Danfoss OMT 315 151B2053 orbital hydraulic motor

Manufacturer: Danfoss

Manufacturer part number / published order designation: 151B2053

Published model: 151B2053

About this compilation

Prepared by Hydmaster from selected manufacturer documentation. Original technical pages follow without cropped drawings, rewritten data or altered units. This cover and index are Hydmaster editorial material, not a manufacturer-issued exact-execution datasheet.

Coverage: selected pages relevant to the identified size and configuration. Other options or neighbouring models retained on an original page apply only where explicitly identified.

Execution notes and conditions

Factory model code: OMT-0315-A-NN-C15-AV-2E-B35-A-A-2C-1-N-NN-NNNNN-NN-NN-NN-SP-NNN

Current exact factory article verified separately from the October 2024 technical reference.

Representative factory photograph; use the applicable execution drawings.

Separate catalogue limits; check operating point, shaft loading and drain requirements.

Source-page index

Source page numbers below are physical pages of each complete original PDF. The original printed page labels and technical content remain unchanged. Compiled page numbers count this cover/index.

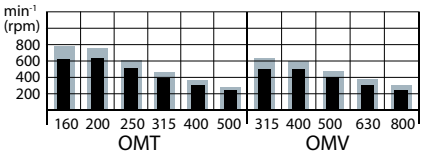
Source A: Danfoss OMT technical information - October 2024

Original pages	Compiled pages	Relevant content
7-13	2-8	Applicable original version, hydraulic limits, installation, shaft, ports or mounting drawing
16	9	Size-specific performance diagram
18	10	Applicable original version, hydraulic limits, installation, shaft, ports or mounting drawing
21	11	Applicable original version, hydraulic limits, installation, shaft, ports or mounting drawing
24-25	12-13	Applicable original version, hydraulic limits, installation, shaft, ports or mounting drawing

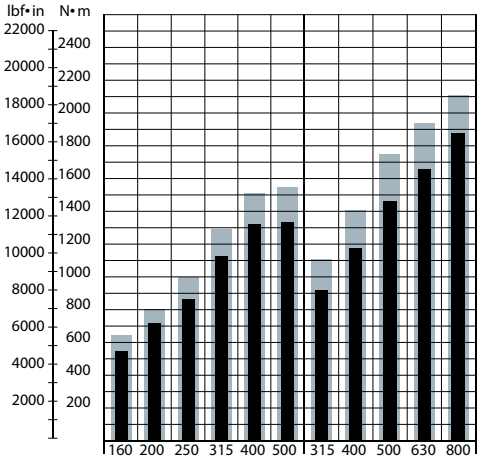
Orbital motors

Speed, torque, and output

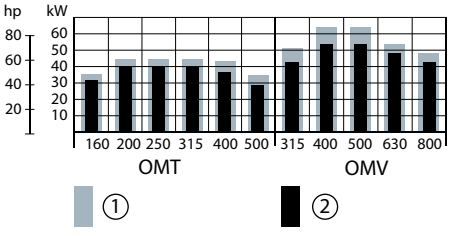
Maximum speed



Maximum torque



Maximum output



1. Intermittend values
2. Continuous values

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: see *OMT Function diagrams* on page 15, or *OMV function diagrams* on page 44.

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 mm^2/s [165 SUS] and a temperature of 50°C [120°F].

OMT

Versions

OMT versions

Mounting flange	Shaft	Port size	European version	US version	Drain connection	Check valve	Low pressure release	High pressure release	Main type designation
Standard flange	Cyl. 40 mm	G 3/4	X		Yes	Yes			OMT
	Cyl. 1.5 in	1 1/16-12 UN		X	Yes	Yes			OMT
	Splined 1.5 in	G 3/4	X		Yes	Yes			OMT
		1 1/16-12 UN		X	Yes	Yes			OMT
	Tapered 45 mm	G 3/4	X		Yes	Yes			OMT
	Tapered 1.75 in	1 1/16-12 UN		X	Yes	Yes			OMT
	P.t.o.	G 3/4	X		Yes	Yes			OMT
Wheel	Cyl. 40 mm	G 3/4	X		Yes	Yes			OMTW
	Tapered 45 mm	G 3/4	X		Yes	Yes			OMTW
	Tapered 1.75 in	1 1/16-12 UN		X	Yes	Yes			OMTW
Brake-wheel	Wheel bolt flange	G 3/4	X		Yes	No	X		OMT FX
	Thread hole flange	G 3/4	X		Yes	No	X		OMT FX
Brake-standard	Cyl. 40 mm	G 3/4	X		Yes	No	X		OMT FL
	Splined 1.5 in	G 3/4	X		Yes	No	X		OMT FL
	Cyl. 40 mm	G 3/4	X		Yes	No		X	OMT FH
	Splined 1.5 in	G 3/4	X		Yes	No		X	OMT FH
Short	No output shaft	G 3/4	X		Yes	Yes			OMTS

Features

Features available (options):

- Speed sensor
- Motor with tacho connection
- Viton shaft seal
- Painted
- Ultra short

Code numbers

OMT code numbers

Code Numbers	Displacement [cm^3]					
	160	**200**	**250**	**315**	**400**	**500**
151B	3000	3001	3002	3003	3004	3005
151B	2050	2051	2052	2053	2054	2055
151B	3006	3007	3008	3009	3010	3011
151B	2056	2057	2058	2059	2060	2061
151B	3012	3013	3014	3015	3016	3017
151B	2062	2063	2064	2065	2066	2067

OMT

OMT code numbers (continued)

Code Numbers	Displacement [cm³]					
	160	200	250	315	400	500
151B	3018	3019	3020	3021	3022	3023
151B	3024	3025	3026	3027	3028	3029
151B	3030	3031	3032	3033	3034	3035
151B	2080	2081	2082	2083	2084	2085
151B	3207	3208	3209	3210	3211	3212
151B	3200	3201	3202	3203	3204	3205
151B	4000	4001	4002	4003	4004	4005
151B	4007	4008	4009	4010	4011	4012
151B	4021	4022	4023	4024	4025	4026
151B	4028	4029	4030	4031	4032	4033
151B	3036	3037	3038	3039	3040	3041

Ordering

Add the four digit prefix “151B” to the four digit numbers from the chart for complete code number.

Example:

151B3002 for an OMT 250 with standard flange, cyl. 40 mm shaft and port size G 3/4.

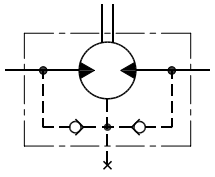
Orders will not be accepted without the four digit prefix.

Technical data

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.



151-320.10

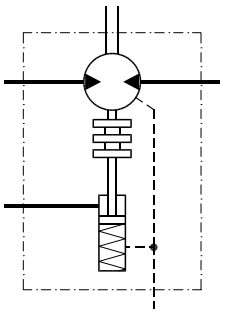
Motor with check valves and with drain connection

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

OMT FX, OMT FL and OMT FH must always be fitted with drain line.

Maximum pressure in drain line is 5 bar [75 psi]

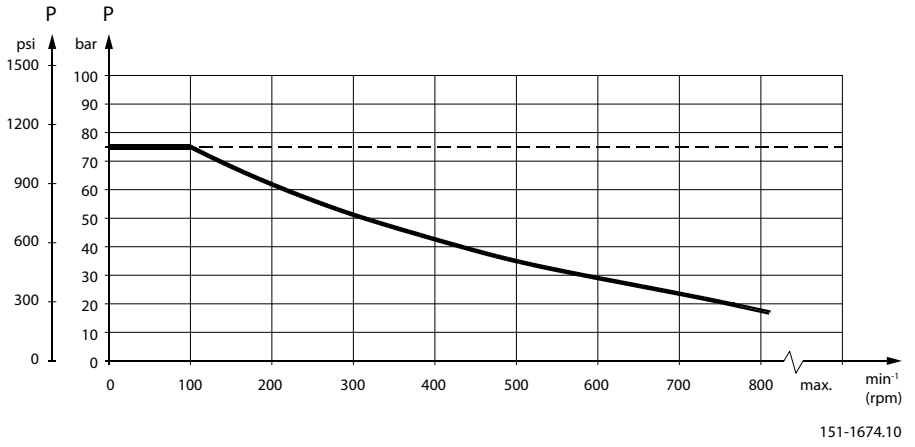
OMT



Motor with check valves and with drain connection

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

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



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

——— Continuous operation

OMT, OMTW, OMTS, OMT FX OMT FL and OMT FH

Technical data for OMT, OMTW, OMTS, OMT FX OMT FL and OMT FH

Type			**OMT OMTW OMTS OMT FX OMT FL OMT FH**	**OMT OMTW OMTS OMT FX OMT FL OMT FH**	**OMT OMTW OMTS OMT FX OMT FL OMT FH**	**OMT OMTW OMTS OMT FX OMT FL OMT FH**	**OMT OMTW OMTS OMT FX OMT FL OMT FH**	**OMT OMTW OMTS OMT FX OMT FL OMT FH**
Motor size			**160**	**200**	**250**	**315**	**400**	**500**
Geometric displacement	cm^3 [in^3]		161.1 [9.83]	201.4 [12.29]	251.8 [15.37]	326.3 [19.91]	410.9 [25.07]	523.6 [31.95]
Maximum speed	min^{-1} [rpm]	cont.	625	625	500	380	305	240
		int[1)]	780	750	600	460	365	285
Maximum torque	Nm [lbf·in]	cont.	470 [4160]	590 [5220]	730 [6460]	950 [8410]	1080 [9560]	1220 [10800]
		int.[1)]	560 [4960]	710 [6280]	880 [7790]	1140 [10090]	1260 [11150]	1370 [12130]

OMT

Technical data for OMT, OMTW, OMTS, OMT FX OMT FL and OMT FH (continued)

Type			**OMT OMTW OMTS OMT FX OMT FL OMT FH**	**OMT OMTW OMTS OMT FX OMT FL OMT FH**	**OMT OMTW OMTS OMT FX OMT FL OMT FH**	**OMT OMTW OMTS OMT FX OMT FL OMT FH**	**OMT OMTW OMTS OMT FX OMT FL OMT FH**	**OMT OMTW OMTS OMT FX OMT FL OMT FH**
Motor size			**160**	**200**	**250**	**315**	**400**	**500**
Maximum output	kW [hp]	cont.	26.5 [35.5]	33.5 [44.9]	33.5 [44.9]	33.5 [44.9]	30.0 [40.2]	26.5 [35.5]
		int.[1)]	32.0 [42.9]	40.0 [53.6]	40.0 [53.6]	40.0 [53.6]	35.0 [46.9]	30.0 [40.2]
Maximum pressure drop	bar [psi]	cont.	200 [2900]	200 [2900]	200 [2900]	200 [2900]	180 [2610]	160 [2320]
		int.[1)]	240 [3480]	240 [3480]	240 [3480]	240 [3480]	210 [3050]	180 [2610]
		peak[2)]	280 [4060]	280 [4060]	280 [4060]	280 [4060]	240 [3480]	210 [3050]
Maximum oil flow	l/min [USgal/min]	cont.	100 [26.4]	125 [33.0]	125 [33.0]	125 [33.0]	125 [33.0]	125 [33.0]
		int.[1)]	125 [33.0]	150 [39.6]	150 [39.6]	150 [39.6]	150 [39.6]	150 [39.6]
Maximum starting pressure with unloaded shaft	bar [psi]		10 [145]	10 [145]	10 [145]	10 [145]	10 [145]	10 [145]
Minimum starting torque	at maximum pressure drop cont. Nm [lbf·in]		200 [2900]	200 [2900]	200 [2900]	200 [2900]	180 [2610]	160 [2320]
	at maximum pressure drop int.[1)] Nm [lbf·in]		240 [3480]	240 [3480]	240 [3480]	240 [3480]	210 [3050]	180 [2610]

[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 maximum permissible combination of flow and pressure, see function diagram for actual motor.

Type			**Maximum inlet pressure**	**Maximum return pressure with drain line**
OMT, OMTW, OMTS, OMT FX, OMT FL, OMT FH	bar [psi]	cont.	210 [3050]	140 [2030]
	bar [psi]	int.[1)]	250 [3630]	175 [2540]
	bar [psi]	peak[2)]	300 [4350]	210 [3050]

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

[2)] Peak load: The permissible values may occur for maximum 1% of every minute.

Brake motors

Type	**Maximum pressure in drain line[3)]**	**Holding torque[4)]**	**Brake-release pressure[3)]**	**Maximum pressure in brake line**
OMT FX, OMT FL	5 bar [70 psi]	1200 Nm [10620 lbf·in]	12 bar [170 psi]	30 bar [440 psi]
OMT FH	5 bar [70 psi]	1200 Nm [10620 lbf·in]	30 bar [440 psi]	280 bar [4060 psi]

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

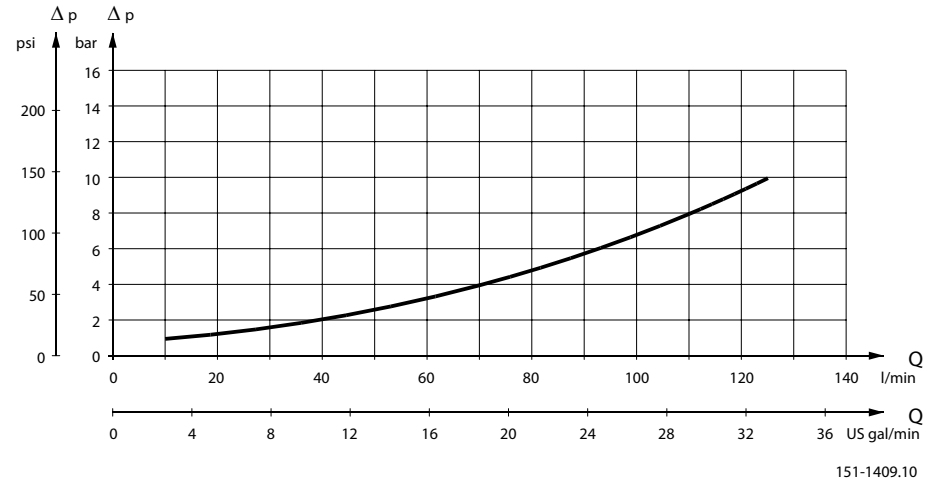
[4)] For the supply of motors with holding torques higher than those stated, please contact the Danfoss sales organization.

For maximum permissible combination of flow and pressure, see function diagram for actual motor.

OMT

Pressure drop in motor

OMT 160, 200, 250, 315, 400, 500 pressure drop



The curve applies to an unloaded motor shaft and an oil viscosity of 35 mm^2/s [165 SUS]

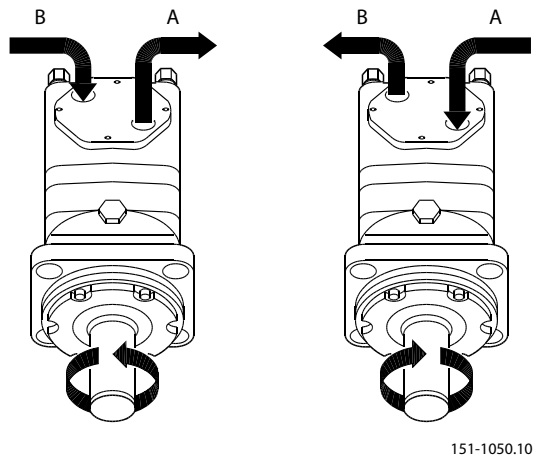
Oil flow in drain line

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

Pressure drop		Viscosity		Oil flow in drain line	
bar	**[psi]**	**mm^2/s**	**[SUS]**	**l/min**	**[US gal/min]**
140	[2030]	20	[100]	2.5	[0.66]
		35	[165]	1.5	[0.40]
210	[3050]	20	[100]	5.0	[1.32]
		35	[165]	3.0	[0.79]

OMT direction of shaft rotation

Standard rotation



OMT

Permissible shaft loads for OMT

Shaft load and bearing life time

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.

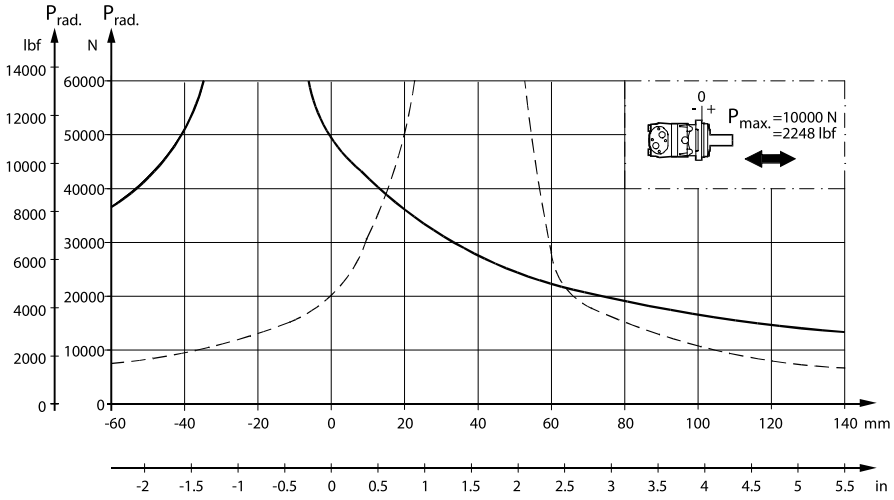
The curves are based on B10 bearing life (2000 hours or 12,000,000 shaft revolutions at 100 min^{-1}) at rated output torque, when mineral-based hydraulic oil with a sufficient content of anti-wear additives, is used.

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

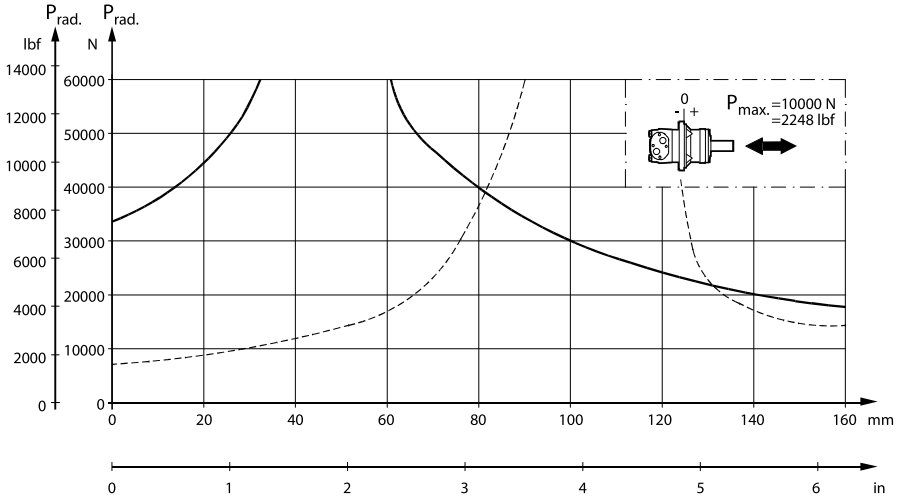
The dash curve shows max. radial shaft load. Any shaft load exceeding the values shown in the curve will involve a risk of breakage.

Bearing life calculations can be made using the explanation and formula provided in the chapter *Bearing dimensioning* in the technical information *General Orbital Motors*, **BC152886483554**.

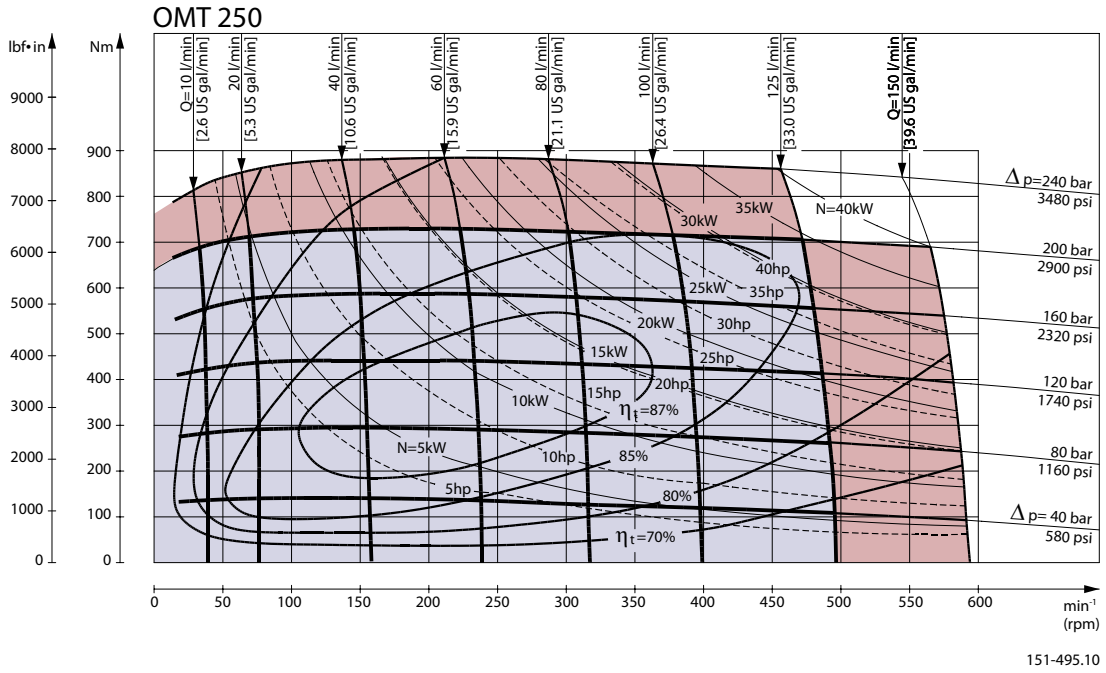
Standard mounting flange with all shaft types

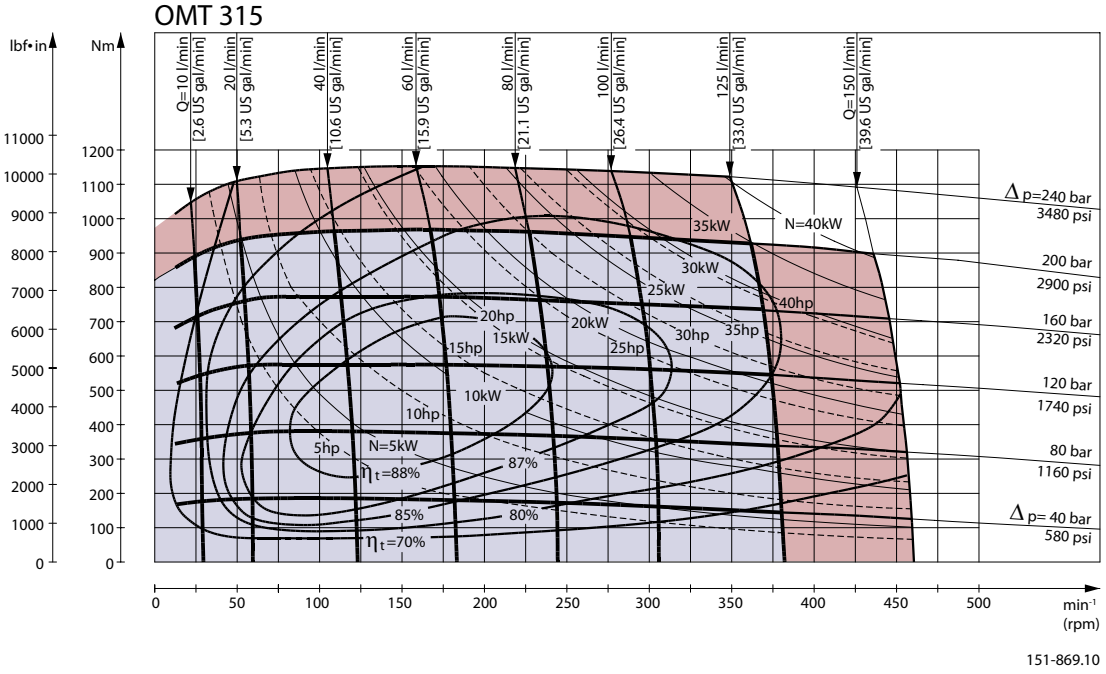


Wheel mounting flange with all shaft types



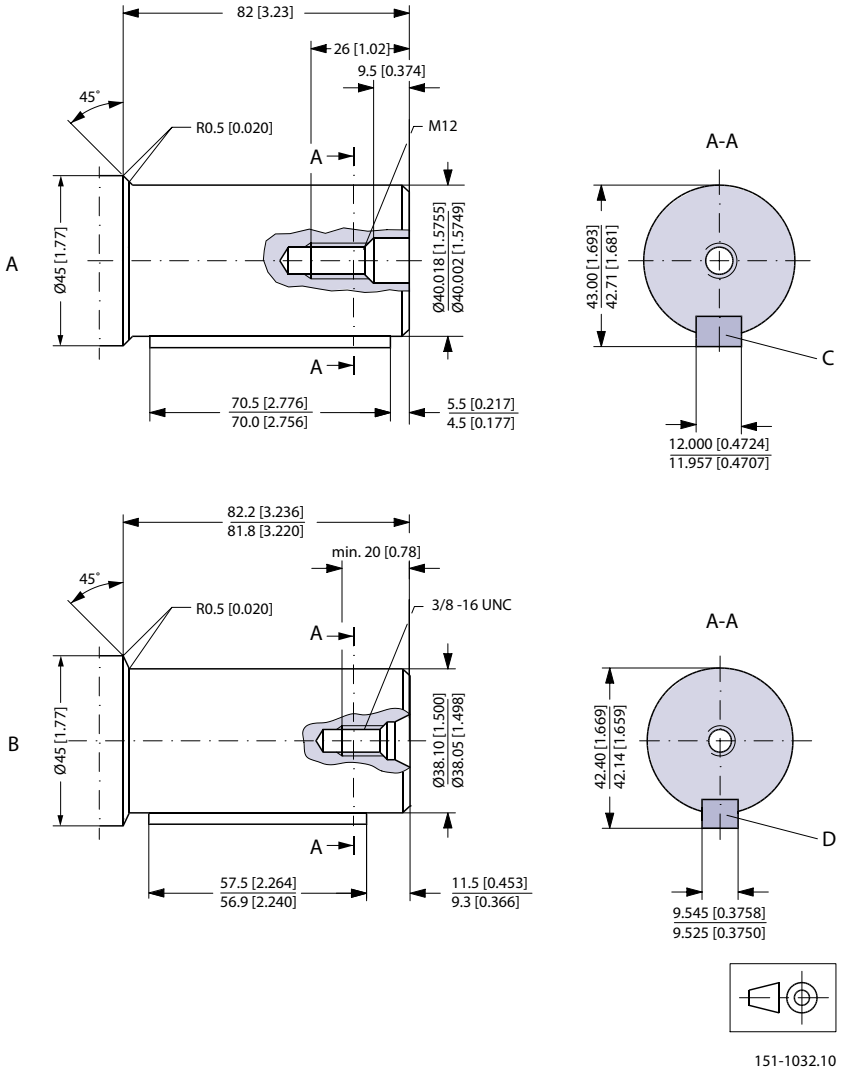
OMT


OMT 250
lbf•in
Nm
Q=10 l/min [2.6 US gal/min]
20 l/min [5.3 US gal/min]
40 l/min [10.6 US gal/min]
60 l/min [15.9 US gal/min]
80 l/min [21.1 US gal/min]
100 l/min [26.4 US gal/min]
125 l/min [33.0 US gal/min]
Q=150 l/min [39.6 US gal/min]
Δp=240 bar 3480 psi
200 bar 2900 psi
160 bar 2320 psi
120 bar 1740 psi
80 bar 1160 psi
Δp= 40 bar 580 psi
N=40kW
35kW
30kW
40hp
25kW
35hp
20kW
30hp
15kW
25hp
20hp
15hp
10kW
ηt=87%
N=5kW
10hp
85%
5hp
80%
ηt=70%
min-1 (rpm)
151-495.10


OMT 315
lbf•in
Nm
Q=10 l/min [2.6 US gal/min]
20 l/min [5.3 US gal/min]
40 l/min [10.6 US gal/min]
60 l/min [15.9 US gal/min]
80 l/min [21.1 US gal/min]
100 l/min [26.4 US gal/min]
125 l/min [33.0 US gal/min]
Q=150 l/min [39.6 US gal/min]
Δp=240 bar 3480 psi
200 bar 2900 psi
160 bar 2320 psi
120 bar 1740 psi
80 bar 1160 psi
Δp= 40 bar 580 psi
N=40kW
35kW
30kW
25kW
40hp
20hp
20kW
30hp
35hp
15hp
15kW
25hp
10kW
10hp
5hp
N=5kW
ηt=88%
87%
85%
80%
ηt=70%
min-1 (rpm)
151-869.10

OMT

Shaft version



A Cylindrical 40 mm shaft

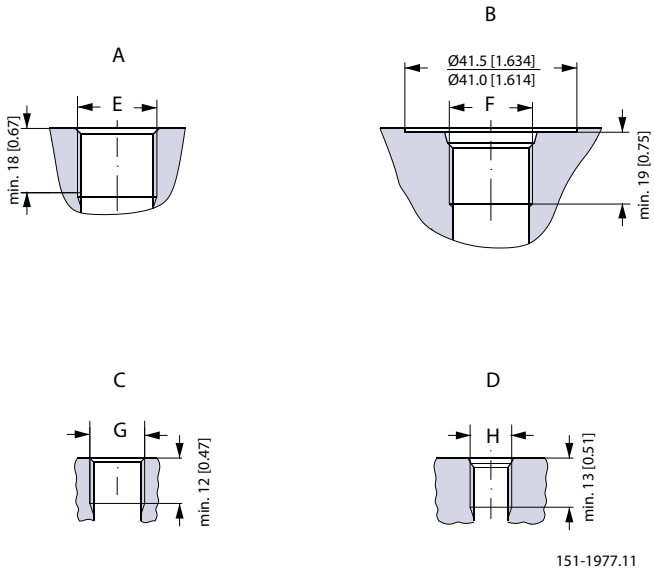
C Parallel key
A12 × 8 × 70
DIN 6885
Keyway deviates from standard

B Cylindrical 1.5 in shaft

D Parallel key
3/8 × 3/8 × 21/4 in
B.S. 46
Keyway deviates from standard

OMT

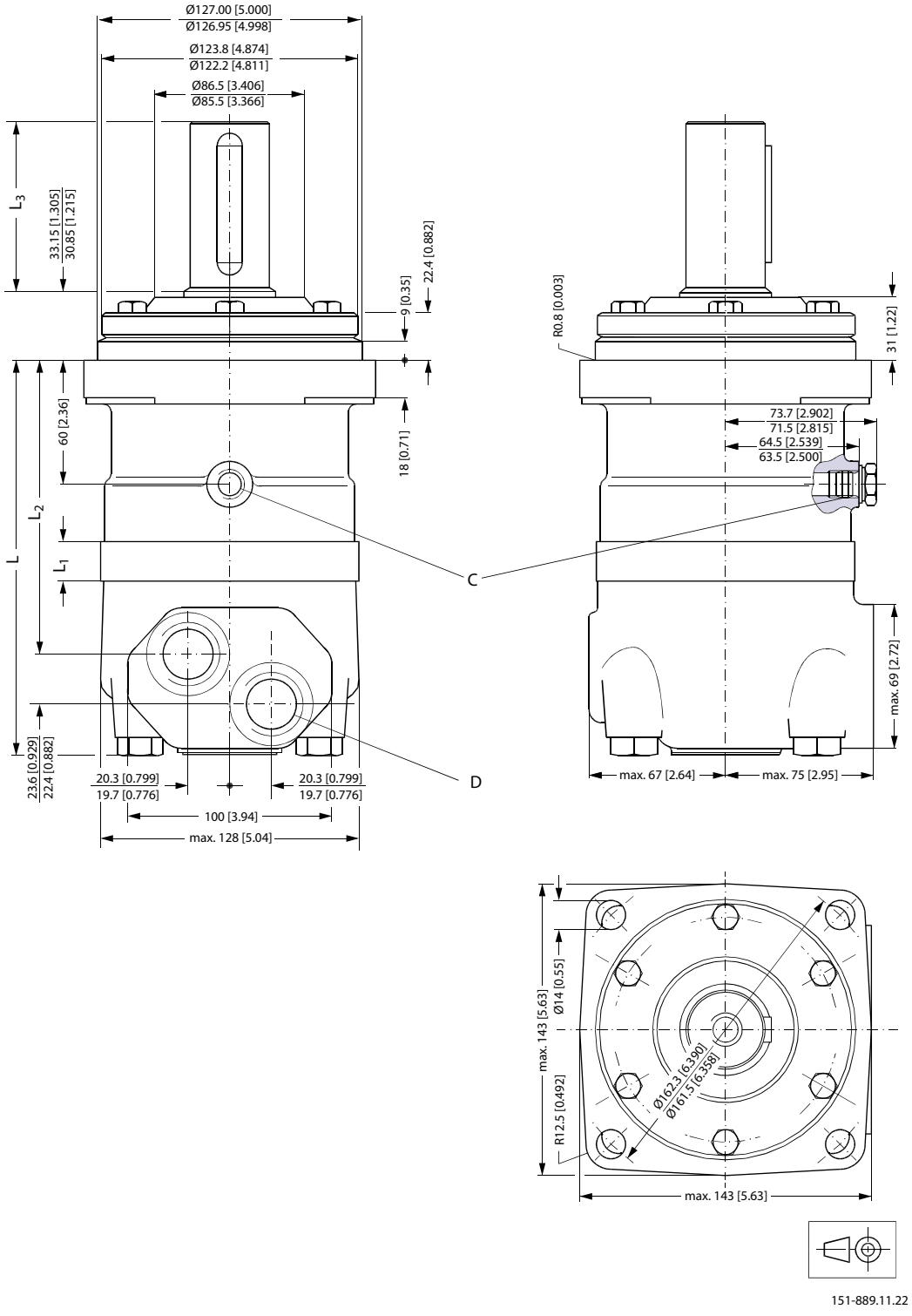
Port thread versions



A	G main ports	**B**	UN main ports
E	ISO 228/1 - G3/4 O-ring boss port	**F**	1 1/16 - 12 UN
C	G drain port	**D**	UNF drain port
G	G: ISO 228/1 - G1/4 O-ring boss port	**H**	9/16 - 18 UNF

OMT

OMT standard flange - US version



151-889.11.22

C: Drain connection 9⁄16 - 18 UNF; 13 mm [0.51 in] deep O-ring boss port

D: 1 1⁄16 - 12 UN; 19 mm [0.75 in] deep O-ring boss port

OMT

Type		OMT 160	OMT 200	OMT 250	OMT 315	OMT 400	OMT 500
$L_{Max.}$	mm	192	197	203	213	223	237
	[in]	[7.56]	[7.76]	[7.99]	[8.39]	[8.78]	[9.33]
L_1*	mm	16.5	21.5	27.8	37.0	47.5	61.5
	[in]	[0.650]	[0.846]	[1.094]	[1.457]	[1.870]	[2.421]
L_2	mm	140	145	151	161	171	185
	[in]	[5.51]	[5.71]	[5.94]	[6.34]	[6.73]	[7.28]
Weight	kg	20.0	20.5	21.0	22.0	23.0	24.0
	[lb]	[44.1]	[45.2]	[46.3]	[48.5]	[50.7]	[52.9]

* The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L1 dimensions

Output shaft		Cyl. 1.5 in, Splined 1.5 in	Tapered 1.75 in
L_3	mm	82	80.4
	[in]	[3.23]	[3.17]