



Technical Information
Orbital Motors
TMVW



Revision history*Table of revisions*

Date	Changed	Rev
September 2015	New curve for permissible shaft load	0201
November 2014	Converted to Danfoss layout - DITA CMS	CA
November 2012		BC

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A wide range of Orbital Motors

Characteristic, features and application areas of Orbital Motors



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 cm³ [0.50 in³] to 800 cm³ [48.9 in³] per revolution.

Speeds range up to approximate 2,500 min⁻¹ (rpm) for the smallest type and up to approximate 600 min⁻¹ (rpm) for the largest type.

Maximum operating torques vary from 13 N·m [115 lbf·in] to 2,700 N·m [24,000 lbf·in] (peak) and maximum outputs are from 2.0 kW [2.7 hp] to 70 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

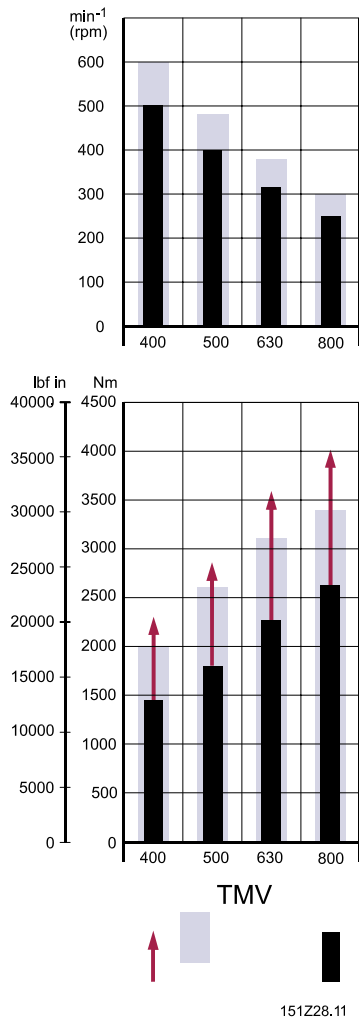
Detailed data on all Danfoss Orbital Motors can be found in our motor catalogue, which is divided into more individual subcatalogues:

- 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



Peak values / Intermittend values / Continuous values

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

Technical Information TMVW Orbital Motors

Versions
Version

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

Motors are painted black.

Code numbers
Code numbers

Code numbers	Displacement (cm ³)					
	400	500	630	800		
151Z	8205	8206	8207	8208	<i>Technical data for TMVW on page 9</i>	<i>European version on page 13</i>
151Z	8210	8211	8212	8213	<i>Technical data for TMVW on page 9</i>	<i>US version on page 14</i>

Ordering

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

Example:

151Z8207 for an 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 Information TMVW Orbital Motors

Technical data

Technical data for TMVW

TMVW technical data

Type			TMVW	TMVW	TMVW	TMVW
Motor size			400	500	630	800
Geometric displacement	cm ³ [in ³]		400.9 [24.46]	499.6 [30.49]	629.1 [38.39]	801.8 [48.93]
Maximum speed	min-1 [rpm]	cont.	500	400	315	250
		int. ⁽¹⁾	600	480	380	300
Maximum torque	N·m [lbf·in]	cont.	1,440 [12,745]	1,800 [15,930]	2,270 [20,090]	2,590 [22,880]
		int. ⁽¹⁾	2,000 [17,700]	2,600 [23,010]	3,100 [27,440]	3,400 [30,090]
		peak ⁽²⁾	2,300 [20,355]	2,860 [25,315]	3,600 [31,860]	4,020 [35,580]
Maximum Output	kW [hp]	cont.	67 [90]	67 [90]	67 [90]	67 [90]
		int. ⁽¹⁾	112 [150]	112 [150]	112 [150]	112 [150]
Maximum pressure drop	bar [psi]	cont.	250 [3,630]	250 [3,630]	250 [3,630]	225 [3,263]
		int. ⁽¹⁾	350 [5,080]	350 [5,080]	350 [5,080]	300 [4,350]
		peak ⁽²⁾	400 [5,800]	400 [5,800]	400 [5,800]	400 [5,800]
Maximum oil flow	l/min [US gal/min]	cont.	200 [63.4]	200 [63.4]	200 [63.4]	200 [63.4]
		int. ⁽¹⁾	240 [63.4]	240 [63.4]	240 [63.4]	240 [63.4]
Maximum starting pressure with unloaded shaft	bar [psi]		5 [70]	5 [70]	5 [70]	5 [70]
Minimum starting torque		at max. press. drop cont.: N·m [lbf·in]	1,245 [11,020]	1,551 [13,730]	1,953 [17,290]	2,490 [22,035]
		at max. press. drop int. ⁽¹⁾ : N·m [lbf·in]	1,743 [15,425]	2,172 [19,220]	2735 [24205]	2,988 [26,440]

⁽¹⁾ Intermittend 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

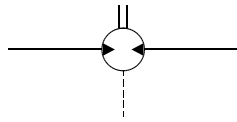
Type			Maximum inlet pressure	Maximum return pressure
TMVW 400 - 800	bar [psi]	cont.	270 [3915]	140 [2030]
	bar [psi]	int. ⁽¹⁾	370 [5365]	175 [2540]
	bar [psi]	peak ⁽²⁾	420 [6090]	210 [3045]

Technical data

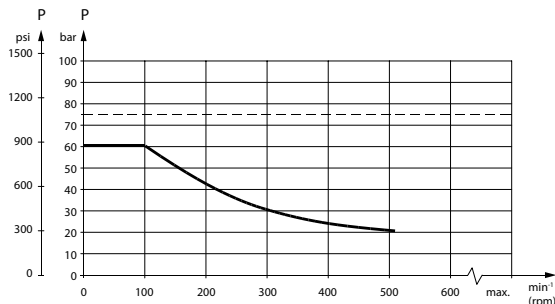
Maximum permissible shaft seal pressure

TMVW with standard shaft seal and drain connection

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



151-1983.10



151-1673.10

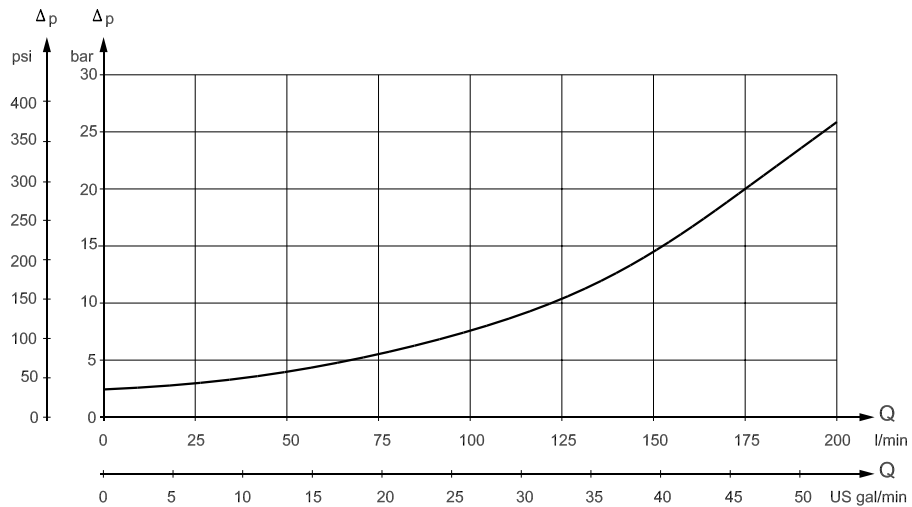
[dotted] Intermittent operation: The permissible values may occur for max. 10% of every minute.

[solid] Continuous operation

Warning

Drain line should always be used.

Pressure drop in motor



151Z34.11

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

Technical Information **TMVW Orbital Motors**

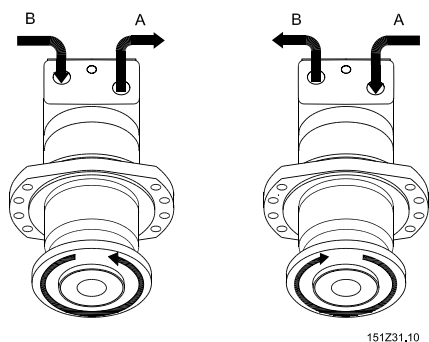
Technical data

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].

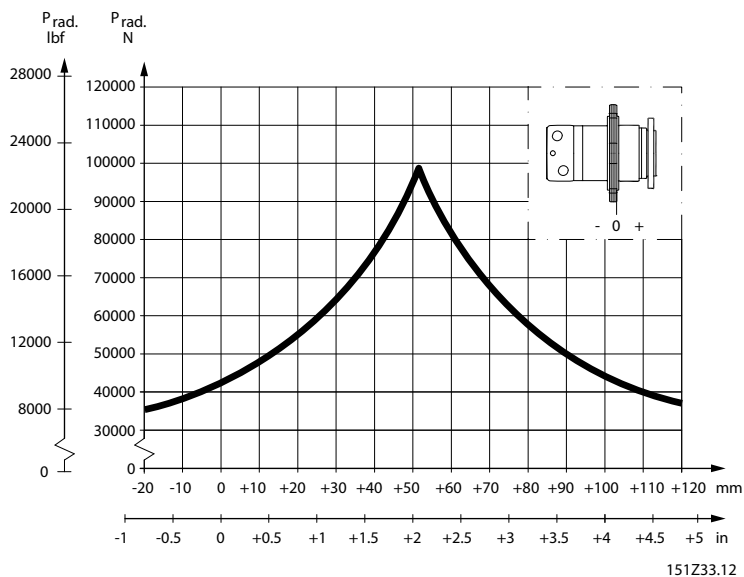
Pressure drop		Viscosity		Oil flow in drain line	
bar	[psi]	mm ² /s	[SUS]	l/min	[US gal/min]
200	[2900]	20	[100]	2.5	[0.66]
		35	[165]	1.5	[0.4]
275	[3990]	20	[100]	4.0	[1.1]
		35	[165]	2.5	[0.66]

Direction of shaft rotation



Permissible shaft load for TMVW

Permissible shaft load for TMVW



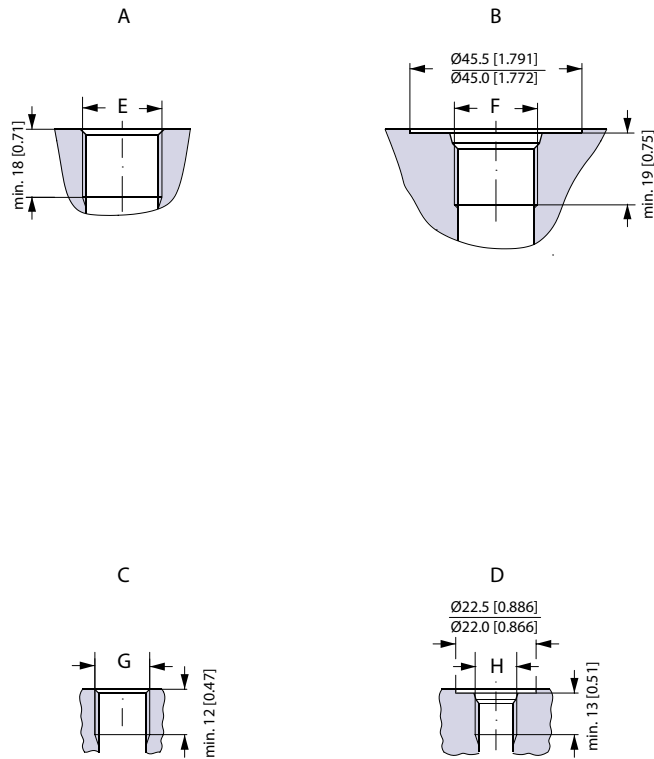
Permissible radial shaft load

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 B₁₀ 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


151-1978.10

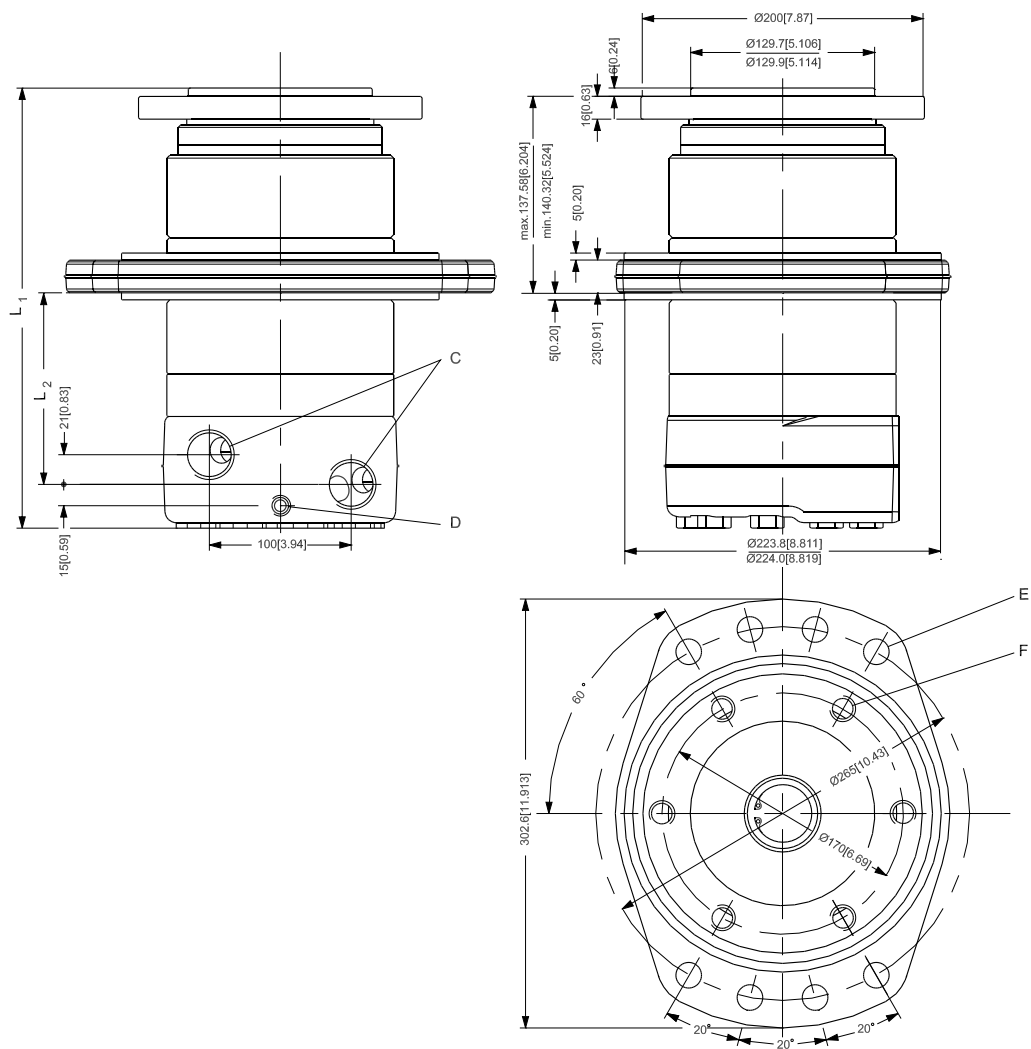
- A:** G Main port
- E:** ISO 228/1 – G 1
- B:** UNF Main port
- F:** 1 5/16 – 12 UN, O-ring boss port
- C:** G Drain port
- G:** ISO 228/1 – G 1/4
- D:** UNF Drain port
- H:** 9/16 – 18 UNF, O-ring boss port

Dimensions

TMVW dimensions

European version

Wheel flange-spigot diameter \varnothing 223.9 mm - BC \varnothing 265 mm



151Z09.12

- C:** G 1 ; 18 mm [0.67 in] deep
- D:** Drain connection
G 1/4 ; 12 mm [0.47 in] deep
- E:** \varnothing 17.6
- F:** 6 • M16 • 1.5

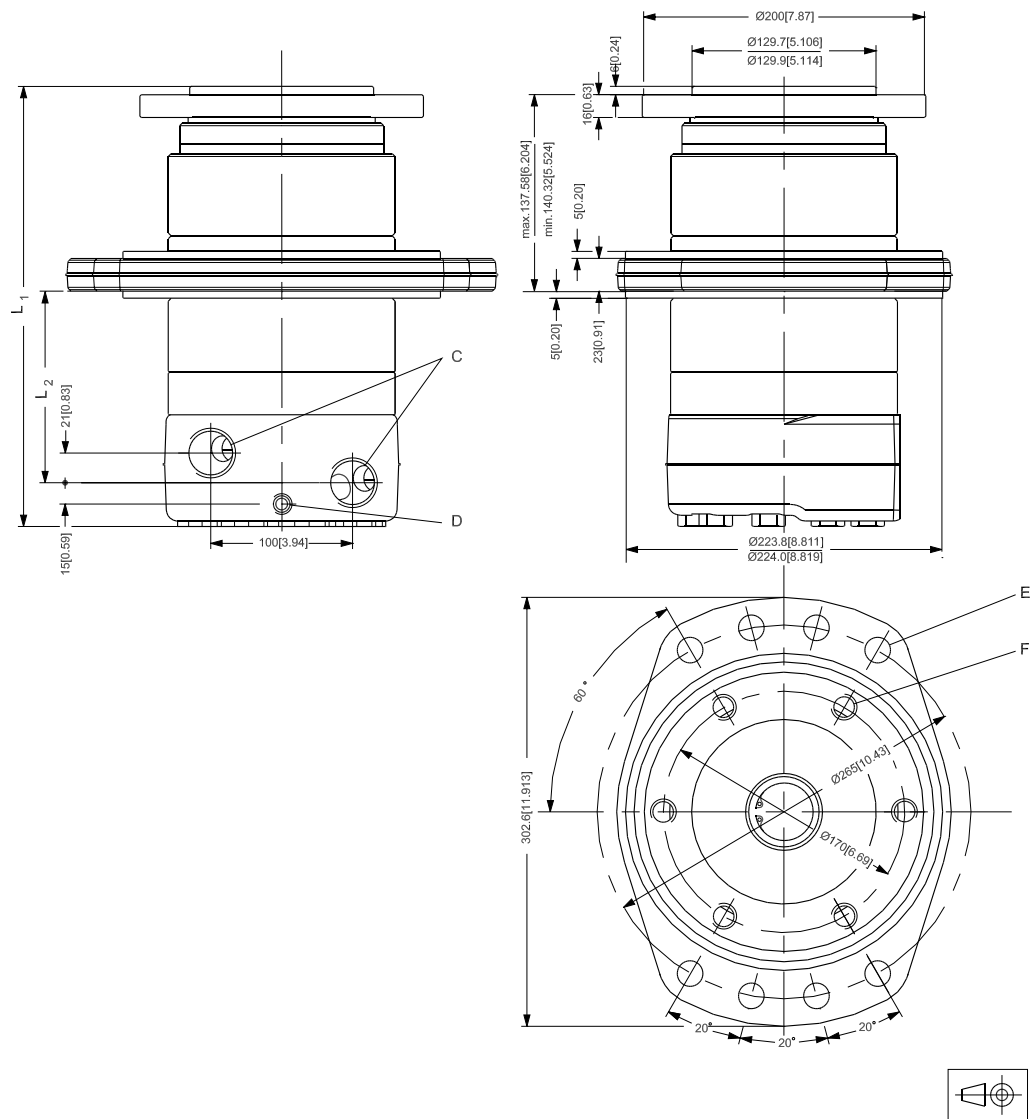
Dimensions

Wheel flange-spigot diameter $\varnothing 223.9$ mm - BC $\varnothing 265$ mm

Type	L ₁		L ₂	
	mm	[in]	mm	[in]
TMVW 400	293.4	[11.6]	116.5	[4.6]
TMVW 500	301.4	[11.9]	124.5	[4.9]
TMVW 630	311.9	[12.3]	135	[5.3]
TMVW 800	325.9	[12.8]	149	[5.9]

US version

Wheel flange-spigot diameter $\varnothing 223.9$ mm - BC $\varnothing 265$ 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: \varnothing 17.6

F: 6 • M16 • 1.5

Wheel flange-spigot diameter \varnothing 223.9 mm - BC \varnothing 265 mm

Type	L ₁		L ₂	
	mm	[in]	mm	[in]
TMVW 400	293.4	[11.6]	116.5	[4.6]
TMVW 500	301.4	[11.9]	124.5	[4.9]
TMVW 630	311.9	[12.3]	135	[5.3]
TMVW 800	325.9	[12.8]	149	[5.9]

Weight of motors**Weight of TMVW motors***Weight of TMVW motors*

Code number	Weight	
	kg	[lb]
151Z8205	43.5	[95.90]
151Z8206	44.4	[97.89]
151Z8207	45.8	[100.97]
151Z8208	47.4	[104.50]
151Z8210	43.5	[95.90]
151Z8211	44.4	[97.89]
151Z8212	45.8	[100.97]
151Z8213	47.4	[104.50]



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