### Revision history

<table>
<thead>
<tr>
<th>Date</th>
<th>Changed</th>
<th>Rev</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 2015</td>
<td>New curve for permissible shaft load</td>
<td>0201</td>
</tr>
<tr>
<td>November 2014</td>
<td>Converted to Danfoss layout - DITA CMS</td>
<td>CA</td>
</tr>
<tr>
<td>November 2012</td>
<td></td>
<td>BC</td>
</tr>
</tbody>
</table>
Technical Information  TMVW Orbital Motors

Contents

A wide range of Orbital Motors
Characteristic, features and application areas of Orbital Motors.................................4
Characteristic features of Danfoss Orbital Motors.................................................................4
Technical features of Danfoss Orbital Motor........................................................................4
Survey of literature with technical data on Danfoss Orbital Motors.....................................5

Data survey

Versions

Code numbers
Ordering.................................................................................................................................................8

Technical data
Technical data for TMVW.................................................................................................................9
Maximum permissible shaft seal pressure................................................................................10
Pressure drop in motor..................................................................................................................10
Oil flow in drain line....................................................................................................................11
Direction of shaft rotation.........................................................................................................11
Permissible shaft load for TMVW............................................................................................11
  Permissible radial shaft load.......................................................................................................11
Port thread versions...................................................................................................................12

Dimensions
TMVW dimensions.......................................................................................................................13
  European version......................................................................................................................13
  US version...............................................................................................................................14

Weight of motors
Weight of TMVW motors..........................................................................................................16
Danfoss is a world leader within production of low speed orbital motors with high torque. We can offer more than 3,000 different orbital motors, categorised in types, variants and sizes (including different shaft versions).

The motors vary in size (rated displacement) from $8 \text{ cm}^3$ [0.50 in$^3$] to $800 \text{ cm}^3$ [48.9 in$^3$] per revolution.

Speeds range up to approximate $2,500 \text{ min}^{-1}$ (rpm) for the smallest type and up to approximate $600 \text{ min}^{-1}$ (rpm) for the largest type.

Maximum operating torques vary from $13 \text{ N} \cdot \text{m}$ [115 lbf\-in] to $2,700 \text{ N} \cdot \text{m}$ [24,000 lbf\-in] (peak) and maximum outputs are from $2.0 \text{ kW}$ [2.7 hp] to $70 \text{ kW}$ [95 hp].

Characteristic features of Danfoss Orbital Motors

- Smooth running over the entire speed range
- Constant operating torque over a wide speed range
- High starting torque
- High return pressure without the use of drain line (High pressure shaft seal)
- High efficiency
- Long life under extreme operating conditions
- Robust and compact design
- High radial and axial bearing capacity
- For applications in both open and closed loop hydraulic systems
- Suitable for a wide variety of hydraulics fluids

Technical features of Danfoss Orbital Motor

The programme is characterised by technical features appealing to a large number of applications and a part of the programme is characterised by motors that can be adapted to a given application. Adaptions comprise the following variants among others:
A wide range of Orbital Motors

- Motors with corrosion resistant parts
- Wheel motors with recessed mounting flange
- OMP, OMR- motors with needle bearing
- OMR motor in low leakage version
- OMR motors in a super low leakage version
- Short motors without bearings
- Ultra short motors
- Motors with integrated positive holding brake
- Motors with integrated negative holding brake
- Motors with integrated flushing valve
- Motors with speed sensor
- Motors with tacho connection
- All motors are available with black finish paint

Survey of literature with technical data on Danfoss Orbital Motors

Detailed data on all Danfoss Orbital Motors can be found in our motor catalogue, which is divided into more individual subcatalogues:

- General information on Danfoss Orbital Motors: function, use, selection of orbital motor, hydraulic systems, etc.
- Technical data on small motors: OML and OMM
- Technical data on medium sized motors: OMP, OMR, OMH
- Technical data on medium sized motors: DH and DS
- Technical data on medium sized motors: OMEW
- Technical data on medium sized motors: VMP
- Technical data on medium sized motors: VMR
- Technical data on large motors: OMS, OMT and OMV
- Technical data on large motors: TMK
- Technical data on large motors: TMT
- Technical data on large motors: TMTHW
- Technical data on large motors: TMVW

A general survey brochure on Danfoss Orbital Motors gives a quick motor reference based on power, torque, speed and capabilities.
Data survey

*Speed and torque*

The bar diagrams above are useful for a quick selection of relevant motor size for the application.
### Versions

**Version**

<table>
<thead>
<tr>
<th>Mounting flange</th>
<th>Spigot diameter</th>
<th>Bolt circle diameter (BC)</th>
<th>Shaft Port size</th>
<th>European version</th>
<th>US version</th>
<th>Side port version</th>
<th>End port version</th>
<th>Standard shaft seal</th>
<th>Drain connection</th>
<th>Check valve</th>
<th>Main type designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheel</td>
<td>223.9 mm</td>
<td>265 mm</td>
<td>Thread hole flange</td>
<td>G 1</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>No</td>
<td>TMVW</td>
<td></td>
</tr>
<tr>
<td></td>
<td>223.9 mm</td>
<td>265 mm</td>
<td>Thread hole flange</td>
<td>1 5/16 - 12 UN</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>No</td>
<td>TMVW</td>
<td></td>
</tr>
</tbody>
</table>

Motors are painted black.
## Code numbers

<table>
<thead>
<tr>
<th>Code numbers</th>
<th>Displacement (cm³)</th>
<th>400</th>
<th>500</th>
<th>630</th>
<th>800</th>
<th>151Z</th>
<th>8205</th>
<th>8206</th>
<th>8207</th>
<th>8208</th>
<th>Technical data for TMVW on page 9</th>
<th>European version on page 13</th>
</tr>
</thead>
<tbody>
<tr>
<td>151Z</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>151Z</td>
<td>8205</td>
<td>8206</td>
<td>8207</td>
<td>8208</td>
<td>Technical data for TMVW on page 9</td>
<td>European version on page 13</td>
</tr>
<tr>
<td>151Z</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>151Z</td>
<td>8210</td>
<td>8211</td>
<td>8212</td>
<td>8213</td>
<td>Technical data for TMVW on page 9</td>
<td>US version on page 14</td>
</tr>
</tbody>
</table>

## Ordering

Add the four digit prefix "151Z" to the four digit numbers from the chart for complete code number.

Example:

151Z8207 for a TMVW 630 with mounting flange Ø 223.9 mm, port size G 1 and side port version.

Orders will not be accepted without the four digit prefix.
### Technical data for TMVW

#### TMVW technical data

<table>
<thead>
<tr>
<th>Type</th>
<th>TMVW 400</th>
<th>TMVW 500</th>
<th>TMVW 630</th>
<th>TMVW 800</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Motor size</strong></td>
<td>cm³</td>
<td>cm³</td>
<td>cm³</td>
<td>cm³</td>
</tr>
<tr>
<td><strong>Geometric displacement</strong></td>
<td>400.9</td>
<td>499.6</td>
<td>629.1</td>
<td>801.8</td>
</tr>
<tr>
<td><strong>Maximum speed</strong></td>
<td>min⁻¹</td>
<td>rpm</td>
<td>rpm</td>
<td>rpm</td>
</tr>
<tr>
<td><strong>cont.</strong></td>
<td>500</td>
<td>400</td>
<td>315</td>
<td>250</td>
</tr>
<tr>
<td><strong>int.</strong>(1)</td>
<td>600</td>
<td>480</td>
<td>380</td>
<td>300</td>
</tr>
<tr>
<td><strong>Maximum torque</strong></td>
<td>N·m</td>
<td>lbf·in</td>
<td>N·m</td>
<td>lbf·in</td>
</tr>
<tr>
<td><strong>cont.</strong></td>
<td>1,440</td>
<td>1,800</td>
<td>2,270</td>
<td>2,590</td>
</tr>
<tr>
<td><strong>int.</strong>(1)</td>
<td>2,000</td>
<td>2,600</td>
<td>3,100</td>
<td>3,400</td>
</tr>
<tr>
<td><strong>peak</strong>(2)</td>
<td>2,300</td>
<td>2,860</td>
<td>3,600</td>
<td>4,020</td>
</tr>
<tr>
<td><strong>Maximum Output</strong></td>
<td>kW</td>
<td>[hp]</td>
<td>kW</td>
<td>[hp]</td>
</tr>
<tr>
<td><strong>cont.</strong></td>
<td>67</td>
<td>67</td>
<td>67</td>
<td>67</td>
</tr>
<tr>
<td><strong>int.</strong>(1)</td>
<td>112</td>
<td>112</td>
<td>112</td>
<td>112</td>
</tr>
<tr>
<td><strong>Maximum pressure drop</strong></td>
<td>bar</td>
<td>psi</td>
<td>bar</td>
<td>psi</td>
</tr>
<tr>
<td><strong>cont.</strong></td>
<td>250</td>
<td>250</td>
<td>250</td>
<td>225</td>
</tr>
<tr>
<td><strong>int.</strong>(1)</td>
<td>350</td>
<td>350</td>
<td>350</td>
<td>300</td>
</tr>
<tr>
<td><strong>peak</strong>(2)</td>
<td>400</td>
<td>400</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td><strong>Maximum oil flow</strong></td>
<td>l/min</td>
<td>US gal/min</td>
<td>l/min</td>
<td>US gal/min</td>
</tr>
<tr>
<td><strong>cont.</strong></td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td><strong>int.</strong>(1)</td>
<td>240</td>
<td>240</td>
<td>240</td>
<td>240</td>
</tr>
<tr>
<td><strong>Maximum starting pressure with unloaded shaft</strong></td>
<td>bar</td>
<td>psi</td>
<td>5</td>
<td>70</td>
</tr>
<tr>
<td><strong>at max. press. drop cont.: N·m [lbf·in]</strong></td>
<td>1,245 [11,020]</td>
<td>1,551 [13,730]</td>
<td>1,953 [17,290]</td>
<td>2,490 [22,035]</td>
</tr>
</tbody>
</table>

(1) Intermittent operation: the permissible values may occur for max. 10% of every minute
(2) Peak load: the permissible value may occur for max. 1% of every minute
Technical data

Maximum permissible shaft seal pressure

TMVW with standard shaft seal and drain connection

The pressure on shaft seal equals the pressure in the drain line.

![Diagram showing pressure relationship]

[dotted] Intermittent operation: The permissible values may occur for max. 10% of every minute.

[solid] Continuous operation

⚠️ Warning

Drain line should always be used.

Pressure drop in motor

![Diagram showing pressure drop vs flow rate]

The curve applies to an unloaded motor shaft and an oil viscosity of 35 mm²/s [165 SUS].
Technical data

Oil flow in drain line

The table below shows the maximum oil flow in the drain line at a return pressure less than 5-10 bar [75-150 psi].

<table>
<thead>
<tr>
<th>Pressure drop</th>
<th>Viscosity</th>
<th>Oil flow in drain line</th>
</tr>
</thead>
<tbody>
<tr>
<td>bar [psi]</td>
<td>mm²/s [SUS]</td>
<td>l/min [US gal/min]</td>
</tr>
<tr>
<td>200 [2900]</td>
<td>20 [100]</td>
<td>2.5 [0.66]</td>
</tr>
<tr>
<td></td>
<td>35 [165]</td>
<td>1.5 [0.4]</td>
</tr>
<tr>
<td>275 [3990]</td>
<td>20 [100]</td>
<td>4.0 [1.1]</td>
</tr>
<tr>
<td></td>
<td>35 [165]</td>
<td>2.5 [0.66]</td>
</tr>
</tbody>
</table>

Direction of shaft rotation

Permissible shaft load for TMVW

Permissible radial shaft load

The output shaft runs in tapered roller bearings that permit high axial and radial forces.
Technical data

The permissible radial load on the shaft is shown for an axial load of 0 N as a function of the distance from the mounting flange to the point of load application.

The curve is based on $B_{10}$ Bearing life (2000 hours or 12 000 000 shaft revolutions at 100 min$^{-1}$) at rated output torque, when mineral-based hydraulic oil with a sufficient content of anti-wear additives, is used.

Port thread versions

A: G Main port  
E: ISO 228/1 – G 1

B: UNF Main port  
F: 1 5/16 – 12 UN, O-ring boss port

C: G Drain port  
G: ISO 228/1 – G 1/4

D: UNF Drain port  
H: 9/16 – 18 UNF, O-ring boss port
Technical Information  TMVW Orbital Motors

Dimensions

TMVW dimensions

**European version**

*Wheel flange-spigot diameter Ø 223.9 mm - BC Ø 265 mm*

C:  G 1 ; 18 mm [0.67 in] deep

D:  Drain connection

   G 1/4 ; 12 mm [0.47 in] deep

E:  ∅ 17.6

F:  6 • M16 • 1.5
### Dimensions

*Wheel flange-spigot diameter Ø 223.9 mm - BC Ø 265 mm*

<table>
<thead>
<tr>
<th>Type</th>
<th>L₁</th>
<th>L₂</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>[mm]</td>
<td>[in]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TMVW 400</td>
<td>293.4</td>
<td>116.5</td>
</tr>
<tr>
<td></td>
<td>[11.6]</td>
<td>[4.6]</td>
</tr>
<tr>
<td>TMVW 500</td>
<td>301.4</td>
<td>124.5</td>
</tr>
<tr>
<td></td>
<td>[11.9]</td>
<td>[4.9]</td>
</tr>
<tr>
<td>TMVW 630</td>
<td>311.9</td>
<td>135</td>
</tr>
<tr>
<td></td>
<td>[12.3]</td>
<td>[5.3]</td>
</tr>
<tr>
<td>TMVW 800</td>
<td>325.9</td>
<td>149</td>
</tr>
<tr>
<td></td>
<td>[12.8]</td>
<td>[5.9]</td>
</tr>
</tbody>
</table>

**US version**

*Wheel flange-spigot diameter Ø 223.9 mm - BC Ø 265 mm*

---

C: 1 5/16 - 12 UN; 19 mm [0.75 in] deep
Technical Information  TMVW Orbital Motors

Dimensions

D: Drain connection, 9/16 - 18 UNF; 13 mm [0.51 in] deep
E: ∅ 17.6
F: 6 • M16 • 1.5

Wheel flange-spigot diameter Ø 223.9 mm - BC Ø 265 mm

<table>
<thead>
<tr>
<th>Type</th>
<th>L₁</th>
<th>[in]</th>
<th>L₂</th>
<th>[in]</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMVW 400</td>
<td>293.4</td>
<td>[11.6]</td>
<td>116.5</td>
<td>[4.6]</td>
</tr>
<tr>
<td>TMVW 500</td>
<td>301.4</td>
<td>[11.9]</td>
<td>124.5</td>
<td>[4.9]</td>
</tr>
<tr>
<td>TMVW 630</td>
<td>311.9</td>
<td>[12.3]</td>
<td>135</td>
<td>[5.3]</td>
</tr>
<tr>
<td>TMVW 800</td>
<td>325.9</td>
<td>[12.8]</td>
<td>149</td>
<td>[5.9]</td>
</tr>
</tbody>
</table>
Technical Information  TMVW Orbital Motors

Weight of motors

Weight of TMVW motors

<table>
<thead>
<tr>
<th>Code number</th>
<th>Weight</th>
<th>[lb]</th>
</tr>
</thead>
<tbody>
<tr>
<td>151Z8205</td>
<td>43.5</td>
<td>95.90</td>
</tr>
<tr>
<td>151Z8206</td>
<td>44.4</td>
<td>97.89</td>
</tr>
<tr>
<td>151Z8207</td>
<td>45.8</td>
<td>100.97</td>
</tr>
<tr>
<td>151Z8208</td>
<td>47.4</td>
<td>104.50</td>
</tr>
<tr>
<td>151Z8210</td>
<td>43.5</td>
<td>95.90</td>
</tr>
<tr>
<td>151Z8211</td>
<td>44.4</td>
<td>97.89</td>
</tr>
<tr>
<td>151Z8212</td>
<td>45.8</td>
<td>100.97</td>
</tr>
<tr>
<td>151Z8213</td>
<td>47.4</td>
<td>104.50</td>
</tr>
</tbody>
</table>
Danfoss Power Solutions is a global manufacturer and supplier of high-quality hydraulic and electronic components. We specialize in providing state-of-the-art technology and solutions that excel in the harsh operating conditions of the mobile off-highway market. Building on our extensive applications expertise, we work closely with our customers to ensure exceptional performance for a broad range of off-highway vehicles.

We help OEMs around the world speed up system development, reduce costs and bring vehicles to market faster.

Danfoss – Your Strongest Partner in Mobile Hydraulics.

Go to www.powersolutions.danfoss.com for further product information.

Wherever off-highway vehicles are at work, so is Danfoss. We offer expert worldwide support for our customers, ensuring the best possible solutions for outstanding performance. And with an extensive network of Global Service Partners, we also provide comprehensive global service for all of our components.

Please contact the Danfoss Power Solution representative nearest you.

Products we offer:

- Bent Axis Motors
- Closed Circuit Axial Piston Pumps and Motors
- Displays
- Electrohydraulic Power Steering
- Electrohydraulics
- Hydraulic Power Steering
- Integrated Systems
- Joysticks and Control Handles
- Microcontrollers and Software
- Open Circuit Axial Piston Pumps
- Orbital Motors
- PLUS+1® GUIDE
- Proportional Valves
- Sensors
- Steering
- Transit Mixer Drives

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without changes being necessary in specifications already agreed.

All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.

Danfoss Power Solutions Trading (Shanghai) Co., Ltd.
Building #22, No. 1000 Jin Hai Rd
Jin Qiao, Pudong New District
Shanghai, China 201206
Phone: +86 21 3418 5200

Danfoss Power Solutions trading (USA) Company
2800 East 13th Street
Ames, IA 50010, USA
Phone: +1 515 239 6000

Danfoss Power Solutions GmbH & Co. OHG
Krokamp 35
D-24539 Neumünster, Germany
Phone: +49 4321 871 0

Danfoss Power Solutions ApS
Nordborgvej 81
DK-6430 Nordborg, Denmark
Phone: +45 7488 2222

Comatrol
www.comatrol.com

Schwarzmüller-Inverter
www.schwarmueller-inverter.com

Turolla
www.turollaocg.com

Hydro-Gear
www.hydro-gear.com

Daikin-Sauer-Danfoss
www.daikin-sauer-danfoss.com

Danfoss
Power Solutions GmbH & Co. OHG
Krokamp 35
D-24539 Neumünster, Germany
Phone: +49 4321 871 0