



DELLNER
WIND SOLUTIONS

PRODUCT TYPE

**WIND TURBINE
COMPONENTS**

2024

**PRODUCT DATA SHEET
CATALOG**

WELCOME TO DELLNER WIND SOLUTIONS



DELLNER WIND SOLUTIONS is a global leader in the design and manufacture of braking and hydraulic systems. Our unrivaled braking equipment offers customized stop-action solutions for a wide variety of industries from sea to sky, and everything in between.

For decades DELLNER WIND SOLUTIONS products have been recognized worldwide as innovative braking solutions that are precision engineered to meet the highest quality standards.

GLOBAL STRENGTH, LOCAL COMMITMENT

Our global team of experts instill trust in our customers, develop and innovate with the latest technology, and provide strength in our product and personalized service.

Anchored by integrity and committed to sustaining our industry-leading product offering, our diverse community of extremely talented people around the world are committed to serving local customers.

The performance of our products and the satisfaction of our customers is our priority. DELLNER WIND SOLUTIONS customers trust our commitment to excellence and recognize the value of our investment in our **Worldwide Service Network**.



PREVENTATIVE SERVICE

INSPECTION &
MAINTENANCE

REPAIRS

TRAINING



REACTIVE SERVICE

TECHNICIANS
ON CALL

24/7 TECHNICAL
SUPPORT



LIFE CYCLE MANAGEMENT

CUSTOMIZED
SERVICE CONTRACTS

RETROFITTING

ORIGINAL
SPARE PARTS

THE HIGHEST STANDARDS FOR MAXIMUM PERFORMANCE

DELLNER WIND SOLUTIONS' innovative braking solutions and products are meticulously tested at our state-of-the-art research and development center. Our rigorous testing process proves and validates our research while ensuring maximum effectiveness, efficiency, and our shared client commitment to safety.

DELLNER WIND SOLUTIONS' product standards are beyond meeting the Association for Iron & Steel Technology (AIST) criteria and the rigid requirements of Deutsches Institut für Normung e.V. (DIN). With a wide range of high capacity and high performance disc and drum brakes designed to operate in severe duty applications, our research, development, and testing center continuously validates our product performance and integrity.

Our commitment to research, development, and testing is the trustworthy foundation of DELLNER WIND SOLUTIONS.



ENGINEERING

- ▶ DELLNER WIND SOLUTIONS' trusted team of expert engineers rely on decades of experience to deliver superior products and braking systems for a multitude of industry-specific applications.
- ▶ From full braking system design to the assessment and optimization of existing solutions, DELLNER WIND SOLUTIONS' engineers offer a full suite of services including 3D conceptualization, technical documentation, customized testing, and development of prototypes.



BRAKING SYSTEM DESIGN

- ▶ DELLNER WIND SOLUTIONS' provides turn-key solutions for complete braking system design for static and dynamic applications.
- ▶ Upon review of input data, our engineers and product specialists evaluate system requirements, determine quantity, size and distribution of system components, perform 3D modeling for system design and/or adjustments, and deliver a complete global FEM model to ensure proper load management and system performance.



CLIMATE TESTING

- ▶ All products designed and manufactured by DELLNER WIND SOLUTIONS endures in-depth climate and pressure performance testing to satisfy a stringent set of requirements for optimal performance, durability and safety.
- ▶ DELLNER WIND SOLUTIONS conducts performance testing on one of the industry's largest test benches to ensure each product is prepared to meet the most rigorous demands within the world's harshest climates.

> PRODUCT TYPE

WIND TURBINE COMPONENTS



JHS-RLH-200	6
JHS-RLH-240	8
JHS-RLM-280	10
JHS-RBA-16-90	12
JHS-RBA-300-75	14
JHS-RBA-SFRA12-120	16
JHS-RBA-SFRA8-100	18
JHS WTC	20
JHS-YBA-16-90	22
JHS-YBA-32-120	24
JHS-YBA-8-120	26
JHS-YBA-BACW200	28
JHS-YBP-1X80	30
JHS-YBP-3X65	32



JHS-RLH-200

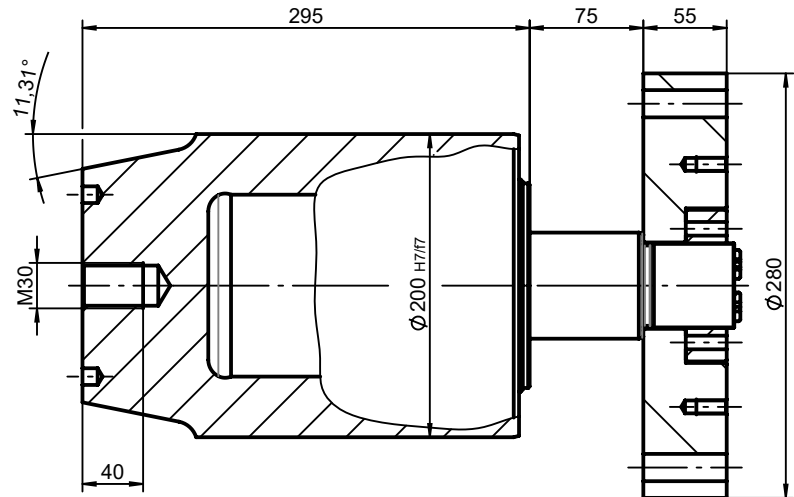
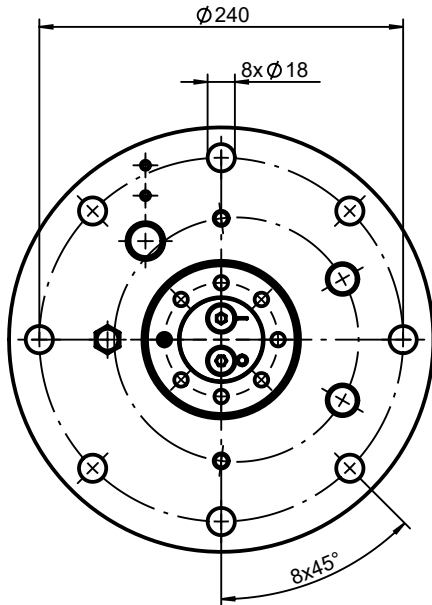
A hydraulic rotor lock offering up to 210 bar pressure with an activation time of 60 seconds

MAIN FEATURES:

- Hydraulic Operation
- Up to 250 bar pressure
- Weight: 90 kgs
- Standard Design package
- Monitoring and display of end position “rotor locked / rotor unlocked”
- Low Maintenance design

OPTIONS:

- Redundant Lock. Switches
- Position Locking Plate
- Hydraulically operated system provided with Check Valves


TECHNICAL DATA

Weight	90 kg
Outer dimensions (in lock position)	Ø280x435 mm
Full stroke*	79 mm
Max. lateral force F_L	2450,0 kN
Operating pressure p (max.)	250 bar
Max. force fore stroke F_+	282,7 kN
Max. force back stroke F_-	187 kN
Piston diameter	120,0 mm
Piston area fore stroke	113 cm ²
Piston area back stroke	74,6 cm ²
Oil volume per 1mm stroke	11 cm ³
Oil volume per 75mm stroke	848,2 cm ³
Temperature range	-40 / +60 °C
Pressure connection port	2x G1/4 "

SPECIAL EQUIPMENT

* different strokes on request

- Redundant lock switches as back up
- Lock Out Tag Out (LOTO)
- Hydraulic power unit



JHS-RLH-240

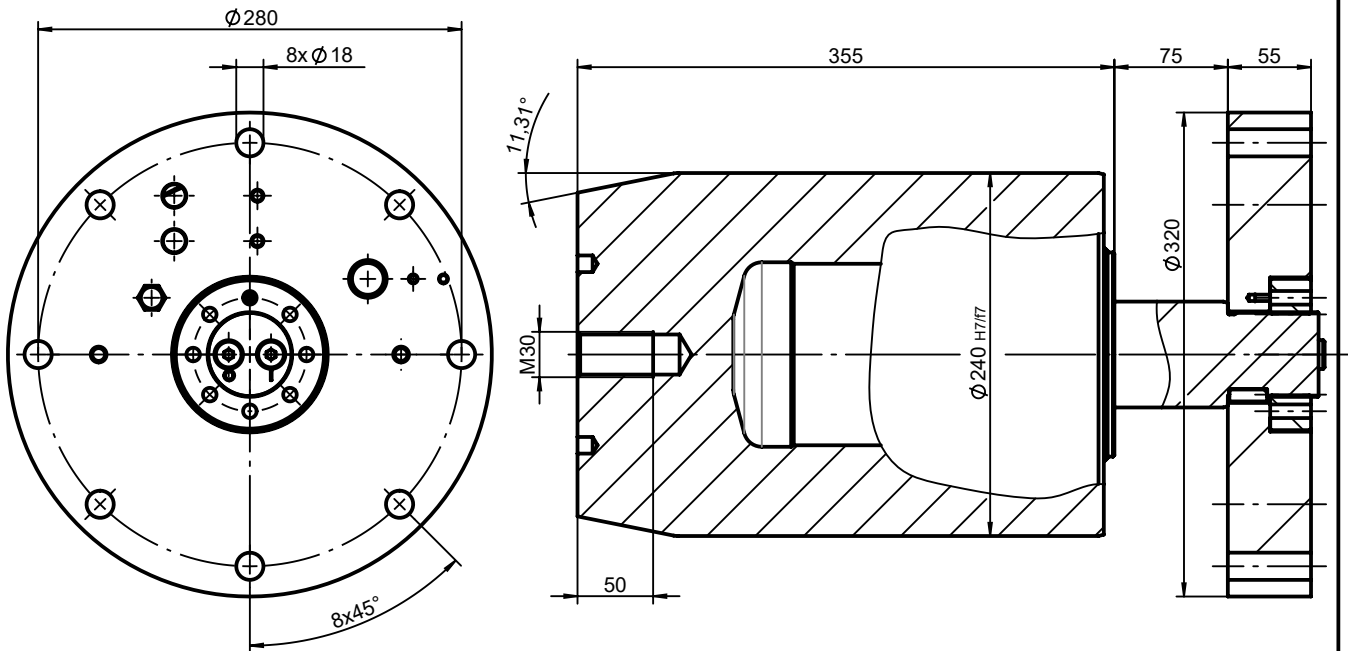
We offer three models of the JHS-RLH-240 hydraulic rotor lock – the GL Type Certified JHS-RLH-240, the JHS-RLM-240 and the JHS-RLH-240-154. All these locks deliver up to 250 bar pressure with an activation time of just 35 seconds.

MAIN FEATURES:

- Hydraulically operation
- Up to 250 bar pressure
- Weight 144 kg
- Monitoring and display of end position "rotor locked / rotor unlocked"
- Low Maintenance Design

OPTIONS:

- Redundant Lock. Switches
- Position Locking Plate
- Hydraulically operated system provided with Check Valves

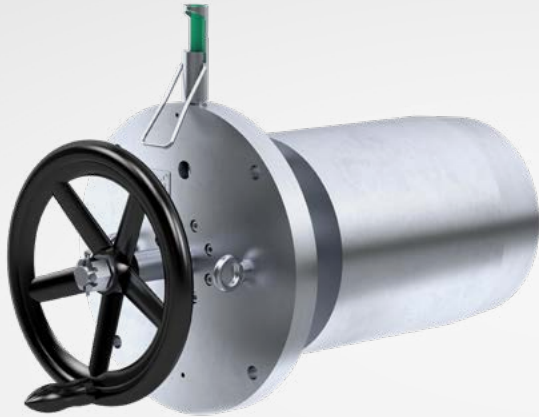


TECHNICAL DATA

Weight	144 kg
Outer dimensions (in lock position)	Ø320 x 495 mm
Full stroke*	79 mm
Max. lateral force FL	4600 kN
Operating pressure p (max)	250 bar
Max. force fore stroke F+	283 kN
Max. force back stroke F-	187 kN
Piston diameter	120 mm
Piston area fore stroke	13,1 cm ²
Piston area back stroke	74,6 cm ²
Oil volume per 1mm stroke	11,3 cm ³
Oil volume per 75 mm stroke	848,2 cm ³
Temperature range	-40 / +60 °C
Pressure connection port	2x G1/4"

SPACIAL EQUIPMENT

- * different strokes on request
- Redundant lock switches as backup
- Lock Out Tag Out (LOTO)
- Hydraulic power unit



JHS-RLM-280

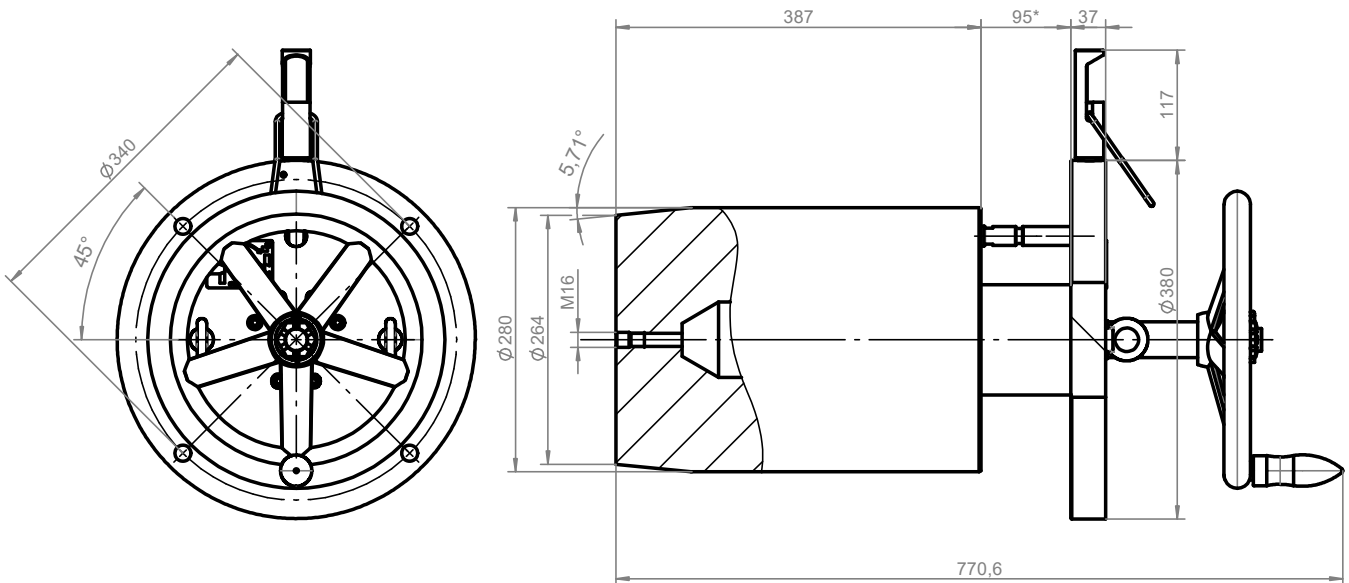
Manually activated rotor lock used for safety purposes during maintenance operations to stop the rotor mechanically. The maximum lateral force is 6400 N and the standard stroke is 95 mm. Other strokes are available upon request.

MAIN FEATURES:

- Manually operation
- Weight 213 kg
- Display device for visual check of end position "rotor locked/ rotor unlocked"
- Low maintenance design
- Comfortable use with large hand wheel

OPTIONS:

- Different strokes on request



TECHNICAL DATA

OPTIONS

Weight	213 kg	* different strokes on request
Pin diameter	Ø280mm	
Outer dimensions (in lock position)	Ø380x770,6 mm	
Full stroke*	95 mm	
Max. lateral force F_L	4600 kN	
Temperature range	-40 / +60 °C	



JHS-RBA-16-90

Hydraulic active rotor brake

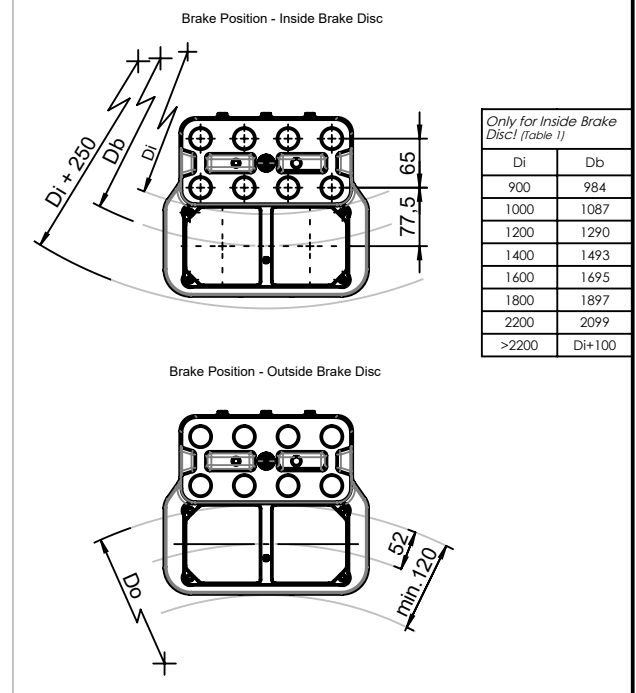
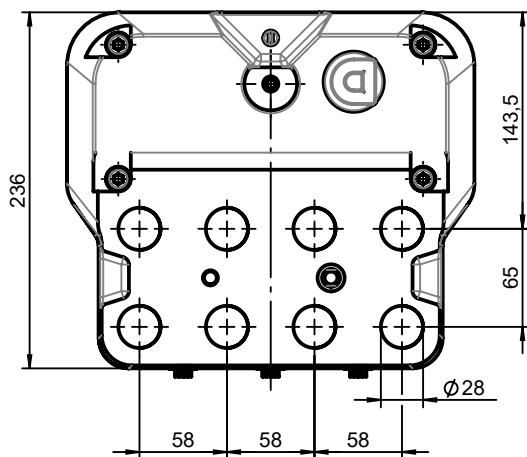
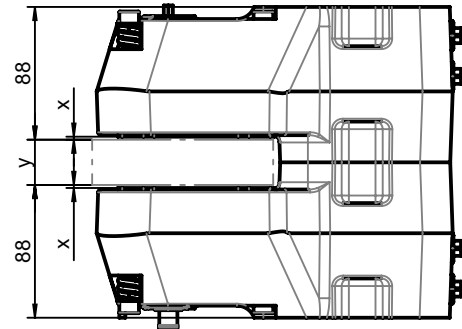
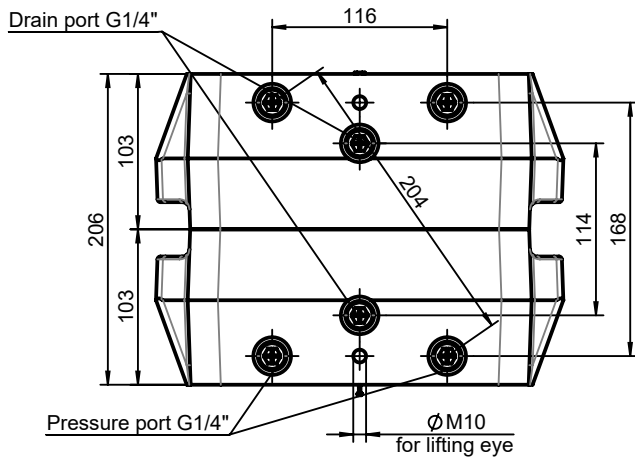
BRAKING FORCE: Up to 188 kN

MAIN FEATURES:

- Hydraulically applied
- Air gap between brake pad and disc according to customer specification
- Tight fitting between brake pad and caliper
- Drain ports for oil leakage, preventing oil from contaminating brake disc
- Min / Max working temperature -40°C / $+60^{\circ}\text{C}$

OPTIONS:

- Complete piped supports for one or more calipers
- Brake Disc
- Optional Brake Pad material
- Brake pad with wear indicators

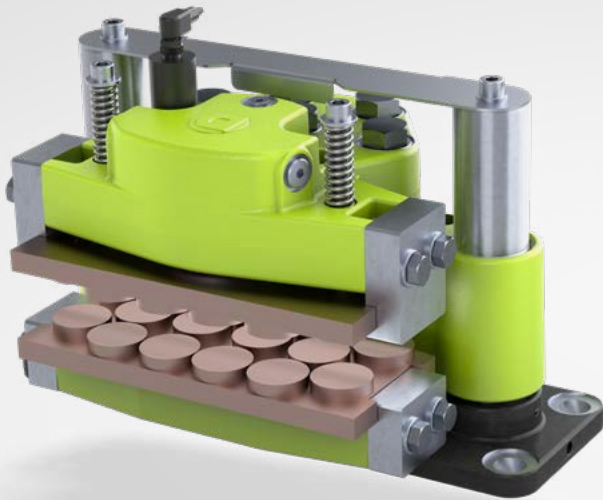


TECHNICAL DATA

Contact force F_A (per side)	235 kN
Operating pressure p (max)	185 bar
Piston area (per side)	127 cm ²
Volume at 1mm stroke (per side)	12,7 cm ³
Survival temperature	-40 / +60 °C
Operation temperature	-30 / +55 °C
Weight	60 kg
Pressure connection port	G1/4"
Drain connection port	G1/4"
Theor. friction coefficient	μ 0,3 - 0,4
Brake disc- ϕ	refer to table 1
Disc thickness (standard)	30 mm

SPECIAL EQUIPMENT

- Entire hose and piping system
- Hydraulic power unit
- Brake pad with different material (e.g. JHS-2200 or JHS-2550)
- Brake pad wear indicator (indicator pin, electrical wear sensor)
- Leak oil bottle
- Service and handling tools



JHS-RBA-300-75

A hydraulic active rotor brake with a braking force of 44 kN that's been specially developed for use in damp, dusty and corrosive working environments.

BRAKING FORCE: Up to 44 kN

MAIN FEATURES:

- Hydraulically applied
- Large Brake pad area and lower brake disc temperature for extended brake pad life
- Small air gap between brake pad and disc for quick response times and fast braking
- Sintered brake pad, suitable for high speed or high torque braking
- Floating axles
- Easy mounting, using just 4xM20 fittings for reduced installation cost
- Drain ports for oil leakage, preventing oil from getting on brake disc
- East to install and maintain with very few moving parts
- Easily removable pads and pad holders
- Suitable for damp, dusty and corrosive working environments
- Min / Max working temperature -40 °C / + 60 °C

OPTIONS:

- Optional Brake Pad material
- Brake Pad wear indicators
- On / Off indicators
- Temperature Sensors

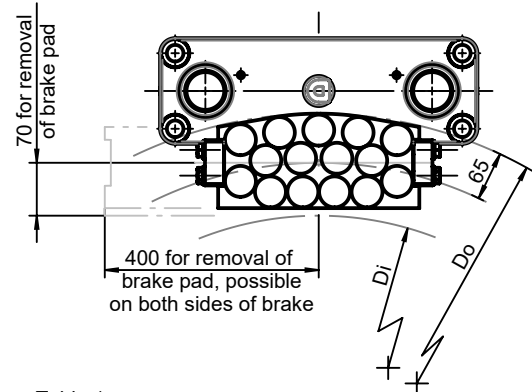
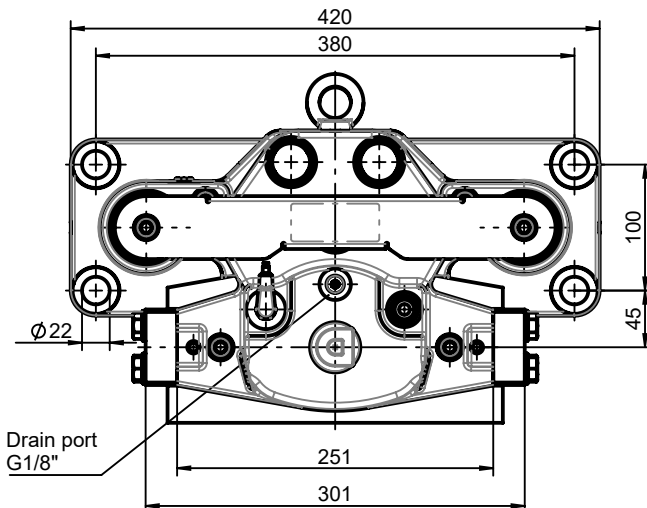
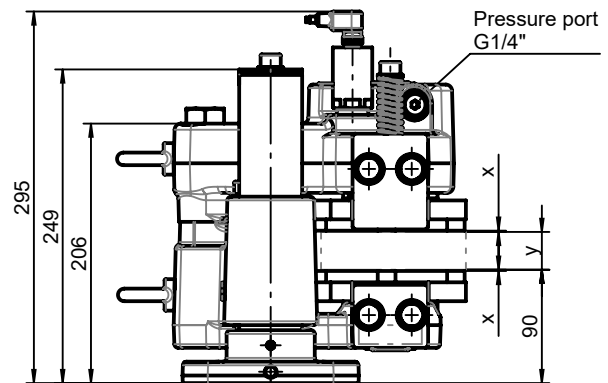
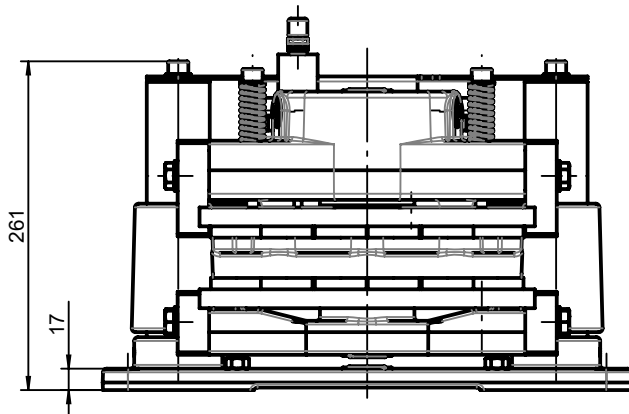


Table 1:

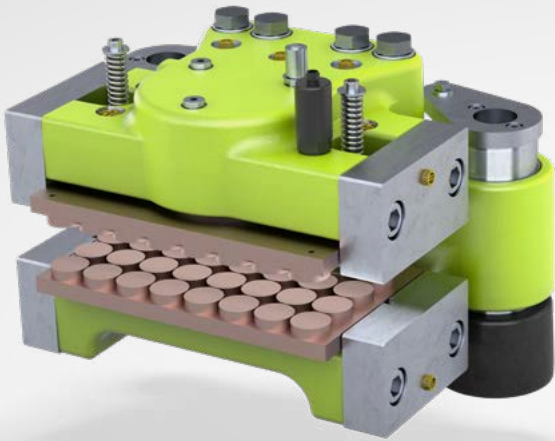
Do	Di	Y	X
500 < Do < 1500	Do - Y	130	20
1500 < Do < 1600	Do - Y	126	18
1600 < Do < 2000	Do - Y	120	15
2000 < Do < 4000	Do - Y	110	10

TECHNICAL DATA

Contact force F_A (per side)	55 kN
Operating pressure p (max)	125 bar
Piston area (per side)	44 cm ²
Volume at 1mm stroke (per side)	4,4 cm ³
Survival temperature	-40 / +60 °C
Operation temperature	-30 / +55 °C
Weight	68,4 kg
Pressure connection port	G1/4"
Drain connection port	G1/8"
Theor. friction coefficient	μ 0,3 - 0,4
Brake disc- \varnothing	refer to table 1
Disc thickness (standard)	30 mm

SPECIAL EQUIPMENT

- Entire hose and piping system
- Hydraulic power unit
- Brake pad with different material (e.g. JHS-2200 or JHS-2550)
- Brake pad wear indicator (electrical wear sensor)
- Leak oil bottle
- Spacer plates for other brake disc thicknesses



JHS-RBA-SFRA12-120

Due to its high capacity, our SFRA brake is mainly used as a rotor brake in wind turbines. It is particularly suitable for applications with a high duty cycle.

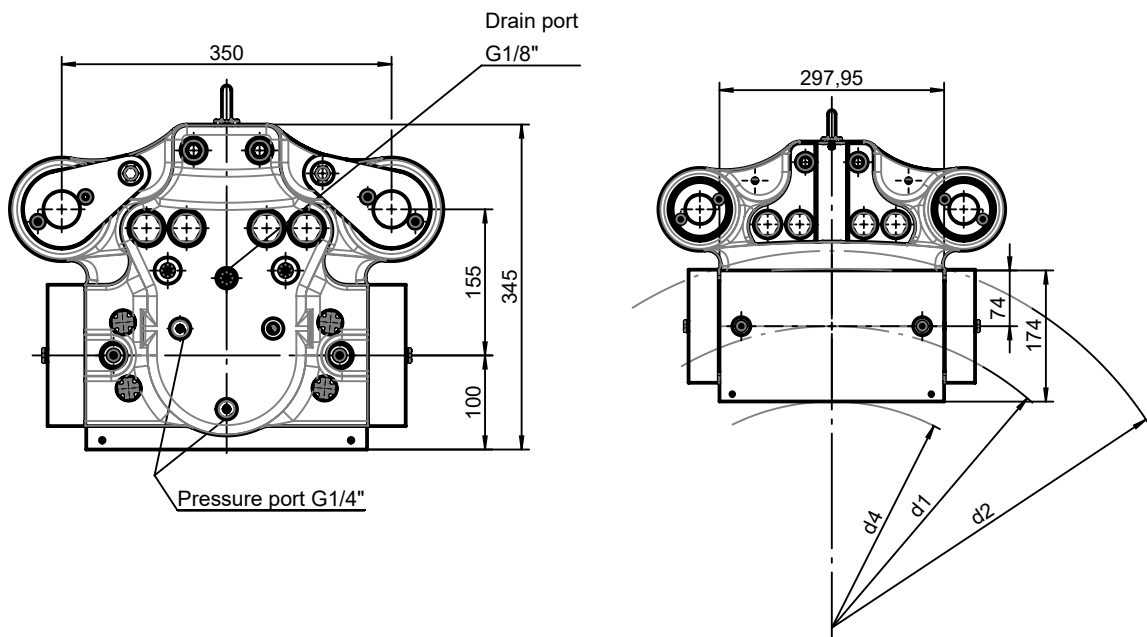
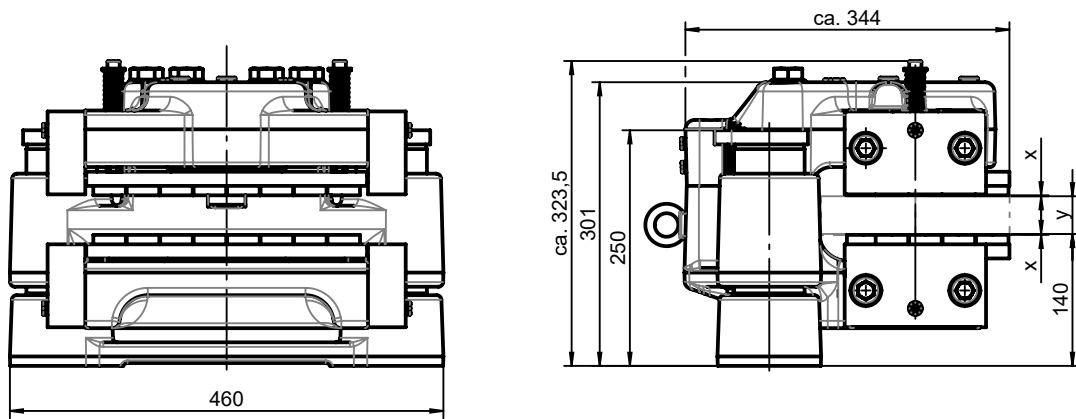
BRAKING FORCE: Up to 104 kN

MAIN FEATURES:

- Active caliper brake, ready for operation, hydraulically applied, spring released
- No Failsafe function
- Sintered Linings
- Horizontal Compensation +/- 5mm
- Support for direct gear box mounting
- Suitable for damp, dusty and corrosive working environments
- Min / Max working temperature -40°C / + 60°C

OPTIONS:

- Limit switch release control
- Limit switch wear control
- Connects to Hydraulic Power Units
- Seals for special fluids
- Sensors for remote monitoring:
 - Temperature Monitoring
 - Wear Sensors
 - Release / Air Gap

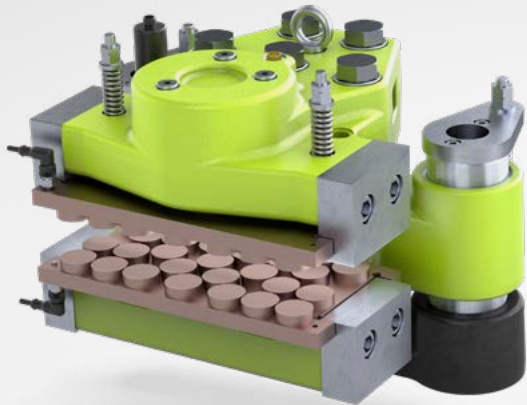


TECHNICAL DATA

Contact force F_a	130 kN
Operating pressure p (max)	115 bar
Piston area (per side)	113 cm ²
Volume at 1mm stroke (per side)	12 cm ³
Survival temperature:	-40 / +60°C
Operation temperature	-30 / +55°C
Weight	178 kg
Pressure connection port	G1/4 "
Drain connection port	G1/8 "
Theor. friction coefficient	0,2 - 0,4 μ
Brake disc $\varnothing d_2$	700-1500 mm
Friction $\varnothing d_1$	d2-200mm
Max. perm. Hub $\varnothing d_4$	d2-400 mm
Disc thickness (standard)	40 mm

SPECIAL EQUIPMENT

- Hydraulic power unit
- Brake pad with different material
- Rotor locking pin
- Temperature sensor
- Limit switch release control
- Limit switch wear control



JHS-RBA-SFRA8-100

Due to its high capacity, our SFRA brake is mainly used as a rotor brake in wind turbines. It is particularly suitable for applications with a high duty cycle.

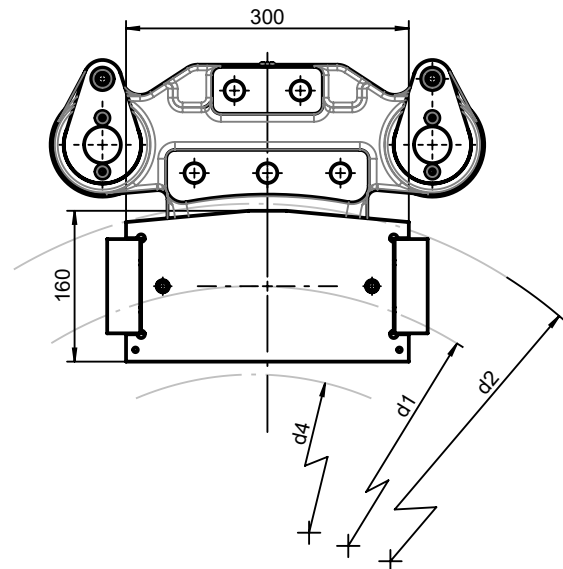
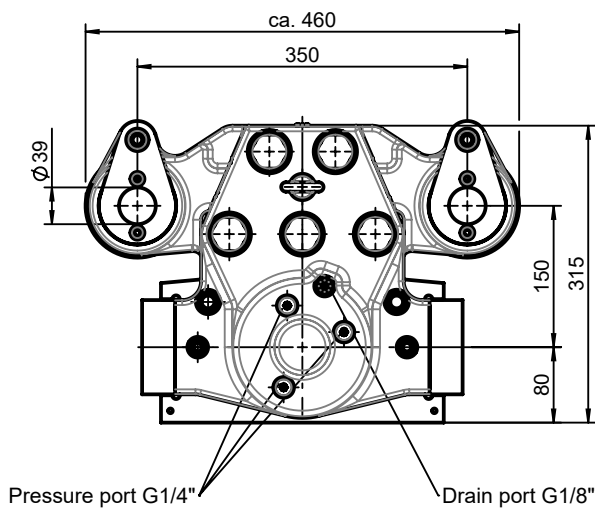
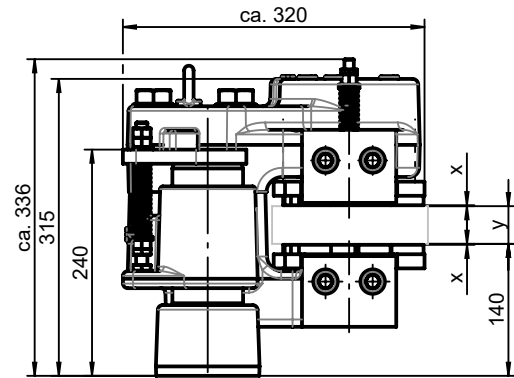
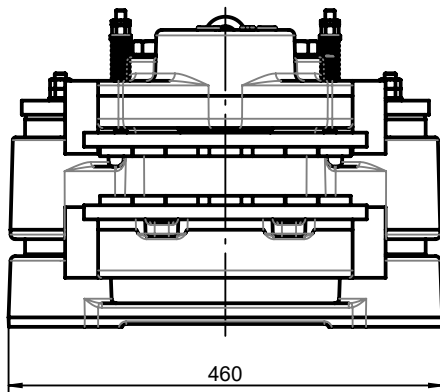
BRAKING FORCE: Up to 63 kN

MAIN FEATURES:

- Active caliper brake, ready for operation, hydraulically applied, spring released
- No Failsafe function
- Sintered Linings
- Horizontal Compensation +/- 5mm
- Support for direct gear box mounting

OPTIONS:

- Limit switch release control
- Limit switch wear control
- Connects to Hydraulic Power Units
- Seals for special fluids
- Sensors for remote monitoring:
 - Temperature Monitoring
 - Wear Sensors
 - Release / Air Gap

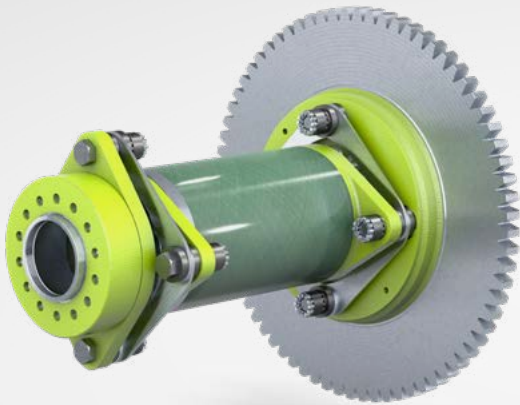


TECHNICAL DATA

Contact force F_A	80 kN
Operating pressure p (max)	100 bar
Piston area (per side)	79 cm ²
Volume at 1mm stroke (per side)	8 cm ³
Survival temperature	-40 / +60 °C
Operation temperature	-30 / +55 °C
Weight	132 kg
Pressure connection port	G1/4 "
Drain connection port	G1/8 "
Theor. friction coefficient	0,2 - 0,4 μ
Min. brake disc $\varnothing d_2$	700-1500 mm
Friction $\varnothing d_1$	d2-175 mm
Max. perm. Hub $\varnothing d_4$	d2-360 mm
Disc thickness (Standard)	40 mm

SPECIAL EQUIPMENT

- Hydraulic power unit
- Brake pad with different material
- Rotor locking pin
- Temperature sensor
- Limit switch release control
- Limit switch wear control



JHS WTC

JHS WTC is a flexible disc coupling mounted between gearbox and generator. It's a tailor-made solution for wind turbine applications (Type WTC = Wind Turbine Coupling).

- High torque capacity
- High deflection value compensation (axial, angular, radial)
- High rotary rigidity
- Maintenance free, no lubrication needed

MAIN FEATURES:

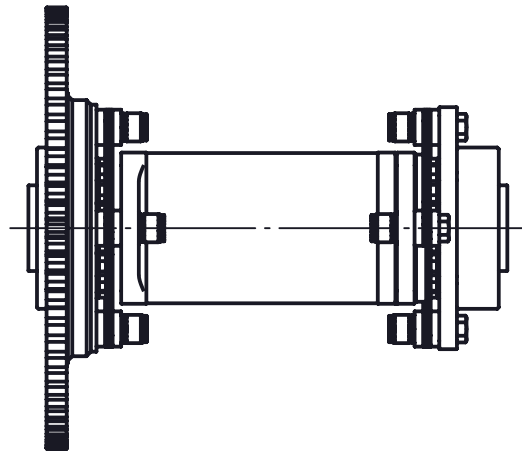
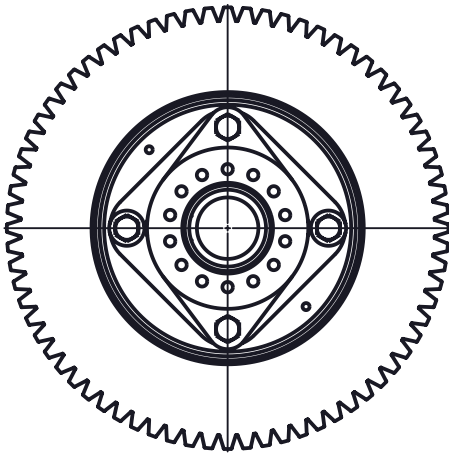
- Integrated torque limiter
- Integrated brake disc
- Electrical insulation using GFRP tube material

OPTIONS:

- Sensor disc for speed measurement
- Torque measuring electronics
- Multi-stud fasteners for low-torque mounting
- Toothed brake disc

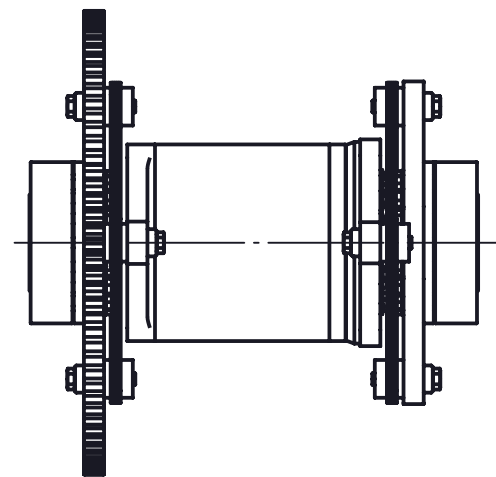
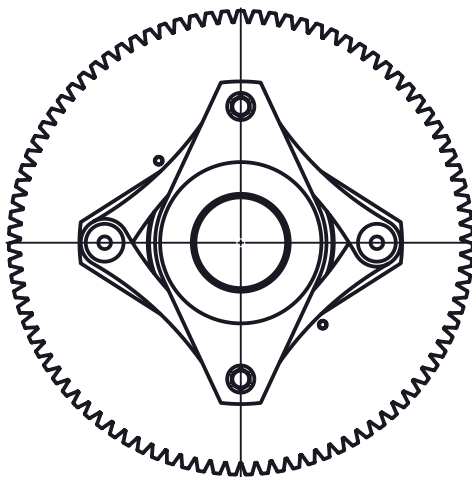
Example of JHS-WTC-402

P = 3,0 MW



Example of JHS-WTC-542

P = 5,3 MW



TECHNICAL DATA WTC-402

Nominal power	3,0 MW
Rated torque	23000 Nm
Slip torque	37000 Nm
Slip torque tolerance	± 10 %

TECHNICAL DATA WTC-542

Nominal power	5,3 MW
Rated torque	31000 Nm
Slip torque	56000 Nm
Slip torque tolerance	± 10 %

SPECIAL EQUIPMENT

- Integrated torque limiter
- Integrated brake disc (toothing optionally)
- Electrical insulation using GFRP or ceramic material
- Sensor discs for speed or torque measurement
- Multi-stud fasteners for low-torque mounting

GENERAL

- JHS WTC couplings are tailor-made solutions for wind turbine applications.
For more information please contact DELLNER BUBENZER.



JHS-YBA-16-90

Hydraulic active yaw brake caliper

BRAKING FORCE: Up to 188 kN

MAIN FEATURES:

- Hydraulically applied
- Air gap between brake pad and disc up to 2mm per side
- Special epoxy resin pad with GFK carrier plate
- Tight fitting between brake pad and caliper
- Drain ports for oil leakage, preventing oil from contaminating brake disc
- Min / Max working temperature -40°C / + 60°C

OPTIONS:

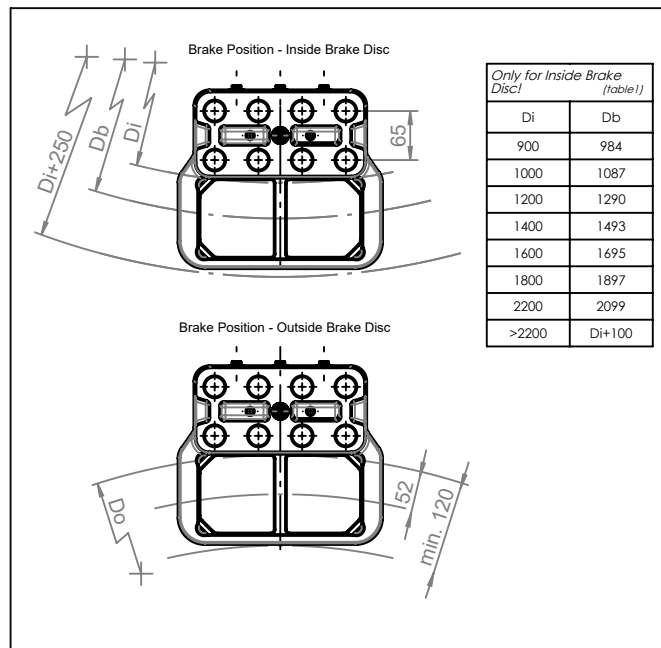
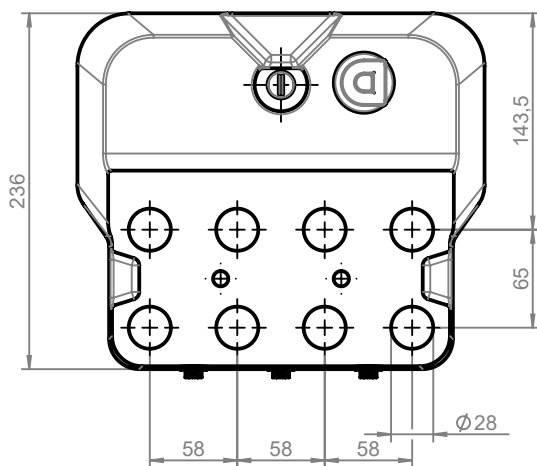
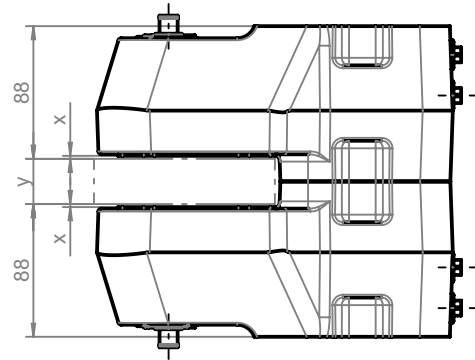
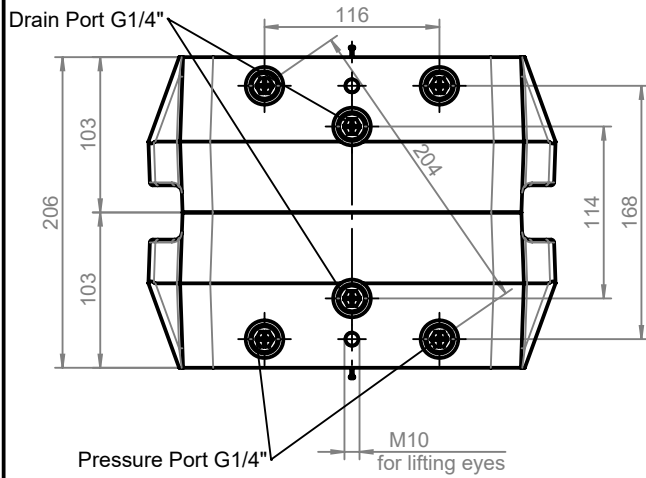
- Complete piped supports for one or more calipers
- Brake Disc
- Optional Brake Pad material
- Brake pad with wear indicators



-Technical Data Sheet-

JHS-YBA-16-90

2022-TDS-DB-000030



TECHNICAL DATA

Contact force F_A (per side)	235 kN
Operating pressure p (max)	185 bar
Piston area (per side)	127 cm ²
Volume at 1mm stroke (per side)	12,7 cm ³
Survival temperature	-40 / +60 °C
Operation temperature	-30 / +55 °C
Weight	60 kg
Pressure connection port	G1/4
Drain connection port	G1/4
Theor. friction coefficient	μ 0,3 - 0,4
Brake disc-Ø	refer to table 1
Disc thickness (standard)	30 mm

SPECIAL EQUIPMENT

- Entire hose and piping system
- Hydraulic power unit
- Brake pad with different material (e.g. JHS-2200 or JHS-1604)
- Brake pad wear indicator (indicator pin, electrical wear sensor)
- Leak oil bottle
- Service and handling tools



JHS-YBA-32-120

Hydraulic active yaw brake caliper with GL Type Certification

BRAKING FORCE: Up to 490 kN

MAIN FEATURES:

- Hydraulically applied
- Air gap between brake pad and disc up to 2mm per side
- Special epoxy resin pad with GFK carrier plate
- Tight fitting between brake pad and caliper
- Drain ports for oil leakage, preventing oil from contaminating brake disc
- Min / Max working temperature -40°C / + 60°C

OPTIONS:

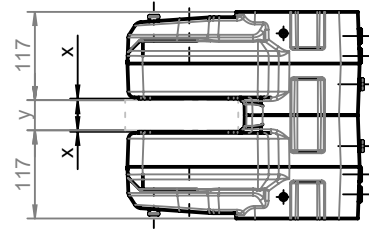
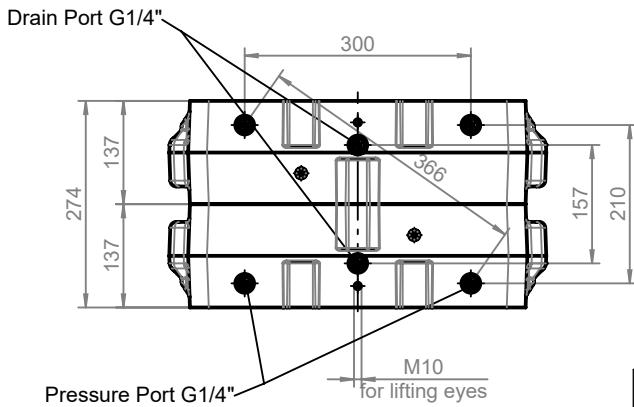
- Complete piped supports for one or more calipers
- Brake Disc
- Optional Brake Pad material
- Brake pad with wear indicators



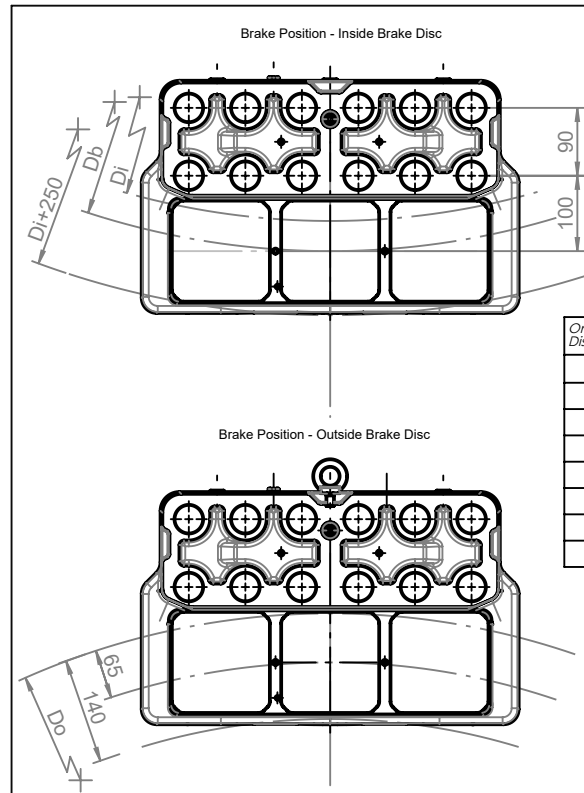
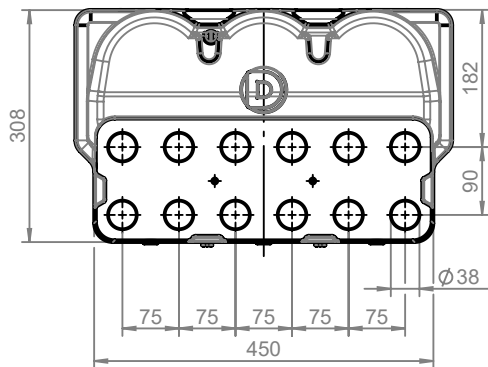
-Technical Data Sheet-

JHS-YBA-32-120

2022-TDS-DB-000031



Pressure Port G1/4"
M10 for lifting eyes



Only for Inside Brake Disc!
(table 1)

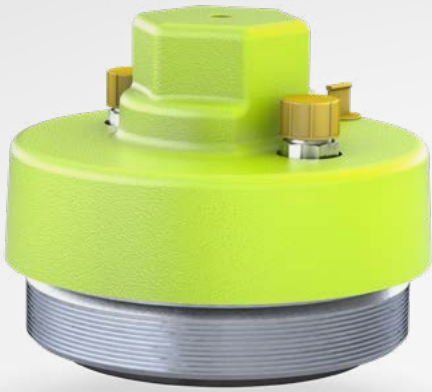
Di	Db
2000	2080
2200	2280
2400	2480
2600	2680
2800	2880
3000	3080
>3200	Di+100

TECHNICAL DATA

Contact force F_A (per side)	610 kN
Operating pressure p (max)	180 bar
Piston area (per side)	339 cm ²
Volume at 1mm stroke (per side)	33,9 cm ³
Survival temperature	-40 / +60 °C
Operation temperature	-30 / +55 °C
Weight	189 kg
Pressure connection port	G1/4
Drain connection port	G1/4
Theor. friction coefficient	μ 0,3 - 0,4
Brake disc-Ø	refer to table 1
Disc thickness (standard)	40 mm

SPECIAL EQUIPMENT

- Entire hose and piping system
- Hydraulic power unit
- Brake pad with different material (e.g. JHS-2200 or JHS-1604)
- Brake pad wear indicator (indicator pin, electrical wear sensor)
- Leak oil bottle
- Service and handling tools



JHS-YBA-8-120

Hydraulic active yaw brake caliper

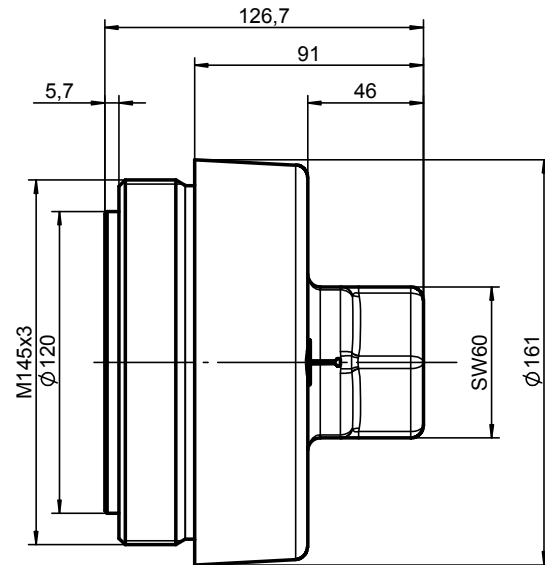
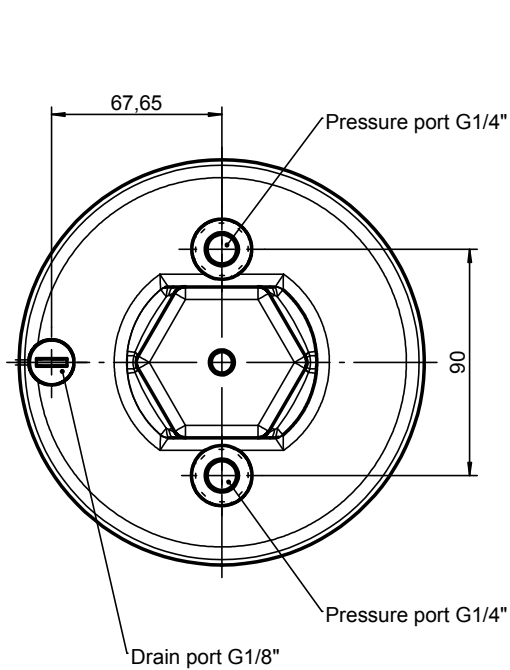
BRAKING FORCE: Up to 136 kN

MAIN FEATURES:

- Hydraulically applied
- Special epoxy resin pads
- Drain ports for oil leakage, which prevents oil getting on to brake disc
- Min / Max working temperature -40°C / + 60°C

OPTIONS:

- Complete piped supports for one or more calipers
- Brake Disc
- Optional Brake Pad material



TECHNICAL DATA

Contact force F_A	196 kN
Operating pressure p (max)	160 bar
Piston area	123 cm ²
Volume at 1mm stroke	12,3 cm ³
Survival temperature	-40 / +60 °C
Operation temperature	-30 / +55 °C
Weight	12 kg
Pressure connection port	G1/4
Drain connection port	G1/8
Theor. friction coefficient	μ 0,3 - 0,4

SPECIAL EQUIPMENT

- Entire hose and piping system
- Hydraulic power unit
- Brake pad with different material (e.g. JHS-2200 or JHS-1604)
- Brake pad wear indicator (indicator pin, electrical wear sensor)
- Leak oil bottle
- Service and handling tools



JHS-YBA-BACW200

A hydraulic active yaw brake with GL Type Certification and braking force of 620 kN.

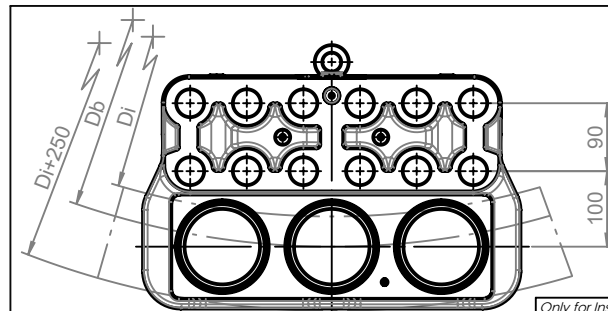
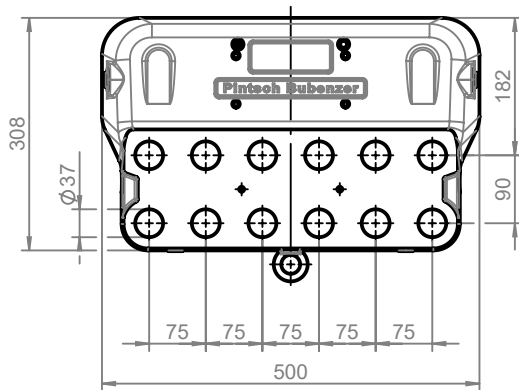
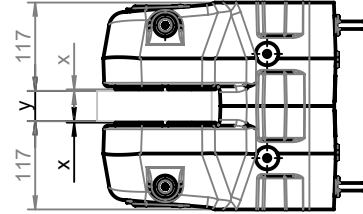
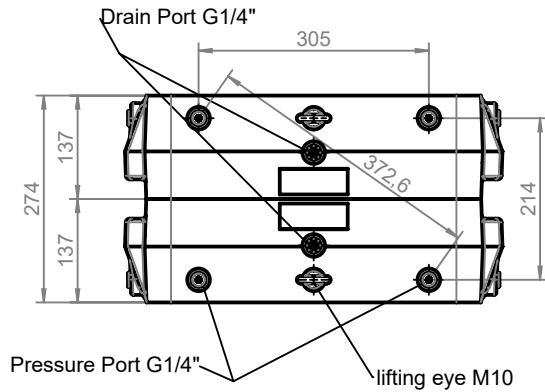
BRAKING FORCE: Up to 620 kN

MAIN FEATURES:

- Hydraulically applied
- Air gap between brake pad and disc up to 2mm per side
- Special epoxy resin pad with GFK carrier plate
- Tight fitting between brake pad and caliper
- Drain ports for oil leakage, preventing oil from contaminating brake disc
- Min/Max working temperature -40°C/+ 60°C

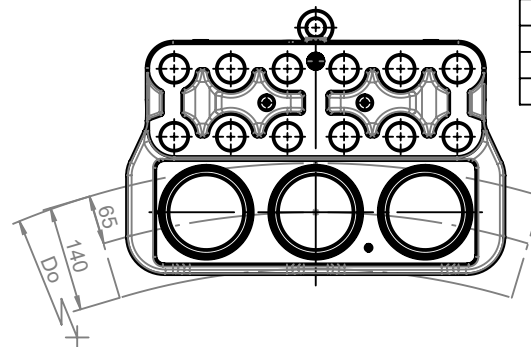
OPTIONS:

- Brake pad wear indicators
- Complete piped supports for one or more calipers
- Brake disc


 Only for Inside Brake Disc!
(table1)

Di	Db
2000	2080
2200	2280
2400	2480
2600	2680
2800	2880
3000	3080
>3200	Di+100

Brake Position - Outside Brake Disc



TECHNICAL DATA

Contact force F_A (per side)	620 kN
Operating pressure p (max)	180 bar
Piston area (per side)	345 cm ²
Volume at 1mm stroke (per side)	34,5 cm ³
Survival temperature	-40 / +60 °C
Operation temperature	-30 / +55 °C
Weight	189 kg
Pressure connection port	G1/4
Drain connection port	G1/4
Theor. friction coefficient	μ 0,3 - 0.5
Brake disc-Ø	refer to table1
Disc thickness (standard)	40 mm

SPECIAL EQUIPMENT

- Entire hose and piping system
- Hydraulic power unit
- Brake pad with different material (e.g. JHS-2200 or JHS-1604)
- Brake pad wear indicator (indicator pin, electrical wear sensor)
- Leak oil bottle
- Service and handling tools



JHS-YBP-1X80

A passive yaw sliding bearing with a robust yet simple design that guarantees optimum performance throughout the life of the turbine. As few components are needed, this bearing is reliable and virtually maintenance free, so there's less need for outages or downtime. Brake torque is applied continuously and the system slides on the yaw bearing, so you don't need an additional brake disc. The brake torque is mainly dependent on surface pressure and friction coefficient, so variations can be built in during the design process.

MAIN FEATURES:

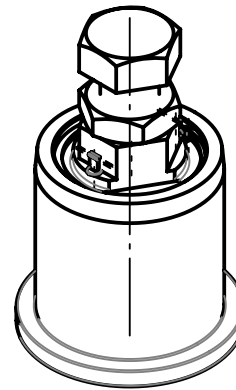
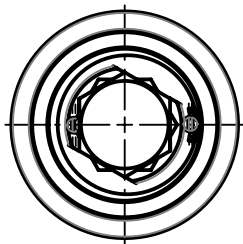
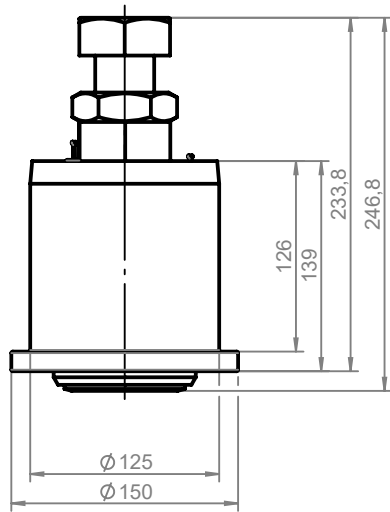
- Fully closed passive brake system
- Special epoxy resin pads
- Min / Max working temperature -40°C / + 60°C



-Technical Data Sheet-

JHS-YBP-1x80

2022-TDS-DB-000033



TECHNICAL DATA

Contact force F_A	100 kN - 175kN
Pad area	50cm ²
Survival temperature	-40 / +60 °C
Operation temperature	-30 / +55 °C
Weight	16kg
Theor. friction coefficient	μ 0,3 - 0,4

SPECIAL EQUIPMENT

- Brake pad with different material (e.g. JHS-2200 or JHS-1604)
- Service and handling tools (e.g. VA000477 & VA001518)



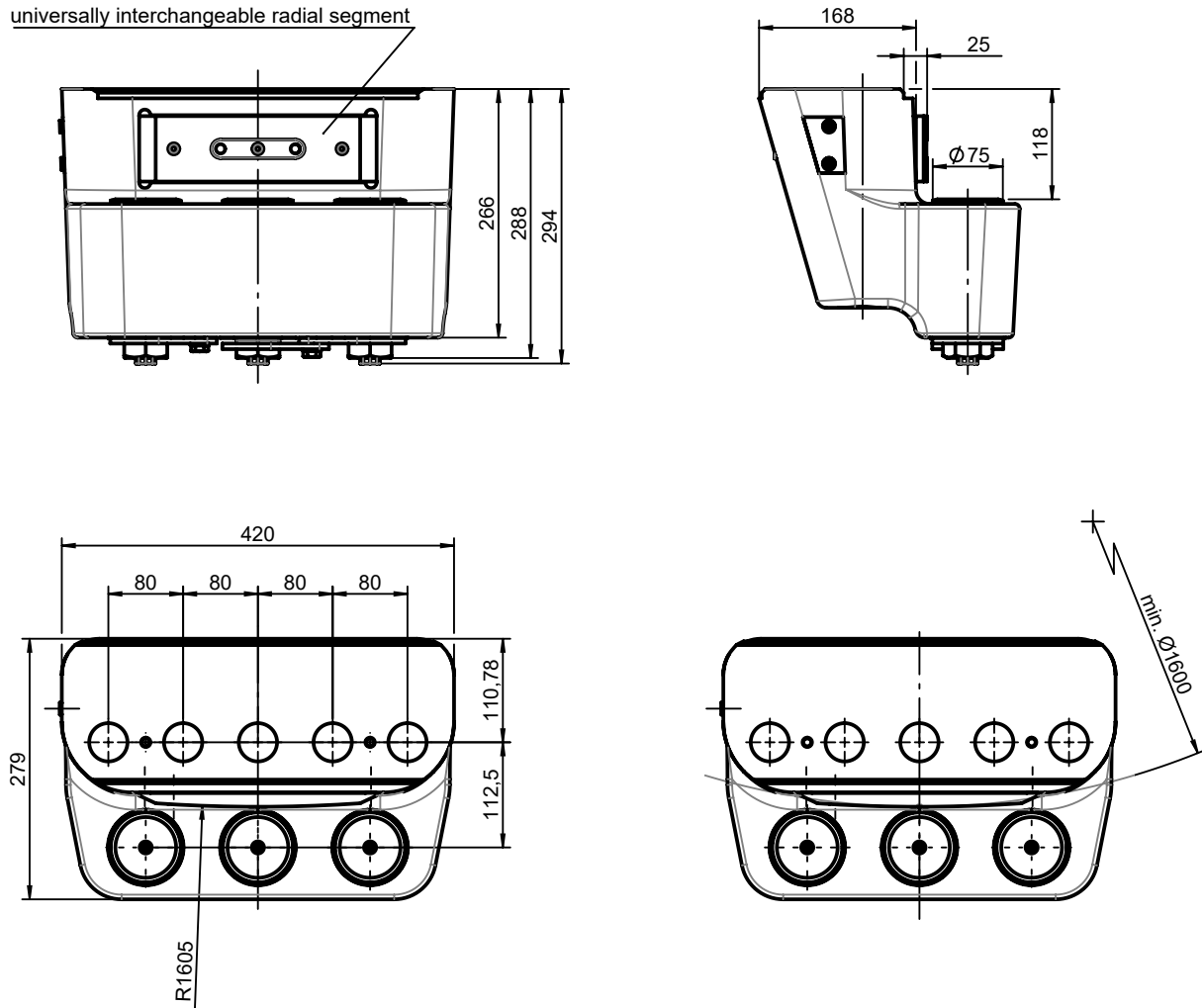
JHS-YBP-3X65

A passive yaw sliding bearing with a robust yet simple design that guarantees optimum performance throughout the life of the turbine. As few components are needed, this bearing is reliable and virtually maintenance free, so there's less need for outages or downtime. Brake torque is applied continuously and the system slides on the yaw bearing, so you don't need an additional brake disc. The brake torque is mainly dependent on surface pressure and friction coefficient, so variations can be built in during the design process.

MAIN FEATURES:

- Fully closed passive brake system
- Special epoxy resin pads
- Min / Max working temperature -40°C / + 60°C

universally interchangeable radial segment



TECHNICAL DATA

Contact force F_A	300kN
Pad Area	100 cm ²
Yaw pitch circle diameter (PCD)	min. 1600 mm
Survival temperature	-40 / +60 °C
Operation temperature	-30 / +55 °C
Weight	200 kg
Theor. friction coefficient	0,3 - 0,4 μ
Straight bore hole row interface for universal use	5xM39

SPECIAL EQUIPMENT

- Radial segment with different material (e.g. JHS-PETP)
- Service and handling tools
- Full engineering package of SBS system available
- Pre-design study
- Full global FEM analysis
- Yaw system design assessment



DELLNER
WIND SOLUTIONS

PRODUCT TYPE

**WIND TURBINE
COMPONENTS**

2024

**PRODUCT DATA SHEET
CATALOG**