MAKING MODERN LIVING POSSIBLE

Technical Information

Orbital Motors

OMT 500 FK

powersolutions.danfoss.com

Revision history

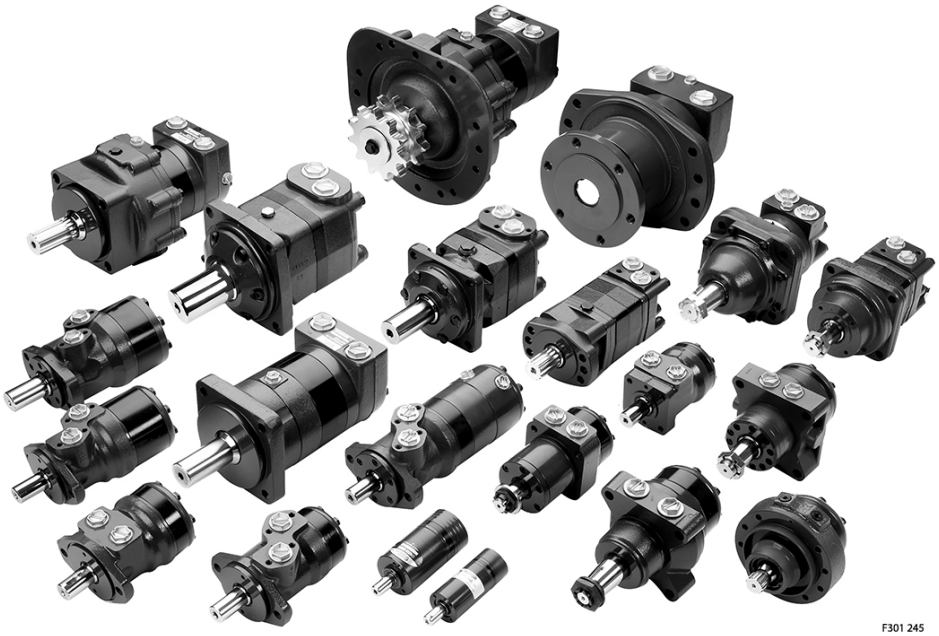
Table of revisions

Date	Changed	Rev
July 2014	Changed to Danfoss layout	BA
September 2010	New back cover	AC
April 2010	Japan location	AB
July 2008	New layout	AA

Contents

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 cm^3 [0.50 in^3] to 800 cm^3 [48.9 in^3] 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 2700 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: TMT
- Technical data on large motors: TMV

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

Introduction, application, schematic diagram

Introduction

This Tech Note introduces an updated version of Danfoss OMT 500 FK motor with integrated brake. This motor is a “super-short” version with integrated muliple-disk brake. This makes it particularly suitable for transmission where strict space requirements must be observed.

Application

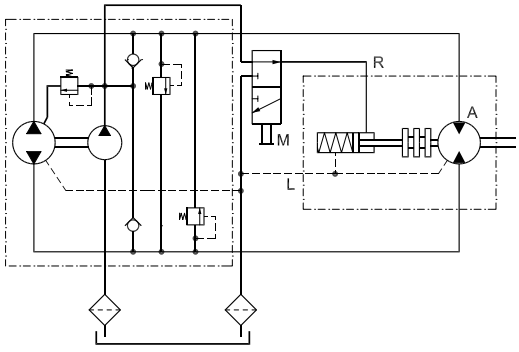
OMT FK is, typically used in closed circuits where a very short overall length is required, e.g. in road rollers and wheels.

Advantages:

- Low brake release pressure
- Direct rim mounting
- Super-short overall length
- Easy to service
- Brake parts are lubricated by drain oil
- Can be used as dynamic emergency brake

Schematic diagram

On OMT FK, the brake release is low-pressure (12 bar). Therefore the release port must not be connected to the motor A/B ports via a shuttle valve. A good solution is to connect the brake-release port to the charge pump of the transmission pump. See drawing below.



A: Motor

L: Drain port

M: Brake release valve

O: Charge pump pressure relief valve

R: Brake release port

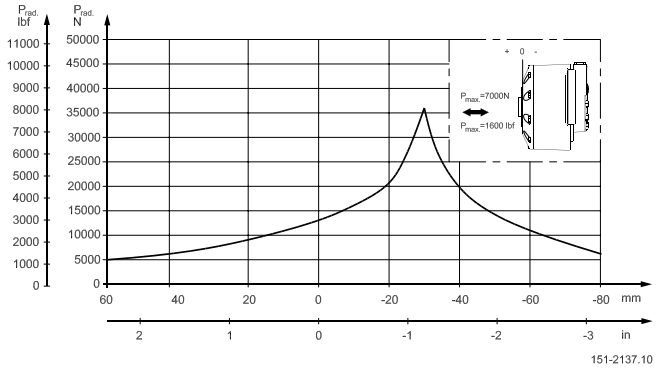
Permissible radial and axial load

Permissible radial and axial load for OMT FK

The OMT FK shaft runs in a race ball bearing and a needle race. This means that OMT FK is suitable for heavy vehicles.

The permissible radial shaft load for an axial load of between 0 and 7000 N, at the point of engagement of the radial load, can be read from the graph. See drawing.

The graph applies to a B10 bearing life of 3000 hours at 50 min^{-1}, when mineral-based hydraulic oil with adequate anti-wear additives is used.



Code numbers

OMT FK code number

Code number	Weight	
	kg	[lb]
11020676	42	[99.2]

Technical data

Technical data

OMT FK technical data

Motor type			OMT FK	
Motor size			500	
Geometric displacement	cm^3/min [in^3/min]		493.8	[30.13]
Maximum speed	min^{-1} [rpm]	cont.	130	
		int.[1]	160	
Maximum torque	N•m [lbf•in]	cont.	1,030	[9,115]
		int.[1]	1,270	[11,240]
		peak[2]	1,500	[13,275]
Maximum output	kW [hp]	cont.	12	[16.1]
		int.[1]	15	[20.1]
Maximum pressure drop	bar [psi]	cont	140	[2,030]
		int.[1]	175	[2,540]
		peak[2]	210	[3,045]
Maximum oil flow	l/min [US gal/min]	Cont.	65	[17.2]
		int.[1]	80	[21.1]
Maximum inlet pressure	bar [psi]	cont	210	[3,045]
		int.[1]	250	[3,625]
		peak [2]	300	[4,351]
Maximum inlet pressure in drainline[3]	bar [psi]	cont. 0-100 o/min [0-100 rpm]	3	[43.5]
		int.[1] 0-max. o/min 0-max. [rpm]	5	[72.5]
Maximum return pressure	bar [psi]	cont.	140	[2,030]
		int.[1]	175	[2,540]
		peak[2]	210	[3,045]
Maximum starting pressure with unloaded shaft bar [psi]			10	[145]
Minimum starting torque	N•m [lbf•in]	at max. pressure cont.	840	[7,435]
		at max. pressure int.[1]	1,030	[9,116]
Minimum holding torque	N•m [lbf•in]		950	[8410]
Brake release pressure	bar [psi]	min.	12	[175]
		max	30	[435]

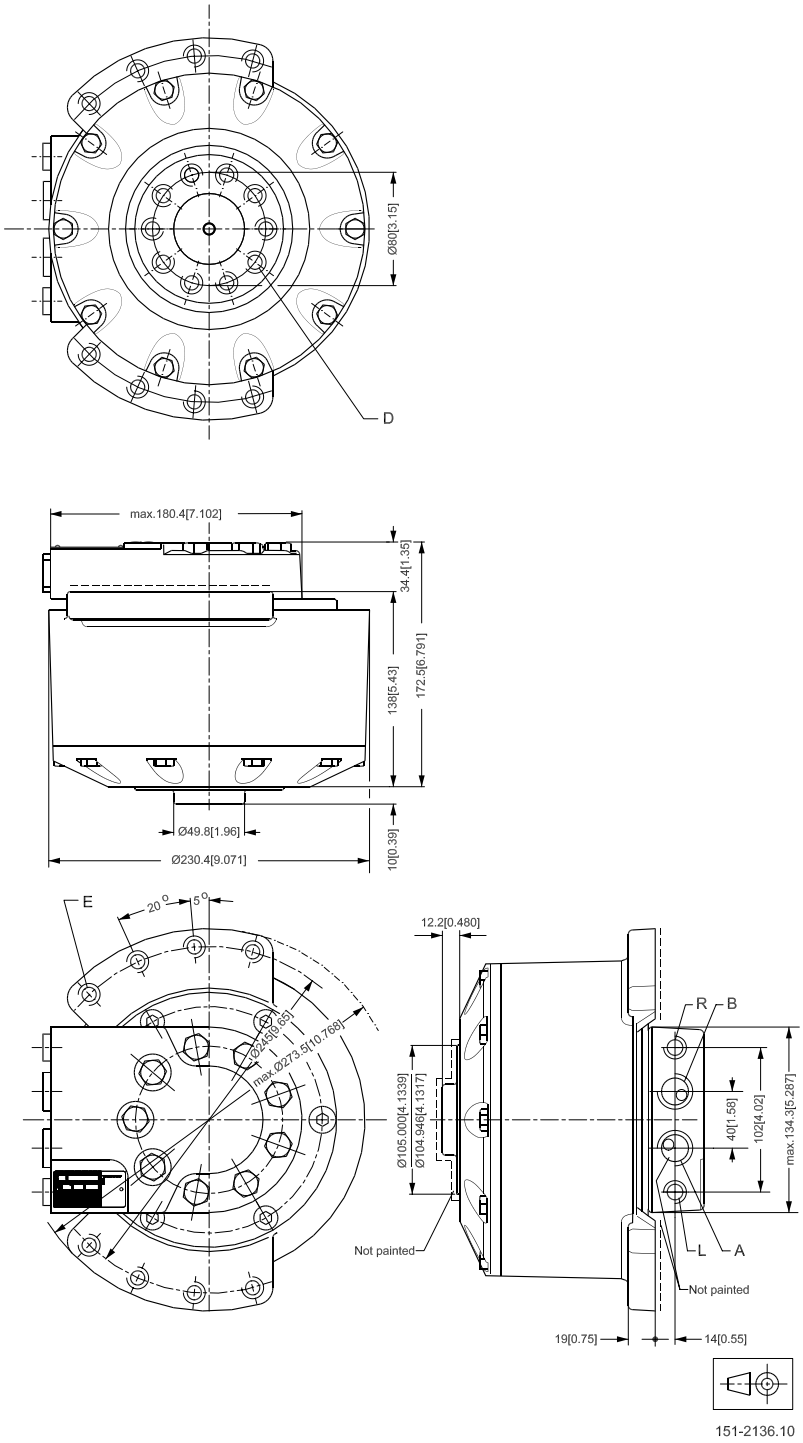
[1] Intermittent operation: the permissible values may occur for max. 10% of every minute.

[2] Peak load: the permissible values may occur for max. 1% of every minute

[3] Brake motors must always have a drain line. The brake release pressure is the difference between the brake line pressure and the drain line pressure

Dimensions

OMT FK dimensions



L: Drain connection, G 1/4; 15 [0.59] deep

R: Brake release part; G 1/4; 15 [0.59] deep

A+B: G 1/2; 18 [0.59] deep

Dimensions

D: M 12 ; 15 [0.59] deep

E: M 12 ; 18 [0.71] deep

Not painted; Paint color: Black

Tolerence for basic dimensions 1 mm [0.04 in]

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