

Technical Information
Orbital Motors
OMS, OMT and OMV



Technical Information **OMS, OMT and OMV Orbital Motors**

Revision history*Table of revisions*

Date	Changed	Rev
February 2016	Corrected Hardening specification for OMSS, OMTS, OMVS	0601
November 2014	Converted to Danfoss layout - DITA CMS	FA
December 2013	Table updated	EL
June 2013	Drawing corrected	EK
April 2013	Drawing corrected	EJ
January 2013	Correct drawing	EI
November 2012	Planetary Gears deleted	EH
July 2012	Typo in 'Major dia'	EG
November 2010	Dimensions changed	EF
November 2009	conversions, and layout adjusted	ED

Technical Information OMS, OMT and OMV Orbital Motors

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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:

Technical Information OMS, OMT and OMV Orbital Motors

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

The Danfoss Orbital Motors are used in the following application areas:

- Construction equipment
- Agricultural equipment
- Material handling & Lifting equipment
- Forestry equipment
- Lawn and turf equipment
- Special purpose
- Machine tools and stationary equipment
- Marine equipment

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:

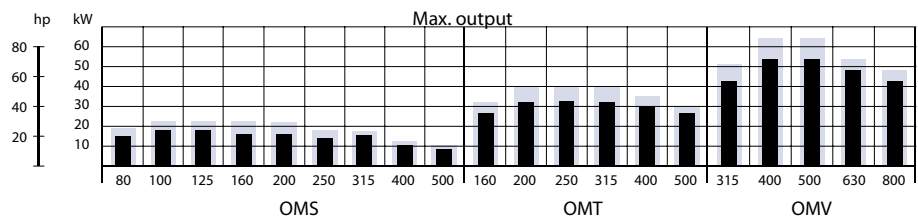
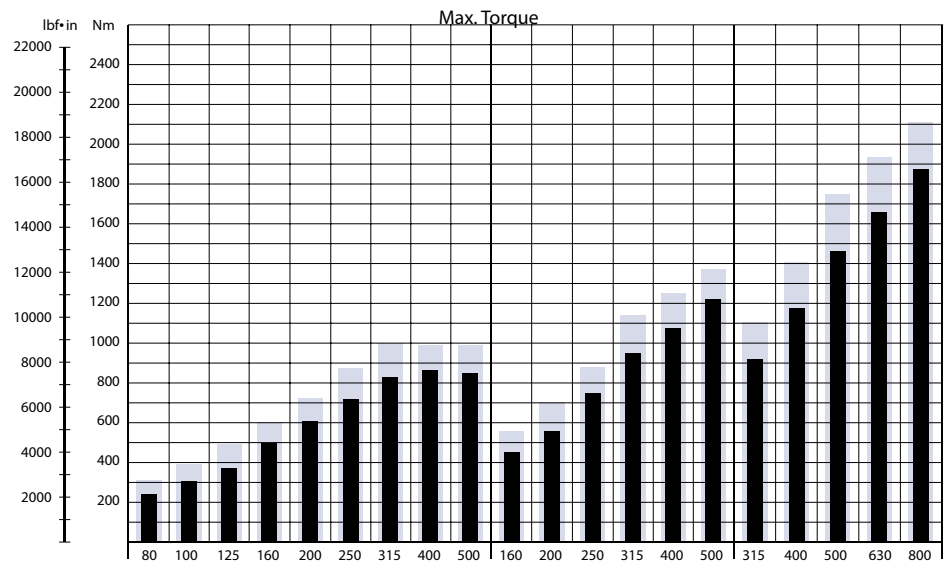
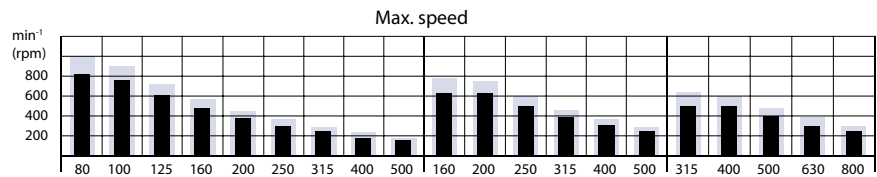
- General information on Danfoss Orbital Motors: function, use, selection of orbital motor, hydraulic systems, etc.
- Technical data on small motors: OML and OMM
- Technical data on medium sized motors: OMP, OMR, OMH
- Technical data on medium sized motors: DH and DS
- Technical data on medium sized 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.

Technical Information OMS, OMT and OMV Orbital Motors

OMS, OMT and OMV

Speed, torque and output



Intermittent values
 Continuous values

151-1407.11

The bar diagrams above are useful for a quick selection of relevant motor size for the application. The final motor size can be determined by using the function diagram for each motor size.

- OMS [Function diagrams](#) on page 18
- OMT [Function diagrams](#) on page 54

Technical Information OMS, OMT and OMV Orbital Motors

OMS, OMT and OMV

- OMV *Function diagrams* on page 81

The function diagrams are based on actual tests on a representative number of motors from our production. The diagrams apply to a return pressure between 5 and 10 bar [75 and 150 psi] when using mineral based hydraulic oil with a viscosity of 35 mm²/s [165 SUS] and a temperature of 50°C [120°F]. For further explanation concerning how to read and use the function diagrams, please consult the paragraph "Selection of motor size" in the technical information "General Orbital motors" 520L0232.

Technical Information OMS, OMT and OMV Orbital Motors
OMS
Versions
OMS versions

Mounting flange	Shaft	Port size	European version	US version	Drain connection	Check valve	Main type designation
Standard flange	Cyl. 32 mm	G 1/2	X		Yes	Yes	OMS
	Cyl. 1.25 in	7/8-14 UNF		X	Yes	Yes	OMS
	Splined 1.25 in	G 1/2	X		Yes	Yes	OMS
		7/8-14 UNF		X	Yes	Yes	OMS
	Tapered 35 mm	G 1/2	X		Yes	Yes	OMS
	Tapered 1.25 in	7/8-14 UNF		X	Yes	Yes	OMS
P.t.o.	G 1/2	X		Yes	Yes	OMS	
Special flange	Splined 1.25 in	G 1/2	X		Yes	Yes	OMS
A-2 flange	Cyl. 1 in	7/8-14 UNF		X	Yes	Yes	OMS
	Cyl. 1.25 in	7/8-14 UNF		X	Yes	Yes	OMS
	Splined 1 in	7/8-14 UNF		X	Yes	Yes	OMS
	Splined 1.25 in	7/8-14 UNF		X	Yes	Yes	OMS
	Tapered 1.25 in	7/8-14 UNF		X	Yes	Yes	OMS
Magneto flange	Cyl. 1 in	7/8-14 UNF		X	Yes	Yes	OMS
	Cyl. 1.25 in	7/8-14 UNF		X	Yes	Yes	OMS
	Splined 1 in	7/8-14 UNF		X	Yes	Yes	OMS
	Splined 1.25 in	7/8-14 UNF		X	Yes	Yes	OMS
SAE B flange	Splined 1.25 in	7/8-14 UNF		X	Yes	Yes	OMS
	Splined 0.875 in	7/8-14 UNF		X	Yes	Yes	OMS
Wheel	Cyl. 32 mm	G 1/2	X		Yes	Yes	OMSW
	Cyl. 1.25 in	7/8-14 UNF		X	Yes	Yes	OMSW
	Tapered 35 mm	G 1/2	X		Yes	Yes	OMSW
	Tapered 1.25 in	7/8-14 UNF		X	Yes	Yes	OMSW
Short	No output shaft	G 1/2	X		Yes	Yes	OMSW

Features

Features available (options):

- Speed sensor
- Motor with tacho connection
- High pressure shaft seal
- Viton shaft seal
- Painted
- Ultra short
- Motor with drum brake

Technical Information OMS, OMT and OMV Orbital Motors
OMS
Code numbers
OMS code numbers

Code Numbers	Displacement [cm ³]								
	80	100	125	160	200	250	315	400	500
151F	0500	0501	0502	0503	0504	0505	0506	0605	-
151F	2200	2201	2202	2203	2204	2205	2206	2261	2268
151F	0507	0508	0509	0510	0511	0512	0513	-	-
151F	2207	2208	2209	2210	2211	2212	2213	2262	2269
151F	0514	0515	0516	0517	0518	0519	0520	-	-
151F	2214	2215	2216	2217	2218	2219	2220	2264	2270
151F	0560	0561	0562	0563	0564	0565	0566	-	-
151F	0542	0543	0544	0545	0546	0547	0548	-	-
151F	2300	2301	2302	2303	2304	2305	2306	2307	2345
151F	2316	2317	2318	2319	2320	2321	2322	2323	2347
151F	2308	2309	2310	2311	2312	2313	2314	2315	2346
151F	2324	2325	2326	2327	2328	2329	2330	2331	2348
151F	2332	2333	2334	2335	2336	2337	2338	2339	2349
151F	2377	2378	2379	2380	2381	2382	2383	2384	2385
151F	2368	2369	2370	2371	2372	2373	2374	2375	2376
151F	2359	2360	2361	2362	2363	2364	2365	2366	2367
151F	2350	2351	2352	2353	2354	2355	2356	2357	2358
151F	2395	2396	2397	2398	2399	2400	2401	2402	2403
151F	2413	2414	2415	2416	2417	-	-	-	-
151F	0521	0522	0523	0524	0525	0526	0527	0610	-
151F	2235	2236	2237	2238	2239	2240	2241	2265	2266
151F	0528	0529	0530	0531	0532	0533	0534	0609	-
151F	2242	2243	2244	2245	2246	2247	2248	2263	2267
151F	0535	0536	0537	0538	0539	0540	0541	0608	-

Ordering

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

Example:

151F0504 for an OMS 200 with standard flange, cyl. 32 mm shaft and port size G 1/2.

Orders will not be accepted without the four digit prefix.

Technical Information OMS, OMT and OMV Orbital Motors
OMS
Technical data

Type			OMS OMSW OMSS	OMS OMSW OMSS	OMS OMSW OMSS	OMS OMSW OMSS	OMS OMSW OMSS	OMS OMSW OMSS	OMS OMSW OMSS	OMS OMSW OMSS	
Motor size			80	100	125	160	200	250	315	400	500
Geometric displacement	cm ³ [in ³]		80.5 [4.91]	100.0 [6.10]	125.7 [7.67]	159.7 [9.75]	200.0 [12.20]	250.0 [15.26]	314.9 [19.22]	393.0 [23.98]	488.0 [29.78]
Max. speed	min ⁻¹ [rpm]	cont.	810	750	600	470	375	300	240	190	155
		int. ¹⁾	1000	900	720	560	450	360	285	230	185
Max. torque	Nm [lbf-in]	cont.	240 [2120]	305 [2700]	375 [3320]	490 [4340]	610 [5400]	720 [6370]	825 [7300]	865 [7660]	850 [7520]
		int. ¹⁾	310 [2740]	390 [3450]	490 [4340]	600 [5310]	720 [6370]	870 [7700]	1000 [8850]	990 [8760]	990 [8760]
Max. output	kW [hp]	cont.	15.5 [20.8]	18.0 [24.1]	18.0 [24.1]	16.5 [22.1]	16.5 [22.1]	14.5 [19.4]	15.0 [20.1]	11.0 [14.8]	9.0 [12.1]
		int. ¹⁾	19.5 [26.2]	22.5 [30.2]	22.5 [30.2]	23.0 [30.8]	22.0 [29.5]	18.0 [24.1]	17.0 [22.8]	12.5 [16.8]	10.5 [14.1]
Max. pressure drop	bar [psi]	cont.	210 [3050]	210 [3050]	210 [3050]	210 [3050]	210 [3050]	200 [2900]	200 [2900]	160 [2320]	120 [1740]
		int. ¹⁾	275 [3990]	275 [3990]	275 [3990]	260 [3770]	250 [3630]	250 [3630]	240 [3480]	190 [2760]	140 [2030]
		peak ²⁾	295 [4280]	295 [4280]	295 [4280]	280 [4060]	270 [3920]	270 [3920]	260 [3770]	210 [3050]	160 [2320]
Max. oil flow	l/min [USgal/min]	cont.	65 [17.2]	75 [19.8]	75 [19.8]	75 [19.8]	75 [19.8]	75 [19.8]	75 [19.8]	75 [19.8]	75 [19.8]
		int. ¹⁾	80 [21.1]	90 [23.8]	90 [23.8]	90 [23.8]	90 [23.8]	90 [23.8]	90 [23.8]	90 [23.8]	90 [23.8]
Max. starting pressure with unloaded shaft	bar [psi]		12 [175]	10 [145]	10 [145]	8 [115]	8 [115]	8 [115]	8 [115]	8 [115]	8 [115]
Min. starting torque	at max. press. drop cont.		180 [1590]	230 [2040]	290 [2570]	370 [3270]	470 [4160]	560 [4960]	710 [6280]	710 [6280]	660 [5840]
	at max. press. drop int. ¹⁾		235 [2080]	300 [2660]	380 [3360]	460 [4070]	560 [4960]	700 [6200]	850 [7520]	840 [7430]	770 [6820]

Type			Max. inlet pressure	Max. return pressure with drain line
OMS OMSW OMSS	bar [psi]	cont.	230 [3340]	140 [2030]
	bar [psi]	int. ¹⁾	295 [4280]	175 [2540]
	bar [psi]	peak ²⁾	300 [4350]	210 [3050]

			Splined 1 in	Cyl. 1 in	Splined 0.875 in
*Max torque for shaft type	Nm [lbf-in]	cont.	360 [3190]	300 [2660]	200 [1770]
		int. ¹⁾	450 [3980]	410 [3630]	200 [1770]

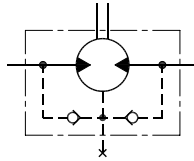
¹⁾ Intermittent operation: the permissible values may occur for max. 10% of every minute.

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

[For max. permissible combination of flow and pressure, see function diagram for actual motor.](#)

OMS
Maximum permissible shaft seal pressure
Motor with check valves and without use of drain connection

The pressure on the shaft seal never exceeds the pressure in the return line.

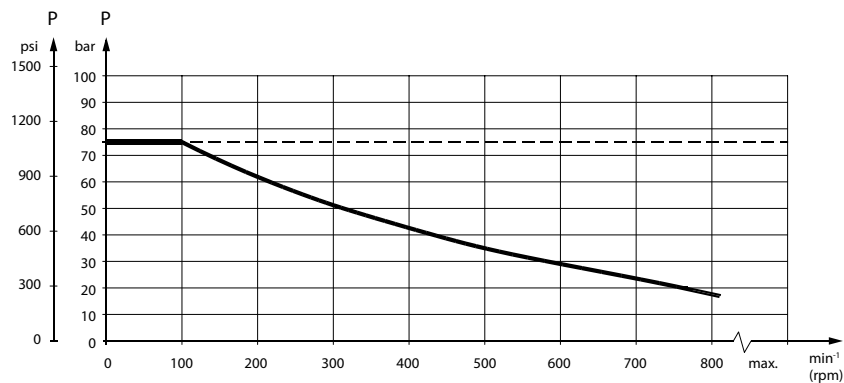


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Maximum return pressure

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

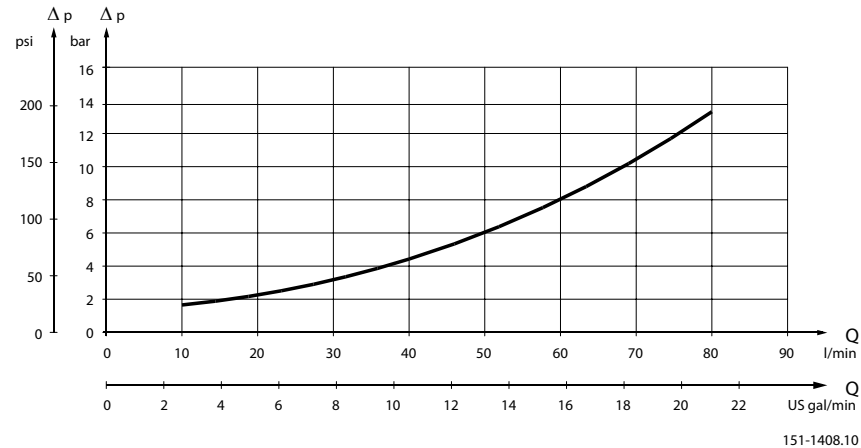
Maximum return pressure without drain line or maximum pressure in the drain line



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

———— Continuous operation

Technical Information OMS, OMT and OMV Orbital Motors
OMS
Pressure drop in motor


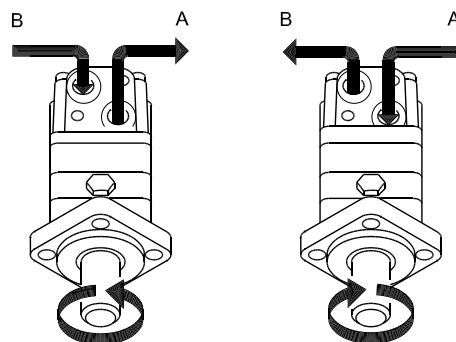
151-1408.10

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

Oil flow in drain line

Maximum oil flow in the drain line at a return pressure less than 5-10 bar [75-150 psi]

Pressure drop bar [psi]	Viscosity mm ² /s [SUS]	Oil flow in drain line l/min [US gal/min]
140 [2030]	20 [100]	1.5 [0.40]
	35 [165]	1.0 [0.26]
210 [3050]	20 [100]	3.0 [0.79]
	35 [165]	2.0 [0.53]

Direction of shaft rotation


151-843.10

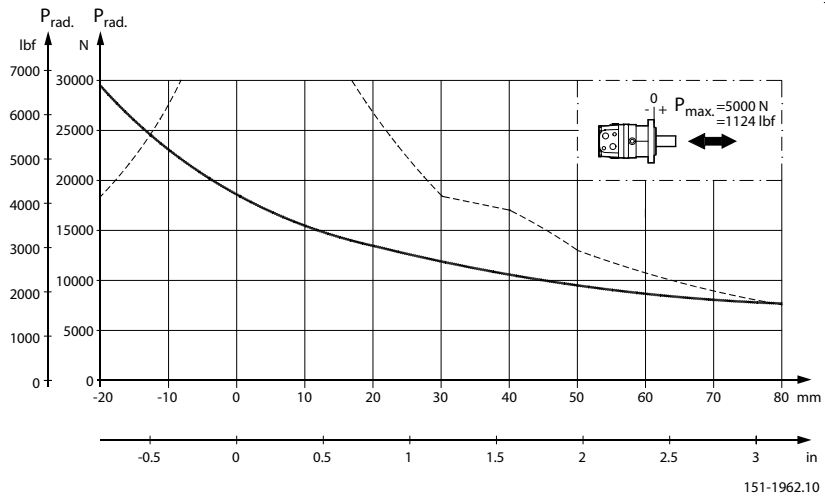
Permissible shaft loads for OMS
Mounting flange:

Standard – A-2 – Magneto – SAE B

Technical Information OMS, OMT and OMV Orbital Motors
OMS
Shaft:

Cyl. 32 mm – Cyl. 1.25 in – Splined 1.25 in.

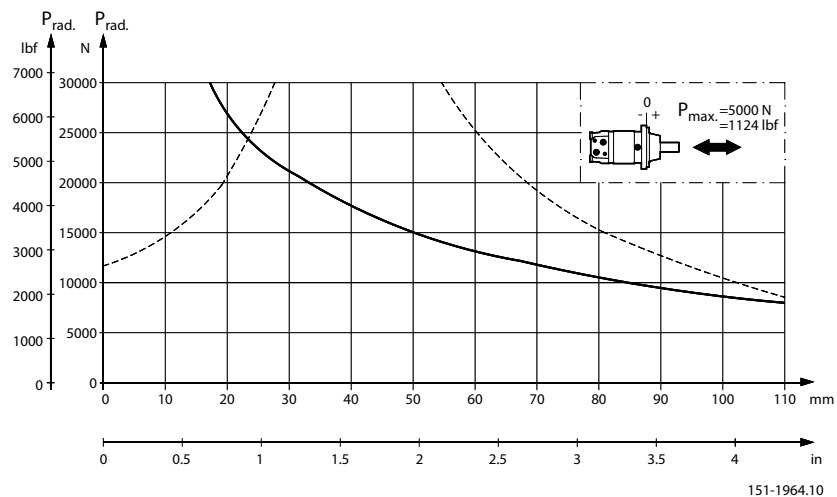
Tapered 35 mm – Tapered 1.25 in – P.t.o.


Mounting flange:

Wheel

Shaft:

All shaft types



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

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.

Technical Information OMS, OMT and OMV Orbital Motors
OMS

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.

For 3,000,000 shaft revolutions or 500 hours – increase these shaft loads with 52%.

The dash curve shows maximum radial shaft load. Any shaft load exceeding the values shown in the curve will involve a risk of breakage.

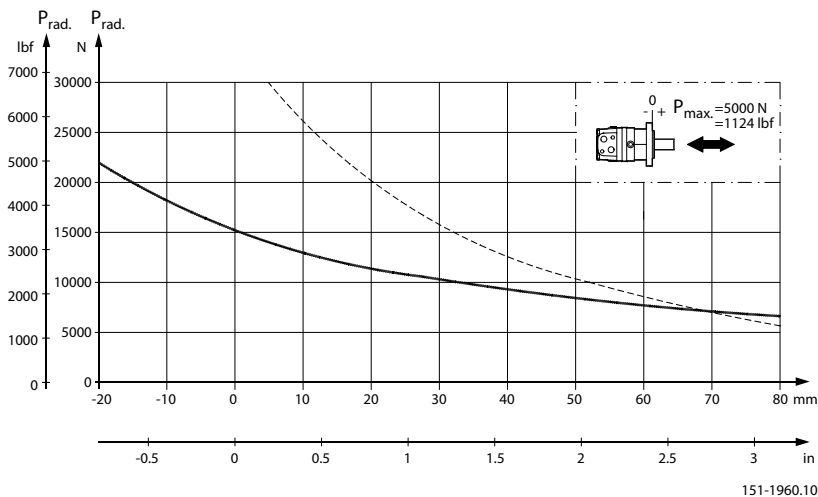
Bearing life calculations can be made using the explanation and formula provided in the chapter "Bearing dimensioning" in the technical information "General Orbital motors" 520L0232.

Mounting flange:

Special

Shaft:

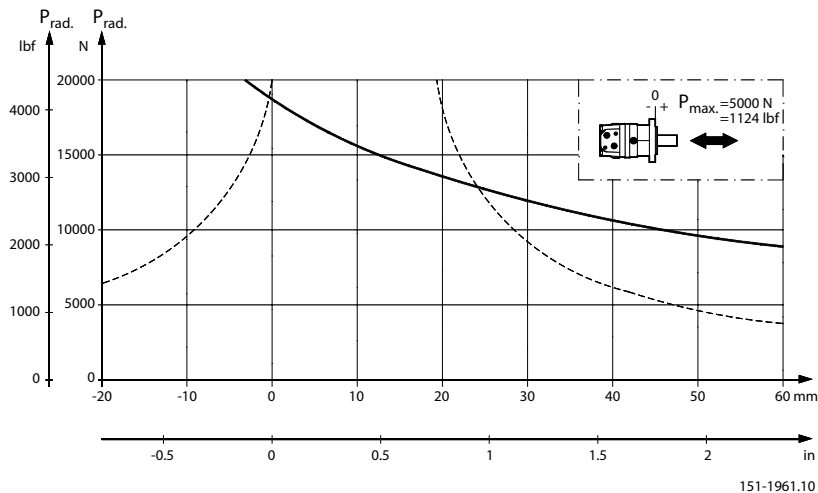
Splined 1.25 in


Mounting flange:

A-2 – Magneto

Shaft:

Cyl. 1 in – Splined 1 in

Technical Information OMS, OMT and OMV Orbital Motors
OMS


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

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.

For 3,000,000 shaft revolutions or 500 hours – increase these shaft loads with 52%.

The dash curve shows max. radial shaft load. Any shaft load exceeding the values shown in the curve will involve a risk of breakage.

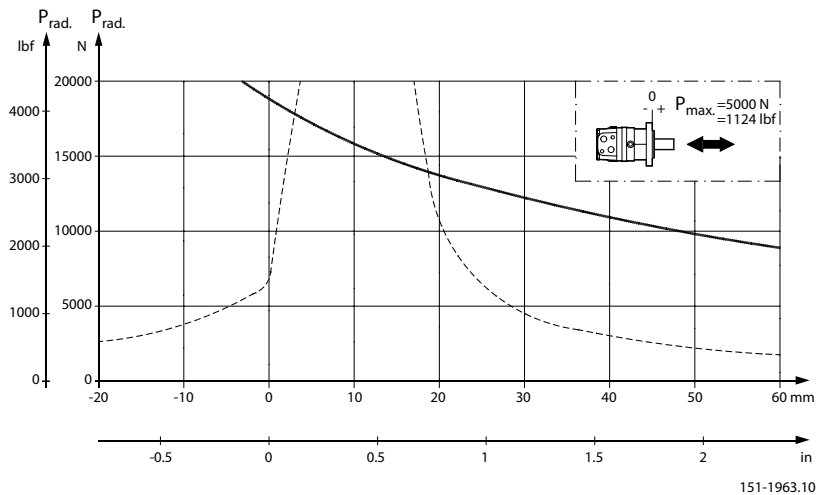
Bearing life calculations can be made using the explanation and formula provided in the chapter "Bearing dimensioning" in the technical information "General Orbital motors" 520L0232.

Mounting flange:

SAE B

Shaft:

Splined 0.875 in

OMS


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

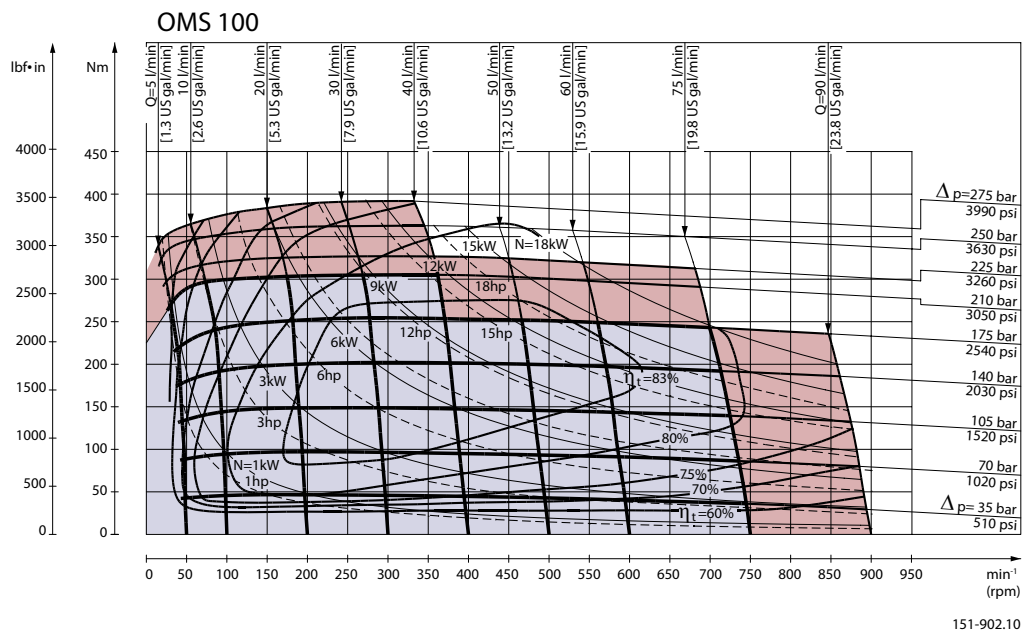
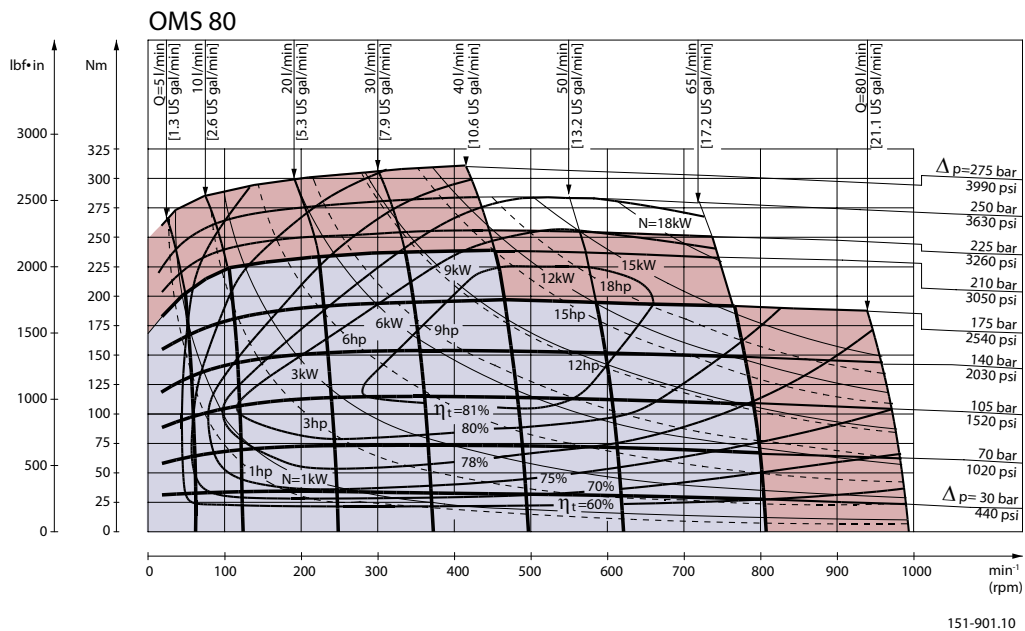
The permissible radial load on the shaft is shown for an axial load of 0 N as a function of the distance from the mounting flange to the point of load application.

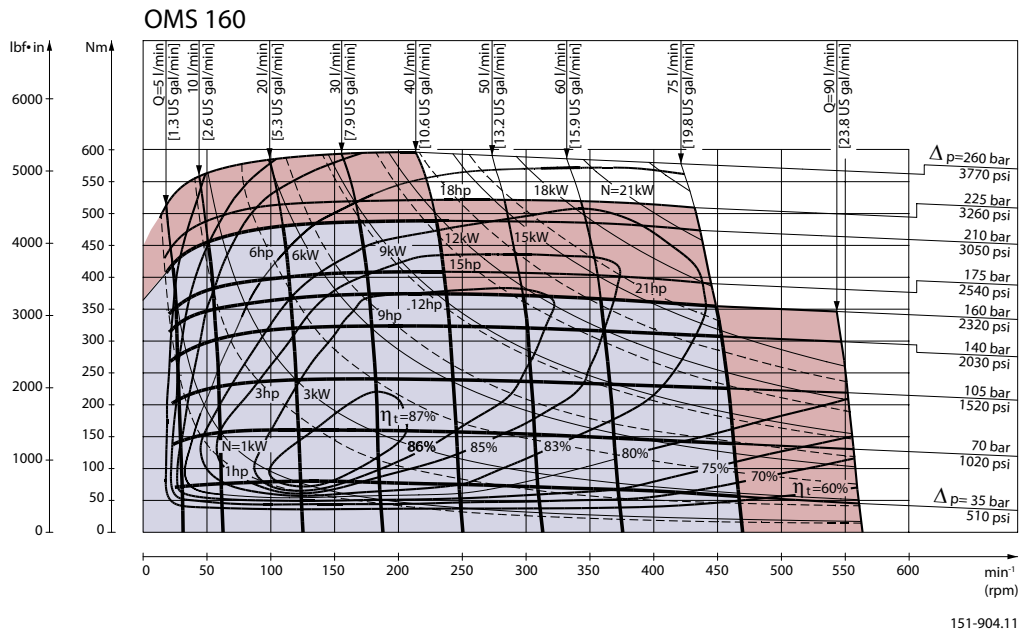
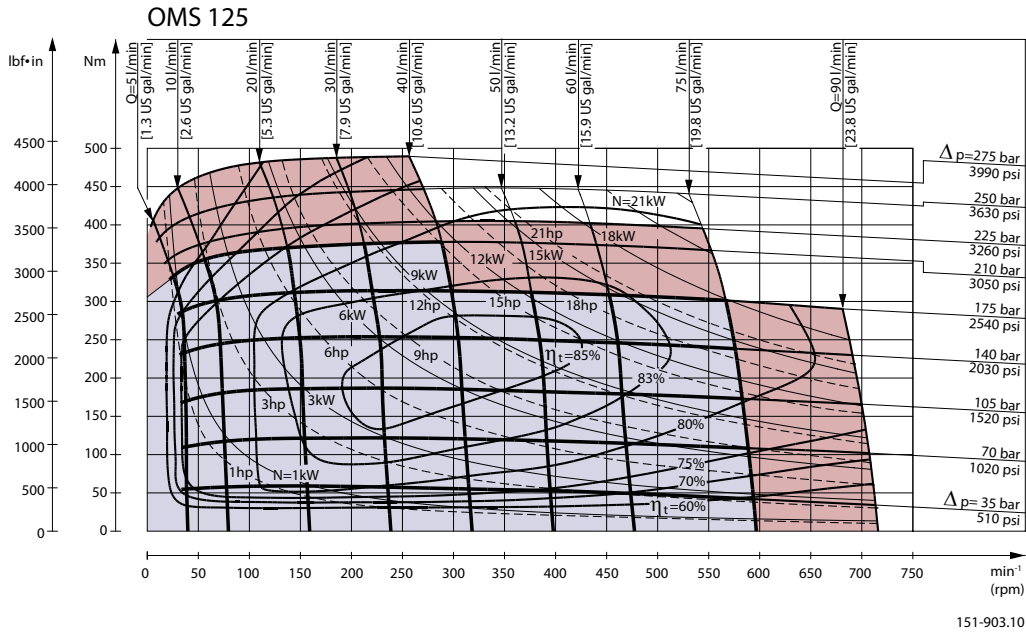
The curve is based on B10 bearing life (2000 hours or 12,000,000 shaft revolutions at 100 min^{-1}) at rated output torque, when mineral-based hydraulic oil with a sufficient content of anti-wear additives, is used.

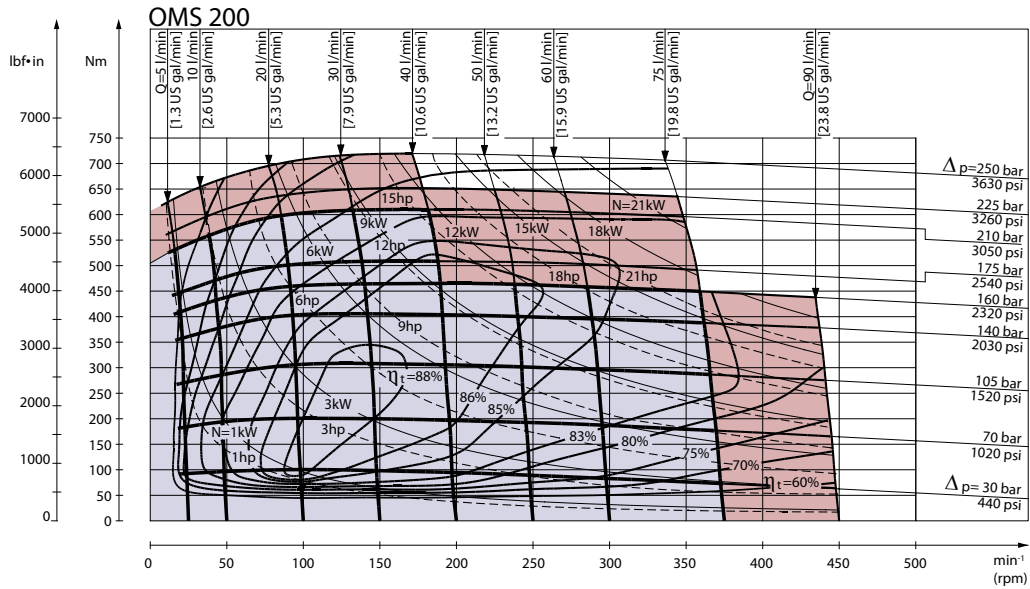
For 3,000,000 shaft revolutions or 500 hours – increase these shaft loads with 52%.

The dash curve shows max. radial shaft load. Any shaft load exceeding the values shown in the curve will involve a risk of breakage.

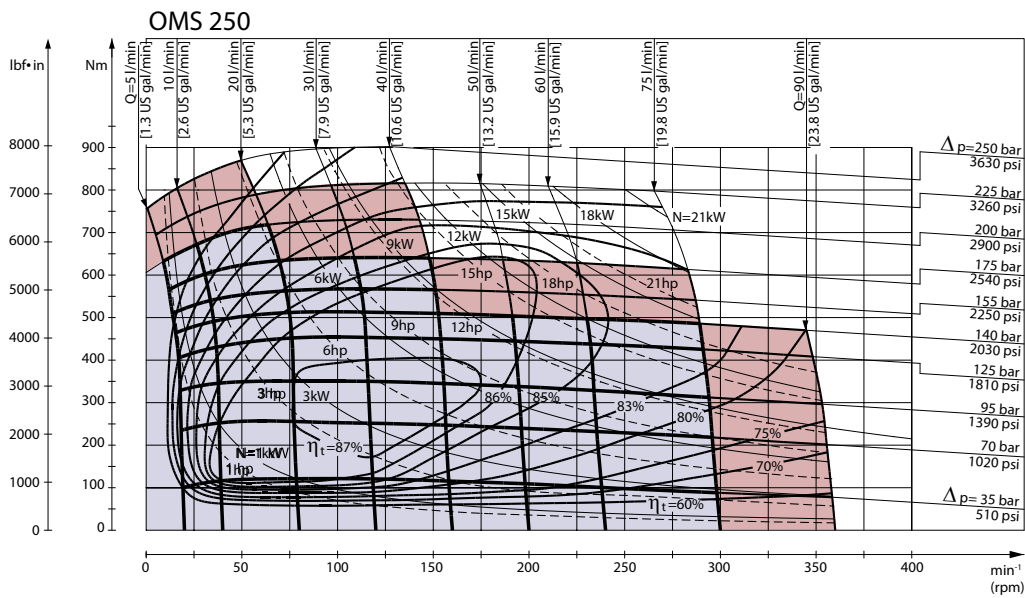
Bearing life calculations can be made using the explanation and formula provided in the chapter "Bearing dimensioning" in the technical information "General Orbital motors" 520L0232.

Technical Information OMS, OMT and OMV Orbital Motors
OMS
Function diagrams
Continuous range
Intermittent range (maximum 10% operation every minute)


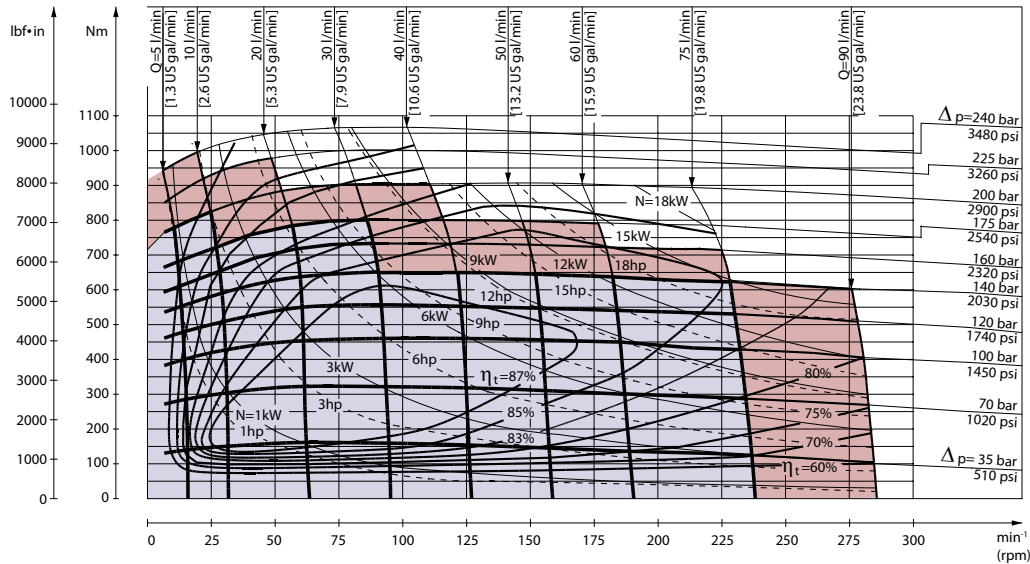
Technical Information OMS, OMT and OMV Orbital Motors
OMS


Technical Information OMS, OMT and OMV Orbital Motors
OMS


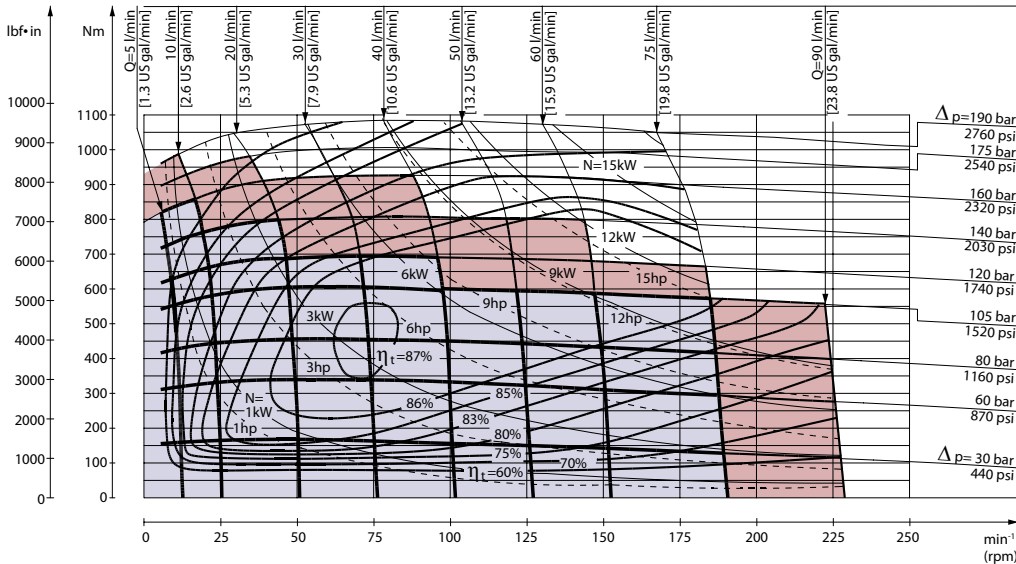
151-905.10



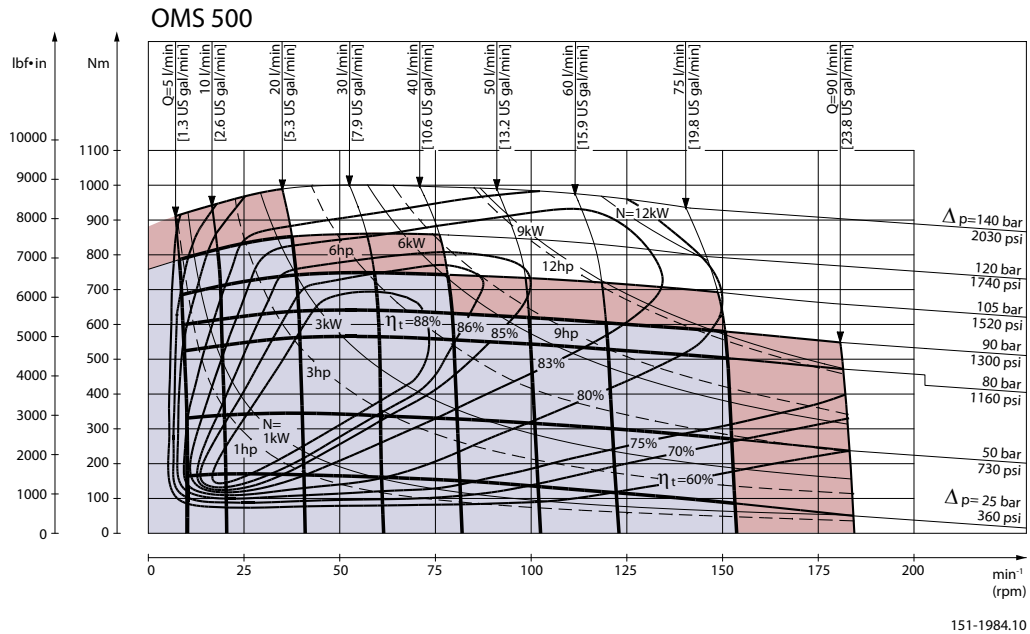
151-1039.10

Technical Information OMS, OMT and OMV Orbital Motors
OMS
OMS 315


151-906.10

OMS 400


151-1491.10

Technical Information OMS, OMT and OMV Orbital Motors
OMS

Function diagram use

Explanation of function diagram use, basis and conditions, see [Speed, torque and output](#) on page 7.

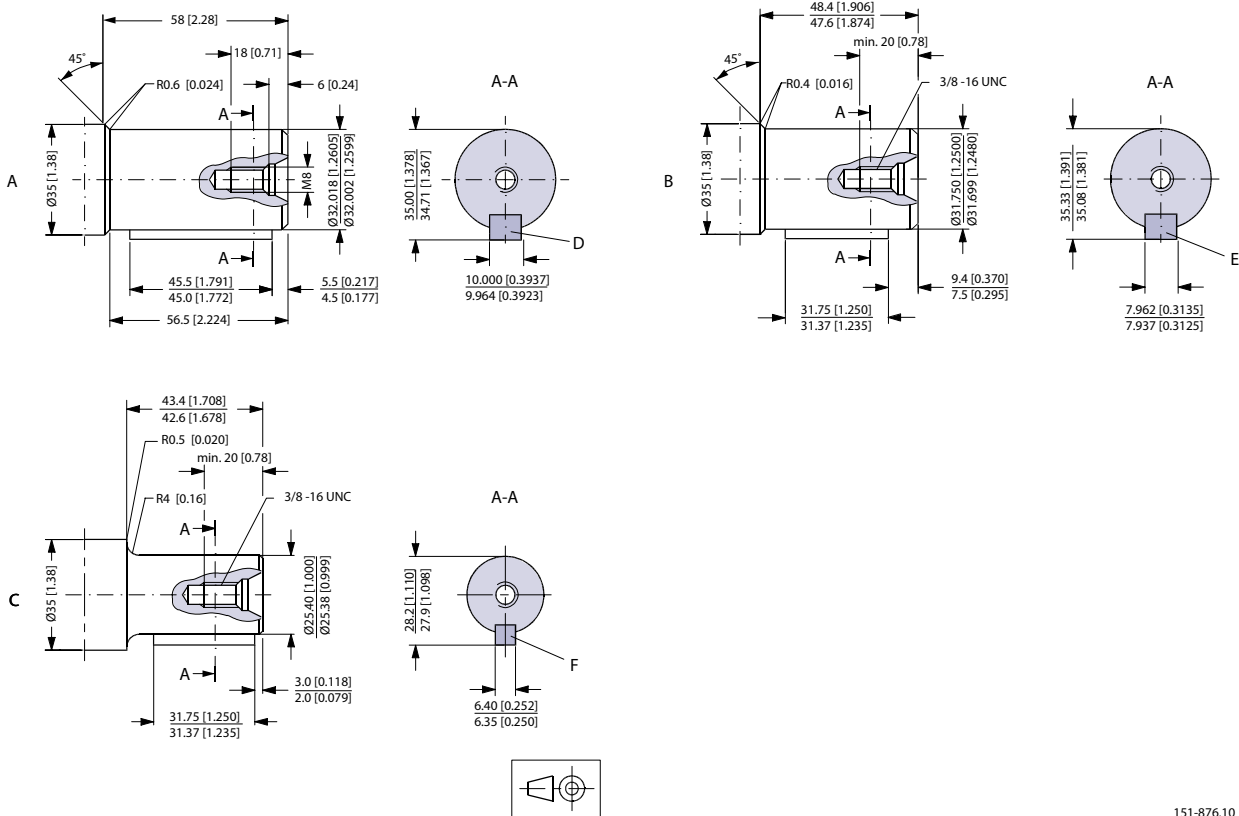
Maximum permissible continuous/intermittent torque for the actual shaft version, see [Technical data](#) on page 11.

Intermittent pressure drop and oil flow must not occur simultaneously.

Technical Information OMS, OMT and OMV Orbital Motors

OMS

Shaft version



151-876.10

A Cylindrical 32 mm shaft

D Parallel key
A10 × 8 × 45
DIN 6885

Keyway deviates from standard

B Cylindrical 1.25 in shaft

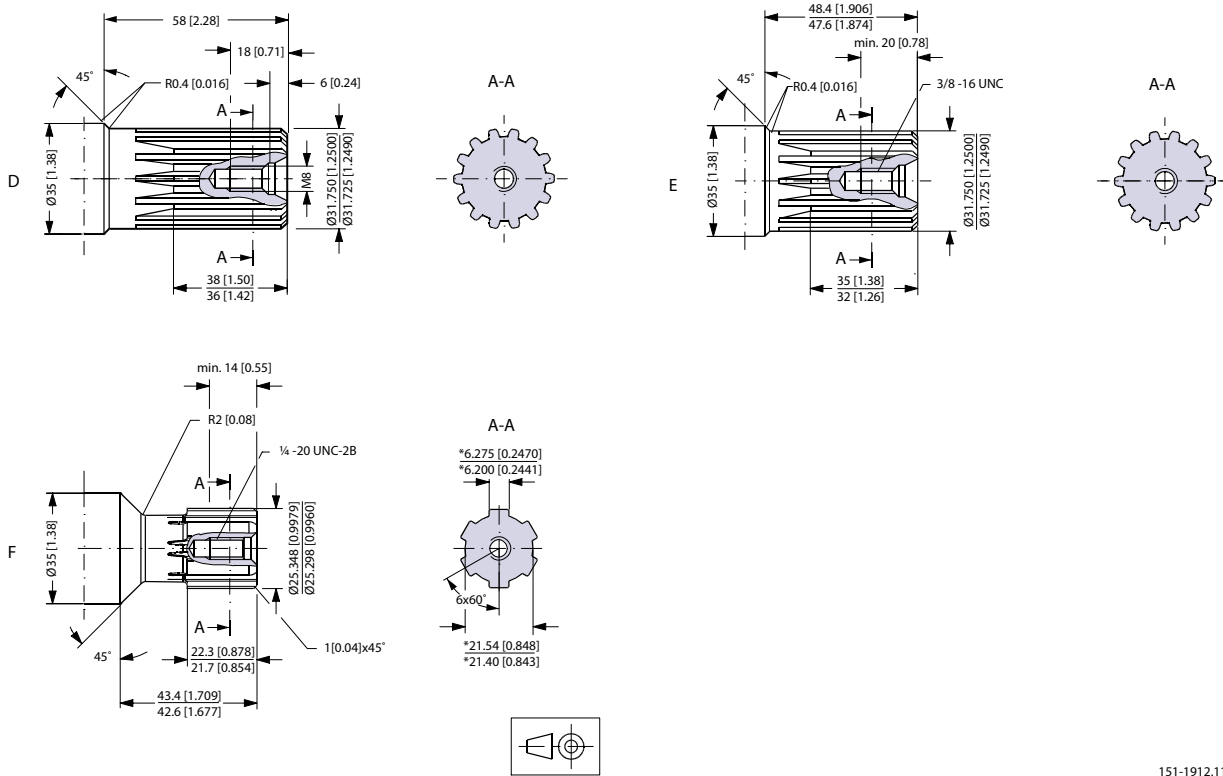
E Parallel key
5/16 × 5/16 × 11/4 in
SAE J744

Keyway deviates from standard

C Cylindrical 1 in shaft

F Parallel key
1/4 × 1/4 × 11/4 in
B.S. 46

Keyway deviates from standard

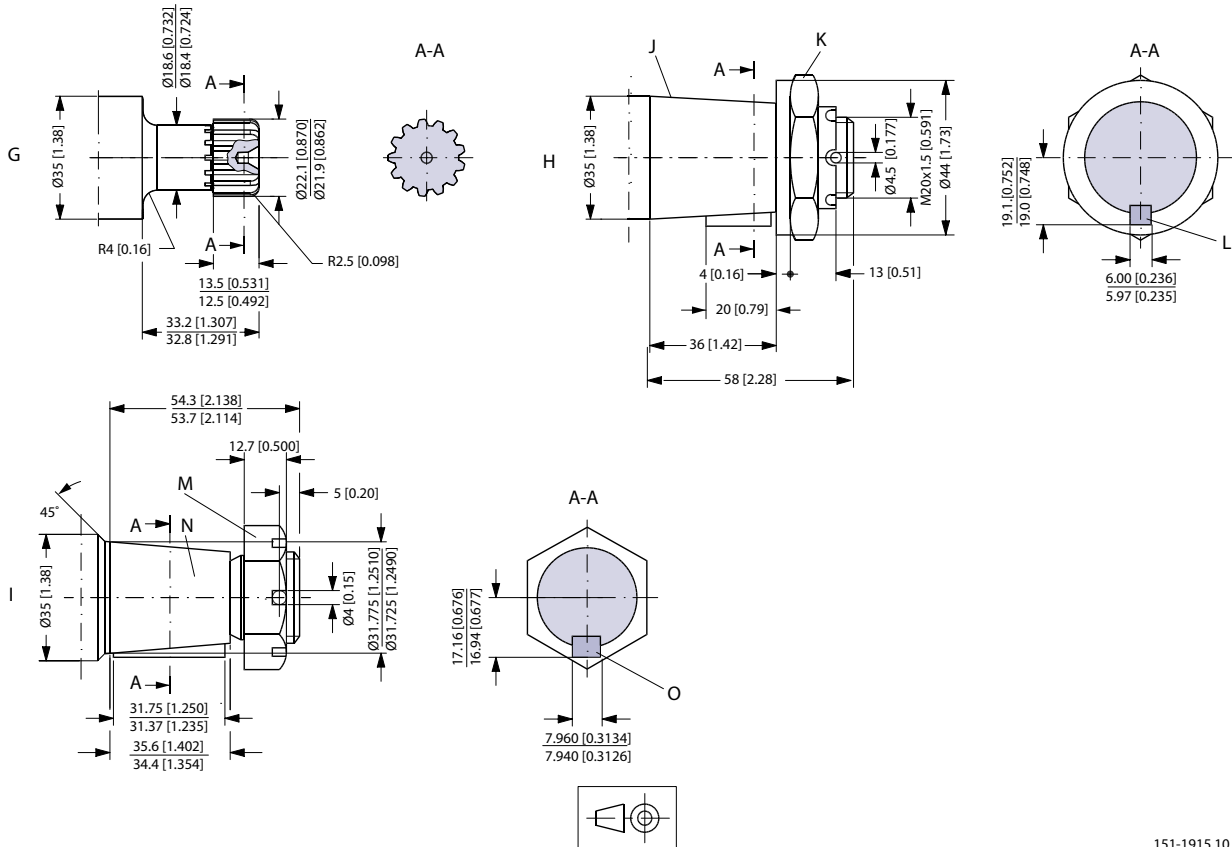
Technical Information OMS, OMT and OMV Orbital Motors
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151-1912.11

D Involute splined shaft
 ANS B92.1 - 1970 standard
 Flat root side fit
 Pitch 12/24
 Teeth 14
 Major diameter 1.25 in
 Pressure angle 30°

E US version
 Involute splined shaft
 ANS B92.1 - 1970 standard
 Flat root side fit
 Pitch 12/24
 Teeth 14
 Major diameter 1.25 in
 Pressure angle 30°

F Splined shaft
 SAE 6 B (B.S. 2059)
 Straight-sided, bottom fitting, deep
 Fit 2
 Nominal size 1 in
 *Deviates from SAE 6 B (B.S. 2059)

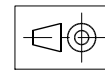
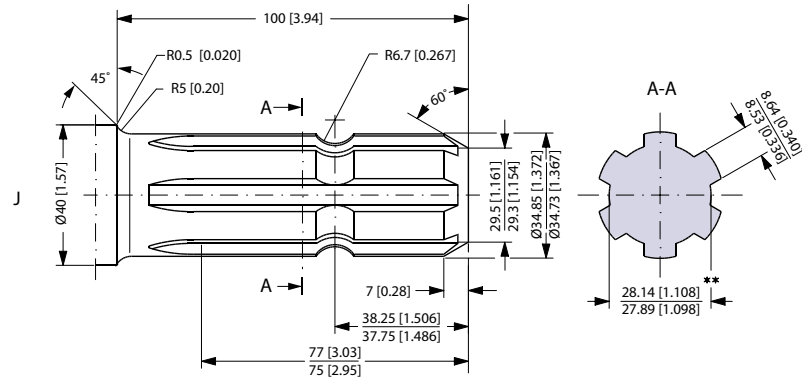
Technical Information OMS, OMT and OMV Orbital Motors
OMS


151-1915.10

- G** Involute splined shaft
ANS B92.1 - 1970 standard
Flat root side fit
Pitch 16/32
Teeth 13
Major dia. 0.875 in
Pressure angle 30°
- I** Tapered 1 1/4 in shaft

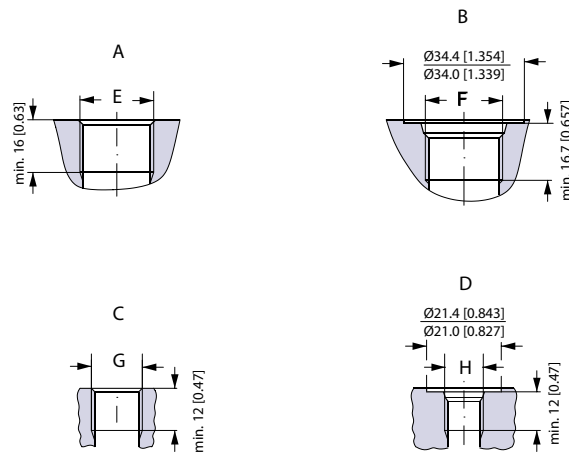
- H** Tapered 35 mm shaft
(ISO/R775)
- K** DIN 937
Across flats: 41 mm
Tightening torque: 200 ± 10 Nm [1770 ± 85 lbf-in]
- J** Taper 1:10
- L** Parallel key
B6 × 6 × 20
DIN 6885
Keyway deviates from standard

- I** Tapered 1 1/4 in shaft
- M** 1 - 20 UNEF
Across flats 1 7/16 in
Tightening torque: 200 ± 10 Nm (1770 ± 85 lbf-in)
- N** Cone 1:8
SAE J501
- O** Parallel key
5/16 × 5/16 × 1 1/4
SAE J501
Keyway deviates from standard

Technical Information OMS, OMT and OMV Orbital Motors
OMS


151-1948.10

- J** P.t.o. shaft
 DIN 9611 Form 1
 (ISO/R500 without pin hole)
 ** Deviates from DIN 9611

Port thread versions


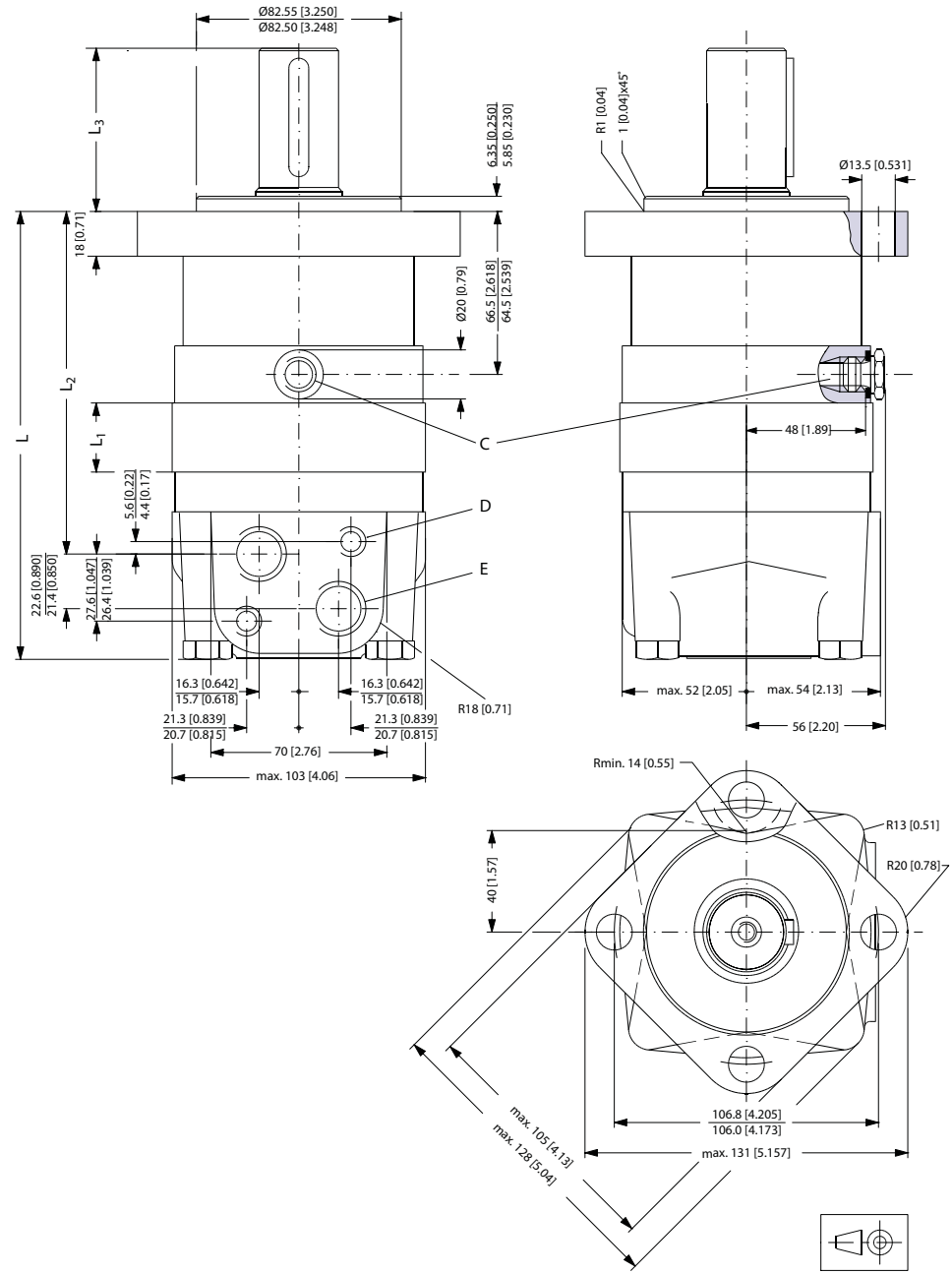
151-1971.11

- | | |
|--|-------------------------|
| A G main ports | B UNF main ports |
| E ISO 228/1 - G1/2 O-ring boss port | F 7/8 - 14 UNF |
| C G drain port | D UNF drain port |
| G ISO 228/1 - G1/4 O-ring boss port | H 7/16 - 20 UNF |

Dimensions

OMS

Standard flange—European version



C: Drain connection
G 1/4; 12 mm [0.47 in] deep
E: G 1/2; 15 mm [0.59 in] deep

D: M10; 13 mm [0.51 in] deep

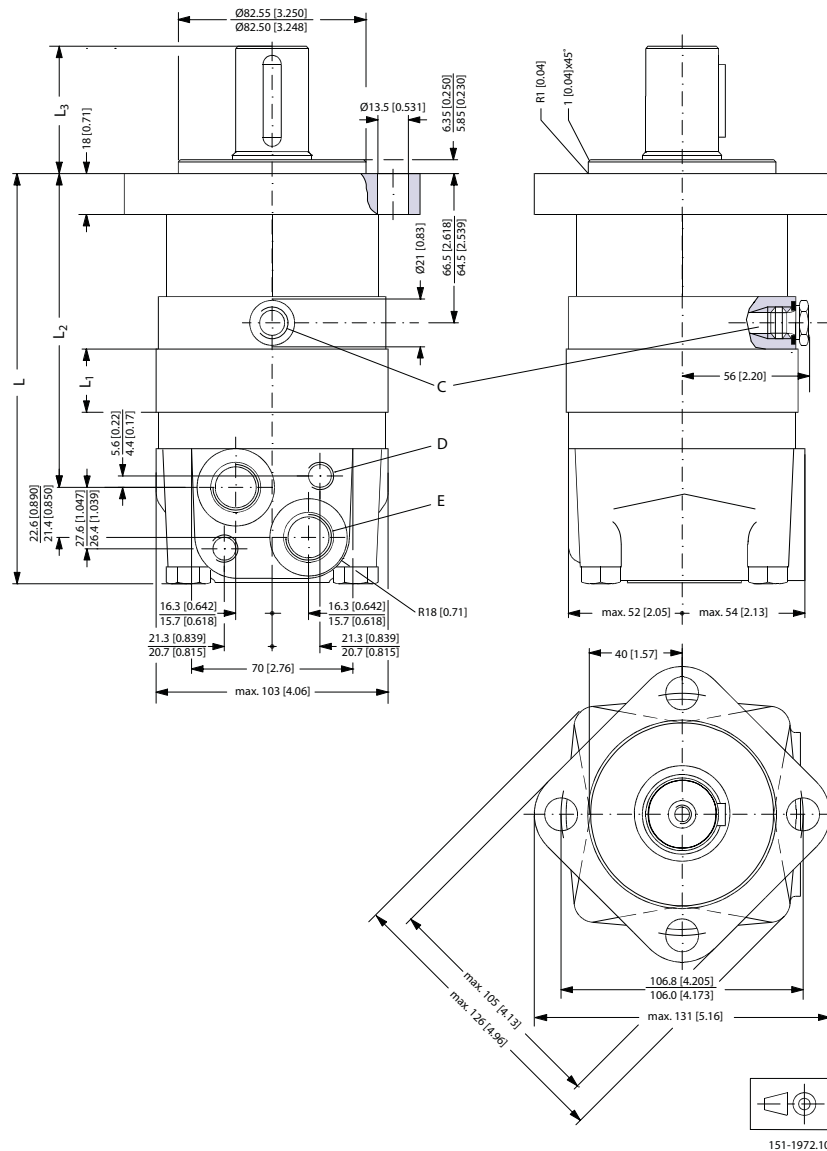
151-1809.10

Technical Information OMS, OMT and OMV Orbital Motors

OMS

Type	L _{max} mm [in]	L ₁ mm [in]	L ₂ mm [in]
OMS 80	167 [6.57]	14.0 [0.551]	124 [4.88]
OMS 100	170 [6.69]	17.4 [0.685]	127 [5.00]
OMS 125	175 [6.89]	21.8 [0.858]	132 [5.20]
OMS 160	181 [7.13]	27.8 [1.094]	138 [5.43]
OMS 200	188 [7.40]	34.8 [1.370]	145 [5.71]
OMS 250	196 [7.72]	43.5 [1.713]	153 [6.02]
OMS 315	208 [8.19]	54.8 [2.157]	165 [6.50]
OMS 400	221 [8.70]	68.4 [2.693]	178 [7.01]

Output shaft		L ₃ mm [in]
All shafts except P.t.o. shaft	max	67 [2.64]
	min	65 [2.56]
P.t.o. shaft	max	109 [4.29]
	min	107 [4.21]

OMS
Standard flange—US version
Standard flange


C: Drain connection
 7/16 - 20 UNF;
 12 mm [0.47 in] deep
 O-ring boss port

D: M10; 13 mm [0.51 in] deep

E: 7/8 - 14 UNF;
 16.7 mm [0.657 in] deep
 O-ring boss port

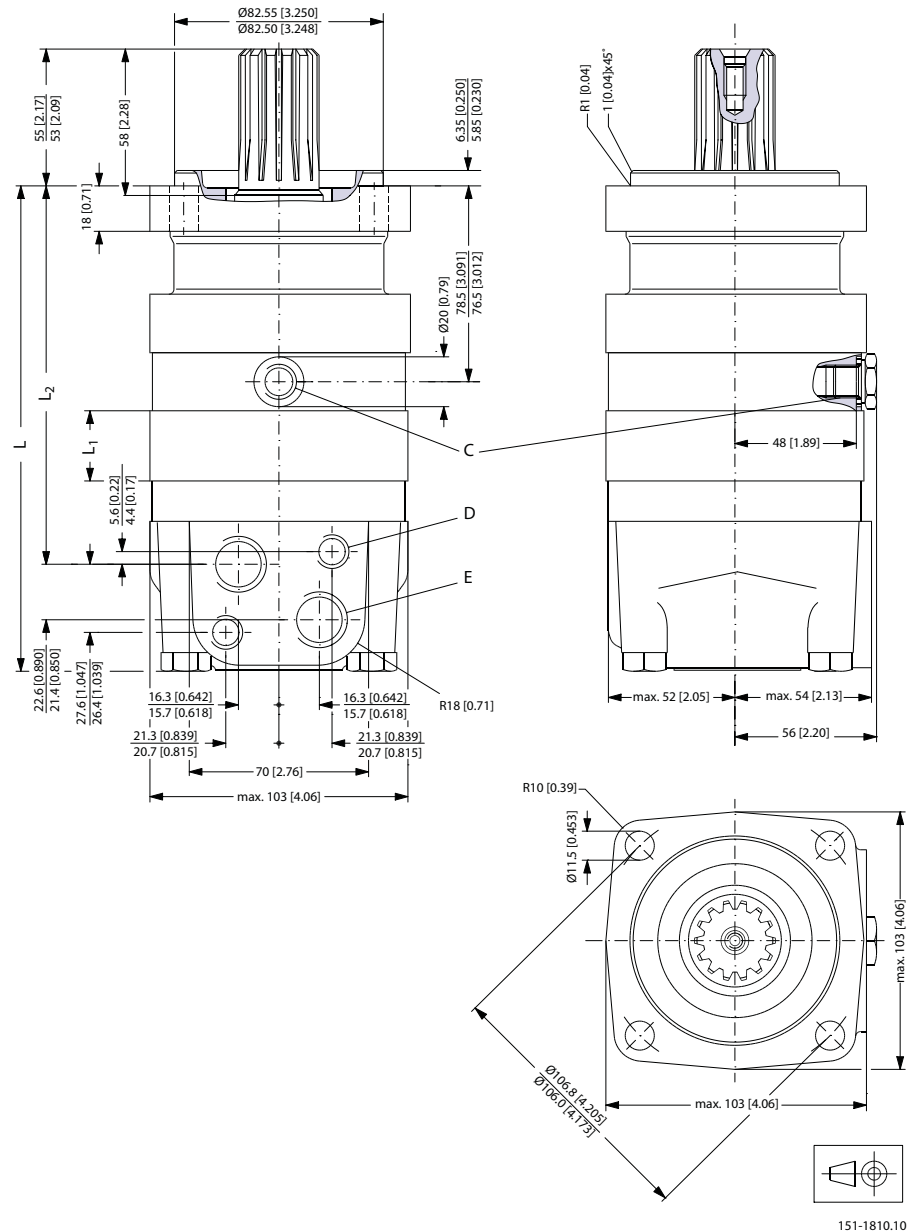
Type	L _{max} mm [in]	L ₁ mm [in]	L ₂ mm [in]
OMS 80	167 [6.57]	14.0 [0.551]	124 [4.88]
OMS 100	170 [6.69]	17.4 [0.685]	127 [5.00]
OMS 125	175 [6.89]	21.8 [0.858]	132 [5.20]

Technical Information OMS, OMT and OMV Orbital Motors

OMS

Type	L _{max} mm [in]	L ₁ mm [in]	L ₂ mm [in]
OMS 160	181 [7.13]	27.8 [1.094]	138 [5.43]
OMS 200	188 [7.40]	34.8 [1.370]	145 [5.71]
OMS 250	196 [7.72]	43.5 [1.713]	153 [6.02]
OMS 315	208 [8.19]	54.8 [2.157]	165 [6.50]
OMS 400	221 [8.70]	68.4 [2.693]	178 [7.01]
OMS 500	221 [8.70]	68.4 [2.693]	178 [7.01]

Output shaft		L ₃ mm [in]
Cyl.1.25 in Splined 1.25 in	max	57 [2.24]
	min	55 [2.17]
Tapered 1.25 in	max	67 [2.64]
	min	65 [2.56]

OMS
Special flange—European version


C: Drain connection
 G 1/4; 12 mm [0.47 in] deep

D: M10; 13 mm [0.51 in] deep

E: G 1/2; 15 mm [0.59 in] deep

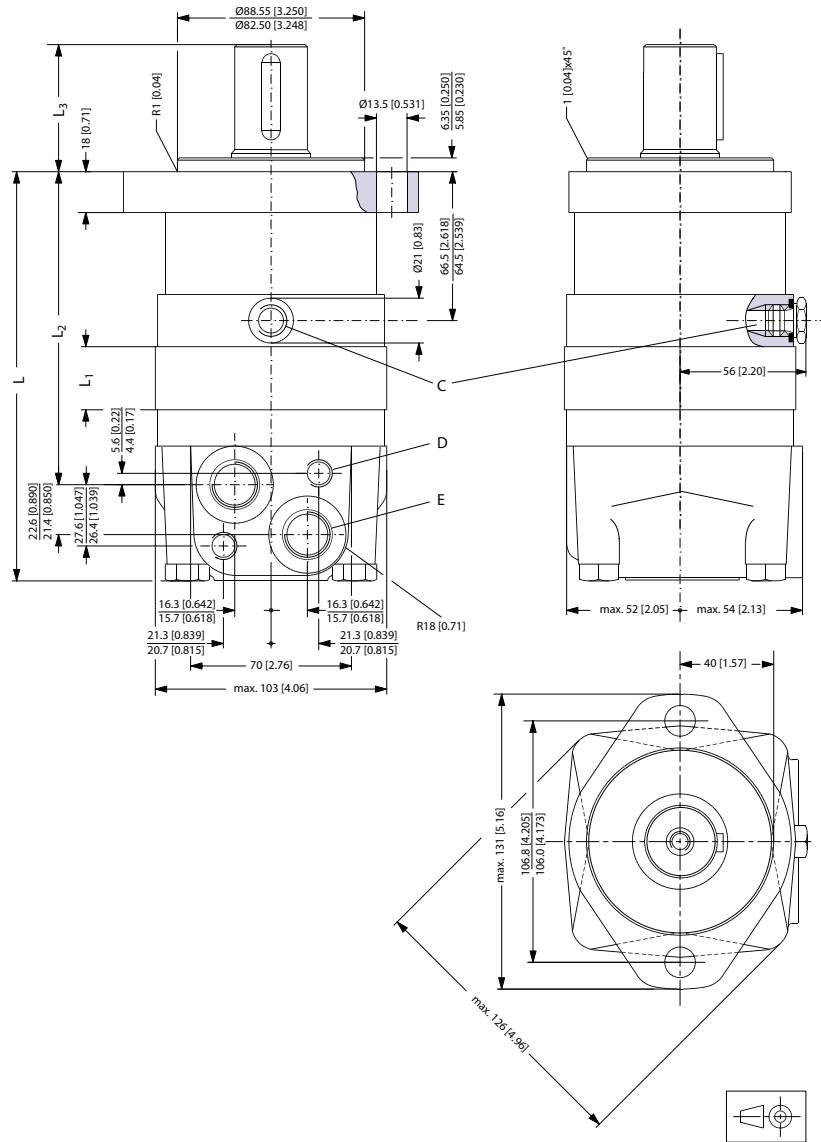
Type	L _{max} mm [in]	L ₁ mm [in]	L ₂ mm [in]
OMS 80	178 [7.01]	14.0 [0.551]	136 [5.35]
OMS 100	182 [7.17]	17.4 [0.685]	140 [5.51]

Technical Information OMS, OMT and OMV Orbital Motors

OMS

Type	L _{max} mm [in]	L ₁ mm [in]	L ₂ mm [in]
OMS 125	186 [7.32]	21.8 [0.858]	144 [5.67]
OMS 160	192 [7.56]	27.8 [1.094]	150 [5.91]
OMS 200	199 [7.83]	34.8 [1.370]	157 [6.18]
OMS 250	208 [8.19]	43.5 [1.713]	166 [6.54]
OMS 315	219 [8.62]	54.8 [2.157]	177 [6.97]
OMS 400	232 [9.13]	68.4 [2.693]	190 [7.48]

A-2 flange—US version



151-1979.10

C: Drain connection
7/16 - 20 UNF;

D: M10; 13 mm [0.51 in] deep

Technical Information OMS, OMT and OMV Orbital Motors
OMS

 12 mm [0.47 in] deep
 O-ring boss port

E: 7/8 - 14 UNF;
 16.7 mm [0.657 in] deep
 O-ring boss port

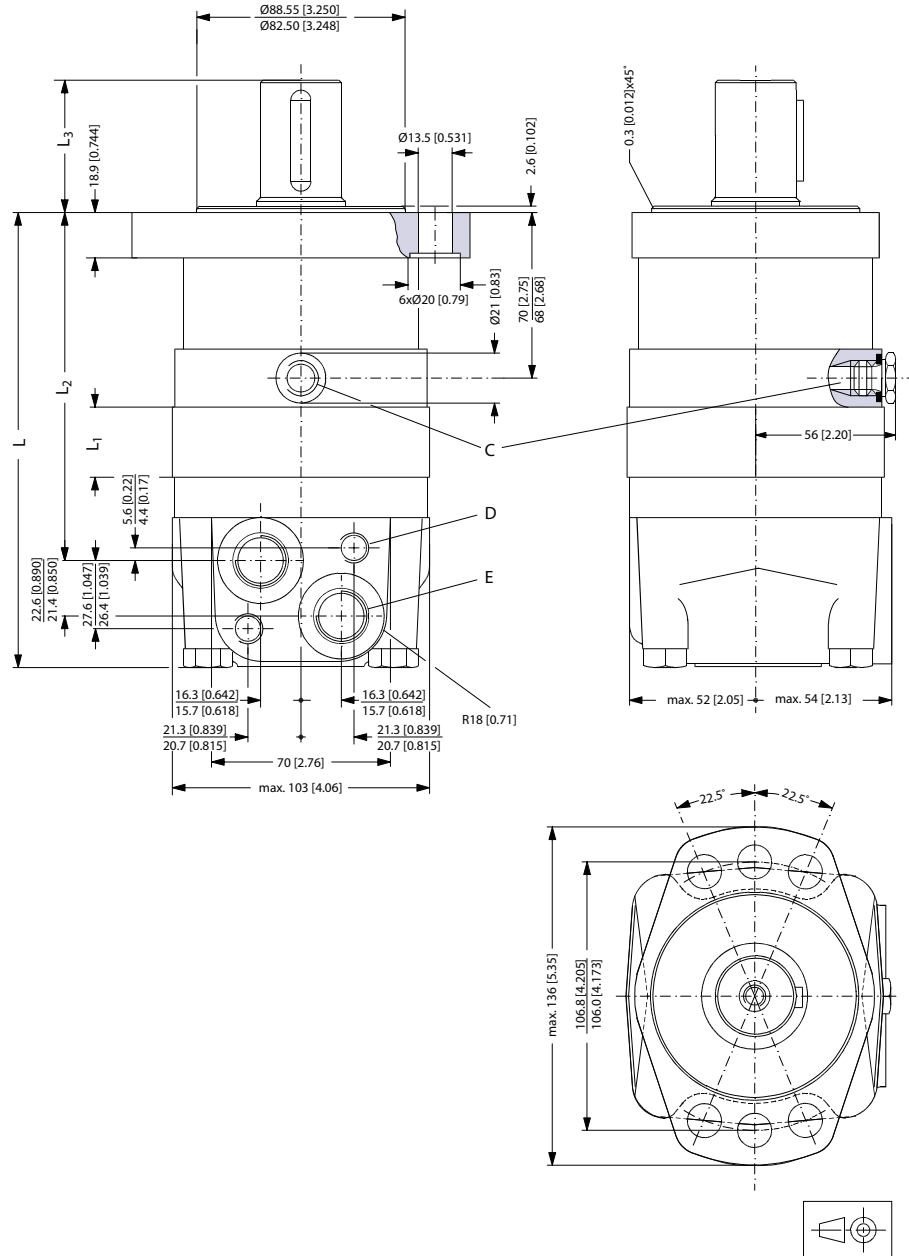
Type	L _{max} mm [in]	L ₁ mm [in]	L ₂ mm [in]
OMS 80	167 [6.57]	14.0 [0.551]	124 [4.88]
OMS 100	170 [6.69]	17.4 [0.685]	127 [5.00]
OMS 125	175 [6.89]	21.8 [0.858]	132 [5.20]
OMS 160	181 [7.13]	27.8 [1.094]	138 [5.43]
OMS 200	188 [7.40]	34.8 [1.370]	145 [5.71]
OMS 250	196 [7.72]	43.5 [1.713]	153 [6.02]
OMS 315	208 [8.19]	54.8 [2.157]	165 [6.50]
OMS 400	221 [8.70]	68.4 [2.693]	178 [7.01]
OMS 500	221 [8.70]	68.4 [2.693]	178 [7.01]

Output shaft		L ₃ mm [in]
Cyl.1 in Splined 1 in	max	52 [2.05]
	min	50 [1.97]
Cyl.1.25 in Splined 1.25 in	max	57 [2.24]
	min	55 [2.17]
Tapered 1.25 in	max	67 [2.64]
	min	65 [2.56]

Technical Information OMS, OMT and OMV Orbital Motors

OMS

Magneto flange—US version



151-1980.10

C: Drain connection
7/16 - 20 UNF;
12 mm [0.47 in] deep
O-ring boss port

D: M10; 13 mm [0.51 in] deep

E: 7/8 - 14 UNF;
16.7 mm [0.657 in] deep
O-ring boss port

Technical Information OMS, OMT and OMV Orbital Motors

OMS

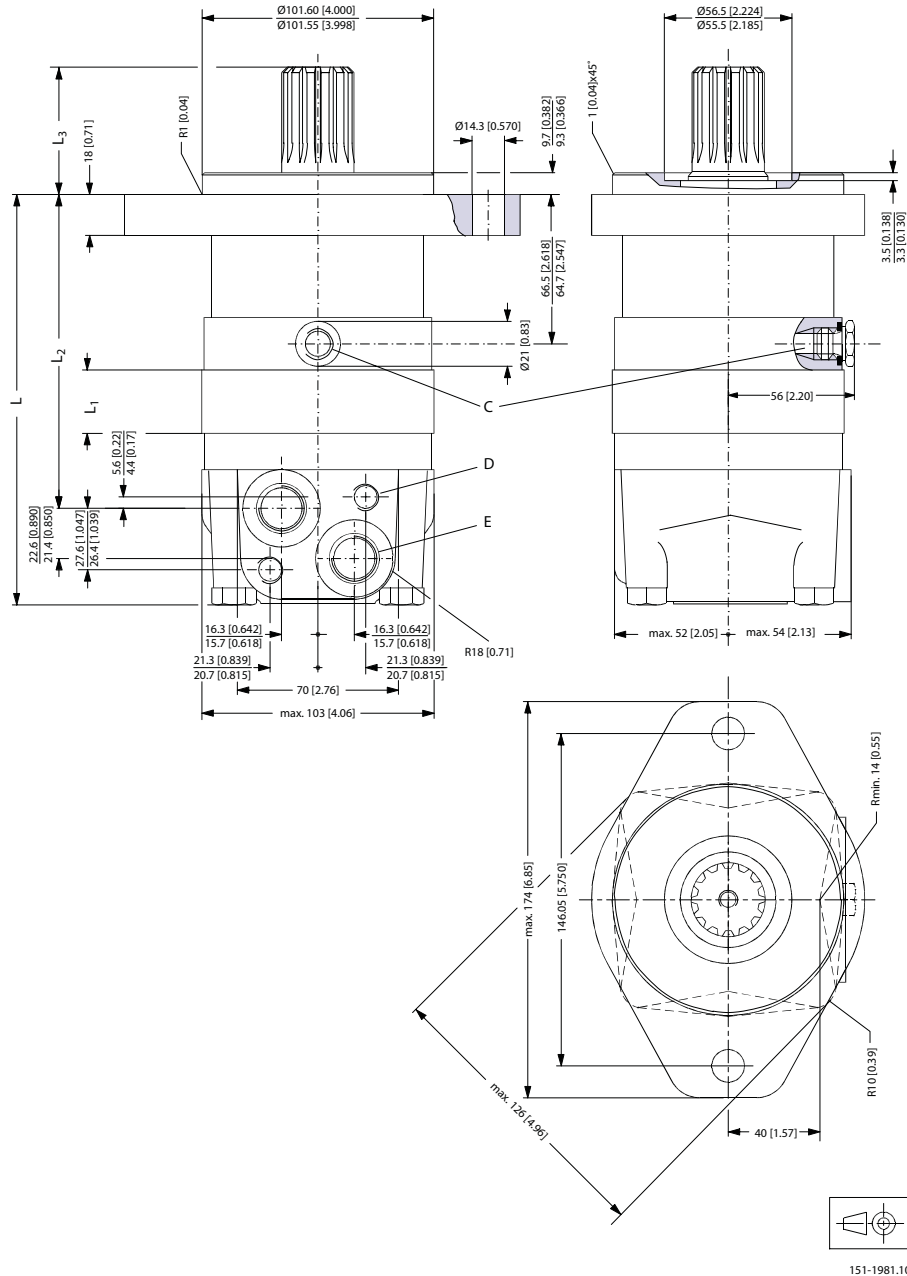
Type	L _{max} mm [in]	L ₁ mm [in]	L ₂ mm [in]
OMS 80	171 [6.73]	14.0 [0.551]	128 [5.04]
OMS 100	174 [6.85]	17.4 [0.685]	131 [5.16]
OMS 125	179 [7.05]	21.8 [0.858]	136 [5.35]
OMS 160	185 [7.28]	27.8 [1.094]	142 [5.59]
OMS 200	192 [7.56]	34.8 [1.370]	149 [5.87]
OMS 250	200 [7.87]	43.5 [1.713]	157 [6.18]
OMS 315	212 [8.35]	54.8 [2.157]	169 [6.65]
OMS 400	225 [8.86]	68.4 [2.693]	182 [7.17]
OMS 500	225 [8.86]	68.4 [2.693]	182 [7.17]

Output shaft		L ₃ mm [in]
Cyl.1 in Splined 1 in	max	49 [1.93]
	min	47 [1.85]
Cyl.1.25 in Splined 1.25 in	max	54 [2.13]
	min	52 [2.05]

Technical Information OMS, OMT and OMV Orbital Motors

OMS

SAE-B flange—US version



Technical Information OMS, OMT and OMV Orbital Motors

OMS

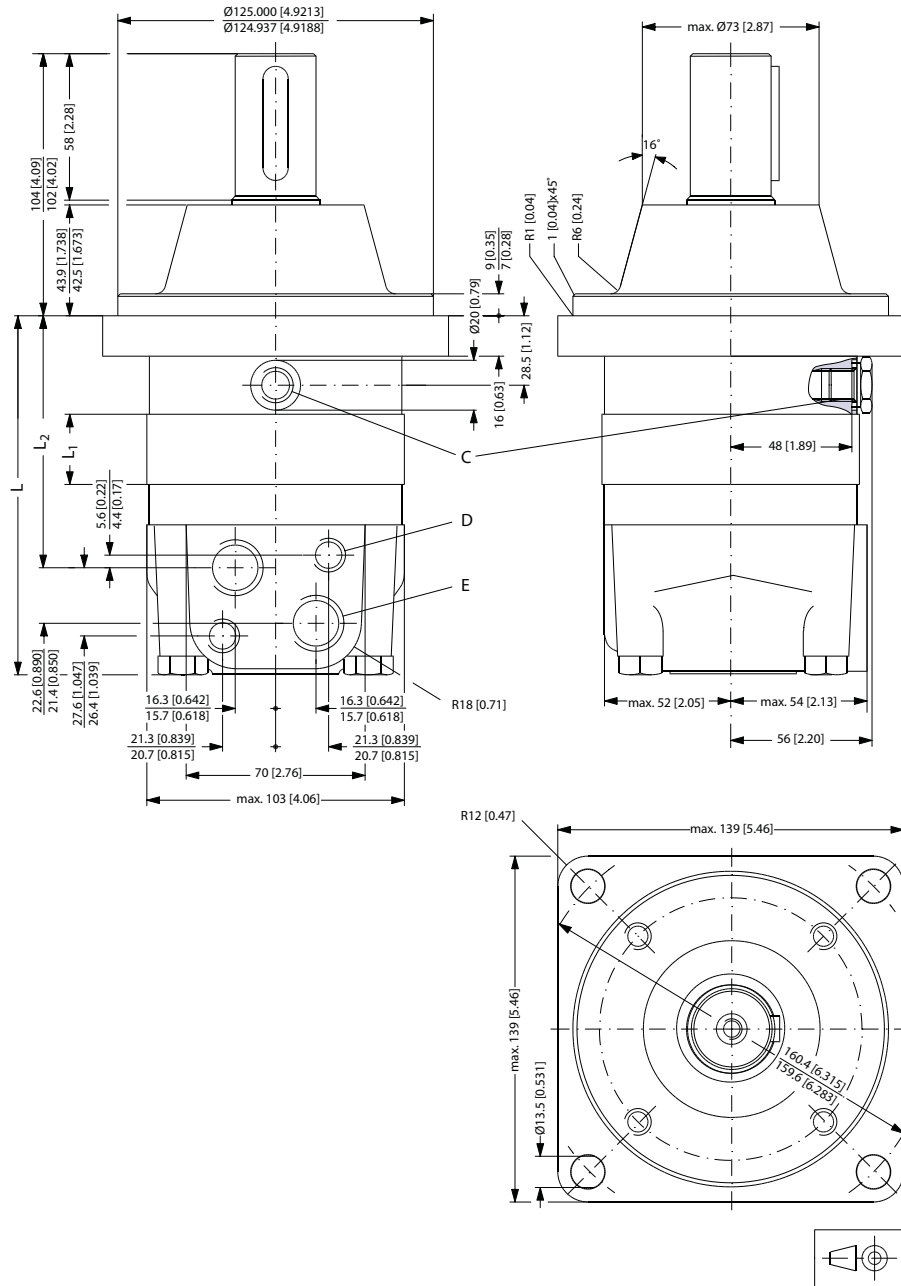
Type	L _{max} mm [in]	L ₁ mm [in]	L ₂ mm [in]
OMS 80	167 [6.57]	14.0 [0.551]	124 [4.88]
OMS 100	170 [6.69]	17.4 [0.685]	127 [5.00]
OMS 125	175 [6.89]	21.8 [0.858]	132 [5.20]
OMS 160	181 [7.13]	27.8 [1.094]	138 [5.43]
OMS 200	188 [7.40]	34.8 [1.370]	145 [5.71]
OMS 250	196 [7.72]	43.5 [1.713]	153 [6.02]
OMS 315	208 [8.19]	54.8 [2.157]	165 [6.50]
OMS 400	221 [8.70]	68.4 [2.693]	178 [7.01]
OMS 500	221 [8.70]	68.4 [2.693]	178 [7.01]

Output shaft		L ₃ mm [in]
Splined 1.25 in	max	57 [2.24]
	min	55 [2.17]
Splined 0.875 in	max	42 [1.65]
	min	40 [1.57]

Technical Information OMS, OMT and OMV Orbital Motors

OMS

Wheel—European version



151-1812.10

C: Drain connection
G 1/4; 12 mm [0.47 in] deep
E: G 1/2; 15 mm [0.59 in] deep

D: M10; 13 mm [0.51 in] deep

Technical Information OMS, OMT and OMV Orbital Motors

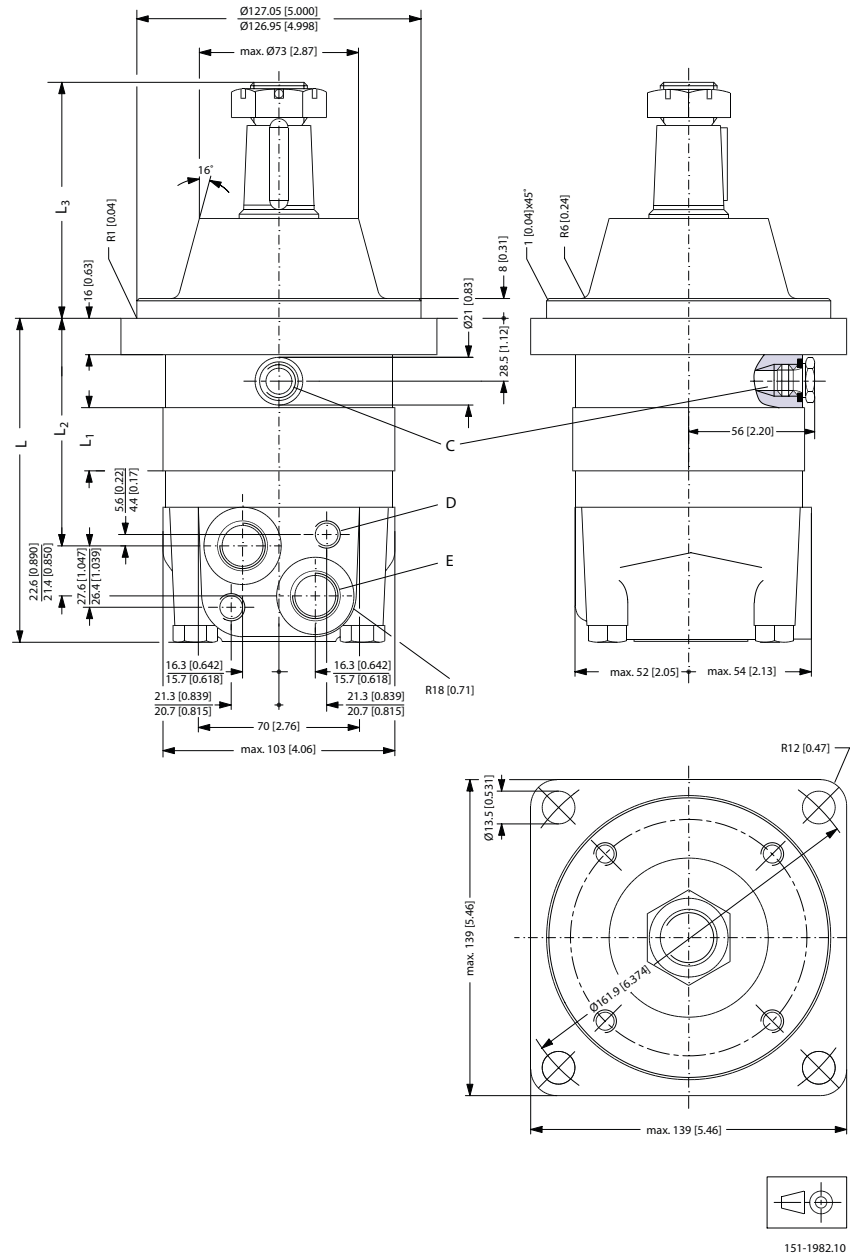
OMS

Type	L _{max} mm [in]	L ₁ mm [in]	L ₂ mm [in]
OMSW 80	129 [5.08]	14.0 [0.551]	87 [3.43]
OMSW 100	132 [5.20]	17.4 [0.685]	90 [3.54]
OMSW 125	137 [5.39]	21.8 [0.858]	95 [3.74]
OMSW 160	143 [5.63]	27.8 [1.094]	101 [3.98]
OMSW 200	150 [5.91]	34.8 [1.370]	108 [4.25]
OMSW 250	158 [6.22]	43.5 [1.713]	116 [4.57]
OMSW 315	170 [6.69]	54.8 [2.157]	128 [5.04]
OMSW 400	183 [7.20]	68.4 [2.693]	142 [5.59]

Technical Information OMS, OMT and OMV Orbital Motors

OMS

Wheel—US version



C: Drain connection
7/16 - 20 UNF;
12 mm [0.47 in] deep
O-ring boss port

D: M10; 13 mm [0.51 in] deep

E: 78 - 14 UNF;
16.7 mm [0.657 in] deep
O-ring boss port

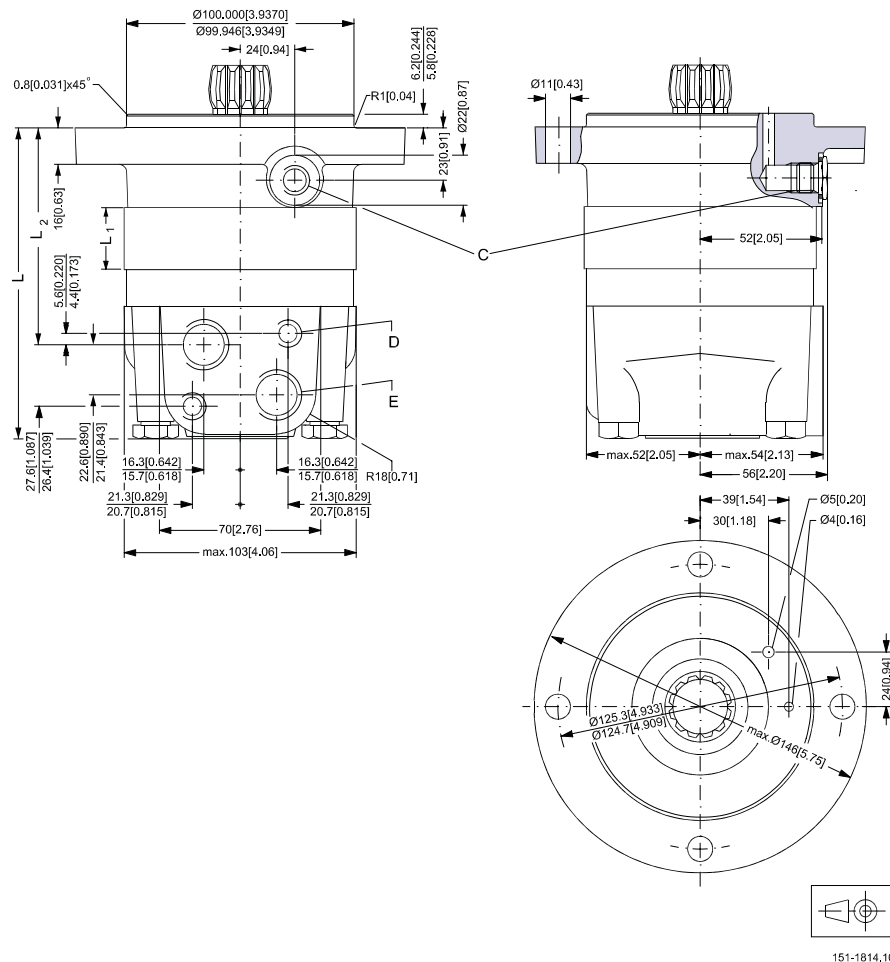
Type	L _{max} mm [in]	L ₁ mm [in]	L ₂ mm [in]
OMSW 80	130 [5.12]	14.0 [0.551]	88 [3.46]
OMSW 100	133 [5.24]	17.4 [0.685]	91 [3.58]

Technical Information OMS, OMT and OMV Orbital Motors

OMS

Type	L _{max} mm [in]	L ₁ mm [in]	L ₂ mm [in]
OMSW 125	138 [5.43]	21.8 [0.858]	96 [3.78]
OMSW 160	144 [5.67]	27.8 [1.094]	102 [4.02]
OMSW 200	151 [5.94]	34.8 [1.370]	109 [4.29]
OMSW 250	159 [6.26]	43.5 [1.713]	117 [4.61]
OMSW 315	171 [6.73]	54.8 [2.157]	129 [5.08]
OMSW 400	184 [7.24]	68.4 [2.693]	142 [5.59]
OMSW 500	184 [7.24]	68.4 [2.693]	142 [5.59]

Output shaft		L ₃ mm [in]
Cyl.1.25 in	max	94 [3.70]
	min	92 [3.62]
Tapered 1.25 in	max	104 [4.09]
	min	102 [4.02]

Technical Information OMS, OMT and OMV Orbital Motors
OMS
Short—European version


C: Drain connection
G 1/4; 12 mm [0.47 in] deep

D: M10; 13 mm [0.51 in] deep

E: G 1/2; 15 mm [0.59 in] deep

Type	L_{max} mm [in]	L_1 mm [in]	L_2 mm [in]
OMSS 80	124 [4.88]	14.0 [0.551]	83 [3.27]
OMSS 100	128 [5.04]	17.4 [0.685]	86 [3.39]
OMSS 125	132 [5.20]	21.8 [0.858]	90 [3.54]
OMSS 160	138 [5.43]	27.8 [1.094]	96 [3.78]
OMSS 200	145 [5.71]	34.8 [1.370]	103 [4.06]
OMSS 250	154 [6.06]	43.5 [1.713]	112 [4.41]
OMSS 315	165 [6.50]	54.8 [2.157]	123 [4.84]
OMSS 400	179 [7.05]	68.4 [2.693]	137 [5.39]

Technical Information OMS, OMT and OMV Orbital Motors
OMS
OMSS
Installing the OMSS

The cardan shaft of the OMSS motor acts as an "output shaft". Because of the movement of the shaft, no seal can be fitted at the shaft output.

Internal oil leakage from the motor will therefore flow into the attached component.

During start and operation it is important that the spline connection and the bearings in the attached component receive oil and are adequately lubricated. To ensure that the spline connection receives sufficient oil, a conical sealing ring between the shaft of the attached component and the motor intermediate plate is recommended. This method is used in the OMS.

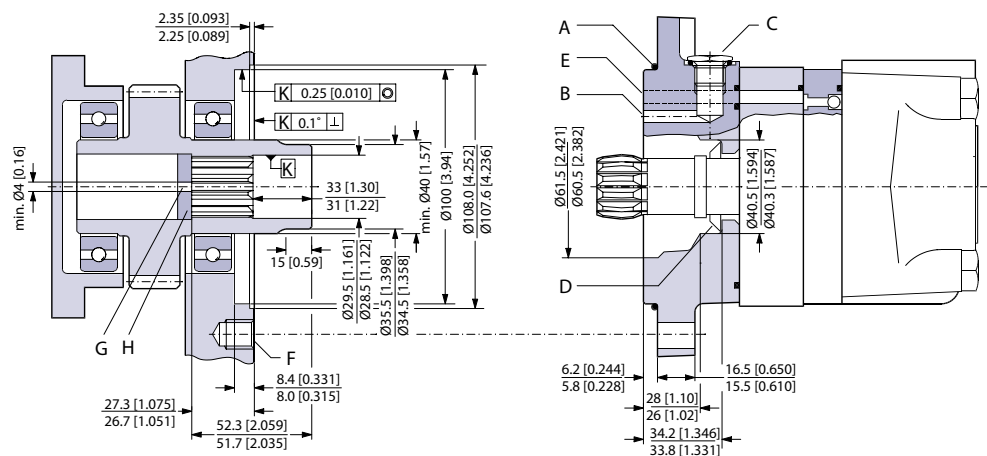
The conical sealing ring (code. no. 633B9023) is supplied with the motor.

To ensure that oil runs to the bearings and other parts of the attached component, the stop plate must have a hole in it (see fig. below).

We recommend an O-ring between motor and attached component. The O-ring (code no. 151F1033) is supplied with the motor. If motor and attached component have been separated, remember to refill before starting up. Fill the oil through the drain connection.

Attached component dimensions

OMSS dimensions of the attached component in millimeter [inches]



151-873.10

- | | | |
|-------------------------------|---------------------------------|---|
| A O-ring: 100 × 3 mm | B External drain channel | C Drain connection G 1/4; 12 mm [0.47 in] deep |
| D Conical seal ring | E Internal drain channel | F M10; min. 15 mm [0.59 in] deep |
| G Oil circulation hole | H Hardened stop plate | |

Internal spline data for the component to be attached

The attached component must have internal splines corresponding to the external splines on the motor cardan shaft (see drawing below).

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Material:

Case hardening steel with a tensile strength corresponding to at least 20 MoCr4 (900 N/mm²) or SAE 8620.

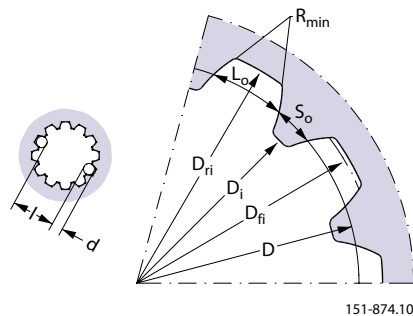
Hardening specification:

- On the surface: HV = 750 ± 50
- 0.7 ± 0.2 mm under the surface: HV = 560

Internal involute spline data; Standard ANS B92.1-1970, class 5 (corrected $m \cdot X = 0.8$; $m = 2.1166$)

Flat root side fit		mm	in
Number of teeth	z	12	12
Pitch	DP	12/24	12/24
Pressure angle		30°	30°
Pitch dia.	D	25.4	1.0
Major dia.	D _{ri}	28.0 ⁰ _{-0.1}	1.10 0–0.004
Form dia. (min.)	D _{fi}	27.6	1.09
Minor dia.	D _i	23.0 ₀ ^{+0.033}	0.9055 ₀ ^{+0.0013}
Space width (circular)	L _o	4.308 ^{±0.020}	0.1696 ^{±0.0008}
Tooth thickness (circular)	S _o	2.341	0.09217
Fillet radius	R _{min.}	0.2	0.008
Max. measurement between pins*	l	17.62 ₀ ^{+0.15}	0.700 _{-0.006} ⁰
Pin dia.	d	4.835 ^{±0.001}	0.1903 ^{±0.00004}

* Finished dimensions (when hardened).


Motor or attached component drain connection

Use the drain line when pressure in the return line exceeds the permissible pressure on the shaft seal of the attached component.

Connect the drain line either at the:

- Motor drain connection
- Drain connection of the attached component

If a drain line is fitted to the attached component, it must be possible for oil to flow freely between motor and attached component.

Technical Information OMS, OMT and OMV Orbital Motors

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The drain line must be led to the tank in such a way that there is no risk of the motor and attached component being drained of oil when at rest.

The maximum pressure in the drain line is limited by the attached component and its shaft seal.

Technical Information OMS, OMT and OMV Orbital Motors

Weight of motors
Code number and weight
Code number and weight of motors

Code no	Weight	
	kg	[lb]
151B2050	20.0	44.1
151B2051	20.5	45.2
151B2052	21.0	46.3
151B2053	22.0	48.5
151B2054	23.0	50.7
151B2055	24.0	52.9
151B2056	20.0	44.1
151B2057	20.5	45.2
151B2058	21.0	46.3
151B2059	22.0	48.5
151B2060	23.0	50.7
151B2061	24.0	52.9
151B2062	20.0	44.1
151B2063	20.5	45.2
151B2064	21.0	46.3
151B2065	22.0	48.5
151B2066	23.0	50.7
151B2067	24.0	52.9
151B2080	22.0	48.5
151B2081	22.5	49.6
151B2082	23.0	50.7
151B2083	24.0	52.9
151B2084	25.0	55.1
151B2085	26.0	57.3
151B2150	31.8	70.1
151B2151	32.6	71.9
151B2152	33.5	73.9
151B2153	34.9	76.9
151B2154	36.5	80.5
151B2155	31.8	70.1
151B2156	32.6	71.9
151B2157	33.5	73.9
151B2158	34.9	76.9
151B2159	36.5	80.5
151B2160	31.8	70.1
151B2161	32.6	71.9
151B2162	33.5	73.9
151B2163	34.9	76.9

Technical Information OMS, OMT and OMV Orbital Motors
Weight of motors
Code number and weight of motors (continued)

Code no	Weight	
	kg	[lb]
151B2164	36.5	80.5
151B2170	32.4	71.4
151B2171	33.2	73.2
151B2172	34.1	75.2
151B2173	35.5	78.3
151B2174	37.1	81.8
151B2183	30.0	66.2
151B2184	30.8	67.9
151B2185	31.7	69.9
151B2186	33.1	73.0
151B2187	34.7	76.5
151B2188	30.0	66.2
151B2189	30.8	67.9
151B2190	31.7	69.9
151B2191	33.1	73.0
151B2192	34.7	76.5
151B3000	20.0	44.1
151B3001	20.5	45.2
151B3002	21.0	46.3
151B3003	22.0	48.5
151B3004	23.0	50.7
151B3005	24.0	52.9
151B3006	20.0	44.1
151B3007	20.5	45.2
151B3008	21.0	46.3
151B3009	22.0	48.5
151B3010	23.0	50.7
151B3011	24.0	52.9
151B3012	20.0	44.1
151B3013	20.5	45.2
151B3014	21.0	46.3
151B3015	22.0	48.5
151B3016	23.0	50.7
151B3017	24.0	52.9
151B3018	20.0	44.1
151B3019	20.5	45.2
151B3020	21.0	46.3
151B3021	22.0	48.5
151B3022	23.0	50.7
151B3023	24.0	52.9

Technical Information OMS, OMT and OMV Orbital Motors
Weight of motors
Code number and weight of motors (continued)

Code no	Weight	
	kg	[lb]
151B3024	22.0	48.5
151B3025	22.5	49.6
151B3026	23.0	50.7
151B3027	24.0	52.9
151B3028	25.0	55.1
151B3029	26.0	57.3
151B3030	22.0	48.5
151B3031	22.5	49.6
151B3032	23.0	50.7
151B3033	24.0	52.9
151B3034	25.0	55.1
151B3035	26.0	57.3
151B3036	15.0	33.1
151B3037	15.5	34.2
151B3038	16.0	35.3
151B3039	17.0	37.5
151B3040	18.0	39.7
151B3041	19.0	41.9
151B3100	31.8	70.1
151B3101	32.6	71.9
151B3102	33.5	73.9
151B3103	34.9	76.9
151B3104	36.5	80.5
151B3105	31.8	70.1
151B3106	32.6	71.9
151B3107	33.5	73.9
151B3108	34.9	76.9
151B3109	36.5	80.5
151B3110	31.8	70.1
151B3111	32.6	71.9
151B3112	33.5	73.9
151B3113	34.9	76.9
151B3114	36.5	80.5
151B3115	32.4	71.4
151B3116	33.2	73.2
151B3117	34.1	75.2
151B3118	35.5	78.3
151B3119	37.1	81.8
151B3120	32.4	71.4
151B3121	33.2	73.2

Technical Information OMS, OMT and OMV Orbital Motors
Weight of motors
Code number and weight of motors (continued)

Code no	Weight	
	kg	[lb]
151B3122	34.1	75.2
151B3123	35.5	78.3
151B3124	37.1	81.8
151B3125	22.7	50.1
151B3126	23.5	51.8
151B3127	24.4	53.8
151B3128	25.6	56.4
151B3129	27.7	61.1
151B3200	31.0	68.3
151B3201	31.5	69.4
151B3202	32.0	70.5
151B3203	33.0	72.8
151B3204	34.0	75.0
151B3205	35.0	77.2
151B3207	31.0	68.3
151B3208	31.5	69.4
151B3209	32.0	70.5
151B3210	33.0	72.8
151B3211	34.0	75.0
151B3212	35.0	77.2
151B4000	24.5	54.0
151B4001	25.0	55.1
151B4002	25.5	56.2
151B4003	26.5	58.4
151B4004	27.5	60.6
151B4005	28.5	62.8
151B4007	24.5	54.0
151B4008	25.0	55.1
151B4009	25.5	56.2
151B4010	26.5	58.4
151B4011	27.5	60.6
151B4012	28.5	62.8
151B4021	24.5	54.0
151B4022	25.0	55.1
151B4023	25.5	56.2
151B4024	26.5	58.4
151B4025	27.5	60.6
151B4026	28.5	62.8
151B4028	24.5	54.0
151B4029	25.0	55.1

Technical Information OMS, OMT and OMV Orbital Motors
Weight of motors
Code number and weight of motors (continued)

Code no	Weight	
	kg	[lb]
151B4030	25.5	56.2
151B4031	26.5	58.4
151B4032	27.5	60.6
151B4033	28.5	62.8
151F0500	9.8	21.6
151F0501	10.0	22.1
151F0502	10.3	22.7
151F0503	10.7	23.6
151F0504	11.1	24.5
151F0505	11.6	25.6
151F0506	12.3	27.1
151F0507	9.8	21.6
151F0508	10.0	22.1
151F0509	10.3	22.7
151F0510	10.7	23.6
151F0511	11.1	24.5
151F0512	11.6	25.6
151F0513	12.3	27.1
151F0514	9.8	21.6
151F0515	10.0	22.1
151F0516	10.3	22.7
151F0517	10.7	23.6
151F0518	11.1	24.5
151F0519	11.6	25.6
151F0520	12.3	27.1
151F0521	10.3	22.7
151F0522	10.5	23.1
151F0523	10.8	23.8
151F0524	11.2	24.7
151F0525	11.6	25.6
151F0526	12.1	26.7
151F0527	12.8	28.2
151F0528	10.3	22.7
151F0529	10.5	23.1
151F0530	10.8	23.8
151F0531	11.2	24.7
151F0532	11.6	25.6
151F0533	12.1	26.7
151F0534	12.8	28.2
151F0535	7.8	17.2

Technical Information OMS, OMT and OMV Orbital Motors
Weight of motors
Code number and weight of motors (continued)

Code no	Weight	
	kg	[lb]
151F0536	8.0	17.6
151F0537	8.3	18.3
151F0538	8.7	19.2
151F0539	9.1	20.1
151F0540	9.6	21.2
151F0541	10.3	22.7
151F0542	10.2	22.5
151F0543	10.4	22.9
151F0544	10.7	23.6
151F0545	11.1	24.5
151F0546	11.5	25.4
151F0547	12.0	26.5
151F0548	12.7	28.0
151F0560	9.8	21.6
151F0561	10.0	22.1
151F0562	10.3	22.7
151F0563	10.7	23.6
151F0564	11.1	24.5
151F0565	11.6	25.6
151F0566	12.3	27.1
151F0605	13.1	28.9
151F0608	11.1	24.5
151F0609	13.6	30.0
151F0610	13.6	30.0
151F2200	9.8	21.6
151F2201	10.0	22.1
151F2202	10.3	22.7
151F2203	10.7	23.6
151F2204	11.1	24.5
151F2205	11.6	25.6
151F2206	12.3	27.1
151F2207	9.8	21.6
151F2208	10.0	22.1
151F2209	10.3	22.7
151F2210	10.7	23.6
151F2211	11.1	24.5
151F2212	11.6	25.6
151F2213	12.3	27.1
151F2214	9.8	21.6
151F2215	10.0	22.1

Technical Information OMS, OMT and OMV Orbital Motors
Weight of motors
Code number and weight of motors (continued)

Code no	Weight	
	kg	[lb]
151F2216	10.3	22.7
151F2217	10.7	23.6
151F2218	11.1	24.5
151F2219	11.6	25.6
151F2220	12.3	27.1
151F2235	10.3	22.7
151F2236	10.5	23.1
151F2237	10.8	23.8
151F2238	11.2	24.7
151F2239	11.6	25.6
151F2240	12.1	26.7
151F2241	12.8	28.2
151F2242	10.3	22.7
151F2243	10.5	23.1
151F2244	10.8	23.8
151F2245	11.2	24.7
151F2246	11.6	25.6
151F2247	12.1	26.7
151F2248	12.8	28.2
151F2261	13.1	28.9
151F2262	13.1	28.9
151F2263	13.6	30.0
151F2264	13.1	28.9
151F2265	13.6	30.0
151F2300	9.8	21.6
151F2301	10.0	22.1
151F2302	10.3	22.7
151F2303	10.7	23.6
151F2304	11.1	24.5
151F2305	11.6	25.6
151F2306	12.3	27.1
151F2307	13.1	28.9
151F2308	9.8	21.6
151F2309	10.0	22.1
151F2310	10.3	22.7
151F2311	10.7	23.6
151F2312	11.1	24.5
151F2313	11.6	25.6
151F2314	12.3	27.1
151F2315	13.1	28.9

Technical Information OMS, OMT and OMV Orbital Motors
Weight of motors
Code number and weight of motors (continued)

Code no	Weight	
	kg	[lb]
151F2316	9.8	21.6
151F2317	10.0	22.1
151F2318	10.3	22.7
151F2319	10.7	23.6
151F2320	11.1	24.5
151F2321	11.6	25.6
151F2322	12.3	27.1
151F2323	13.1	28.9
151F2324	9.8	21.6
151F2325	10.0	22.1
151F2326	10.3	22.7
151F2327	10.7	23.6
151F2328	11.1	24.5
151F2329	11.6	25.6
151F2330	12.3	27.1
151F2331	13.1	28.9
151F2332	9.8	21.6
151F2333	10.0	22.1
151F2334	10.3	22.7
151F2335	10.7	23.6
151F2336	11.1	24.5
151F2337	11.6	25.6
151F2338	12.3	27.1
151F2339	13.1	28.9
151F2345	14.0	30.9
151F2346	14.0	30.9
151F2347	14.0	30.9
151F2348	14.0	30.9
151F2349	14.0	30.9
151F2350	9.8	21.6
151F2351	10.0	22.1
151F2352	10.3	22.7
151F2353	10.7	23.6
151F2354	11.1	24.5
151F2355	11.6	25.6
151F2356	12.3	27.1
151F2357	13.1	28.9
151F2358	14.0	30.9
151F2359	9.8	21.6
151F2360	10.0	22.1

Technical Information OMS, OMT and OMV Orbital Motors

Weight of motors*Code number and weight of motors (continued)*

Code no	Weight	
	kg	[lb]
151F2361	10.3	22.7
151F2362	10.7	23.6
151F2363	11.1	24.5
151F2364	11.6	25.6
151F2365	12.3	27.1
151F2366	13.1	28.9
151F2367	14.0	30.9
151F2368	9.8	21.6
151F2369	10.0	22.1
151F2370	10.3	22.7
151F2371	10.7	23.6
151F2372	11.1	24.5
151F2373	11.6	25.6
151F2374	12.3	27.1
151F2375	13.1	28.9
151F2376	14.0	30.9
151F2395	9.8	21.6
151F2396	10.0	22.1
151F2397	10.3	22.7
151F2398	10.7	23.6
151F2399	11.1	24.5
151F2400	11.6	25.6
151F2401	12.3	27.1
151F2402	13.1	28.9
151F2403	14.0	30.9
151F2413	9.8	21.6
151F2414	10.0	22.1
151F2415	10.3	22.7
151F2416	10.7	23.6
151F2417	11.1	24.5



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