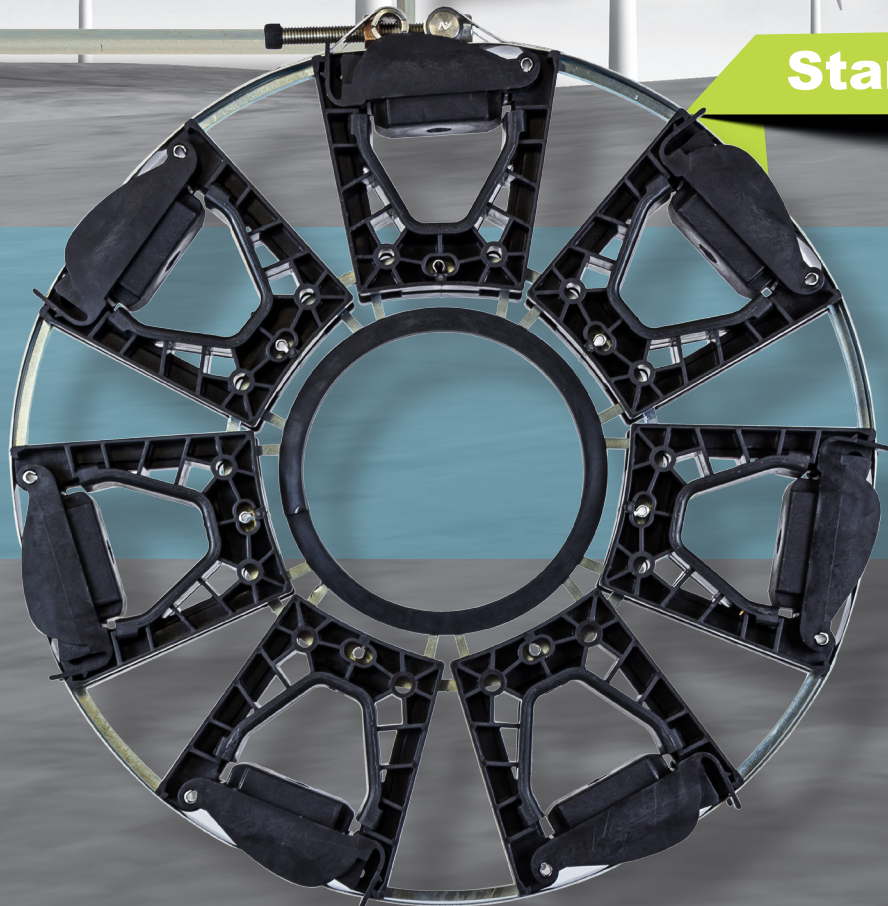


HYDAC Accessories Optimum Hold with HY-ROFLEX

Crescent



Star





HYDAC Suzbach/Saar, Plant 8



HYDAC Denmark



HYDAC China



HYDAC USA



HYDAC Italy



HYDAC France



Your partner for expertise in wind turbines.

With over 8,000 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 application knowledge and experience are your assets.

HYDAC products can be found in thousands of wind turbines worldwide: complete systems and components for hydraulics, lubrication and cooling, as well as mounting solutions for cables and components.

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.

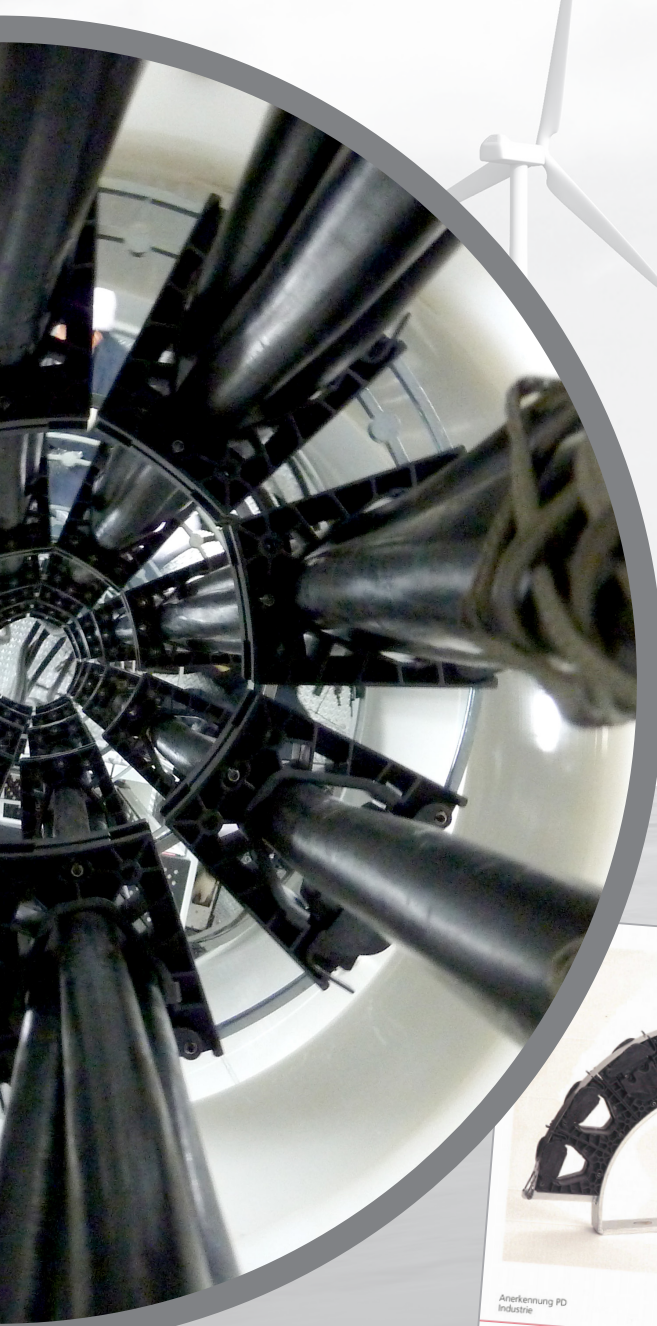
Wherever you need us, we are there to help you find the most effective solution.

For every application – from components to a complete system.

Worldwide specifications and approvals.



Note
The information in this brochure relates to the operating conditions and applications described. For applications or operating conditions not described, please contact the relevant technical department. Subject to technical modifications.



With HY-ROFLEX, you're sure to go far

Mounting technology in wind turbines, towers and high-rise buildings

Regardless of how and where cables need to be laid securely, we have the solution!

Conceived using the expertise of our engineers. Implemented with our vast selection of mounting elements. All components can be combined and modified to meet your requirements.

We support unusual customer requests, and we look forward to developing tailor-made solutions for you.

As the main focus is safety...

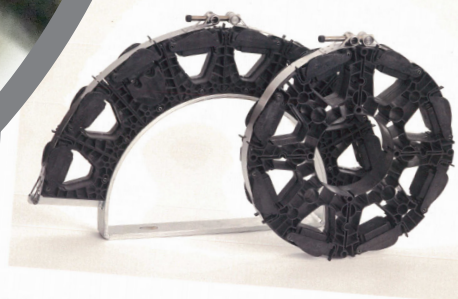
... our mounting, Buegu, block and swivel bolt clamps, series strips and brackets cover almost all cable mounting applications.

Always on top thanks to "towering" advantages

- Large standard range of products
- Designed to meet your requirements
- Fast delivery
- Rapid and secure installation
- Free choice of support surfaces
- Economic use of materials
- Clear system of laying cables
- Cable protection due to round cable clamps in the mounting brackets
- Designed to suit a wide variety of cable insulations

Not in the slipstream, but ahead of it ...

... with **HY-ROS** mounting technology for all forms of pipes and components.

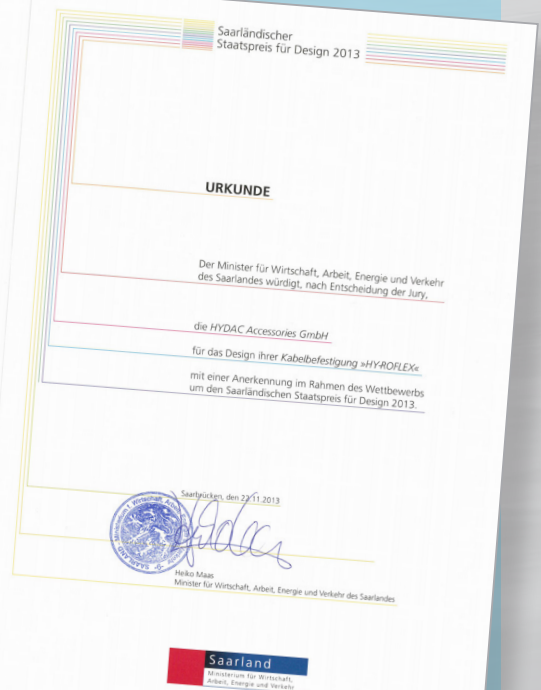


Anerkennung PD
Industrie

Kabelbefestigung Windkraft »HY-ROFLEX«

Verborgene Technik kann einen hohen Designanspruch haben. Dies wird durch das Kabelbefestigungssystem besonders deutlich. Die Montage und Demontage von Kabeln in modernen Windkraftanlagen wird so zu einer einfachen Arbeit. Die intelligente Clipstechnik und die einfache Spannsicherung machen diese Technik zu einer perfekten Arbeitserleichterung.

Bei der Ausgestaltung der Clipselemente wurde auf saubere Ordnungsgeschichte geachtet. Die Handhabung ist deutlich ergonomisch ausgerichtet. [HGF]

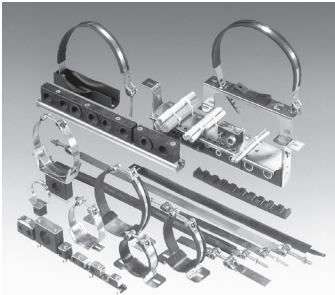


HYDAC Accessories

We make your project perfect



- Single-source supplier for accessory components.
- In-house development capacity, interdisciplinary transfer of expertise among all HYDAC companies, minimised distances between development, production and sales.
- Rapid access to an extensive product range thanks to intelligent warehousing and lean logistics.
- Individual product development to customer specification.



Current range:

- **HY-RDS** mounts for pipes, hoses, cables and components
- Mounting technology for pipes according to DIN 3015
- Hose, cable and component mounts in accordance with individual requirements
- Buegu clamps made of thermoplastic elastomer
- Series strips
- Quick release swivel bolt clamps
- Clamping bands
- Assembly systems
- **HY-ROFLEX** cable holders



HYDAC ball valves for shutting off and switching without leakage

- Block-type, sleeve-type and manifold mounted ball valves
- Change-over ball valves
- 3-way and 4-way ball valves
- Flanges to DIN, ANSI, SAE and ISO
- High pressure, low pressure
- Isolator sandwich plates
- Electric / pneumatic actuator
- Individual customer solutions



Coaxial valves for open and closed-loop control

- 2/2-way, 3/2-way
- Direct acting, pilot operated
- Modular series
- Special valves
- Pressure relief valves
- Piston control valves
- Individual customer solutions



Fluid level gauges / fluid level (FSA / FSK) sensors for easy collection, visualisation and control of the fluid level values in a tank

- Lengths from 76 mm to 1000 mm
- FSA, standard
- FSA with side inspection window
- FSK, standard
- FSK with 2 switching points
- FSK with variable switching points
- FSA options: temperature switch element, thermometer in display tube, temperature probe, mineral glass display tube, individual customer label, non-return valves, shut-off connectors
- FSK options: temperature switch element, temperature probe, mineral glass display tube, different types of connection such as Z4, MPM, sensor connector M12x1



Accessories for frictional connection, damping and tanks...

- Bell housings with flexible pump mounting and oil/air cooler
- Flexible and rigid bell housings
- Bell housing accessories
- Tank set
- Flexible drive (spider) and gear couplings



Mounting technology for risers

The **HYROFLEX** Crescent cable harness mount and **HYROFLEX** series strip are part of a system of various mounting supports for securing power cables and supply cables developed for wind power.

The basic frame is formed by a steel support structure. This allows the clamping system to be fixed to the tower and provides the frame for mounting the individual cable clamp segments. For the Crescent these segments are arranged in a semicircle on the support frame, and in a straight line for the series strip. The pivoting, spring-action fastenings are snap closures to prevent the cable from jumping out. When it is fastened, the side-mounted clamping band protects against any potential short-circuit forces. The **HYROFLEX** brackets are supplied in various versions (different number of cable clamps). Different cable groupings are considered by customised adaptations.



Series strip for single cable



Segment



Selection of insert variants



Pre-assembled Crescents



Crescents in use

Crescent and series strip

- Simple and rapid cable installation in horizontal and vertical towers
- Cables can be replaced very quickly
- Flexible for power cables $\pm 5\%$ $\varnothing$ tolerance
- $\varnothing$ up to 35 mm for triple bundles and up to 72 mm for single cables
- Very good protection of cable insulation
- Short circuit protection

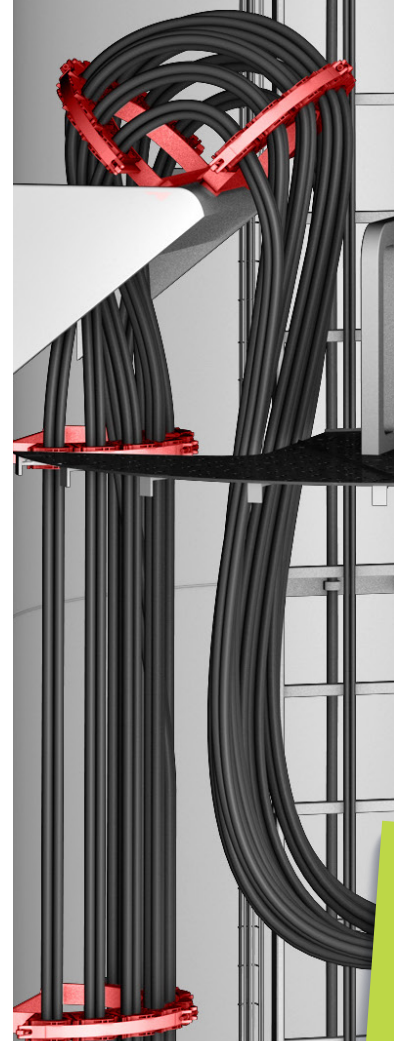
Segments

- Modular design of the mounting system due to individual segments which are connected to a Crescent or series strip by means of a steel substructure.
- A variety of shapes and finishes available for a wide range of cables.
- The segments lock by means of a spring-mounted fastener which can be opened again at any time to replace cables.
- The spring elements integrated in the fasteners enable tolerance compensation and ensure permanent pretensioning.

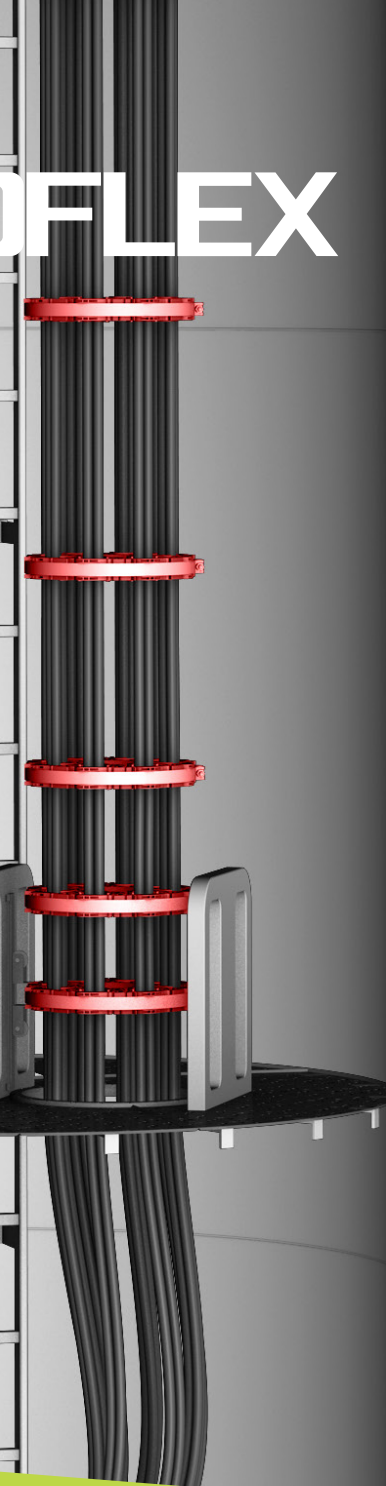
Inserts

- For even better adaptation to the cables being used, inserts which can be fitted into the segments are also available.
- Inserts available include those for flat cables or smaller cable diameters.
- Materials that protect the cables, such as elastomer materials, are also available.

HYRO



FLEX



Mounting technology for the loop



Star

Star

- Spacers for power cables etc.
- Ideal distancing between cable bundles
- Minimised eddy current losses due to optimised cable arrangement
- Optimum cooling of triple cable bundles
- Minimised cable insulation wear thanks to excellent hold
- Cable knotting prevented by fixing in radial direction and guiding in axial direction
- Optimum cable guiding from the nacelle to the tower
- Dimensions: basic version x8, Øext. = 420 mm, Øint. = 100 mm
Other versions on request

Fixed Star

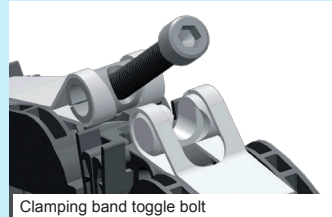
- Substructure-mounted Star for absorbing the torsion of the cable bundles
- Prevents the cable bundles from twisting when crossing over to the risers
- Dimensions: basic version x8, Øext. = 420 mm, Øint. = 100 mm
Other versions on request



Fixed Star



Star when installed



Clamping band toggle bolt



Stars in a loop



Stars in a test rig

HY-ROFLEX - Customised quality for maximum system availability

- Supply of fully turnkey modules
- Practically tool-free installation
- As a spring assembly guarantees the necessary preload, no torque wrench is required. This also reduces the risk of incorrect installation (crushing the cables).
- Flame-resistant material to UL94 V0
- Damaged cable harnesses can be replaced easily
- No falling components and therefore no risk of injury
- Short-circuit-tested with 20kA
- All cable harnesses are freely accessible and can be replaced easily at any time as they are not arranged on several levels.
- Thanks to the spring preload, no tightening is necessary in case of settling
- Operating temperatures: -40 °C to +90 °C

HYDAC Accessories in nacelles

Fluid level gauges and fluid level sensors for mounting on the outside of tanks

01

Aluminium, vacuum-resistant ball valves for the suction side of transmissions

02

Three-way ball valves for draining, filling and flushing hydraulic systems in transmissions

03

Coaxial valves for switching from normal to coasting operation or for switching to bypass mode when the oil is cold

04

Bell housings for the precisely centred connection of electric motors to hydraulic pumps in filtration units

05

Quick release swivel bolt clamps and clamping bands for mounting cylindrical or square components

06

Clamps to DIN 3015 for mounting pipes, hoses and cables

07



01



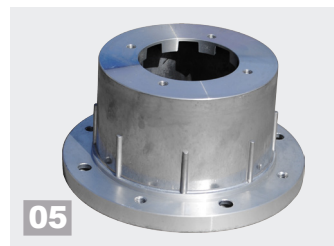
02



03



04



05



06



07

Application examples



05



06



01



03



02



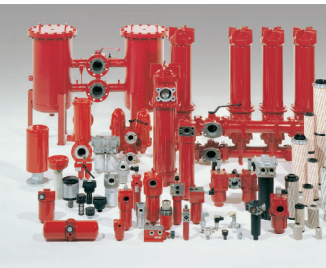
07



04



Accumulators 30.000



Filter Technology 70.000



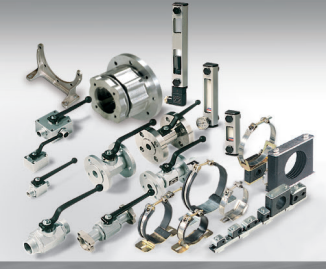
Process Technology 77.000



Filter Systems 79.000



Compact Hydraulics 53.000



Accessories 61.000



Electronics 180.000



Cooling Systems 57.000

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