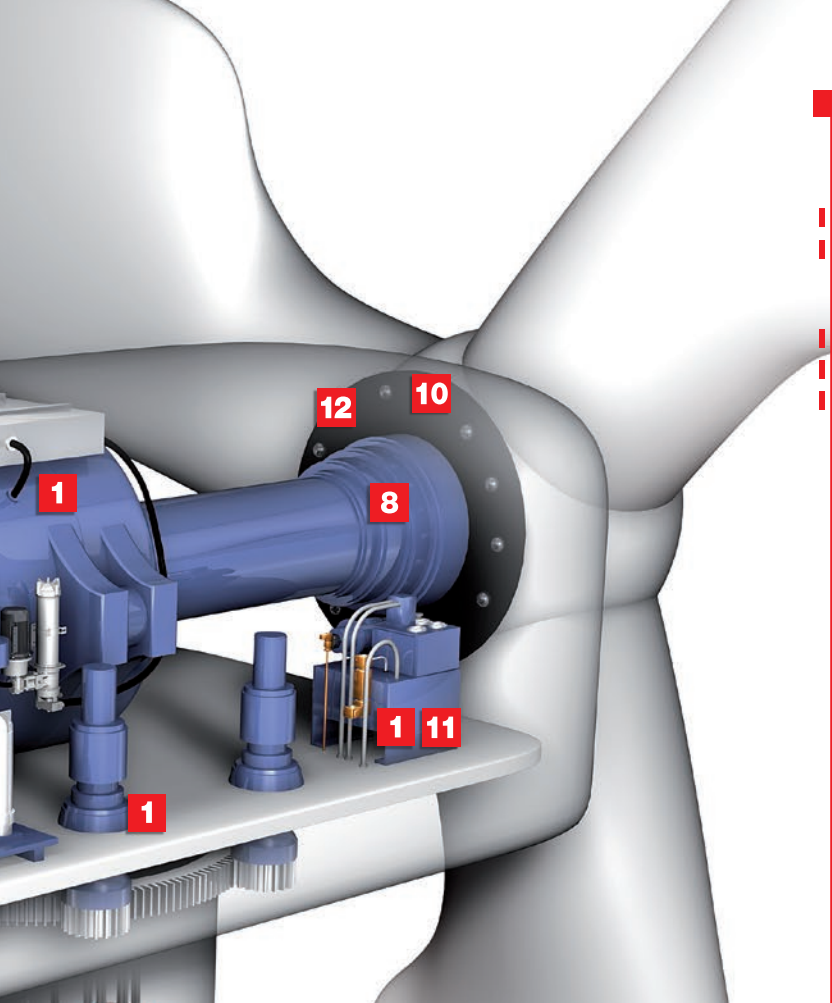
Filter block solution

Stat-Free-Elements®
to prevent static charging

Optimized filter elements
(e.g. BN4HX) also with Quality Protection to protect against product piracy

Breather
Dryer BDE

Trimicron elements
Offline filter elements for combined removal of oil ageing products, water and solid particles (suitable for OLFP offline filters)



Hydraulic Systems and Components

System advice and system design

- Pitch control
- Brake functions:
  - Safety brake
  - Yaw brake
- Yaw adjustment
- Nacelle hood
- Locking cylinder

Accumulators of all types for:
- Pulsation damping
- Energy storage
- Energy storage for emergency functions
- Remote monitoring

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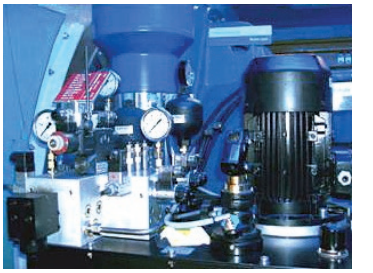
Lubrication unit for main bearing



Bladder and diaphragm accumulator in a hydraulic power unit for braking and lubrication systems:
- Pulsation damping
- Energy storage

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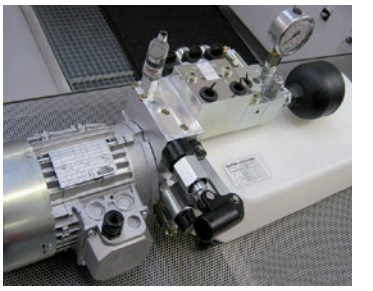
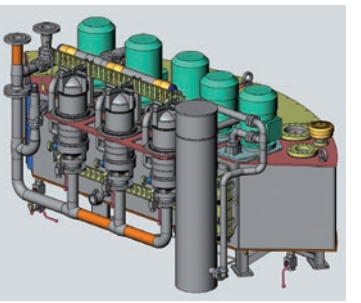
Hydraulic brake supply and gear lubrication



Energy efficient compact power unit to actuate the rotor lock



Dry sump oil supply

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HPU Brake Control
Hydraulic braking unit

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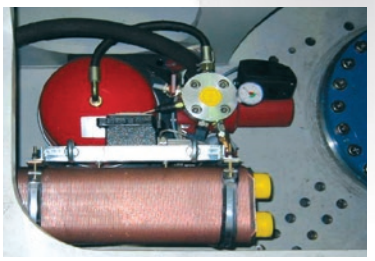
Accessories

- For the completion of hydraulic systems
- Mounting elements for components and lines, particularly the cabling in the tower

Drain valve for gearbox



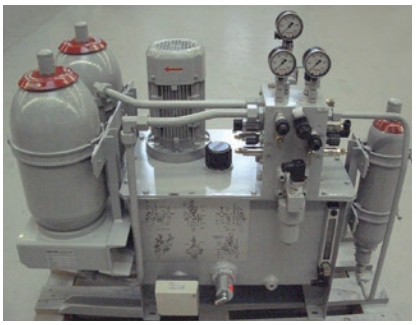
Mounting of plate heat exchangers

HY-ROFLEX for mounting cables

Fluid level gauges and fluid level sensors

Pitch Control

Cylinder for pitch adjustment
with integrated linear position system, subplate-mounted control block with control valve and piston accumulator for emergency function



Central pitch system power unit with hydraulic accumulators and double cylinders

Energy storage as emergency function

Types: Bladder accumulators
– 2 x SB330-10 litres
– 1 x SB330-2.5 litres

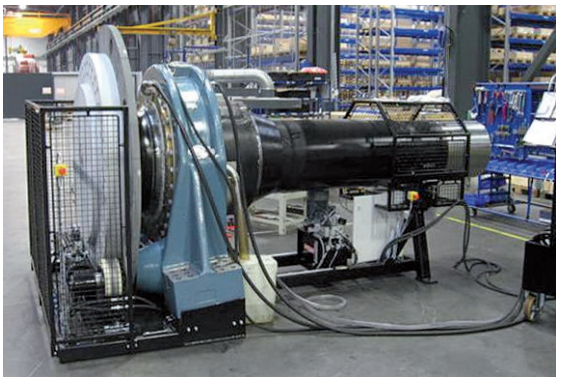
Hydraulic cylinder for pitch adjustment

Hydraulic seals:
low friction seal system
Coating: seawater resistant
Damping of the end position:
self-adjusting

In-Plant Technology: Test Rigs / Test Room Equipment

Lubrication oil supply for gear test rig

Tank volume:	2,000 l
Power:	2 x 11 kW
Flow rate:	2 x 300 l/min
Operating pressure:	max. 12 bar
Medium:	gear oil VG 320



Rotor bearing flushing and testing unit

Test room equipment

Filter transfer unit
for filling and cleaning hydraulic and lubrication systems, including particle counter and heater

Cylinder testing & flushing unit

Test rig for low temperature testing, e.g. water glycol systems and oil supply

Rotation test rig for components, e.g. bladder and piston accumulators

Systems and Service – Worldwide.

HYDAC does not just manufacture components but combines these together expertly to produce specific complete systems. Tried and tested technology, high quality standards and detailed testing procedures guarantee the performance capability of HYDAC system solutions.

HYDAC Brazil

HYDAC China

HYDAC India

HYDAC USA

Service and Optimization

HYDAC SERVICENTER

As a systems and fluid service specialist, HYDAC SERVICENTER can provide individual packages: from cleaning to complete maintenance packages and action plans for system optimization. Our aim is to increase machine availability, reduce system failures and to increase productivity.

Accumulator Technology 30.000

Filter Technology 70.000

Process Technology 77.000

Filter Systems 79.000

Compact Hydraulics 53.000

Accessories 61.000

Electronics 180.000

Cooling Systems 5.700

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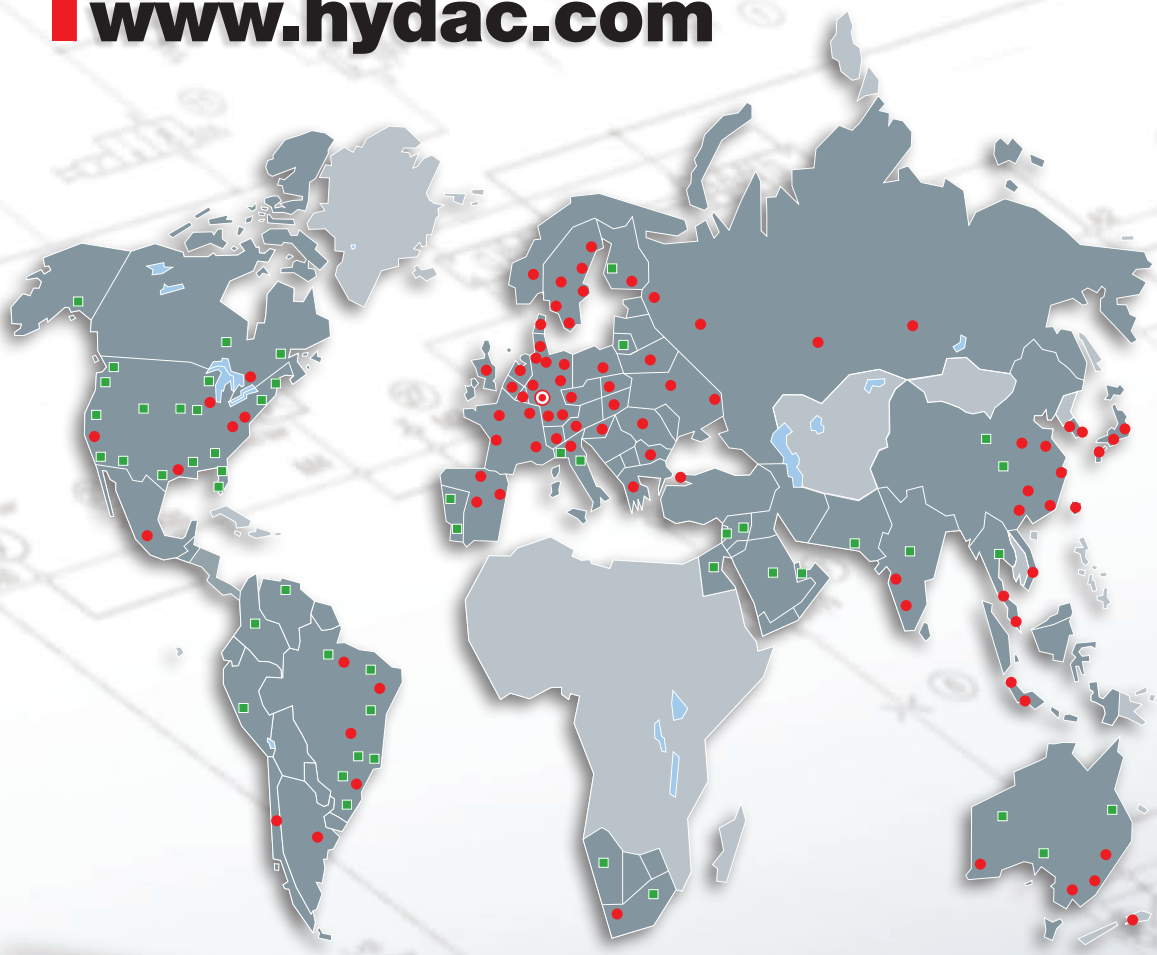

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