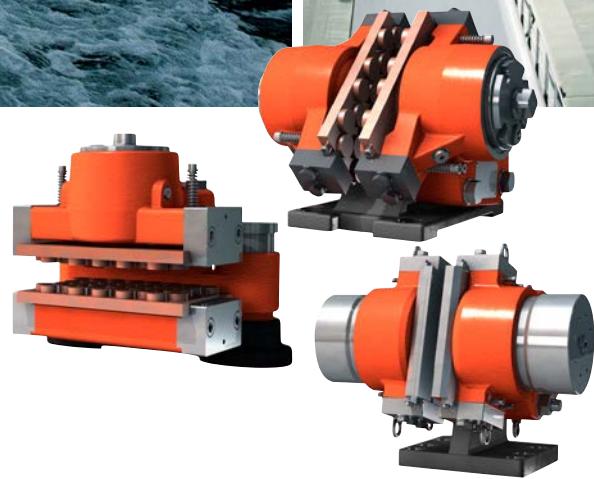


Svendborg Brakes Range Product Specifications



 **Svendborg Brakes®**
Altra Industrial Motion

SVENDBORG BRAKES

ALTRA INDUSTRIAL MOTION

Since 1989, Svendborg Brakes has been recognized as a leading global expert in intelligent braking solutions for industrial applications. Extensive application knowledge, innovative design, fast prototyping and exhaustive testing ensures that customers get the most technically advanced, most durable and safest braking systems to meet their specific requirements.

Svendborg offers a wide range of highly engineered products including hydraulic brakes and power units, thruster brakes, soft braking controls and couplings. Svendborg braking solutions are hard at work in key markets including renewable energy, mining, hydropower, cranes and oil & gas, mining, and marine & offshore on applications such as wind and tidal turbines, overland conveyors, propulsion systems, deck equipment, hoists, drawworks, elevators & escalators and dam turbines.



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Products

- Hydraulic Brakes
- Hydraulic Power Units
- Soft Braking Controls
- Couplings
- Yaw Systems
- Thruster Brakes
- Rotor Locks
- Brake Disc
- Spares & Accessories

Key Markets

- Wind
- Tidal
- Hydro
- Oil & Gas
- Mining & Aggregate
- Marine
- Crane & Hoist

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Disc Brake: BSFI 100 MONOspring

Specification

Name: DEB-0100-010-MS-MAR

Date: 24.04.2012

Revision: F



TECHNICAL DATA AND CALCULATION FUNDAMENTALS

| CALIPER TYPE | CLAMPING FORCE ¹⁾ [N] | | BRAKING FORCE ²⁾ [N] | LOSS OF FORCE PER 1MM [%] | OPERATING PRESSURE ³⁾ MPa | BALANCING PRESSURE ¹⁾ MIN MPa | PAD SURFACE PRESSURE ⁴⁾ [N/mm ²] |
|-----------------|-------------------------------------|-------|---------------------------------------|------------------------------------|--------------------------------------------|---------------------------------------------------|------------------------------------------------------------------|
| | MIN | MAX | | | | | |
| BSFI 105 | 500 | 560 | 400 | 7.0 | 14.5 | 1.50 | 0.16 - 0.25 |
| BSFI 110 | 1,000 | 1,125 | 800 | 13.0 | 14.5 | 3.00 | 0.34 - 0.51 |
| BSFI 115 | 1,500 | 1,650 | 1,200 | 8.0 | 14.5 | 4.50 | 0.49 - 0.75 |
| BSFI 120 | 2,000 | 2,250 | 1,600 | 12.0 | 14.5 | 6.00 | 0.67 - 1.02 |
| BSFI 125 | 2,500 | 2,800 | 2,000 | 8.5 | 14.5 | 7.49 | 0.84 - 1.27 |
| BSFI 130 | 3,000 | 3,350 | 2,400 | 7.0 | 14.5 | 8.99 | 1.00 - 1.52 |

¹⁾ All figures are based on 1 mm air gap (total)

²⁾ Braking force is based on a min clamping force, nominal coefficient of friction $\mu = 0.4$ and 2 brake surfaces.

³⁾ The operating pressure is the minimum needed for operating the brake

⁴⁾ Pad pressure for organic / sintered pads respectively (based on max. clamping force)

Disc brake: BSFI 100 MONOspring

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_0 is the brake disc outer diameter [m]

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_0 - 0,023)}{2} \text{ [Nm]}$$

$$F_B = F_C \cdot 2 \cdot \mu$$

CALCULATION FUNDAMENTALS

Weight of caliper without bracket:

MONOSPRING

Approx. 7 kg

Overall dimensions:

131 x 129 x 147 mm

Pad width (width for heat calculation):

56 mm (organic) 53 mm (sintered)

Pad area: (organic)

3350 mm² (*)

Max. wear of pad: (organic)

4 mm (*) (=7.0 mm thick)

Pad area: (sintered)

2205 mm² (*)

Max. wear of pad: (sintered)

4 mm (*) (=7.0 mm thick)

Nominal coefficient of friction:

$\mu = 0.4$

Total piston area - each caliper half:

334 cm²

Total piston area - each caliper:

334 cm²

Actuating time (guide value for calculation):

0.4 sec

Pressure connection/port:

1/8" BSP

Recommended pipe size:

6 mm

Maximum operating pressure

23.0 MPa

Operating temperature range - general

from -20°C to +70°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

Disc Brake: BSFI 200 DUALspring - HIGH pressure

Specification

Name: DEB-0200-004-DS-MAR

Date: 24.01.2012

Revision: C



High pressure (option 400)

TECHNICAL DATA AND CALCULATION FUNDAMENTALS

| CALIPER TYPE | CLAMPING FORCE ¹⁾ [N] | | BRAKING FORCE ²⁾ [N] | LOSS OF FORCE PER 1MM [%] | OPERATING PRESSURE ³⁾ MPa | BALANCING PRESSURE ¹⁾ MIN MPa | PAD SURFACE PRESSURE ⁴⁾ [N/mm ²] |
|------------------------|-------------------------------------|--------|---------------------------------------|------------------------------------|--------------------------------------------|---------------------------------------------------|------------------------------------------------------------------|
| | MIN | MAX | | | | | |
| BSFI 201 ⁵⁾ | 1,000 | 1,300 | 800 | 14.0 | 3.0 | 1.16 | 0.16 - 0.24 |
| BSFI 202 | 2,000 | 2,340 | 1,600 | 10.0 | 5.0 | 2.31 | 0.29 - 0.43 |
| BSFI 203 | 3,000 | 3,470 | 2,400 | 6.0 | 6.5 | 3.47 | 0.43 - 0.64 |
| BSFI 204 | 4,000 | 4,500 | 3,200 | 13.0 | 8.0 | 4.62 | 0.56 - 0.83 |
| BSFI 205 | 5,000 | 5,640 | 4,000 | 9.0 | 10.0 | 5.77 | 0.71 - 1.03 |
| BSFI 206 | 6,000 | 6,750 | 4,800 | 7.0 | 11.5 | 6.93 | 0.85 - 1.24 |
| BSFI 207 | 7,000 | 7,720 | 5,600 | 5.0 | 13.0 | 8.08 | 0.97 - 1.42 |
| BSFI 208 | 8,000 | 8,930 | 6,400 | 4.0 | 14.5 | 9.23 | 1.12 - 1.64 |
| BSFI 209 | 9,000 | 9,970 | 7,200 | 8.0 | 16.0 | 10.39 | 1.25 - 1.83 |
| BSFI 210 | 10,000 | 10,840 | 8,000 | 7.0 | 18.0 | 11.54 | 1.36 - 1.99 |
| BSFI 211 | 11,000 | 11,960 | 8,800 | 6.0 | 19.5 | 12.69 | 1.50 - 2.19 |
| BSFI 212 | 12,000 | 12,920 | 9,600 | 6.0 | 21.0 | 13.85 | 1.62 - 2.37 |

¹⁾ All figures are based on 1 mm air gap (each side)

²⁾ Braking force is based on a min clamping force, nominal coefficient of friction $\mu = 0.4$ and 2 brake surfaces.

³⁾ The operating pressure is the minimum needed for operating the brake

⁴⁾ Pad pressure for organic / sintered pads respectively (based on max. clamping force)

⁵⁾ Not recommended for general usage - hydraulic balancing pressure is low

Disc Brake: BSFI 200 DUALspring - HIGH pressure

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,07)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu$$

CALCULATION FUNDAMENTALS

Weight of caliper without bracket:

DUALSPRING

Approx. 19 kg

Overall dimensions:

195 x 220 x 260 mm

Pad width:

70 mm

Pad area: (organic)

8,000 mm² (*)

Max. wear of pad: (organic)

7,5 mm (*) "(=8 mm thick)"

Pad area: (sintered)

5,450 mm² (*)

Max. wear of pad: (sintered)

7,5mm (*) "(=8 mm thick)"

Nominal coefficient of friction:

$\mu = 0.4$

Total piston area - each caliper half:

8.67 cm²

Total piston area - each caliper:

17.34 cm²

Volume for each caliper at 1 mm stroke:

1.7 cm³

Volume for each caliper at 3 mm stroke:

5.2 cm³

Actuating time (guide value for calculation):

0.3 sec

Pressure connection/port:

1/8" BSP

Drain connection port:

1/8" BSP

Recommended pipe size:

10/8 mm

Maximum operating pressure

23.0 MPa

Operating temperature range - general

from -20°C to +70°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

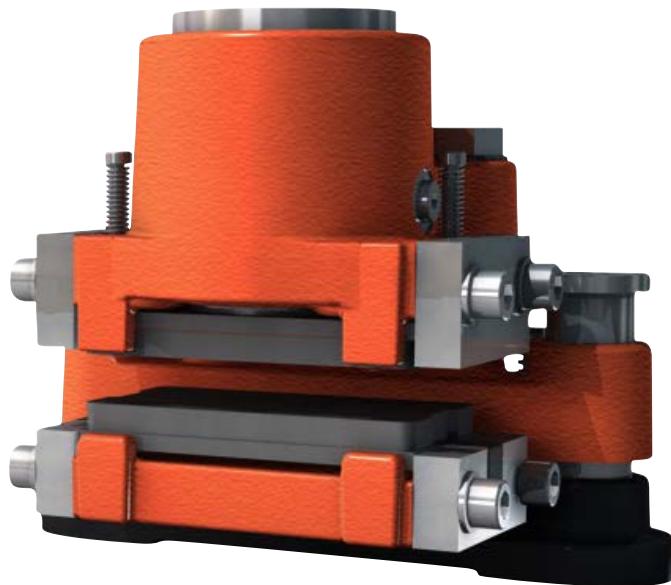
Disc Brake: BSFI 200 MONOspring - HIGH pressure

Specification

Name: DEB-0200-004-MS-MAR

Date: 24.01.2012

Revision: C



High pressure (option 400)

TECHNICAL DATA AND CALCULATION FUNDAMENTALS

| CALIPER TYPE | CLAMPING FORCE ¹⁾ [N] | | BRAKING FORCE ²⁾ [N] | LOSS OF FORCE PER 1MM [%] | OPERATING PRESSURE ³⁾ MPa | BALANCING PRESSURE ¹⁾ MIN MPa | PAD SURFACE PRESSURE ⁴⁾ [N/mm ²] |
|------------------------|-------------------------------------|--------|---------------------------------------|------------------------------------|--------------------------------------------|---------------------------------------------------|------------------------------------------------------------------|
| | MIN | MAX | | | | | |
| BSFI 201 ⁵⁾ | 1,000 | 1,300 | 800 | 14.0 | 3.0 | 1.16 | 0.16 - 0.24 |
| BSFI 202 | 2,000 | 2,340 | 1,600 | 10.0 | 5.0 | 2.31 | 0.29 - 0.43 |
| BSFI 203 | 3,000 | 3,470 | 2,400 | 6.0 | 6.5 | 3.47 | 0.43 - 0.64 |
| BSFI 204 | 4,000 | 4,500 | 3,200 | 13.0 | 8.0 | 4.62 | 0.56 - 0.83 |
| BSFI 205 | 5,000 | 5,640 | 4,000 | 9.0 | 10.0 | 5.77 | 0.71 - 1.03 |
| BSFI 206 | 6,000 | 6,750 | 4,800 | 7.0 | 11.5 | 6.93 | 0.85 - 1.24 |
| BSFI 207 | 7,000 | 7,720 | 5,600 | 5.0 | 13.5 | 8.08 | 0.97 - 1.42 |
| BSFI 208 | 8,000 | 8,930 | 6,400 | 4.0 | 14.5 | 9.23 | 1.12 - 1.64 |
| BSFI 209 | 9,000 | 9,970 | 7,200 | 8.0 | 160 | 10.39 | 1.25 - 1.83 |
| BSFI 210 | 10,000 | 10,840 | 8,000 | 7.0 | 18.0 | 11.54 | 1.36 - 1.99 |
| BSFI 211 | 11,000 | 11,960 | 8,800 | 6.0 | 19.5 | 12.69 | 1.50 - 2.19 |
| BSFI 212 | 12,000 | 12,920 | 9,600 | 6.0 | 21.0 | 13.85 | 1.62 - 2.37 |

¹⁾ All figures are based on 1 mm air gap (total)

²⁾ Braking force is based on a min clamping force, nominal coefficient of friction $\mu = 0.4$ and 2 brake surfaces.

³⁾ The operating pressure is the minimum needed for operating the brake

⁴⁾ Pad pressure for organic / sintered pads respectively (based on max. clamping force)

⁵⁾ Not recommended for general usage - hydraulic balancing pressure is low

Disc Brake: BSFI 200 MONOspring - HIGH pressure

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,07)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu$$

CALCULATION FUNDAMENTALS

Weight of caliper without bracket:

MONOSPRING

Approx. 19 kg

Overall dimensions:

240 x 180 x 190 mm

Pad width:

70 mm

Pad area: (organic)

8,000 mm² (*)

Max. wear of pad: (organic)

5 mm (*) "(=10,5 mm thick)"

Pad area: (sintered)

5,450 mm² (*)

Max. wear of pad: (sintered)

5 mm (*) "(=10,5 mm thick)"

Nominal coefficient of friction:

$\mu = 0.4$

Total piston area - each caliper half:

8.67 cm²

Total piston area - each caliper:

8.67 cm²

Volume for each caliper at 1 mm stroke:

0.87 cm³

Volume for each caliper at 3 mm stroke:

1.73 cm³

Actuating time (guide value for calculation):

0.3 sec

Pressure connection/port:

1/8" BSP

Drain connection port:

1/8" BSP

Recommended pipe size:

10/8 mm

Maximum operating pressure

23.0 MPa

Operating temperature range - general

from -20°C to +70°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

Disc Brake: BSFI 200 DUALspring - low pressure

Specification

Name: DEB-0200-004-DS-MAR

Date: 24.01.2012

Revision: C



Low pressure (option 300)

TECHNICAL DATA AND CALCULATION FUNDAMENTALS

| CALIPER TYPE | CLAMPING FORCE ¹⁾ [N] | | BRAKING FORCE ²⁾ [N] | LOSS OF FORCE PER 1MM [%] | OPERATING PRESSURE ³⁾ MPa | BALANCING PRESSURE ¹⁾ MIN MPa | PAD SURFACE PRESSURE ⁴⁾ [N/mm ²] |
|-----------------|-------------------------------------|--------|---------------------------------------|------------------------------------|--------------------------------------------|---------------------------------------------------|------------------------------------------------------------------|
| | MIN | MAX | | | | | |
| BSFI 202 | 2,000 | 2,340 | 1,600 | 10.0 | 4.0 | 1.82 | 0.29 - 0.43 |
| BSFI 203 | 3,000 | 3,470 | 2,400 | 6.0 | 5.5 | 2.73 | 0.43 - 0.64 |
| BSFI 204 | 4,000 | 4,500 | 3,200 | 13.0 | 6.5 | 3.64 | 0.56 - 0.83 |
| BSFI 205 | 5,000 | 5,640 | 4,000 | 9.0 | 8.0 | 4.55 | 0.71 - 1.03 |
| BSFI 206 | 6,000 | 6,750 | 4,800 | 7.0 | 9.0 | 5.46 | 0.85 - 1.24 |
| BSFI 207 | 7,000 | 7,720 | 5,600 | 5.0 | 10.5 | 6.37 | 0.97 - 1.42 |
| BSFI 208 | 8,000 | 8,930 | 6,400 | 4.0 | 11.5 | 7.28 | 1.12 - 1.64 |
| BSFI 209 | 9,000 | 9,970 | 7,200 | 8.0 | 13.0 | 8.19 | 1.25 - 1.83 |
| BSFI 210 | 10,000 | 10,840 | 8,000 | 7.0 | 14.0 | 9.10 | 1.36 - 1.99 |
| BSFI 211 | 11,000 | 11,960 | 8,800 | 6.0 | 15.5 | 10.01 | 1.50 - 2.19 |
| BSFI 212 | 12,000 | 12,920 | 9,600 | 6.0 | 17.0 | 10.92 | 1.62 - 2.37 |
| BSFI 213 | 13,000 | 14,000 | 10,400 | 11.0 | 18.0 | 11.83 | 1.75 - 2.57 |

¹⁾ All figures are based on 1 mm air gap (each side)

²⁾ Braking force is based on a min clamping force, nominal coefficient of friction $\mu = 0.4$ and 2 brake surfaces.

³⁾ The operating pressure is the minimum needed for operating the brake

⁴⁾ Pad pressure for organic / sintered pads respectively (based on max. clamping force)

Disc Brake: BSFI 200 DUALspring - low pressure

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,07)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu$$

CALCULATION FUNDAMENTALS

Weight of caliper without bracket:

DUALSPRING

Approx. 19 kg

Overall dimensions:

195 x 220 x 260 mm

Pad width:

70 mm

Pad area: (organic)

8,000 mm² (*)

Max. wear of pad: (organic)

7,5 mm (*) "(=8 mm thick)"

Pad area: (sintered)

5,450 mm² (*)

Max. wear of pad: (sintered)

7,5mm (*) "(=8 mm thick)"

Nominal coefficient of friction:

$\mu = 0.4$

Total piston area - each caliper half:

11.0 cm²

Total piston area - each caliper:

22.0 cm²

Volume for each caliper at 1 mm stroke:

2.2 cm³

Volume for each caliper at 3 mm stroke:

6.6 cm³

Actuating time (guide value for calculation):

0.3 sec

Pressure connection/port:

1/8" BSP

Drain connection port:

1/8" BSP

Recommended pipe size:

10/8 mm

Maximum operating pressure

23.0 MPa

Operating temperature range - general

from -20°C to +70°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

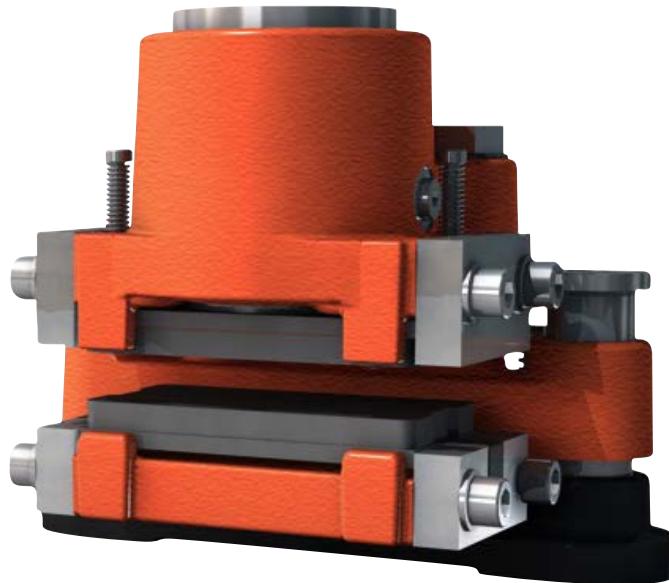
Disc Brake: BSFI 200 MONOspring - low pressure

Specification

Name: DEB-0200-004-MS-MAR

Date: 24.01.2012

Revision: C



Low pressure (option 300)

TECHNICAL DATA AND CALCULATION FUNDAMENTALS

| CALIPER TYPE | CLAMPING FORCE ¹⁾ [N] | | BRAKING FORCE ²⁾ [N] | LOSS OF FORCE PER 1MM [%] | OPERATING PRESSURE ³⁾ MPa | BALANCING PRESSURE ¹⁾ MIN MPa | PAD SURFACE PRESSURE ⁴⁾ [N/mm ²] |
|--------------|----------------------------------|--------|------------------------------------|------------------------------|-----------------------------------------|------------------------------------------|------------------------------------------------------------|
| | MIN | MAX | | | | | |
| BSFI 202 | 2,000 | 2,340 | 1,600 | 10.0 | 4.0 | 1.82 | 0.29 - 0.43 |
| BSFI 203 | 3,000 | 3,470 | 2,400 | 6.0 | 5.5 | 2.73 | 0.43 - 0.64 |
| BSFI 204 | 4,000 | 4,500 | 3,200 | 13.0 | 6.5 | 3.64 | 0.56 - 0.83 |
| BSFI 205 | 5,000 | 5,640 | 4,000 | 9.0 | 8.0 | 4.55 | 0.71 - 1.03 |
| BSFI 206 | 6,000 | 6,750 | 4,800 | 7.0 | 9.0 | 5.46 | 0.85 - 1.24 |
| BSFI 207 | 7,000 | 7,720 | 5,600 | 5.0 | 10.5 | 6.37 | 0.97 - 1.42 |
| BSFI 208 | 8,000 | 8,930 | 6,400 | 4.0 | 11.5 | 7.28 | 1.12 - 1.64 |
| BSFI 209 | 9,000 | 9,970 | 7,200 | 8.0 | 13.0 | 8.19 | 1.25 - 1.83 |
| BSFI 210 | 10,000 | 10,840 | 8,000 | 7.0 | 14.0 | 9.10 | 1.36 - 1.99 |
| BSFI 211 | 11,000 | 11,960 | 8,800 | 6.0 | 15.5 | 10.01 | 1.50 - 2.19 |
| BSFI 212 | 12,000 | 12,920 | 9,600 | 6.0 | 17.0 | 10.92 | 1.62 - 2.37 |
| BSFI 213 | 13,000 | 14,000 | 10,400 | 11.0 | 18.0 | 11.83 | 1.75 - 2.57 |

¹⁾ All figures are based on 1 mm air gap (total)

²⁾ Braking force is based on a min clamping force, nominal coefficient of friction $\mu = 0.4$ and 2 brake surfaces.

³⁾ The operating pressure is the minimum needed for operating the brake

⁴⁾ Pad pressure for organic / sintered pads respectively (based on max. clamping force)

Disc Brake: BSFI 200 MONOspring - low pressure

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,07)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu$$

CALCULATION FUNDAMENTALS

Weight of caliper without bracket:

MONOSPRING

Approx. 17 kg

Overall dimensions:

240 x 180 x 190 mm

Pad width:

70 mm

Pad area: (organic)

8,000 mm² (*)

Max. wear of pad: (organic)

5 mm (*) (=10,5 mm thick)"

Pad area: (sintered)

5,450 mm² (*)

Max. wear of pad: (sintered)

5 mm (*) (=10,5 mm thick)"

Nominal coefficient of friction:

$\mu = 0.4$

Total piston area - each caliper half:

11.0 cm²

Total piston area - each caliper:

11.0 cm²

Volume for each caliper at 1 mm stroke:

1.1 cm³

Volume for each caliper at 3 mm stroke:

3.3 cm³

Actuating time (guide value for calculation):

0.3 sec

Pressure connection/port:

1/8" BSP

Drain connection port:

1/8" BSP

Recommended pipe size:

10/8 mm

Maximum operating pressure

23.0 MPa

Operating temperature range - general

from -20°C to +70°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

Disc Brake: BSFI 300-X-200 ("E") DUALspring

Specification

Name: DEB-0300-016-DS-MAR

Date: 15.07.2011R

Revision: F



TECHNICAL DATA AND CALCULATION FUNDAMENTALS

| CALIPER TYPE | CLAMPING FORCE ¹⁾ [N] | | BRAKING FORCE ²⁾ [N] | LOSS OF FORCE PER 1MM [%] | OPERATING PRESSURE ³⁾ MPa | BALANCING PRESSURE ¹⁾ MIN MPa | PAD SURFACE PRESSURE ⁴⁾ [N/mm ²] |
|--------------|----------------------------------|--------|------------------------------------|------------------------------|-----------------------------------------|---------------------------------------------|------------------------------------------------------------|
| | MIN | MAX | | | | | |
| BSFI 317 | 17,000 | 19,000 | 13,600 | 4.0 | 4.2 | 2.46 | 0.66 - 0.95 |
| BSFI 318 | 18,000 | 19,500 | 14,400 | 4.0 | 4.2 | 2.61 | 0.67 - 0.98 |
| BSFI 320 | 20,000 | 22,200 | 16,000 | 3.0 | 4.5 | 2.90 | 0.77 - 1.11 |
| BSFI 322 | 22,000 | 24,500 | 17,600 | 3.0 | 5.0 | 3.19 | 0.84 - 1.23 |
| BSFI 325 | 25,000 | 27,800 | 20,000 | 12.0 | 5.5 | 3.62 | 0.96 - 1.39 |
| BSFI 330 | 30,000 | 33,100 | 24,000 | 10.0 | 7.0 | 4.35 | 1.14 - 1.66 |
| BSFI 332 | 32,000 | 35,200 | 25,600 | 9.0 | 7.0 | 4.63 | 1.21 - 1.76 |
| BSFI 335 | 35,000 | 38,300 | 28,000 | 8.0 | 7.5 | 5.07 | 1.32 - 1.92 |
| BSFI 340 | 40,000 | 43,600 | 32,000 | 7.0 | 8.5 | 5.79 | 1.50 - 2.18 |
| BSFI 345 | 45,000 | 48,800 | 36,000 | 6.0 | 9.5 | 6.52 | 1.68 - 2.44 |
| BSFI 350 | 50,000 | 55,000 | 40,000 | 11.0. | 10.5 | 7.24 | 1.86 - 3,70 |
| BSFI 355 | 55,000 | 59,300 | 44,000 | 10.0 | 12.0 | 7.69 | 2.04 - 2.97 |
| BSFI 360 | 60,000 | 65,000 | 48,000 | 9.0 | 13.0 | 8.69 | 2.22 - 3.22 |

¹⁾ All figures are based on 1 mm air gap. (Each side)

²⁾ Braking force is based on a min clamping force, nominal coefficient of friction $\mu = 0.4$ and 2 brake surfaces.

³⁾ The operating pressure is the minimum needed for operating the brake

⁴⁾ Pad pressure for organic / sintered pads respectively (based on max. clamping force)

Disc Brake: BSFI 300-X-200 ("E") DUALspring

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_0 is the brake disc outer diameter [m]

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_0 - 0,13)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu$$

CALCULATION FUNDAMENTALS

Weight of caliper without bracket:

DUALSPRING

Approx. 65 kg

Overall dimensions:

326 x 316 x 379 mm

Pad width:

130 mm

Pad area: (organic)

29,000 mm² (*)

Max. wear of pad: (organic)

10 mm (*) "(=14 mm thick)"

Pad area: (sintered)

20,000 mm² (*)

Max. wear of pad: (sintered)

7 mm (*) "(=17 mm thick)"

Nominal coefficient of friction:

$\mu = 0.4$

Total piston area - each caliper half:

69.1 cm²

Total piston area - each caliper:

138.2 cm²

Volume for each caliper at 1 mm stroke:

13.8 cm³

Volume for each caliper at 3 mm stroke:

41.4 cm³

Actuating time (guide value for calculation):

0.3 sec

Pressure connection/port:

1/4" BSP

Drain connection port:

1/8" BSP

Recommended pipe size:

10/8 mm

Maximum operating pressure

23.0 MPa

Operating temperature range - general

from -20°C to +70°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

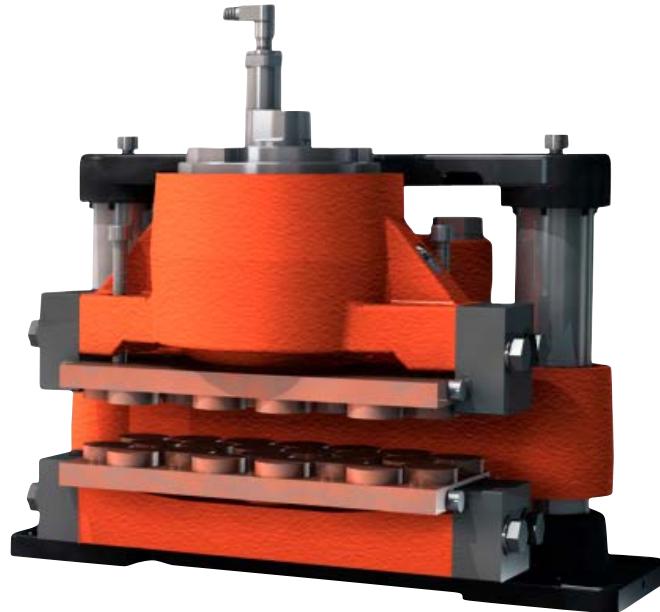
Disc Brake: BSFI 300-MSXX-200 ("E") MONOspring

Specification

Name: DEB-0300-016-MS-MAR

Date: 15.07.2011

Revision: F



TECHNICAL DATA AND CALCULATION FUNDAMENTALS

| CALIPER TYPE | CLAMPING FORCE ¹⁾ [N] | | BRAKING FORCE ²⁾ [N] | LOSS OF FORCE PER 1MM [%] | OPERATING PRESSURE ³⁾ MPa | BALANCING PRESSURE ¹⁾ MIN MPa | PAD SURFACE PRESSURE ⁴⁾ [N/mm ²] |
|-----------------|-------------------------------------|--------|---------------------------------------|------------------------------------|--------------------------------------------|---------------------------------------------------|------------------------------------------------------------------|
| | MIN | MAX | | | | | |
| BSFI 317 | 17,000 | 19,000 | 13,600 | 4.0 | 4.2 | 2.46 | 0.66 - 0.95 |
| BSFI 318 | 18,000 | 19,500 | 14,400 | 4.0 | 4.2 | 2.61 | 0.67 - 0.98 |
| BSFI 320 | 20,000 | 22,200 | 16,000 | 3.0 | 4.5 | 2.90 | 0.77 - 1.11 |
| BSFI 322 | 22,000 | 24,500 | 17,600 | 3.0 | 5.0 | 3.19 | 0.84 - 1.23 |
| BSFI 325 | 25,000 | 27,800 | 20,000 | 12.0 | 5.5 | 3.62 | 0.96 - 1.39 |
| BSFI 330 | 30,000 | 33,100 | 24,000 | 10.0 | 7.0 | 4.35 | 1.14 - 1.66 |
| BSFI 332 | 32,000 | 35,200 | 25,600 | 9.0 | 7.0 | 4.63 | 1.21 - 1.76 |
| BSFI 335 | 35,000 | 38,300 | 28,000 | 8.0 | 7.5 | 5.07 | 1.32 - 1.92 |
| BSFI 340 | 40,000 | 43,600 | 32,000 | 7.0 | 8.5 | 5.79 | 1.50 - 2.18 |
| BSFI 345 | 45,000 | 48,800 | 36,000 | 6.0 | 9.5 | 6.52 | 1.68 - 2.44 |
| BSFI 350 | 50,000 | 55,000 | 40,000 | 11.0. | 10.5 | 7.24 | 1.86 - 3,70 |
| BSFI 355 | 55,000 | 59,300 | 44,000 | 10.0 | 12.0 | 7.69 | 2.04 - 2.97 |
| BSFI 360 | 60,000 | 65,000 | 48,000 | 9.0 | 13.0 | 8.69 | 2.22 - 3.22 |

¹⁾ All figures are based on 1 mm air gap. (Total)

²⁾ Braking force is based on a min clamping force, nominal coefficient of friction $\mu = 0.4$ and 2 brake surfaces.

³⁾ The operating pressure is the minimum needed for operating the brake

⁴⁾ Pad pressure for organic / sintered pads respectively (based on max. clamping force)

Disc Brake: BSFI 300-MSXX-200 ("E") MONOspring

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,13)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu$$

CALCULATION FUNDAMENTALS

Weight of caliper withoutout bracket:

MONOSPRING

Approx. 85 kg

Overall dimensions:

279 x 420 x 299 mm

Pad width:

130 mm

Pad area: (organic)

29,000 mm² (*)

Max. wear of pad: (organic)

5 mm (*) "(=19 mm thick)"

Pad area: (sintered)

20,000 mm² (*)

Max. wear of pad: (sintered)

5 mm (*) "(=19 mm thick)"

Nominal coefficient of friction:

$\mu = 0.4$

Total piston area - each caliper half:

69.1 cm²

Total piston area - each caliper:

69.1 cm²

Volume for each caliper at 1 mm stroke:

6,9 cm³

Volume for each caliper at 3 mm stroke:

20,7 cm³

Actuating time (guide value for calculation):

0.3 sec

Pressure connection/port:

1/4" BSP

Drain connection port:

1/8" BSP

Recommended pipe size:

10/8 mm

Maximum operating pressue

23.0 MPa

Operating temperature range - general

from -20°C to +70°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

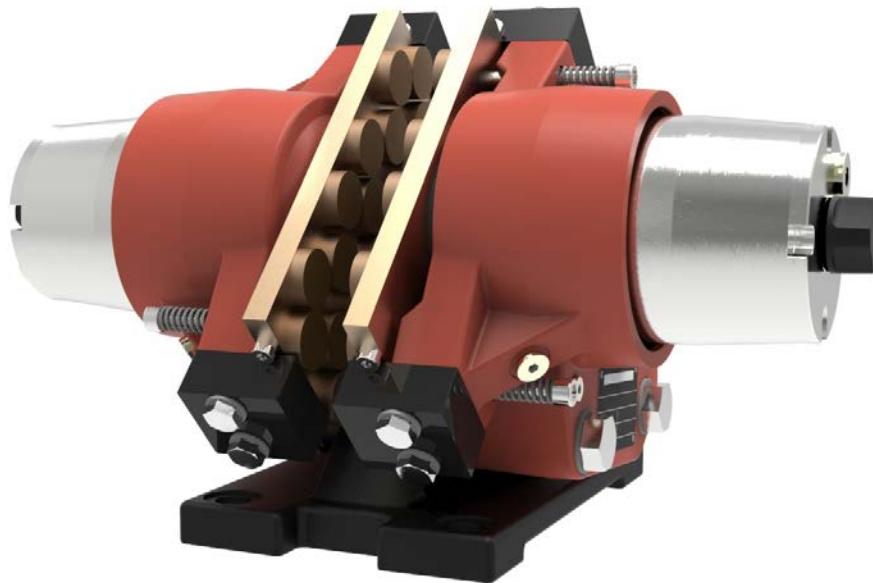
Disc Brake: BSFI 300-X-300 ("EE") DUALspring

Specification

Name: DEB-0300-DS-MAR

Date: 21.03.2013

Revision: D



TECHNICAL DATA AND CALCULATION FUNDAMENTALS

| CALIPER TYPE | CLAMPING FORCE ¹⁾ [N] | | BRAKING FORCE ²⁾ [N] | LOSS OF FORCE PER 1MM [%] | OPERATING PRESSURE ³⁾ MPa | BALANCING PRESSURE ¹⁾ MIN MPa | PAD SURFACE PRESSURE ⁴⁾ [N/mm ²] |
|--------------|----------------------------------|--------|------------------------------------|---------------------------|--------------------------------------|------------------------------------------|---------------------------------------------------------|
| | MIN | MAX | | | | | |
| BSFI 317 | 17,000 | 19,000 | 13,600 | 3.0 | 4.0 | 2.46 | 0.66 - 0.95 |
| BSFI 318 | 18,000 | 19,500 | 14,400 | 4.0 | 4.3 | 2.61 | 0.67 - 0.98 |
| BSFI 320 | 20,000 | 22,200 | 16,000 | 9.0 | 4.5 | 2.90 | 0.77 - 1.11 |
| BSFI 323 | 23,000 | 25,800 | 18,400 | 8.5 | 5.0 | 3.33 | 0.89 - 1.29 |
| BSFI 325 | 25,000 | 27,800 | 20,000 | 7.0 | 5.5 | 3.62 | 0.96 - 1.39 |
| BSFI 330 | 30,000 | 33,100 | 24,000 | 6.0 | 7.0 | 4.35 | 1.14 - 1.66 |
| BSFI 332 | 32,000 | 35,200 | 25,600 | 5.0 | 7.0 | 4.63 | 1.21 - 1.76 |
| BSFI 335 | 35,000 | 38,300 | 28,000 | 5.0 | 7.5 | 5.07 | 1.32 - 1.92 |
| BSFI 340 | 40,000 | 43,600 | 32,000 | 4.0 | 8.5 | 5.79 | 1.50 - 2.18 |
| BSFI 345 | 45,000 | 48,800 | 36,000 | 3.0 | 9.5 | 6.52 | 1.68 - 2.44 |
| BSFI 350 | 50,000 | 55,000 | 40,000 | 7.0 | 10.5 | 7.24 | 1.86 - 3,70 |
| BSFI 355 | 55,000 | 59,300 | 44,000 | 6.0 | 12.0 | 7.69 | 2.04 - 2.97 |
| BSFI 360 | 60,000 | 65,000 | 48,000 | 6.0 | 13.0 | 8.69 | 2.22 - 3.22 |

¹⁾ All figures are based on 1 mm air gap. (Each side)

²⁾ Braking force is based on a min clamping force, nominal coefficient of friction $\mu = 0.4$ and 2 brake surfaces.

³⁾ The operating pressure is the minimum needed for operating the brake

⁴⁾ Pad pressure for organic / sintered pads respectively (based on max. clamping force)

Disc Brake: BSFI 300-X-300 ("EE") DUALspring

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,13)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu$$

CALCULATION FUNDAMENTALS

Weight of caliper withoutout bracket:

DUALSPRING

Approx. 80 kg

Overall dimensions:

326 x 316 x 540 mm

Pad width:

130 mm

Pad area: (organic)

29,000 mm² (*)

Max. wear of pad: (organic)

10 mm (*) "(=14 mm thick)"

Pad area: (sintered)

20,000 mm² (*)

Max. wear of pad: (sintered)

7 mm (*) "(=17 mm thick)"

Nominal coefficient of friction:

$\mu = 0.4$

Total piston area - each caliper half:

69.1 cm²

Total piston area - each caliper:

138.2 cm²

Volume for each caliper at 1 mm stroke:

13.8 cm³

Volume for each caliper at 3 mm stroke:

41.4 cm³

Actuating time (guide value for calculation):

0.3 sec

Pressure connection/port:

1/4" BSP

Drain connection port:

1/8" BSP

Recommended pipe size:

10/8 mm

Maximum operating pressure

23.0 MPa

Operating temperature range - general

from -20°C to +70°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

Disc Brake: BSFI 300-MSXX-300 ("EE") MONOspring

Specification

Name: DEB-0300-MS-MAR

Date: 21.03.2013

Revision: D



TECHNICAL DATA AND CALCULATION FUNDAMENTALS

| CALIPER TYPE | CLAMPING FORCE ¹⁾ [N] | | BRAKING FORCE ²⁾ [N] | LOSS OF FORCE PER 1MM [%] | OPERATING PRESSURE ³⁾ MPa | BALANCING PRESSURE ¹⁾ MIN MPa | PAD SURFACE PRESSURE ⁴⁾ [N/mm ²] |
|--------------|----------------------------------|--------|------------------------------------|---------------------------|--------------------------------------|------------------------------------------|---------------------------------------------------------|
| | MIN | MAX | | | | | |
| BSFI 317 | 17,000 | 19,000 | 13,600 | 3.0 | 4.0 | 2.46 | 0.66 - 0.95 |
| BSFI 318 | 18,000 | 19,500 | 14,400 | 4.0 | 4.3 | 2.61 | 0.67 - 0.98 |
| BSFI 320 | 20,000 | 22,200 | 16,000 | 9.0 | 4.5 | 2.90 | 0.77 - 1.11 |
| BSFI 323 | 23,000 | 25,800 | 18,400 | 8.5 | 5.0 | 3.33 | 0.89 - 1.29 |
| BSFI 325 | 25,000 | 27,800 | 20,000 | 7.0 | 5.5 | 3.62 | 0.96 - 1.39 |
| BSFI 330 | 30,000 | 33,100 | 24,000 | 6.0 | 7.0 | 4.35 | 1.14 - 1.66 |
| BSFI 332 | 32,000 | 35,200 | 25,600 | 5.0 | 7.0 | 4.63 | 1.21 - 1.76 |
| BSFI 335 | 35,000 | 38,300 | 28,000 | 5.0 | 7.5 | 5.07 | 1.32 - 1.92 |
| BSFI 340 | 40,000 | 43,600 | 32,000 | 4.0 | 8.5 | 5.79 | 1.50 - 2.18 |
| BSFI 345 | 45,000 | 48,800 | 36,000 | 6.0 | 9.5 | 6.52 | 1.68 - 2.44 |
| BSFI 350 | 50,000 | 55,000 | 40,000 | 7.0 | 10.5 | 7.24 | 1.86 - 3,70 |
| BSFI 355 | 55,000 | 59,300 | 44,000 | 10.0 | 12.0 | 7.96 | 2.04 - 2.97 |
| BSFI 360 | 60,000 | 65,000 | 48,000 | 6.0 | 13.0 | 8.69 | 2.22 - 3.22 |

¹⁾ All figures are based on 1 mm air gap. (Total)

²⁾ Braking force is based on a min clamping force, nominal coefficient of friction $\mu = 0.4$ and 2 brake surfaces.

³⁾ The operating pressure is the minimum needed for operating the brake

⁴⁾ Pad pressure for organic / sintered pads respectively (based on max. clamping force)

Disc Brake: BSFI 300-MSXX-300 ("EE") MONOspring

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,13)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu$$

CALCULATION FUNDAMENTALS

Weight of caliper withoutout bracket:

MONOSPRING

Approx. 85 kg

Overall dimensions:

326 x 316 x 540 mm

Pad width:

130 mm

Pad area: (organic)

29,000 mm² (*)

Max. wear of pad: (organic)

5 mm (*) "(=19 mm thick)"

Pad area: (sintered)

20,000 mm² (*)

Max. wear of pad: (sintered)

5 mm (*) "(=19 mm thick)"

Nominal coefficient of friction:

$\mu = 0.4$

Total piston area - each caliper half:

69.1 cm²

Total piston area - each caliper:

69.1 cm²

Volume for each caliper at 1 mm stroke:

6,9 cm³

Volume for each caliper at 3 mm stroke:

20,7 cm³

Actuating time (guide value for calculation):

0.3 sec

Pressure connection/port:

1/4" BSP

Drain connection port:

1/8" BSP

Recommended pipe size:

10/8 mm

Maximum operating pressue

23.0 MPa

Operating temperature range - general

from -20°C to +70°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

Disc Brake: BSFI 3000 DUALspring

Specification

Name: DEB-3000-001-DS-MAR

Date: 23.01.2012

Revision: B



TECHNICAL DATA AND CALCULATION FUNDAMENTALS

| CALIPER TYPE | CLAMPING FORCE ¹⁾ [N] | | BRAKING FORCE ²⁾ [N] | LOSS OF FORCE PER 1MM [%] | OPERATING PRESSURE ³⁾ MPa | BALANCING PRESSURE ¹⁾ MIN MPa | PAD SURFACE PRESSURE ⁴⁾ [N/mm ²] |
|--------------|-------------------------------------|---------|------------------------------------|------------------------------|-----------------------------------------|---------------------------------------------|------------------------------------------------------------|
| | MIN | MAX | | | | | |
| BSFI 3020 | 20,000 | 23,000 | 16,000 | 5.0 | 4.0 | 2.28 | 0.39 - 0.64 |
| BSFI 3025 | 24,800 | 24,800 | 19,840 | 4.0 | 4.5 | 2.82 | 0.46 - 0.76 |
| BSFI 3030 | 30,000 | 33,500 | 24,000 | 5.0 | 5.0 | 3.42 | 0.56 - 0.93 |
| BSFI 3040 | 40,000 | 44,000 | 32,000 | 4.0 | 6.5 | 4.55 | 0.74 - 1.22 |
| BSFI 3046 | 46,000 | 50,000 | 36,800 | 4.0 | 7.5 | 5.23 | 0.84 - 1.39 |
| BSFI 3050 | 50,000 | 55,000 | 40,000 | 6.0 | 8.0 | 5.69 | 0.92 - 1.53 |
| BSFI 3056 | 56,000 | 60,000 | 44,800 | 6.0 | 9.0 | 6.37 | 1.01 - 1.67 |
| BSFI 3060 | 60,000 | 66,000 | 48,000 | 5.0 | 9.5 | 6.83 | 1.11 - 1.83 |
| BSFI 3070 | 70,000 | 77,000 | 56,000 | 4.0 | 11.5 | 7.96 | 1.29 - 2.14 |
| BSFI 3080 | 80,000 | 88,000 | 64,000 | 7.0 | 13.0 | 9.10 | 1.48 - 2.44 |
| BSFI 3085 | 85,000 | 93,000 | 68,000 | 7.0 | 14.0 | 9.67 | 1.56 - 2.58 |
| BSFI 3090 | 90,000 | 98,500 | 72,000 | 13.0 | 14.5 | 10.24 | 1.65 - 2.74 |
| BSFI 3100 | 100,000 | 109,000 | 80,000 | 11.0 | 16.0 | 11.37 | 1.83 - 3.03 |
| BSFI 3110 | 110,000 | 119,000 | 88,000 | 10.0 | 17.5 | 12.51 | 2.00 - 3.31 |
| BSFI 3120 | 120,000 | 130,000 | 96,000 | 9.0 | 19.0 | 13.65 | 2.18 - 3.61 |

¹⁾ All figures are based on 1 mm air gap. (Each side)

²⁾ Braking force is based on a min clamping force, nominal coefficient of friction $\mu = 0.4$ and 2 brake surfaces.

³⁾ The operating pressure is the minimum needed for operating the brake

⁴⁾ Pad pressure for organic / sintered pads respectively (based on max. clamping force)

Disc Brake: BSFI 3000 DUALspring

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,20)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu$$

CALCULATION FUNDAMENTALS

Weight of caliper without bracket:

DUALSPRING

Approx. 170 kg

Pad width:

200 mm

Pad area: (organic)

59,600 mm² (*)

Max. wear of pad: (organic)

10 mm (*) "(=22 mm thick)"

Pad area: (sintered)

36,000 mm² (*)

Max. wear of pad: (sintered)

10 mm (*) "(=22 mm thick)"

Nominal coefficient of friction:

$\mu = 0.4$

Total piston area - each caliper half:

88 cm²

Total piston area - each caliper:

176 cm²

Volume for each caliper at 1 mm stroke:

17.6 cm³

Volume for each caliper at 3 mm stroke:

52.8 cm³

Actuating time (guide value for calculation):

0.3 sec

Pressure connection/port:

1/4" BSP

Drain connection port:

1/8" BSP

Recommended pipe size:

10/8 mm

Maximum operating pressure

23.0 MPa

Operating temperature range - general

from -20°C to +70°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

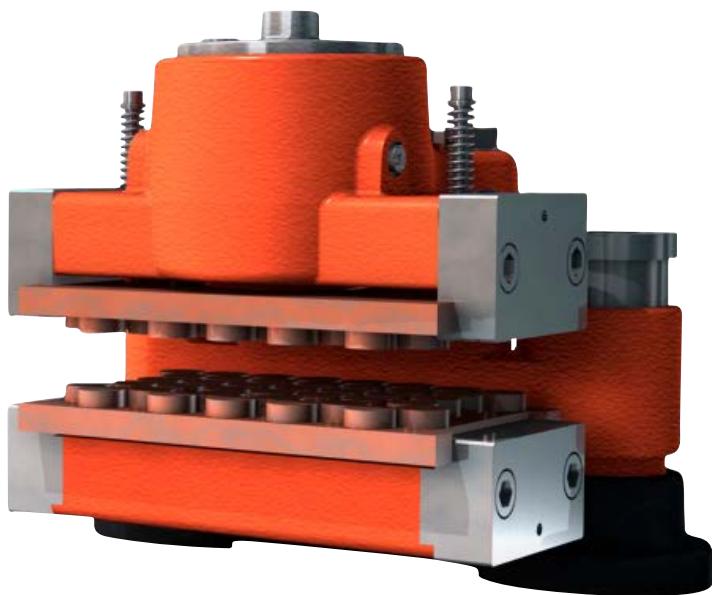
Disc Brake: BSFI 3000 MONOspring

Specification

Name: DEB-3000-001-MS-MAR

Date: 23.01.2012

Revision: B



TECHNICAL DATA AND CALCULATION FUNDAMENTALS

| CALIPER TYPE | CLAMPING FORCE ¹⁾ [N] | | BRAKING FORCE ²⁾ [N] | LOSS OF FORCE PER 1MM [%] | OPERATING PRESSURE ³⁾ MPa | BALANCING PRESSURE ¹⁾ MIN MPa | PAD SURFACE PRESSURE ⁴⁾ [N/mm ²] |
|--------------|-------------------------------------|---------|------------------------------------|------------------------------|-----------------------------------------|---------------------------------------------|------------------------------------------------------------|
| | MIN | MAX | | | | | |
| BSFI 3020 | 20,000 | 23,000 | 16,000 | 5.0 | 4.0 | 2.28 | 0.39 - 0.64 |
| BSFI 3025 | 24,800 | 24,800 | 19,840 | 4.0 | 4.5 | 2.82 | 0.46 - 0.76 |
| BSFI 3030 | 30,000 | 33,500 | 24,000 | 5.0 | 5.0 | 3.42 | 0.56 - 0.93 |
| BSFI 3040 | 40,000 | 44,000 | 32,000 | 4.0 | 6.5 | 4.55 | 0.74 - 1.22 |
| BSFI 3046 | 46,000 | 50,000 | 36,800 | 4.0 | 7.5 | 5.23 | 0.84 - 1.39 |
| BSFI 3050 | 50,000 | 55,000 | 40,000 | 6.0 | 8.0 | 5.69 | 0.92 - 1.53 |
| BSFI 3056 | 56,000 | 60,000 | 44,800 | 6.0 | 9.0 | 6.37 | 1.01 - 1.67 |
| BSFI 3060 | 60,000 | 66,000 | 48,000 | 5.0 | 9.5 | 6.83 | 1.11 - 1.83 |
| BSFI 3070 | 70,000 | 77,000 | 56,000 | 4.0 | 11.5 | 7.96 | 1.29 - 2.14 |
| BSFI 3080 | 80,000 | 88,000 | 64,000 | 7.0 | 13.0 | 9.10 | 1.48 - 2.44 |
| BSFI 3085 | 85,000 | 93,000 | 68,000 | 7.0 | 14.0 | 9.67 | 1.56 - 2.58 |
| BSFI 3090 | 90,000 | 98,500 | 72,000 | 13.0 | 14.5 | 10.24 | 1.65 - 2.74 |
| BSFI 3100 | 100,000 | 109,000 | 80,000 | 11.0 | 16.0 | 11.37 | 1.83 - 3.03 |
| BSFI 3110 | 110,000 | 119,000 | 88,000 | 10.0 | 17.5 | 12.51 | 2.00 - 3.31 |
| BSFI 3120 | 120,000 | 130,000 | 96,000 | 9.0 | 19.0 | 13.65 | 2.18 - 3.61 |

¹⁾ All figures are based on 1 mm air gap. (Total)

²⁾ Braking force is based on a min clamping force, nominal coefficient of friction $\mu = 0.4$ and 2 brake surfaces.

³⁾ The operating pressure is the minimum needed for operating the brake

⁴⁾ Pad pressure for organic / sintered pads respectively (based on max. clamping force)

Disc Brake: BSFI 3000 MONOspring

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,20)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu$$

CALCULATION FUNDAMENTALS

| MONOSPRING | |
|-----------------------------------------------|----------------------------|
| Weight of caliper without bracket: | 175 kg |
| Pad width: | 200 mm |
| Pad area: (organic) | 59,600 mm ² (*) |
| Max. wear of pad: (organic) | 5 mm (*) "(=27 mm thick)" |
| Pad area: (sintered) | 36,000 mm ² (*) |
| Max. wear of pad: (sintered) | 5 mm (*) "(=27 mm thick)" |
| Nominal coefficient of friction: | $\mu = 0.4$ |
| Total piston area - each caliper half: | 88 cm ² |
| Total piston area - each caliper: | 88 cm ² |
| Volume for each caliper at 1 mm stroke: | 8.8 cm ³ |
| Volume for each caliper at 3 mm stroke: | 26.4 cm ³ |
| Actuating time (guide value for calculation): | 0.3 sec |
| Pressure connection/port: | 1/4" BSP |
| Drain connection port: | 1/8" BSP |
| Recommended pipe size: | 10/8 mm |
| Maximum operating pressure | 23.0 MPa |
| Operating temperature range - general | from -20°C to +70°C |

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

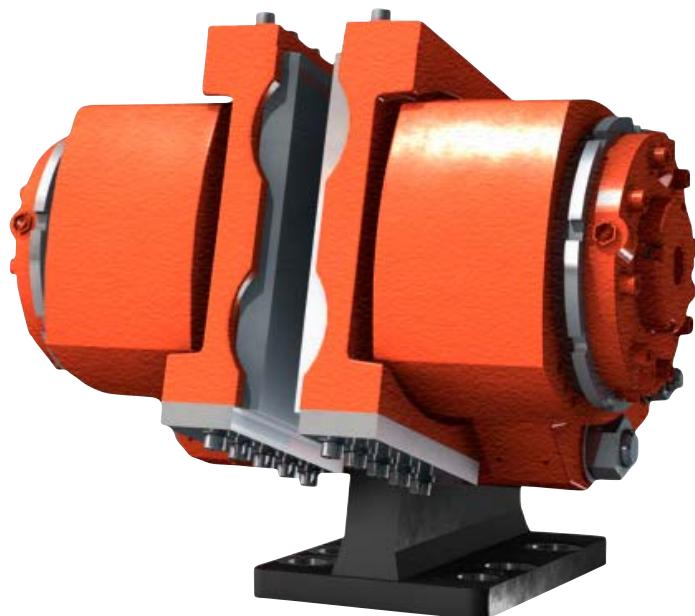
Disc Brake: BSFG 400 DUALspring

Specification

Name: DEB-0400-001-DS-MAR

Date: 24.04.2007

Revision: A



TECHNICAL DATA AND CALCULATION FUNDAMENTALS

| CALIPER TYPE | CLAMPING FORCE ¹⁾ [N] | | BRAKING FORCE ³⁾ [N] | LOSS OF FORCE PER 1MM [%] | OPERATING PRESSURE ³⁾ MPa | PAD SURFACE PRESSURE ¹⁾ MPa | PAD SURFACE PRESSURE ⁴⁾ [N/mm ²] |
|------------------------|-------------------------------------|---------|---------------------------------------|------------------------------------|--------------------------------------------|-------------------------------------------------|------------------------------------------------------------------|
| | MIN | MAX | | | | | |
| BSFG 403 | 34,300 | 38,400 | 27,500 | 7.0 | 7.0 | 4.60 | 0.61 |
| BSFG 405 | 55,900 | 62,600 | 45,000 | 6.0 | 10.5 | 7.50 | 0.99 |
| BSFG 408 | 80,100 | 89,700 | 64,000 | 6.0 | 14.5 | 10.74 | 1.42 |
| BSFG 412 ⁵⁾ | 120,000 | 134,000 | 96,000 | 9.0 | 22.0 | 16.09 | 2.13 |

¹⁾ All figures are based on 1 mm air gap. (Each side)

²⁾ Braking force is based on a min clamping force, nominal coefficient of friction $\mu = 0.4$ and 2 brake surfaces.

³⁾ The operating pressure is the minimum needed for operating the brake

⁴⁾ Pad pressure for organic pads (based on max. clamping force)

⁵⁾ Not recommended for general usage - special high pressure version

Disc Brake: BSFG 400 DUALspring

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,22)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu$$

CALCULATION FUNDAMENTALS

Weight of caliper without bracket:

DUALSPRING

Approx. 280 kg

Overall dimensions

520 x 570 x 590 mm

Pad width (width for heat calculation):

220 mm

Pad area: (organic)

63,000 mm² (*)

Max. wear of pad: (organic)

"11 mm (*) (=14 mm thick - lining)"

Nominal coefficient of friction:

$\mu = 0.4$

Total piston area - each caliper half:

74.5 cm²

Total piston area - each caliper:

149 cm²

Volume for each caliper at 1 mm stroke:

15 cm³

Volume for each caliper at 3 mm stroke:

45 cm³

Actuating time (guide value for calculation):

0.4 sec

Pressure connection/port:

3/8" BSP

Drain connection port:

1/4" BSP

Recommended pipe size:

16/12 mm

Maximum operating pressure

23.0 MPa

Operating temperature range - general

from -20°C to +70°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

Disc Brake: BSFH 500 DUALspring

Specification

Name: DEB-0500-001-DS-MAR

Date: 23.01.2012

Revision: G



TECHNICAL DATA AND CALCULATION FUNDAMENTALS

| CALIPER TYPE | CLAMPING FORCE ¹⁾ [N] | | BRAKING FORCE ²⁾ | LOSS OF FORCE PER 1MM [%] | OPERATING PRESSURE ³⁾ MPa | BALANCING PRESSURE ¹⁾ MIN MPa | PAD SURFACE PRESSURE ⁴⁾ [N/mm ²] |
|-----------------|-------------------------------------|---------|--------------------------------|------------------------------------|--------------------------------------------|---------------------------------------------------|------------------------------------------------------------------|
| | MIN | MAX | [N] | | | | |
| BSFH 507 | 70,000 | 74,000 | 56,000 | 9.0 | 8.0 | 4.82 | 1.17 - 1.70 |
| BSFH 508 | 80,000 | 85,000 | 64,000 | 7.0 | 8.5 | 5.51 | 1.35 - 1.95 |
| BSFH 509 | 90,000 | 95,000 | 72,000 | 6.0 | 9.0 | 6.20 | 1.51 - 2.18 |
| BSFH 510 | 100,000 | 105,000 | 80,000 | 5.0 | 10.0 | 6.89 | 1.67 - 2.41 |
| BSFH 511 | 110,000 | 115,000 | 88,000 | 4.5 | 11.0 | 7.58 | 1.83 - 2.64 |
| BSFH 512 | 120,000 | 130,000 | 96,000 | 8.0 | 12.0 | 8.26 | 2.06 - 2.98 |
| BSFH 514 | 140,000 | 153,000 | 112,000 | 7.0 | 14.0 | 9.64 | 2.42 - 3.51 |
| BSFH 515 | 150,000 | 164,000 | 120,000 | 6.0 | 14.5 | 10.33 | 2.60 - 3.76 |
| BSFH 516 | 160,000 | 175,000 | 128,000 | 6.0 | 15.0 | 11.02 | 2.78 - 4.01 |
| BSFH 520 | 200,000 | 218,000 | 160,000 | 10.0 | 19.0 | 13.77 | 3.46 - 5.00 |

¹⁾ All figures are based on 1 mm air gap. (Each side)

²⁾ Braking force is based on a min clamping force, nominal coefficient of friction $\mu = 0.4$ and 2 brake surfaces.

³⁾ The operating pressure is the minimum needed for operating the brake

⁴⁾ Pad pressure for organic / sintered pads respectively (based on max. clamping force)

Disc Brake: BSFH 500 DUALspring

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,22)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu$$

CALCULATION FUNDAMENTALS

Weight of caliper without bracket:

DUALSPRING

Approx. 330 kg

Overall dimensions:

430 x 465 x 490 mm

Pad width (width for heat calculation):

220 mm

Pad area: (organic)

63,000 mm² (*)

Max. wear of pad: (organic)

10 mm (*) "(=37 mm thick incl. brake shoe)"

Pad area: (sintered)

43,600 mm² (*)

Max. wear of pad: (sintered)

5 mm (*) "(=42 mm thick incl. brake shoe)"

Nominal coefficient of friction:

$\mu = 0.4$

Total piston area - each caliper half:

145 cm²

Total piston area - each caliper:

290 cm²

Volume for each caliper at 1 mm stroke:

30 cm³

Volume for each caliper at 3 mm stroke:

90 cm³

Actuating time (guide value for calculation):

0.4 sec

Pressure connection/port:

3/8" BSP

Drain connection port:

1/4" BSP

Recommended pipe size:

16/12 mm

Maximum operating pressure

23.0 MPa

Operating temperature range - general

from -20°C to +70°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

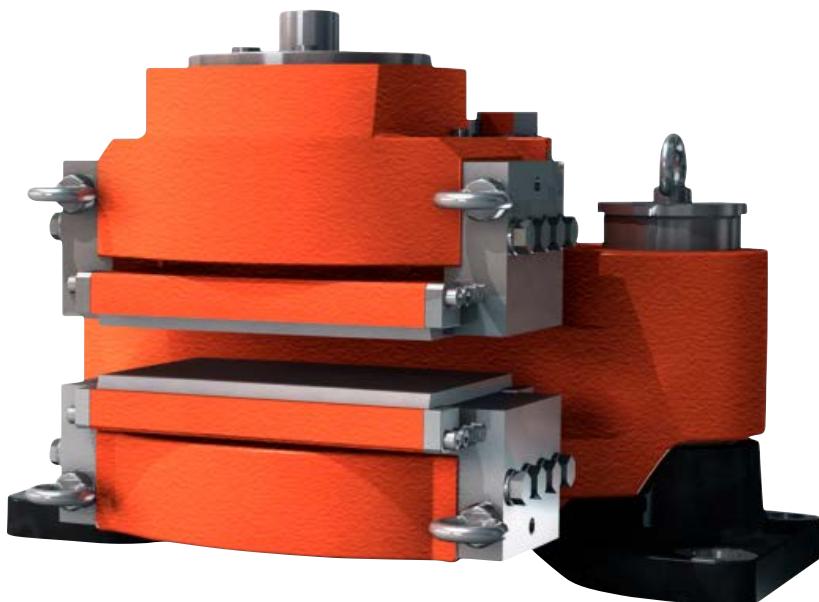
Disc Brake: BSFH 500 MONOspring

Specification

Name: DEB-0500-001-MS-MAR

Date: 23.01.2012

Revision: G



TECHNICAL DATA AND CALCULATION FUNDAMENTALS

| CALIPER TYPE | CLAMPING FORCE ¹⁾ [N] | | BRAKING FORCE ²⁾ [N] | LOSS OF FORCE PER 1MM [%] | OPERATING PRESSURE ³⁾ MPa | BALANCING PRESSURE ¹⁾ MIN MPa | PAD SURFACE PRESSURE ⁴⁾ [N/mm ²] |
|--------------|----------------------------------|---------|------------------------------------|---------------------------|--------------------------------------|------------------------------------------|---------------------------------------------------------|
| | MIN | MAX | | | | | |
| BSFH 507 | 70,000 | 74,000 | 56,000 | 9.0 | 8.0 | 4.82 | 1.17 - 1.70 |
| BSFH 508 | 80,000 | 85,000 | 64,000 | 7.0 | 8.5 | 5.51 | 1.35 - 1.95 |
| BSFH 509 | 90,000 | 95,000 | 72,000 | 6.0 | 9.0 | 6.20 | 1.51 - 2.18 |
| BSFH 510 | 100,000 | 105,000 | 80,000 | 5.0 | 10.0 | 6.89 | 1.67 - 2.41 |
| BSFH 511 | 110,000 | 115,000 | 88,000 | 4.5 | 11.0 | 7.58 | 1.83 - 2.64 |
| BSFH 512 | 120,000 | 130,000 | 96,000 | 8.0 | 12.0 | 8.26 | 2.06 - 2.98 |
| BSFH 514 | 140,000 | 153,000 | 112,000 | 7.0 | 14.0 | 9.64 | 2.42 - 3.51 |
| BSFH 515 | 150,000 | 164,000 | 120,000 | 6.0 | 14.5 | 10.33 | 2.60 - 3.76 |
| BSFH 516 | 160,000 | 175,000 | 128,000 | 6.0 | 15.0 | 11.02 | 2.78 - 4.01 |
| BSFH 520 | 200,000 | 218,000 | 160,000 | 10.0 | 19.0 | 13.77 | 3.46 - 5.00 |

¹⁾ All figures are based on 1 mm air gap. (Total)

²⁾ Braking force is based on a min clamping force, nominal coefficient of friction $\mu = 0.4$ and 2 brake surfaces.

³⁾ The operating pressure is the minimum needed for operating the brake

⁴⁾ Pad pressure for organic / sintered pads respectively (based on max. clamping force)

Disc Brake: BSFH 500 MONOspring

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,22)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu$$

CALCULATION FUNDAMENTALS

Weight of caliper without bracket:

MONOSPRING

Approx. 500 kg

Overall dimensions:

720 x 540 x 470 mm

Pad width (width for heat calculation):

220 mm

Pad area: (organic)

63,000 mm² (*)

Max. wear of pad: (organic)

5 mm (*) "(=42 mm thick incl. brake shoe)"

Pad area: (sintered)

43,600 mm² (*)

Max. wear of pad: (sintered)

5 mm (*) "(=42 mm thick incl. brake shoe)"

Nominal coefficient of friction:

$\mu = 0.4$

Total piston area - each caliper half:

145 cm²

Total piston area - each caliper:

145 cm²

Volume for each caliper at 1 mm stroke:

15 cm³

Volume for each caliper at 3 mm stroke:

45 cm³

Actuating time (guide value for calculation):

0.4 sec

Pressure connection/port:

3/8" BSP

Drain connection port:

1/4" BSP

Recommended pipe size:

16/12 mm

Maximum operating pressure

23.0 MPa

Operating temperature range - general

from -20°C to +70°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

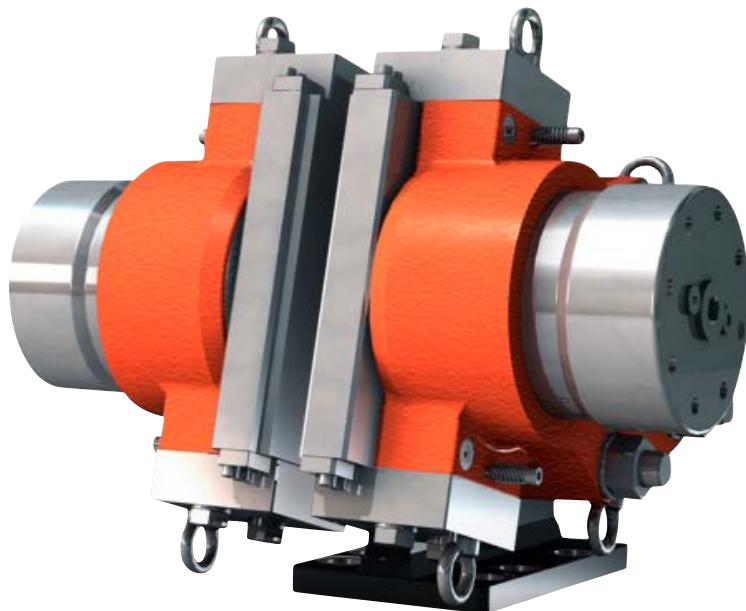
Disc Brake: BSFK 500 DUALspring

Specification

Name: DEB-0500-027-DS-MAR

Date: 23.01.2012

Revision: A



TECHNICAL DATA AND CALCULATION FUNDAMENTALS

| CALIPER TYPE | CLAMPING FORCE ¹⁾ [N] | | BRAKING FORCE ²⁾ [N] | LOSS OF FORCE PER 1MM [%] | OPERATING PRESSURE ³⁾ MPa | BALANCING PRESSURE ¹⁾ MIN MPa | PAD SURFACE PRESSURE ⁴⁾ [N/mm ²] |
|------------------------|-------------------------------------|---------|---------------------------------------|------------------------------------|--------------------------------------------|---------------------------------------------------|------------------------------------------------------------------|
| | MIN | MAX | | | | | |
| BSFK 520 | 200,000 | 220,000 | 160,000 | 5.5 | 13.5 | 8.57 | 3.07 - 3.05 |
| BSFK 523 | 230,000 | 250,000 | 184,000 | 6.5 | 14.0 | 9.86 | 3.48 - 3.45 |
| BSFK 525 | 250,000 | 270,000 | 200,000 | 5.5 | 14.5 | 10.72 | 3.76 - 3.73 |
| BSFK 527 | 270,000 | 295,000 | 216,000 | 5.0 | 15.5 | 11.58 | 4.11 - 4.07 |
| BSFK 530 ⁵⁾ | 300,000 | 320,000 | 240,000 | 12.5 | 19.0 | 12.86 | 4.46 - 4.42 |
| BSFK 535 ⁵⁾ | 350,000 | 380,000 | 280,000 | 10.0 | 21.0 | 15.00 | 5.30 - 5.25 |

¹⁾ All figures are based on 1 mm air gap (Each side)

²⁾ Braking force is based on a min clamping force, nominal coefficient of friction $\mu = 0.4$ and 2 brake surfaces.

³⁾ The operating pressure is the minimum needed for operating the brake

⁴⁾ Pad pressure for organic / sintered pads respectively (based on max. clamping force)

⁵⁾ Not recommended for general usage

Disc Brake: BSFK 500 DUALspring

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,23)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu$$

CALCULATION FUNDAMENTALS

Weight of caliper without bracket:

DUALSPRING

Approx. 420 kg

Overall dimensions:

720 x 472 x 490 mm

Pad width (width for heat calculation):

230 mm (205 mm)

Pad area: (organic)

71,750 mm² (*)

Max. wear of pad: (organic)

10 mm (*) "(=47mm thick)"

Pad area: (sintered)

72,400 mm² (*)

Max. wear of pad: (sintered)

10 mm (*) "(=47mm thick)"

Nominal coefficient of friction:

$\mu = 0.4$

Total piston area - each caliper half:

233 cm²

Total piston area - each caliper:

466 cm²

Volume for each caliper at 1 mm stroke:

47 cm³

Volume for each caliper at 3 mm stroke:

140 cm³

Actuating time (guide value for calculation):

0.4sec

Pressure connection/port:

3/8" BSP

Drain connection port:

1/4" BSP

Recommended pipe size:

16/12 mm

Maximum operating pressure

23.0 MPa

Operating temperature range - general

from -20°C to +70°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

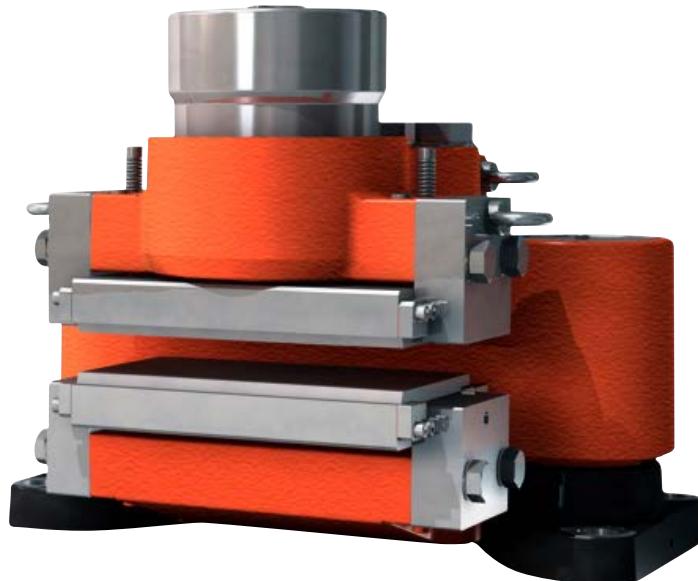
Disc Brake: BSFK 500 MONOspring

Specification

Name: DEB-0500-027-MS-MAR

Date: 23.01.2012

Revision: A



TECHNICAL DATA AND CALCULATION FUNDAMENTALS

| CALIPER TYPE | CLAMPING FORCE ¹⁾ [N] | | BRAKING FORCE ²⁾ [N] | LOSS OF FORCE PER 1MM [%] | OPERATING PRESSURE ³⁾ MPa | BALANCING PRESSURE ¹⁾ MIN MPa | PAD SURFACE PRESSURE ⁴⁾ [N/mm ²] |
|------------------------|-------------------------------------|---------|---------------------------------------|------------------------------------|--------------------------------------------|---------------------------------------------------|------------------------------------------------------------------|
| | MIN | MAX | | | | | |
| BSFK 520 | 200,000 | 220,000 | 160,000 | 5.5 | 13.5 | 8.57 | 3.07 - 3.05 |
| BSFK 523 | 230,000 | 250,000 | 184,000 | 6.5 | 15.5 | 9.86 | 3.48 - 3.45 |
| BSFK 525 | 250,000 | 270,000 | 200,000 | 5.5 | 15.5 | 10.72 | 3.76 - 3.73 |
| BSFK 527 | 270,000 | 295,000 | 216,000 | 5.5 | 16.0 | 11.58 | 4.11 - 4.07 |
| BSFK 530 ⁵⁾ | 300,000 | 320,000 | 240,000 | 13.0 | 20.5 | 12.86 | 4.46 - 4.42 |
| BSFK 535 ⁵⁾ | 350,000 | 380,000 | 280,000 | 11.0 | 23.5 | 15.00 | 5.30 - 5.25 |

¹⁾ All figures are based on 1 mm air gap (Total)

²⁾ Braking force is based on a min clamping force, nominal coefficient of friction $\mu = 0.4$ and 2 brake surfaces.

³⁾ The operating pressure is the minimum needed for operating the brake

⁴⁾ Pad pressure for organic / sintered pads respectively (based on max. clamping force)

⁵⁾ Not recommended for general usage

Disc Brake: BSFK 500 MONOspring

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,23)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu$$

CALCULATION FUNDAMENTALS

Weight of caliper without bracket:

MONOSPRING

Approx. 550 kg

Overall dimensions:

710 x 532 x 565 mm

Pad width (width for heat calculation):

230 mm (205 mm)

Pad area: (organic)

71,750 mm² (*)

Max. wear of pad: (organic)

5 mm (*) "(=52mm thick)"

Pad area: (sintered)

72,400 mm² (*)

Max. wear of pad: (sintered)

5 mm (*) "(=52mm thick)"

Nominal coefficient of friction:

$\mu = 0.4$

Total piston area - each caliper half:

233 cm²

Total piston area - each caliper:

233 cm²

Volume for each caliper at 1 mm stroke:

23 cm³

Volume for each caliper at 3 mm stroke:

70 cm³

Actuating time (guide value for calculation):

0.4sec

Pressure connection/port:

3/8" BSP

Drain connection port:

1/4" BSP

Recommended pipe size:

16/12 mm

Maximum operating pressure

23.0 MPa

Maximum operating pressure BSFK 535

26.0 MPa

Operating temperature range - general

from -20°C to +70°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

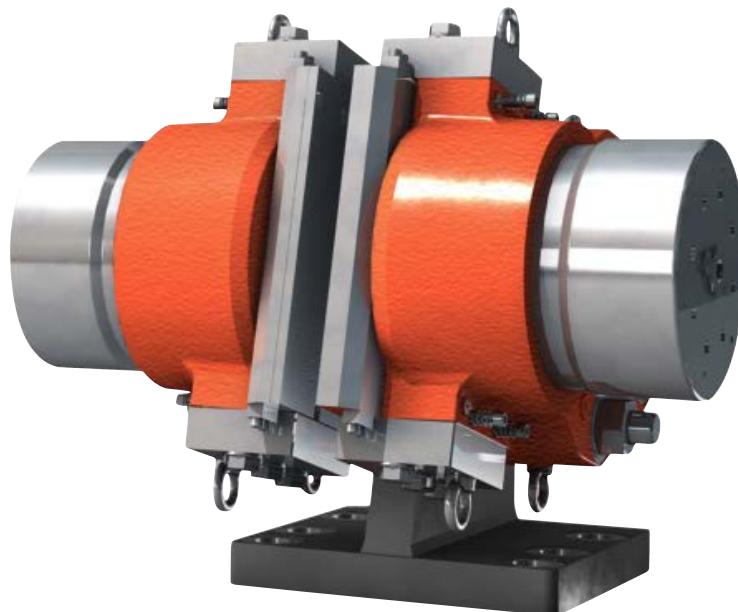
Disc Brake: BSFB 600 DUALspring

Specification

Name: DEB-0600-016-DS-MAR

Date: 24.05.2012

Revision: A



TECHNICAL DATA AND CALCULATION FUNDAMENTALS

| CALIPER TYPE | CLAMPING FORCE ¹⁾ [N] | | BRAKING FORCE ²⁾ [N] | LOSS OF FORCE PER 1MM [%] | OPERATING PRESSURE ³⁾ MPa | BALANCING PRESSURE ¹⁾ MIN MPa | PAD SURFACE PRESSURE ⁴⁾ [N/mm ²] |
|-----------------|-------------------------------------|---------|---------------------------------------|------------------------------------|--------------------------------------------|---------------------------------------------------|------------------------------------------------------------------|
| | MIN | MAX | | | | | |
| BSFB 630 | 300,000 | 320,000 | 240,000 | 4.5 | 11.0 | 7.23 | 2.71 - 3.05 |
| BSFB 635 | 350,000 | 380,000 | 280,000 | 5.5 | 12.5 | 8.44 | 3.05 - 3.22 |
| BSFB 640 | 400,000 | 430,000 | 320,000 | 4.5 | 13.5 | 9.65 | 3.64 - 4.10 |
| BSFB 645 | 450,000 | 490,000 | 360,000 | 8.5 | 16.0 | 10.85 | 3.81 - 4.29 |
| BSFB 650 | 500,000 | 540,000 | 400,000 | 7.5 | 17.5 | 12.06 | 4.58 - 5.14 |

¹⁾ All figures are based on 2 mm air gap (Each side)

²⁾ Braking force is based on a min clamping force, nominal coefficient of friction $\mu = 0.4$ and 2 brake surfaces.

³⁾ The operating pressure is the minimum needed for operating the brake

⁴⁾ Pad pressure for organic / sintered pads respectively (based on max. clamping force)

Disc Brake: BSFB 600 DUALspring

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_0 is the brake disc outer diameter [m]

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_0 - 0,3)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu$$

CALCULATION FUNDAMENTALS

Weight of caliper without bracket:

DUALSPRING

Approx. 765 kg

Overall dimensions:

584 x 565 x 797 mm

Pad width (width for heat calculation):

300 mm

Pad area: (organic)

118,000 mm² (*)

Max. wear of pad: (organic)

10 mm (*) "(=37 mm thick)"

Pad area: (sintered)

105,000 mm² (*)

Max. wear of pad: (sintered)

10 mm (*) "(=37 mm thick)"

Nominal coefficient of friction:

$\mu = 0.4$

Total piston area - each caliper half:

415 cm²

Total piston area - each caliper:

830 cm²

Volume for each caliper at 1 mm stroke:

83 cm³

Volume for each caliper at 3 mm stroke:

249 cm³

Actuating time (guide value for calculation):

0.3 - 0,5 sec

Pressure connection/port:

1/2" BSP

Drain connection port:

1/4" BSP

Recommended pipe size:

16 mm

Maximum operating pressure

18.5 MPa

Operating temperature range - general

from -20°C to +70°C

(For temperatures outside this range contact Svendborg Brakes)

(C=disc thickness)

(*) On each brake pad.

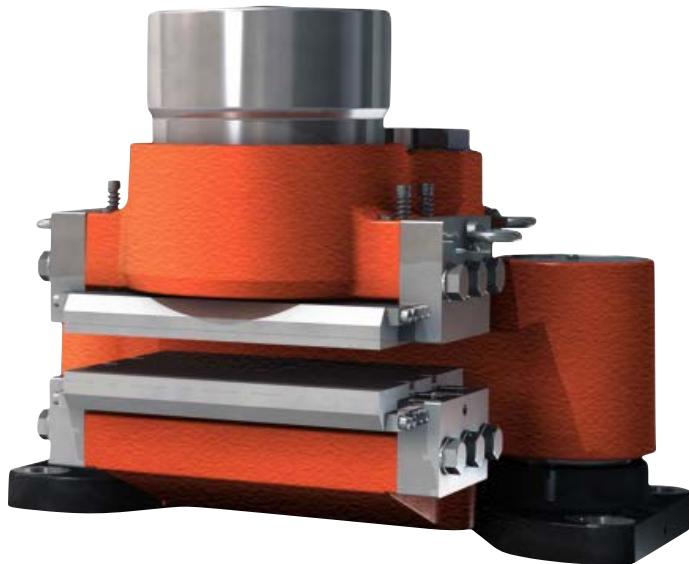
Disc Brake: BSFB 600 MONOspring

Specification

Name: DEB-0600-016-MS-MAR

Date: 24.05.2012

Revision: A



TECHNICAL DATA AND CALCULATION FUNDAMENTALS

| CALIPER TYPE | CLAMPING FORCE ¹⁾ [N] | | BRAKING FORCE ²⁾ [N] | LOSS OF FORCE PER 1MM [%] | OPERATING PRESSURE ³⁾ MPa | BALANCING PRESSURE ¹⁾ MIN MPa | PAD SURFACE PRESSURE ⁴⁾ [N/mm ²] |
|-----------------|-------------------------------------|---------|---------------------------------------|------------------------------------|--------------------------------------------|---------------------------------------------------|------------------------------------------------------------------|
| | MIN | MAX | | | | | |
| BSFB 630 | 300,000 | 330,000 | 240,000 | 7.5 | 12.5 | 7.23 | 2.80 - 3.14 |
| BSFB 635 | 350,000 | 380,000 | 280,000 | 5.0 | 13.5 | 8.44 | 3.05 - 3.22 |
| BSFB 638 | 350,000 | 380,000 | 280,000 | 5.0 | 13.5 | 8.44 | 3.05 - 3.22 |
| BSFB 640 | 400,000 | 430,000 | 320,000 | 4.5 | 15.0 | 9.65 | 3.64 - 4.10 |

¹⁾ All figures are based on 3 mm air gap (Total)

²⁾ Braking force is based on a min clamping force, nominal coefficient of friction $\mu = 0.4$ and 2 brake surfaces.

³⁾ The operating pressure is the minimum needed for operating the brake

⁴⁾ Pad pressure for organic / sintered pads respectively (based on max. clamping force)

Disc Brake: BSFB 600 MONOspring

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_0 is the brake disc outer diameter [m]

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_0 - 0,3)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu$$

CALCULATION FUNDAMENTALS

Weight of caliper without bracket:

MONOSPRING

Approx. 850 kg

Overall dimensions:

840 x 620 x 620 mm

Pad width (width for heat calculation):

300 mm

Pad area: (organic)

118,000 mm² (*)

Max. wear of pad: (organic)

10 mm (*) "(=37 mm thick)"

Pad area: (sintered)

105,000 mm² (*)

Max. wear of pad: (sintered)

10 mm (*) "(=37 mm thick)"

Nominal coefficient of friction:

$\mu = 0.4$

Total piston area - each caliper half:

415 cm²

Total piston area - each caliper:

415 cm²

Volume for each caliper at 1 mm stroke:

41 cm³

Volume for each caliper at 3 mm stroke:

124 cm³

Actuating time (guide value for calculation):

0.3 - 0,5 sec

Pressure connection/port:

1/2" BSP

Drain connection port:

1/4" BSP

Recommended pipe size:

16 mm

Maximum operating pressure

18.5 MPa

Operating temperature range - general

from -20°C to +70°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

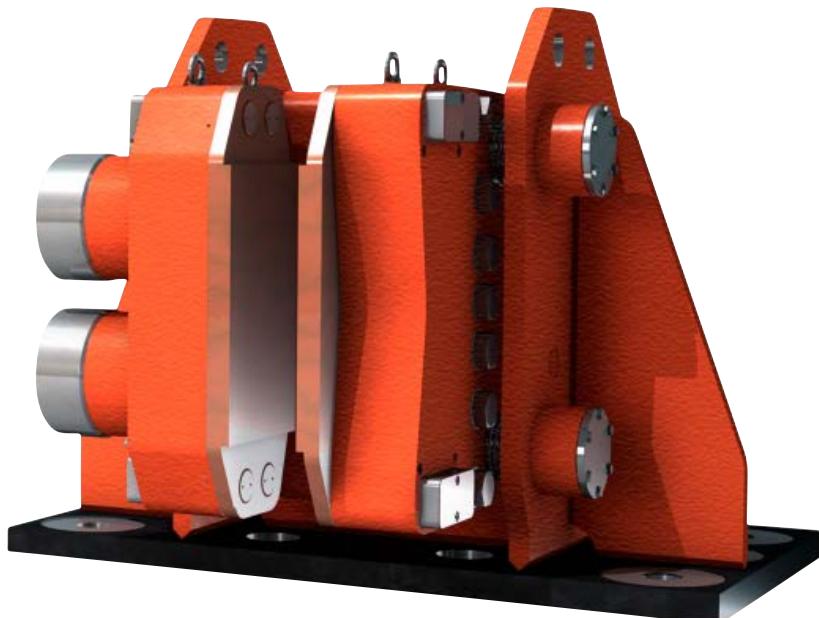
Disc Brake: BSFA 1000 MONOspring

Specification

Name: DEB-1000-001-MS-MAR

Date: 17.05.2010

Revision: A



TECHNICAL DATA AND CALCULATION FUNDAMENTALS

| CALIPER TYPE | CLAMPING FORCE ¹⁾ [N] | | BRAKING FORCE ²⁾ [N] | LOSS OF FORCE PER 1MM [%] | OPERATING PRESSURE ³⁾ MPa | BALANCING PRESSURE ¹⁾ MIN MPa | PAD SURFACE PRESSURE ⁴⁾ [N/mm ²] |
|--------------|----------------------------------|-----------|---------------------------------|---------------------------|--------------------------------------|------------------------------------------|---------------------------------------------------------|
| | MIN | MAX | | | | | |
| BSFA 1060 | 600,000 | 640,000 | 480,000 | 8.5 | 13.0 | 7.36 | 4.18 |
| BSFA 1070 | 700,000 | 740,000 | 560,000 | 8.5 | 14.0 | 8.58 | 4.84 |
| BSFA 1080 | 800,000 | 850,000 | 640,000 | 10.5 | 17.0 | 9.81 | 5.56 |
| BSFA 1090 | 900,000 | 950,000 | 720,000 | 9.5 | 18.0 | 11.03 | 6.21 |
| BSFA 1100 | 1.000,000 | 1.050,000 | 800,000 | 8.5 | 20.5 | 12.26 | 6.86 |
| BSFA 1110 | 1.100,000 | 1.160,000 | 880,000 | 8.0 | 23.5 | 13.49 | 7.58 |

¹⁾ All figures are based on 2 mm air gap (total) and 2 spring packs.

²⁾ Braking force is based on a min clamping force, nominal coefficient of friction $\mu = 0.4$ and 2 brake surfaces.

³⁾ The operating pressure is the minimum needed for operating the brake

⁴⁾ Pad pressure for organic / sintered pads respectively (based on max. clamping force)

Bracket is not part of brake.

Disc Brake: BSFA 1000 MONOspring

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,3)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu$$

CALCULATION FUNDAMENTALS

Weight of complete caliper

incl. pads and without bracket: 1,400 - 1600 kg depending on the disc thickness

Disc thickness:

80 - 135 mm (depending on type)

Overall caliper dimensions:

766 - 859 x 800 x 615mm (depending on disc thickness)

Pad width:

300 mm

Pad friction area: (organic)

153,000 mm² (*)

Max. wear of pad:

5 mm (*)

Nominal coefficient of friction:

$\mu = 0.4$

Total piston area - each caliper half:

2 x 40,800 mm² = 81,600 mm²

Volume for each caliper half at 1 mm stroke: 81.6 cm³

Volume for each caliper at 3 mm stroke: 245 cm³

Actuating time (guide value for calculation): 0.4sec

Pressure connection (port size): 3/4" BSP

Drain connection R (port size): 1/4" BSP

Recommended hydraulic pipe size OD: 16 mm

Max. operating pressure 23,0 MPa

Operating temperature range - general from -20°C to +70°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

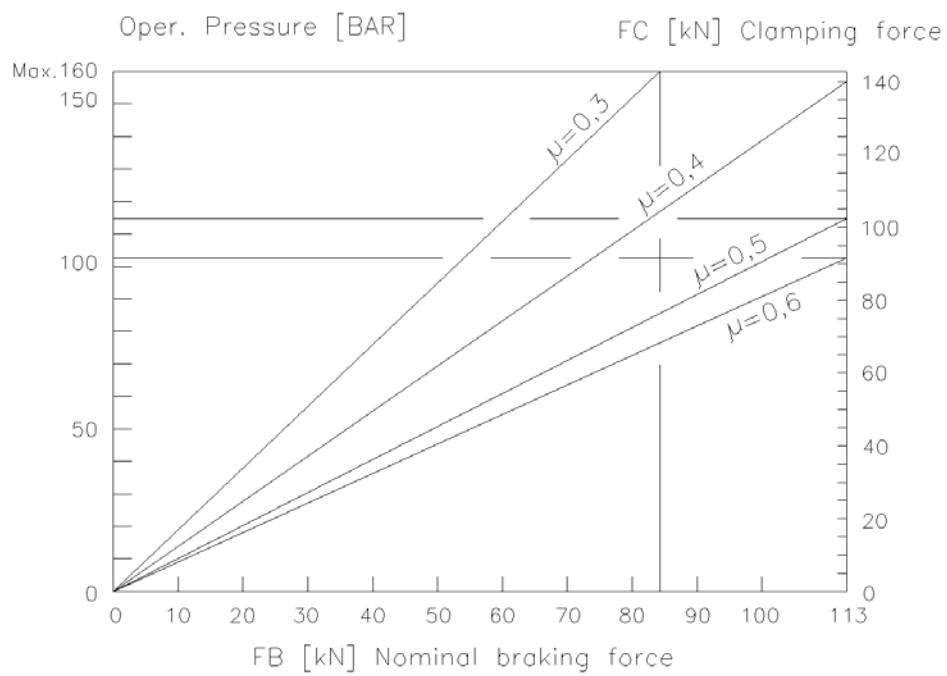
Disc Brake: BSAB 75 DUAL-ACTION

Specification

Name: DEB-0075-002-DA-MAR
Date: 07.03.2008
Revision: A



TECHNICAL DATA AND CALCULATION FUNDAMENTALS



Disc Brake: BSAB 75 DUAL-ACTION

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

F_c is the clamping force [N]

A [cm²], P [bar] and μ see values below

The actual braking torque may vary depending on friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,102)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu \text{ [N]}$$

$$F_c = A \cdot P \cdot 10 \text{ [N]}$$

CALCULATION FUNDAMENTALS

| | |
|-----------------------------------------------|----------------------------|
| Weight of caliper without bracket: | Approx. 60 kg |
| Overall dimensions: | 220 x 240 x 260 mm |
| Pad width: | 102 mm |
| Pad area: (organic) | 20,300 mm ² (*) |
| Max. wear of pad: (organic) | 7 mm (*) "(=11 mm thick)" |
| Pad area: (sinter) | 16,350 mm ² (*) |
| Max. wear of pad: (sinter) | 6 mm (*) "(=12 mm thick)" |
| Nominal coefficient of friction: | $\mu = 0.4$ |
| Total piston area - each caliper half: | A=88 cm ² |
| Total piston area - each caliper: | 176 cm ² |
| Volume for each caliper at 1 mm stroke: | 18 cm ³ |
| Volume for each caliper at 3 mm stroke: | 54 cm ³ |
| Actuating time (guide value for calculation): | 0.4 sec |
| Pressure connection/port: | 1/4" BSP |
| Drain connection/port: | 1/4" BSP |
| Max. operating pressure: | 16 MPa |
| Recommended pipe size: | 10/8 mm |
| Operating temperature range - general | from -20°C to +70°C |
| Operating temperature range - wind turbine | from -40°C to +60°C |

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

Disc Brake: BSAB 90 DUAL-ACTION

Specification

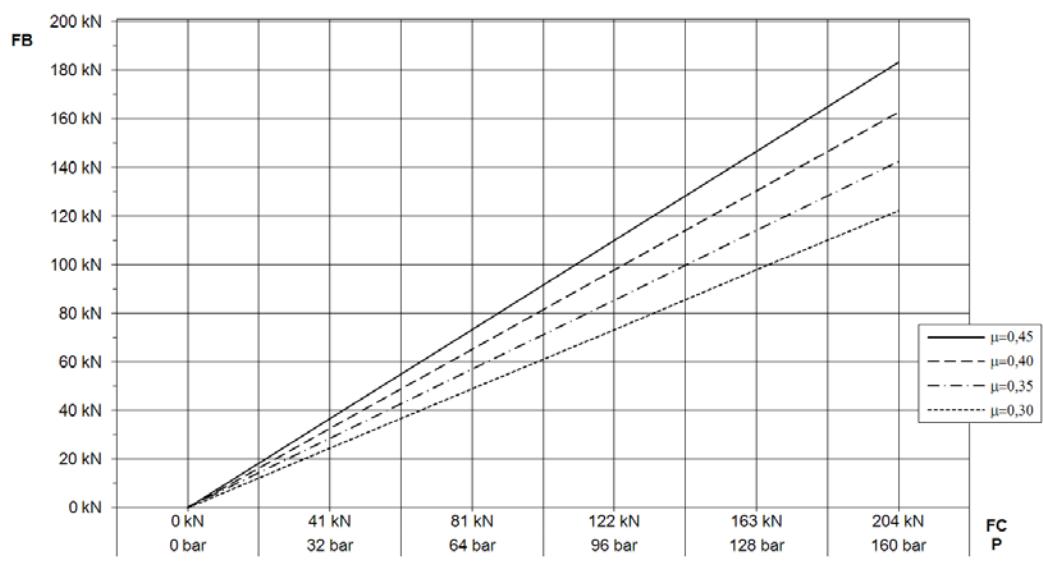
Name: DEB-0090-001-DA-MAR

Date: 09.12.2009

Revision: B



TECHNICAL DATA AND CALCULATION FUNDAMENTALS



Disc Brake: BSAB 90 DUAL-ACTION

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

F_c is the clamping force [N]

A [cm²], P [bar] and μ see values below

The actual braking torque may vary depending on friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,102)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu \text{ [N]}$$

$$F_c = A \cdot P \cdot 10 \text{ [N]}$$

CALCULATION FUNDAMENTALS

| | |
|-----------------------------------------------|----------------------------|
| Weight of caliper without bracket: | Approx. 60 kg |
| Overall dimensions: | 220 x 240 x 260 mm |
| Pad width: | 102 mm |
| Pad area: (organic) | 20,300 mm ² (*) |
| Max. wear of pad: (organic) | 7 mm (*) "(=14 mm thick)" |
| Pad area: (sinter) | 16,350 mm ² (*) |
| Max. wear of pad: (sinter) | 6 mm (*) "(=12 mm thick)" |
| Nominal coefficient of friction: | $\mu = 0.4$ |
| Total piston area - each caliper half: | $A=127 \text{ cm}^2$ |
| Total piston area - each caliper: | 254 cm^2 |
| Volume for each caliper at 1 mm stroke: | 25 cm^3 |
| Volume for each caliper at 3 mm stroke: | 76 cm^3 |
| Actuating time (guide value for calculation): | 0.4 sec |
| Pressure connection/port: | 1/4" BSP |
| Drain connection/port: | 1/4" BSP |
| Max. operating pressure: | 15.7 MPa |
| Recommended pipe size: | 10/8 mm |
| Operating temperature range - general | from -20°C to +70°C |
| Operating temperature range - wind turbine | from -40°C to +60°C |

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

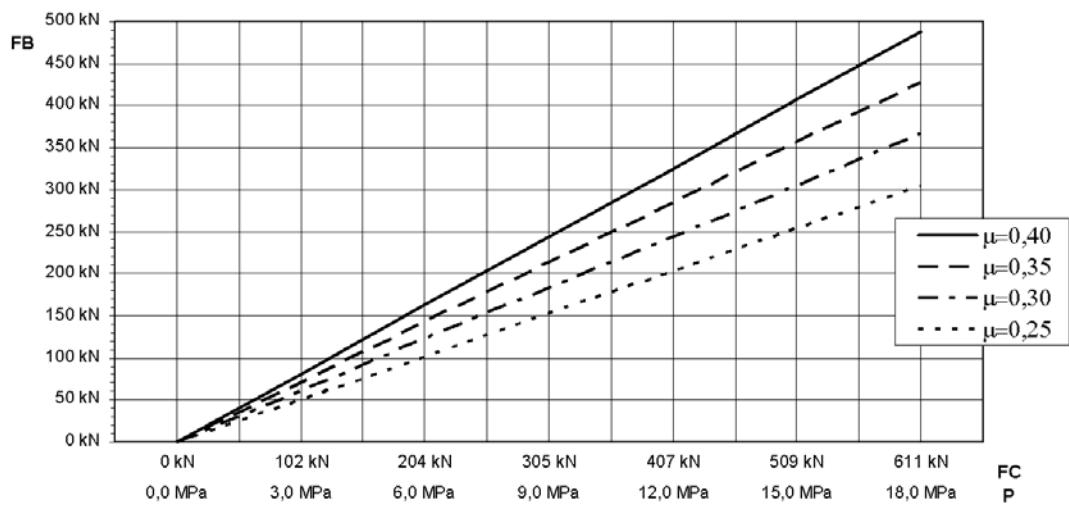
Disc Brake: BSAB 120 DUAL-ACTION

Specification

Name: DEB-0120-001-DA-MAR
Date: 03.12.2009
Revision: B



TECHNICAL DATA AND CALCULATION FUNDAMENTALS



Disc Brake: BSAB 120 DUAL-ACTION

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

F_c is the clamping force [N]

A [cm²], P [bar] and μ see values below

The actual braking torque may vary depending on friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,136)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu \text{ [N]}$$

$$F_c = A \cdot P \cdot 10 \text{ [N]}$$

CALCULATION FUNDAMENTALS

| | |
|-----------------------------------------------|----------------------------|
| Weight of caliper without braket: | Approx. 210 kg |
| Overall dimensions: | 500 x 310 x 274 mm |
| Pad width: | 138 mm |
| Pad area: (organic) | 50,000 mm ² (*) |
| Max. wear of pad: (organic) | 7 mm (*) "(=14 mm thick)" |
| Nominal coefficient of friction: | $\mu = 0.4$ |
| Total piston area - each caliper half: | $A=339.3 \text{ cm}^2$ |
| Total piston area - each caliper: | 678.6 cm^2 |
| Volume for each caliper at 1 mm stroke: | 67.86 cm^3 |
| Volume for each caliper at 3 mm stroke: | 203.5 cm^3 |
| Actuating time (guide value for calculation): | 0.8 sec |
| Pressure connection/port: | 1/4" BSP |
| Drain connection/port: | 1/4" BSP |
| Max. operating pressure: | 16.0 MPa |
| Recommended pipe size: | 10 mm |

Operating temperature range - general from -20°C to +70°C
 Operating temperature range - wind turbine from -40°C to +60°C

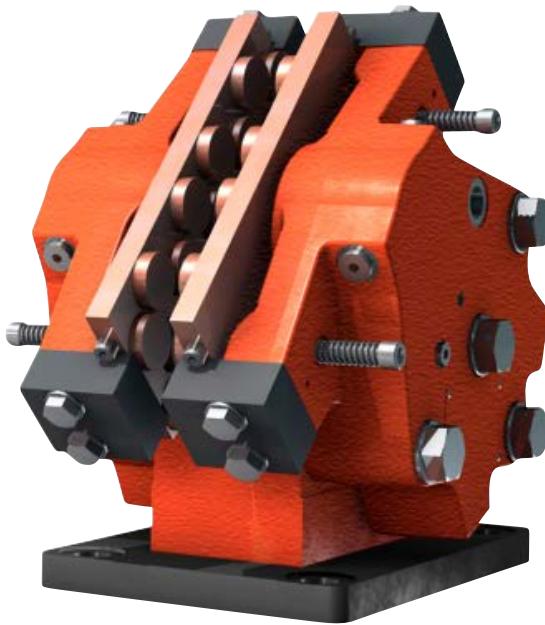
(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

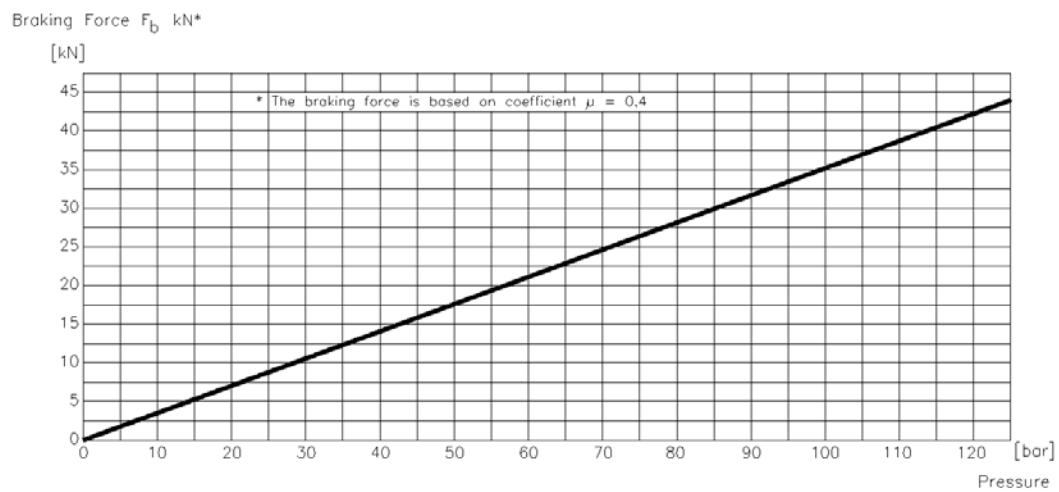
Disc Brake: BSAK 300 DUAL-ACTION

Specification

Name: DEB-0300-043-DA-MAR
Date: 15.05.2009
Revision: A



TECHNICAL DATA AND CALCULATION FUNDAMENTALS



Disc Brake: BSAK 300 DUAL-ACTION

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

F_c is the clamping force [N]

A [cm²], P [bar] and μ see values below

The actual braking torque may vary depending on friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,13)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu \text{ [N]}$$

$$F_c = A \cdot P \cdot 10 \text{ [N]}$$

CALCULATION FUNDAMENTALS

DUAL-ACTION

| | |
|-----------------------------------------------|----------------------------|
| Weight of caliper without bracket: | Approx. 55 kg |
| Overall dimensions: | 331 x 320 x 321 mm |
| Pad width: | 130 mm |
| Pad area: (organic) | 29,000 mm ² (*) |
| Max. wear of pad: (organic) | 10 mm (*) "(=14 mm thick)" |
| Pad area: (sinter) | 20,000 mm ² (*) |
| Max. wear of pad: (sinter) | 7 mm (*) "(=17 mm thick)" |
| Nominal coefficient of friction: | $\mu = 0.4$ |
| Total piston area - each caliper half: | $A=44.2 \text{ cm}^2$ |
| Total piston area - each caliper: | 88.4 cm^2 |
| Volume for each caliper at 1 mm stroke: | 8.8 cm^3 |
| Volume for each caliper at 3 mm stroke: | 24.6 cm^3 |
| Actuating time (guide value for calculation): | 0.3 sec |
| Pressure connection/port: | 1/4" BSP |
| Drain connection/port: | 1/8" BSP |
| Max. operating pressure: | 12.5 MPa |
| Recommended pipe size: | 10/8 mm |

Operating temperature range - general from -20°C to +70°C

Operating temperature range - wind turbine from -40°C to +60°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

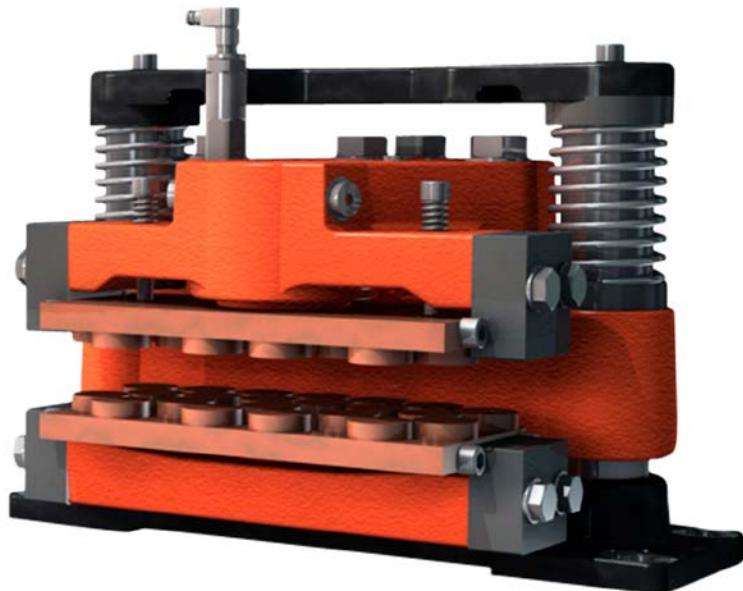
Disc Brake: BSAK 300 MONO-ACTION

Specification

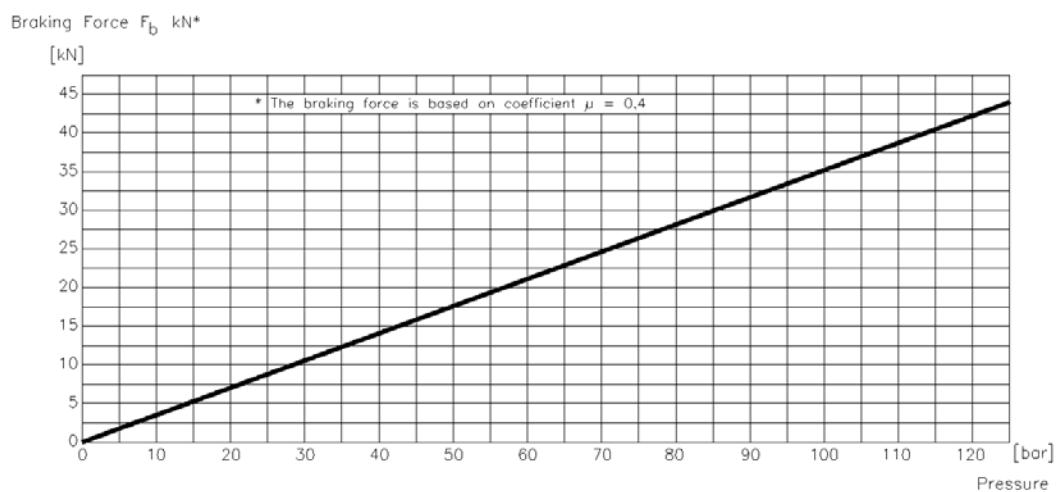
Name: DEB-0300-043-DA-MAR

Date: 15.05.2009

Revision: A



TECHNICAL DATA AND CALCULATION FUNDAMENTALS



Disc Brake: BSAK 300 MONO-ACTION

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

F_c is the clamping force [N]

A [cm²], P [bar] and μ see values below

The actual braking torque may vary depending on friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,13)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu \text{ [N]}$$

$$F_c = A \cdot P \cdot 10 \text{ [N]}$$

CALCULATION FUNDAMENTALS

MONO-ACTION

| | |
|-----------------------------------------------|----------------------------|
| Weight of caliper without bracket: | Approx. 75 kg |
| Overall dimensions: | 260 x 420 x 300 mm |
| Pad width: | 130 mm |
| Pad area: (organic) | 29,000 mm ² (*) |
| Max. wear of pad: (organic) | 5 mm (*) "(=19 mm thick)" |
| Pad area: (sinter) | 20,000 mm ² (*) |
| Max. wear of pad: (sinter) | 5 mm (*) "(=19 mm thick)" |
| Nominal coefficient of friction: | $\mu = 0.4$ |
| Total piston area - each caliper half: | $A=44.2 \text{ cm}^2$ |
| Total piston area - each caliper: | 44.2 cm^2 |
| Volume for each caliper at 1 mm stroke: | 4.4 cm^3 |
| Volume for each caliper at 3 mm stroke: | 13.2 cm^3 |
| Actuating time (guide value for calculation): | 0.3 sec |
| Pressure connection/port: | 1/4" BSP |
| Drain connection/port: | 1/8" BSP |
| Max. operating pressure: | 12.5 MPa |
| Recommended pipe size: | 10/8 mm |

Operating temperature range - general from -20°C to +70°C

Operating temperature range - wind turbine from -40°C to +60°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

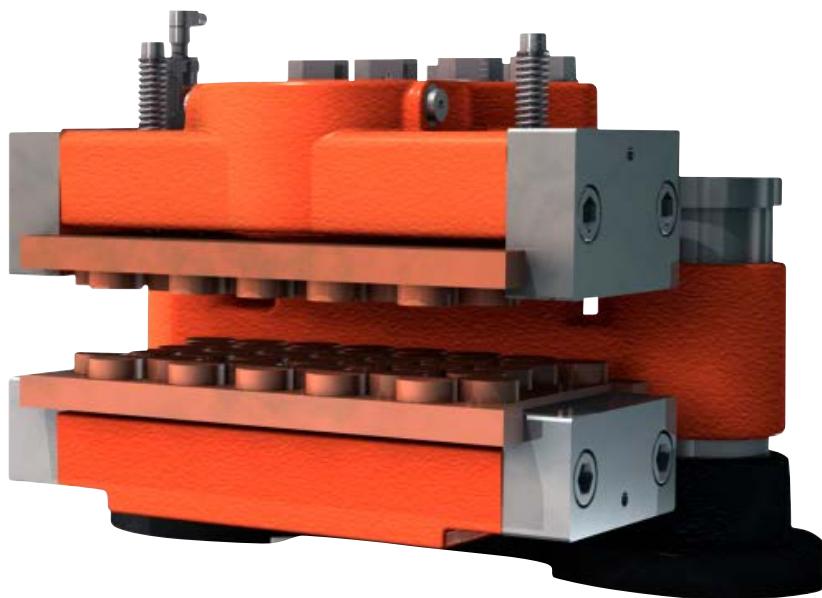
Disc Brake: BSAK 3000 DUAL-ACTION

Specification

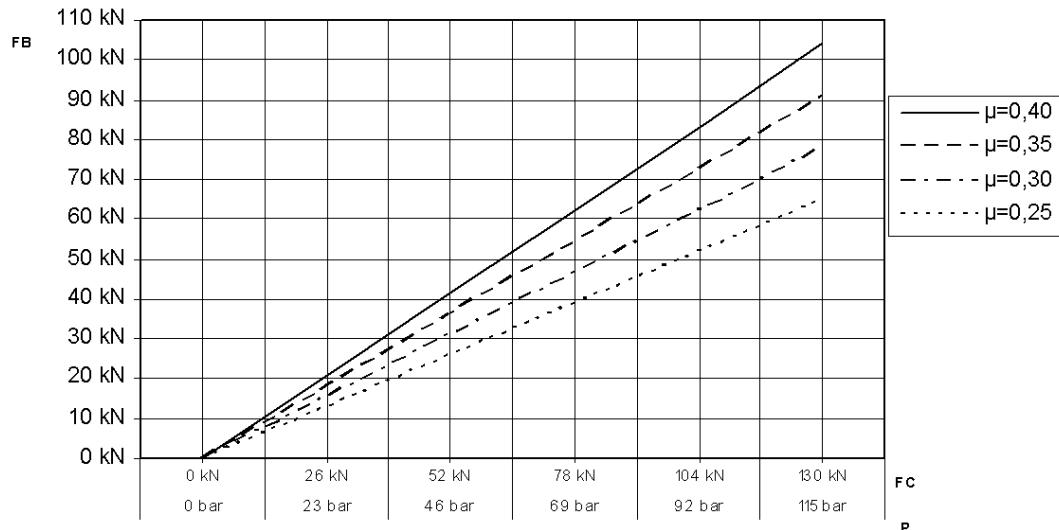
Name: DEB-3000-020-DA-MAR

Date: 15.05.2009

Revision: A



TECHNICAL DATA AND CALCULATION FUNDAMENTALS



Disc Brake: BSAK 3000 DUAL-ACTION

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

F_c is the clamping force [N]

A [cm^2], P [bar] and μ see values below

The actual braking torque may vary depending on friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,2)}{2} \quad [\text{Nm}]$$

$$F_B = F_c \cdot 2 \cdot \mu \quad [\text{N}]$$

$$F_c = A \cdot P \cdot 10 \quad [\text{N}]$$

CALCULATION FUNDAMENTALS

DUAL-ACTION

Weight of caliper without bracket: Approx. 130 kg

Pad width: 200 mm

Pad area: (organic) 59,600 mm^2 (*)

Max. wear of pad: (organic) 10 mm (*) "(=22 mm thick)"

Pad area: (sinter) 36,000 mm^2 (*)

Max. wear of pad: (sinter) 10 mm (*) "(=22 mm thick)"

Nominal coefficient of friction: $\mu = 0.4$

Total piston area - each caliper half: $A=113.1 \text{ cm}^2$

Total piston area - each caliper: 226.2 cm^2

Volume for each caliper at 1 mm stroke: 22.6 cm^3

Volume for each caliper at 3 mm stroke: 67.9 cm^3

Actuating time (guide value for calculation): 0.3 sec

Pressure connection/port: 1/4" BSP

Max. operating pressure: 11.5 MPa

Operating temperature range - general from -20°C to +70°C

Operating temperature range - wind turbine from -40°C to +60°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

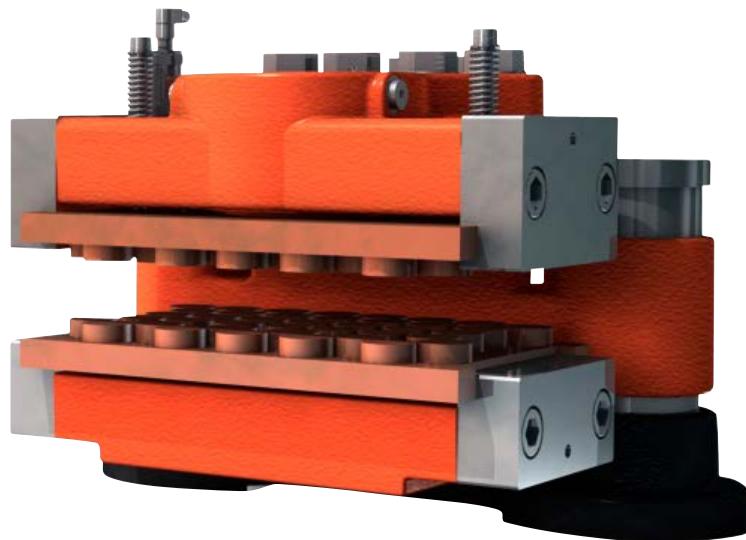
Disc Brake: BSAK 3000 MONO-ACTION

Specification

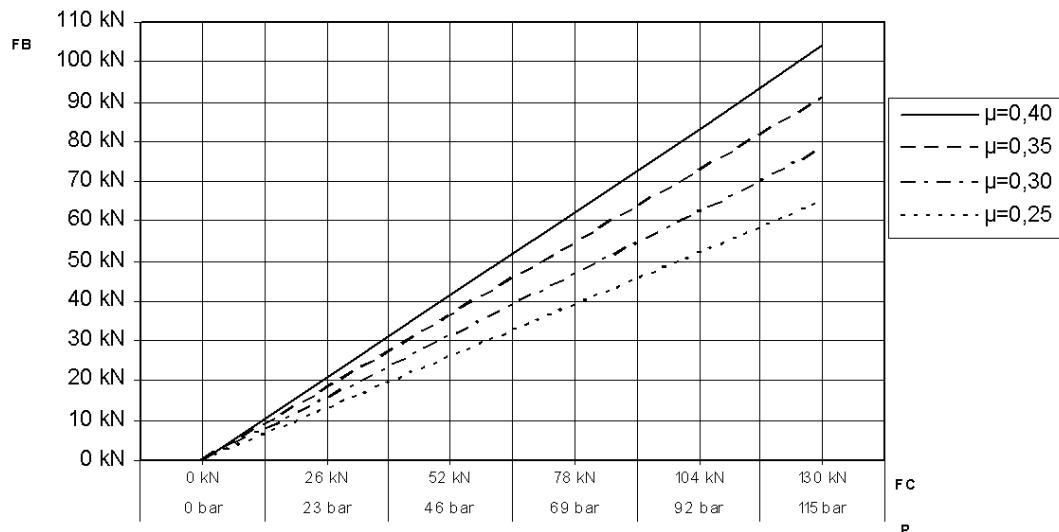
Name: DEB-0300-043-DA-MAR

Date: 15.05.2009

Revision: A



TECHNICAL DATA AND CALCULATION FUNDAMENTALS



Disc Brake: BSAK 3000 MONO-ACTION

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

F_c is the clamping force [N]

A [cm^2], P [bar] and μ see values below

The actual braking torque may vary depending on friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,2)}{2} \quad [\text{Nm}]$$

$$F_B = F_c \cdot 2 \cdot \mu \quad [\text{N}]$$

$$F_c = A \cdot P \cdot 10 \quad [\text{N}]$$

CALCULATION FUNDAMENTALS

MONO-ACTION

Weight of caliper without bracket: Approx. 160 kg

Pad width: 200 mm

Pad area: (organic) 59,600 mm^2 (*)

Max. wear of pad: (organic) 5 mm (*) "(=23 mm thick)"

Pad area: (sinter) 36,000 mm^2 (*)

Max. wear of pad: (sinter) 5 mm (*) "(=23 mm thick)"

Nominal coefficient of friction: $\mu = 0.4$

Total piston area - each caliper half: $A=113.1 \text{ cm}^2$

Total piston area - each caliper: 113.1 cm^2

Volume for each caliper at 1 mm stroke: 11.31 cm^3

Volume for each caliper at 3 mm stroke: 33.9 cm^3

Actuating time (guide value for calculation): 0.3 sec

Pressure connection/port: 1/4" BSP

Max. operating pressure: 11.5 MPa

Operating temperature range - general from -20°C to +70°C

Operating temperature range - wind turbine from -40°C to +60°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

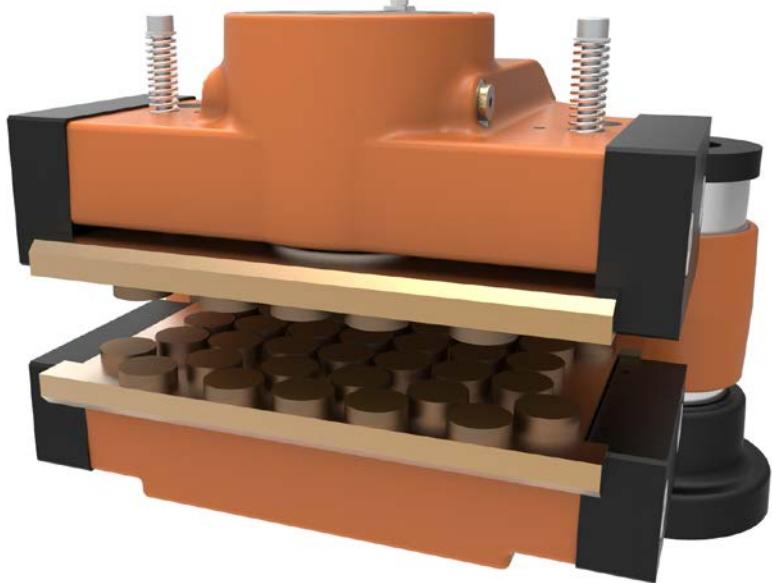
Disc Brake: BSAL 3000 MONO-ACTION

Specification

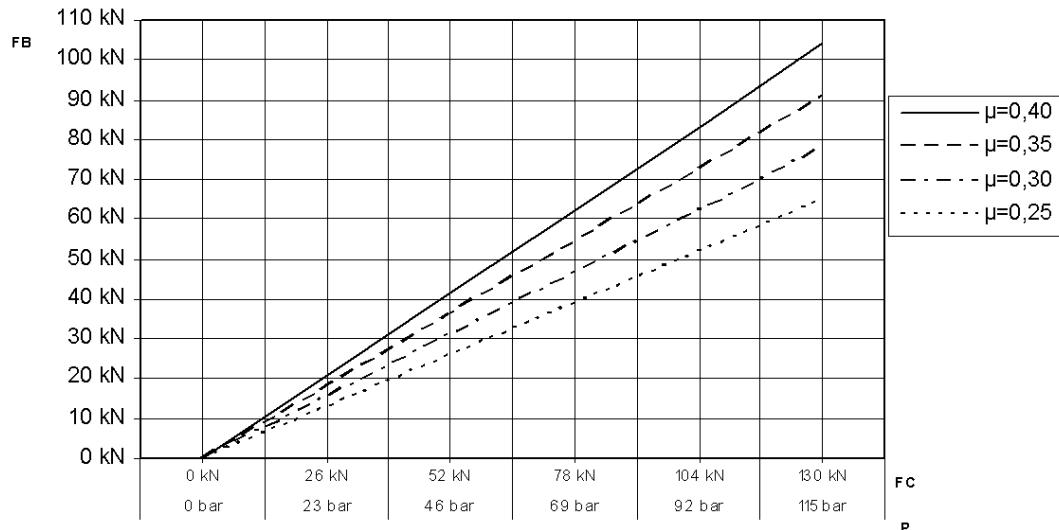
Name: DEB-3000-030-MA-MAR

Date: 07.03.2012

Revision: -



TECHNICAL DATA AND CALCULATION FUNDAMENTALS



Disc Brake: BSAL 3000 MONO-ACTION

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

F_c is the clamping force [N]

A [cm²], P [bar] and μ see values below

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,2)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu \text{ [N]}$$

$$F_c = A \cdot P \cdot 10 \text{ [N]}$$

CALCULATION FUNDAMENTALS

Weight of caliper without bracket:

MONO-ACTION

Approx. 180 kg

Pad width:

200 mm

Pad area: (organic)

59,600 mm² (*)

Max. wear of pad: (organic)

5 mm (*) "(=23 mm thick)"

Pad area: (sinter)

36,000 mm² (*)

Max. wear of pad: (sinter)

5 mm (*) "(=23 mm thick)"

Nominal coefficient of friction:

$\mu = 0.4$

Total piston area - each caliper half:

$A=113.1 \text{ cm}^2$

Total piston area - each caliper:

113.1 cm^2

Volume for each caliper at 1 mm stroke:

11.31 cm^3

Volume for each caliper at 3 mm stroke:

33.9 cm^3

Actuating time (guide value for calculation):

0.3 sec

Pressure connection/port:

1/4" BSP, 1/8" BSP

Max. operating pressure:

11.5 MPa

Operating temperature range - general

from -20°C to +70°C

Operating temperature range - wind turbine

from -40°C to +60°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

Disc Brake: BSAC 120 DUAL-ACTION

Specification

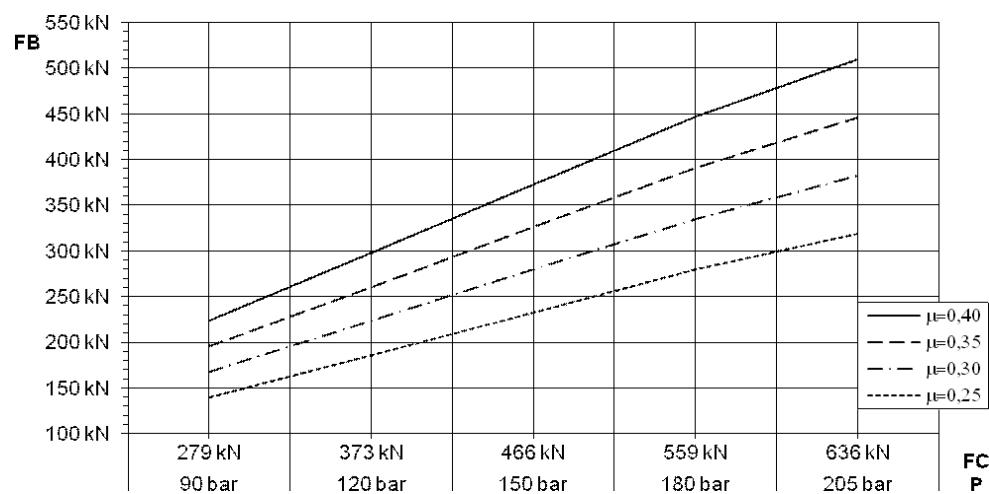
Name: DEB-0120-004-DA-MAR

Date: 03.07.2012

Revision: -



TECHNICAL DATA AND CALCULATION FUNDAMENTALS



Disc Brake: BSAC 120 DUAL-ACTION

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

F_c is the clamping force [N]

A [cm²], P [bar] and μ see values below

The actual braking torque may vary depending on friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,136)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu \text{ [N]}$$

$$F_c = A \cdot P \cdot 10 \text{ [N]}$$

CALCULATION FUNDAMENTALS

Weight of caliper without bracket:

DUAL-ACTION

Approx. 850 kg

Overall dimensions:

572 x 318 x 278 mm

Pad width:

138 mm

Pad area:(organic)

58,500 mm² (*)

Max. wear of pad:(organic)

7 mm (*) "(=14 mm thick)"

Nominal coefficient of friction:

$\mu = 0.4$

Total piston area - each caliper half:

A=339,3 cm²

Total piston area - each caliper:

678,6 cm²

Volume for each caliper at 1 mm stroke:

67,8 cm³

Volume for each caliper at 3 mm stroke:

203,5 cm³

Actuating time (guide value for calculation):

0.8 sec

Pressure connection/port:

1/4" BSP

Drain connection port:

1/4" BSP

Max. operating pressure Pmax

20.5 MPa

Min. operating pressure Pmin

9.0 MPa

Recommended pipe size:

10 mm

Operating temperature range - general

from -20°C to +70°C

Operating temperature range - wind turbine

from -40°C to +60°C

(For temperatures outside this range contact Svendborg Brakes)

(*) On each brake pad.

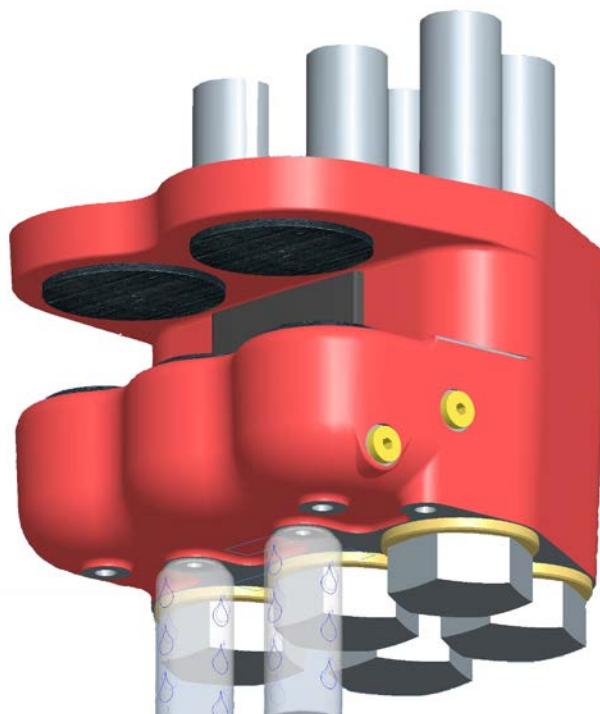
Disc Brake: YSAA 60

Specification

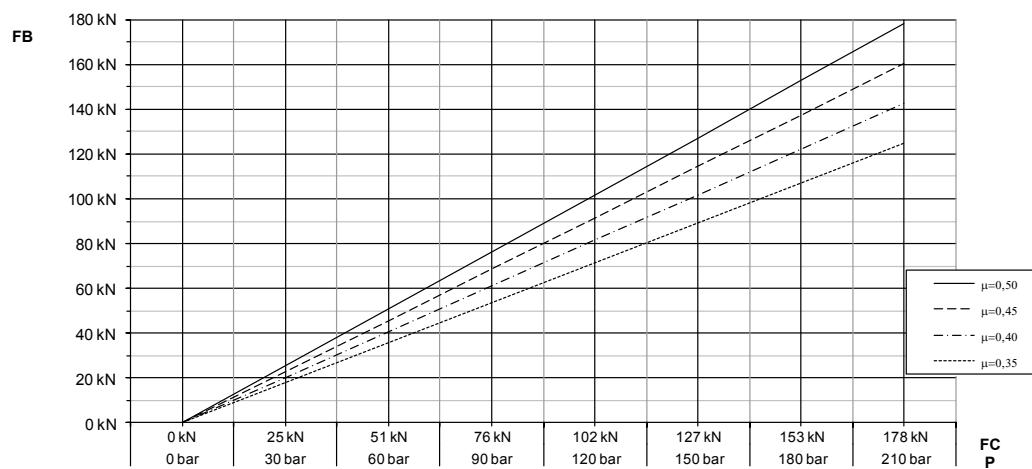
Name: DEB-0060-001- MAR

Date: 10.09.2012

Revision: -



TECHNICAL DATA AND CALCULATION FUNDAMENTALS



Disc Brake: YSAA 60

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N]

D_o is the brake disc outer diameter [m]

F_c is the clamping force [N]

A [cm²], P [bar] and μ see values below

The actual braking torque may vary depending on friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,102)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu \text{ [N]}$$

$$F_c = A \cdot P \cdot 10 \text{ [N]}$$

CALCULATION FUNDAMENTALS

Weight of caliper without bracket incl. pads: Approx. 51 kg

Overall dimensions: 171 x 265 x 278 mm

Pad diameter: 3xØ 63 mm + 2xØ 93 mm

Pad area: 9,352 mm² + 13,586 mm²

Max. wear of Slide/brake material: TBD

Nominal coefficient of friction: $\mu = 0.4$

Total piston area - each caliper: 85 cm²

Volume for each caliper at 1 mm stroke: 8,5 cm³

Actuating time (guide value for calculation): 0.4 sec

Pressure connection/port: 1/4" BSP

Drain connection port: 1/8" BSP

Max. operating pressure: 200 bar

Recommended pipe size: 8-10 mm

Operating temperature range - general from -40°C to +70°C

Operating temperature range - wind turbine from -40°C to +60°C

(For temperatures outside this range contact Svendborg Brakes)

Notes:



SVENDBORG NEW BRAKES

Svendborg Brakes is the global market leader in intelligent braking solutions. This is why.

Disc Brake: BSFH D500 (DOUBLE PISTON) DUALspring

Specification



Name: DEB-0500-029-DS-MAR

Date: 20.05.2013

Revision: -

TECHNICAL DATA AND CALCULATION FUNDAMENTALS

| CALIPER TYPE | CLAMPING FORCE ¹⁾ [N] | | BRAKING FORCE ²⁾ [N] | LOSS OF FORCE PER 1MM [%] | OPERATING PRESSURE ³⁾ MPa | BALANCING PRESSURE ¹⁾ MIN MPa | PAD SURFACE PRESSURE ⁵⁾ [N/mm ²] |
|--------------|----------------------------------|---------|---------------------------------|---------------------------|--------------------------------------|------------------------------------------|---------------------------------------------------------|
| | MIN | MAX | | | | | |
| BSFH D524 | 240,000 | 260,000 | 192,000 | 8.0 | 12.0 | 8.3 | 2.4 |
| BSFH D528 | 280,000 | 306,000 | 224,000 | 7.0 | 14.0 | 9.7 | 2.8 |
| BSFH D530 | 300,000 | 328,000 | 240,000 | 6.0 | 14.5 | 10.3 | 3.0 |
| BSFH D532 | 320,000 | 350,000 | 256,000 | 6.0 | 15.0 | 11.0 | 3.2 |
| BSFH D540 | 400,000 | 436,000 | 320,000 | 10.0 | 19.0 | 13.8 | 4.0 |

¹⁾ All figures are based on 1 mm air gap (Total) and 2 spring packs

²⁾ Braking force is based on a min clamping force, nominal coefficient of friction $\mu = 0.4$ and 2 brake surfaces.

³⁾ The piston travel at which the pressure limits is measured - the nominal pressure limits is identical to balancing pressure values

⁵⁾ Pad pressure for organic pads respectively (based on max. clamping force)

Disc Brake: BSFH D500 (DOUBLE PISTON) DUALspring

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,2)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu$$

CALCULATION FUNDAMENTALS

Weight of caliper without bracket:

Approx. 780 kg

Overall dimensions without base plate:

698 x 530 x 533 (+C) mm

Pad width:

200 mm

Pad area: (organic)

110,000 mm² (*)

Max. wear of pad: (organic)

10 mm (*)

Nominal coefficient of friction:

$\mu = 0.4$

Total piston area - each caliper half:

$2 \times 145 \text{ cm}^2 = 290 \text{ cm}^2$

Total piston area - each caliper:

$4 \times 145 \text{ cm}^2 = 580 \text{ cm}^2$

Volume for each caliper at 1 mm stroke:

60 cm³

Volume for each caliper at 3 mm stroke:

180 cm³

Actuating time (guide value for calculation):

0.4sec

Pressure connection/P-port:

G3/8, ISO 288

Air breathing connection/A-port:

G3/8, ISO 288

Drain connection/L-port:

G1/4, ISO 288

Recommended pipe size:

16/12 mm

Operating temperature range - general

from -20°C to +70°C

DUALSPRING

(For temperatures outside this range contact Svendborg Brakes)

(C = Brake disc thickness)

(*) On each brake pad.

Disc Brake: BSFH D500 (DOUBLE PISTON) MONOspring

Specification

Name: DEB-0500-029-MS-MAR

Date: 20.05.2013

Revision: -



TECHNICAL DATA AND CALCULATION FUNDAMENTALS

| CALIPER TYPE | CLAMPING FORCE ¹⁾ [N] | | BRAKING FORCE ²⁾ [N] | LOSS OF FORCE PER 1MM [%] | OPERATING PRESSURE ³⁾ MPa | BALANCING PRESSURE ¹⁾ MIN MPa | PAD SURFACE PRESSURE ⁵⁾ [N/mm ²] |
|--------------|-------------------------------------|---------|---------------------------------------|------------------------------------|--------------------------------------------|---------------------------------------------------|------------------------------------------------------------------|
| | MIN | MAX | | | | | |
| BSFH D524 | 240,000 | 260,000 | 192,000 | 8.0 | 12.0 | 8.3 | 2.4 |
| BSFH D528 | 280,000 | 306,000 | 224,000 | 7.0 | 14.0 | 9.7 | 2.8 |
| BSFH D530 | 300,000 | 328,000 | 240,000 | 6.0 | 14.5 | 10.3 | 3.0 |
| BSFH D532 | 320,000 | 350,000 | 256,000 | 6.0 | 15.0 | 11.0 | 3.2 |
| BSFH D540 | 400,000 | 436,000 | 320,000 | 10.0 | 19.0 | 13.8 | 4.0 |

¹⁾ All figures are based on 1 mm air gap (Total) and 2 spring packs

²⁾ Braking force is based on a min clamping force, nominal coefficient of friction $\mu = 0.4$ and 2 brake surfaces.

³⁾ The piston travel at which the pressure limits is measured - the nominal pressure limits is identical to balancing pressure values

⁵⁾ Pad pressure for organic pads respectively (based on max. clamping force)

Disc Brake: BSFH D500 (DOUBLE PISTON) MONOspring

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force according to table above [N] or calculated from formula

D_o is the brake disc outer diameter [m]

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,2)}{2} \text{ [Nm]}$$

$$F_B = F_c \cdot 2 \cdot \mu$$

CALCULATION FUNDAMENTALS

Weight of caliper without bracket:

MONOSPRING

Approx. 910 - 1100 kg

Overall dimensions without base plate:

698 x 530 x 351 (+C) mm

Pad width:

200 mm

Pad area: (organic)

110,000 mm² (*)

Max. wear of pad: (organic)

5 mm (*)

Nominal coefficient of friction:

$\mu = 0.4$

Total piston area - each caliper half:

$2 \times 145 \text{ cm}^2 = 290 \text{ cm}^2$

Total piston area - each caliper:

$2 \times 145 \text{ cm}^2 = 290 \text{ cm}^2$

Volume for each caliper at 1 mm stroke:

30 cm^3

Volume for each caliper at 3 mm stroke:

90 cm^3

Actuating time (guide value for calculation):

0.4sec

Pressure connection/P-port:

G3/8, ISO 288

Air breathing connection/A-port:

G3/8, ISO 288

Drain connection/L-port:

G1/4, ISO 288

Recommended pipe size:

16/12 mm

Operating temperature range - general

from -20°C to +70°C

(For temperatures outside this range contact Svendborg Brakes)

(C = Brake disc thickness)

(*) On each brake pad.

Disc Brake: BSAH D500 (DOUBLE PISTON) DUAL-ACTION

Specification

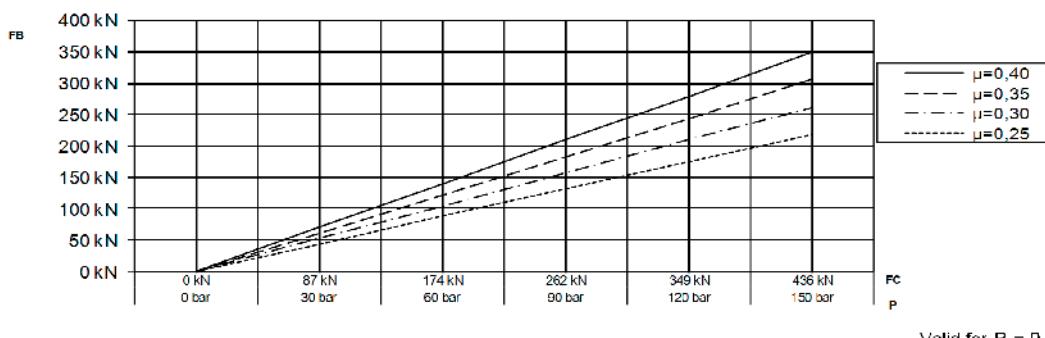
Name: DEB-0500-030-DA-MAR

Date: 20.05.2013

Revision: -



TECHNICAL DATA AND CALCULATION FUNDAMENTALS



Disc Brake: BSAH D500 (DOUBLE PISTON) DUAL-ACTION

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force [N]

D_o is the brake disc outer diameter [m]

F_c is the clamping force [N]

F_r is the piston retraction force [N]

A is the active piston area[cm²]

A_r is the retraction piston area[cm²]

P is the hydraulic pressure[bar]

P_r is the hydraulic retraction pressure[bar]

μ is the coefficient of friction - see values below

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,2)}{2} \text{ [Nm]}$$

$$F_B = (F_c - F_r) \cdot 2 \cdot \mu \text{ [N]} \\ (\text{valid for } F_c > F_r)$$

$$F_c = A \cdot P \cdot 10 \text{ [N]}$$

$$F_r = A_r \cdot P_r \cdot 10 \text{ [N]}$$

CALCULATION FUNDAMENTALS

Weight of caliper without bracket:

Overall dimensions excl. base plate:

Pad width:

Pad area:(organic)

Max. wear of pad:(organic)

Nominal coefficient of friction:

Total piston area - each caliper half "A" (active braking):

Total piston area - each caliper "A" (active braking):

Total piston area - each caliper half "A" (retraction):

Total piston area - each caliper "A" (retractio):

Volume for each caliper at 1 mm stroke (active braking):

Volume for each caliper at 3 mm stroke (active braking):

Volume for each caliper at 1 mm stroke (retraction):

Volume for each caliper at 3 mm stroke (retraction):

Actuating time (guide value for calculation):

Active pressure connection size (A-port):

Retraction connection size (P-port):

Drain connection size (L-port):

Max. operating pressure Pmax

Recommended pipe size:

Operating temperature range - general

DUAL-ACTION

Approx. 780 kg

698 x 530 x 533 (+C) mm

200 mm

110,000 mm² (*)

8 mm (*)

$\mu = 0.4$

$2 \times 145 \text{ cm}^2 = 290 \text{ cm}^2$

$4 \times 145 \text{ cm}^2 = 580 \text{ cm}^2$

$2 \times 145 \text{ cm}^2 = 290 \text{ cm}^2$

$4 \times 145 \text{ cm}^2 = 580 \text{ cm}^2$

60 cm³

180 cm³

60 cm³

180 cm³

0.4 sec

G3/8, ISO 228

G3/8, ISO 228

G1/4, ISO 228

15.0 MPa (150 bar)

16/12 mm

from -20°C to +70°C

(For temperatures outside this range contact Svendborg Brakes)

(C= Brake disc thickness)

(*) On each brake pad.

Disc Brake: BSAH D500 (DOUBLE PISTON) MONO-ACTION

Specification

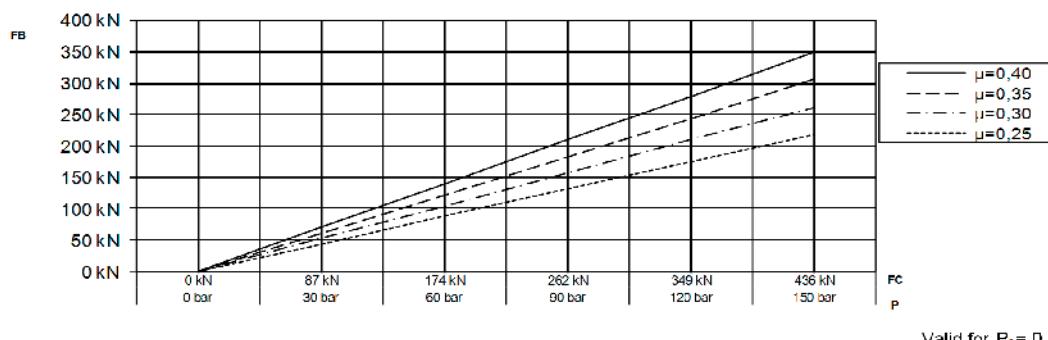
Name: DEB-0500-030-MA-MAR

Date: 20.05.2013

Revision: -



TECHNICAL DATA AND CALCULATION FUNDAMENTALS



Disc Brake: BSAH D500 (DOUBLE PISTON) MONO-ACTION

Specification

BRAKING TORQUE

The braking torque M_B is calculated from following formula where:

a is the number of brakes acting on the disc

F_B is the braking force [N]

D_o is the brake disc outer diameter [m]

F_c is the clamping force [N]

F_r is the piston retraction force [N]

A is the active piston area[cm²]

A_r is the retraction piston area[cm²]

P is the hydraulic pressure[bar]

P_r is the hydraulic retraction pressure[bar]

μ is the coefficient of friction - see values below

The actual braking torque may vary depending on adjustment of brake and friction coefficient.

$$M_B = a \cdot F_B \cdot \frac{(D_o - 0,2)}{2} \text{ [Nm]}$$

$$F_B = (F_c - F_r) \cdot 2 \cdot \mu \text{ [N]} \\ (\text{valid for } F_c > F_r)$$

$$F_c = A \cdot P \cdot 10 \text{ [N]}$$

$$F_r = A_r \cdot P_r \cdot 10 \text{ [N]}$$

CALCULATION FUNDAMENTALS

Weight of caliper without bracket:

Overall dimensions excl. base plate:

Pad width:

Pad area:(organic)

Max. wear of pad:(organic)

Nominal coefficient of friction:

Total piston area - each caliper half "A" (active braking):

Total piston area - each caliper "A" (active braking):

Total piston area - each caliper half "A" (retraction):

Total piston area - each caliper "A" (retractio):

Volume for each caliper at 1 mm stroke (active braking):

Volume for each caliper at 3 mm stroke (active braking):

Volume for each caliper at 1 mm stroke (retraction):

Volume for each caliper at 3 mm stroke (retraction):

Actuating time (guide value for calculation):

Active pressure connection size (A-port):

Retraction connection size (P-port):

Drain connection size (L-port):

Max. operating pressure Pmax

Recommended pipe size:

Operating temperature range - general

MONO-ACTION

Approx. 910-1000 kg

698 x 530 x 351 (+C) mm

200 mm

110,000 mm² (*)

6 mm (*)

$\mu = 0.4$

$2 \times 145 \text{ cm}^2 = 290 \text{ cm}^2$

$2 \times 145 \text{ cm}^2 = 290 \text{ cm}^2$

$2 \times 145 \text{ cm}^2 = 290 \text{ cm}^2$

$2 \times 145 \text{ cm}^2 = 290 \text{ cm}^2$

30 cm^3

90 cm^3

30 cm^3

90 cm^3

0.4 sec

G3/8, ISO 228

G3/8, ISO 228

G1/4, ISO 228

15.0 MPa (150 bar)

16/12 mm

from -20°C to +70°C

(For temperatures outside this range contact Svendborg Brakes)

(C= Brake disc thickness)

(*) On each brake pad.

Notes:



SVENDBORG SPECIAL RANGE

Svendborg Brakes is the global market leader in intelligent braking solutions.

Electro-Hydraulic Brake: DRUM Brake 18735

Specification

Name: 18735-MAR
Date: 25.05.2012
Revision: A



TECHNICAL DATA AND CALCULATION FUNDAMENTALS

Svendborg Brakes – drum brakes are built in their details and connecting dimensions according to DIN 15435.

All pin joints are furnished with maintenance-free, self-lubricating bearing bushes.

The braking torques are stepless adjustable with a screw and will be read directly on spring tube.

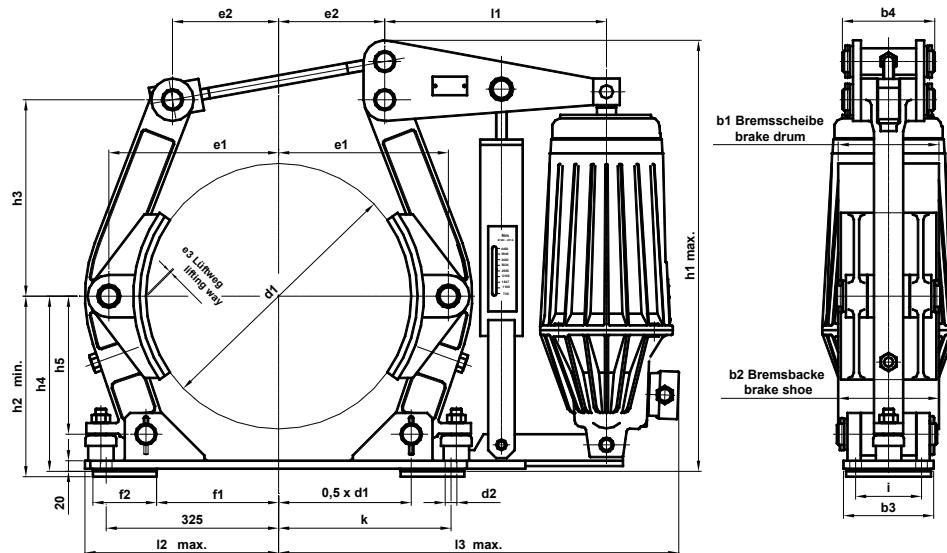
Svendborg Brakes – drum brakes are delivered with aluminium brake shoes and stucked-on brake linings, if not other requested.

Electro-Hydraulic Brake: DRUM Brake 18735

Specification

Designation of a drum brake Ø 400 for brake lifter Ed 80/6:
 SB – Drum brake 400-80/6 NO 18735

DRAWINGS



CALCULATION FUNDAMENTALS

| Abmessungen - Dimensions (mm) | | | | | | | | | | | | | | | | | | | M_B max. | $\mu=0,4$ | lifter | unit weight | | | | |
|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-----|------------|-----------|--------|-------------|------|--------|--------|--|
| d_1 | b_1 | b_2 | b_3 | b_4 | d_2 | e_1 | e_2 | e_3 | f_1 | f_2 | h_1 | h_2 | h_3 | h_4 | h_5 | h_6 | i | k | l_1 | l_2 | l_3 | Nm | Ed | kg | | |
| 200 | 75 | 70 | 80 | 85 | 14 | 140 | 100 | 1,1 | 65 | 100 | 396 | 160 | 165 | 155 | 110 | 15 | 55 | 145 | 240 | 175 | 460 | 230 | 23/5 | 20 | | |
| | | | | | | | | | | | 480 | | | | | | | | | | | 457 | 300 | 30/5 | | |
| 250 | 95 | 90 | 100 | 100 | 18 | 170 | 125 | 1,3 | 95 | 100 | 466 | 190 | 200 | 185 | 135 | 17 | 65 | 180 | 260 | 205 | 505 | 240 | 23/5 | 30 | | |
| | | | | | | | | | | | 485 | | | | | | | | | | | 502 | 320 | 30/5 | | |
| 315 | 118 | 110 | 110 | 125 | 18 | 212 | 140 | | | 1,2 | 566 | | | | | | | | | | | 557 | 420 | 30/5 | | |
| | | | | | | | | | | 1,5 | 135 | 100 | 570 | 230 | 250 | 225 | 170 | 17 | 80 | 220 | 300 | 248 | 597 | 620 | 50/6 | |
| | | | | | | | | | | | 585 | | | | | | | | | | | | 1060 | 80/6 | | |
| 400 | 150 | 140 | 140 | 165 | 22 | 260 | 160 | 1,5 | 170 | 120 | 676 | 795 | 280 | 305 | 270 | 205 | 20 | 100 | 270 | 355 | 300 | 672 | 1310 | 80/6 | | |
| | | | | | | | | | | | 676 | | | | | | | | | | | 655 | 1890 | 121/6 | | |
| | | | | | | | | | | | 795 | | | | | | | | | | | | 3300 | 201/6 | | |
| 500 | 190 | 180 | 170 | 200 | 22 | 320 | 200 | | 1,4 | 230 | 120 | 812 | 340 | 370 | 330 | 260 | 20 | 130 | 325 | 418 | 365 | 775 | 1810 | 80/6 | | |
| | | | | | | | | | | | 920 | | | | | | | | | | | 758 | 2650 | 121/6 | | |
| | | | | | | | | | | | | | | | | | | | | | | | 4550 | 201/6 | 201/12 | |
| 630 | 236 | 225 | 220 | 240 | 27 | 390 | 255 | | 1,5 | 280 | 150 | 977 | 420 | 440 | 410 | 325 | 25 | 170 | 400 | 475 | 445 | 870 | 3200 | 121/6 | | |
| | | | | | | | | | | | 3 | | | | | | | | | | | | 5500 | 201/6 | | |
| | | | | | | | | | | | | | | | | | | | | | | | 8600 | 301/6 | | |
| 710 | 265 | 255 | 240 | 270 | 27 | 440 | 285 | | 1,5 | 335 | 150 | 1089 | 470 | 490 | 460 | 370 | 25 | 190 | 450 | 505 | 500 | 930 | 5900 | 201/6 | | |
| | | | | | | | | | | | 3 | | | | | | | | | | | | 9500 | 301/6 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | 301/12 | | |

- 1) Settings in accordance with the optimal nominal running parameters of the thruster. Other settings on request.

Application with other lifting devices by order agreed.

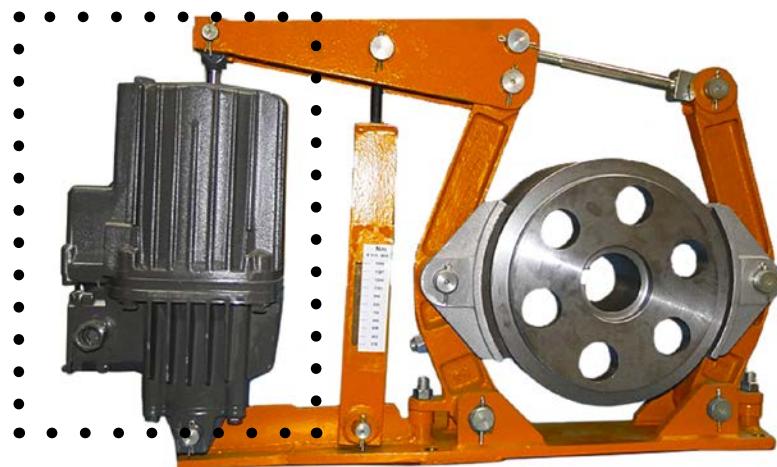
SB – Brake shoes see NO 18800

SB – Brake linings see NO 18812

Electro-Hydraulic Brake: LIFTING Devices 18830

Specification

Name: 18830-MAR
 Date: 24.05.2012
 Revision: A



TECHNICAL DATA AND CALCULATION FUNDAMENTALS

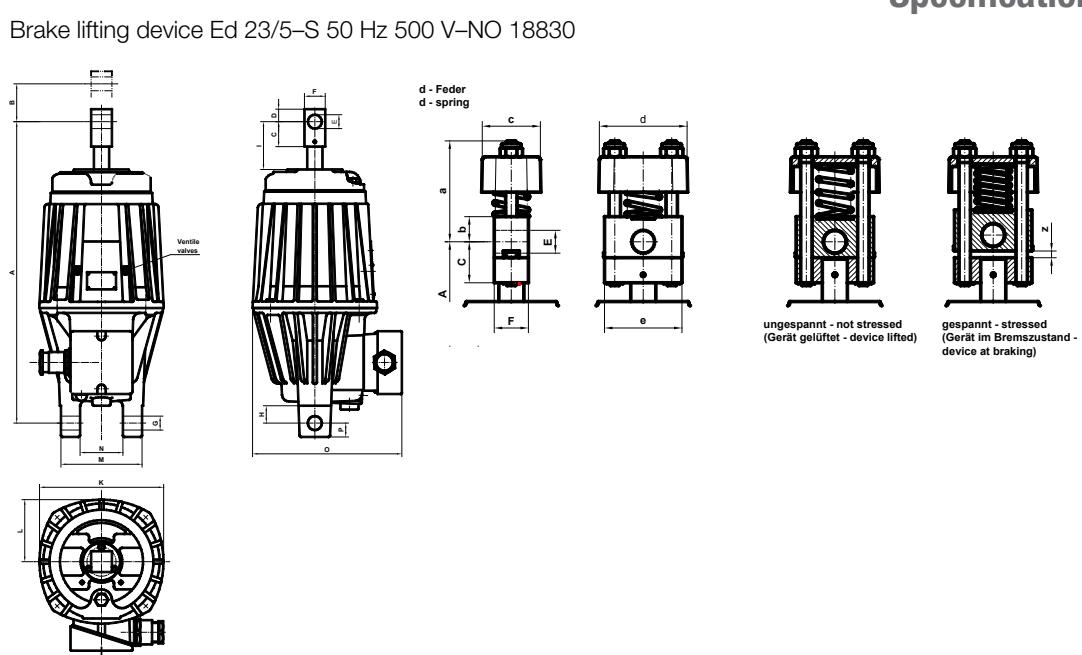
Designation of an electro-hydraulic brake lifting device with three phase alternating current design (Ed) with a nominal lifting force of 220 N, a stroke B of 50 mm, with countersunk valve S for operating voltage 3 AC 50 Hz 500 V:

| Nenngröße size Ed | Abmessungen - Dimensions (mm) | | | | | | | | | | | | | | | | | | | | Stück- gewicht unit weight kg | |
|-------------------------|-------------------------------|-----|----|----|-------------------|----|----|-------------------------------------|-----|-----|-----|-----|-----|-----|----|-----|----|----|-----|-----|----------------------------------------|----|
| | A | B | C | D | E ^{+0.1} | F | G | H ^{+0.05} _{-0.15} | I | K | L | M | N | O | P | a | b | c | d | e | z | |
| 23/5 | 286 | 50 | 26 | 12 | 12 | 20 | 16 | 20 | | | | 40 | 200 | 16 | | 20 | | 55 | 85 | 75 | 15 | 10 |
| 30/5 | 370 | | 34 | 15 | 16 | 25 | | 18 | | 160 | | 80 | | 197 | | 100 | | | | | | 14 |
| 50/6 | 435 | 60 | | | | | | | | | | | | | | 22 | | | | | | 23 |
| 50/12 | 515 | 120 | 36 | 18 | 20 | 30 | 20 | 23 | - | 195 | - | 120 | 60 | 254 | 22 | | | | | | | 26 |
| 80/6 | 450 | 60 | | | | | | | | | | | | | | 100 | 22 | 55 | 85 | 75 | 15 | 24 |
| 80/12 | 530 | 120 | | | | | | | | | | | | | | - | - | - | - | - | | 27 |
| 121/6 | 645 | 60 | | | | | | | | | | | | | | 147 | 35 | 80 | 130 | 120 | 20 | |
| 121/12 | 705 | 120 | | | | | | | | | | | | | | - | - | - | - | - | | 39 |
| 201/6 | 645 | 60 | 38 | 25 | 25 | 40 | 25 | 35 | 117 | 240 | 112 | 90 | 40 | 260 | 25 | 147 | 35 | 80 | 130 | 120 | 20 | |
| 201/12 | 705 | 120 | | | | | | | | | | | | | | - | - | - | - | - | | |
| 301/6 | 645 | 60 | | | | | | | | | | | | | | 147 | 35 | 80 | 130 | 120 | 20 | 40 |
| 301/12 | 705 | 120 | | | | | | | | | | | | | | - | - | - | - | - | | |

Electro-Hydraulic Brake: LIFTING Devices 18830

Specification

DRAWINGS



CALCULATION FUNDAMENTALS

| Nenngröße size | Hubkraft stroke power Ed | Hubweg stroke distance N | Hubarbeit stroke operating mm | Bremsfederkraft brake spring power (c - Feder) N/cm | Leistungs- aufnahme W |
|-------------------|---------------------------------------|---------------------------------------|--------------------------------------------|---------------------------------------------------------------------|------------------------------------|
| 23/5 | 220 | | 50 | 1100 | 165 |
| 30/5 | 300 | | | 1500 | 200 |
| 50/6 | 500 | 60 | 3000 | 460 | 210 |
| 50/12 | | 120 | 6000 | - | |
| 80/6 | 800 | 60 | 4800 | 750 | 330 |
| 80/12 | | 120 | 9600 | - | |
| 121/6 | 1250 | 60 | 7500 | 120 | 450 |
| 121/12 | | 120 | 15000 | - | |
| 201/6 | 2000 | 60 | 12000 | 1900 | 550 |
| 201/12 | | 120 | 24000 | - | |
| 301/6 | 3000 | 60 | 18000 | 2700 | |
| 301/12 | | 120 | 36000 | - | |

Electro-Hydraulic Brake: BRAKE Shoes 18800

Specification

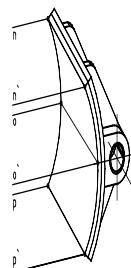
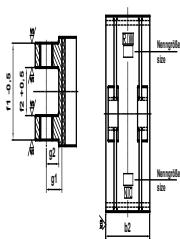
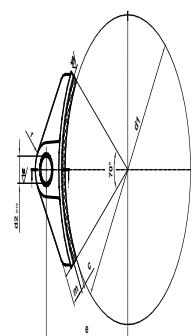
Name: 18800-MAR

Date: 24.05.2012

Revision: A



Measuring points for determination of form variation.



Designation of a brake shoe without rivet holes with stucked on brake lining (form C) for brake drum diameter $d_1 = 500$ mm:

SB - brake shoe C 500 NO 18800 with lining 3)

Electro-Hydraulic Brake: BRAKE Shoes 18800

Specification

CALCULATION FUNDAMENTALS

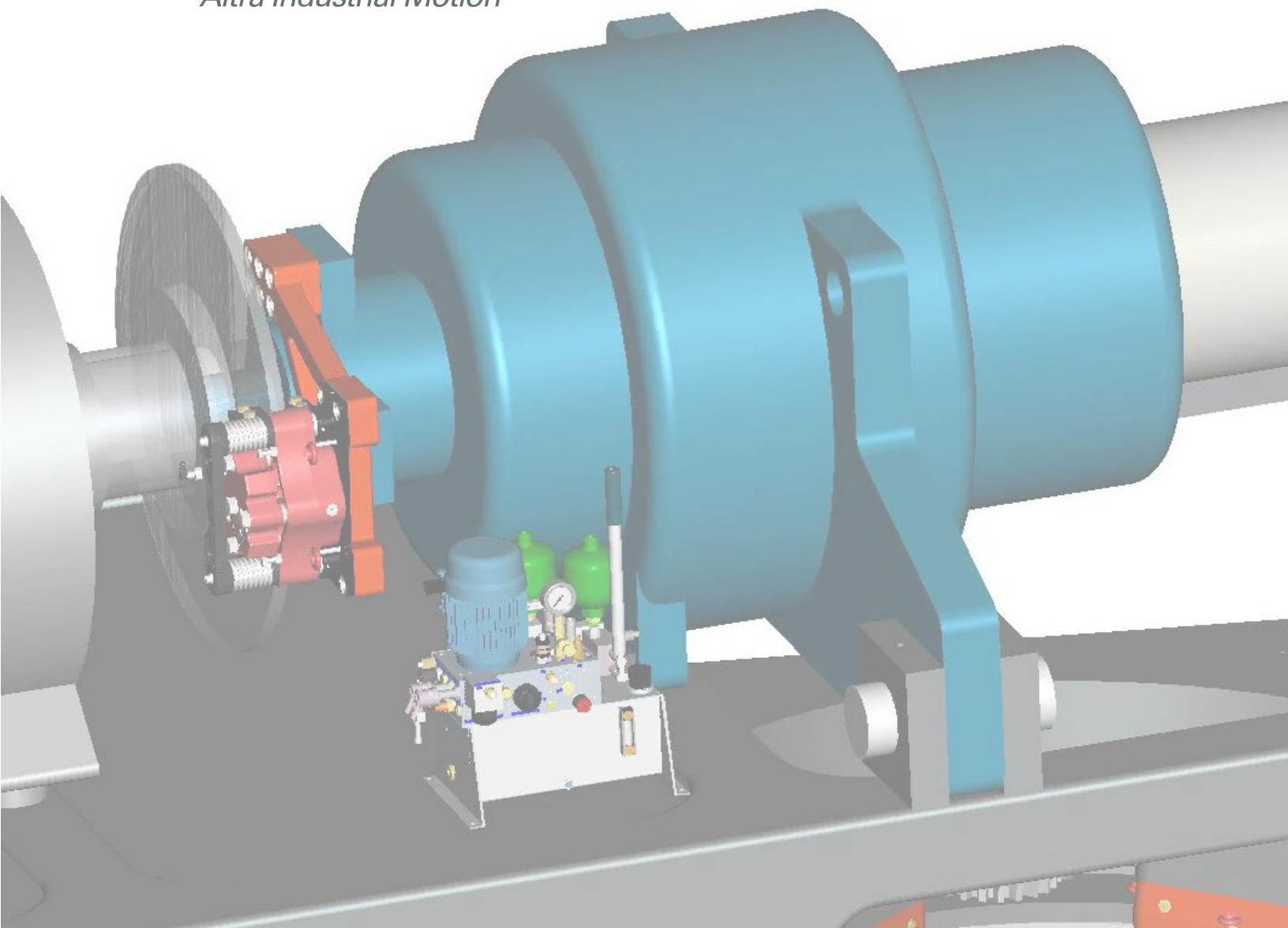
- 1) Admissible deviation of parallelism related to bores d2 and sticking area.
- 2) Admissible form deviation related to friction area between brake lining and brake drum (with tolerance range h11) reh11) related to measuring points n, o, p and n', o', p'.
- 3) SB – Brake lining according to NO 18812 respectively by choice of purchaser.

Material: Aluminium – sand-casting

SB – Drum brakes see NO 18735

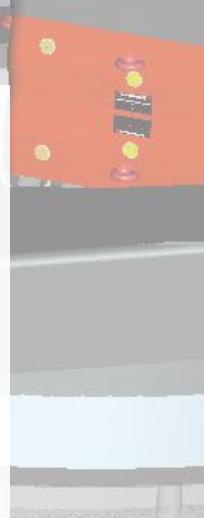
| Nenngröße size | Abmessungen - Dimensions (mm) | | | | | | | | zulässige ¹⁾ Abweichung admissible deviation | zulässige Formabw. admissible form deviation | Stückgewicht unit weight | |
|-------------------|-------------------------------|----------------|----|--------------------|-----|----------------|----------------|----------------|------------------------------------------------------------------|-------------------------------------------------------|-----------------------------|-----|
| | d ₁ | b ₂ | c | d ₂ / r | e | f ₁ | f ₂ | g ₁ | | | | |
| 200 | 70 | 8 | 20 | 140 | 65 | 35 | 32 | | 24 | 17 | | 0,5 |
| 250 | 90 | 8 | 25 | 170 | 80 | 40 | 37 | | 29 | 22 | 0,15 | 0,8 |
| 315 | 110 | 10 | 30 | 212 | 100 | 50 | 44,5 | | 34,5 | 25 | | 1,4 |
| 400 | 140 | 10 | 35 | 260 | 125 | 62 | 50 | | 40 | 30 | 0,2 | 2,1 |
| 500 | 180 | 12 | 40 | 320 | 160 | 80 | 58 | | 46 | 33 | | 3,8 |
| 630 | 225 | 12 | 45 | 390 | 200 | 100 | 63 | | 51 | 38 | 0,3 | 5,5 |
| 710 | 255 | 15 | 50 | 440 | 224 | 112 | 70 | | 56 | 40 | | 8,2 |

Notes:



HYDRAULIC WIND RANGE

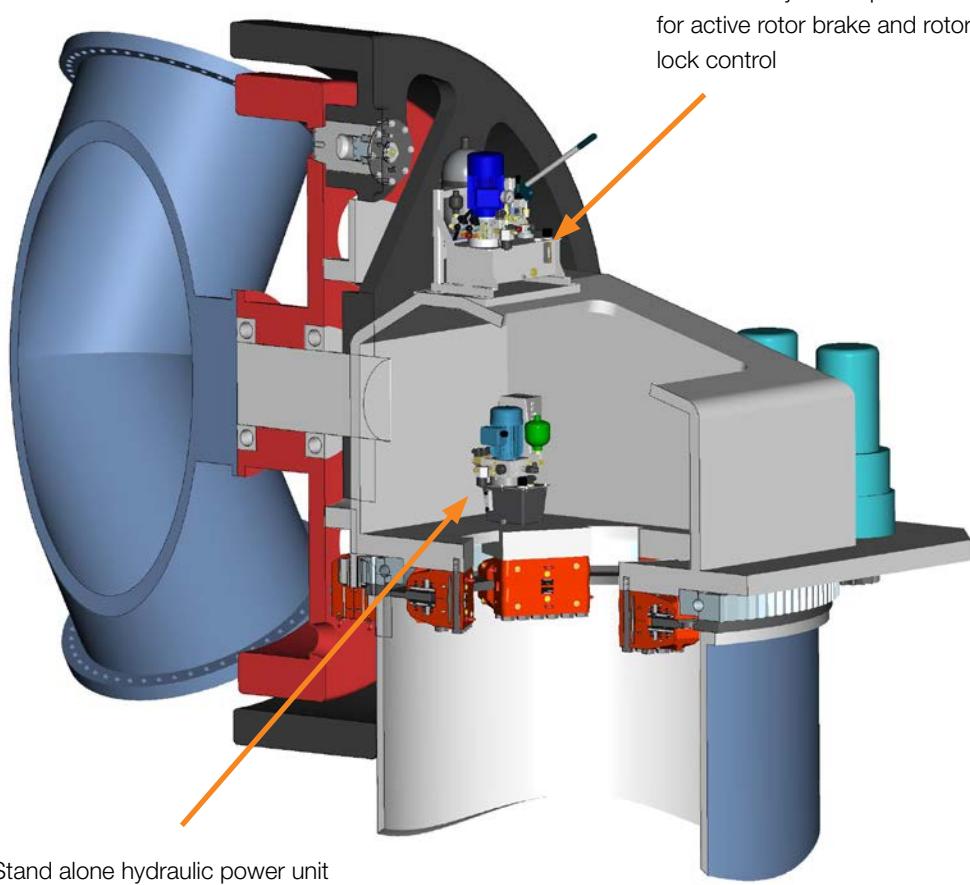
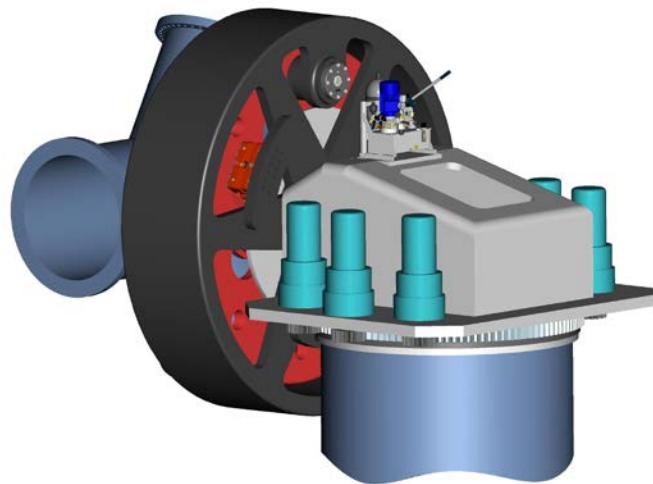
Svendborg Brakes is the global market leader in intelligent braking solutions. This is why.



Notes:

Example for a Direct Drive Wind Turbine

Specification



Example for a Direct Drive Wind Turbine

Specification

SYSTEM CIRCUIT

The electrical motor drives a hydraulic gearpump. The Pump feeds the system accumulator, controlled by a pressure switch or a transmitter. The System pressure can be released manually by shut-off cock or manual override of the valves. A High pressure filter between the pump and the system ensures the cleanliness of the hydraulic system. A Certified pressure control valve ensures pressure relief in case of control failures. Optional transmitter on system accumulator for checking the nitrogen pre-charge.

Combined hydraulic power unit for active rotor brakes and rotor lock control

1010-0124-8XX

GENERAL FEATURES:

- compact and cost efficient design
- mounted on 20 liter tank
- 2/2 seat valve technology, leak oil free
- sub components from qualified suppliers
- universal manifold
- robust asynchronous 400V/50Hz el. motor
- oil level + temperature control

OPTIONAL FEATURES:

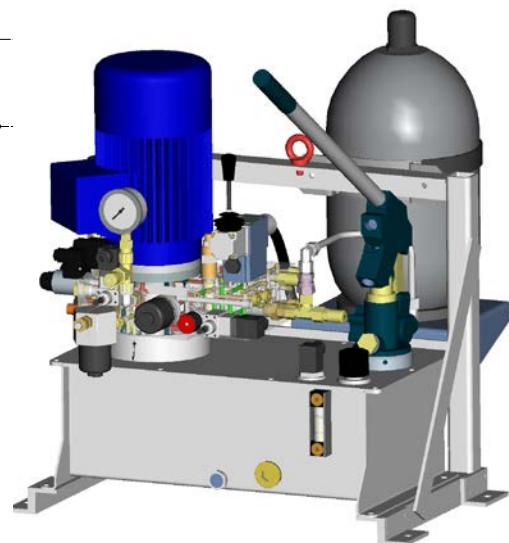
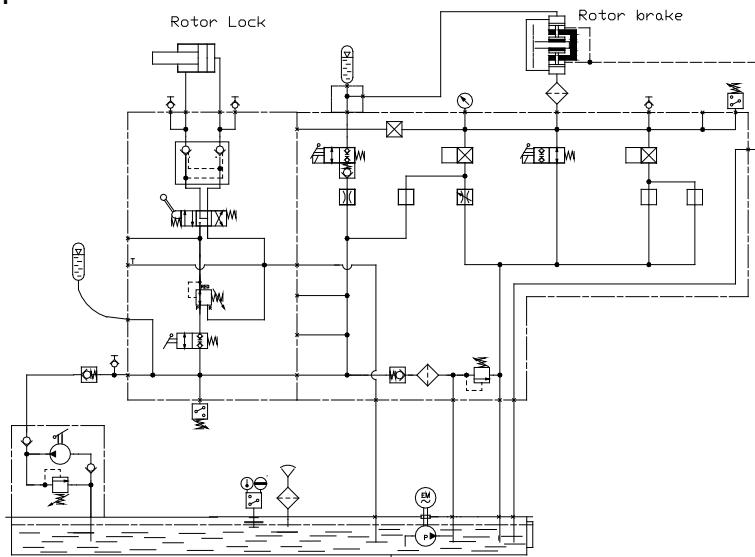
- UL-approved electrical components
- drip pan
- electrical cabinet
- customer specific electrical plug connection
- cold climate version
- 690 V electrical motor
- 60Hz
- Handpump
- pressure gauge for visual inspection

ROTOR BRAKE CIRCUIT:

- fail safe brake activation or idling function in case of power loss
- 24h / 7 days pressure holding capacity
- delay time according to customer demands
- pressure switch or transmitter for brake status control
- flushing function with filter in return line

- adjustable pressure for rotor lock
- 4/3 valve for rotor lock control is protected by additional 2/2 valves
- 24h / 7 days pressure holding capacity
- 'cylinder holding function' included

ROTOR LOCK CIRCUIT:



Functions:

SYSTEM CIRCUIT

The electrical motor drives a hydraulic gearpump. The Pump feeds the system accumulator, controlled by a pressure switch or a transmitter. The System pressure can be released manually by cock or a manual override of the valves. A High pressure filter between the pump and the system ensures cleanliness of the hydraulic system. A Certified pressure control valve ensures pressure relief in case of control failures. Optional transmitter on system accumulator for checking the nitrogen pre-charge.

- yaw brakes with 3 pressure levels, i.e.
-)160 bar for holding function
-)30 bar for slewing
-)0 bar for cable loop unwinding operation
- flushing function with filter in return line
- 24h / 7 days pressure holding capacity
- pressure switch or transmitter for brake status control

YAW BRAKE CIRCUIT:

Stand-alone hydraulic power unit for yaw brakes control

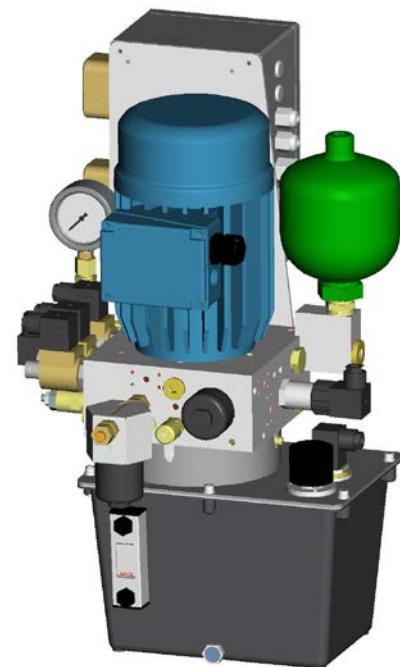
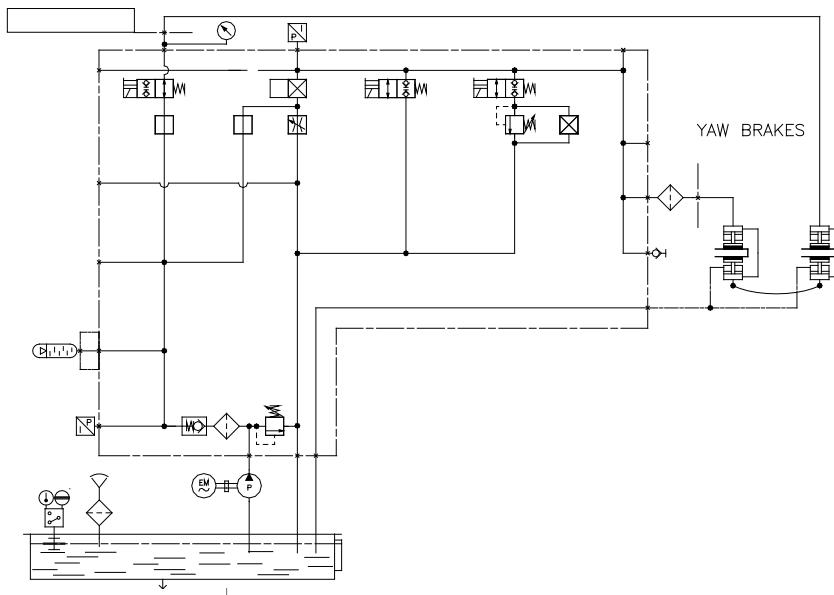
1010-0084-8XX

GENERAL FEATURES:

- compact and cost efficient design mounted on 6 liter tank
- 2/2 seat valve technology, leak oil free
- sub components from qualified suppliers
- universal manifold
- robust asynchronous 400V/50Hz el. motor
- oil level + temperature control

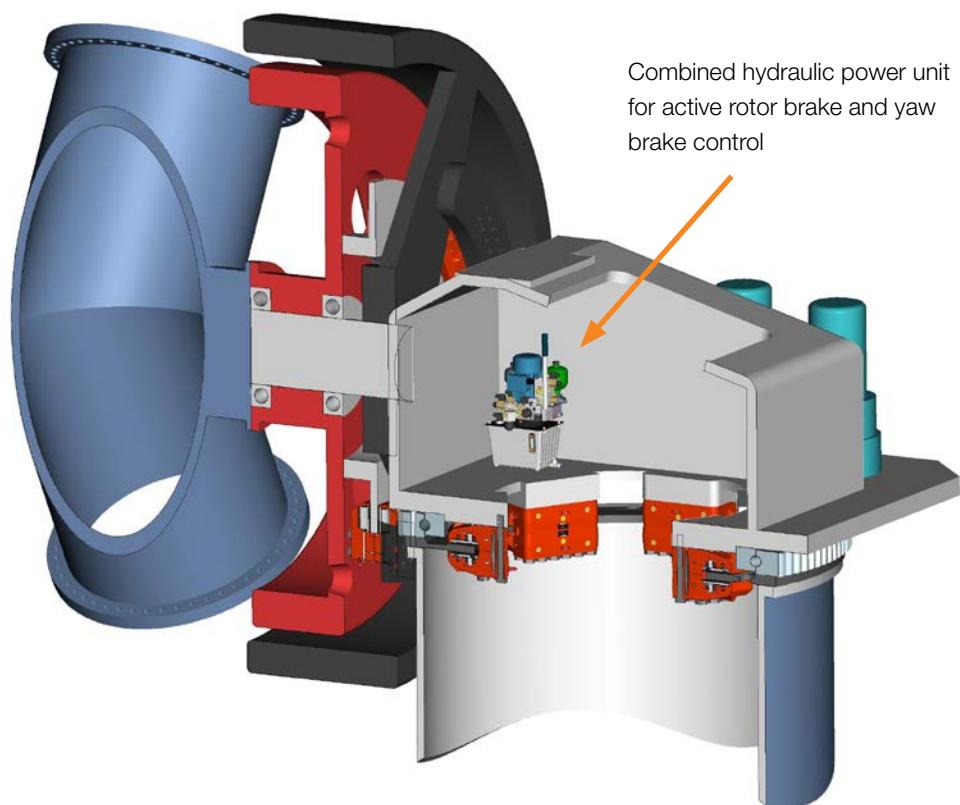
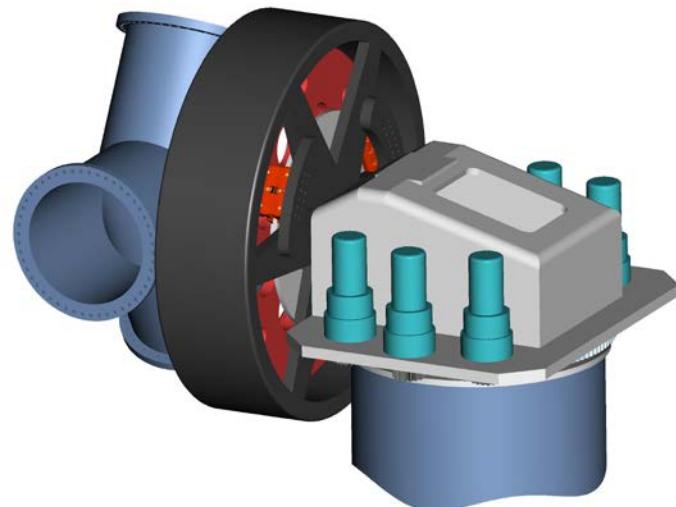
OPTIONAL FEATURES:

- UL-approved electrical components
- drip pan
- electrical cabinet
- customer specific electrical plug connection
- cold climate version
- 690 V el. motor
- 60Hz
- Handpump
- pressure gauge for visual inspection



Example for a Direct Drive Wind Turbine

Specification



Example for a Direct Drive Wind Turbine

Specification

SYSTEM CIRCUIT

The electrical motor drives a hydraulic gearpump. The Pump feeds the system accumulator, controlled by a pressure switch or a transmitter. The system pressure can be released manually by shut-off cock or manual override of valves. The high pressure filter between the pump and the system ensures the cleanliness of the hydraulical system. The certified pressure control valve ensures pressure relief in case of control failures. Optional transmitter on system accumulator for checking the nitrogen pre-charge.

- fail safe brake activation or idling function in case of power loss
- 24h / 7 days pressure holding capacity
- pressure switch or transmitter for brake status control

ROTOR BRAKE CIRCUIT:

- yaw brakes with 3 pressure levels, i.e.
-)160 bar for holding function
-)30 bar for yaw operation
-)0 bar for cable loop unwinding operation
- flushing function with filter in return line
- 24h / 7 days pressure holding capacity
- pressure switch or transmitter for brake status control

YAW BRAKE CIRCUIT:

Combined hydraulic power unit for active rotor brakes of BSAB series and yaw brake control

1010-0099-8XX

TYPICAL APPLICATION:

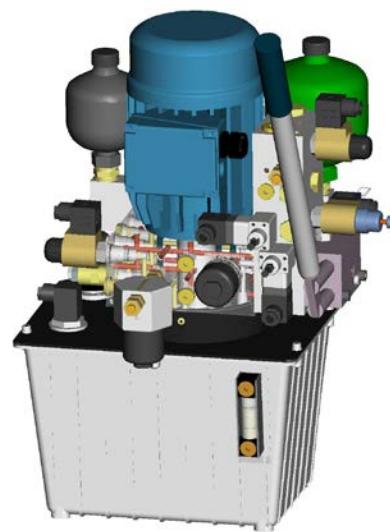
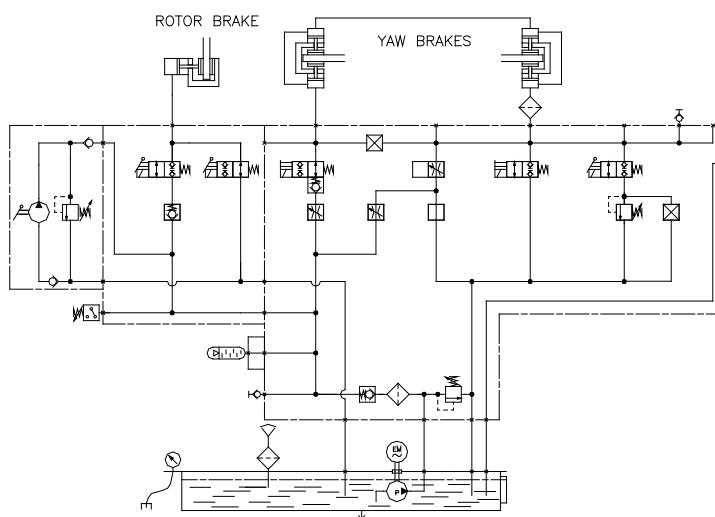
- hydraulic Power pack for gearless turbines.

GENERAL FEATURES:

- compact and cost efficient design mounted on 6 liter tank
- 2/2 seat valve technology, leak oil free
- sub components from qualified suppliers
- universal manifold
- robust asynchronous 400V/50Hz el. motor
- oil level + temperature control

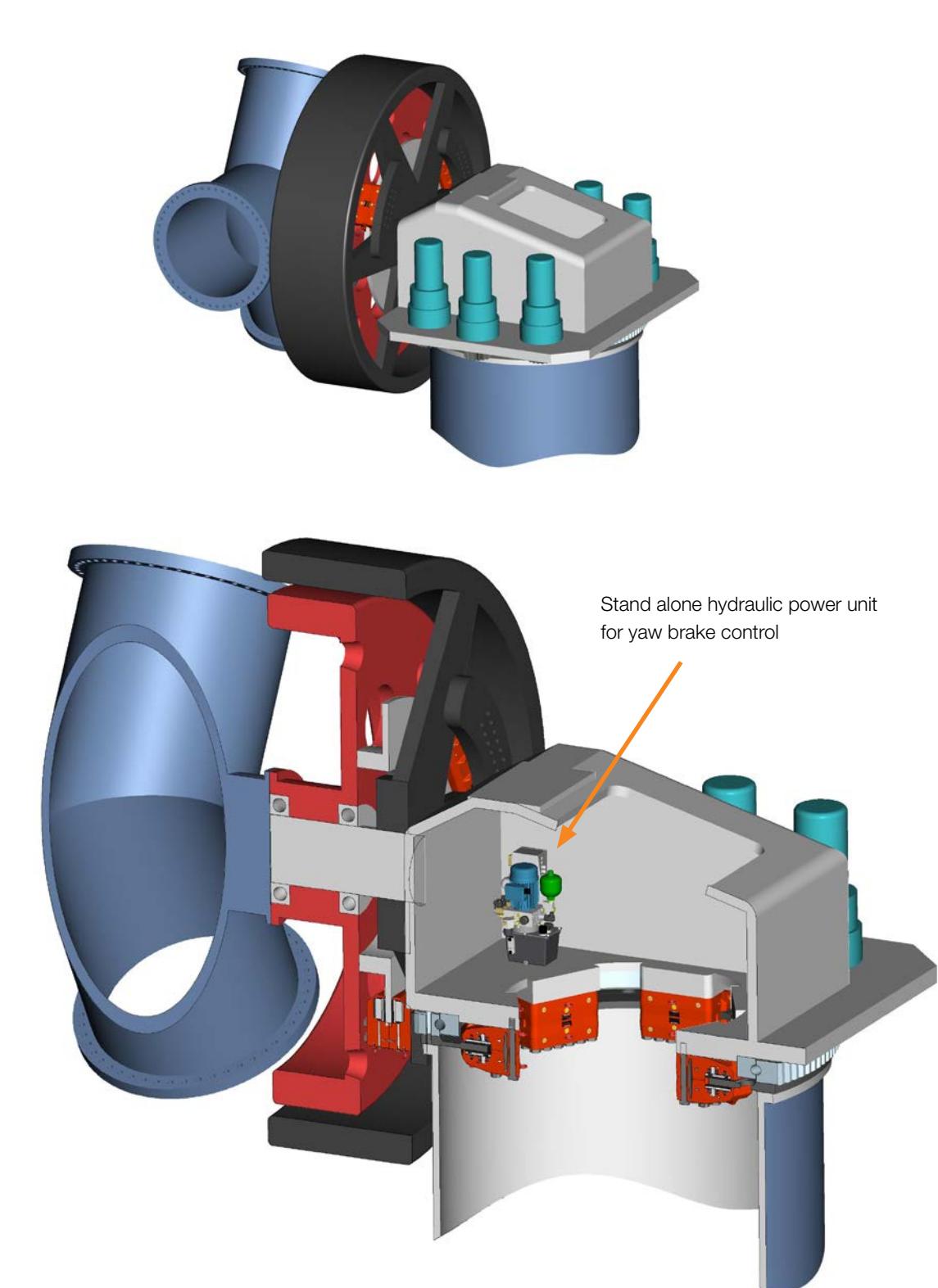
OPTIONAL FEATURES:

- UL-approved electrical components
- drip pan
- electrical cabinet
- customer specific electrical plug connection
- cold climate version
- 690 V el. motor
- 60Hz
- Handpump
- Pressure gauge for visual inspection



Example for a Direct Drive Wind Turbine

Specification



Example for a Direct Drive Wind Turbine

Specification

SYSTEM CIRCUIT

The electrical motor drives a hydraulic gearpump. The pump feeds the system accumulator, controlled by a pressure switch or a transmitter. The system pressure can be released manually by a shut-off cock or by manual override of valves. The high pressure filter between the pump and the system ensures the cleanliness of the hydraulic system. The certified pressure control valve ensures pressure relief in case of control failures. Optional transmitter on the system accumulator for checking the nitrogen pre-charge.

- yaw brakes with 3 pressure levels, i.e.
-)160 bar for holding function
-)30 bar for yaw operation
-)0 bar for cable loop unwinding operation
- flushing function with filter in return line
- 24h / 7 days pressure holding capacity
- pressure switch or transmitter for brake status control

YAW BRAKE CIRCUIT

Stand-alone hydraulic power unit for yaw brakes control

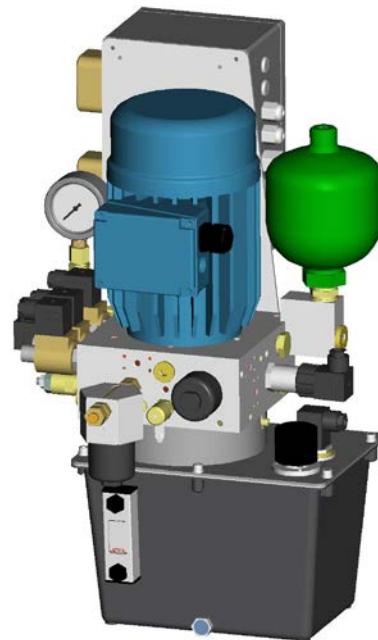
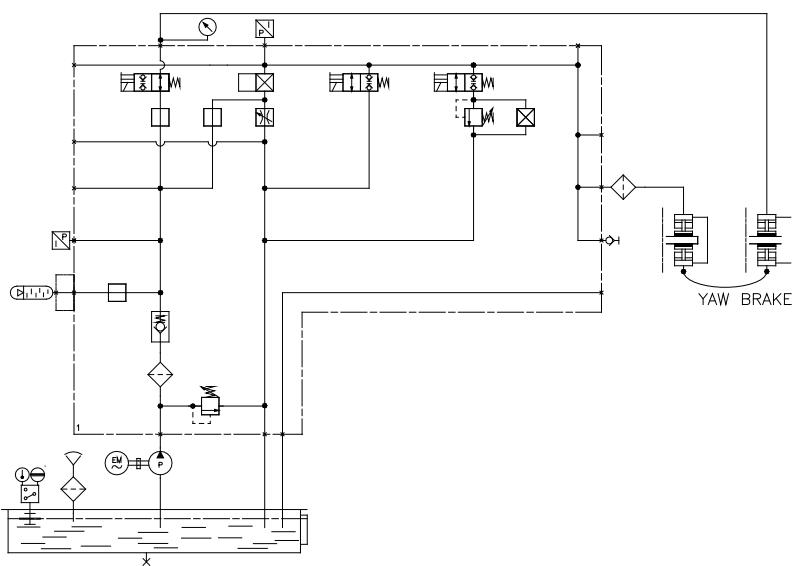
1010-0084-8XX

GENERAL FEATURES:

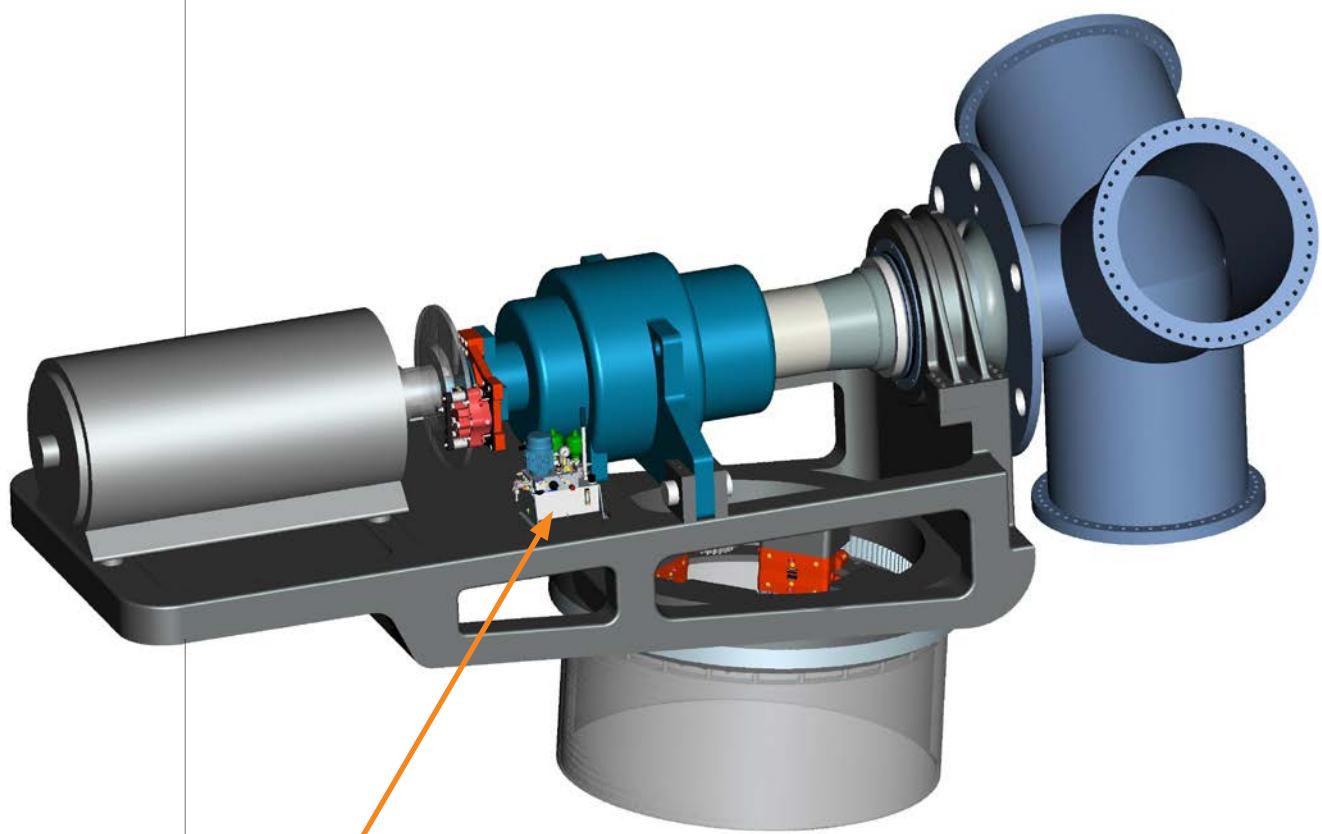
- compact and cost efficient design
- mounted on 6 liter tank
- 2/2 seat valve technology, leak oil free
- sub components from qualified suppliers
- universal manifold
- robust asynchronous 400V/50Hz el. motor
- oil level + temperature control

OPTIONAL FEATURES:

- UL-approved electrical components
- drip pan
- electrical cabinet
- customer specific electrical plug connection
- cold climate version
- 690 V el. motor
- 60Hz
- Handpump
- pressure gauge for visual inspection



Example for a Conventional Wind Turbine



Combined hydraulic power unit for active
rotor brake and yaw brake control

VARIANTE:ROLO-EXAMPLE

Example for a Conventional Wind Turbine

Specification

SYSTEM CIRCUIT

The electrical motor drives a hydraulic gearpump. The pump feeds the system accumulator, controlled by a pressure switch or a transmitter. The system pressure can be released manually by a shut-off cock or manual override of valves. The high pressure filter between the pump and the system ensures the cleanliness of hydraulic system. The certified pressure control valve ensures pressure relief in case of control failures. Optional transmitter on system accumulator for checking the nitrogen pre-charge.

- fail safe brake activation or idling function in case of power loss
- 24h / 7 days pressure holding capacity
- delay time according to customer demands
- pressure switch or transmitter for brake status control

- yaw brakes with 3 pressure levels, i.e.
-)160 bar for holding function
-)30 bar for yaw operation
-)0 bar for cable loop unwinding operation
- flushing function with filter in return line
- 24h / 7 days pressure holding capacity
- pressure switch or transmitter for brake status control

ROTOR BRAKE CIRCUIT:

Combined hydraulic power unit for active rotor brakes and yaw brake control

1010-0139-8XX

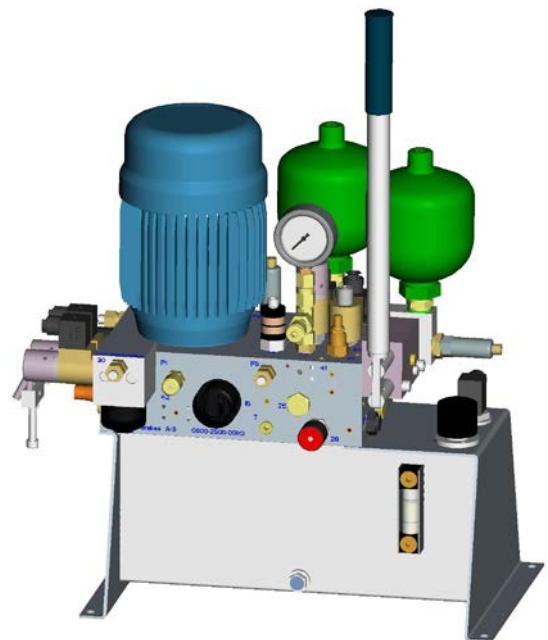
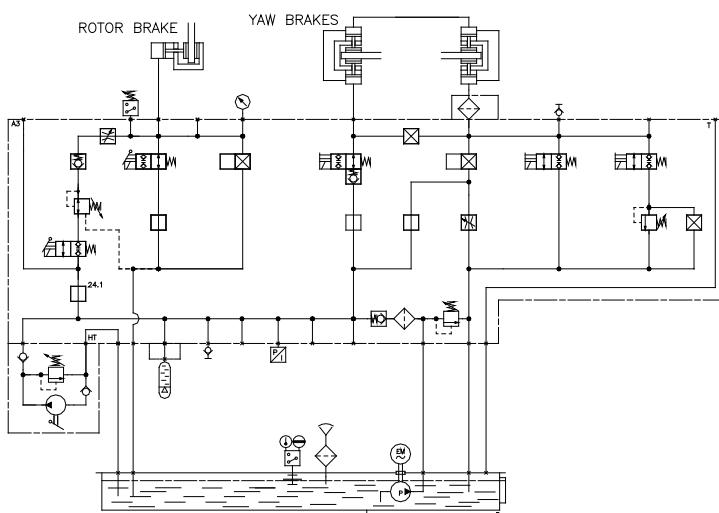
GENERAL FEATURES:

- compact and cost efficient design mounted on 10 liter tank
- 2/2 seat valve technology, leak oil free
- sub components from qualified suppliers
- universal manifold
- robust asynchronous 400V/50Hz el. motor
- oil level + temperature control

OPTIONAL FEATURES:

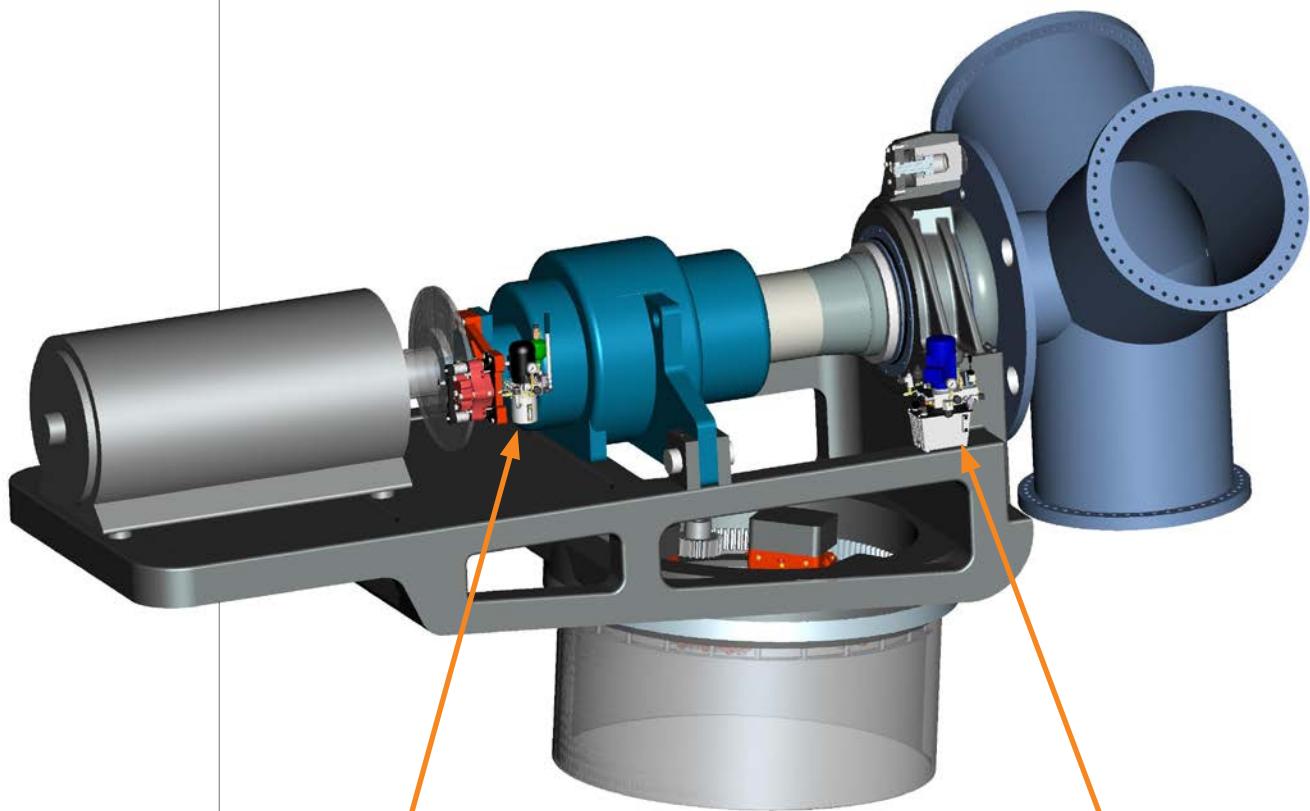
- UL approved electrical components
- drip pan
- electrical cabinet
- customer specific electrical plug connection
- cold climate version
- 690 V el. motor
- 60Hz
- Handpump
- Pressure gauge for visual inspection

YAW BRAKE CIRCUIT:



Notes:

Example for a Conventional Wind Turbine



Stand alone hydraulic power unit
for active rotor brake control

Combined hydraulic power unit for
yaw brake and rotor lock control

VARIANTE:ROLO-EXAMPLE

Example for a Conventional Wind Turbine

Specification

SYSTEM CIRCUIT

The electrical motor drives a hydraulic gearpump. The pump feeds the system accumulator, controlled by a pressure switch or a transmitter. The system pressure can be released manually by a shut-off cock or manual override of valves. The high pressure filter between the pump and the system ensures cleanliness of hydraulic system. The certified pressure control valve ensures pressure relief in case of control failures. Optional transmitter on system accumulator for checking the nitrogen pre-charge.

- adjustable pressure for rotor lock
- 4/3 valve for rotor lock control is protected by additional 2/2 valves
- 24h / 7 days pressure holding capacity
- 'cylinder holding function' included

ROTOR LOCK CIRCUIT:

- yaw brakes with 3 pressure levels, i.e.
-)160 bar for holding function
-)30 bar for yaw operation
-)0 bar for cable loop unwinding operation
- flushing function with filter in return line
- 24h / 7 days pressure holding capacity
- pressure switch or transmitter for brake status control

YAW BRAKE CIRCUIT:

Combined hydraulic power unit for yaw brake and rotor lock control

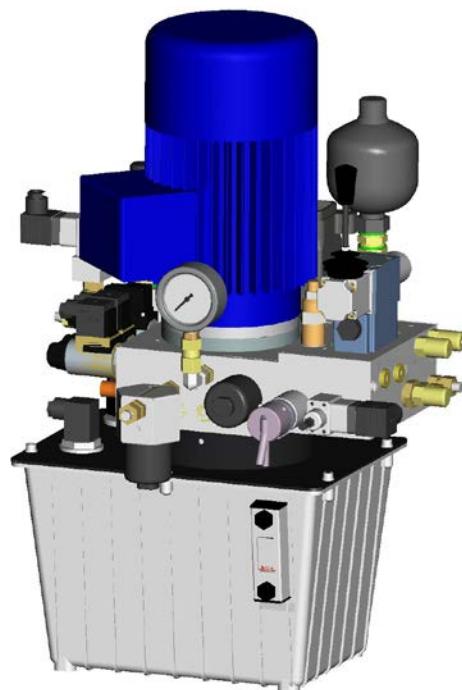
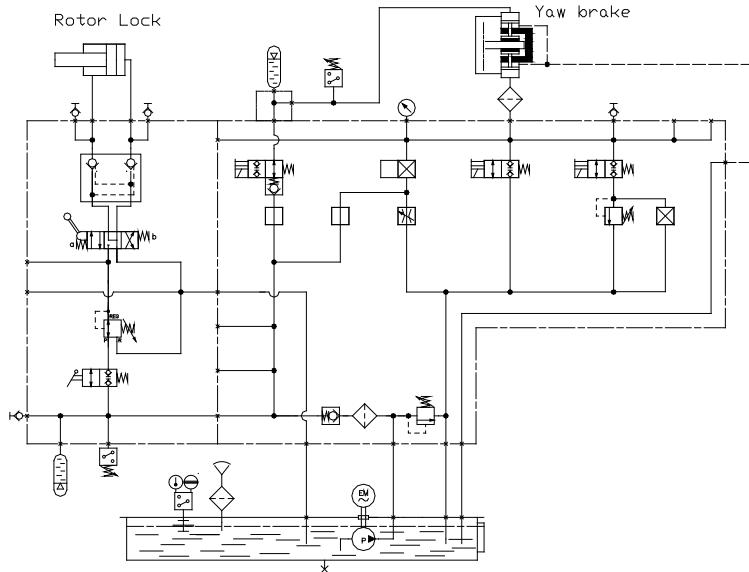
1010-0124-802

GENERAL FEATURES:

- compact and cost efficient design
- mounted on 6 liter tank
- 2/2 seat valve technology, leak oil free
- sub components from qualified suppliers
- universal manifold
- robust asynchronous 400V/50Hz el. motor
- oil level + temperature control

OPTIONAL FEATURES:

- UL-approved electrical components
- drip pan
- electrical cabinet
- customer specific electrical plug connection
- cold climate version
- 690 V el. motor
- 60Hz
- handpump
- pressure gauge for visual inspection



Example for a Conventional Wind Turbine

Specification

SYSTEM CIRCUIT

The electrical motor drives a hydraulic gearpump. The pump feeds the system accumulator, controlled by a pressure switch or a transmitter. The system pressure can be released manually by shut-off cock or manual override of valves. The high pressure filter between the pump and the system ensures the cleanliness of the hydraulic system. The certified pressure control valve ensures pressure relief in case of control failures. Optional transmitter on system accumulator for checking the nitrogen pre-charge.

- fail safe brake activation or idling function in case of power loss
- 2 modes of brake activation, with and without delay
- 2 step braking torque, i.e. reduced torque for braking, full torque for holding function
- 24h / 7 days pressure holding capacity
- delay time according to customer demands
- pressure switch or transmitter for brake status control

ROTOR BRAKE CIRCUIT

Stand-alone hydraulic power unit for active rotor brakes (on hss)

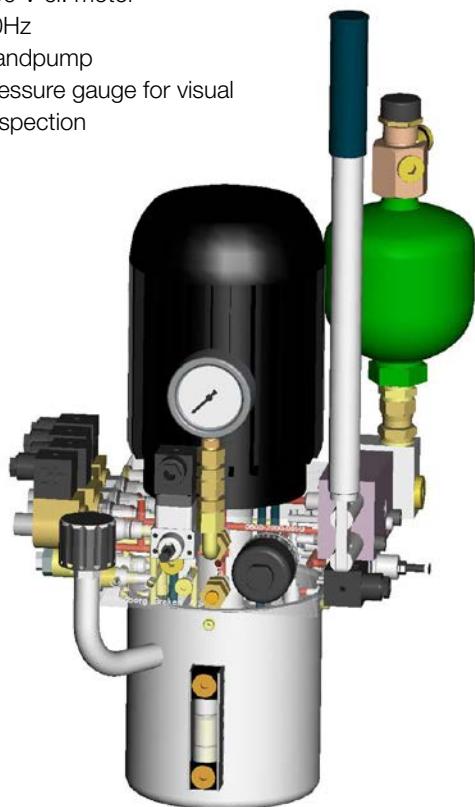
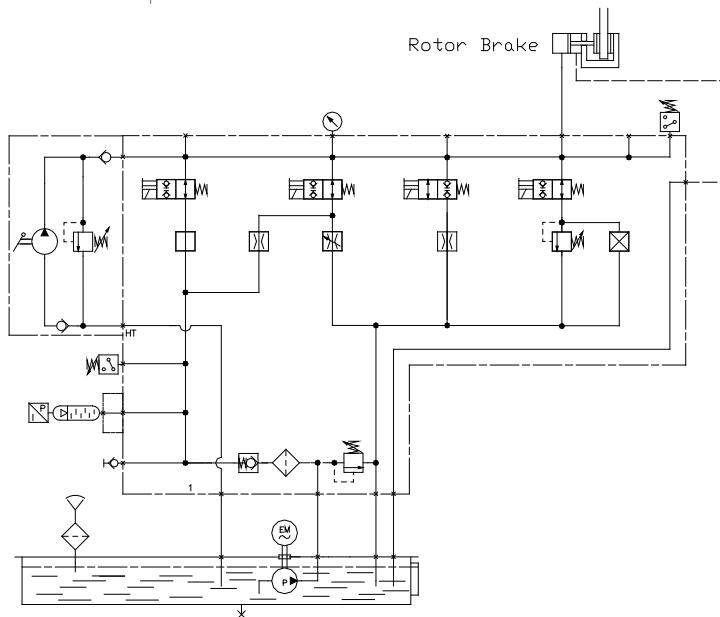
1010-006X-8XX

GENERAL FEATURES:

- compact and cost efficient design
- mounted on 3 liter tank
- 2/2 seat valve technology, leak oil free
- sub components from qualified suppliers
- universal manifold
- robust asynchronous 400V/50Hz el. motor
- oil level + temperature control

OPTIONAL FEATURES:

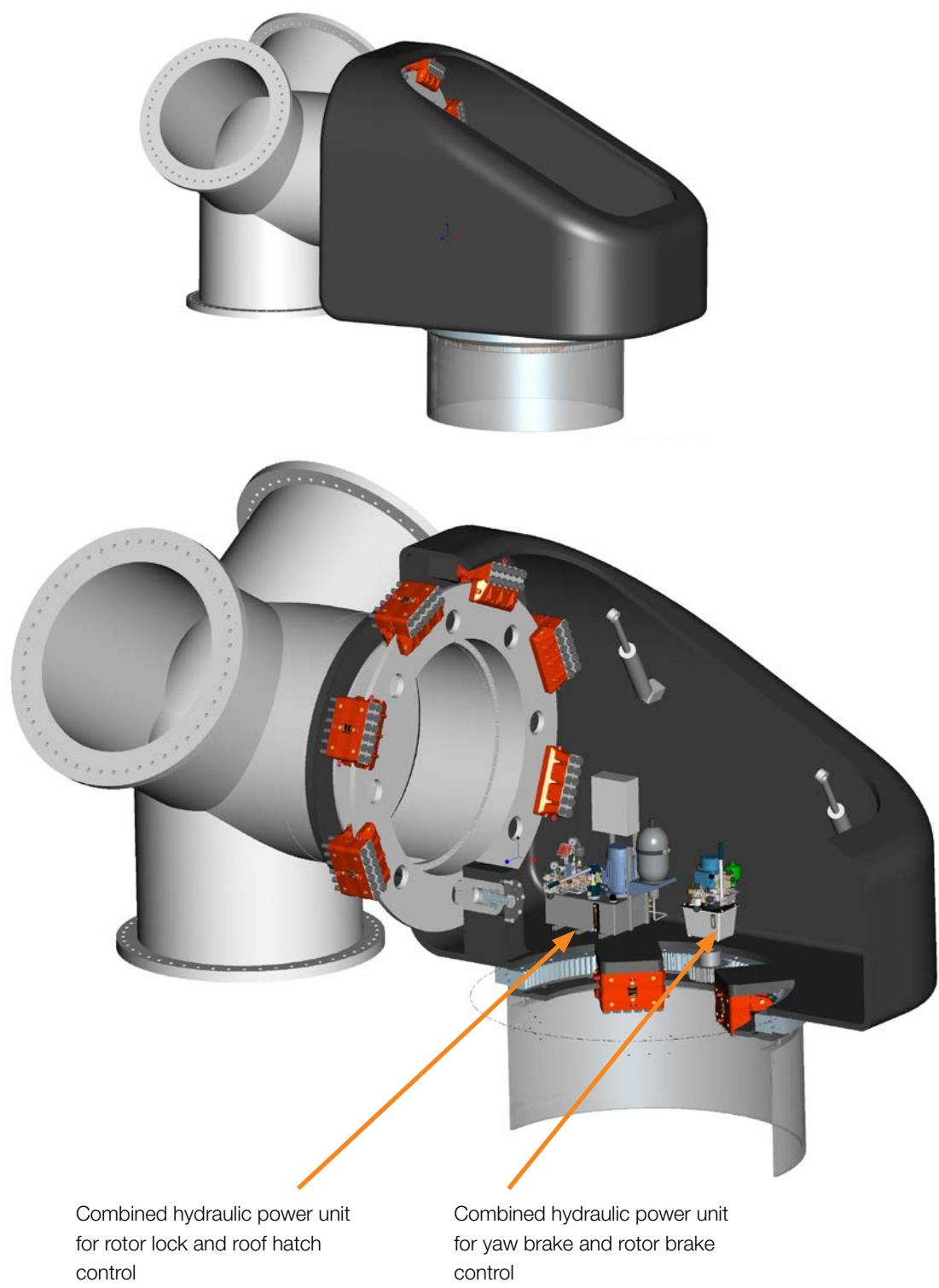
- UL-approved electrical components
- drip pan
- electrical cabinet
- customer specific electrical plug connection
- cold climate version
- 690 V el. motor
- 60Hz
- Handpump
- pressure gauge for visual inspection



Notes:

Example for a Compact Drive Wind Turbine

Specification



Example for a Compact Drive Wind Turbine

Specification

SYSTEM CIRCUIT

The electrical motor drives a hydraulic gearpump. The pump feeds the system accumulator, controlled by a pressure switch or a transmitter. The system pressure can be released manually by a shut-off cock or by manual override of valves. The high pressure filter between the pump and the system ensures the cleanliness of the hydraulic system. The certified pressure control valve ensures pressure relief in case of control failures.

- adjustable pressure for rotor lock
- 4/3 valve for rotor lock control is protected by additional 2/2 valves
- 24h / 7 days pressure holding capacity
- ‘cylinder holding function’ included
- over pressure protection with pressure relief valves
- manual activation of the valve or via remote control
- ‘Auto-Rolo’ capable

- hyd. cylinder for hatches can be operated separately
- adjustable pressure
- manual activation of the valves or via remote control

ROTOR LOCK CIRCUIT:

ROOF HATCHES CIRCUIT:

Combined hydraulic power unit for activating rotor locks and roof hatch control

1110-0002-8XX

TYPICAL APPLICATION:

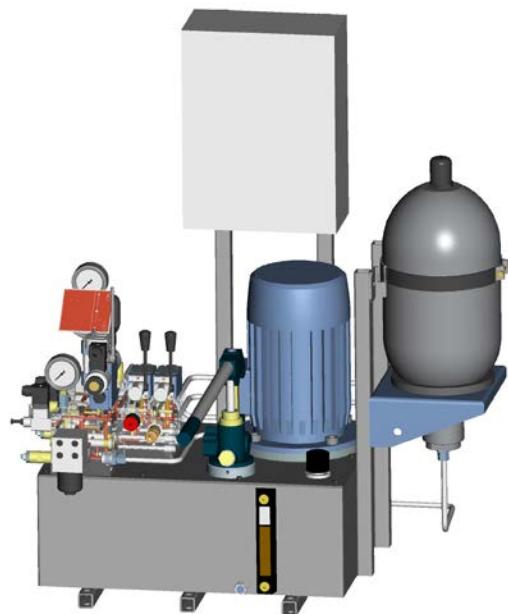
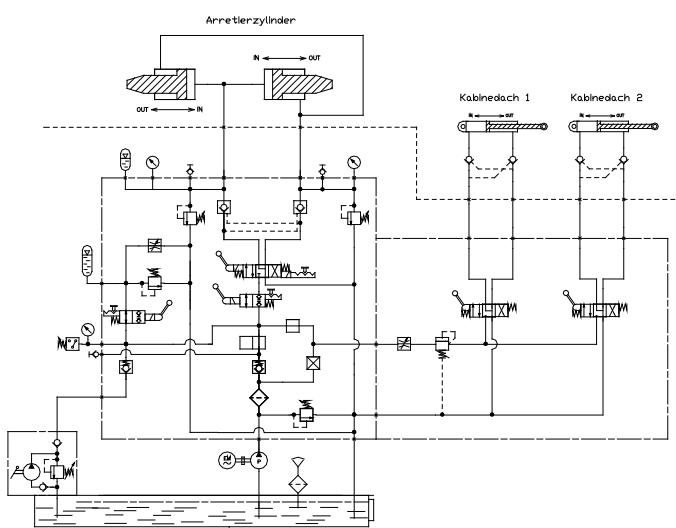
- Service hydraulic for multi-megawatt turbines

GENERAL FEATURES:

- compact and cost efficient design
- mounted on 25 liter tank
- sub components from qualified suppliers
- universal manifold
- robust asynchronous 400V/50Hz el. motor
- oil level + temperature control

OPTIONAL FEATURES:

- UL-approved electrical components
- drip pan
- electrical cabinet
- remote control operating panel
- customer specific electrical plugconnection
- cold climate version
- 690 V el. motor
- 60Hz
- Handpump
- pressure gauge for visual inspection



Example for a Compact Drive Wind Turbine

Specification

SYSTEM CIRCUIT

The electrical motor drives a hydraulic gearpump. The Pump feeds the system accumulator, controlled by a pressure switch or a transmitter. The system pressure can be released manually by shut-off cock or manual override of valves. The high pressure filter between the pump and the system ensures the cleanliness of the hydraulical system. The certified pressure control valve ensures pressure relief in case of control failures. Optional transmitter on system accumulator for checking the nitrogen pre-charge.

- fail safe brake activation or idling function in case of power loss
- 24h / 7 days pressure holding capacity
- pressure switch or transmitter for brake status control

ROTOR BRAKE CIRCUIT:

- yaw brakes with 3 pressure levels, i.e.
-)160 bar for holding function
-)30 bar for yaw operation
-)0 bar for cable loop unwinding operation
- flushing function with filter in return line
- 24h / 7 days pressure holding capacity
- pressure switch or transmitter for brake status control

YAW BRAKE CIRCUIT:

Combined hydraulic power unit for active rotor brakes of BSAB series and yaw brake control

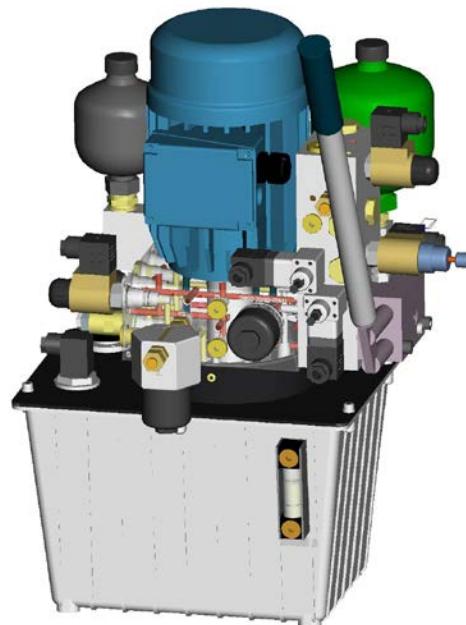
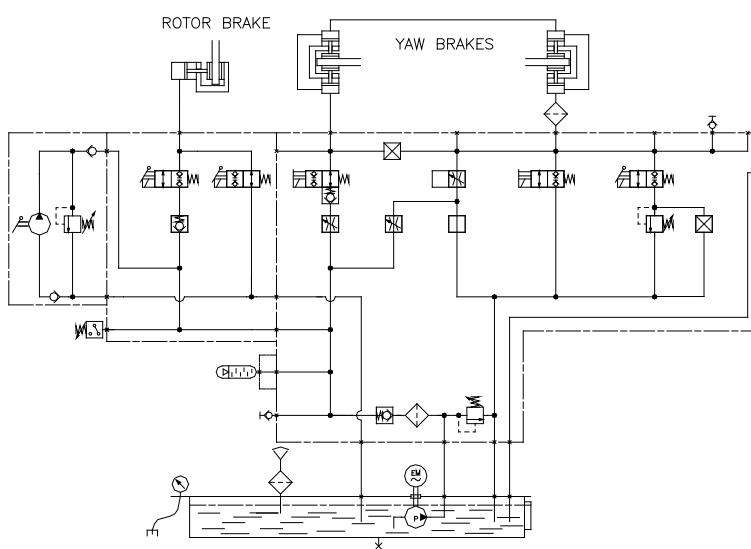
1010-0099-8XX

GENERAL FEATURES:

- compact and cost efficient design
- mounted on 6 liter tank
- 2/2 seat valve technology, leak oil free
- sub components from qualified suppliers
- universe manifold
- robust asynchronous 400V/50Hz el. motor
- oil level + temperature control

OPTIONAL FEATURES:

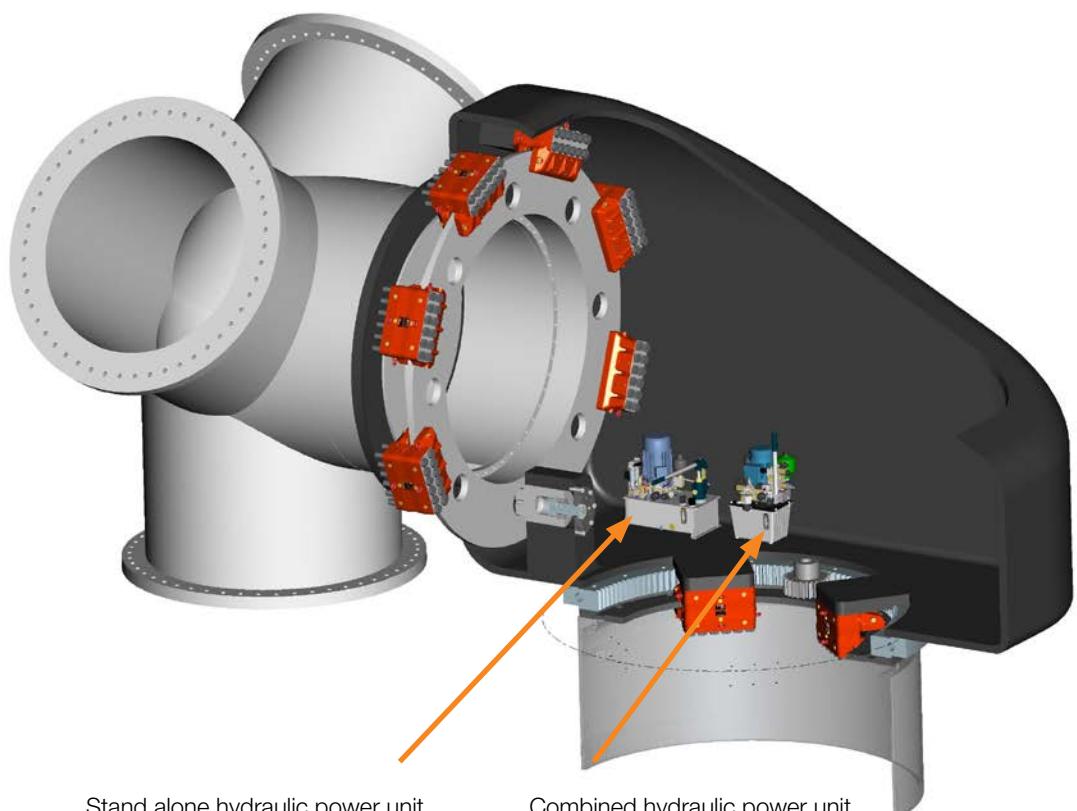
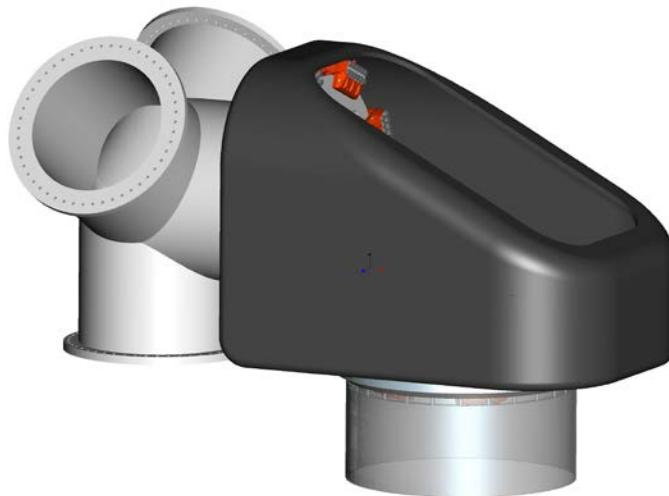
- UL-approved electrical components
- drip pan
- electrical cabinet
- customer specific electrical plug connection
- cold climate version
- 690 V el. motor
- 60Hz
- Handpump
- Pressure gauge for visual inspection



Notes:

Example for a Compact Drive Wind Turbine

Specification



Stand alone hydraulic power unit
for active rotor lock control

Combined hydraulic power unit
for yaw brake and rotor brake
control

Example for a Compact Drive Wind Turbine

Specification

SYSTEM CIRCUIT

The electrical motor drives a hydraulic gearpump. The Pump feeds the system accumulator, controlled by a pressure switch or a transmitter. The system pressure can be released manually by shut-off cock or manual override of valves. The high pressure filter between the pump and the system ensures the cleanliness of the hydraulical system. The certified pressure control valve ensures pressure relief in case of control failures. Optional transmitter on system accumulator for checking the nitrogen pre-charge.

- fail safe brake activation or idling function in case of power loss
- 24h / 7 days pressure holding capacity
- pressure switch or transmitter for brake status control

ROTOR BRAKE CIRCUIT:

- yaw brakes with 3 pressure levels, i.e.
-)160 bar for holding function
-)30 bar for yaw operation
-)0 bar for cable loop unwinding operation
- flushing function with filter in return line
- 24h / 7 days pressure holding capacity
- pressure switch or transmitter for brake status control

YAW BRAKE CIRCUIT:

Combined hydraulic power unit for active rotor brakes of BSAB series and yaw brake control

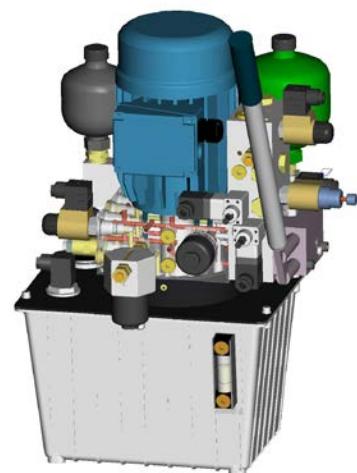
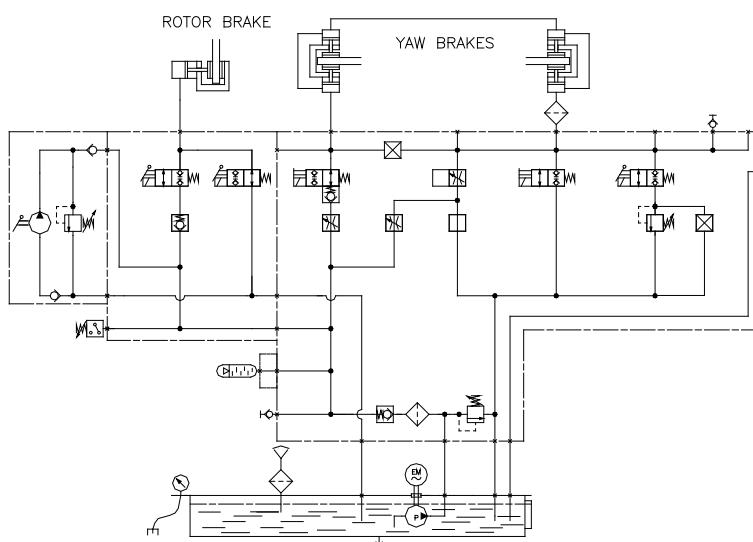
1010-0099-8XX

GENERAL FEATURES:

- compact and cost efficient design
- mounted on 6 liter tank
- 2/2 seat valve technology, leak oil free
- sub components from qualified suppliers
- universal manifold
- robust asynchronous 400V/50Hz el. motor
- oil level + temperature control

OPTIONAL FEATURES:

- UL-approved electrical components
- drip pan
- electrical cabinet
- customer specific electrical plug connection
- cold climate version
- 690 V el. motor
- 60Hz
- Handpump
- Pressure gauge for visual inspection connection
- cold climate version
- 690 V el. motor
- 60Hz
- Handpump
- pressure gauge for visual inspection



Example for a Compact Drive Wind Turbine

Specification

SYSTEM CIRCUIT

The electrical motor drives a hydraulic gearpump. The pump feeds the system accumulator, controlled by a pressure switch or a transmitter. The system pressure can be released manually by a shut-off cock or by manual override of valves. The high pressure filter between the pump and the system ensures the cleanliness of the hydraulic system. The certified pressure control valve ensures pressure relief in case of control failures.

- control valve is protected by additional 2/2 valve
- 24h / 7 days pressure holding capacity
- ‘cylinder holding function’ included
- manual activation of the valve or via remote control

ROTOR LOCK CIRCUIT:

Stand-alone hydraulic power unit for rotor lock control

1110-0012-8XX

TYPICAL APPLICATION:

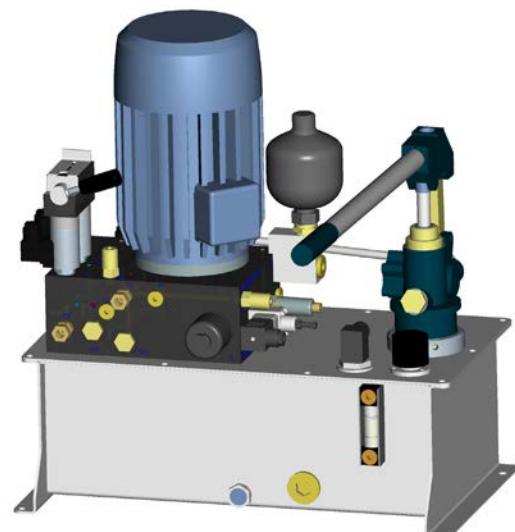
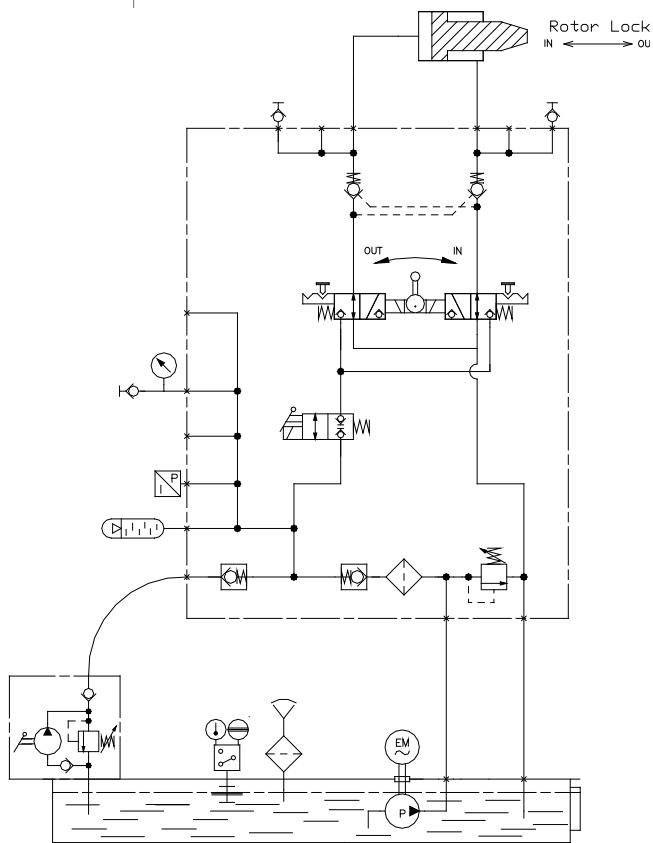
- Service hydraulic for multi-megawatt turbines

GENERAL FEATURES:

- compact and cost efficient design
- mounted on 20 liter tank
- sub components from qualified suppliers
- universal manifold
- robust asynchronous 400V/50Hz el. motor
- oil level + temperature control

OPTIONAL FEATURES:

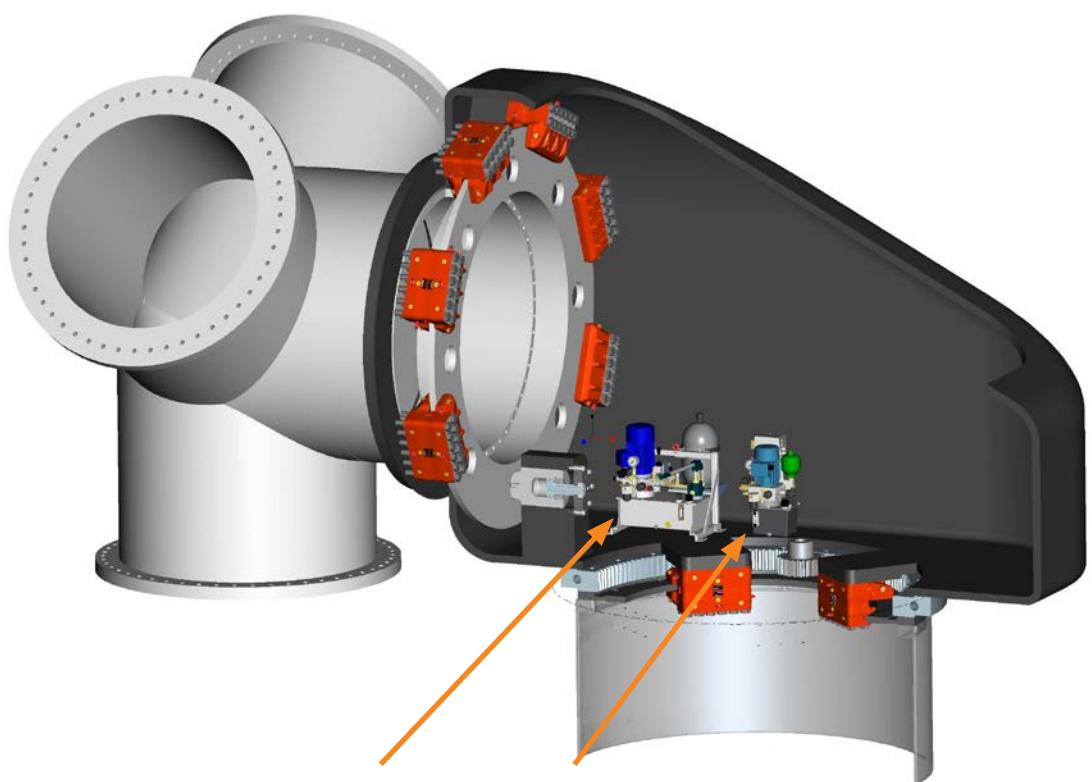
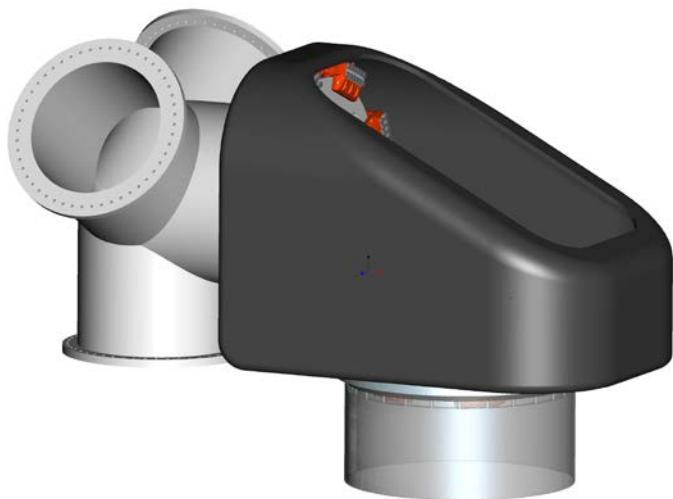
- UL-approved electrical components
- drip pan
- electrical cabinet
- remote control operating panel
- customer specific electrical plug connection
- cold climate version
- 690 V el. motor
- 60Hz
- Handpump
- pressure gauge for visual inspection



Notes:

Example for a Compact Drive Wind Turbine

Specification



Combined hydraulic power unit
for active rotor lock
and rotor brake control

Stand alone hydraulic power unit
for yaw brake control

Example for a Compact Drive Wind Turbine

Specification

SYSTEM CIRCUIT

The electrical motor drives a hydraulic gearpump. The pump feeds the system accumulator, controlled by a pressure switch or a transmitter. The system pressure can be released manually by a shut-off cock or by manual override of valves. The high pressure filter between the pump and the system ensures the cleanliness of the hydraulic system. The certified pressure control valve ensures pressure relief in case of control failures. Optional transmitter on the system accumulator for checking the nitrogen pre-charge.

- yaw brakes with 3 pressure levels, i.e.
-)160 bar for holding function
-)30 bar for yaw operation
-)0 bar for cable loop unwinding operation
- flushing function with filter in return line
- 24h / 7 days pressure holding capacity
- pressure switch or transmitter for brake status control

YAW BRAKE CIRCUIT:

Stand-alone hydraulic power unit for yaw brakes control

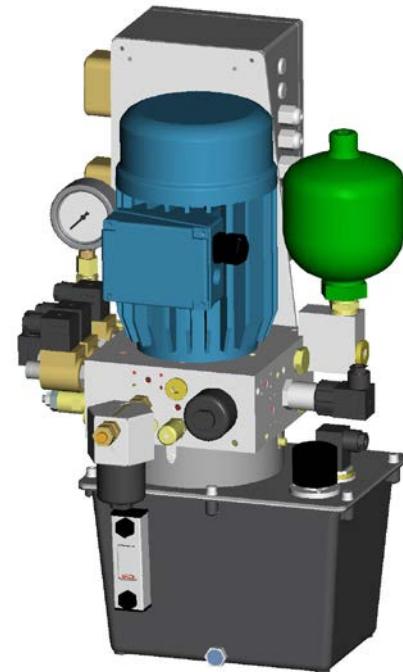
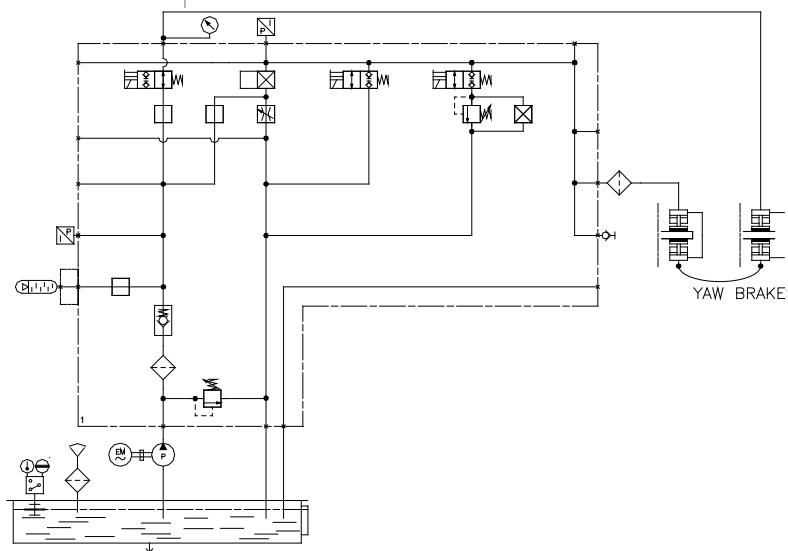
1010-0084-8XX

GENERAL FEATURES:

- compact and cost efficient design
- mounted on 6 liter tank
- 2/2 seat valve technology, leak oil free
- sub components from qualified suppliers
- universal manifold
- robust asynchronous 400V/50Hz el. motor
- oil level + temperature control

OPTIONAL FEATURES:

- UL-approved electrical components
- drip pan
- electrical cabinet
- customer specific electrical plug connection
- cold climate version
- 690 V el. motor
- 60Hz
- Handpump
- pressure gauge for visual inspection



Example for a Compact Drive Wind Turbine

Specification

SYSTEM CIRCUIT

The electrical motor drives a hydraulic gearpump. Pump feeds the system accumulator, controlled by pressure switch or transmitter. System pressure can be released manually by cock or manual override on valves. High pressure filter between pump and system ensures cleanliness of hyd. system. Certified pressure control valve ensures pressure relief in case of control failures. Optional transmitter on system accumulator for checking the nitrogen pre-charge.

ROTOR BRAKE CIRCUIT:

- fail safe brake activation or idling function in case of power loss
- 24h / 7 days pressure holding capacity
- delay time according to customer demands
- pressure switch or transmitter for brake status control
- flushing function with filter in return line

ROTOR LOCK CIRCUIT:

- adjustable pressure for rotor lock
- 4/3 valve for rotor lock control is protected by additional 2/2 valves
- 24h / 7 days pressure holding capacity
- ‘cylinder holding function’ included

Combined hydraulic power unit for active rotor brakes and rotor lock control

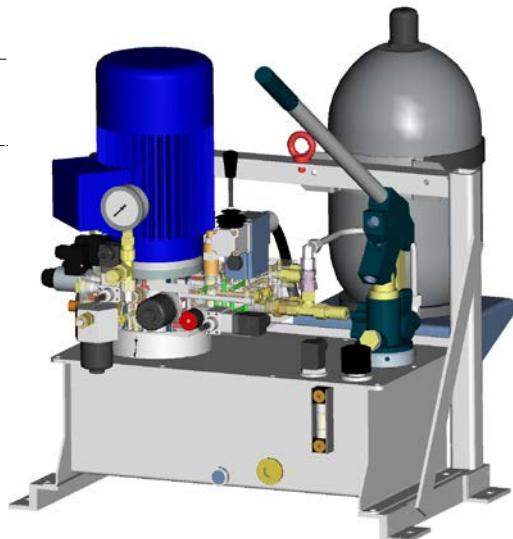
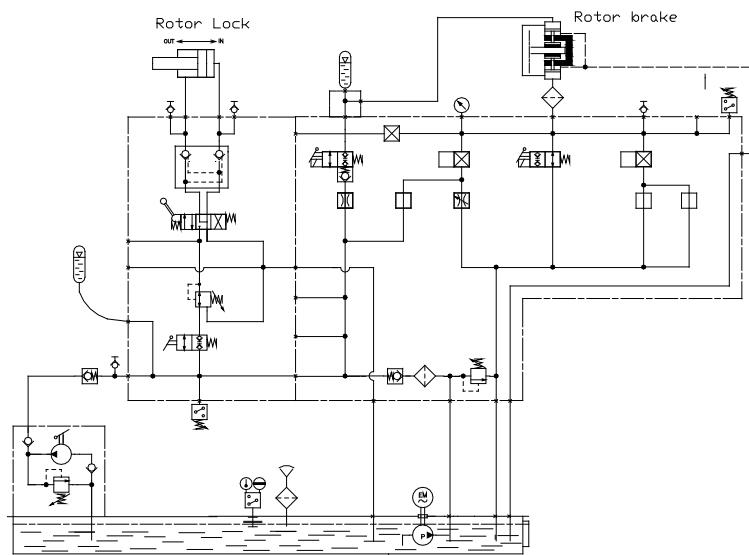
1010-0124-804

GENERAL FEATURES:

- compact and cost efficient design
- mounted on 20 liter tank
- 2/2 seat valve technology, leak oil free
- sub components from qualified suppliers
- universe manifold
- robust asynchronous 400V/50Hz el. motor
- oil level + temperature control

OPTIONAL FEATURES:

- UL el. components
- drip pan
- el. cabinet
- customer specific el. plug connection
- cold climate version
- 690 V el. motor
- 60Hz
- Handpump
- manometer for visual inspection



Notes:

Notes:

Notes:

The Power Of One, The Strength Of Many.

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Twiflex
Wichita Clutch



OVERRUNNING CLUTCHES

Formsprag Clutch
Marland Clutch
Stieber



ENGINEERED COUPLINGS AND UNIVERSAL JOINTS

Ameridrives
Bibby Turboflex
Guardian Couplings
Huco
Lamiflex Couplings
Stromag
TB Wood's



GEAR DRIVES

Bauer Gear Motor
Boston Gear
Delroyd Worm Gear
Nuttall Gear



GEAR MOTORS

Bauer Gear Motor



POWER TRANSMISSION COMPONENTS

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Kilian

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Couplings

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