# Danfoss OMT 315 151B3009 orbital hydraulic motor

Manufacturer: Danfoss

Manufacturer part number / published order designation: 151B3009

Published model: 151B3009

## 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-G21-AD-1D-D21-A-A-1B-1-N-NN-NNNNN-NN-NN-NN-SP-NNN

Representative series photograph; use selected manufacturer drawings for the shaft execution.

Catalogue maxima are separate limits; verify the size-specific operating point, shaft load and drain/shaft-seal conditions.

## 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 and OMV - October 2024

| Original pages | Compiled pages | Relevant content |
|---|---|---|
| 8-13 | 2-7 | Factory ordering/versions; Applicable hydraulic data, constraints and mounting/port drawings |
| 16 | 8 | Size-specific performance diagram |
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| 21-23 | 10-12 | Applicable hydraulic data, constraints and mounting/port drawings |

## 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.

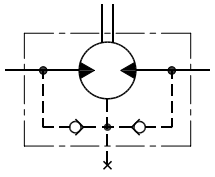
Orders will not be accepted without the four digit prefix.

## 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

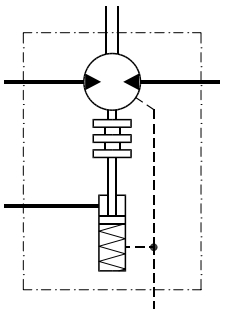
***Motor with check valves and with drain connection***

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]

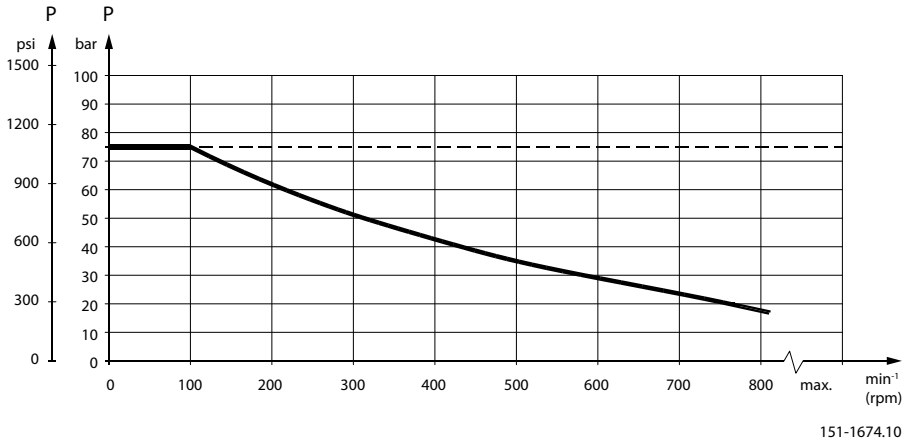
## OMT




***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.

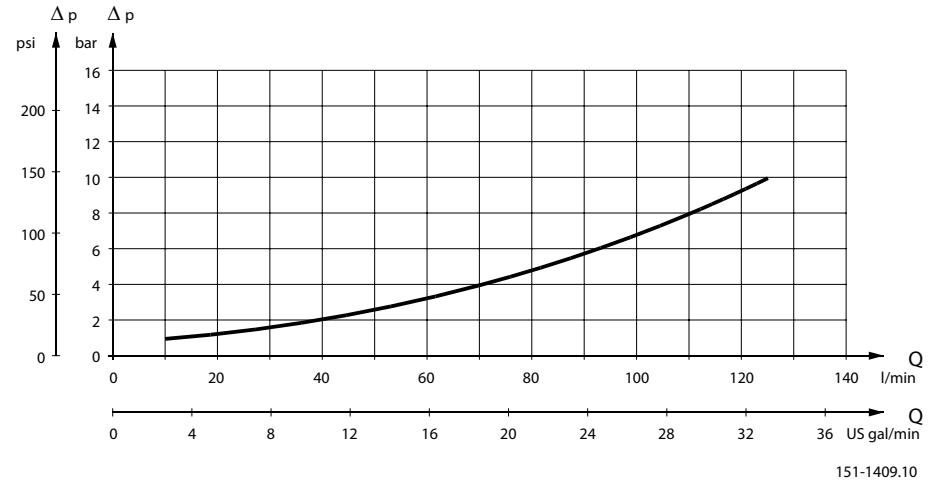
[4)] For the supply of motors with holding torques higher than those stated, please contact the Danfoss sales organization.

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]

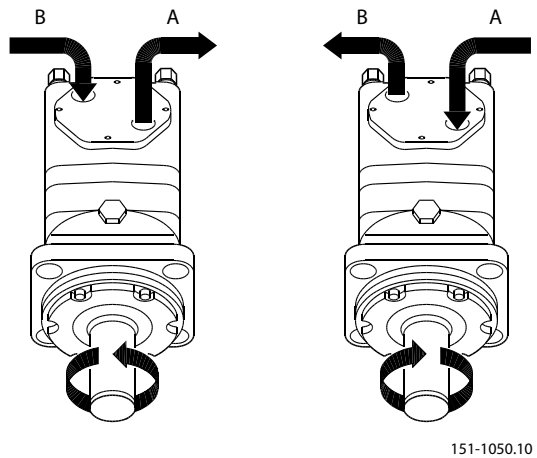
### Oil flow in drain line

*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.

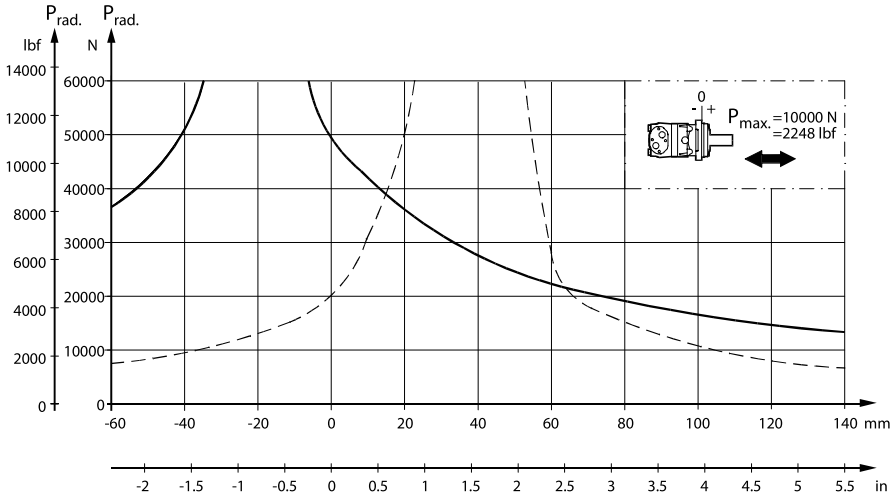
The curves are based on B10 bearing life (2000 hours or 12,000,000 shaft revolutions at 100 $min^{-1}$) at rated output torque, when mineral-based hydraulic oil with a sufficient content of anti-wear additives, is used.

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

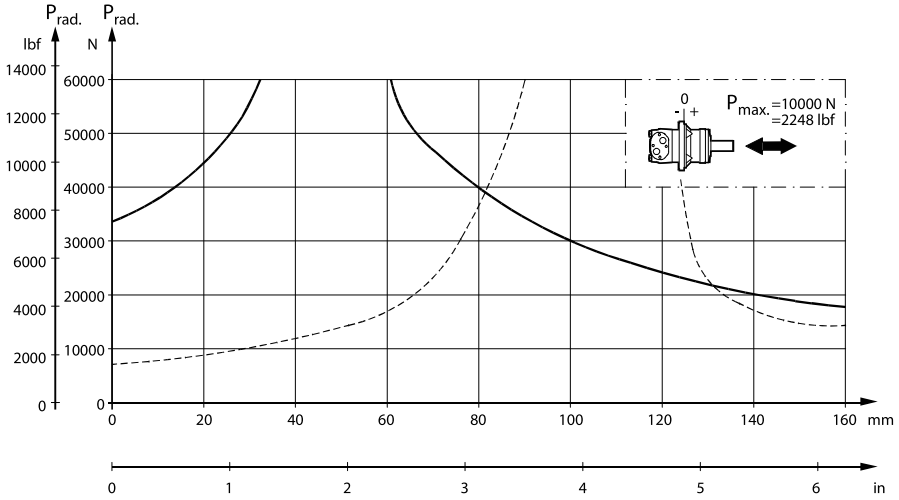
The dash curve shows max. radial shaft load. Any shaft load exceeding the values shown in the curve will involve a risk of breakage.

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**.

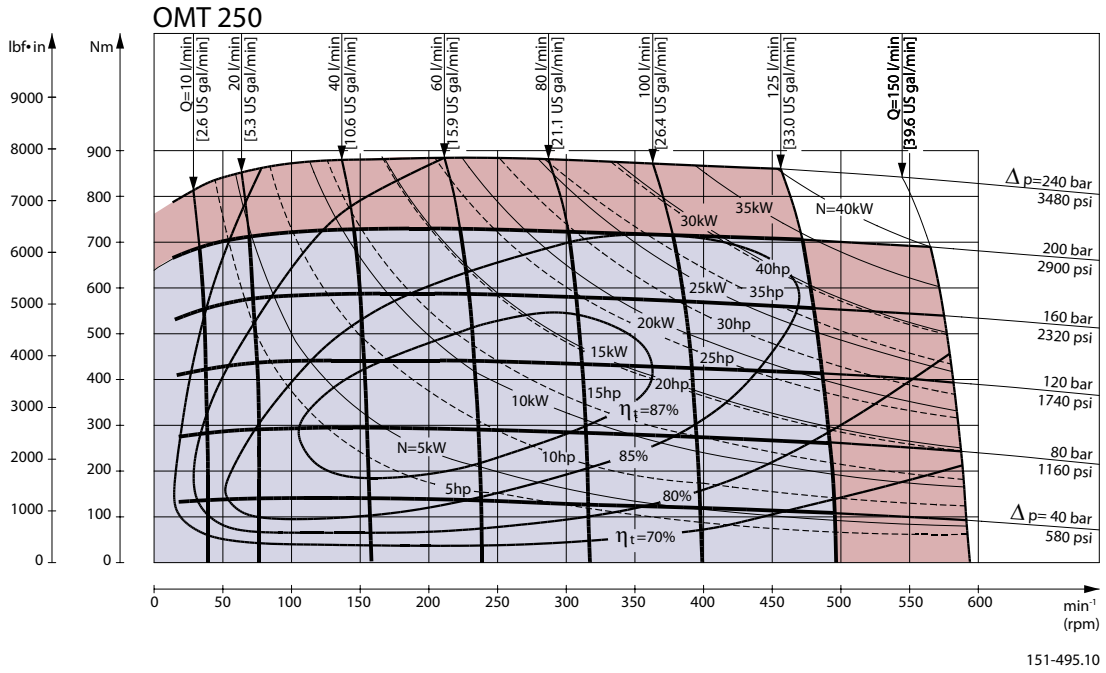
#### *Standard mounting flange with all shaft types*

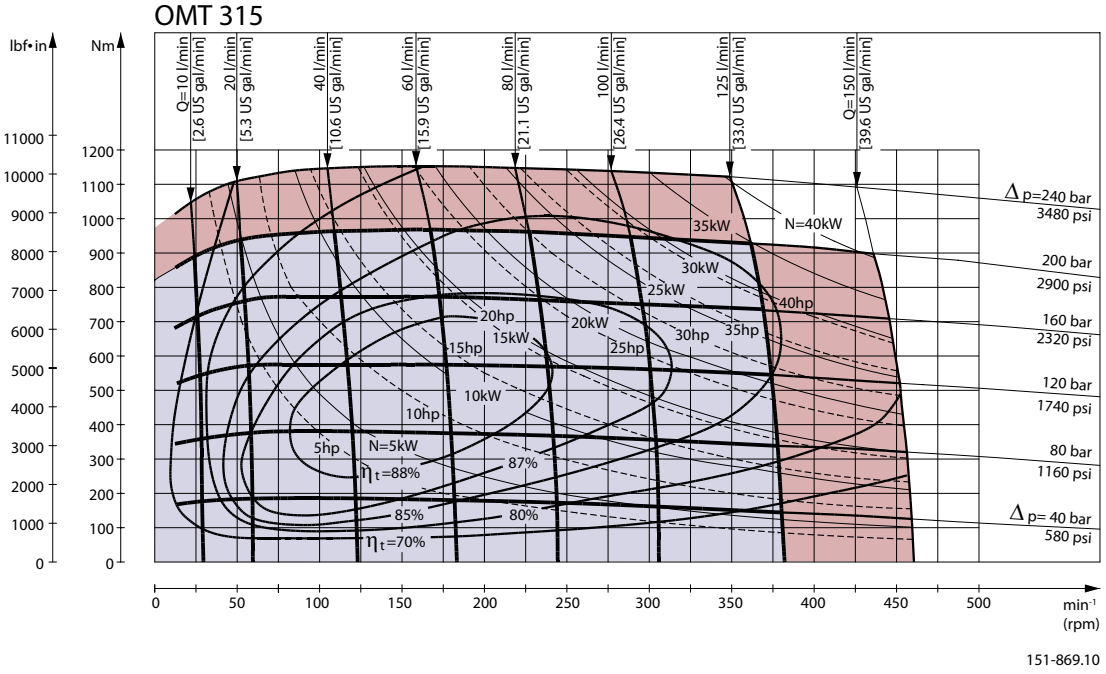



#### *Wheel mounting flange with all shaft types*

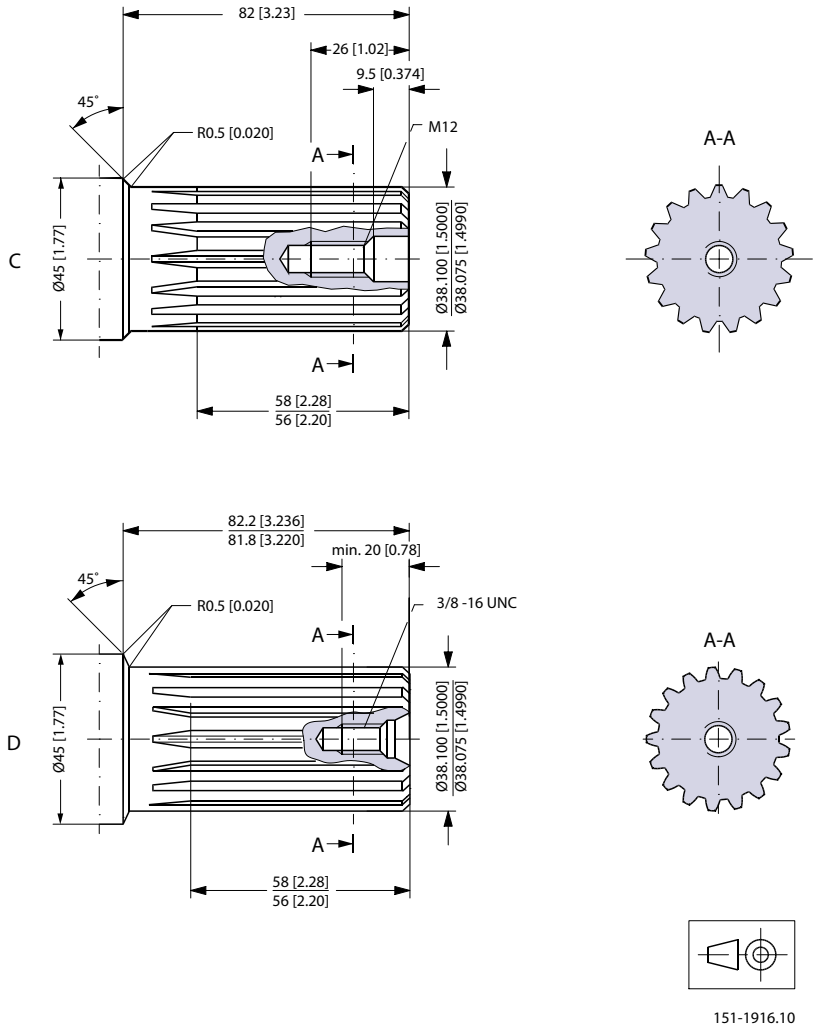


## OMT


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

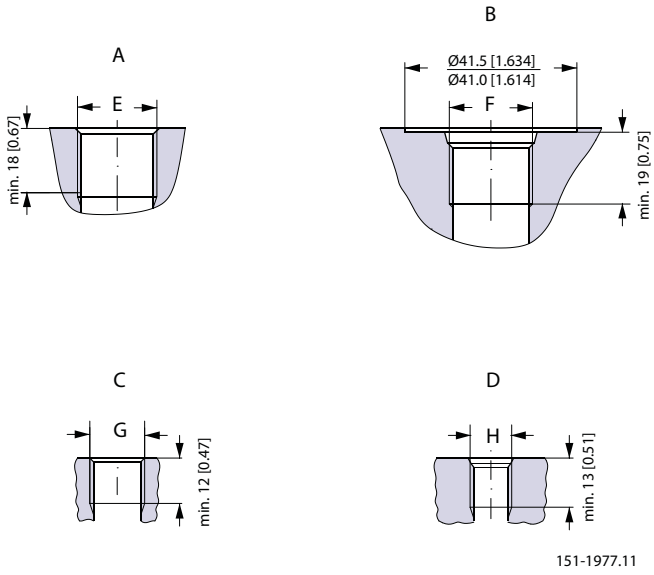



**C** Involute splined shaft
ANS B92.1 - 1970 standard
Flat root side fit
Pitch 12/24
Teeth 17
Major diameter 1.50 in
Pressure angle 30°

**D** **US version**
Involute splined shaft
ANS B92.1 - 1970 standard
Flat root side fit
Pitch 12/24
Teeth 17
Major diameter 1.50 in
Pressure angle 30°

## OMT

### Port thread versions

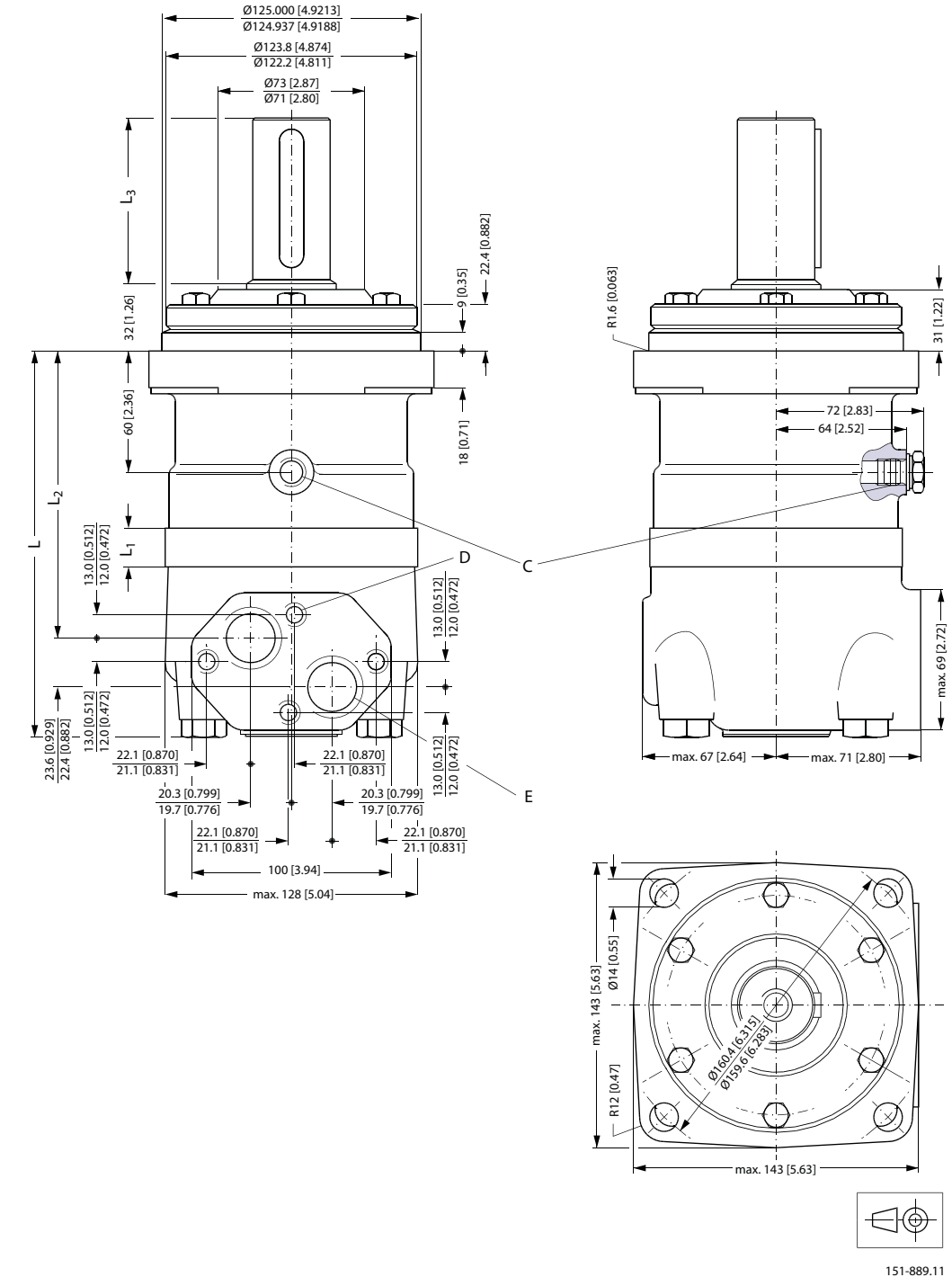



| | | | |
|---|---|---|---|
| **A** | G main ports | **B** | UN main ports |
| **E** | ISO 228/1 - G3/4<br>O-ring boss port | **F** | 1 1/16 - 12 UN |
| **C** | G drain port | **D** | UNF drain port |
| **G** | G: ISO 228/1 - G1/4<br>O-ring boss port | **H** | 9/16 - 18 UNF |

## OMT

### Dimensions

**OMT standard flange - European version**




151-889.11

**C:** Drain connection, G 1⁄4; 12 mm [0.47 in] deep

**D:** M10; 10 mm [0.39 in] deep

**E:** G 3⁄4; 17 mm [0.67 in] deep

## 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 | | All shafts except P.t.o. shaft | P.t.o. shaft |
|---|---|---|---|
| $L_3$ | mm | 82 | 102 |
| | [in] | [3.23] | [4.02] |