Low-speed high-torque axial piston motor

Eaton DOWMAX® ME motor

Pressure: 280/250 bar rated, 325bar peak
Displacement: 99 to 4097cc
Torque: 15,990 Nm rated (motor itself)
Precautions for selecting DOWMAX motors

**WARNING**

- Attention should be paid to the following matters when selecting DOWMAX motors. Carefully read precautions shown in the catalog and instruction manual to thoroughly understand them before selecting motors.
- Check that the hydraulic system is planned in a manner to satisfy the matters described in the catalog, instruction manual, delivery drawing, manufacturing specifications, etc. Pay special attention to the following:

1. The performance curves shown in this catalog show the summary (average values) of data on motors that have already been run-in. Provide sufficient margin of safety when selecting motors in accordance with specific applications. When motors are new (before running-in), they may fail to achieve the performance shown in the catalog. Contact us if that will cause any problem.
2. In cases where high back pressure is applied to the outlet line of the motor in a special application, the performance described in the catalog may not be exhibited. Contact us if the back pressure applied to the outlet line of the motor exceeds 2.0MPa (20kgf/cm²).
3. In cases where the motor is turned by a load, it is necessary to apply boost pressure to the suction line of the motor to prevent cavitation. The boost pressure is subject to the motor speed and the viscosity of hydraulic fluid. In general, apply pressure that exceeds the minimum boost pressure shown for each model.
4. In cases where external load torque is applied to the motor shaft while the motor is at rest, the motor will turn (slip) due to the leakage inside the motor. If there is no supply circuit, cavitation occurs and the motor goes out of control. (For example, a load will drop suddenly.) Use a mechanical brake as necessary in these cases.
5. In cases where the inertial force of a driving body is large, abnormal pressure will be produced. Measure the pressure of the actual motor, and use a brake valve if the peak pressure exceeds the value shown in the catalog; otherwise the motor shaft, key, and other parts may be damaged. Plan pipe installation in a manner to satisfy matters described in the related instruction manual.

**Precautions for mechanical brake**

1. The mechanical brake of a DOWMAX motor is a reverse-operation type; the brake is released when brake pilot line is pressurized.
   a. Pay attention, when planning the hydraulic circuit, to the brake pilot line not being pressurized at any time the brake is necessary, even if for a short time.
   b. When residual pressure remains at the brake pilot line, brake torque decreases proportional to the residual pressure. Brake torque shown in this catalog is for the brake pilot line pressure of 0kgf/cm².
2. The mechanical brake of DOWMAX motor is originally for a static brake use (parking brake). Avoid the use of dynamic brake to the utmost. When dynamic brake is used unavoidably, pay attention to the following:
   a. Mechanical brake and hydraulic brake shall not be used together. When the mechanical and hydraulic brake are planned to be used together, consult Eaton for the applicability.
   b. Usage classified as “Unsafe range” in the “Brake Use Limit Judging Diagram” in the related Instruction Manual shall be avoided.
   c. When the brake is used as a dynamic brake, the brake friction plate will be worn. Check the brake torque periodically and replace the brake friction plates with new ones, if necessary.
3. Brake torque shown in this catalog is for the use of standard mineral oil as a hydraulic fluid. When other oils such as fire-resistant fluid or special oils containing additive are used, brake characteristics will differ from the value in the catalog. Consult us in the case.

**Do not plan operation exceeding the usable conditions described in this catalog. (This does not apply to motors made to special specifications if special mention is shown in the delivery drawing or product specifications.)**

1. Operation exceeding the viscosity range of 15-500 cSt.
2. Operation exceeding the usable range (pressure and speed). Refer to this catalog for confirmation of limits for respective models.
3. Operation exceeding the allowable external force (radial and thrust load). Refer to the shaft strength diagrams shown in this catalog for confirmation.
4. Operation exceeding the operating conditions (pressure and speed) corresponding to the desired life of motor. Check the bearing life diagrams shown in this catalog for confirmation.
5. Operation in cold places (below -25°C). (Contact us for special motors for operation at temperatures from -25°C to -45°C.)
6. Operation that causes the case temperature to exceed 80°C.

- Never remodel motors.

**CAUTION**

- Use the recommended hydraulic fluid shown in the instruction manual. When fire-resistant fluid is used, strictly observe the cautions and notes described in the instruction manual. Standard motors cannot be used when phosphate-ester is used as hydraulic fluid. In that case, select the seal code of V or X (seal material: fluororubber). As in the case of water-glycol type hydraulic fluid, the motor life can substantially be shortened depending on the type of fire-resistant fluid. (Contact us for the expected life of motor under specific operating condition.)
- When the direction of rotation of the motor is to be changed frequently, select models with a spline shaft.
- Metal chips, sand, and other fine foreign substances contained in hydraulic fluid will reach the sliding surface of the motor, advancing the abrasion of component parts and causing malfunction and seizure of the motor. Prevent entry of dust, and be sure to install a filter in the circuit. Refer to the related instruction manual for the filter specifications.
- Precautions regarding the drain port position and drain piping are described in the related instruction manual. Be sure to refer to them and reflect them in the piping plan.
- When installation of motor with its shaft facing upward is desired, select “DOWMAX for installing the shaft upward” (mentioned before) that permits air bleeding from the case.
- Keep the drain pressure inside the motor case below 0.3MPa (3 kgf/cm²). Take care the pressure as it rises depending on the tank position and the length and diameter of pipes. The pressure on the low-pressure side of the main port must be higher than the drain pressure.
- When the shaft is exposed to water or seawater, the standard seal will allow the shaft to rust, and the abraded oil seal may cause oil leakage. In such a case, select or specify models made to the double oil seal specifications.
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<th>Mechanical brake</th>
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<th>Speed sensor</th>
<th>Hollow shaft</th>
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<tr>
<td>ME100</td>
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<td>X</td>
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<td>X</td>
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</tr>
</tbody>
</table>

**Note:** Above are standard available options, please contact Eaton representative for any other combinations - which is not available above.
ME low-speed high-torque motor is a double swash plate type axial piston motor and has highest performance at low-speed range.

- Wide range of models - 13 displacements from 99 to 4097 cm³/rev are available.
- High pressure-Continuous operating pressure 275 Mpa (280 kgf/cm²) & 24.5 Mpa (250 kgf/cm²).
- Smooth operation at low-speed. Multiple pistons and double swash plate result in smooth rotation at speeds down to 1 rev/min.
- High starting torque and high overall efficiency.
- Compact and easy installation.
- Robust construction.
- Quiet operation.
- Unaffected by thermal shock (good for starting at cold temperature).
- Speed pickup system is available.

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DOWMAX, is respectively registered trade mark.
Structure and operation

Fluid entering the supply port is directed via internal passages and timing plate to the center of the cylinder bores. Fluid pressure forces the pistons apart causing the slippers to slide on the angled faces of the swash plates and rotate the barrel and shaft assembly. After work, fluid is exhausted through the timing plate and internal passages to the return port.

Performance data

<table>
<thead>
<tr>
<th>Model</th>
<th>Displacement cm³/rev</th>
<th>Rated pressure MPa (kgf/cm²)</th>
<th>Peak pressure MPa (kgf/cm²)</th>
<th>Rated torque Nm (kgf·m)</th>
<th>Rated speed rpm</th>
<th>Max. speed rpm</th>
<th>Rated horse power kW (PS)</th>
<th>Mass Kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME100</td>
<td>99</td>
<td>27.5 (280)</td>
<td>31.9 (325)</td>
<td>432 (44)</td>
<td>1000</td>
<td>1000</td>
<td>45 (62)</td>
<td>22</td>
</tr>
<tr>
<td>ME150</td>
<td>152</td>
<td></td>
<td></td>
<td>667 (68)</td>
<td>600</td>
<td>800</td>
<td>42 (57)</td>
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<tr>
<td>ME175</td>
<td>175</td>
<td></td>
<td></td>
<td>765 (78)</td>
<td>600</td>
<td>800</td>
<td>48 (65)</td>
<td>42</td>
</tr>
<tr>
<td>ME300B</td>
<td>300</td>
<td></td>
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<td>1320 (135)</td>
<td>660</td>
<td>800</td>
<td>90 (123)</td>
<td>60</td>
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<tr>
<td>ME350B</td>
<td>350</td>
<td></td>
<td></td>
<td>1530 (156)</td>
<td>660</td>
<td>800</td>
<td>106 (144)</td>
<td>60</td>
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<tr>
<td>ME500B</td>
<td>600</td>
<td></td>
<td></td>
<td>2620 (267)</td>
<td>500</td>
<td>600</td>
<td>137 (186)</td>
<td>96</td>
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<tr>
<td>ME750B</td>
<td>750</td>
<td></td>
<td></td>
<td>3280 (334)</td>
<td>450</td>
<td>520</td>
<td>154 (210)</td>
<td>123</td>
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<td>3708 (378)</td>
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<td>450</td>
<td>155 (211)</td>
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<td>5250 (535)</td>
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<td>390</td>
<td>138 (188)</td>
<td>170</td>
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<td>7290 (743)</td>
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<td>110</td>
<td>230</td>
<td>159 (216)</td>
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<td>ME3100</td>
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<td>230</td>
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<td>ME4100</td>
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<td></td>
<td>15990 (1630)</td>
<td>75</td>
<td>200</td>
<td>211 (287)</td>
<td>520</td>
</tr>
</tbody>
</table>

☐ Limit of hydraulic fluid temperature: −20°C~80°C
☐ Limit of hydraulic fluid viscosity; 15~500cSt (Advisable fluid viscosity range; 25~100cSt)
DOWMAX® ME motor

Coding

Series
High pressure series DOWMAX ME motor

Motor size
(Metric displacement)

Design no.
1st design change ‘A’

Motor shaft
C – Metric parallel keyed shaft with screws for key retention plate (std.)
P – Metric spline shaft
G – Metric hollowed spline shaft
B – 1/10 tapered shaft
K – Inch size parallel keyed shaft
H – Inch size spline shaft
S – Other special shaft

Seal
No indication – Standard seal (Nitrile rubber)
V – Viton seal for phosphate ester fluid
W – Double seal (Nitrile rubber)
X – Double seal (Viton)

Special spec.
S – Special specification

Special specification number
No indication – Standard

Ports
No indication – Standard metric ports
A & B – Special ports for counter balance valves (see table below)
E – SAE port

This chart indicates the relation of actual torque and shaft rotation at the rated pressure of 27.5MPa (280kgf/cm²) and 24.5MPa (250kgf/cm²).

Given the required torque and shaft speed the appropriate model can be selected from the diagram. When the operating pressure differs from 27.5 or 24.5MPa (280 or 250kgf/cm²), refer to the performance date for the respective model.

<table>
<thead>
<tr>
<th>Model</th>
<th>ME100</th>
<th>ME150 – ME850B</th>
<th>ME1300A</th>
<th>ME1900</th>
<th>ME2600</th>
<th>ME3100</th>
<th>ME4100</th>
</tr>
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<tbody>
<tr>
<td>C100</td>
<td>–</td>
<td>A</td>
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<td>–</td>
</tr>
<tr>
<td>C300CB</td>
<td>*</td>
<td>B</td>
<td>A</td>
<td>B</td>
<td>B</td>
<td>–</td>
<td>B</td>
</tr>
<tr>
<td>CW300A</td>
<td>*</td>
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<td>A</td>
<td>B</td>
<td>B</td>
<td>–</td>
<td>B</td>
</tr>
</tbody>
</table>

* Valves cannot be attached
DOWMAX® ME Motor Catalog

**ME100**

(Dimensions in mm)

<table>
<thead>
<tr>
<th>Applicable Range</th>
<th>Displacement</th>
<th>99 cm³/rev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure 1MPa</td>
<td>Rated pressure</td>
<td>275 MPa (280 kgf/cm²)</td>
</tr>
<tr>
<td>Speed (rpm)</td>
<td>Peak pressure</td>
<td>31.9 MPa (325 kgf/cm²)</td>
</tr>
<tr>
<td></td>
<td>Rated torque</td>
<td>432 Nm (44 kgf.m)</td>
</tr>
<tr>
<td></td>
<td>Rated speed</td>
<td>1000 rpm</td>
</tr>
<tr>
<td></td>
<td>Max. speed</td>
<td>1000 rpm</td>
</tr>
<tr>
<td></td>
<td>Rated horse power</td>
<td>45 kW (62 PS)</td>
</tr>
<tr>
<td></td>
<td>Mass</td>
<td>22 kg</td>
</tr>
</tbody>
</table>

Nominal dimensions

Direction of rotation
R : Supplied high pressure oil at port R
L : Supplied high pressure oil at port L

**JIS B1301**
Shaft with screw for key retention
Shaft code : C

Splined shaft
Shaft code : P

Tapered shaft (1/10 taper)
Shaft code : B (Single oil seal)

Tapered shaft (1/10 taper)
Shaft code : BW (Double oil seal)

Drain port (Dr) Rc1/4

JIS D2001 Involute spline
35 x 19 x 1.667 (Class b)
Performance data

Fluid: Shell tellus 56 (Viscosity 37cSt at 50°C)

The graphs shown are mean values obtained for production units.

**Fig. 1: Mechanical efficiency**
Mechanical efficiency at various speeds is shown for 4 operating pressures.

**Fig. 2: Volumetric efficiency**
Volumetric efficiency at various speeds is shown for 4 operating pressures.

**Fig. 3: Starting torque**
Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

**Fig. 4: External leakage**
External leakage (from motor drain ports) relative to various speeds is shown for 4 operating pressures.

**Fig. 5: Minimum boost pressure**
It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

**Fig. 6: Pressure drop**
Pressure necessary to run motor without load is shown for various speeds.
DOWMAX® ME motor

ME150
(Dimensions in mm)

<table>
<thead>
<tr>
<th>Applicable Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure (MPa)</td>
</tr>
<tr>
<td>Speed (rpm)</td>
</tr>
</tbody>
</table>

Displacement | 152cm³/rev |
Rated pressure | 275MPa (280kgf/cm²) |
Peak pressure | 31.9MPa (325kgf/cm²) |
Rated torque | 667Nm (68kgfm) |
Rated speed | 600rpm |
Max. speed | 800rpm |
Rated horse power | 42kW (57PS) |
Mass | 42kg |

Nominal dimensions

Drain port (Dr) Rc1/2
L : Supplied high pressure oil at port L
R : Supplied high pressure oil at port R

Shaft code : P
Shaft with screw for key retention
JIS B1301

Tapered shaft (1/10 taper)
Shaft code : B (Single oil seal)

Tapered shaft (1/10 taper)
Shaft code : BW (Double oil seal)

Splined shaft
Shaft code : P
JIS D2001 Involute spline
45 x 16 x 2.5 (Class b)

Seal land area of shaft is chrome plated

Seal land area of shaft is chrome plated

JIS  D2001 Involute spline
45 × 16 × 2.5 (Class b)
Performance data

Fluid: Shell tellus 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

**Fig. 1: Mechanical efficiency**
Mechanical efficiency at various speeds is shown for 4 operating pressures.

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It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

**Fig. 6: Pressure drop**
Pressure necessary to run motor without load is shown for various speeds.
**DOWMAX® ME motor**

**ME175**

(Dimensions in mm)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
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<tr>
<td>Rated torque</td>
<td>765Nm (78kgfm)</td>
</tr>
<tr>
<td>Rated speed</td>
<td>600rpm</td>
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<tr>
<td>Max. speed</td>
<td>800rpm</td>
</tr>
<tr>
<td>Rated horse power</td>
<td>48kW (65PS)</td>
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<tr>
<td>Mass</td>
<td>42kg</td>
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**Applicable Range**

<table>
<thead>
<tr>
<th>Pressure (MPa)</th>
<th>Speed (rpm)</th>
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<tbody>
<tr>
<td>0</td>
<td>27.5</td>
</tr>
<tr>
<td>13.7</td>
<td>600</td>
</tr>
<tr>
<td>27.5</td>
<td>800</td>
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</tbody>
</table>

**Nominal dimensions**

**Drain port** (Dr) Rc1/2

**Direction of rotation**
- R: Supplied high pressure oil at port R
- L: Supplied high pressure oil at port L

**Shaft code:**
- B: (Single oil seal) Tapered shaft (1/10 taper)
- BW: (Double oil seal) Tapered shaft (1/10 taper)
- C: Shaft with screw for key retention
- P: Splined shaft

**JIS D2001 Involute spline**
45 × 16 × 2.5 (Class b)

**Tooth form** Stub tooth
- Module: 2.5
- Pressure angle: 20°
- Number of teeth: 16
- Dia. of basic pitch circle (reference): 40

**Outer dia.** 44.5
**Inner dia.** 39

**Eye bolt M8**

2-M8 depth 12
M10 depth 20

**’A’~’A’**
- Seal land area of shaft is chrome plated

**JIS B1301**
- Shaft with screw for key retention
- Shaft code: C

**Splined shaft**
- Shaft code: P

**Tapered shaft (1/10 taper)**
- Shaft code: B (Single oil seal)
- Shaft code: BW (Double oil seal)

**Seal land area of shaft** is chrome plated

**Pressure (MPa)**

<table>
<thead>
<tr>
<th>Pressure (MPa)</th>
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<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>13.7</td>
</tr>
<tr>
<td>27.5</td>
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</table>

**Speed (rpm)**

<table>
<thead>
<tr>
<th>Speed (rpm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>600</td>
</tr>
<tr>
<td>800</td>
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</table>
DOWMAX® ME motor

Performance data

Fluid: Shell tellus 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

Fig. 1: Mechanical efficiency
Mechanical efficiency at various speeds is shown for 4 operating pressures.

Fig. 2: Volumetric efficiency
Volumetric efficiency at various speeds is shown for 4 operating pressures.

Fig. 3: Starting torque
Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

Fig. 4: External leakage
External leakage (from motor drain ports) relative to various speeds is shown for 4 operating pressures.

Fig. 5: Minimum boost pressure
It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

Fig. 6: Pressure drop
Pressure necessary to run motor without load is shown for various speeds.
**ME300B**

(Dimensions in mm)

<table>
<thead>
<tr>
<th>Speed (rpm)</th>
<th>Pressure (MPa)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>660</td>
<td>13.7</td>
</tr>
<tr>
<td>800</td>
<td>27.5</td>
</tr>
</tbody>
</table>

Displacement 300cm³/rev

Rated pressure 27.5MPa (280kgf/cm²)

Peak pressure 31.9MPa (325kgf/cm²)

Rated torque 1320Nm (134kgfm)

Rated speed 660rpm

Max. speed 800rpm

Rated horse power 90kW (123PS)

Mass 60kg

**Nominal dimensions**

- **Splined shaft**
  - Shaft code: P

- **Tapered shaft (1/10 taper)**
  - Shaft code: B (Single oil seal)

- **Tapered shaft (1/10 taper)**
  - Shaft code: BW (Double oil seal)

- **JIS B1301-1976 Shaft with screw for key retention**
  - Shaft code: C

- **JIS D2001 Involute spline 45 × 16 × 2.5 (Class b)**

- **Details of main port**
- **Details of drain port**

-----

**Key specifications**

- **Applicable Range**
  - Pressure: 0 - 27.5 MPa
  - Speed: 660 - 800 rpm

- **Displacement**: 300 cm³/rev
- **Rated pressure**: 27.5 MPa (280 kgf/cm²)
- **Peak pressure**: 31.9 MPa (325 kgf/cm²)
- **Rated torque**: 1320 Nm (134 kgfm)
- **Rated speed**: 660 rpm
- **Max. speed**: 800 rpm
- **Rated horse power**: 90 kW (123 PS)
- **Mass**: 60 kg

**JIS B1301-1976**

- Shaft with screw for key retention

**JIS D2001 Involute spline 45 × 16 × 2.5 (Class b)**

- Shaft code: M12 (Mounting bolt size)

**Drain port**

- G1/2

**Main port**

- G1/2

**Eye bolt**

- M10

**Port face**

- 28°

---

**Eye bolt M10**

**Drain port G1/2**

**Port face**

**M16×35**

---

**Shaft code : BW**

(Double oil seal)

**Tapered shaft (1/10 taper)**

**Shaft code : B**

(Single oil seal)

**JIS B1301-1976 Shaft with screw for key retention**

**Shaft code : C**

**JIS D2001 Involute spline 45 × 16 × 2.5 (Class b)**

---

**Details of main port**

**Details of drain port**

---

**EATON DOWMAX ME MOTOR CATALOG E-MOPI-CC006-E1 – July 2021 www.eaton.com**
Performance data

Fluid: Shell tellus K46 (Viscosity 30cSt at 50°C)
The graphs shown are mean values obtained for production units.

Fig. 1: Mechanical efficiency
Mechanical efficiency at various speeds is shown for 4 operating pressures.

Fig. 2: Volumetric efficiency
Volumetric efficiency at various speeds is shown for 4 operating pressures.

Fig. 3: Starting torque
Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

Fig. 4: External leakage
External leakage (from motor drain ports) relative to various speeds is shown for 4 operating pressures.

Fig. 5: Minimum boost pressure
It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

Fig. 6: Pressure drop
Pressure necessary to run motor without load is shown for various speeds.
**ME350B**  
*(Dimensions in mm)*

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement</td>
<td>350cm³/rev</td>
</tr>
<tr>
<td>Rated pressure</td>
<td>275MPa (280kgf/cm²)</td>
</tr>
<tr>
<td>Peak pressure</td>
<td>31.9MPa (325kgf/cm²)</td>
</tr>
<tr>
<td>Rated torque</td>
<td>1530Nm (156kgfm)</td>
</tr>
<tr>
<td>Rated speed</td>
<td>660rpm</td>
</tr>
<tr>
<td>Max. speed</td>
<td>800rpm</td>
</tr>
<tr>
<td>Rated horse power</td>
<td>106kW (144PS)</td>
</tr>
<tr>
<td>Mass</td>
<td>60kg</td>
</tr>
</tbody>
</table>

**Nominal dimensions**

### Draining port

<table>
<thead>
<tr>
<th>Port Code</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>Supplies high pressure oil at port L</td>
</tr>
<tr>
<td>R</td>
<td>Supplies high pressure oil at port R</td>
</tr>
</tbody>
</table>

### Direction of rotation

- R: Supplies high pressure oil at port R
- L: Supplies high pressure oil at port L

### Key retention

Shaft code: C

### Key retention

Shaft code: B

### Top half key retention

Shaft code: P

### Splined shaft

Shaft code: P

### Tapered shaft (1/10 taper)

Shaft code: B (Single oil seal)

### Tapered shaft (1/10 taper)

Shaft code: BW (Double oil seal)

### JIS D2001 Involute spline

45 × 16 × 2.5 (Class b)

### Machine dimensions

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure (MPa)</td>
<td>Speed (rpm)</td>
</tr>
<tr>
<td>0</td>
<td>27.5</td>
</tr>
<tr>
<td>13.7</td>
<td>800</td>
</tr>
</tbody>
</table>

### EATON DOWMAX ME MOTOR CATALOG

E-MOPI-CC006-E1 – July 2021  www.eaton.com
**Performance data**

Fluid: Shell tellus K46 (Viscosity 30cSt at 50°C)
The graphs shown are mean values obtained for production units.

**Fig. 1: Mechanical efficiency**
Mechanical efficiency at various speeds is shown for 4 operating pressures.

**Fig. 2: Volumetric efficiency**
Volumetric efficiency at various speeds is shown for 4 operating pressures.

**Fig. 3: Starting torque**
Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

**Fig. 4: External leakage**
External leakage (from motor drain ports) relative to various speeds is shown for 4 operating pressures.

**Fig. 5: Minimum boost pressure**
It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

**Fig. 6: Pressure drop**
Pressure necessary to run motor without load is shown for various speeds.
DOWMAX® ME motor

ME600B

(Dimensions in mm)

Displacement | 600cm³/rev
Rated pressure | 275MPa (280kgf/cm²)
Peak pressure | 31.9MPa (325kgf/cm²)
Rated torque | 2620Nm (267kgfm)
Rated speed | 500rpm
Max. speed | 600rpm
Rated horse power | 137kW (186PS)
Mass | 96kg

Nominal dimensions

Displacement | 600cm³/rev
Rated pressure | 275MPa (280kgf/cm²)
Peak pressure | 31.9MPa (325kgf/cm²)
Rated torque | 2620Nm (267kgfm)
Rated speed | 500rpm
Max. speed | 600rpm
Rated horse power | 137kW (186PS)
Mass | 96kg

Direction of rotation
R: Supplied high pressure oil at port R
L: Supplied high pressure oil at port L
Performance data

Fluid: Shell tellus K46 (Viscosity 30cSt at 50°C)

The graphs shown are mean values obtained for production units.

**Fig. 1: Mechanical efficiency**
Mechanical efficiency at various speeds is shown for 4 operating pressures.

**Fig. 2: Volumetric efficiency**
Volumetric efficiency at various speeds is shown for 4 operating pressures.

**Fig. 3: Starting torque**
Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

**Fig. 4: External leakage**
External leakage (from motor drain ports) relative to various speeds is shown for 4 operating pressures.

**Fig. 5: Minimum boost pressure**
It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

**Fig. 6: Pressure drop**
Pressure necessary to run motor without load is shown for various speeds.
**ME750B**

*(Dimensions in mm)*

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement</td>
<td>750cm³/rev</td>
</tr>
<tr>
<td>Rated pressure</td>
<td>275MPa (280kgf/cm²)</td>
</tr>
<tr>
<td>Peak pressure</td>
<td>31.9MPa (325kgf/cm²)</td>
</tr>
<tr>
<td>Rated torque</td>
<td>3280Nm (334kgfm)</td>
</tr>
<tr>
<td>Rated speed</td>
<td>450rpm</td>
</tr>
<tr>
<td>Max. speed</td>
<td>520rpm</td>
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<tr>
<td>Rated horse power</td>
<td>154kW (210PS)</td>
</tr>
<tr>
<td>Mass</td>
<td>123kg</td>
</tr>
</tbody>
</table>

**Nominal dimensions**

- **Spliced shaft**
  - Shaft code: P
  - JIS B1301...
  - Shaft with screw for key retention

- **Tapered shaft (1/10 taper)**
  - Shaft code: B (Single oil seal)
  - JIS B1301...

- **Tapered shaft (1/10 taper)**
  - Shaft code: BW (Double oil seal)

**JIS D2001 Involute spline**

60 x 22 x 2.5 (Class b)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coefficient of friction</td>
<td>+0.800</td>
</tr>
<tr>
<td>Tooth form</td>
<td>Stub tooth</td>
</tr>
<tr>
<td>Module</td>
<td>2.5</td>
</tr>
<tr>
<td>Pressure angle</td>
<td>20°</td>
</tr>
<tr>
<td>Number of teeth</td>
<td>22</td>
</tr>
<tr>
<td>Grade</td>
<td>55</td>
</tr>
<tr>
<td>Over-pin dia.</td>
<td>64.516°</td>
</tr>
<tr>
<td>Pin dia.</td>
<td>+0.045</td>
</tr>
<tr>
<td>Overall across a given number of grooves</td>
<td>27.970 (4-teeth)</td>
</tr>
<tr>
<td>Outer dia.</td>
<td>59.5</td>
</tr>
<tr>
<td>Inner dia.</td>
<td>54</td>
</tr>
<tr>
<td>Overall diameter of pin shaft</td>
<td>+0.800</td>
</tr>
<tr>
<td>Tooth form</td>
<td>Stub tooth</td>
</tr>
<tr>
<td>Module</td>
<td>2.5</td>
</tr>
<tr>
<td>Pressure angle</td>
<td>20°</td>
</tr>
<tr>
<td>Number of teeth</td>
<td>22</td>
</tr>
<tr>
<td>Grade</td>
<td>55</td>
</tr>
<tr>
<td>Over-pin dia.</td>
<td>50.168°</td>
</tr>
<tr>
<td>Pin dia.</td>
<td>+0.050</td>
</tr>
<tr>
<td>Thickness of chamfered part.</td>
<td>27.970 (4-teeth)</td>
</tr>
<tr>
<td>Outer dia.</td>
<td>60.75</td>
</tr>
<tr>
<td>Inner dia.</td>
<td>55.5</td>
</tr>
</tbody>
</table>
Performance data

Fluid: Shell tellus K46 (Viscosity 30cSt at 50°C)
The graphs shown are mean values obtained for production units.

**Fig. 1: Mechanical efficiency**
Mechanical efficiency at various speeds is shown for 4 operating pressures.

**Fig. 2: Volumetric efficiency**
Volumetric efficiency at various speeds is shown for 4 operating pressures.

**Fig. 3: Starting torque**
Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

**Fig. 4: External leakage**
External leakage (from motor drain ports) relative to various speeds is shown for 4 operating pressures.

**Fig. 5: Minimum boost pressure**
It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

**Fig. 6: Pressure drop**
Pressure necessary to run motor without load is shown for various speeds.
DOWMAX® ME motor

ME850B
(Dimensions in mm)

Displacement \(848\text{cm}^3/\text{rev}\)
Rated pressure \(27.5\text{MPa (280kgf/cm}^2\))
Peak pressure \(31.9\text{MPa (325kgf/cm}^2\))
Rated torque \(3708\text{Nm (378kgfm)}\)
Rated speed \(400\text{rpm}\)
Max. speed \(450\text{rpm}\)
Rated horse power \(155\text{kW (211PS)}\)
Mass \(123\text{kg}\)

Nominal dimensions
Performance data

Fluid: Shell Tellus K46 (Viscosity 30cSt at 50°C)

The graphs shown are mean values obtained for production units.

**Fig. 1: Mechanical efficiency**
Mechanical efficiency at various speeds is shown for 4 operating pressures.

**Fig. 2: Volumetric efficiency**
Volumetric efficiency at various speeds is shown for 4 operating pressures.

**Fig. 3: Starting torque**
Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

**Fig. 4: External leakage**
External leakage (from motor drain ports) relative to various speeds is shown for 4 operating pressures.

**Fig. 5: Minimum boost pressure**
It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

**Fig. 6: Pressure drop**
Pressure necessary to run motor without load is shown for various speeds.
**ME1300A**

(Dimensions in mm)

- **Displacement**: 1345cm³/rev
- **Rated pressure**: 24.5MPa (250kgf/cm²)
- **Peak pressure**: 31.9MPa (325kgf/cm²)
- **Rated torque**: 5250Nm (535kgfm)
- **Rated speed**: 200rpm
- **Max. speed**: 390rpm
- **Rated horse power**: 138kW (188PS)
- **Mass**: 170kg

**Nominal dimensions**

- **Displacement**: 1345cm³/rev
- **Rated pressure**: 24.5MPa (250kgf/cm²)
- **Peak pressure**: 31.9MPa (325kgf/cm²)
- **Rated torque**: 5250Nm (535kgfm)
- **Rated speed**: 200rpm
- **Max. speed**: 390rpm
- **Rated horse power**: 138kW (188PS)
- **Mass**: 170kg

**Main port**: 2-G1/4

**Splined shaft**:
- **Shaft code**: C

**Tapered shaft (1/10 taper)**
- **Shaft code**: B

**Tapered shaft (1/10 taper)**
- **Shaft code**: BW

**JIS B1301**: Shaft with screw for key retention

**Shaft code**: C

**JIS D2001 Involute spline**
- **80 x 14 x 5 (Class b)**

**Eye bolt M12**

**Drain port Dr Rc1/2**

**Pressure (MPa)**

- Applicable Range: 24.5 to 13.7

**Speed (rpm)**

- 0 to 390

**Pressure Angle**: +0.800

**Module**: 5

**Number of teeth**: 14

**Grade**: 2

**Over-pin dia.**: 88.345

**Pin dia.**: 0

**Outer dia.**: 79

**Inner dia.**: 68

**Over-all, across a given number of teeth (reference)**

**Over-pin dia.**: 40.618

**Pin dia.**: 0

**Outer dia.**: 81.5

**Inner dia.**: 70

**Over-all, across a given number of grooves (reference)**

- **Tooth form**: Stub tooth
- **Module**: 5
- **Pressure angle**: 20°
- **Number of teeth**: 14
- **Use of anti-backlash**: 70

**Tooth form**: Stub tooth

**Module**: 5

**Pressure angle**: 20°

**Number of teeth**: 14

**Use of anti-backlash**: 70

**Nominal dimensions**

**Direction of rotation**

- R: Supplied high pressure oil at port R
- L: Supplied high pressure oil at port L

**Seal land area of shaft is chrome plated**

**Shaft code**: C

**Shaft code**: BW

**Main port**: 2-G1/4

**Splined shaft**

**Tapered shaft (1/10 taper)**

**Eye bolt M12**

**Drain port Dr Rc1/2**

**Pressure (MPa)**

- Applicable Range: 24.5 to 13.7

**Speed (rpm)**

- 0 to 390

**Pressure Angle**: +0.800

**Module**: 5

**Number of teeth**: 14

**Grade**: 2

**Over-pin dia.**: 88.345

**Pin dia.**: 0

**Outer dia.**: 79

**Inner dia.**: 68

**Over-all, across a given number of teeth (reference)**

**Over-pin dia.**: 40.618

**Pin dia.**: 0

**Outer dia.**: 81.5

**Inner dia.**: 70

**Over-all, across a given number of grooves (reference)**

- **Tooth form**: Stub tooth
- **Module**: 5
- **Pressure angle**: 20°
- **Number of teeth**: 14
- **Use of anti-backlash**: 70

**Tooth form**: Stub tooth

**Module**: 5

**Pressure angle**: 20°

**Number of teeth**: 14

**Use of anti-backlash**: 70
Performance data

Fluid: Shell tellus 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

**Fig. 1: Mechanical efficiency**
Mechanical efficiency at various speeds is shown for 4 operating pressures.

**Fig. 2: Volumetric efficiency**
Volumetric efficiency at various speeds is shown for 4 operating pressures.

**Fig. 3: Starting torque**
Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

**Fig. 4: External leakage**
External leakage (from motor drain ports) relative to various speeds is shown for 4 operating pressures.

**Fig. 5: Minimum boost pressure**
It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

**Fig. 6: Pressure drop**
Pressure necessary to run motor without load is shown for various speeds.
**DOWMAX® ME motor**

**ME1900**  
(Dimensions in mm)

<table>
<thead>
<tr>
<th>Details</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement</td>
<td>1868cm³/rev</td>
</tr>
<tr>
<td>Rated pressure</td>
<td>24.5MPa (250kgf/cm²)</td>
</tr>
<tr>
<td>Peak pressure</td>
<td>31.9MPa (325kgf/cm²)</td>
</tr>
<tr>
<td>Rated torque</td>
<td>7290Nm (743kgfcm)</td>
</tr>
<tr>
<td>Rated speed</td>
<td>140rpm</td>
</tr>
<tr>
<td>Max. speed</td>
<td>260rpm</td>
</tr>
<tr>
<td>Rated horse power</td>
<td>128kW (174PS)</td>
</tr>
<tr>
<td>Mass</td>
<td>270kg</td>
</tr>
</tbody>
</table>

**Nominal dimensions**

<table>
<thead>
<tr>
<th>Pressure (MPa)</th>
<th>Applicable Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>24.5</td>
<td>180</td>
</tr>
<tr>
<td>13.7</td>
<td>30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Speed (rpm)</th>
<th>Max. speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>260 rpm</td>
</tr>
<tr>
<td>140</td>
<td></td>
</tr>
</tbody>
</table>

**Tooth form**

- Module: 5
- Pressure angle: 20°
- Number of teeth: 17
- Hardened: 85
- Grade: 105-242
- Flank width of pin: 103.242
- Pin dia.: Ø25.4
- Over-pin dia.: 40.828

**Shaft code: BW**

- (Double oil seal)
- Tapered shaft (1/10 taper)

**Spined shaft**

- Shaft code: P
- JIS D2001 Involute spline 95 x 17 x 5 (Class a)

**Tapered shaft (1/10 taper)**

- Shaft code: B (Single oil seal)
- JIS B1301
- Shaft with screw for key retention
- Shaft code: C

**Drain port (Dr)**

- G1/2
- Ø105 h6
- Ø100
- Ø125

**Eye bolt H16**

- Ø105
- Ø428
- Ø30

**Seal land area of shaft is chrome plated**

**Details of main port**

- G
- Ø18
- R0.1 ~ 0.3
- 3.5°

**Details of drain port**

- G1/2
- Ø22.6
- Ø18
- 2-M12 depth 20
- R0.1 ~ 0.3

**JIS B3001**

- Shaft with screw for key retention
- Shaft code: C

**Shaft with screw for key retention**

- Shaft code: B (Single oil seal)
- JIS B1301
- Shaft with screw for key retention
- Shaft code: C

**Tapered shaft (1/10 taper)**

- Shaft code: BW (Double oil seal)
- JIS B1301
- Shaft with screw for key retention
- Shaft code: C

**Eye bolt H16**

- Ø105
- Ø428
- Ø30

**Seal land area of shaft is chrome plated**

**Details of main port**

- G
- Ø18
- R0.1 ~ 0.3
- 3.5°
Performance data

Fluid: Shell tellus 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

**Fig. 1: Mechanical efficiency**
Mechanical efficiency at various speeds is shown for 4 operating pressures.

**Fig. 2: Volumetric efficiency**
Volumetric efficiency at various speeds is shown for 4 operating pressures.

**Fig. 3: Starting torque**
Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

**Fig. 4: External leakage**
External leakage (from motor drain ports) relative to various speeds is shown for 4 operating pressures.

**Fig. 5: Minimum boost pressure**
It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

**Fig. 6: Pressure drop**
Pressure necessary to run motor without load is shown for various speeds.
ME2600
(Dimensions in mm)

Displacement | 2578cm³/rev
Rated pressure | 24.5MPa (250kgf/cm²)
Peak pressure | 31.9MPa (325kgf/cm²)
Rated torque | 10060Nm (1026kgfm)
Rated speed | 110rpm
Max. speed | 230rpm
Rated horse power | 159kW (216PS)
Mass | 350kg

Nominal dimensions
Performance data
Fluid: Shell tellus 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

**Fig. 1: Mechanical efficiency**
Mechanical efficiency at various speeds is shown for 4 operating pressures.

**Fig. 2: Volumetric efficiency**
Volumetric efficiency at various speeds is shown for 4 operating pressures.

**Fig. 3: Starting torque**
Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

**Fig. 4: External leakage**
External leakage (from motor drain ports) relative to various speeds is shown for 4 operating pressures.

**Fig. 5: Minimum boost pressure**
It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

**Fig. 6: Pressure drop**
Pressure necessary to run motor without load is shown for various speeds.
DOWMAX® ME motor

ME3100
(Dimensions in mm)

Displacement 3104cm³/rev
Rated pressure 24.5MPa (250kgf/cm²)
Peak pressure 31.9MPa (325kgf/cm²)
Rated torque 12110Nm (1235kgf·m)
Rated speed 110rpm
Max. speed 230rpm
Rated horse power 186kW (253PS)
Mass 364kg

Nominal dimensions

<table>
<thead>
<tr>
<th>Displacement 3104cm³/rev</th>
<th>Rated pressure 24.5MPa (250kgf/cm²)</th>
<th>Peak pressure 31.9MPa (325kgf/cm²)</th>
<th>Rated torque 12110Nm (1235kgf·m)</th>
<th>Rated speed 110rpm</th>
<th>Max. speed 230rpm</th>
<th>Rated horse power 186kW (253PS)</th>
<th>Mass 364kg</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Pressure (MPa)</th>
<th>Applicable Range</th>
<th>Speed (rpm)</th>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>24.5</td>
<td>13.7</td>
<td>230</td>
<td>175</td>
<td>110</td>
<td>0</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Tooth form</th>
<th>Module</th>
<th>Pressure angle</th>
<th>Number of teeth</th>
<th>Diameter</th>
<th>Over-pin dia.</th>
<th>Over-all, across a given number of teeth (reference)</th>
</tr>
</thead>
<tbody>
<tr>
<td>JIS D2001 Involute spline</td>
<td>95 x 17 x 5 (Class b)</td>
<td>+0.800</td>
<td>Tooth form</td>
<td>Stub tooth</td>
<td>5</td>
<td>20°</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Over-pin dia.</th>
<th>Pin dia = 0.030 (3-teeth)</th>
<th>Outer dia.</th>
<th>Inner dia.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>94</td>
<td>82</td>
<td>85</td>
<td></td>
</tr>
</tbody>
</table>

Details of G:
- Seal land area of shaft is chrome plated
- M36 x 65
- 18°
- 72°
- 36°

Details of main port:
- 2-M12 depth 18
- M16 depth 30
- 2-G1/2 segment 26
- 6-M16 depth 26
DOWMAX® ME motor

Performance data

Fluid: Shell tellus 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.

**Fig. 1: Mechanical efficiency**
Mechanical efficiency at various speeds is shown for 4 operating pressures.

**Fig. 2: Volumetric efficiency**
Volumetric efficiency at various speeds is shown for 4 operating pressures.

**Fig. 3: Starting torque**
Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

**Fig. 4: External leakage**
External leakage (from motor drain ports) relative to various speeds is shown for 4 operating pressures.

**Fig. 5: Minimum boost pressure**
It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

**Fig. 6: Pressure drop**
Pressure necessary to run motor without load is shown for various speeds.
ME4100

(Dimensions in mm)

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement</td>
<td>4097 cm³/rev</td>
</tr>
<tr>
<td>Rated pressure</td>
<td>24.5 MPa (250 kgf/cm²)</td>
</tr>
<tr>
<td>Peak pressure</td>
<td>31.9 MPa (325 kgf/cm²)</td>
</tr>
<tr>
<td>Rated torque</td>
<td>15990 Nm (1630 kgf·m)</td>
</tr>
<tr>
<td>Rated speed</td>
<td>75 rpm</td>
</tr>
<tr>
<td>Max. speed</td>
<td>200 rpm</td>
</tr>
<tr>
<td>Rated horse power</td>
<td>211 kW (287 PS)</td>
</tr>
<tr>
<td>Mass</td>
<td>520 kg</td>
</tr>
</tbody>
</table>

Nominal dimensions

- **Applicable Range**
  - Pressure (MPa): 0 to 24.5
  - Speed (rpm): 0 to 200

- **Displacement**
  - 4097 cm³/rev

- **Rated pressure**
  - 24.5 MPa (250 kgf/cm²)

- **Peak pressure**
  - 31.9 MPa (325 kgf/cm²)

- **Rated torque**
  - 15990 Nm (1630 kgf·m)

- **Rated speed**
  - 75 rpm

- **Max. speed**
  - 200 rpm

- **Rated horse power**
  - 211 kW (287 PS)

- **Mass**
  - 520 kg

- **Pressure (MPa)**
  - Applicable Range: 13.7 to 24.5

- **Speed (rpm)**
  - Applicable Range: 0 to 200

<table>
<thead>
<tr>
<th>Tooth form</th>
<th>Module</th>
<th>Pressure angle</th>
<th>Number of teeth</th>
<th>Dia. of basic pitch circle</th>
</tr>
</thead>
<tbody>
<tr>
<td>JIS B1301</td>
<td>5</td>
<td>+0.800</td>
<td>22</td>
<td>Ø120 x 22 x 5 (Class a)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Splined shaft**
  - Shaft code: P

- **Tapered shaft (1/10 taper)**
  - Shaft code: B (Single oil seal)

- **Tapered shaft (1/10 taper)**
  - Shaft code: BW (Double oil seal)

- **Drain port**
  - G1

- **Eye bolt M16**

- **Port face**

- **Direction of rotation**
  - R: Supplied high pressure oil at port R
  - L: Supplied high pressure oil at port L

- **Details of main port**

- **Details of G**

- **Details of drain port**

- **Details of mounting bolt size M20**
Performance data

Fluid: Shell tellus 56 (Viscosity 37cSt at 50°C)

The graphs shown are mean values obtained for production units.

**Fig. 1: Mechanical efficiency**
Mechanical efficiency at various speeds is shown for 4 operating pressures.

**Fig. 2: Volumetric efficiency**
Volumetric efficiency at various speeds is shown for 4 operating pressures.

**Fig. 3: Starting torque**
Starting torque versus effective pressure is shown. Oil viscosity will not affect the starting torque efficiency.

**Fig. 4: External leakage**
External leakage (from motor drain ports) relative to various speeds is shown for 4 operating pressures.

**Fig. 5: Minimum boost pressure**
It is important that sufficient inlet pressure is maintained, when the motor is operated as a pump or when the load overruns the motor, to prevent cavitation.

**Fig. 6: Pressure drop**
Pressure necessary to run motor without load is shown for various speeds.
Nominal dimensions of inch size shaft and SAE ports

**ME100-KE (HE)**

Rotation (Viewed from shaft end)
- **CW**: Port R pressurized
- **CCW**: Port L pressurized

**Shaft K**
- Inch size Parallel keyed shaft

**ME150-KE (HE)**

Rotation (Viewed from shaft end)
- **CW**: Port R pressurized
- **CCW**: Port L pressurized

**Shaft H**
- Inch size Spline shaft
**DOWMAX® ME motor**

**ME175-KE (HE)**

- **Drain port (Dr) Rc 1/2**
  - (With plug)
- **Shaft K**
  - Inch size Parallel keyed shaft
- **Rotation (Viewed from shaft end)**
  - CW: Port R pressurized
  - CCW: Port L pressurized

**ME300KE (HE)**

- **Drain port Dr 3/4-16UNF-2B**
  - (Adapter Rc 1/2x3/4-16UNF-2B)
- **Eye bolt M8**
- **Shaft K**
  - Inch size Parallel keyed shaft
- **Shaft H**
  - Inch size Spline shaft
- **Rotation (Viewed from shaft end)**
  - CW: Port R pressurized
  - CCW: Port L pressurized
Nominal dimensions of inch size shaft and SAE ports

**ME350BKE (HE)**

Rotation (viewed from shaft end):
- CW: Port R pressurized
- CCW: Port L pressurized

**Shaft K**
- Inch size parallel keyed shaft
- 6Ø14 (Mounting bolt size M12)

**Shaft H**
- Inch size spline shaft
- 6Ø18 (Mounting bolt size M16)

**ME600BKE (HE)**

Rotation (viewed from shaft end):
- CW: Port R pressurized
- CCW: Port L pressurized

**Shaft K**
- Inch size parallel keyed shaft
- 6Ø14 (Mounting bolt size M12)

**Shaft H**
- Inch size spline shaft
- 6Ø18 (Mounting bolt size M16)
Nominal dimensions of inch size shaft and SAE ports

**ME1300AKE (HE)**

- **Shaft K**
  - Inch size
  - Parallel keyed shaft

- **ME1900-KE (HE)**
  - **Shaft K**
    - Inch size
    - Parallel keyed shaft
**DOWMAX® ME motor**

**ME2600-KE (HE)**

- **Shaft K**: Inch size, Parallel keyed shaft
- **Shaft H**: Inch size, Spline shaft

**ME3100-KE (HE)**

- **Shaft K**: Inch size, Parallel keyed shaft
- **Shaft H**: Inch size, Spline shaft
Nominal dimensions of inch size shaft and SAE ports

ME4100-KE (HE)

Shaft K
Inch size parallel keyed shaft

Shaft H
Inch size spline shaft
## Specification of spline

### ME100
Type of spline: Involute: Flat root side fit
Pressure angle 30°: Pitch 16/32 Class 1 Fit:
To B. S. 3550 Or A. S. A. -B5-15

<table>
<thead>
<tr>
<th>Shaft</th>
<th>No. of teeth</th>
<th>21</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pitch dia.</td>
<td>33.338</td>
</tr>
<tr>
<td></td>
<td>Base dia.</td>
<td>28.872</td>
</tr>
<tr>
<td></td>
<td>Tooth thickness</td>
<td>2.416 $\pm 0.030$</td>
</tr>
<tr>
<td></td>
<td>Major dia.</td>
<td>34.506 $\pm 0.127$</td>
</tr>
<tr>
<td></td>
<td>Form dia.</td>
<td>31.648</td>
</tr>
<tr>
<td></td>
<td>Minor dia.</td>
<td>31.052 $\pm 0.279$</td>
</tr>
<tr>
<td></td>
<td>Fillet radius</td>
<td>0.28</td>
</tr>
</tbody>
</table>

### ME150 & ME175
Type of spline: Involute: Flat root side fit
Pressure angle 30°: Pitch 12/24
Class 1 Fit: To B. S. 3550 Or A. S. A. -B5-15

<table>
<thead>
<tr>
<th>Shaft</th>
<th>No. of teeth</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pitch dia.</td>
<td>42.324</td>
</tr>
<tr>
<td></td>
<td>Base dia.</td>
<td>36.662</td>
</tr>
<tr>
<td></td>
<td>Tooth thickness</td>
<td>3.286 $\pm 0.036$</td>
</tr>
<tr>
<td></td>
<td>Major dia.</td>
<td>43.924 $\pm 0.127$</td>
</tr>
<tr>
<td></td>
<td>Form dia.</td>
<td>40.114</td>
</tr>
<tr>
<td></td>
<td>Minor dia.</td>
<td>39.692</td>
</tr>
<tr>
<td></td>
<td>Fillet radius</td>
<td>0.3556</td>
</tr>
</tbody>
</table>

### ME300B & ME350B
Type of spline: Involute: Flat root side fit
Pressure angle 30°: Pitch 12/24
Class 1 Fit: To B. S. 3550 Or A. S. A. -B5-15

<table>
<thead>
<tr>
<th>Shaft</th>
<th>No. of teeth</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pitch dia.</td>
<td>42.334</td>
</tr>
<tr>
<td></td>
<td>Base dia.</td>
<td>36.662</td>
</tr>
<tr>
<td></td>
<td>Tooth thickness</td>
<td>3.286 $\pm 0.036$</td>
</tr>
<tr>
<td></td>
<td>Major dia.</td>
<td>43.924 $\pm 0.127$</td>
</tr>
<tr>
<td></td>
<td>Form dia.</td>
<td>40.114</td>
</tr>
<tr>
<td></td>
<td>Minor dia.</td>
<td>39.692</td>
</tr>
<tr>
<td></td>
<td>Fillet radius</td>
<td>0.3556</td>
</tr>
</tbody>
</table>

### ME600B
Type of spline: Involute: Flat root side fit
Pressure angle 30°: Pitch 8/16
Class 1 Fit: To B. S. 3550 Or A. S. A. -B5-15

<table>
<thead>
<tr>
<th>Shaft</th>
<th>No. of teeth</th>
<th>19</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pitch dia.</td>
<td>60.325</td>
</tr>
<tr>
<td></td>
<td>Base dia.</td>
<td>52.423</td>
</tr>
<tr>
<td></td>
<td>Tooth thickness</td>
<td>4.897 $\pm 0.036$</td>
</tr>
<tr>
<td></td>
<td>Major dia.</td>
<td>62.763 $\pm 0.127$</td>
</tr>
<tr>
<td></td>
<td>Form dia.</td>
<td>57.028</td>
</tr>
<tr>
<td></td>
<td>Minor dia.</td>
<td>56.413 $\pm 0.207$</td>
</tr>
<tr>
<td></td>
<td>Fillet radius</td>
<td>0.991</td>
</tr>
</tbody>
</table>

### ME750B & ME850B
Type of spline: Involute: Flat root side fit
Pressure angle 30°: Pitch 5/10
Class 1 Fit: To B. S. 3550 Or A. S. A. -B5-15

<table>
<thead>
<tr>
<th>Shaft</th>
<th>No. of teeth</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pitch dia.</td>
<td>76.2</td>
</tr>
<tr>
<td></td>
<td>Base dia.</td>
<td>65.992</td>
</tr>
<tr>
<td></td>
<td>Tooth thickness</td>
<td>7.879 $\pm 0.207$</td>
</tr>
<tr>
<td></td>
<td>Major dia.</td>
<td>80.162 $\pm 0.293$</td>
</tr>
<tr>
<td></td>
<td>Form dia.</td>
<td>71.00</td>
</tr>
<tr>
<td></td>
<td>Minor dia.</td>
<td>70.000 $\pm 0.293$</td>
</tr>
<tr>
<td></td>
<td>Fillet radius</td>
<td>0.889</td>
</tr>
</tbody>
</table>

### ME1300A
Type of spline: Involute: Flat root side fit
Pressure angle 30°: Pitch 5/10
Class 1 Fit: To B. S. 3550 Or A. S. A. -B5-15

<table>
<thead>
<tr>
<th>Shaft</th>
<th>No. of teeth</th>
<th>15</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pitch dia.</td>
<td>76.2</td>
</tr>
<tr>
<td></td>
<td>Base dia.</td>
<td>65.992</td>
</tr>
<tr>
<td></td>
<td>Tooth thickness</td>
<td>7.879 $\pm 0.207$</td>
</tr>
<tr>
<td></td>
<td>Major dia.</td>
<td>80.162 $\pm 0.293$</td>
</tr>
<tr>
<td></td>
<td>Form dia.</td>
<td>71.00</td>
</tr>
<tr>
<td></td>
<td>Minor dia.</td>
<td>70.000 $\pm 0.293$</td>
</tr>
<tr>
<td></td>
<td>Fillet radius</td>
<td>0.889</td>
</tr>
</tbody>
</table>

---

EATON DOWMAX ME MOTOR CATALOG E-MOPI-CC005-E1—July 2021 www.eaton.com 41
**DOWMAX® ME motor**

**ME1900**
Type of spline: Involute, Flat root side fit  
Pressure angle 30°: Pitch 5/10  
Class 1 Fit: To B.S. 3550 or A.S.A.-B5-15

<table>
<thead>
<tr>
<th>Shaft</th>
<th>Hole</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of teeth</td>
<td>18</td>
</tr>
<tr>
<td>Pitch dia.</td>
<td>91.44</td>
</tr>
<tr>
<td>Base dia.</td>
<td>79.19</td>
</tr>
<tr>
<td>Tooth thickness</td>
<td>7.932/7.836</td>
</tr>
<tr>
<td>Major dia.</td>
<td>95.402</td>
</tr>
<tr>
<td>Form dia.</td>
<td>86.215</td>
</tr>
<tr>
<td>Minor dia.</td>
<td>85.242</td>
</tr>
<tr>
<td>Fillet radius</td>
<td>0.813</td>
</tr>
</tbody>
</table>

| No. of teeth | 18 |
| Pitch | 5/10 |
| Pressure angle | 30° |
| Pitch dia. | 91.44 |
| Major dia. | 96.52 | + 0.035 |
| Minor dia. | 86.398 | + 0.203 |
| Space width | 8.037 | + 0.04 |

**ME2600**
Type of spline: Involute, Flat root side fit  
Pressure angle 30°: Pitch 5/10  
Class 1 Fit: To B.S. 3550 or A.S.A.-B5-15

<table>
<thead>
<tr>
<th>Shaft</th>
<th>Hole</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of teeth</td>
<td>20</td>
</tr>
<tr>
<td>Pitch dia.</td>
<td>101.6</td>
</tr>
<tr>
<td>Base dia.</td>
<td>87.988</td>
</tr>
<tr>
<td>Tooth thickness</td>
<td>7.932</td>
</tr>
<tr>
<td>Major dia.</td>
<td>105.562</td>
</tr>
<tr>
<td>Form dia.</td>
<td>96.317</td>
</tr>
<tr>
<td>Minor dia.</td>
<td>95.402</td>
</tr>
<tr>
<td>Fillet radius</td>
<td>0.7874</td>
</tr>
</tbody>
</table>

| No. of teeth | 20 |
| Pitch | 5/10 |
| Pressure angle | 30° |
| Pitch dia. | 101.6 |
| Major dia. | 106.68 | + 0.63 |
| Minor dia. | 96.52 | + 0.30 |
| Space width | 8.039 | + 0.041 |

**ME3100**
Type of spline: Involute, Flat root side fit  
Pressure angle 30°: Pitch 5/10  
Class 1 Fit: To B.S. 3550 or A.S.A.-B5-15

<table>
<thead>
<tr>
<th>Shaft</th>
<th>Hole</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of teeth</td>
<td>18</td>
</tr>
<tr>
<td>Pitch dia.</td>
<td>91.440</td>
</tr>
<tr>
<td>Base dia.</td>
<td>79.190</td>
</tr>
<tr>
<td>Tooth thickness</td>
<td>7.932</td>
</tr>
<tr>
<td>Major dia.</td>
<td>95.402</td>
</tr>
<tr>
<td>Form dia.</td>
<td>86.215</td>
</tr>
<tr>
<td>Minor dia.</td>
<td>85.242</td>
</tr>
<tr>
<td>Fillet radius</td>
<td>0.813</td>
</tr>
</tbody>
</table>

| No. of teeth | 18 |
| Pitch | 5/10 |
| Pressure angle | 30° |
| Pitch dia. | 91.44 |
| Major dia. | 96.52 | + 0.035 |
| Minor dia. | 86.398 | + 0.203 |
| Space width | 8.042 | + 0.036 |

**ME4100**
Type of spline: Involute, Flat root side fit  
Pressure angle 30°: Pitch 5/10  
Class 1 Fit: To B.S. 3550 or A.S.A.-B5-15

<table>
<thead>
<tr>
<th>Shaft</th>
<th>Hole</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of teeth</td>
<td>23</td>
</tr>
<tr>
<td>Pitch dia.</td>
<td>116.84</td>
</tr>
<tr>
<td>Base dia.</td>
<td>101.186</td>
</tr>
<tr>
<td>Tooth thickness</td>
<td>7.932/7.831</td>
</tr>
<tr>
<td>Major dia.</td>
<td>120.802</td>
</tr>
<tr>
<td>Form dia.</td>
<td>115.526</td>
</tr>
<tr>
<td>Minor dia.</td>
<td>110.642</td>
</tr>
<tr>
<td>Fillet radius</td>
<td>0.762</td>
</tr>
</tbody>
</table>

| No. of teeth | 23 |
| Pitch | 5/10 |
| Pressure angle | 30° |
| Pitch dia. | 116.84 |
| Major dia. | 121.92 | + 0.635 |
| Minor dia. | 111.76 | + 0.035 |
| Space width | 8.042 | + 0.040 |


**ME100**

![Graph showing allowable radial load for ME100](image)

**ME150**

![Graph showing allowable radial load for ME150](image)

**ME175**

![Graph showing allowable radial load for ME175](image)
**ME300B**

![Graph 1](image1)

**ME350B**

![Graph 2](image2)

**ME600B**

![Graph 3](image3)

**Note:**
1. If motors are operated within the proper ratings and conditions, the operational life is determined by the bearing life.
2. In order to maintain the maximum bearing life, when a radial load is imposed on the output shaft the motor should be installed as illustrated in Fig. 2 or Fig. 3.
   - For a uni-directional application, motor should be installed so that side load acts as shown in Fig. 2.
   - For a bi-directional application, a radial load for each rotational direction being applied, the motor should be installed so that side loads act as shown in Fig. 3.
3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed (500 rpm only for ME100) for various pressures and radial loads. When the shaft speed differs from 100 rpm (500 rpm only for ME100) the bearing life can be obtained by the following formula:
   
   \[ B-10 \text{ Life} = (\text{Bearing Life obtainable in the graph}) \times \frac{100}{\text{Actual Shaft Speed, rpm}} \]

   In case where the side load acts at a different location to the midpoint of the shaft projection please refer to us.
4. Applications with axial thrust loads should be referred to us.
5. When motor is used in meter-out circuit, pressure in Fig. 2 & 3 shaft be a sum of motor inlet and outlet pressure.
6. Bearing life varies due to kind of fluid. Bearing life should be decided by multiplying by the factor as shown in table:

<table>
<thead>
<tr>
<th>Fluid type</th>
<th>Life factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral-based fluid</td>
<td>1.0</td>
</tr>
<tr>
<td>Phosphate-ester fluid</td>
<td>1.0</td>
</tr>
<tr>
<td>Water-glycol w/o forced lubrication</td>
<td>0.05–0.10</td>
</tr>
<tr>
<td>Water-glycol w/ forced lubrication</td>
<td>0.6</td>
</tr>
</tbody>
</table>
DOWMAX® ME motor

Bearing life and allowable radial load for shaft

**ME750B**

![Graph](image1)

**ME850B**

![Graph](image2)

**ME1300A**

![Graph](image3)
### ME1900

![Graph showing allowable radial load vs. distance from mounting surface](image)

**Note:**
1. If motors are operated within the proper ratings and conditions, the operational life is determined by the Bearing Life.
2. In order to maintain the maximum bearing life, when a radial load is imposed on the output shaft the motor should be installed as illustrated in Fig. 2 or Fig. 3. For a uni-directional application, motor should be installed so that side load acts as shown in Fig. 2. For a bi-directional application, a radial load for each rotational direction being applied, the motor should be installed so that side loads act as shown in Fig. 3.
3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed (500 rpm only for ME100) for various pressures and radial loads. When the shaft speed differs from 100 rpm (500 rpm only for ME100) the bearing life can be obtained by the following formula:

   \[ \text{B-10 Life} = \left( \frac{\text{Actual shaft speed}}{100} \right) \times (\text{Bearing Life obtainable in the graph}) \]

4. Applications with axial thrust loads should be referred to us.
5. When motor is used in meter-out circuit, pressure in Fig. 2 & 3 shaft be a sum of motor inlet and outlet pressure.
6. Bearing life varies due to kind of fluid. Bearing life should be decided by multiplying by the factor as shown in table:

<table>
<thead>
<tr>
<th>Fluid type</th>
<th>Life factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral-based fluid</td>
<td>1.0</td>
</tr>
<tr>
<td>Phosphate-ester fluid</td>
<td>1.0</td>
</tr>
<tr>
<td>Water-glycol w/o forced lubrication</td>
<td>0.05-0.10</td>
</tr>
<tr>
<td>Water-glycol w/ forced lubrication</td>
<td>0.6</td>
</tr>
</tbody>
</table>

---

### ME2600

![Graph showing allowable radial load vs. distance from mounting surface](image)

---

### ME3100

![Graph showing allowable radial load vs. distance from mounting surface](image)
DOWMAX® ME motor

Bearing life and allowable radial load for shaft

ME4100

Fig. 1

Fig. 2

Fig. 3
### Accessory parts dimensions

#### Adapter

<table>
<thead>
<tr>
<th>Part No.</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>O</th>
<th>Part No. of bonded seal</th>
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<tbody>
<tr>
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</tbody>
</table>

**Note:** The Part No. with suffix “-A” indicates that adapter is supplied with bonded seal.

#### Straight flange

*(Socket welding connection)*

- **ME100, ME1300A**
- **ME150～ME850**
- **ME1900～ME4100**

**Note:** The cut shown with R50 is only for ME2600.

#### Elbow flange

*(Socket welding connection)*

- **ME100, ME1300A**
- **ME150～ME850**
- **ME1900～ME4100**

**Note:** 1. The spot-facing for hex. socket head bolt is only for ME100 & ME3100. 2. The cut shown with R50 is only for ME2600.

---

**DOWMAX® ME motor**

**EATON DOWMAX ME MOTOR CATALOG**

E-MOP1-CC005-E1 — July 2021

www.eaton.com
Straight flange
(Thread connection)

ME100, ME1300A

ME150~ME850

ME1900~ME4100

Note: The cut shown with R50 is only for ME2600.

Elbow flange
(Thread connection)

ME100, ME1300A

ME150~ME850

ME1900~ME4100

Note: The cut shown with R50 is only for ME2600.

<table>
<thead>
<tr>
<th>DOWMAX Model</th>
<th>ME100</th>
<th>ME150</th>
<th>ME175</th>
<th>ME300B</th>
<th>ME350B</th>
<th>ME600B</th>
<th>ME750B</th>
<th>ME850B</th>
<th>ME1300A</th>
<th>ME1900</th>
<th>ME2600</th>
<th>ME3100</th>
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</tr>
</tbody>
</table>
DOWMAX® ME motor

DOWMAX motor standardizes for special function

* The following motors with special functions are available. Select an appropriate motor that best suits your requirements.

1. DOWMAX motors with rotation detecting shaft
   - These motors are for speed control use on injection molding machines, steel rolling mills, winches, etc. In these applications, they sense rotary motions and detect rotational speed for control.
   - Each DOWMAX motor in the ME Series can be supplied with a rotation detecting shaft.
   - Refer to drawing; DZ3503B.

2. DOWMAX motors for Water-Glycol Hydraulic fluid use (with flushing circuit)
   - Water-glycol fluid, commonly employed as fire-resistant hydraulic oil, shorten bearing life because of its low lubricating property. This DOWMAX motor is equipped with internal flushing circuit in order to extend the bearing life.
   - Refer to drawing; DZ5821B and DZ5861B (with flow control valve).

3. DOWMAX for installing the shaft upward
   - With air bleeding hole: An air bleeding hole (with plug) is provided in the end cover in order to facilitate oil filling in the motor casing before operation. Refer to drawing; DZ5823B.
   - With special drain port: The highest portion of the motor (when its shaft faces upward) is provided with a special drain port to completely fill the motor casing with oil. Refer to drawing; DZ5822B.

4. DOWMAX motors with speed sensor
   - With Shaft encoder type: motor shaft comes with the option, where customer can fit their own encoder
   - With Pulse type: motor comes with compact no contact type speed sensor, which can measure 9 to 11 pulse per revolution
   - Contact us for any other customized Sensor which needs more accuracy, or specific outputs

5. Coating and rustproofing
   - In addition to the standard coating, 8 types of coating system are standardized for DOWMAX motors. Refer to drawing; DZ6373B
   - The uncoated surfaces (excluding the nameplate) of all DOWMAX motors are rustproofed. This standard rustproofing is valid for approx. three months. Contact us if the storage period will be longer than that or the motor is to be used in a corrosive atmosphere.

6. Others
   - Contact us for motors with special capacities, such as 250, 450, and 530 cc/rev.
   - Contact us for the cold-resistant specification for operation at temperatures from -25°C to -45°C. (Standard motors are usable up to -25°C.)
   - A socket welding type flange is shown in this catalog for main port piping. A screw type flange is also available. Refer to drawing; DZ5831B (straight flange, screw connection) and DZ5852B (elbow flange, screw connection).
The structure of this two-speed motor is simple because of a construction where the front and rear piston travel independently, making use of the advantages of the opposed piston and double swash plates motor.

- **High starting efficiency** - Because of the same working structure as standard Dowmax motor.
- **Good low-speed performance** - Because of multiple-piston construction.
- **Slim configuration** - Motor diameter is same as standard Dowmax motor.
- **Change-over between large and small displacement can be done while running with a load.**
- **No separate pilot pressure is required for change-over because of the self pressure utilized as a pilot pressure.**

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Coding, change-over circuit in two-speed operation ....................... 53
MK300 .............................................................................. 54
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Bearing life and radial load ......................................................... 58
**DOWMAX® two-speed motor**

### Performance data

<table>
<thead>
<tr>
<th>Model</th>
<th>Displacement cm³/rev</th>
<th>Rated pressure MPa (kgf/cm²)</th>
<th>Peak pressure MPa (kgf/cm²)</th>
<th>Rated torque Nm (kgf·cm)</th>
<th>Max. speed rpm</th>
<th>Change-over pilot pressure MPa (kgf/cm²)</th>
<th>Max. pressure for pilot port MPa (kgf/cm²)</th>
<th>Pilot piston stroke volume cm³</th>
<th>Mass kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>MK300</td>
<td>304/152</td>
<td>24.5 (250)</td>
<td>31.9 (325)</td>
<td>1190/594 (121/61)</td>
<td>600/800</td>
<td>more than self-pressure min.0.98 (min.10)</td>
<td>31.9 (325)</td>
<td>3.1</td>
<td>60</td>
</tr>
<tr>
<td>MK600</td>
<td>602/301</td>
<td>24.5 (250)</td>
<td>31.9 (325)</td>
<td>2350/1180 (240/120)</td>
<td>300/600</td>
<td>more than self-pressure min.0.98 (min.10)</td>
<td>31.9 (325)</td>
<td>4.1</td>
<td>110</td>
</tr>
</tbody>
</table>

- Limit of hydraulic fluid temperature: −20°C to +80°C
- Limit of hydraulic fluid viscosity: 15–500 cSt (Advisable fluid viscosity range: 25–100 cSt)
- In case motors are used, as its output shaft to be positioned upward, special specification should be applied. In this case, please contact us.

### Construction and working principle

In the Fig. 1 the high pressure fluid flowing in from the main port enters through the passage in the thrust retainer plate. It then flows into the port which opens at the shaft end surface which slides against the timing plate, and branches into both right and left cylinders. One flow reaches the piston bores at the right side of the cylinder block, after passing through port holes of the shaft and cylinder block. The other flows into the piston bores at the left side through the groove in the main spool and port holes in the shaft and cylinder block. Thus the drive shaft starts to rotate through the rotation of cylinder block which is caused by the tangential force on the swash plates exerted by the axial movement of pistons (the pistons are located in the cylinder block which is integral with a drive shaft).

The low-pressure fluid, after working on the pistons, is pushed back by the pistons in the cylinder bore, flows out from the low-pressure main port, through the passage in the reverse way as it came in.

Fig. 2 shows a case of large displacement. When high pressure fluid is fed to the pilot pressure port B, it arrives at the pilot piston chamber 3 through the passage 1 and 2, and pushes the pilot piston 6 to the right. With the pilot piston 6 pressed to the right side, the main spool 8 also moves to the right by the piston rod 7. The groove 9 on the main spool comes to the position shown in Fig. 2. With this movement of the main spool, the high pressure fluid coming from the main port flows into both passages of 10 and 11 and exerts force on the right and left pistons, thus working as a large displacement motor.

Fig. 3 shows a case of small displacement. When high pressure fluid is fed to the pilot pressure port A, it flows to the pilot piston chamber 5 through the passage 4, and pushes the pilot piston 6 to the left. With the movement of the pilot piston 6 to the left side, the main spool 8 also moves to the left by the piston rod 7. The groove 9 on the main spool comes to the position shown in Fig. 2. With this movement of the main spool, the high pressure fluid coming from the main port flows only to the passage 10, exerting force on the right pistons only on the right pistons thus working as a small displacement motor.

In this case, although high pressure fluid does not flow to the left side pistons, it reciprocates in the cylinders repeating suction and discharge stroke along with the shaft rotation. This is made possible because the groove 9 around the main spool is positioned as shown by which each left side cylinder is channelled through the passage 12. Further, as the passage 12 is connected with the hole 13, fluid is supplied and cooled through the flow to the drain.
### Model code & symbols

<table>
<thead>
<tr>
<th>Model code</th>
<th>Motor size</th>
<th>Shaft code</th>
<th>Flange code</th>
<th>Special specification code</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOWMAX</td>
<td>(Metric displacement)</td>
<td>C</td>
<td>F1 – Flange w/o shuttle Valve (Rc3/4 Port)</td>
<td>No sign – Standard specification</td>
</tr>
<tr>
<td>two-speed</td>
<td></td>
<td>P</td>
<td>FA – Flange w/o shuttle Valve (1-1/16-12UN-2B port)</td>
<td>S – Special specification</td>
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<td>series motor</td>
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<td>F2 – Flange w/ shuttle Valve (Rc3/4 port)</td>
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<td></td>
<td>H</td>
<td>FB – Flange w/ shuttle Valve (1-1/16-12UN-2B port)</td>
<td></td>
</tr>
</tbody>
</table>

### Change-over circuit in two-speed operation

#### (Basic conditions of a changeover operation)

1. The change-over pilot pressure is basically self-pressure. However, when a separate pilot pressure other than system-pressure is used, it must be higher than the system-pressure.
2. When the system-pressure is utilized as the pilot pressure for the change-over, the change-over can not be done if the system-pressure is below 1MPa (10 kgf/cm²). (If back-pressure exists at the low pressure side of the change-over pilot pressure, the system-pressure must be larger than the back pressure by 1MPa (10 kgf/cm²) or more.)

#### (Example of 2-speed change-over circuit)

1. Where a F2 flange with solenoid valve is used.

![Diagram of F2 flange with solenoid valve](image1)

2. Where a F2 flange with manual valve is used.

![Diagram of F2 flange with manual valve](image2)

3. Where a F2 flange is used.

![Diagram of F2 flange](image3)

4. Where a F1 flange (without shuttle valve) is used.

![Diagram of F1 flange](image4)
**MK300**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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<tbody>
<tr>
<td>Displacement</td>
<td>304/152 cm³/rev</td>
</tr>
<tr>
<td>Rated pressure</td>
<td>24.5 MPa (250 kgf/cm²)</td>
</tr>
<tr>
<td>Peak pressure</td>
<td>31.9 MPa (325 kgf/cm²)</td>
</tr>
<tr>
<td>Rated torque</td>
<td>1190/594 Nm (121/61 kgf·m)</td>
</tr>
<tr>
<td>Max. Speed</td>
<td>600/800 rpm</td>
</tr>
<tr>
<td>Change-over pilot pressure</td>
<td>more than self-pressure, Min.0.98 MPa (10 kgf/cm²)</td>
</tr>
<tr>
<td>Max. pressure for pilot port</td>
<td>31.9 MPa (325 kgf/cm²)</td>
</tr>
<tr>
<td>Pilot piston stroke volume</td>
<td>3.1 cm³</td>
</tr>
<tr>
<td>Mass</td>
<td>60 kg</td>
</tr>
</tbody>
</table>

**Nominal dimensions**

**MK300-CF1**

**MK300-CF2**

**MK300-CF2A~D**

**MK300-CF2M**

---

Change of capacity  
Large displacement: Solenoid valve off  
Small displacement: Solenoid valve on  

---

When manufacturing a flange in the customer, the flange center part process like the figure above.

---

**Direction of rotation**  
R: Supplied high pressure oil at port R  
L: Supplied high pressure oil at port L  

---

**Change of capacity**  
Large displacement: Operate the lever to the right  
Small displacement: Operate the lever to the left  

---

**Change of capacity**  
Large displacement: Solenoid valve off  
Small displacement: Solenoid valve on  

---

When manufacturing a flange in the customer, the flange center part process like the figure above.
Performance data

Fluid: Shell tellus 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.
DOWMAX® two-speed motor

**MK600**

<table>
<thead>
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<th>Specification</th>
<th>Value</th>
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<tr>
<td>Rated pressure</td>
<td>24.5MPa (250kgf/cm²)</td>
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<tr>
<td>Peak pressure</td>
<td>31.9MPa (325kgf/cm²)</td>
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<tr>
<td>Rated torque</td>
<td>2354/1177Nm (240/120kgf/m)</td>
</tr>
<tr>
<td>Max. Speed</td>
<td>300/600rpm</td>
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<tr>
<td>Change-over pilot pressure</td>
<td>more than self-pressure, Min. 0.98MPa (10kgf/cm²)</td>
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<tr>
<td>Max. pressure for pilot port</td>
<td>31.9MPa (325kgf/cm²)</td>
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<td>Pilot piston stroke volume</td>
<td>4.1cm³</td>
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<td>Mass</td>
<td>110 kg</td>
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</table>

**Nominal dimensions**

When manufacturing a flange in the customer, the flange central part process like the figure above.

Change of capacity
- Large displacement: Solenoid valve off
- Small displacement: Solenoid valve on

Change of capacity
- Large displacement: operate the lever to the right
- Small displacement: operate the lever to the left
Performance data

Fluid: Shell tellus 56 (Viscosity 37cSt at 50°C)
The graphs shown are mean values obtained for production units.
Bearing life and allowable radial load for shaft

**MK300**

**Allowable max. radial load**

<table>
<thead>
<tr>
<th>Pressure (MPa)</th>
<th>Bearing life (B-10 Life) (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>14</td>
<td>20</td>
</tr>
<tr>
<td>21</td>
<td>30</td>
</tr>
</tbody>
</table>

**Note:**
1. If motors are operated within the proper ratings and conditions, the operational life is determined by the Bearing Life.
2. In order to maintain the maximum bearing life, when a radial load is imposed on the output shaft the motor should be installed as illustrated in Fig. 2 or Fig. 3.
   - For a uni-directional application, motor should be installed so that side load acts as shown in Fig. 2.
   - For a bi-directional application, a radial load for each rotational direction being applied, the motor should be installed so that side loads act as shown in Fig. 3.
3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed for various pressures and radial loads.
   - When the shaft speed differs from 100 rpm the bearing life can be obtained by the following formula:
     \[
     \text{B-10 Life} = \left( \frac{\text{Bearing life obtainable in the graph}}{100} \right) \times \text{Actual shaft speed, rpm}
     \]

4. Applications with axial thrust loads should be referred to us.
5. When motor is used in Meter-Out circuit, pressure in Fig. 2 & 3 should be a sum of motor inlet and outlet pressure.
6. Bearing life varies due to kind of fluid. Bearing life should be decided by multiplying by the factor recommended:

<table>
<thead>
<tr>
<th>Fluid type</th>
<th>Life factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral-based fluid</td>
<td>1.0</td>
</tr>
<tr>
<td>Phosphate-ester fluid</td>
<td>1.0</td>
</tr>
<tr>
<td>Water-glycol w/o forced lubrication</td>
<td>0.05~0.10</td>
</tr>
<tr>
<td>Water-glycol w/ forced lubrication</td>
<td>0.6</td>
</tr>
</tbody>
</table>

**MK600**

**Allowable max. radial load**

<table>
<thead>
<tr>
<th>Pressure (MPa)</th>
<th>Bearing life (B-10 Life) (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>14</td>
<td>20</td>
</tr>
<tr>
<td>21</td>
<td>30</td>
</tr>
</tbody>
</table>

**Note:**
1. If motors are operated within the proper ratings and conditions, the operational life is determined by the Bearing Life.
2. In order to maintain the maximum bearing life, when a radial load is imposed on the output shaft the motor should be installed as illustrated in Fig. 2 or Fig. 3.
   - For a uni-directional application, motor should be installed so that side load acts as shown in Fig. 2.
   - For a bi-directional application, a radial load for each rotational direction being applied, the motor should be installed so that side loads act as shown in Fig. 3.
3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed for various pressures and radial loads.
   - When the shaft speed differs from 100 rpm the bearing life can be obtained by the following formula:
     \[
     \text{B-10 Life} = \left( \frac{\text{Bearing life obtainable in the graph}}{100} \right) \times \text{Actual shaft speed, rpm}
     \]

4. Applications with axial thrust loads should be referred to us.
5. When motor is used in Meter-Out circuit, pressure in Fig. 2 & 3 should be a sum of motor inlet and outlet pressure.
6. Bearing life varies due to kind of fluid. Bearing life should be decided by multiplying by the factor recommended:
This brake is a wet multi-disc type and is of a pressure-release type (negative brake type) where the brake is on at all time and is released only when the pilot fluid is led through the brake releasing port. Any adjustment after initial installation is not required.

The mechanical brake provides the following two types. Select one depending on application.

- Cartridge type mechanical brake which enables easy mounting and dismounting with the hydraulic motor (BB, BC, BP, BR types)
- Integral shaft type mechanical brake which is compact and light weight (MB type)
  - The mechanical brake is highly durable as it has adopted wet type multiple discs/plates.
  - Having a large torque capacity, it is suited for a wide range of applications.
  - Safe operation is ensured as it is a pressure-release type (brake is only released by applying pressure).
  - Being compact in construction, it is easy to design its installation on any equipment.
  - It provides a large radial load capability, because of a large capacity roller bearing being adopted on the drive shaft.
  - The brake motor has a quick access for servicing as the removal of either brake or motor can easily be made.

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MB175AP100 ......................................................................................................................................... 64
MB300BP150 ........................................................................................................................................ 66
MB350BP150 ........................................................................................................................................ 66
ME600BCS2550+BB250BC .................................................................................................................. 68
ME750BCS2560+BC300-C .................................................................................................................... 70
ME850BCS2570+BC300-C .................................................................................................................... 70
MK300-FS001+BP121-C ......................................................................................................................... 72
MK600-CS002+BR250-C ......................................................................................................................... 74
Structure & operating principle

The internal structure of the mechanical brake is shown above. The friction plates and steel plates are located one side the other, and the braking torque is generated by the friction force applied when the spring presses these plates. The friction plates are placed on the splined drive shaft for cartridge type and on the brake spline for integral shaft type, which are connected to the motor shaft with a key. The steel plates are placed on the brake cylinder for cartridge type and brake plunger for integral shaft type by splines. The braking torque is generated by the force of the spring, and when a pressure higher than a spring force is applied in the brake releasing port, the friction plates and steel plates are separated and the brake is released. When the pressure at the brake releasing port is lowered, the brake plunger is pressed against the friction plate by the spring force, and the brake torque is generated by the friction force between the plates.
**Performance data**

<table>
<thead>
<tr>
<th>Model</th>
<th>Displacement cm³/rev</th>
<th>Rated pressure MPa (kgf/cm²)</th>
<th>Peak pressure MPa (kgf/cm²)</th>
<th>Rated torque Nm (kgf·m)</th>
<th>Rated speed rpm</th>
<th>Max. speed rpm</th>
<th>Static brake torque Nm (kgf·m)</th>
<th>Brake releasing pressure MPa (kgf/cm²)</th>
<th>Max. pressure for cylinder MPa (kgf/cm²)</th>
<th>Brake cylinder stroke volume cm³</th>
<th>Mass kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>MB100-C40</td>
<td>99</td>
<td>27.5 (280)</td>
<td>31.9 (325)</td>
<td>432 (44)</td>
<td>1000</td>
<td>1000</td>
<td>392 (40)</td>
<td>1.23 (12.5)</td>
<td>980 (100)</td>
<td>31.9 (325)</td>
<td>13</td>
</tr>
<tr>
<td>MB150AP100</td>
<td>152</td>
<td></td>
<td></td>
<td>667 (68)</td>
<td>600</td>
<td>800</td>
<td>600 (80)</td>
<td>1.0 (10)</td>
<td>1470 (150)</td>
<td>1.2 (12)</td>
<td>20</td>
</tr>
<tr>
<td>MB175AP100</td>
<td>175</td>
<td></td>
<td></td>
<td>765 (78)</td>
<td>600</td>
<td>800</td>
<td>765 (78)</td>
<td>1.0 (10)</td>
<td>1470 (150)</td>
<td>1.2 (12)</td>
<td>20</td>
</tr>
<tr>
<td>MB300BP150</td>
<td>300</td>
<td></td>
<td></td>
<td>1320 (134)</td>
<td>660</td>
<td>800</td>
<td>1320 (134)</td>
<td>1.2 (12)</td>
<td>2940 (300)</td>
<td>1.2 (12)</td>
<td>56</td>
</tr>
<tr>
<td>MB300BP150</td>
<td>350</td>
<td></td>
<td></td>
<td>1530 (156)</td>
<td>660</td>
<td>800</td>
<td>1530 (156)</td>
<td>1.2 (12)</td>
<td>2940 (300)</td>
<td>1.2 (12)</td>
<td>56</td>
</tr>
<tr>
<td>MB600BCS250+BB250BC</td>
<td>300</td>
<td></td>
<td></td>
<td>2620 (267)</td>
<td>500</td>
<td>600</td>
<td>2620 (267)</td>
<td>1.2 (12)</td>
<td>2940 (300)</td>
<td>1.2 (12)</td>
<td>56</td>
</tr>
<tr>
<td>MB790BCS250+BC300-C</td>
<td>750</td>
<td></td>
<td></td>
<td>3280 (334)</td>
<td>450</td>
<td>520</td>
<td>3280 (334)</td>
<td>1.2 (12)</td>
<td>2940 (300)</td>
<td>1.2 (12)</td>
<td>56</td>
</tr>
<tr>
<td>MB350BCS250+BC300-C</td>
<td>848</td>
<td></td>
<td></td>
<td>3700 (377)</td>
<td>400</td>
<td>450</td>
<td>3700 (377)</td>
<td>1.2 (12)</td>
<td>2940 (300)</td>
<td>1.2 (12)</td>
<td>56</td>
</tr>
<tr>
<td>MK100-FS001+BF121-C</td>
<td>304</td>
<td></td>
<td></td>
<td>1190 (121)</td>
<td>600</td>
<td>600</td>
<td>1190 (121)</td>
<td>1.2 (12)</td>
<td>2940 (300)</td>
<td>1.2 (12)</td>
<td>56</td>
</tr>
<tr>
<td>MK100-FS001+BF121-C</td>
<td>301</td>
<td></td>
<td></td>
<td>1180 (120)</td>
<td>600</td>
<td>600</td>
<td>1180 (120)</td>
<td>1.2 (12)</td>
<td>2940 (300)</td>
<td>1.2 (12)</td>
<td>56</td>
</tr>
</tbody>
</table>

**Examples of application**

**Winch circuit.**

A case where the mechanical brake is applied to hold the load, when a change-over lever at neutral.

When this mechanical brake is used as dynamic brake, the friction plate will slip against steel plate, and in some cases excessive heat would be generated by friction. In such a case, please contact us.

**Truck (carrier) drive circuit.**

A case where the mechanical brake is used in combination with counter balance valve with brake valves, for traction drive use.

When this mechanical brake is used in combination with brake valve, for traction drive use.

**Brake characteristics**

The Brake torque is generated in proportion to the force exerted between the friction plates and steel plates. Therefore, the brake torque varies with the pressure at the brake releasing port and the drain pressure in the motor case. Every displacement have a specific curve, which is shown in respective motor brake characteristic graph, to show the relationship between the brake torque vs. the pressure at the brake releasing port and the drain pressure in the motor case.

Brake torque varies due to unevenness of friction coefficient between friction plate and steel plate, these curves shows the lower limit of these values.

**CAUTION:** In case motors are used as it’s output shaft to be positioned upward, some modification would be necessary. In this case, please contact us.

**Note:**

1. If motors are operated within the proper ratings and conditions, the operational life is determined by the Bearing Life.
2. In order to maintain the maximum bearing life, when a radial load is imposed on the output shaft the motor should be installed as illustrated in Fig. 2 or Fig. 3.
   - For a uni-directional application, motor should be installed so that side load acts as shown in Fig. 2.
   - For a bi-directional application, a radial load for each rotational direction being applied, the motor should be installed so that side loads act as shown in Fig. 3.
3. The graphs shown are the bearing life (B-10 Life) at 100 rpm shaft speed for various pressures and radial loads.

When the shaft speed differs from 100 rpm the bearing life can be obtained by the following formula:

\[
\text{B-10 Life} = \left( \frac{\text{Bearing life obtainable in the graph}}{100} \right) \times \frac{\text{Actual shaft speed, rpm}}{100}
\]

Caution: In case where the side load acts at a different location to the midpoint of the shaft projection please refer to us.
DOWMAX® with mechanical brake

**MB100–C40**

<table>
<thead>
<tr>
<th>Hydraulic motor</th>
<th>Displacement</th>
<th>99cm³/rev</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rated pressure</td>
<td>27.5MPa (280kgf/cm²)</td>
</tr>
<tr>
<td></td>
<td>Peak pressure</td>
<td>31.9MPa (325kgf/cm²)</td>
</tr>
<tr>
<td></td>
<td>Rated torque (theoretical)</td>
<td>432Nm (44kgf·m)</td>
</tr>
<tr>
<td></td>
<td>Rated speed</td>
<td>1000rpm</td>
</tr>
<tr>
<td></td>
<td>Max. speed</td>
<td>1000rpm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical brake</th>
<th>Static brake torque</th>
<th>392Nm (40kgf·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Brake releasing pressure</td>
<td>1.2MPa (12.5kgf/cm²)</td>
</tr>
<tr>
<td></td>
<td>Endurable press. of brake cylinder</td>
<td>31.9MPa (325kgf/cm²)</td>
</tr>
<tr>
<td></td>
<td>Brake cylinder stroke volume</td>
<td>13cm³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GD²</th>
<th>0.08kgm²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casing capacity</td>
<td>0.7 t</td>
</tr>
<tr>
<td>Mass</td>
<td>34kg</td>
</tr>
</tbody>
</table>

**Outline dimensions**

- **Spline shaft**
  - Shaft code: P
  - M8 depth 18
  - 2-M6 depth 12

- **Drain port (Dr) Rc1/4**
- **Eye bolt M8**
- **Port for brake releasing (Br) Rc1/8**
- **Main port 2-G1/2**

- **JIS B1301**
  - Parallel keyed shaft (std.)
  - Shaft code: C

- **JIS D2001 Involute spline**
  - 35 x 19 x 1.667 (Class b)
**DOWMAX® with mechanical brake**

### Coding

**Output shaft**
- C – Standard shaft (New JIS key straight shaft)
- P – Metric spline shaft
- S – Special shaft

**Special specification number**

**Special spec.**
- No indication – Standard specification
- S – Special specification

**Brake characteristics**

**Bearing life**

### Allowable radial load

(Pressure at brake releasing port) minus (Drain pressure in case)

#### Bearing life

<table>
<thead>
<tr>
<th>Direction of radial load</th>
<th>MB100</th>
<th>N = 500rpm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image" alt="Diagram" /></td>
<td><img src="image" alt="Diagram" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pressure (MPa)</th>
<th>Bearing life (B-10Life) (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0.2</td>
<td>2.5</td>
</tr>
<tr>
<td>0.4</td>
<td>5.0</td>
</tr>
<tr>
<td>0.6</td>
<td>7.5kN</td>
</tr>
<tr>
<td>0.8</td>
<td>10kN</td>
</tr>
<tr>
<td>1.0</td>
<td>15kN</td>
</tr>
<tr>
<td>1.2</td>
<td>20kN</td>
</tr>
</tbody>
</table>

---

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MB150AP100
MB175AP100

| Hydraulic motor | Displacement | 152 | 175 | cm³/rev
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated pressure</td>
<td>27.5 (280)</td>
<td>MPa (kgf/cm²)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak pressure</td>
<td>31.9 (325)</td>
<td>MPa (kgf/cm²)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated torque (theoretical)</td>
<td>667 (68)</td>
<td>765 (78)</td>
<td>Nm (kgf·m)</td>
<td></td>
</tr>
<tr>
<td>Rated speed</td>
<td>800</td>
<td>rpm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. speed</td>
<td>800</td>
<td>rpm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical brake</th>
<th>Static brake torque</th>
<th>981 (100)</th>
<th>Nm (kgf·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brake releasing pressure</td>
<td>1.0 (10)</td>
<td>MPa (kgf/cm²)</td>
<td></td>
</tr>
<tr>
<td>Endurable press. of brake cylinder</td>
<td>31.9 (325)</td>
<td>MPa (kgf/cm²)</td>
<td></td>
</tr>
<tr>
<td>Brake cylinder stroke volume</td>
<td>20</td>
<td>cm³</td>
<td></td>
</tr>
</tbody>
</table>

| GD² | 0.25 | kgm² |
| Casing capacity | 1.0 | ℓ |
| Mass | 71 | kg |

Outline dimensions

Direction of rotation
R : Supplied high pressure oil at port R
L : Supplied high pressure oil at port L

Spline shaft
Shaft code : P

JIS D2001 Involute Spline
45 × 16 × 2.5 (Class b)
**Coding**

<table>
<thead>
<tr>
<th>DOWMAX model No.</th>
<th>Output shaft</th>
<th>Special spec.</th>
<th>Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>MB 175 A P 100</td>
<td>C – Standard shaft (New JIS key straight shaft)</td>
<td>No indication – Standard specification</td>
<td>No indication – Standard metric port</td>
</tr>
<tr>
<td>(Displacement (cm³/rev)</td>
<td>P – Metric Spline shaft</td>
<td>S – Special shaft</td>
<td>A – C100 counter balance valve mounting port</td>
</tr>
<tr>
<td>150 175</td>
<td>S – Special shaft</td>
<td>B – C300 B &amp; CW300A counter balance valve mounting port</td>
<td></td>
</tr>
</tbody>
</table>

**Brake characteristics**

- **Bearing life**
  - **F** = 30kN
  - **N** = 100rpm

**Allowable radial load**

- **MB150AP100**
- **MB175AP100**

**Bearing life**

- **MB150A**
- **MB175A**
### Hydraulic Motor

<table>
<thead>
<tr>
<th>Metric</th>
<th>MB300BP150</th>
<th>MB350BP150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement</td>
<td>300</td>
<td>350</td>
</tr>
<tr>
<td>Rated pressure</td>
<td>27.5 (280)</td>
<td>MPa (kgf/cm²)</td>
</tr>
<tr>
<td>Peak pressure</td>
<td>31.9 (325)</td>
<td>MPa (kgf/cm²)</td>
</tr>
<tr>
<td>Rated torque</td>
<td>1320 (135)</td>
<td>Nm (kgfcm)</td>
</tr>
<tr>
<td>Rated speed</td>
<td>660</td>
<td>rpm</td>
</tr>
<tr>
<td>Max. speed</td>
<td>800</td>
<td>rpm</td>
</tr>
<tr>
<td>Static brake torque</td>
<td>1470 (150)</td>
<td>Nm (kgfcm)</td>
</tr>
<tr>
<td>Brake releasing pressure</td>
<td>1.2 (12)</td>
<td>MPa (kgf/cm²)</td>
</tr>
<tr>
<td>Endurable press. of brake cylinder</td>
<td>31.9 (325)</td>
<td>MPa (kgf/cm²)</td>
</tr>
<tr>
<td>Brake cylinder stroke volume</td>
<td>20</td>
<td>cm³</td>
</tr>
</tbody>
</table>

### Mechanical Brake

<table>
<thead>
<tr>
<th>Metric</th>
<th>MB300BP150</th>
<th>MB350BP150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Static brake torque</td>
<td>1470 (150)</td>
<td>Nm (kgfcm)</td>
</tr>
<tr>
<td>Brake releasing pressure</td>
<td>1.2 (12)</td>
<td>MPa (kgf/cm²)</td>
</tr>
<tr>
<td>Endurable press. of brake cylinder</td>
<td>31.9 (325)</td>
<td>MPa (kgf/cm²)</td>
</tr>
<tr>
<td>Brake cylinder stroke volume</td>
<td>20</td>
<td>cm³</td>
</tr>
</tbody>
</table>

### Outline Dimensions

- **Spline shaft**
  - **Shaft code:** P
- **Parallel keyed shaft** (std.)
  - **Shaft code:** C

### Diagrams

- Port for brake releasing
- Drain port (Dr) G1/2
- Eye bolt M10

### Tables

- **JIS B1301 Involute spline**
  - 50 x 18 x 2.5 (Class b)

### Other Information

- **Casing capacity:** 1.5 ℓ
- **Mass:** 89 kg

---

**Model Numbers**

- MB300BP150
- MB350BP150
DOWMAX® with mechanical brake

Coding

**DOWMAX model No.**
- Model: 300 350
- Displacement (cm³/rev): 300 350

**Output shaft**
- C – Standard shaft (New JIS key straight shaft)
- P – Metric Spline shaft
- S – Special shaft

**Special spec.**
- No indication – Standard specification
- S – Special specification

**Special specification number**

**Port**
- No indication – Standard metric port
  - A – C100C1 counter balance valve mounting port
  - B – C300C1 B & CV300A counter balance valve mounting port

**Brake characteristics**

**Allowable radial load**

(Pressure at brake releasing port) minus (Drain pressure in case)

**Bearing life**

<table>
<thead>
<tr>
<th>Direction of radial load</th>
<th>MB300B</th>
<th>MB350B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="chart1.png" alt="Diagram" /></td>
<td><img src="chart2.png" alt="Diagram" /></td>
</tr>
<tr>
<td></td>
<td><img src="chart3.png" alt="Diagram" /></td>
<td><img src="chart4.png" alt="Diagram" /></td>
</tr>
</tbody>
</table>

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**ME600BCS2550+BB250BC**

### Hydraulic motor

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement</td>
<td>600 cm³/rev</td>
</tr>
<tr>
<td>Rated pressure</td>
<td>27.5 MPa (280 kgf/cm²)</td>
</tr>
<tr>
<td>Peak pressure</td>
<td>31.9 MPa (325 kgf/cm²)</td>
</tr>
<tr>
<td>Rated torque (theoretical)</td>
<td>2620 Nm (267 kgf·m)</td>
</tr>
<tr>
<td>Rated speed</td>
<td>500 rpm</td>
</tr>
<tr>
<td>Max. speed</td>
<td>600 rpm</td>
</tr>
</tbody>
</table>

### Mechanical brake

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Static brake torque</td>
<td>2450 Nm (250 kgf·m)</td>
</tr>
<tr>
<td>Brake releasing pressure</td>
<td>1.2 MPa (12 kgf/cm²)</td>
</tr>
<tr>
<td>Endurable press. of brake cylinder</td>
<td>31.9 MPa (325 kgf/cm²)</td>
</tr>
<tr>
<td>Brake cylinder stroke volume</td>
<td>58 cm³</td>
</tr>
</tbody>
</table>

**GD²** 0.91 kg·m²

Casing capacity 2.7 ℓ

Mass 190 kg

### Outline dimensions

**Spline shaft**

**Shaft code: P**

**Parallel keyed shaft (std.)**

**Shaft code: C**

**Port for brake releasing (Br) Rc1/4:**

- Port for brake releasing (Br) Rc1/4
- Drain port (Dr) G1/2
- Drain port (Dr) G1/2
- Drain port (Dr) G1/2
- Drain port (Dr) G1/2
- Drain port (Dr) G1/2

**Shaft code: C**

**JIS B1301 Involute spline**

**60 x 22 x 2.5 (Class b)**

**Direction of rotation**

- R: Supplied high pressure oil at port R
- L: Supplied high pressure oil at port L
DOWMAX® with mechanical brake

Coding

<table>
<thead>
<tr>
<th>ME600BC</th>
<th>S2550+BB250BC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port</td>
<td>Special Spec.</td>
</tr>
<tr>
<td>No indication</td>
<td>No indication</td>
</tr>
<tr>
<td>A - C100</td>
<td>Standard specification</td>
</tr>
<tr>
<td>B - C300&lt;sup&gt;□&lt;/sup&gt; &amp; CW00A</td>
<td>Special specification</td>
</tr>
<tr>
<td>brake valve mounting port</td>
<td></td>
</tr>
<tr>
<td>Indication</td>
<td>Special Specification Number</td>
</tr>
<tr>
<td>sign</td>
<td></td>
</tr>
<tr>
<td>Brake torque</td>
<td></td>
</tr>
<tr>
<td>Nm (kgfm)</td>
<td></td>
</tr>
<tr>
<td>2450 (250)</td>
<td></td>
</tr>
<tr>
<td>1960 (200)</td>
<td></td>
</tr>
<tr>
<td>1470 (150)</td>
<td></td>
</tr>
<tr>
<td>981 (100)</td>
<td></td>
</tr>
<tr>
<td>491 (50)</td>
<td></td>
</tr>
</tbody>
</table>

Special Spec.

<table>
<thead>
<tr>
<th>No indication</th>
<th>Standard specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td></td>
</tr>
</tbody>
</table>

Motor shaft

<table>
<thead>
<tr>
<th>No indication</th>
<th>Standard specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>New JIS key straight shaft</td>
</tr>
<tr>
<td>P</td>
<td>Metric Spline shaft</td>
</tr>
<tr>
<td>S</td>
<td>Special shaft</td>
</tr>
</tbody>
</table>

Brake characteristics

![Graph showing brake characteristics](image)

Allowable radial load

![Graph showing allowable radial load](image)

Bearing life

<table>
<thead>
<tr>
<th>Direction of radial load</th>
<th>ME600B</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>83mm</td>
</tr>
</tbody>
</table>

![Graph showing bearing life](image)

<table>
<thead>
<tr>
<th>ME600B</th>
<th>ME600B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bearing life (B-10Life) (hrs)</td>
<td>Bearing life (B-10Life) (hrs)</td>
</tr>
<tr>
<td>N = 100rpm</td>
<td>N = 100rpm</td>
</tr>
<tr>
<td>F = 40kN</td>
<td>F = 40kN</td>
</tr>
</tbody>
</table>

F = 40kN
**ME750BCS2560+BC300-C**

**ME850BCS2570+BC300-C**

<table>
<thead>
<tr>
<th>Hydraulic motor</th>
<th>Displacement</th>
<th>750</th>
<th>848</th>
<th>cm³/rev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated pressure</td>
<td>27.5 (280)</td>
<td>MPa (kgf/cm²)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak pressure</td>
<td>31.9 (325)</td>
<td>MPa (kgf/cm²)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated torque (theoretical)</td>
<td>3280 (334)</td>
<td>3708 (378)</td>
<td>Nm (kgfcm)</td>
<td></td>
</tr>
<tr>
<td>Rated speed</td>
<td>450</td>
<td>400</td>
<td>rpm</td>
<td></td>
</tr>
<tr>
<td>Max. speed</td>
<td>520</td>
<td>450</td>
<td>rpm</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical brake</th>
<th>Static brake torque</th>
<th>2940 (300)</th>
<th>Nm (kgfcm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brake releasing pressure</td>
<td>1.2 (12)</td>
<td>MPa (kgf/cm²)</td>
<td></td>
</tr>
<tr>
<td>Endurable press. of brake cylinder</td>
<td>31.9 (325)</td>
<td>MPa (kgf/cm²)</td>
<td></td>
</tr>
<tr>
<td>Brake cylinder stroke volume</td>
<td>58</td>
<td>cm³</td>
<td></td>
</tr>
</tbody>
</table>

| GD² | 1.25 | kgm² |
| Casing capacity | 3.0 | ℓ |
| Mass | 217 | kg |

**Outline dimensions**

- **Direction of rotation**
  - R: Supplied high pressure oil at port R
  - L: Supplied high pressure oil at port L

- **Spline shaft**
  - Shaft code: P

- **JIS D2001 Involute spline**
  - 60 x 22 x 2.5 (Class b)
DOWMAX® with mechanical brake

Coding

DOWMAX® model No.

<table>
<thead>
<tr>
<th>Model</th>
<th>ME750B</th>
<th>ME850B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement (cm^3/rev)</td>
<td>750</td>
<td>848</td>
</tr>
</tbody>
</table>

Port

No indication - Standard metric port
A - C100C counter balance valve mounting port
B - C300C B & CV300A counter balance valve mounting port

Motor shaft

C - Standard shaft (New JIS key straight shaft)
P - Metric spline shaft
S - Special shaft

Special specification number

Bearing characteristics

Brake torque

<table>
<thead>
<tr>
<th>Pressure (MPa)</th>
<th>70</th>
<th>14</th>
<th>21</th>
<th>27.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure at brake releasing port</td>
<td>10000</td>
<td>20000</td>
<td>40000</td>
<td>0</td>
</tr>
</tbody>
</table>

Allowable radial load

<table>
<thead>
<tr>
<th>Pressure (MPa)</th>
<th>70</th>
<th>14</th>
<th>21</th>
<th>27.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure at brake releasing port</td>
<td>10000</td>
<td>20000</td>
<td>30000</td>
<td>0</td>
</tr>
</tbody>
</table>

Bearing life

Direction of radial load

<table>
<thead>
<tr>
<th>ME750B</th>
<th>ME850B</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = 100rpm</td>
<td></td>
</tr>
<tr>
<td>0 7 14 21 27.5</td>
<td></td>
</tr>
<tr>
<td>0 7 14 21 27.5</td>
<td></td>
</tr>
<tr>
<td>0 7 14 21 27.5</td>
<td></td>
</tr>
<tr>
<td>F = 40kN</td>
<td></td>
</tr>
<tr>
<td>F = 40kN</td>
<td></td>
</tr>
<tr>
<td>F = 40kN</td>
<td></td>
</tr>
</tbody>
</table>

Special specification

No indication - Standard specification
S - Special specification

Brake torque

<table>
<thead>
<tr>
<th>Pressure (MPa)</th>
<th>70</th>
<th>14</th>
<th>21</th>
<th>27.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure at brake releasing port</td>
<td>10000</td>
<td>20000</td>
<td>30000</td>
<td>0</td>
</tr>
</tbody>
</table>

Allowable radial load

<table>
<thead>
<tr>
<th>Pressure (MPa)</th>
<th>70</th>
<th>14</th>
<th>21</th>
<th>27.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure at brake releasing port</td>
<td>10000</td>
<td>20000</td>
<td>30000</td>
<td>0</td>
</tr>
</tbody>
</table>
**DOWMAX® with mechanical brake**

**MK300-FS001+BP121-C**

<table>
<thead>
<tr>
<th>Hydraulic motor</th>
<th>Displacement</th>
<th>304</th>
<th>152</th>
<th>cm³/rev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated pressure</td>
<td>24.5 (250)</td>
<td>MPa</td>
<td>kgf/cm²</td>
<td></td>
</tr>
<tr>
<td>Peak pressure</td>
<td>31.9 (325)</td>
<td>MPa</td>
<td>kgf/cm²</td>
<td></td>
</tr>
<tr>
<td>Rated torque (theoretical)</td>
<td>1190 (121)</td>
<td>Nm</td>
<td>kgfcm</td>
<td></td>
</tr>
<tr>
<td>Rated speed</td>
<td>600</td>
<td>rpm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. speed</td>
<td>600</td>
<td>rpm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Mechanical brake              | Static brake torque | 1190 (121) | Nm (kgfcm) |
| Braking releasing pressure    | 1.2 (12)         | MPa (kgf/cm²) |
| Endurable press. of brake cylinder | 31.9 (325) | MPa (kgf/cm²) |
| Brake cylinder stroke volume | 37             | cm³       |

| GD²                          | 0.34          | kgm²     |
| Casing capacity              | 1.9           | ℓ        |
| Mass                         | 102           | kg       |

**Outline dimensions**

**JIS D2001 Involute spline**

- Length: 45 x 16 x 2.5 (Class b)

**Shaft Code C**

- JIS B1301 parallel keyed shaft (std.)
- M10 depth 20
- 2-M8 depth 12
- 6×14 (Mounting bolt size M12)
- Drain port (Dr) Rc1/2
- Port for brake releasing (Br) Rc1/4
- Drain port (Dr) Rc1/2
- Main port 2-Rc3/4
- Drain port (Dr) Rc1/2, Port for brake releasing (Br) Rc1/4

**Shaft Code P**

- M10 depth 20
- 2-M8 depth 12
- JIS D2001 Involute spline

**Spline shaft**

- 45 x 16 x 2.5 (Class b)

**Outline dimensions**

- Drain port (Dr) Rc1/2
- Port for brake releasing (Br) Rc1/4
- Drain port (Dr) Rc1/2
- Main port 2-Rc3/4
- Drain port (Dr) Rc1/2, Port for brake releasing (Br) Rc1/4

**Shaft Code C**

- JIS B1301 parallel keyed shaft (std.)
- M10 depth 20
- 2-M8 depth 12
- 6×14 (Mounting bolt size M12)

**Shaft Code P**

- M10 depth 20
- 2-M8 depth 12

**JIS D2001 Involute spline**

- 45 x 16 x 2.5 (Class b)
DOWMAX® with mechanical brake

**Coding**

<table>
<thead>
<tr>
<th>Directional valve sign</th>
<th>Brake torque</th>
<th>Output shaft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flange sign</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Refer to Page 52

<table>
<thead>
<tr>
<th>Special specification number</th>
</tr>
</thead>
<tbody>
<tr>
<td>MK300-FF2AS001+BP121-C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Special spec.</th>
</tr>
</thead>
<tbody>
<tr>
<td>No indication</td>
</tr>
<tr>
<td>Standard specification</td>
</tr>
<tr>
<td>S – Special specification</td>
</tr>
</tbody>
</table>

**Brake characteristics**

<table>
<thead>
<tr>
<th>Bearing life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direction of radial load</td>
</tr>
<tr>
<td>Large displacement</td>
</tr>
<tr>
<td>Small displacement</td>
</tr>
</tbody>
</table>

(Pressure at brake releasing port) minus (Drain pressure in case)

![Graph of Brake characteristics](image1)

![Graph of Allowable radial load](image2)

![Graph of Bearing life](image3)
### MK600-CS002+BR250-C

#### Hydraulic motor

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displacement</td>
<td>602, 301 cm³/rev</td>
</tr>
<tr>
<td>Rated pressure</td>
<td>24.5 (250) MPa (kgf/cm²)</td>
</tr>
<tr>
<td>Peak pressure</td>
<td>31.9 (325) MPa (kgf/cm²)</td>
</tr>
<tr>
<td>Rated torque (theoretical)</td>
<td>2350 (240) Nm (kgfcm)</td>
</tr>
<tr>
<td>Max. speed</td>
<td>300, 600 rpm</td>
</tr>
</tbody>
</table>

#### Mechanical brake

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Static brake torque</td>
<td>2450 (250) Nm (kgfcm)</td>
</tr>
<tr>
<td>Brake releasing pressure</td>
<td>1.2 (12) MPa (kgf/cm²)</td>
</tr>
<tr>
<td>Endurable press. of brake cylinder</td>
<td>31.9 (325) MPa (kgf/cm²)</td>
</tr>
<tr>
<td>Brake cylinder stroke volume</td>
<td>58 cm³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>GD²</td>
<td>1.0 kgm²</td>
</tr>
<tr>
<td>Casing capacity</td>
<td>2.9 ℓ</td>
</tr>
<tr>
<td>Mass</td>
<td>204 kg</td>
</tr>
</tbody>
</table>

#### Outline dimensions

[Diagram of hydraulic motor and mechanical brake with dimensions and annotations]

**Drain port (Dr) Rc1/2**

**Port for brake releasing (Br) Rc1/4**

**Eye bolt M10**

**Eye bolt M12**

**Drain port (Dr) Rc1/2**

**Port for brake releasing (Br) Rc1/4**

**M16 depth 30**

**2-M10 depth 15**

**JIS D2001 Involute spline**

**Spline shaft**

**Shaft code: P**

**Parallel keyed shaft (std.)**

**Shaft code: C**

**Direction of rotation**

R : Supplied high pressure oil at port R
L : Supplied high pressure oil at port L

**JIS B1301**

**Over-pin dia.**

**Over-all across a point number**

**Outer dia.**

**Inner dia.**

### Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tooth form</td>
<td>+0.800</td>
</tr>
<tr>
<td>Modulus</td>
<td>2.5</td>
</tr>
<tr>
<td>Pressure angle</td>
<td>20°</td>
</tr>
<tr>
<td>Number of teeth</td>
<td>22</td>
</tr>
<tr>
<td>Grade</td>
<td>5G</td>
</tr>
<tr>
<td>Over-pin dia.</td>
<td>64.516</td>
</tr>
<tr>
<td>Over-all across a point number</td>
<td>27.970</td>
</tr>
<tr>
<td>Outer dia.</td>
<td>59.5</td>
</tr>
<tr>
<td>Inner dia.</td>
<td>54</td>
</tr>
</tbody>
</table>

#### Displacement

- **602 cm³/rev**
- **301 cm³/rev**

#### Rated pressure

- **24.5 MPa (kgf/cm²)**
- **250 MPa (kgf/cm²)**

#### Peak pressure

- **31.9 MPa (kgf/cm²)**
- **325 MPa (kgf/cm²)**

#### Rated torque (theoretical)

- **2350 Nm (kgfcm)**
- **240 Nm (kgfcm)**

#### Rated speed

- **300 rpm**
- **600 rpm**

#### Max. speed

- **300 rpm**
- **600 rpm**

#### Static brake torque

- **2450 Nm (kgfcm)**

#### Brake releasing pressure

- **1.2 MPa (kgf/cm²)**

#### Endurable press. of brake cylinder

- **31.9 MPa (kgf/cm²)**

#### Brake cylinder stroke volume

- **58 cm³**

#### GD²

- **1.0 kgm²**

#### Casing capacity

- **2.9 ℓ**

#### Mass

- **204 kg**
### Coding

- **Directional valve sign**
- **Flange sign**

Refer to Page 52

- **Indication sign**
- **Brake torque**
  - Nm (kgf·m)
  - 250 (250), 200 (200), 150 (150), 100 (100), 50 (50)

- **Output shaft**
  - C – Standard shaft (New JIS key straight shaft)
  - P – Metric spline shaft
  - S – Special shaft

### Brake characteristics

- **Bearing life**
- **Allowable radial load**

---

### Bearing life

**Direction of radial load**

- Large displacement
- Small displacement

**Bearing life (B-10Life) (hrs)**

<table>
<thead>
<tr>
<th>Pressure (MPa)</th>
<th>Large displacement</th>
<th>Small displacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>14</td>
<td>21</td>
</tr>
<tr>
<td>14</td>
<td>21</td>
<td>24.5</td>
</tr>
<tr>
<td>21</td>
<td>24.5</td>
<td>24.5</td>
</tr>
</tbody>
</table>

**Allowable radial load (kN)**

<table>
<thead>
<tr>
<th>Pressure (MPa)</th>
<th>Large displacement</th>
<th>Small displacement</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>20</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>30</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

---

### Allowable radial load

- **Distance from mounting face (mm)**
- **Center of shaft**

---

- **Bearing life (B-10Life) (hrs)**
- **Pressure (MPa)**

---

- **Brake characteristics**
- **Bearing life**
- **Allowable radial load**

---

- **Brake torque (Nm)**
- **Pressure at brake releasing port** minus **Drain pressure in case**

---

- **0.20**
- **1000**
- **2000**
- **3000**

---

- **0.40 0.60 0.80 1.00 1.20**
- **10**
- **20**
- **30**
- **40**

---

- **0 10 20 30 40 50 60 83**
- **83mm**

---

- **F**
- **83mm**

---

- **BR050**
- **BR100**
- **BR150**
- **BR200**
- **BR250**
With a recent trend that a larger capacity is required for machinery like those for construction, ship/marine equipment and steel mill, a compact hydraulic motor with a larger torque capacity is much more required.

Geared motor DOWMAX (using planetary reduction gear) is developed to answer this requirement and they are already proving its merits in many fields including the shield tunneling machines, steel mill equipment.

Hydraulic motor:
DOWMAX motor - a reputable low-speed high-torque motor for its superior performance and reliability owing to the structure of the double swash plate and opposed multiple piston.

Reduction gear:
Planetary gears boast impact-resistance, superior anti-wear features, reliability for long time use and compact size, as they are manufactured with high quality material through heat treatment and high-precision gear cutting, based on the principle of an effective load distribution.

This catalog is useful for frequent use.

Note: This catalog contains planetary gear combinations which are frequently used. There motors can be mige compatible for high-torque, high reduction ratio other than specified values in this catalog. We appreciate your inquiry in this regard.

Single-Stage Reduction Gear with DOWMAX motor (Reduction ratio: 5.091)
Double-Stage Reduction Gear with DOWMAX motor (Reduction ratio: 24 or 26.3)
DOWMAX motor is developed with planetary gear suitable for the application of Shield Tunneling.
All kind of DOWMAX motor (two-speed, with Mechanical Brake, with Counter Balance Valve etc.) and special motor and planetary gear reduction motor combined together are compatible.

### Model no.

<table>
<thead>
<tr>
<th>Hydraulic motor</th>
<th>Gear reducer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Series</strong></td>
<td><strong>Motor size</strong></td>
</tr>
<tr>
<td>DOWMAX motor</td>
<td>Metric displacement</td>
</tr>
<tr>
<td><strong>Model no.</strong></td>
<td><strong>Motor shaft</strong></td>
</tr>
<tr>
<td>ME 300 B G</td>
<td>G – Metric hollowed spline shaft</td>
</tr>
<tr>
<td>GE 180 H F P005 - 002</td>
<td>G – Metric hollowed spline shaft</td>
</tr>
</tbody>
</table>
### Single reduction

**Gear ratio 5.091**

#### Specification

<table>
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- The allowable output torque differs for the output speed used.
- The intermittent max. torque shall be within the duty cycle of 1% per every time.
- Effective pressure is calculated for the rated output torque, by using following values for efficiency.
- Mechanical efficiency of gear (Single reduction): 0.98
- Mechanical efficiency of gear (Double reduction): 0.95
- Torque efficiency of motor: 0.95
- The allowable radial load is at the midpoint of the standard shaft length.
- Incase motor casing pressure (Drain line) comes below 0 gauge pressure even when motor is off-operation, special specification (Double oil seal) should be applied. In this case please contact us.
- For detail information for motor, please refer to catalog another page.
- In case motor are used, as its output shaft to be positioned upward or downward, special specification (Double oil seal) should be applied. In this case, please contact us.
- Please contact us if none of the above meet the specification. Special specification should be applied.
DOWMAX® motor with planetary gear

Dimensions

Single reduction

Involute spline shaft (Old Std. JIS D2001-1959, Side fit, Class b)

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Parallel keyed shaft (Key Std. JIS B1301-1976, Parallel key)

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Planetary gear

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Note: Volume of lubrication oil shows for horizontal installation.

Hydraulic motor with hollow shaft

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<td>18.1</td>
<td>78880</td>
<td>26.7</td>
<td>411000</td>
<td>1023</td>
</tr>
<tr>
<td>ME1300AT</td>
<td>GE500HFP024-046</td>
<td>24.0</td>
<td>32280</td>
<td>10</td>
<td>93800</td>
<td>20.0</td>
<td>103290</td>
<td>22.0</td>
<td>470000</td>
<td>1370</td>
</tr>
</tbody>
</table>

- The allowable output torque differs for the output speed used.
- The Intermittent max. torque shall be within the duty cycle of 1% per every minute.
- Effective pressure is calculated for the rated output torque, by using following values for efficiency.
- Mechanical efficiency of gear: 0.96
- Torque efficiency of motor: 0.99
- The allowable radial load is at the midpoint of the standard shaft length.
- In case motor casing pressure (Drain line) comes below 0 gauge pressure even when motor is off-operation, Special specification (Double oil seal) should be applied. In this case, please contact us.
- In case motor are used, as its output shaft to be positioned upward or downward, special specification (Double oil seal) should be applied. In this case, please contact us.
- Please contact us if none of the above meet the specification. Special specification should be applied.
Dimensions

Double reduction

Involute spline shaft (Old std. JIS D2001-1959, Side fit, Class b)

\[
\begin{array}{|c|c|c|c|c|c|c|c|}
\hline
\text{Model} & D^* & Z & m & L_1 & L_2 & S & W \\
\hline
\text{GE250***026} & 110 & 20 & 5 & 120 & 35 & M16 & 70 \\
\text{GE31M***024} & 130 & 24 & 5 & 130 & 35 & M16 & 80 \\
\text{GE35S***024} & 150 & 28 & 5 & 145 & 40 & M20 & 90 \\
\text{GE35S***024} & 170 & 32 & 5 & 170 & 40 & M20 & 100 \\
\text{GE35S***024} & 200 & 38 & 5 & 200 & 50 & M24 & 130 \\
\text{GE500***024} & 220 & 27 & 7.5 & 250 & 50 & M24 & 130 \\
\hline
\end{array}
\]

Parallel keyed shaft (Key std. JIS B1301-1976, Parallel key)

\[
\begin{array}{|c|c|c|c|c|c|c|c|}
\hline
\text{Model} & D (m6) & b & h & t & S & L_2 & L \\
\hline
\text{GE250***026} & 105 & 28 & 16 & 10 & M12 & 28 & 140 & 207 \\
\text{GE31M***024} & 125 & 32 & 18 & 11 & M12 & 28 & 170 & 239 \\
\text{GE35S***024} & 145 & 36 & 20 & 12 & M16 & 30 & 210 & 285 \\
\text{GE400***024} & 165 & 40 & 22 & 13 & M16 & 30 & 225 & 315 \\
\text{GE500***024} & 195 & 45 & 25 & 15 & M16 & 30 & 270 & 358 \\
\text{GE600***024} & 215 & 50 & 28 & 17 & M20 & 35 & 300 & 408 \\
\hline
\end{array}
\]

Planetary gear

\[
\begin{array}{|c|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline
\text{Model} & C & D_1 & D_2 & D_3 (f8) & DC & E & G & H_1 & H_2 & P & d & n & \alpha & \text{Lub Oil (ℓ)} \\
\hline
\text{GE250***026} & 412 & 410 & 360 & 265 & 315 & 28 & 287 & 218 & 10 & 22 & 16 & 11.25 & 4 \\
\text{GE35S***024} & 643 & 625 & 555 & 485 & 540 & 45 & 260 & 360 & 25 & 33 & 16 & 11.25 & 18 \\
\text{GE500***024} & 723 & 710 & 640 & 570 & 575 & 55 & 288 & 398 & 25 & 33 & 16 & 11.25 & 23 \\
\text{GE500***024} & 782 & 780 & 690 & 600 & 600 & 60 & 358 & 452 & 25 & 39 & 16 & 11.25 & 30 \\
\hline
\end{array}
\]

Note: Volume of lubrication oil shows for horizontal installation.

Hydraulic motor with hollow shaft

\[
\begin{array}{|c|c|c|c|c|c|c|c|c|c|c|c|}
\hline
\text{Model} & B & D_4 & H_2 & H_3 & H_4 & J_1 & J_2 & K_1 & k_2 \\
\hline
\text{ME18B} & 195 & 174 & – & 81 & – & 41 & – & Rc4 & – \\
\text{ME18B} & 184 & 220 & 154 & 107 & 107 & 50 & 80 & Rc5 & Rc5 \\
\text{ME18B} & 261 & 240 & 171 & 116 & 111 & 55 & 174 & G5 & G5 \\
\text{ME30B} & 261 & 240 & 171 & 116 & 111 & 55 & 174 & G5 & G5 \\
\text{ME30B} & 305 & 280 & 205 & 137 & 130 & 64 & 133 & G5 & G5 \\
\text{ME70B} & 337 & 297 & 211.5 & 141.5 & 145.5 & 110 & 70 & G5 & G5 \\
\text{ME85B} & 337 & 297 & 211.5 & 141.5 & 145.5 & 110 & 70 & G5 & G5 \\
\text{ME100A} & 373 & 335 & 228.5 & 167.5 & 153 & 72 & 208 & Rc5 & Rc5 \\
\hline
\end{array}
\]
DOWMAX® motor with planetary gear

Shield tunneling application

DOWMAX motors with planetary gear reduction are widely used in shield tunneling application due to outstanding durability and high efficiency.

- High performance result.......................................................... Good result in all Shield Tunneling Operation.
- High pressure application....................................................... Rated pressure 20.6 MPa, Max. pressure 24.5 MPa
- Compact....................................................................................... Compact and light weight due to special Dowmax shape.
- Outstanding durability............................................................... Dowmax and planetary gear has sufficient durability for Shield Tunneling Operation
- Smooth operation ..................................................................... Even at full power Dowmax with Planetary Gear can be run smooth and noise free.
- Smooth operation even at low-speed............................... With excellent performance at Low-Speed and Positioning performance Dowmax can be used as Electors also.

Specification

<table>
<thead>
<tr>
<th>Model</th>
<th>Gear ratio</th>
<th>Equivalent displacement cm³/rev</th>
<th>Rated pressure MPa (kgf/cm²)</th>
<th>Max. pressure MPa (kgf/cm²)</th>
<th>Rated torque Nm (kgfm)</th>
<th>Max. torque Nm (kgfm)</th>
<th>Rated speed (rpm)</th>
<th>Allowable radial load (kN)</th>
<th>Radial load point (Distance from mounting surface) (mm)</th>
<th>Mass kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME150-G + GE280HFP031-184</td>
<td>1/31.03</td>
<td>4717</td>
<td>20.6 (210)</td>
<td>24.5 (250)</td>
<td>14710 (1500)</td>
<td>17652 (1800)</td>
<td>20</td>
<td>160</td>
<td>128</td>
<td>252</td>
</tr>
<tr>
<td>ME1300AG+GEN18HFP006-185</td>
<td>1/6</td>
<td>8070</td>
<td>20.6 (210)</td>
<td>24.5 (250)</td>
<td>25125 (2562)</td>
<td>29910 (3050)</td>
<td>15</td>
<td>250</td>
<td>142.5</td>
<td>500</td>
</tr>
</tbody>
</table>

- Rated output torque and peak output torque is 95% of efficiency
- For the service life refer other catalog in conjunction with this catalog as life varies with different models.
  Rated speed is suitable for the rated pressure.
  In case of low pressure used continuously, there are other models also suitable for application according to use. Please enquire for any further requirement.
- This catalog is exclusively for Shield Cutter Drive. Therefore useful for Horizontal use only.
  In case of requirement of shaft in Upward or Downward direction please enquire as it becomes special specification.
- In case Dowmax motors of this series are required to be used for the operation other than cutter and that of Shield Tunneling please discuss with us.
- Dowmax motor with Planetary Gear can also be built with other reduction ratio as well as torque specification than those mentioned in the catalog.

We appreciate your enquiry for these models.

Selection chart

This chart indicates the relation of actual torque and shaft rotation at the rated pressure of 20.6MPa. Given the required torque and shaft speed the appropriate model can be selected from the diagram. When the operating pressure differs from 20.6MPa, refer to the performance data for the respective model.
ME150-G+GE280HFP031-184

Gear Parts No.: DY2184B

Equivalent displacement: 4,717 cm³/rev
Gear ratio: 1/31.03
Output torque: 14,710 Nm
Max. output torque: 17,652 Nm
Rated speed: 20 rpm

Bearing life

1. Radial load
   The load applied radially on the midpoint of the shaft extension should be less than the value indicated below:

<table>
<thead>
<tr>
<th>Pressure MPa</th>
<th>Radial load kN</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.6</td>
<td>160</td>
</tr>
</tbody>
</table>

2. Bearing life
   The gear box bearing life will vary as shown on the chart depending on the radial load imposed on the output shaft. The chart indicates the bearing life (B-10 Life) when the output speed is 20 rpm with the varied pressures and the radial load magnitudes. When the output speed is other than 20 rpm, it is obtained by the following formula:

   \[ B-10 \text{ Life} = \frac{\text{Bearing life obtainable on the chart}}{20} \times \text{Output speed} \]

   The bearing life, when the load point is not at the middle of shaft extension, is different from the chart. Refer to factory in such a case.

3. Lubrication
   - Quantity of lubricating oil: 4L for horizontal use
   - Lubricating oil: Mild EP gear oil equivalent to ISO VG220 (ambient temp. 0–35°C)

4. For detailed information for motor, please refer to other page.
ME1300AG+GEN18HFP006-185

Gear Parts No.: DY2185B

Equivalent displacement: 8,070cm³/rev
Gear ratio: 1/6
Output torque: 25,125Nm
Max. output torque: 29,910Nm
Rated speed: 15rpm

Bearing life

1. Radial load
   The load applied radially on the midpoint of the shaft extension should be
   less than the value indicated below:

   | Pressure MPa | 20.6 |
   | Radial load kN | 250 |

2. Bearing life
   The gear box bearing life will vary as shown on the chart depending on
   the radial load imposed on the output shaft. The chart indicates the bearing life
   (B-10 Life) when the output speed is 15 rpm with the varied pressures and
   the radial load magnitudes. When the output speed is other than 15 rpm, it
   is obtained by the following formula:

   B-10 Life = (Bearing life obtainable on the chart) x 15
   Output speed

   The bearing life, when the load point is not at the middle of shaft
   extension, is different from the chart. Refer to factory in such a case.

3. Lubrication
   Quantity of lubricating oil: 6L for horizontal use
   Lubricating oil: Mild EP gear oil equivalent to ISO VG220

4. For detailed information for motor, please refer to other page.
This counter balance valve generates the braking pressure in the hydraulic motor, proportional to the load in lowering loads at slewing, running and winching operations and thus prevent overrunning of motor forced by loads.

In addition, the counter balance valve contains housed brake valves to protect the hydraulic motor from overloads as well as smooth acceleration and deceleration of load.

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C300B ................................................................................ 89
CW300A .............................................................................. 91
Counter balance valve with brake valves

Model code

Series code
C – Counter balance valve with two-directional brake valve
CW – Counter balance valve with one-directional brake valve

rated flow
(CW 300 Y X A) Special function code
No sign – Standard product
Y – With mechanical brake release port
Z – With stroke adjusting mechanism for main spool
W – Y function + Z function

Cracking pressure
No sign – Standard cracking pressure
X – Higher cracking pressure model

Special specification code
No sign – Standard specification
S – Special specification

Design code
(begginging with - and in alphabetical order henceforth)

Accessory sub-plate code
for Direct connection with DOWMAX
(refer to the table below)

Special specification number

Special specification

Seal code
No sign – Standard seal
(nitrile rubber)
V – Viton Seal
(Fluoro-rubber)

Specification

<table>
<thead>
<tr>
<th>Model</th>
<th>Rated flow (ℓ/min)</th>
<th>Adjustable range of relief valve pressure (MPa)</th>
<th>Mass (kg)</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>C100</td>
<td>100</td>
<td>9.8<del>27.5 [100</del>280]</td>
<td>7</td>
<td>Allows smooth acceleration/deceleration at slewing, running and winching operations.</td>
</tr>
<tr>
<td>C100Y</td>
<td></td>
<td></td>
<td></td>
<td>To be used for hydraulic motors with mechanical brake, an automatic brake release ports is provided.</td>
</tr>
<tr>
<td>C100Z</td>
<td></td>
<td></td>
<td></td>
<td>To be used for devices at low flow rate and greater load changes, and matching with machines to be easily adjusted from outside.</td>
</tr>
<tr>
<td>C100W</td>
<td></td>
<td></td>
<td></td>
<td>Both Y and Z functions above are combined.</td>
</tr>
<tr>
<td>C300B</td>
<td>300</td>
<td></td>
<td>19</td>
<td>Allows smooth acceleration/deceleration at slewing, running and winching operations.</td>
</tr>
<tr>
<td>C300YB</td>
<td></td>
<td></td>
<td></td>
<td>To be used for hydraulic motors with mechanical brake, an automatic brake release ports is provided.</td>
</tr>
<tr>
<td>C300ZB</td>
<td></td>
<td></td>
<td></td>
<td>To be used for devices at low flow rate and greater load changes, and matching with machines to be easily adjusted from outside.</td>
</tr>
<tr>
<td>C300WB</td>
<td></td>
<td></td>
<td></td>
<td>Both Y and Z functions above are combined.</td>
</tr>
<tr>
<td>CW300A</td>
<td>300</td>
<td></td>
<td>24</td>
<td>This one-directional counter balance valve is used for winches allowing smooth rolling down operation.</td>
</tr>
</tbody>
</table>

• Operating oil temperature range : -20°C to +80°C.
• Operating oil viscosity range : 15 to 500cSt (optimum viscosity range : 25 to 100cSt)

★ Accessory sub-plate code for direct connection with DOWMAX

<table>
<thead>
<tr>
<th>Applicable DOWMAX Model</th>
<th>ME100</th>
<th>ME150 ME175 ME200B ME300B ME350B</th>
<th>ME60B</th>
<th>ME750B ME850B</th>
<th>ME1300A</th>
<th>ME1900</th>
<th>ME2000</th>
<th>ME3100</th>
<th>ME4100</th>
</tr>
</thead>
<tbody>
<tr>
<td>C100</td>
<td>–</td>
<td>A</td>
<td>N</td>
<td>C</td>
<td>R</td>
<td>G</td>
<td>H</td>
<td>K</td>
<td>J</td>
</tr>
<tr>
<td>C300</td>
<td>A</td>
<td>A</td>
<td>C</td>
<td>R</td>
<td>G</td>
<td>H</td>
<td>K</td>
<td>J</td>
<td></td>
</tr>
<tr>
<td>CW300A</td>
<td>A</td>
<td>A</td>
<td>C</td>
<td>R</td>
<td>G</td>
<td>H</td>
<td>K</td>
<td>J</td>
<td></td>
</tr>
</tbody>
</table>

(Models marked - can be directly connected without a sub-plate. However, a sub-plate code for direct connection in ME100+C100Y & C100W is NM.)
Counter balance valve with brake valves

Operation principle

1. Two-directional counter balance valves, C100, C300B

(During acceleration)
When the directional valve is switched to either direction to accelerate the hydraulic motor, assuming that the valve is switched to the (a) side, the fluid will be introduced to the A_v port. Then, the fluid is directed to the spring chamber A_s at the edge surface of the main spool through the pilot passage A_p of the counter balance valve and thus, the main spool will move to the right direction. Then, the fluid flown into the A_v port is introduced to the hydraulic motor from the A_m port through the check valve in the main spool. A_s, the hydraulic motor cannot absorb all the fluid flown into the A_v port until acceleration has been completed, the fluid pressure will rise up to the relief valve set pressure and the excessive fluid is discharged to the return line from the relief valve R_a.

(During neutral brake)
When the directional valve is returned to the neutral position, the pressure of A_v and B_v become equivalent, reaching the tank pressure and thus the main spool of the counter balance valve will be pushed back to the neutral position by the spring force. As the return line is closed by the check valve in the main spool, the pressure at the return side will be raised up to the relief valve set pressure and the hydraulic brake is applied to the motor to stop rotation.

(Prevention of overrun)
When the hydraulic motor is going to overrun exceeding the pump discharge volume due to external loads, the pressure at the inflow side decreases and the main spool will return to the neutral position. Thus the brake is applied to the hydraulic motor and overrun is prevented.

2. One-directional counter balance valves CW300A

(During rolling up)
When the directional valve is switched to the (a) side and the fluid is introduced from the A_v port, the fluid will be directed to the hydraulic motor inlet from A_m port through the check valve in the counter balance valve, and the load will be raised.
The fluid drained from the hydraulic motor outlet will be discharged to the B_v port through B_m port.

(During rolling down)
When the directional valve is switched to the (b) side, the fluid will be flown into the B_v port. The fluid introduced to the B_m port is directed to the main spool end surface through the pilot passage B_p. If the pilot pressure becomes higher than the spool spring force, the main spool will move to the left and the return side passage will be opened. The fluid flown into the B_v port is introduced to the hydraulic motor inlet through the B_m port and the load is lowered. The fluid discharged from the hydraulic motor outlet is drained to the A_v port through the A_m port. When the load is going to overrun exceeding the pump discharge volume due to gravity, the pressure at the inflow side of the motor is reduced and the pilot pressure decreases. Thus, the main spool is returned to the right side by the spring force and the return line is closed, which generates the pressure at the outlet side of the hydraulic motor and overrun is prevented.
Rated flow
100 ℓ/min

Adjusting range of relief valve set pressure
9.8~27.5MPa (100~280kgf/cm²)

Main spool cracking pressure
0.57MPa (5.8kgf/cm²)

(Higher cracking pressure model)
1.31MPa (13.4kgf/cm²)

Check valve cracking pressure
0.015MPa (0.15kgf/cm²)

Mass
7kg

Counter balance valve with brake valves

### C100

- Rated flow: 100 ℓ/min
- Adjusting range of relief valve set pressure: 9.8~27.5MPa (100~280kgf/cm²)
- Main spool cracking pressure: 0.57MPa (5.8kgf/cm²)
- (Higher cracking pressure model): 1.31MPa (13.4kgf/cm²)
- Check valve cracking pressure: 0.015MPa (0.15kgf/cm²)
- Mass: 7kg

### C100Y

- Rated flow: 100 ℓ/min
- Adjusting range of relief valve set pressure: 9.8~27.5MPa (100~280kgf/cm²)
- Main spool cracking pressure: 0.57MPa (5.8kgf/cm²)
- (Higher cracking pressure model): 1.31MPa (13.4kgf/cm²)
- Check valve cracking pressure: 0.015MPa (0.15kgf/cm²)
- Mass: 7kg

### C100Z

- Rated flow: 100 ℓ/min
- Adjusting range of relief valve set pressure: 9.8~27.5MPa (100~280kgf/cm²)
- Main spool cracking pressure: 0.57MPa (5.8kgf/cm²)
- (Higher cracking pressure model): 1.31MPa (13.4kgf/cm²)
- Check valve cracking pressure: 0.015MPa (0.15kgf/cm²)
- Mass: 7kg

### C100W

- Rated flow: 100 ℓ/min
- Adjusting range of relief valve set pressure: 9.8~27.5MPa (100~280kgf/cm²)
- Main spool cracking pressure: 0.57MPa (5.8kgf/cm²)
- (Higher cracking pressure model): 1.31MPa (13.4kgf/cm²)
- Check valve cracking pressure: 0.015MPa (0.15kgf/cm²)
- Mass: 7kg
Counter balance valve with brake valves

Standard performance data
Hydraulic fluid: Shell tellus #56, viscosity: 37 cSt (Oil temperature 50° C.)
(Data are not guaranteed values but averages)

1. Pressure override performance

2. Pressure drop

Application example

Sub-plate dimension for DOWMAX hydraulic motor direct connection

<table>
<thead>
<tr>
<th>Motor Model</th>
<th>ME100</th>
<th>ME150</th>
<th>ME175</th>
<th>ME300B</th>
<th>ME350B</th>
<th>ME600B</th>
<th>ME750B</th>
<th>ME850B</th>
<th>ME1300A</th>
<th>ME1900</th>
<th>ME2600</th>
<th>ME3100</th>
<th>ME4100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subplate code</td>
<td>–</td>
<td>(M)</td>
<td>A</td>
<td>N</td>
<td>C</td>
<td>R</td>
<td>G</td>
<td>H</td>
<td>K</td>
<td>J</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td>–</td>
<td>(20)</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Y</td>
<td>90</td>
<td>(110)</td>
<td>130</td>
<td>130</td>
<td>130</td>
<td>120</td>
<td>130</td>
<td>140</td>
<td>140</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z</td>
<td>–</td>
<td>(80)</td>
<td>80</td>
<td>80</td>
<td>82</td>
<td>110</td>
<td>100</td>
<td>120</td>
<td>120</td>
<td>115</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Numbers in () for ME 100 show sub-plate dimensions in direct connection with C100Y & C100W. ME100 with-mark can be directly connected without sub-plate.
Counter balance valve with brake valves

### Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>C300B</th>
<th>C300YB</th>
<th>C300ZB</th>
<th>C300WB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated flow</td>
<td>300 ℓ/min</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusting range of relief valve set pressure</td>
<td>9.8<del>27.5MPa (100</del>280kgf/cm²)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main spool cracking pressure</td>
<td>0.59MPa (6.0kgf/cm²)</td>
<td>1.18MPa (12kgf/cm²)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Higher cracking pressure model)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check valve cracking pressure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mass</td>
<td>19kg</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Diagrams

- **C300B**: Diagram showing the hydraulic circuit, including 8-M12 Hexagon socket head bolts, 1BG-40 O-ring, SAE standard J518C 4-bolts split flange (6000PSI), 2-Ø30, View A, and adjusting screw for main spool stroke.

- **C300YB**: Diagram similar to C300B, with additional details on 2-Ø26, Hydraulic Circuit, and view A.

- **C300ZB**: Diagram similar to C300B, with additional details on 8-M12 Effective thread depth 20, hydraulic circuit, and view A.

- **C300WB**: Diagram similar to C300B, with additional details on 8-M12 Effective thread depth 20, hydraulic circuit, and view A.
Counter balance valve with brake valves

Standard performance data

Hydraulic fluid: Shell tellus #56, viscosity: 37 cSt (Oil temperature 50°C)
(Data are not guaranteed values but averages)

1. Pressure override performance

2. Pressure drop

Application example

Sub-plate dimension for DOWMAX hydraulic motor direct connection
Counter balance valve with brake valves

**CW300A**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated flow</td>
<td>300 ℓ/min</td>
</tr>
<tr>
<td>Adjusting range of relief valve set pressure</td>
<td>9.8–27.5MPa (100–280kgf/cm²)</td>
</tr>
<tr>
<td>Main spool cracking pressure</td>
<td>0.87MPa (8.9kgf/cm²)</td>
</tr>
<tr>
<td>(Higher cracking pressure model)</td>
<td>1.37MPa (14kgf/cm²)</td>
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<tr>
<td>Check valve cracking pressure</td>
<td>0.69MPa (7.0kgf/cm²)</td>
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<tr>
<td>Mass</td>
<td>24kg</td>
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Outline dimensions and circuit diagram
Counter balance valve with brake valves

Standard performance data
Hydraulic fluid: Shell tellus #56, viscosity: 37 cSt (Oil temperature 50°C)
(Data are not guaranteed values but averages)

1. Pressure override performance

![Graph showing pressure override performance]

2. Pressure drop

![Graph showing pressure drop]

Application example

![Diagram showing application example]

Sub-plate dimension for DOWMAX hydraulic motor direct connection

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<tr>
<th>Motor Model</th>
<th>ME100</th>
<th>ME150</th>
<th>ME175</th>
<th>ME300B</th>
<th>ME350B</th>
<th>ME600B</th>
<th>ME750B</th>
<th>ME850B</th>
<th>ME1300A</th>
<th>ME1900</th>
<th>ME2600</th>
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<td>C</td>
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<td>H</td>
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