



Technical Information

# Orbital Motors

## OMS, OMT and OMV



**Revision history***Table of revisions*

| <b>Date</b>   | <b>Changed</b>                                         | <b>Rev</b> |
|---------------|--------------------------------------------------------|------------|
| 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         |

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**Orbital motors**

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**OMV**

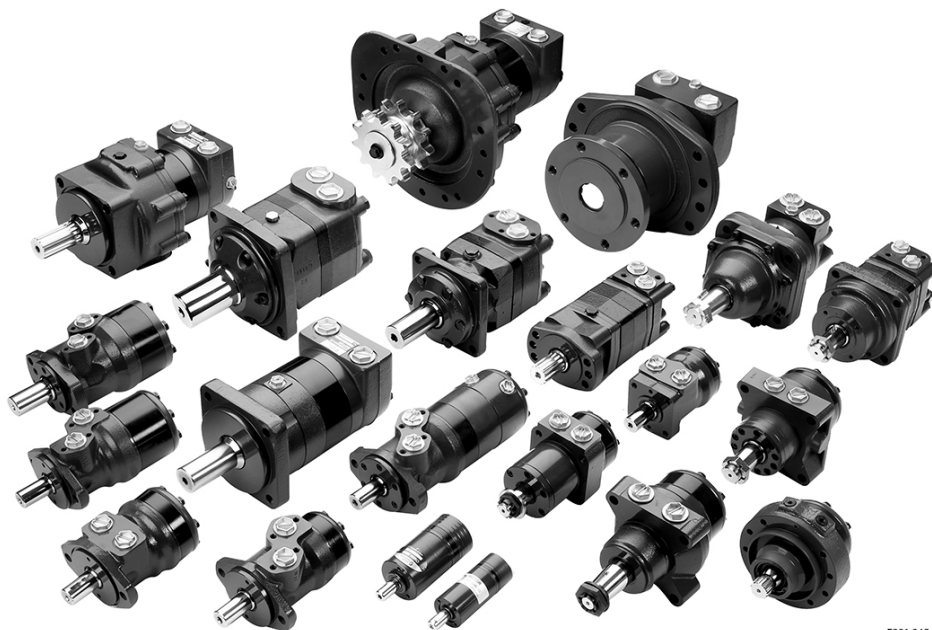
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## Orbital motors

### 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 cm<sup>3</sup> [0.50 in<sup>3</sup>] to 800 cm<sup>3</sup> [48.9 in<sup>3</sup>] per revolution.

Speeds range up to approximate 2,500 min<sup>-1</sup> (rpm) for the smallest type and up to approximate 600 min<sup>-1</sup> (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:

### 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

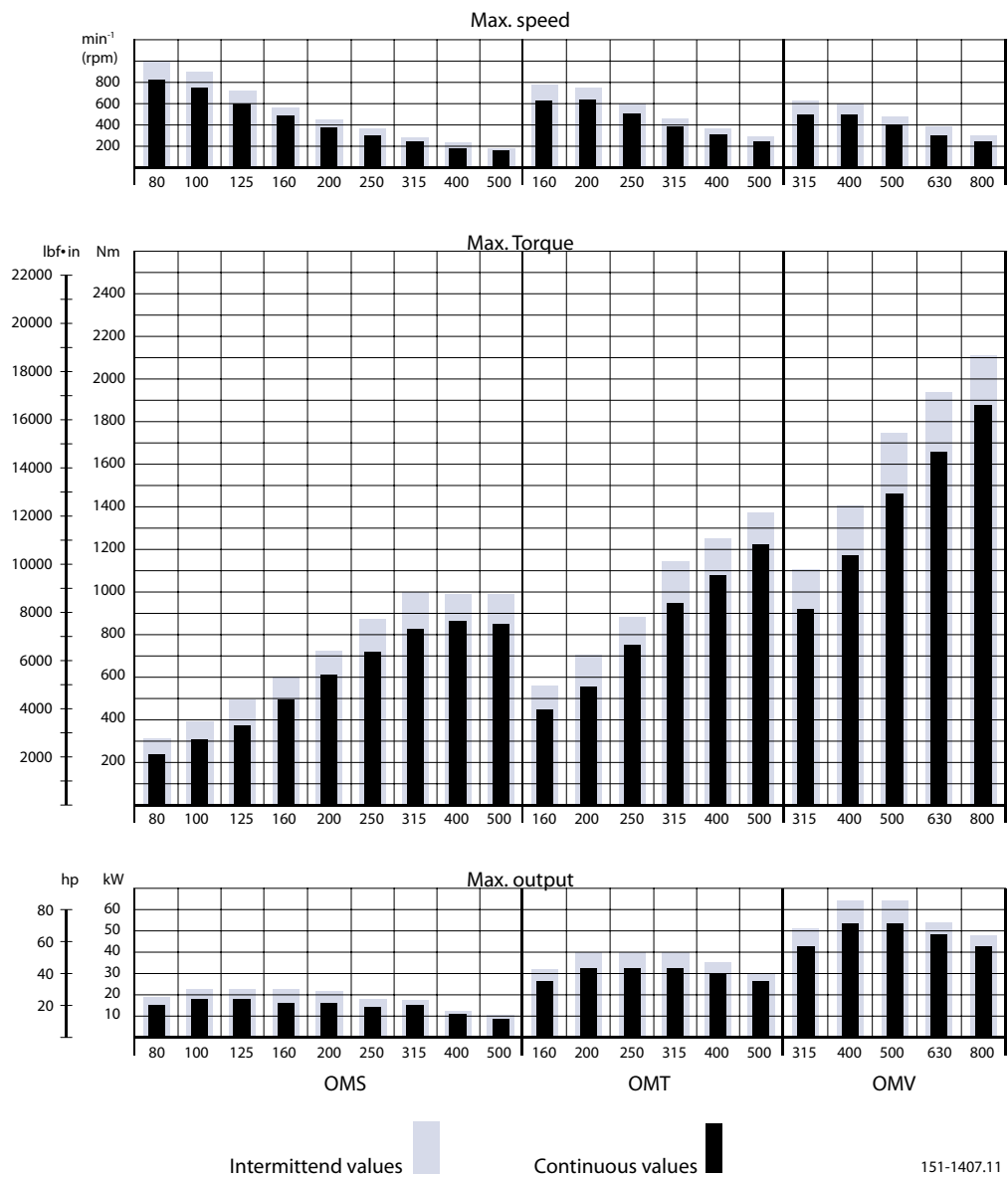
Detailed data on all Danfoss Orbital Motors can be found in our motor catalogue, which is divided into more individual subcatalogues:

- 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.

OMS, OMT and OMV

Speed, torque and output



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

**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 mm<sup>2</sup>/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.



**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

**OMS**
**Code numbers**
*OMS code numbers*

| Code Numbers | Displacement [cm <sup>3</sup> ] |      |      |      |      |      |      |      |      |
|--------------|---------------------------------|------|------|------|------|------|------|------|------|
|              | 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.

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Orders will not be accepted without the four digit prefix.

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**OMS**
**Technical data**

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

| Type                |           |                    | Max. inlet pressure | Max. return pressure with drain line |
|---------------------|-----------|--------------------|---------------------|--------------------------------------|
| OMS<br>OMSW<br>OMSS | bar [psi] | cont.              | 230 [3340]          | 140 [2030]                           |
|                     | bar [psi] | int. <sup>1)</sup> | 295 [4280]          | 175 [2540]                           |
|                     | bar [psi] | peak <sup>2)</sup> | 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. <sup>1)</sup> | 450 [3980]   | 410 [3630] | 200 [1770]       |

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

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

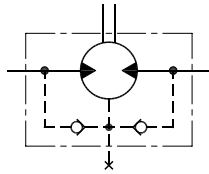
[For max. permissible combination of flow and pressure, see function diagram for actual motor.](#)

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.

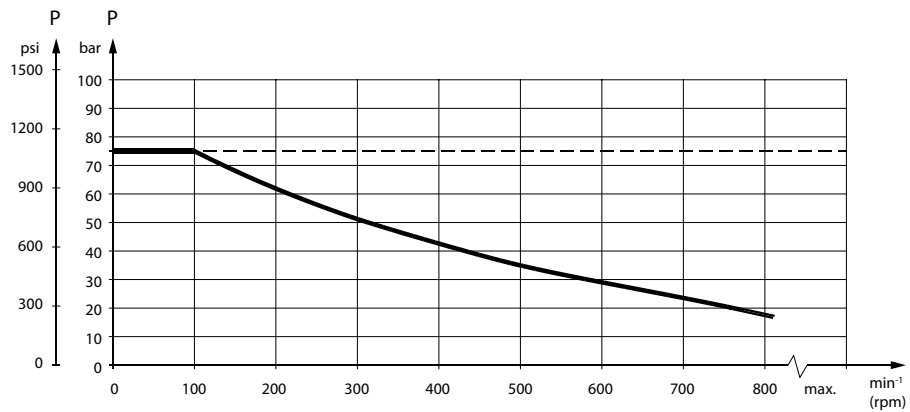


151-320.10

**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



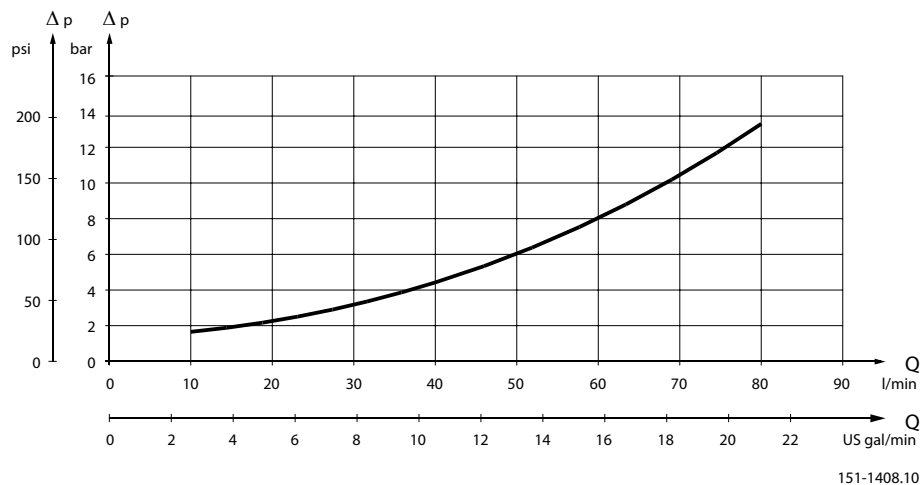
151-1674.10

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

———— Continuous operation

OMS

**Pressure drop in motor**



151-1408.10

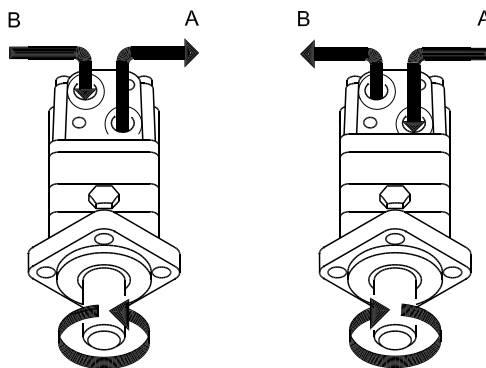
The curve applies to an unloaded motor shaft and an oil viscosity of 35 mm<sup>2</sup>/s [165 SUS]

**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<br>bar [psi] | Viscosity<br>mm <sup>2</sup> /s [SUS] | Oil flow in drain line<br>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:**

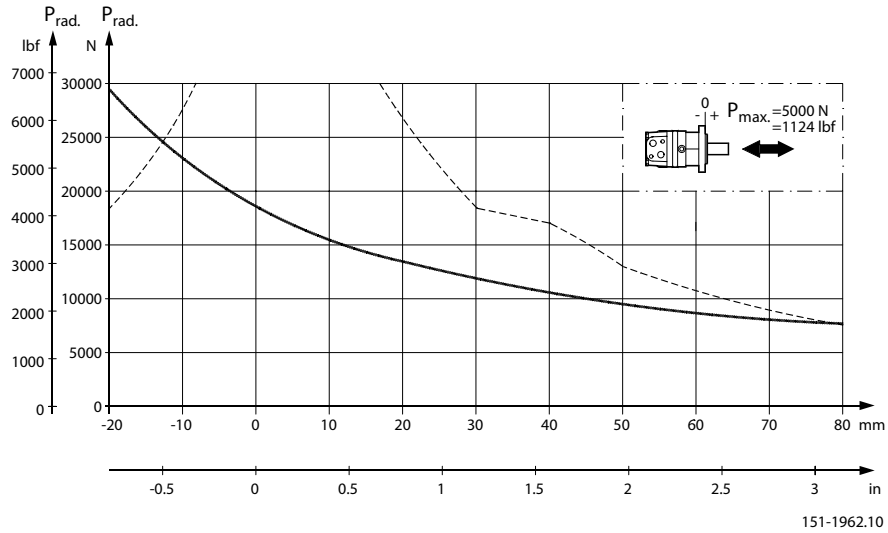
Standard – A-2 – Magneto – SAE B

OMS

**Shaft:**

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

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

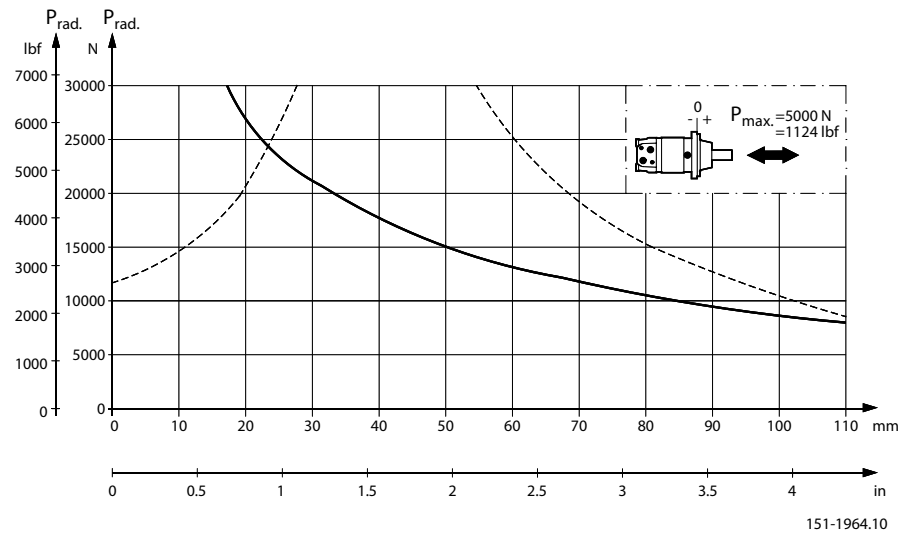


**Mounting flange:**

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.

**OMS**

The curve is based on B10 bearing life (2000 hours or 12,000,000 shaft revolutions at 100 min<sup>-1</sup>) 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.

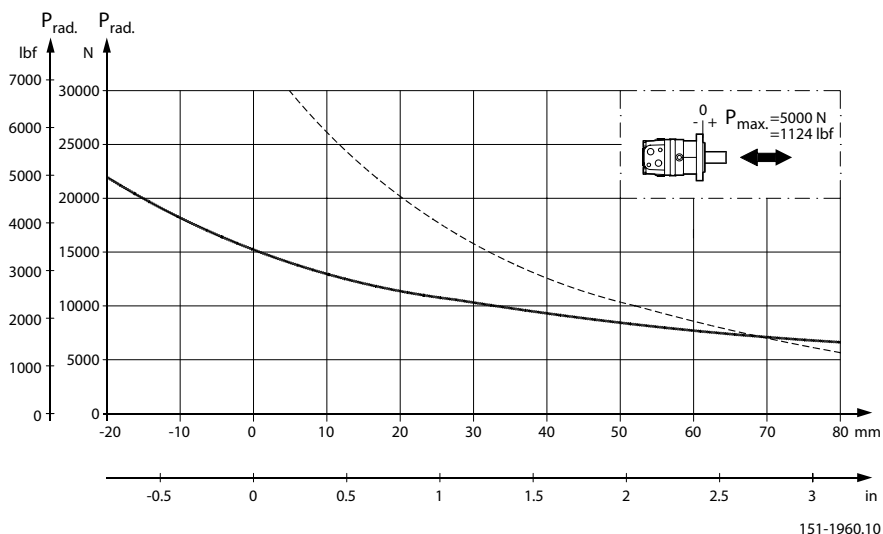
Bearing life calculations can be made using the explanation and formula provided in the chapter "Bearing dimensioning" in the technical information "General Orbital motors" 520L0232.

**Mounting flange:**

Special

**Shaft:**

Splined 1.25 in



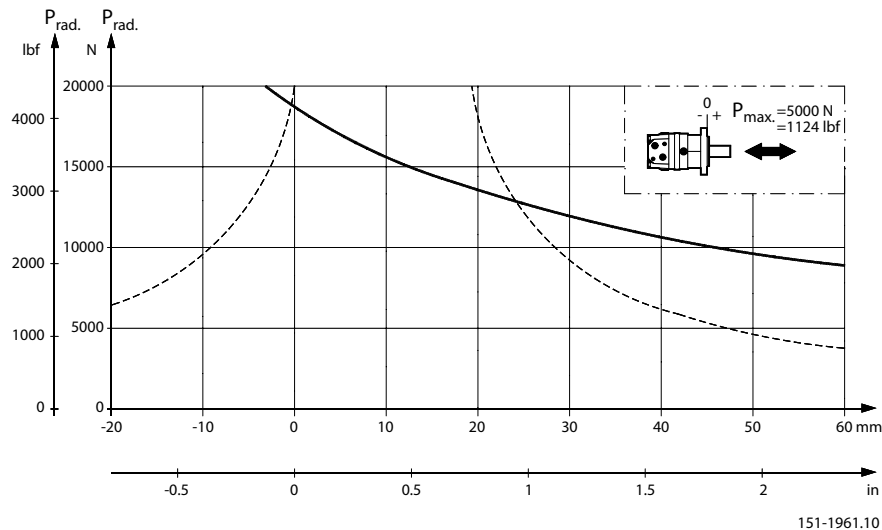
**Mounting flange:**

A-2 – Magneto

**Shaft:**

Cyl. 1 in – Splined 1 in

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<sup>-1</sup>) 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:**

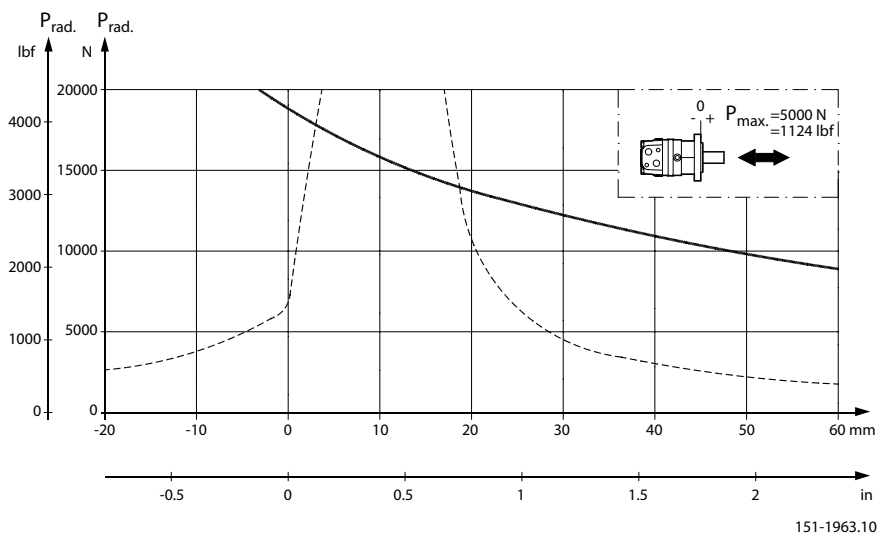
SAE B

**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  $100 \text{ min}^{-1}$ ) 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.

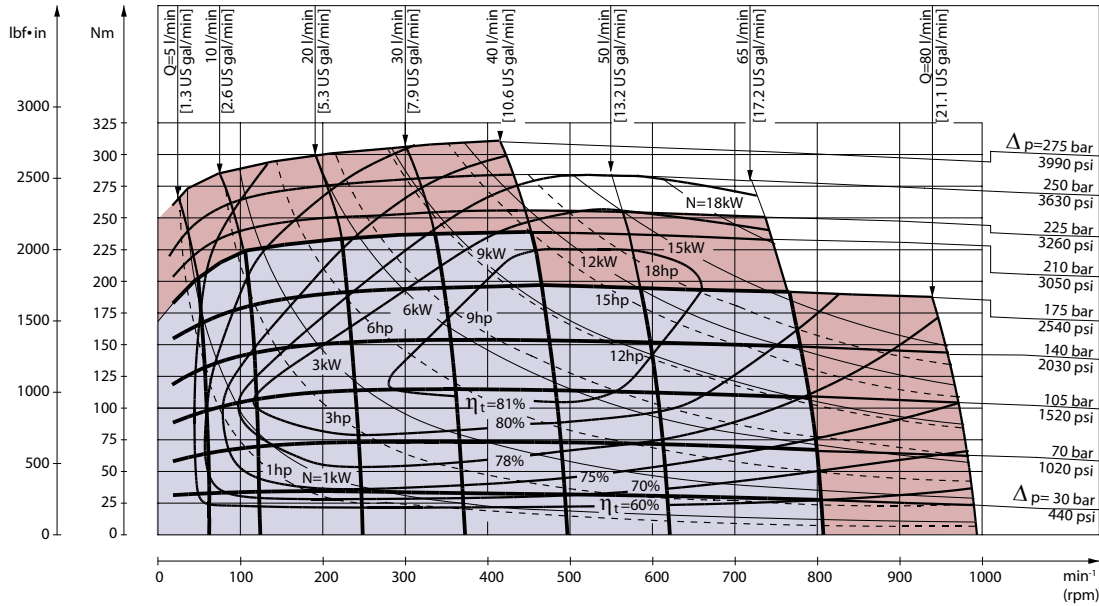
OMS

Function diagrams

Continuous range

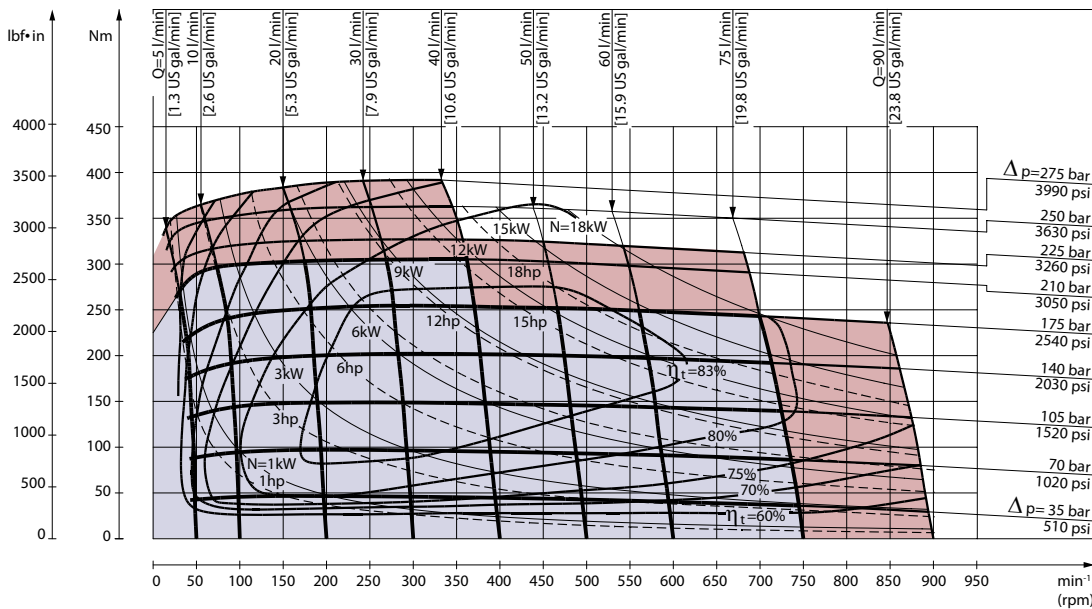
Intermittent range (maximum 10% operation every minute)

OMS 80



151-901.10

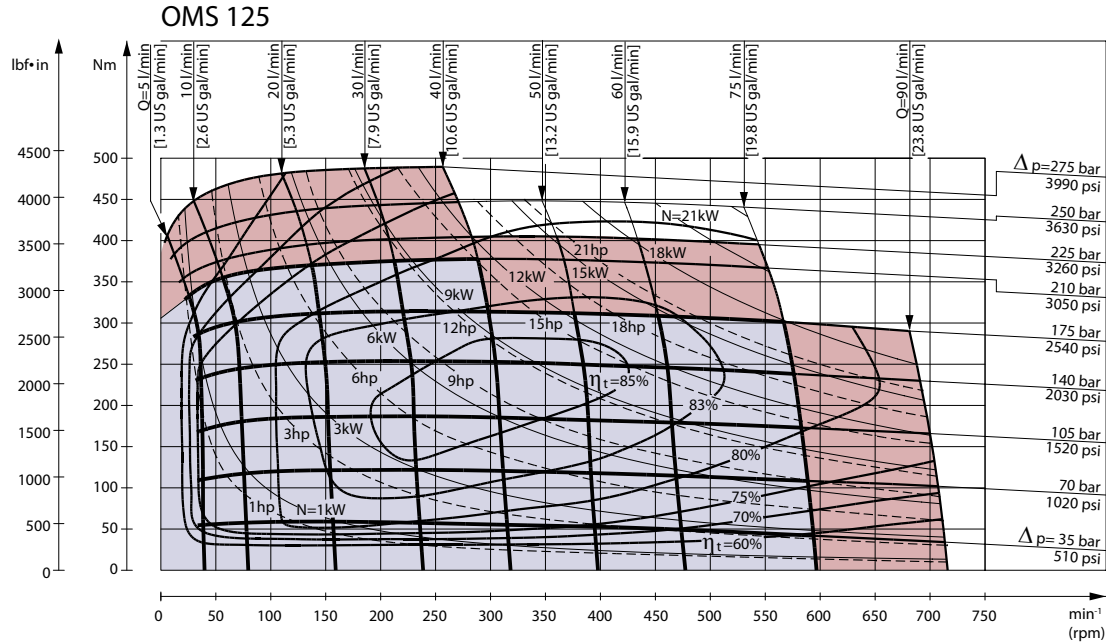
OMS 100



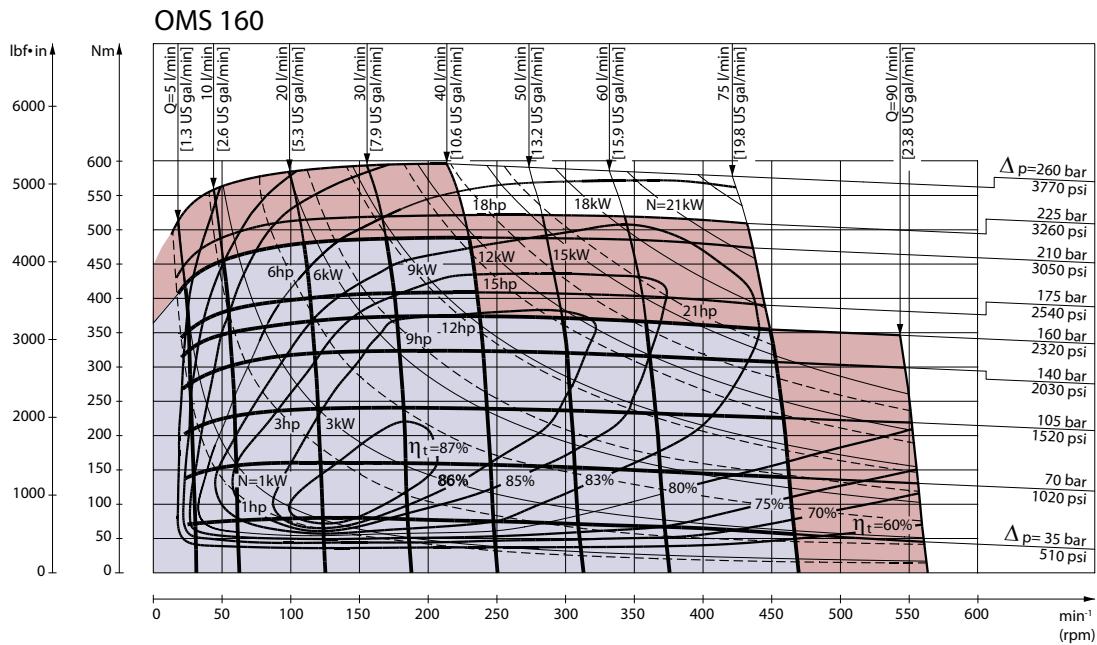
151-902.10

9hp

OMS

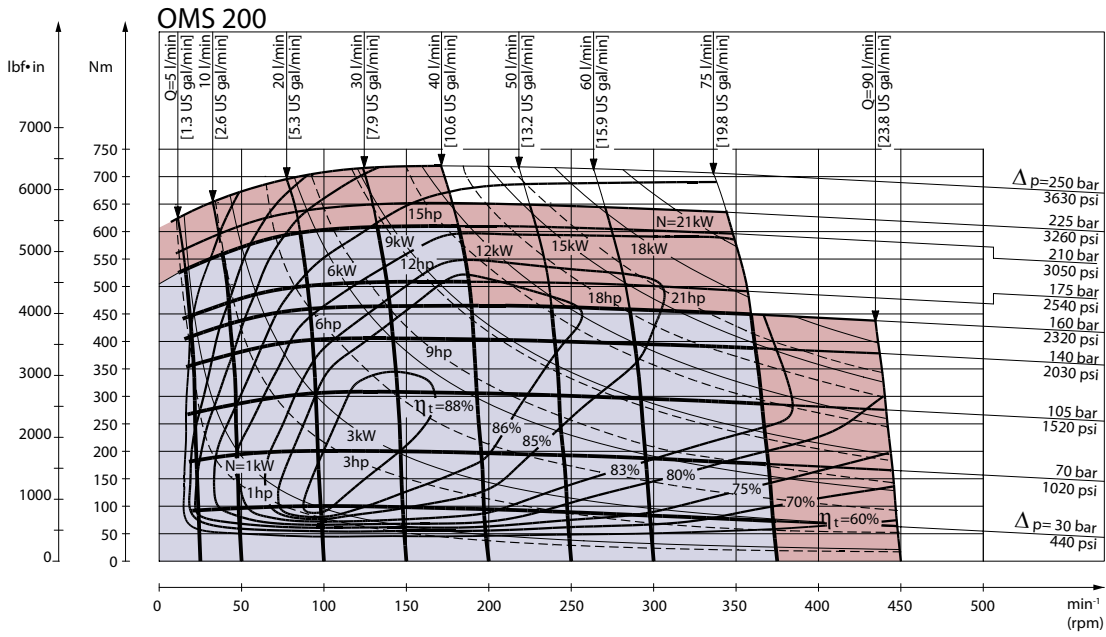


151-903.10

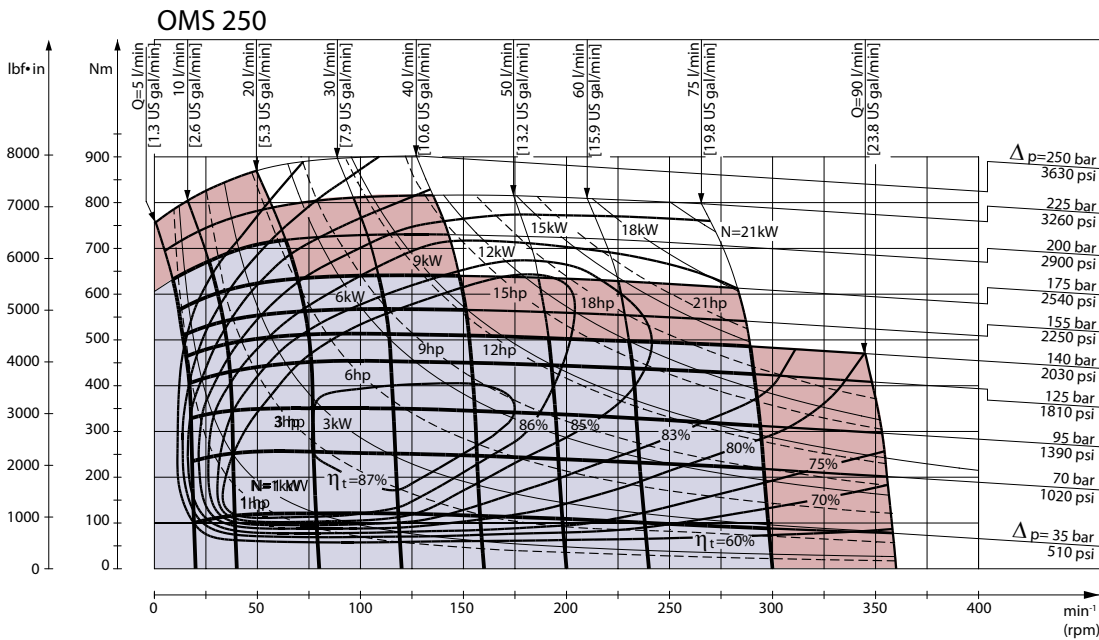


151-904.11

OMS



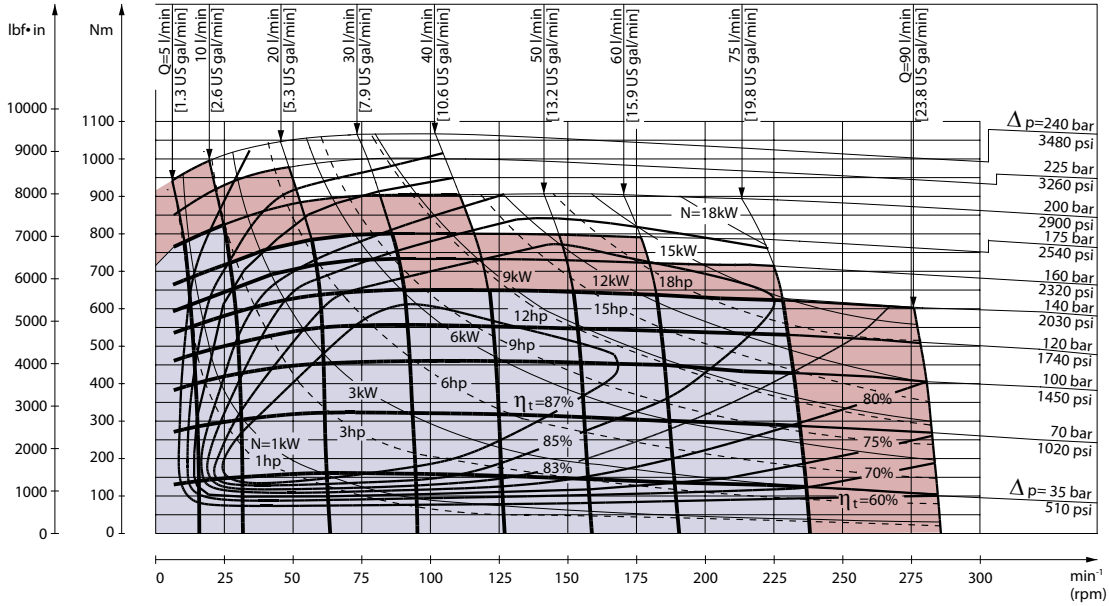
151-905.10



151-1039.10

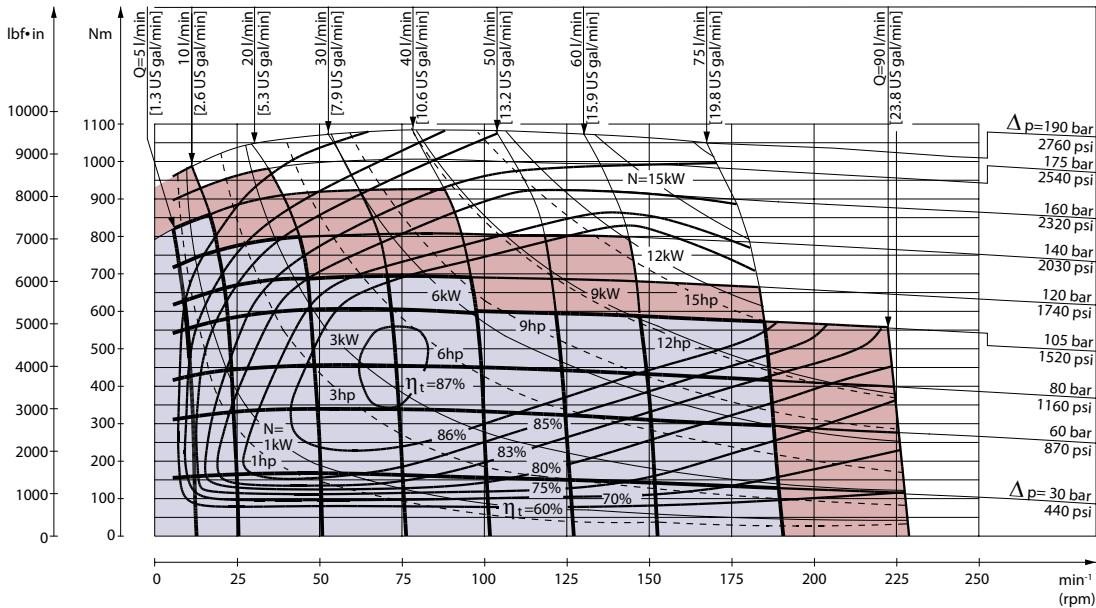
OMS

OMS 315



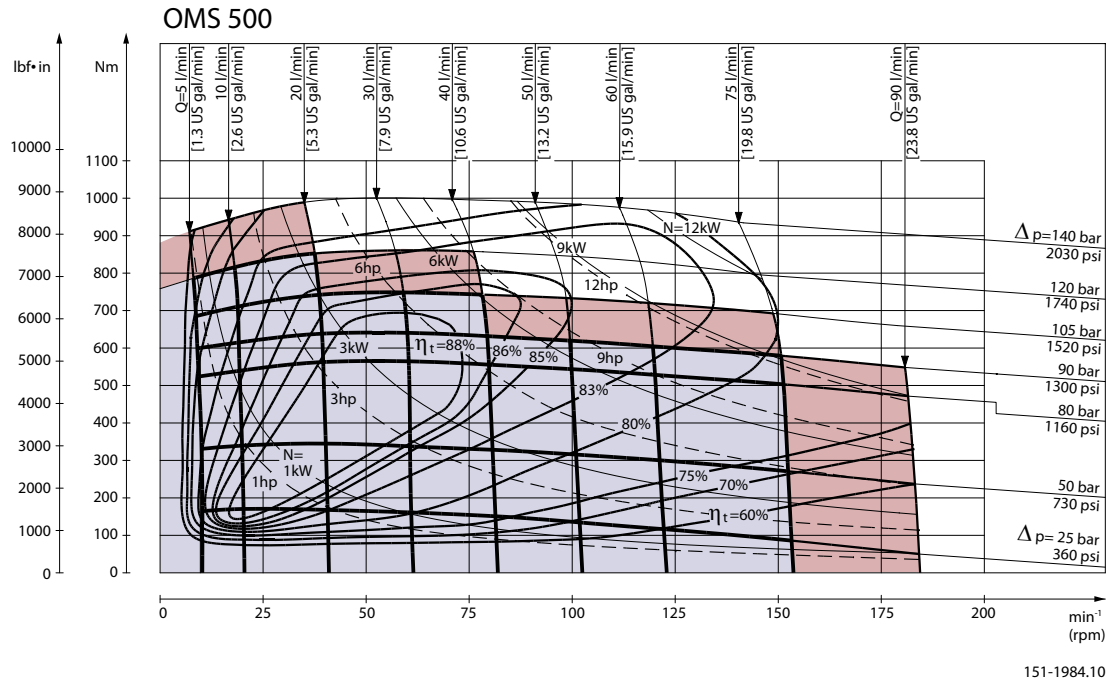
151-906.10

OMS 400



151-1491.10

OMS



**Function diagram use**

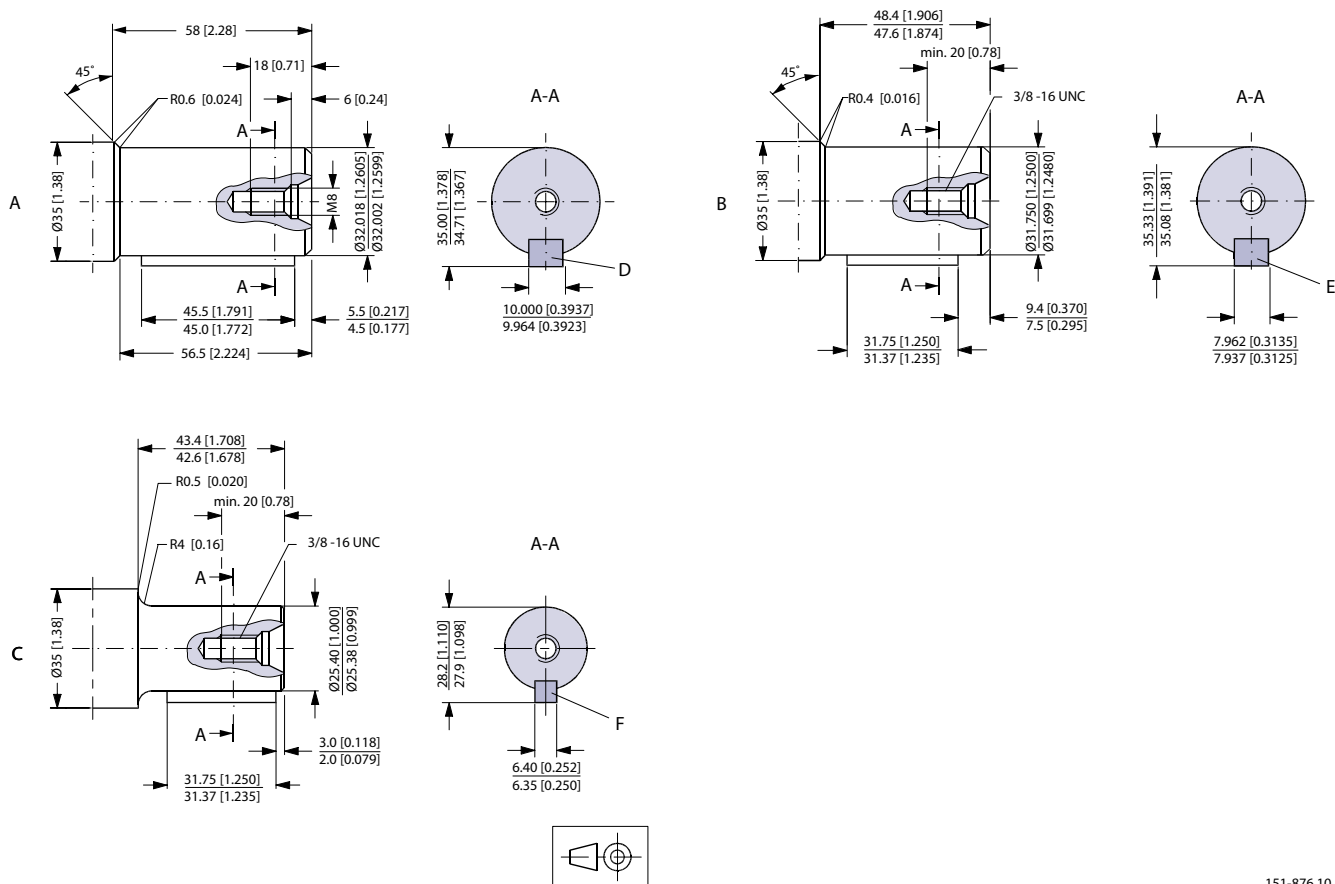
Explanation of function diagram use, basis and conditions, see [Speed, torque and output](#) on page 7.

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.

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

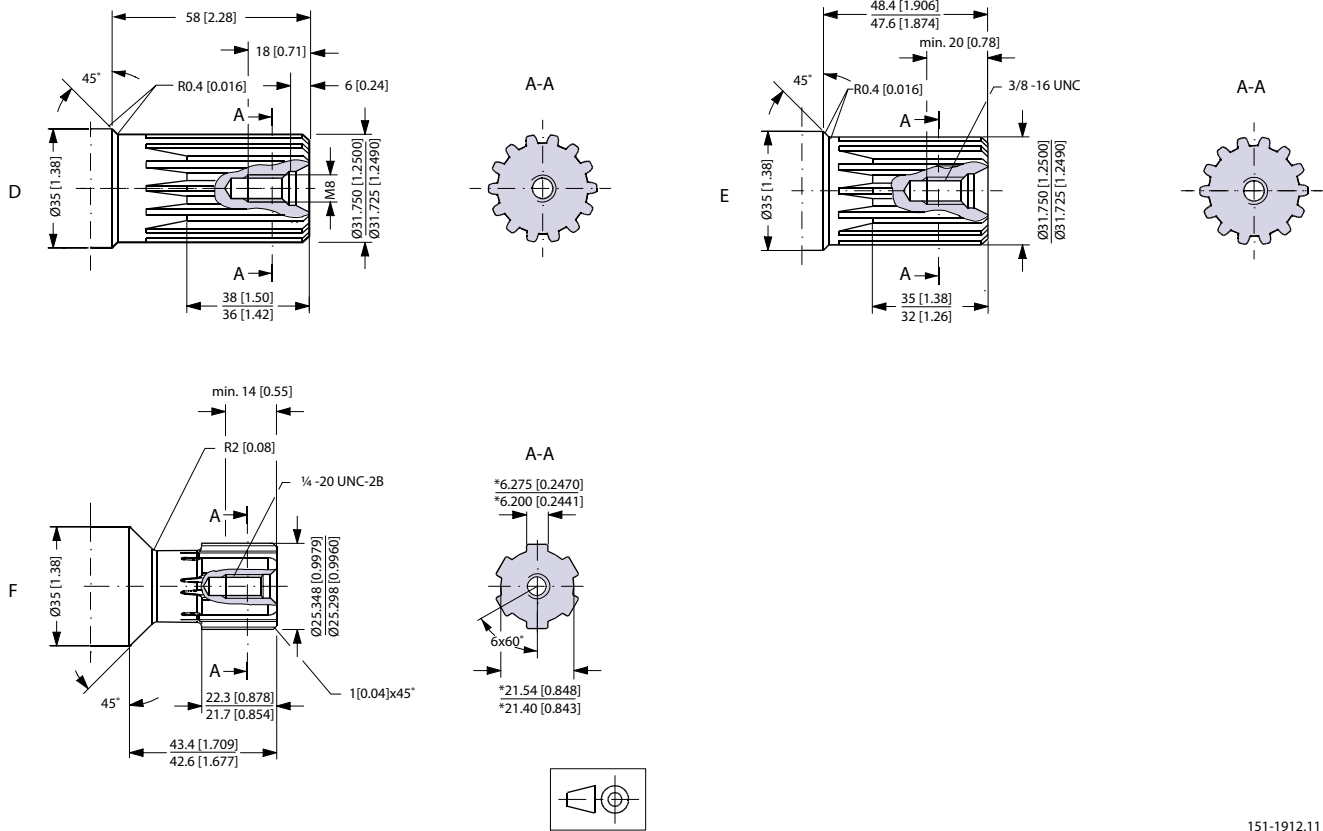
**F** Parallel key

1/4 × 1/4 × 11/4 in

B.S. 46

Keyway deviates from standard

**OMS**



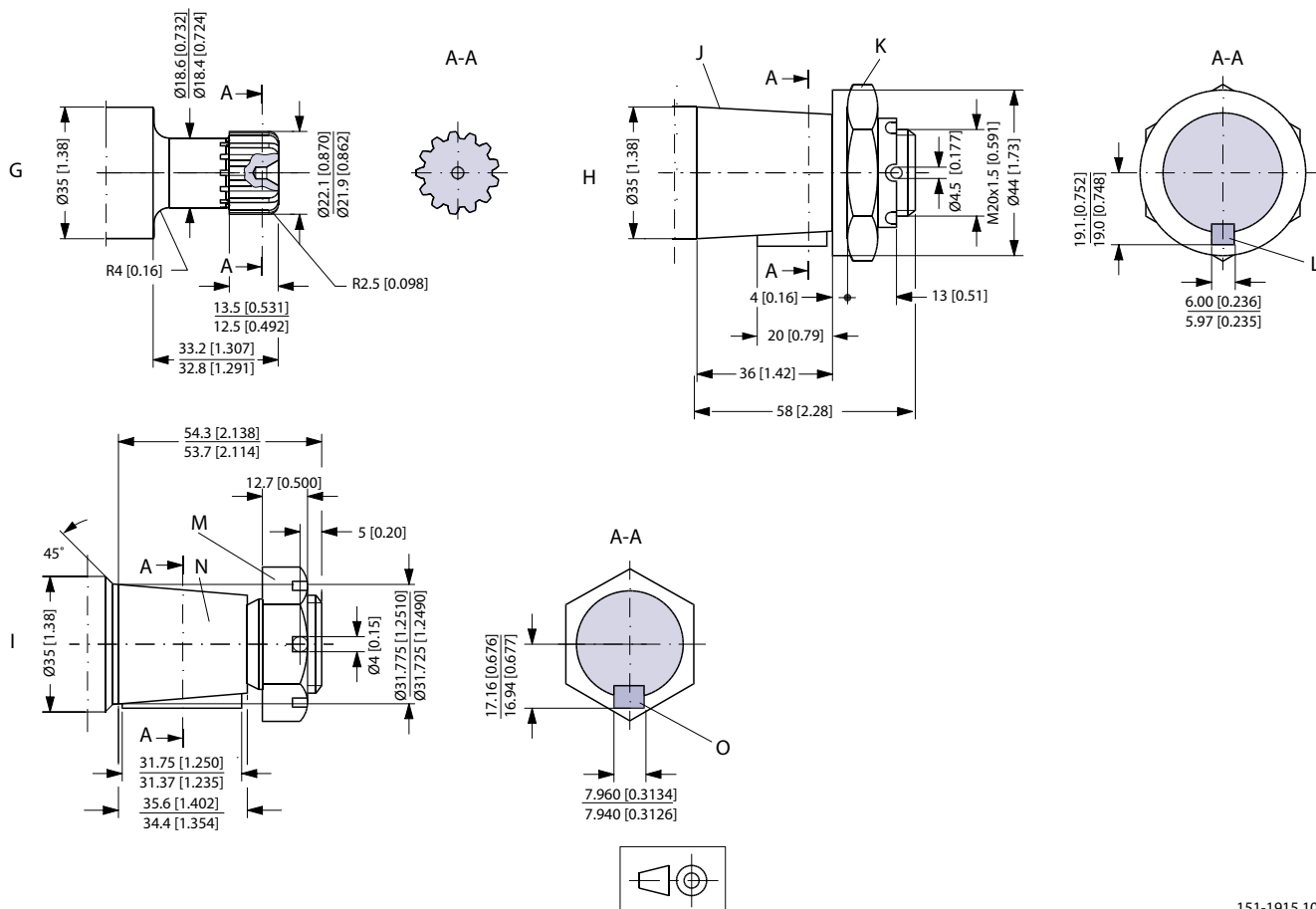
**D** Involute splined shaft  
ANS B92.1 - 1970 standard  
Flat root side fit  
Pitch 12/24  
Teeth 14  
Major diameter 1.25 in  
Pressure angle 30°

**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)

151-1912.11



**OMS**


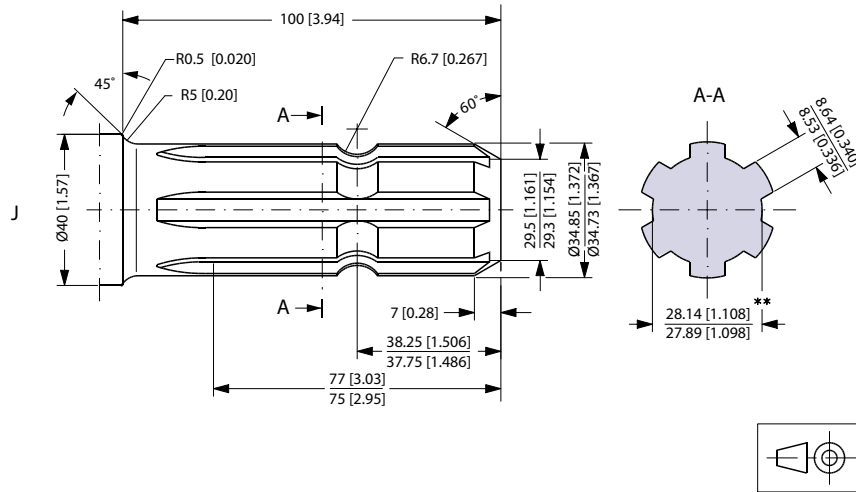
151-1915.10

- 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

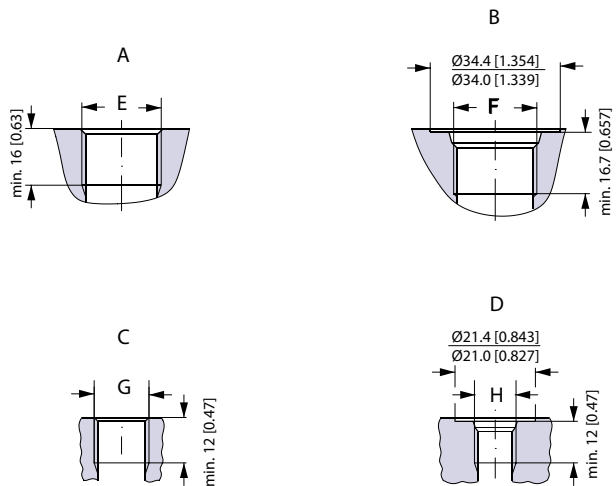
OMS



151-1948.10

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

Port thread versions



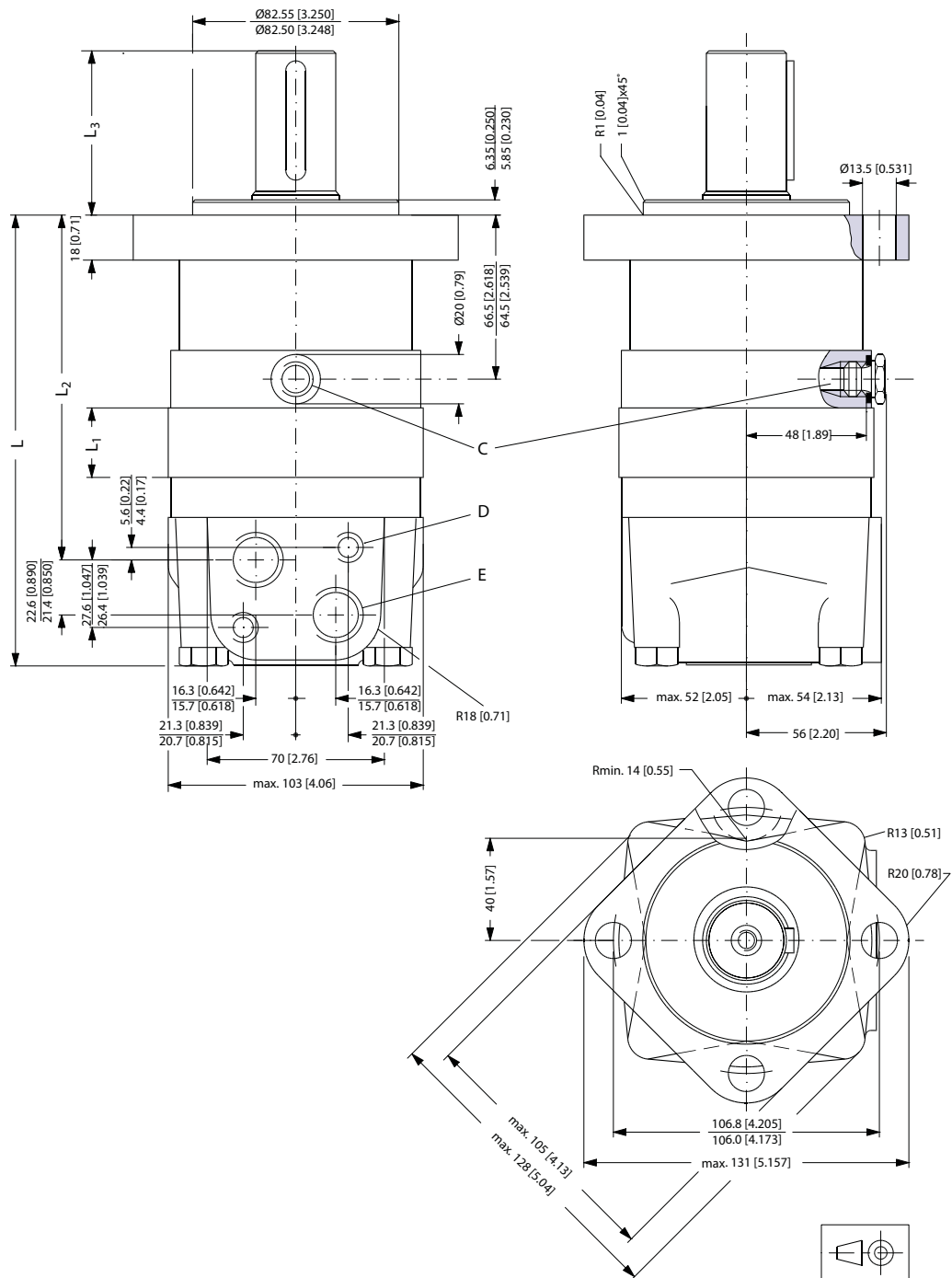
151-1971.11

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

**OMS**

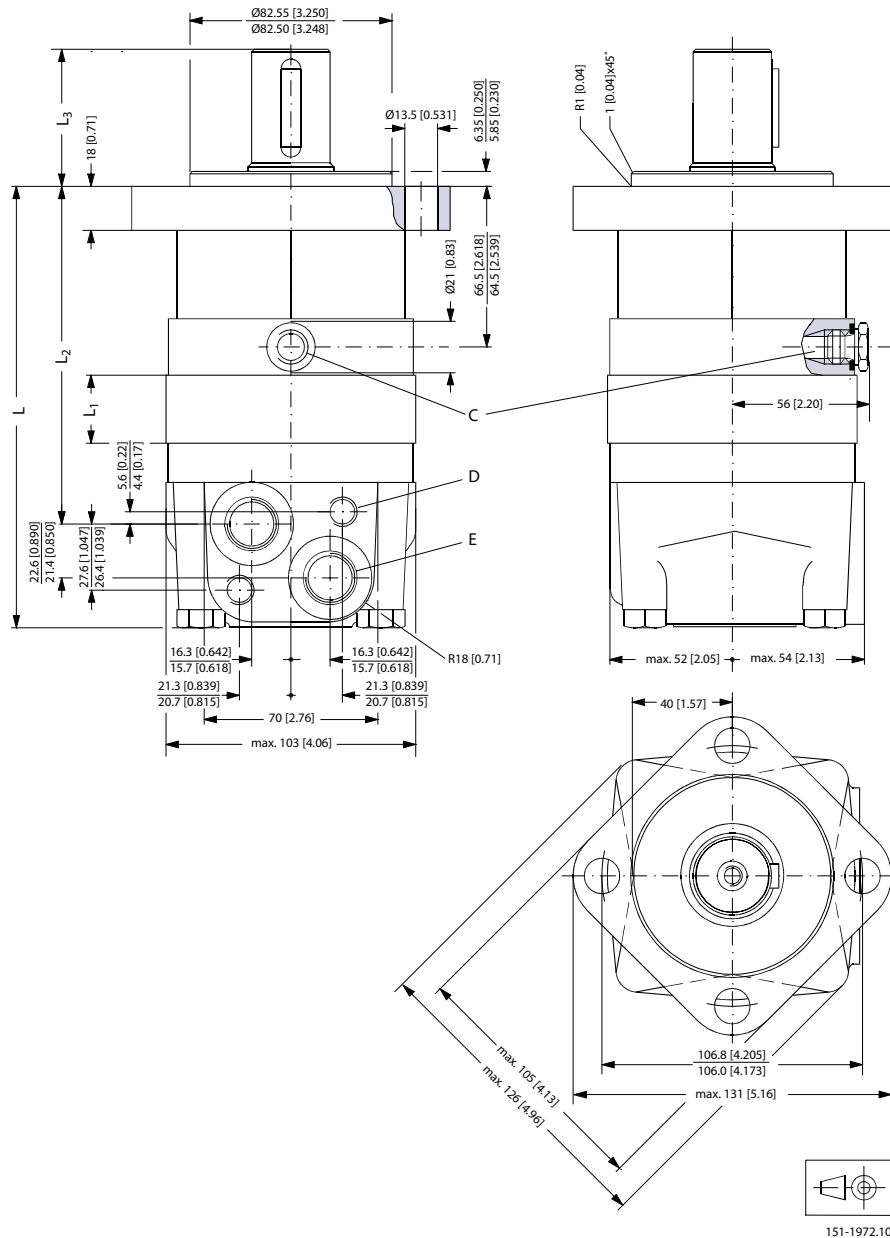
| Type    | L <sub>max</sub> mm [in] | L <sub>1</sub> mm [in] | L <sub>2</sub> mm [in] |
|---------|--------------------------|------------------------|------------------------|
| OMS 80  | 167 [6.57]               | 14.0 [0.551]           | 124 [4.88]             |
| OMS 100 | 170 [6.69]               | 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 <sub>3</sub> 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 <sub>max</sub> mm [in] | L <sub>1</sub> mm [in] | L <sub>2</sub> 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]             |

151-1972.10

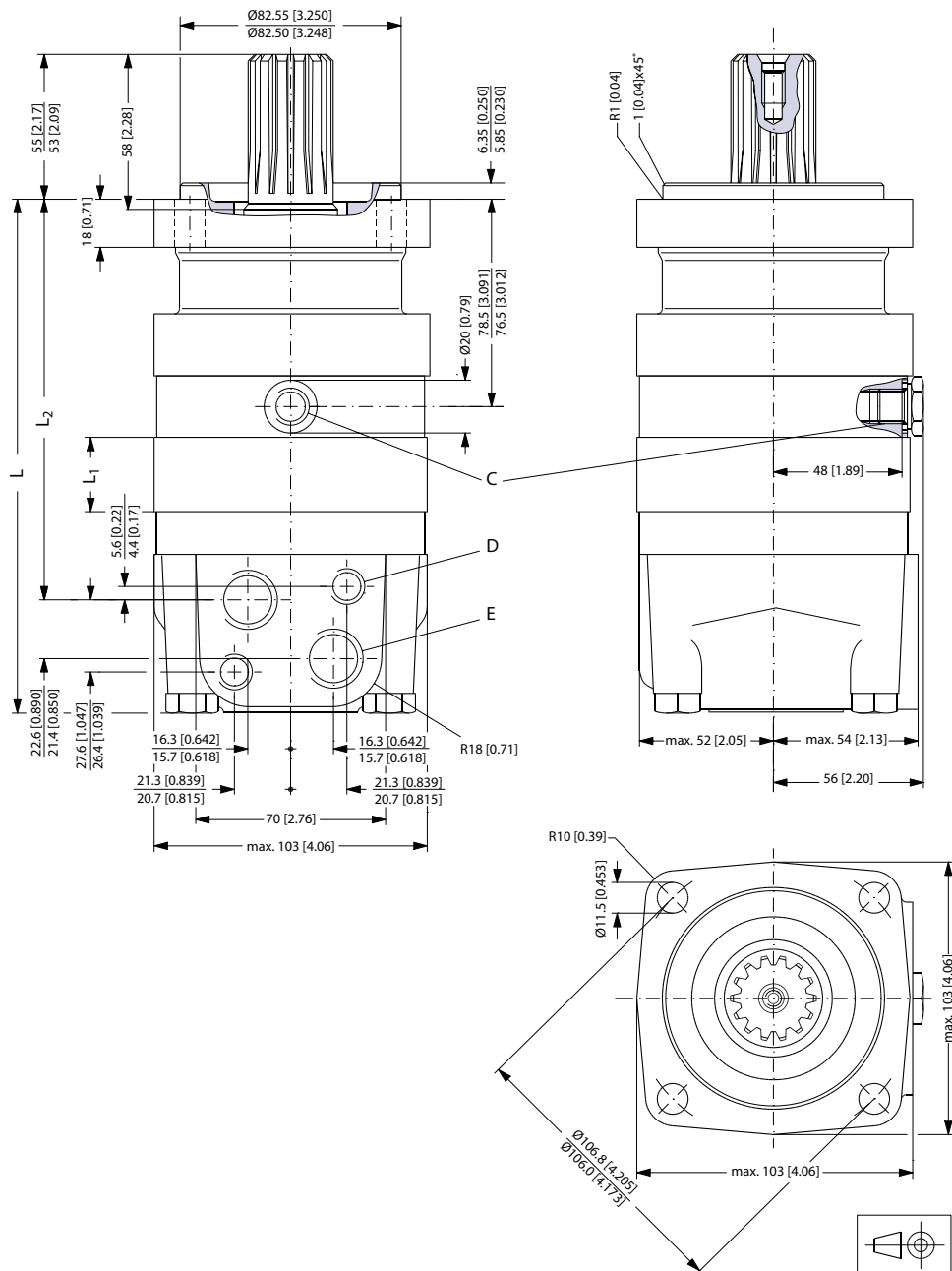
**OMS**

| Type    | L <sub>max</sub> mm [in] | L <sub>1</sub> mm [in] | L <sub>2</sub> 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 <sub>3</sub> mm [in] |
|--------------------------------|-----|------------------------|
| Cyl.1.25 in<br>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



151-1810.10

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

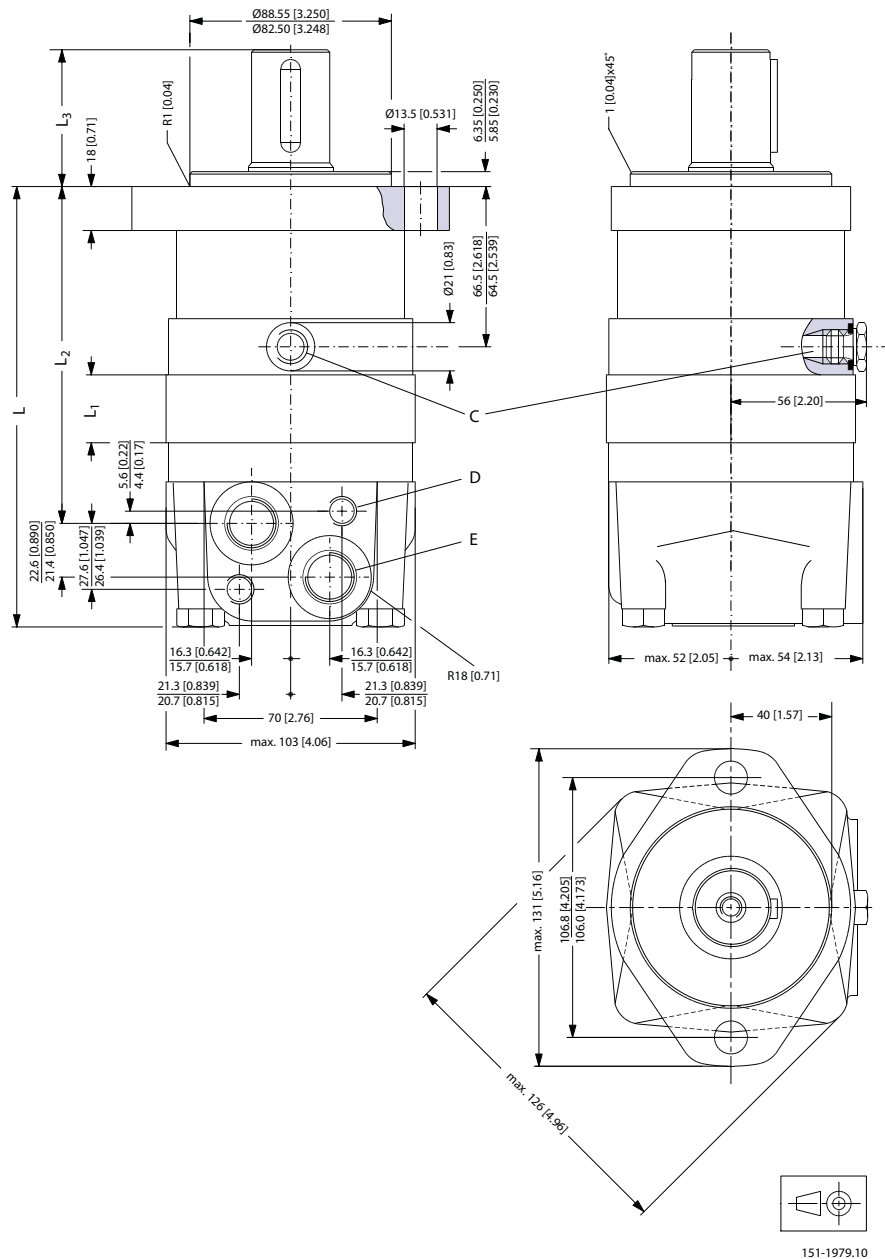
**D:** M10; 13 mm [0.51 in] deep

| Type    | L <sub>max</sub> mm [in] | L <sub>1</sub> mm [in] | L <sub>2</sub> 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]             |

OMS

| Type    | L <sub>max</sub> mm [in] | L <sub>1</sub> mm [in] | L <sub>2</sub> 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



**C:** Drain connection  
7/16 - 20 UNF;

**D:** M10; 13 mm [0.51 in] deep



**OMS**

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

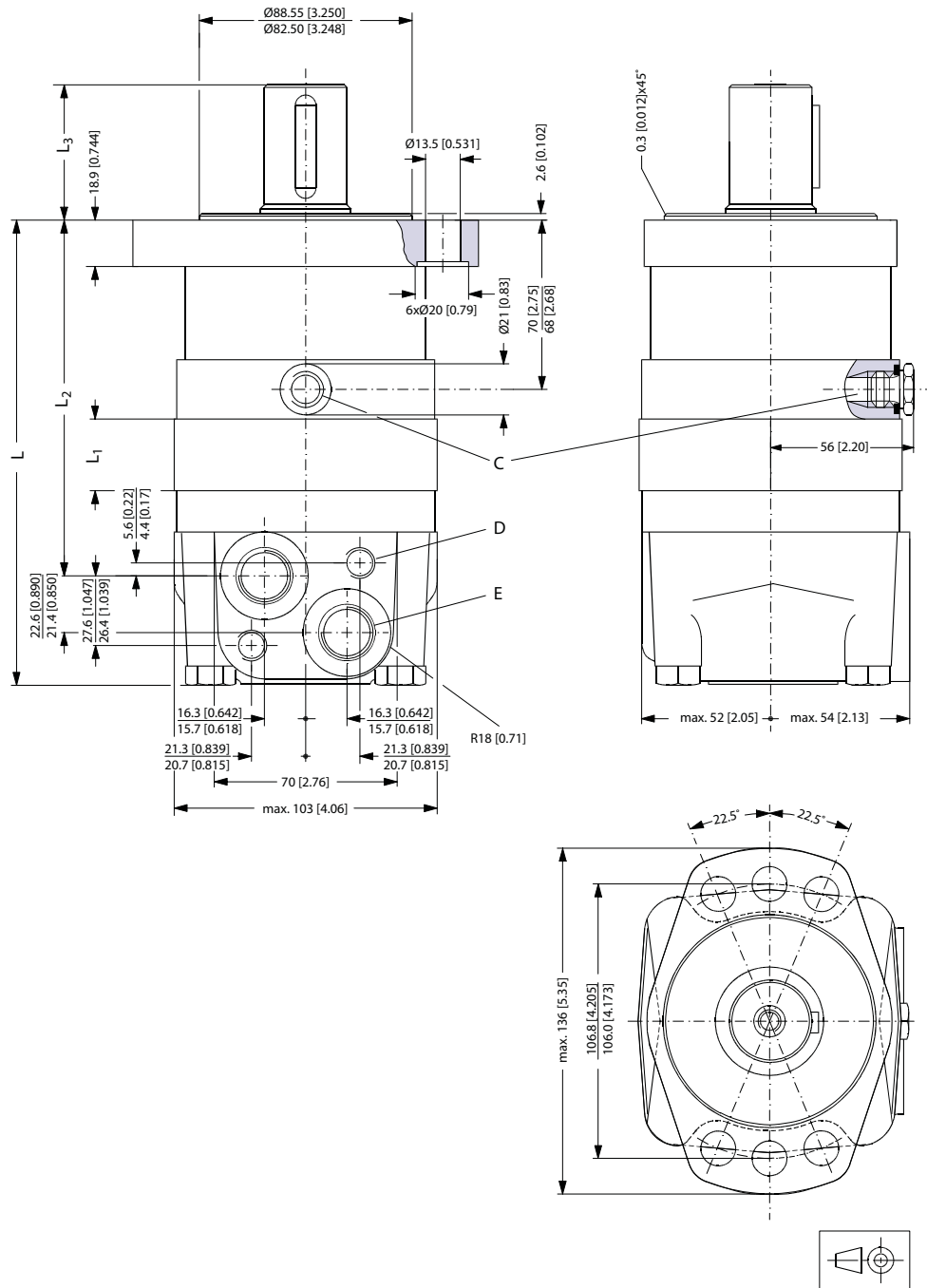
**E:** 7/8 - 14 UNF;  
16.7 mm [0.657 in] deep  
O-ring boss port

| Type    | L <sub>max</sub> mm [in] | L <sub>1</sub> mm [in] | L <sub>2</sub> 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 <sub>3</sub> mm [in] |
|--------------------------------|-----|------------------------|
| Cyl.1 in<br>Splined 1 in       | max | 52 [2.05]              |
|                                | min | 50 [1.97]              |
| Cyl.1.25 in<br>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**

**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

**OMS**

| Type    | L <sub>max</sub> mm [in] | L <sub>1</sub> mm [in] | L <sub>2</sub> 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 <sub>3</sub> mm [in] |
|--------------------------------|-----|------------------------|
| Cyl.1 in<br>Splined 1 in       | max | 49 [1.93]              |
|                                | min | 47 [1.85]              |
| Cyl.1.25 in<br>Splined 1.25 in | max | 54 [2.13]              |
|                                | min | 52 [2.05]              |



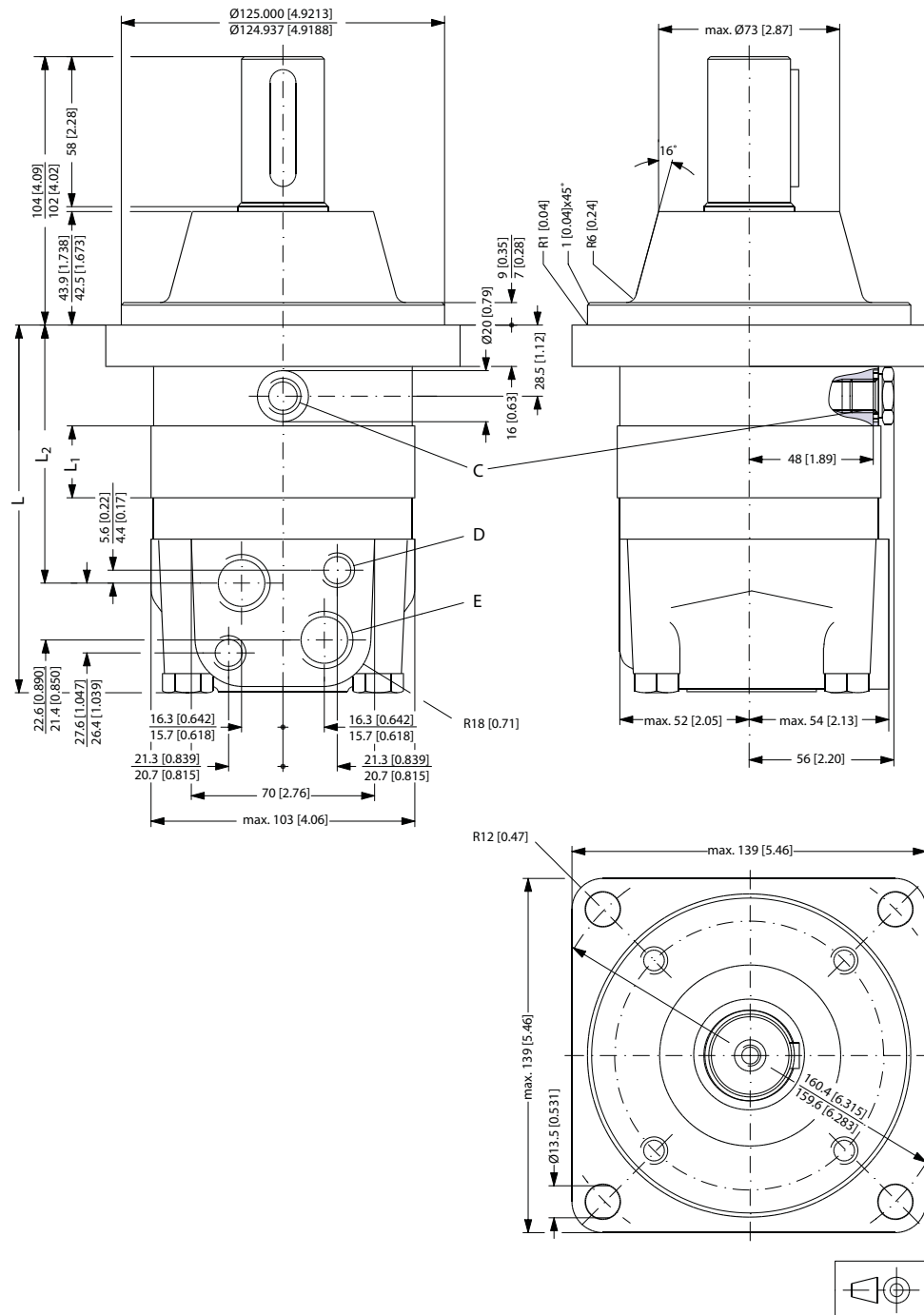
**OMS**

| Type    | L <sub>max</sub> mm [in] | L <sub>1</sub> mm [in] | L <sub>2</sub> 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 <sub>3</sub> 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]              |

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

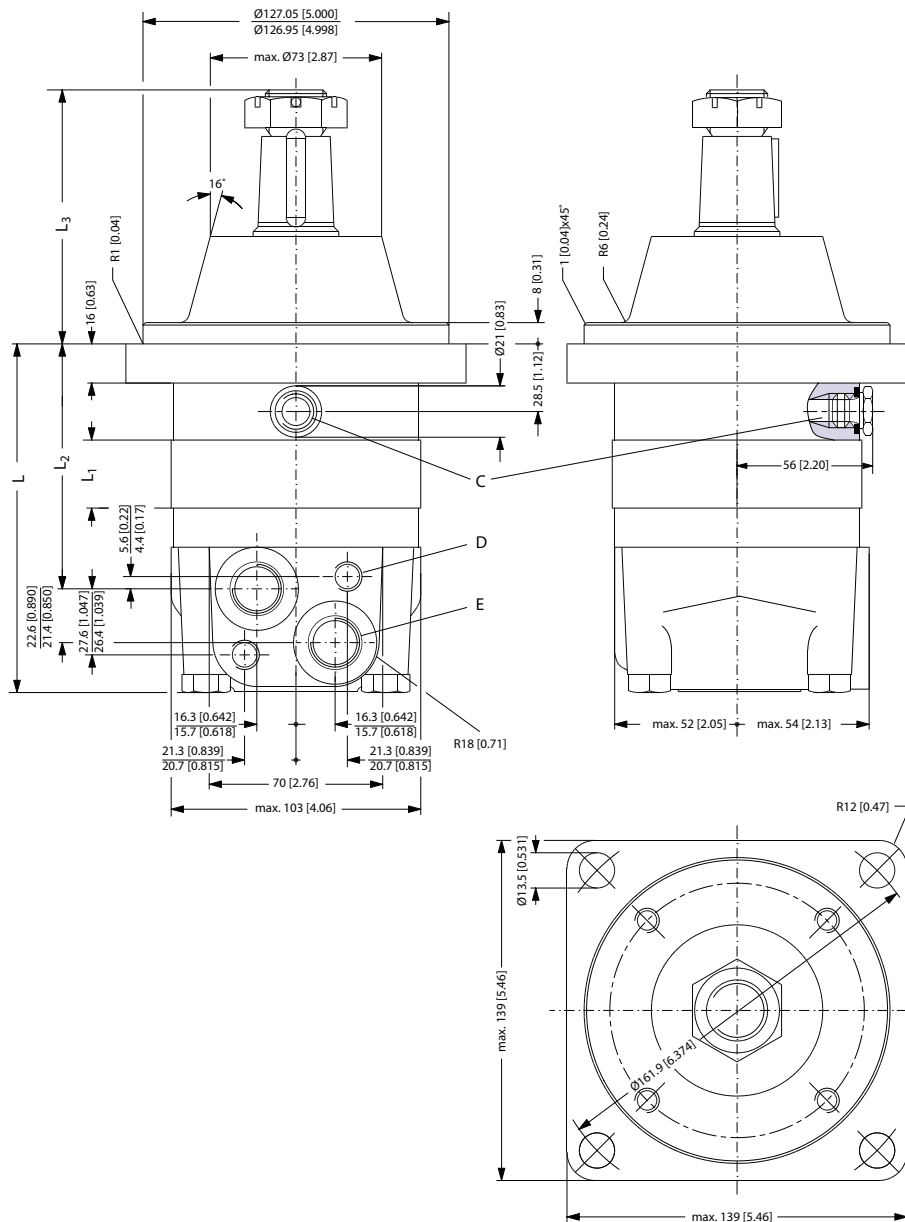
**D:** M10; 13 mm [0.51 in] deep

**OMS**

| Type     | L <sub>max</sub> mm [in] | L <sub>1</sub> mm [in] | L <sub>2</sub> 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]             |

**OMS**

**Wheel—US version**



151-1982.10

**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

| Type     | L <sub>max</sub> mm [in] | L <sub>1</sub> mm [in] | L <sub>2</sub> 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]              |



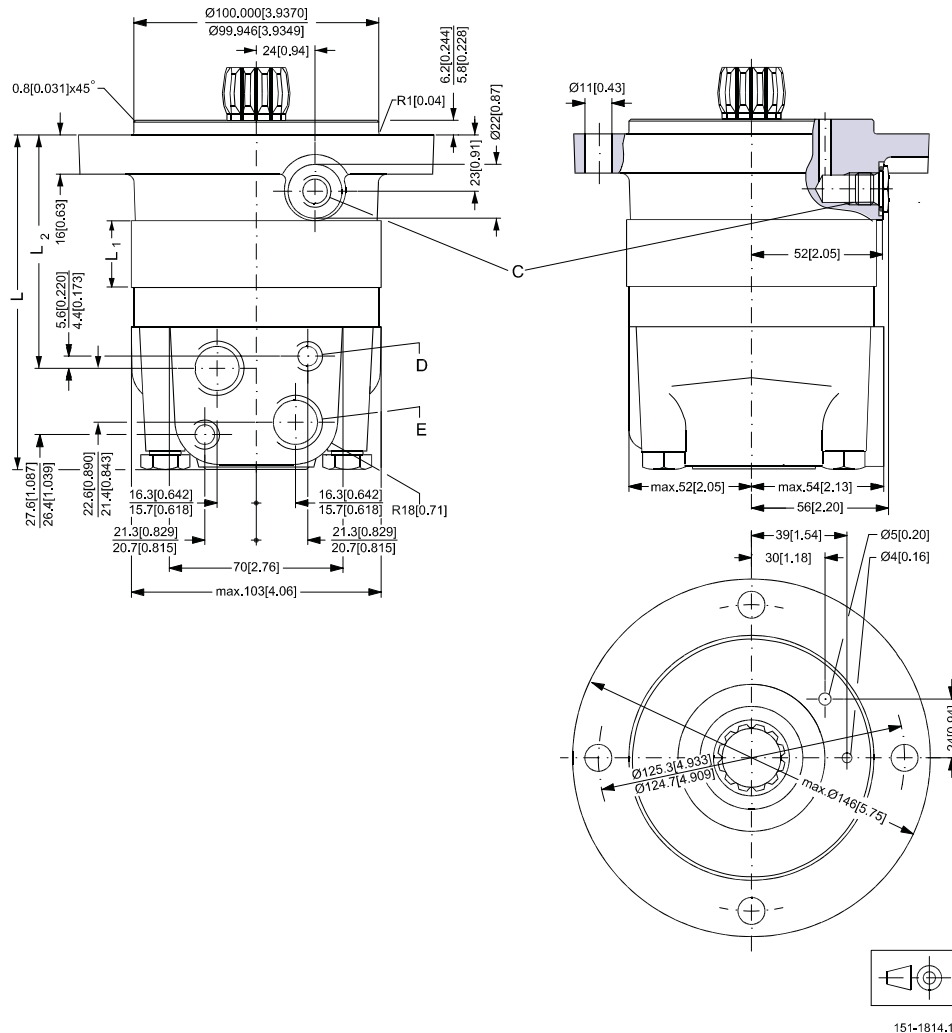
**OMS**

| Type     | L <sub>max</sub> mm [in] | L <sub>1</sub> mm [in] | L <sub>2</sub> 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 <sub>3</sub> 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]             |

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 <sub>max</sub> mm [in] | L <sub>1</sub> mm [in] | L <sub>2</sub> 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]             |

**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.

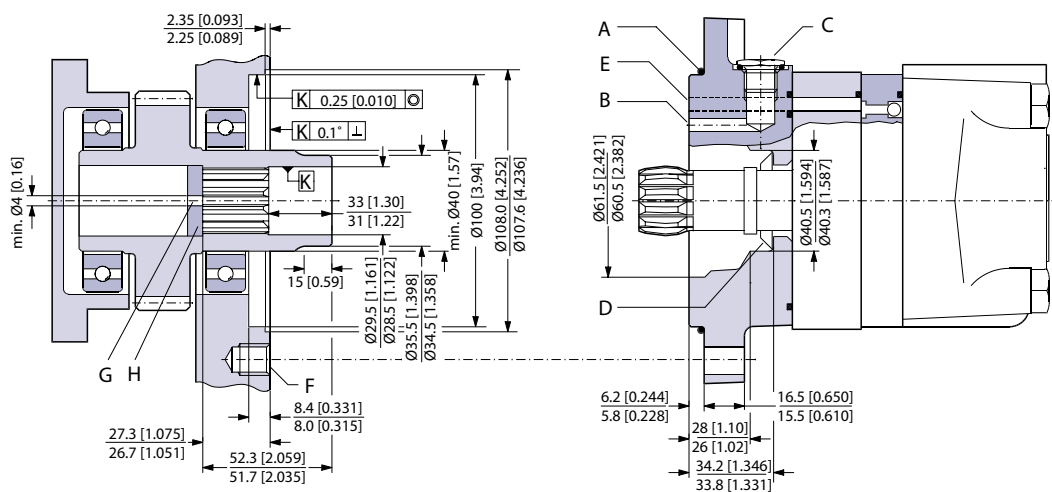
The conical sealing ring (code. no. 633B9023) is supplied with the motor.

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

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

**OMS**
**Material:**

Case hardening steel with a tensile strength corresponding at least to 20 MoCr4 (900 N/mm<sup>2</sup>) or SAE 8620.

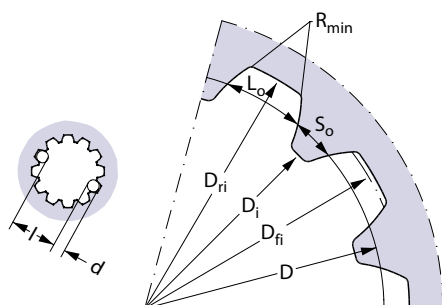
**Hardening specification:**

- 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 <sub>ri</sub>   | 28.0 <sup>0</sup> <sub>-0.1</sub>   | 1.10 0-0.004                           |
| Form dia. (min.)               | D <sub>fi</sub>   | 27.6                                | 1.09                                   |
| Minor dia.                     | D <sub>i</sub>    | 23.0 <sup>0</sup> <sub>+0.033</sub> | 0.9055 <sup>0</sup> <sub>+0.0013</sub> |
| Space width (circular)         | L <sub>o</sub>    | 4.308 <sup>±0.020</sup>             | 0.1696 <sup>±0.0008</sup>              |
| Tooth thickness (circular)     | S <sub>o</sub>    | 2.341                               | 0.09217                                |
| Fillet radius                  | R <sub>min.</sub> | 0.2                                 | 0.008                                  |
| Max. measurement between pins* | l                 | 17.62 <sup>0</sup> <sub>+0.15</sub> | 0.700 <sup>0</sup> <sub>-0.006</sub>   |
| Pin dia.                       | d                 | 4.835 <sup>±0.001</sup>             | 0.1903 <sup>±0.00004</sup>             |

\* Finished dimensions (when hardened).



151-874.10

**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.

**OMS**

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.

**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 <sup>3</sup> ] |      |      |      |      |      |
|--------------|---------------------------------|------|------|------|------|------|
|              | 160                             | 200  | 250  | 315  | 400  | 500  |
| <b>151B</b>  | 3000                            | 3001 | 3002 | 3003 | 3004 | 3005 |
| <b>151B</b>  | 2050                            | 2051 | 2052 | 2053 | 2054 | 2055 |
| <b>151B</b>  | 3006                            | 3007 | 3008 | 3009 | 3010 | 3011 |
| <b>151B</b>  | 2056                            | 2057 | 2058 | 2059 | 2060 | 2061 |
| <b>151B</b>  | 3012                            | 3013 | 3014 | 3015 | 3016 | 3017 |
| <b>151B</b>  | 2062                            | 2063 | 2064 | 2065 | 2066 | 2067 |

**OMT**
*OMT code numbers (continued)*

| Code Numbers | Displacement [cm <sup>3</sup> ] |      |      |      |      |      |
|--------------|---------------------------------|------|------|------|------|------|
|              | 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.

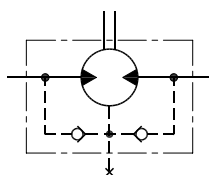
Example:

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

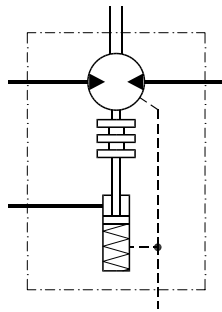
***Motor with check valves and with drain connection***

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

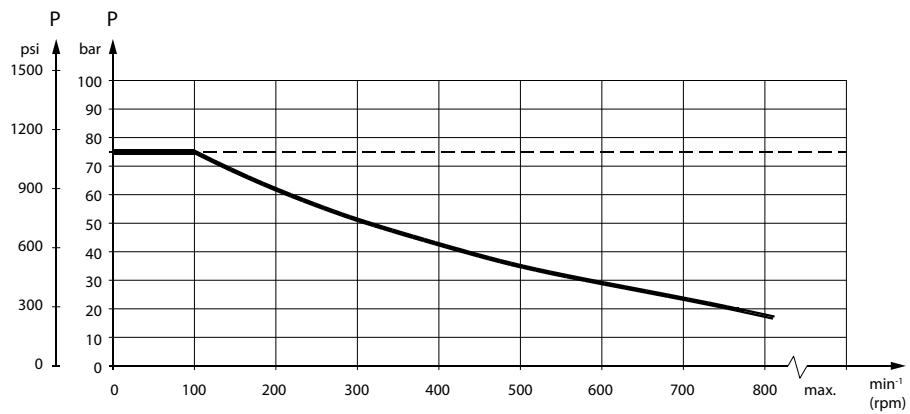


151-1405.10

**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



151-1674.10

----- 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<br>OMTW<br>OMTS<br>OMT FX<br>OMT FL<br>OMT FH | OMT<br>OMTW<br>OMTS<br>OMT FX<br>OMT FL<br>OMT FH | OMT<br>OMTW<br>OMTS<br>OMT FX<br>OMT FL<br>OMT FH | OMT<br>OMTW<br>OMTS<br>OMT FX<br>OMT FL<br>OMT FH | OMT<br>OMTW<br>OMTS<br>OMT FX<br>OMT FL<br>OMT FH | OMT<br>OMTW<br>OMTS<br>OMT FX<br>OMT FL<br>OMT FH |     |
|------------------------|---------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|-----|
| <b>Motor size</b>      |                                       | <b>160</b>                                        | <b>200</b>                                        | <b>250</b>                                        | <b>315</b>                                        | <b>400</b>                                        | <b>500</b>                                        |     |
| Geometric displacement | cm <sup>3</sup><br>[in <sup>3</sup> ] | 161.1<br>[9.83]                                   | 201.4<br>[12.29]                                  | 251.8<br>[15.37]                                  | 326.3<br>[19.91]                                  | 410.9<br>[25.07]                                  | 523.6<br>[31.95]                                  |     |
| Maximum speed          | min <sup>-1</sup><br>[rpm]            | cont.                                             | 625                                               | 625                                               | 500                                               | 380                                               | 305                                               | 240 |
|                        |                                       | int <sup>1)</sup>                                 | 780                                               | 750                                               | 600                                               | 460                                               | 365                                               | 285 |



**Technical Information OMS, OMT and OMV Orbital Motors**
**OMT**
*Technical data for OMT, OMTW, OMTS, OMT FX OMT FL and OMT FH (continued)*

| Type                                          |                                                            |                    | OMT<br>OMTW<br>OMTS<br>OMT FX<br>OMT FL<br>OMT FH | OMT<br>OMTW<br>OMTS<br>OMT FX<br>OMT FL<br>OMT FH | OMT<br>OMTW<br>OMTS<br>OMT FX<br>OMT FL<br>OMT FH | OMT<br>OMTW<br>OMTS<br>OMT FX<br>OMT FL<br>OMT FH | OMT<br>OMTW<br>OMTS<br>OMT FX<br>OMT FL<br>OMT FH | OMT<br>OMTW<br>OMTS<br>OMT FX<br>OMT FL<br>OMT FH |
|-----------------------------------------------|------------------------------------------------------------|--------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|
| Motor size                                    |                                                            |                    | 160                                               | 200                                               | 250                                               | 315                                               | 400                                               | 500                                               |
| Maximum torque                                | Nm<br>[lbf-in]                                             | cont.              | 470<br>[4160]                                     | 590<br>[5220]                                     | 730<br>[6460]                                     | 950<br>[8410]                                     | 1080<br>[9560]                                    | 1220<br>[10800]                                   |
|                                               |                                                            | int. <sup>1)</sup> | 560<br>[4960]                                     | 710<br>[6280]                                     | 880<br>[7790]                                     | 1140<br>[10090]                                   | 1260<br>[11150]                                   | 1370<br>[12130]                                   |
| Maximum output                                | kW<br>[hp]                                                 | cont.              | 26.5<br>[35.5]                                    | 33.5<br>[44.9]                                    | 33.5<br>[44.9]                                    | 33.5<br>[44.9]                                    | 30.0<br>[40.2]                                    | 26.5<br>[35.5]                                    |
|                                               |                                                            | int. <sup>1)</sup> | 32.0<br>[42.9]                                    | 40.0<br>[53.6]                                    | 40.0<br>[53.6]                                    | 40.0<br>[53.6]                                    | 35.0<br>[46.9]                                    | 30.0<br>[40.2]                                    |
| Maximum pressure drop                         | bar<br>[psi]                                               | cont.              | 200<br>[2900]                                     | 200<br>[2900]                                     | 200<br>[2900]                                     | 200<br>[2900]                                     | 180<br>[2610]                                     | 160<br>[2320]                                     |
|                                               |                                                            | int. <sup>1)</sup> | 240<br>[3480]                                     | 240<br>[3480]                                     | 240<br>[3480]                                     | 240<br>[3480]                                     | 210<br>[3050]                                     | 180<br>[2610]                                     |
|                                               |                                                            | peak <sup>2)</sup> | 280<br>[4060]                                     | 280<br>[4060]                                     | 280<br>[4060]                                     | 280<br>[4060]                                     | 240<br>[3480]                                     | 210<br>[3050]                                     |
| Maximum oil flow                              | l/min<br>[USgal/min]                                       | cont.              | 100<br>[26.4]                                     | 125<br>[33.0]                                     | 125<br>[33.0]                                     | 125<br>[33.0]                                     | 125<br>[33.0]                                     | 125<br>[33.0]                                     |
|                                               |                                                            | int. <sup>1)</sup> | 125<br>[33.0]                                     | 150<br>[39.6]                                     | 150<br>[39.6]                                     | 150<br>[39.6]                                     | 150<br>[39.6]                                     | 150<br>[39.6]                                     |
| Maximum starting pressure with unloaded shaft | bar<br>[psi]                                               |                    | 10<br>[145]                                       | 10<br>[145]                                       | 10<br>[145]                                       | 10<br>[145]                                       | 10<br>[145]                                       | 10<br>[145]                                       |
| Minimum starting torque                       | at maximum pressure drop cont.<br>Nm [lbf-in]              |                    | 340<br>[3010]                                     | 430<br>[3810]                                     | 530<br>[4690]                                     | 740<br>[6550]                                     | 840<br>[7430]                                     | 950<br>[8410]                                     |
|                                               | at maximum pressure drop int. <sup>1)</sup><br>Nm [lbf-in] |                    | 410<br>[3630]                                     | 520<br>[4600]                                     | 630<br>[5580]                                     | 890<br>[7880]                                     | 970<br>[8590]                                     | 1060<br>[9380]                                    |

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.

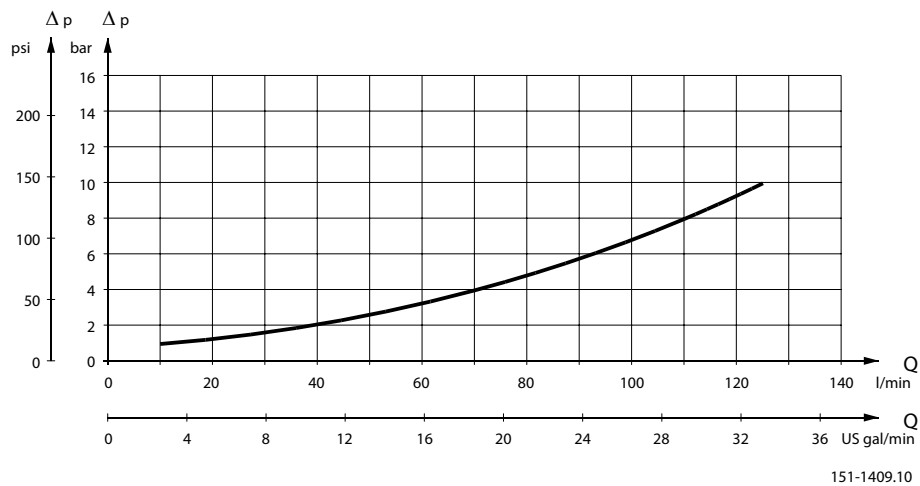
| Type                                    |              |                    | Maximum inlet pressure | Maximum return pressure with drain line |
|-----------------------------------------|--------------|--------------------|------------------------|-----------------------------------------|
| OMT,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

**OMT**
*Brake motors*

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

- 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.
- 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.

**Pressure drop in motor**


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

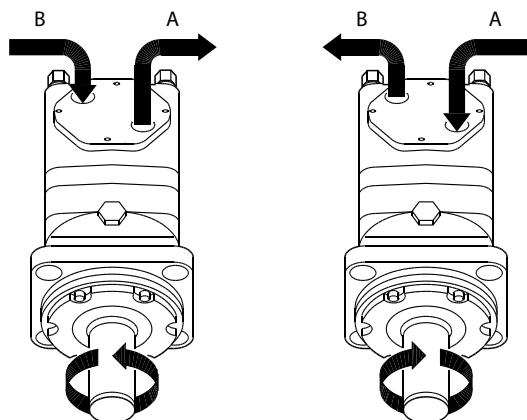
**Oil flow in drain line**

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 <sup>2</sup> /s [SUS] | Oil flow in drain line l/min [US gal/min] |
|-------------------------|------------------------------------|-------------------------------------------|
| 140<br>[2030]           | 20 [100]                           | 2.5 [0.66]                                |
|                         | 35 [165]                           | 1.5 [0.40]                                |
| 210<br>[3050]           | 20 [100]                           | 5.0 [1.32]                                |
|                         | 35 [165]                           | 3.0 [0.79]                                |

OMT

Direction of shaft rotation



151-1050.10

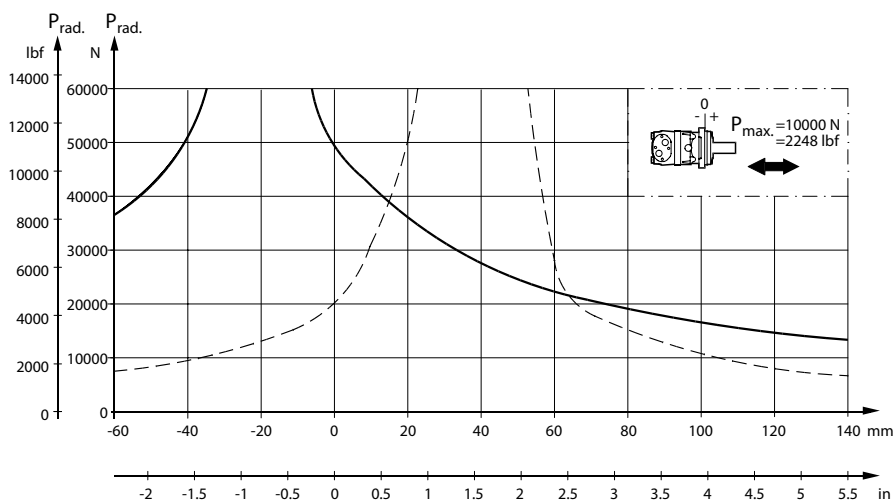
Permissible shaft loads for OMT

**Mounting flange:**

Standard

**Shaft:**

All shaft types



151-1967.10

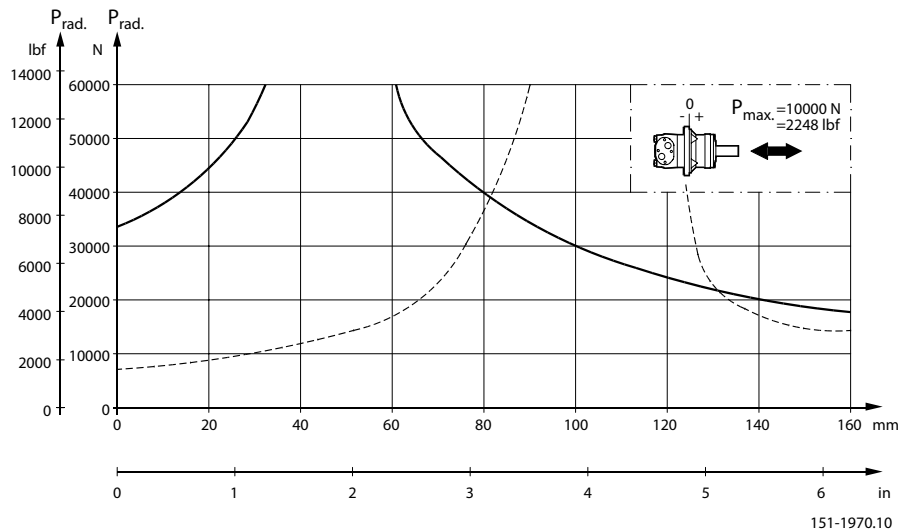
**Mounting flange:**

Wheel

**Shaft:**

All shaft types

OMT



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<sup>-1</sup>) 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.

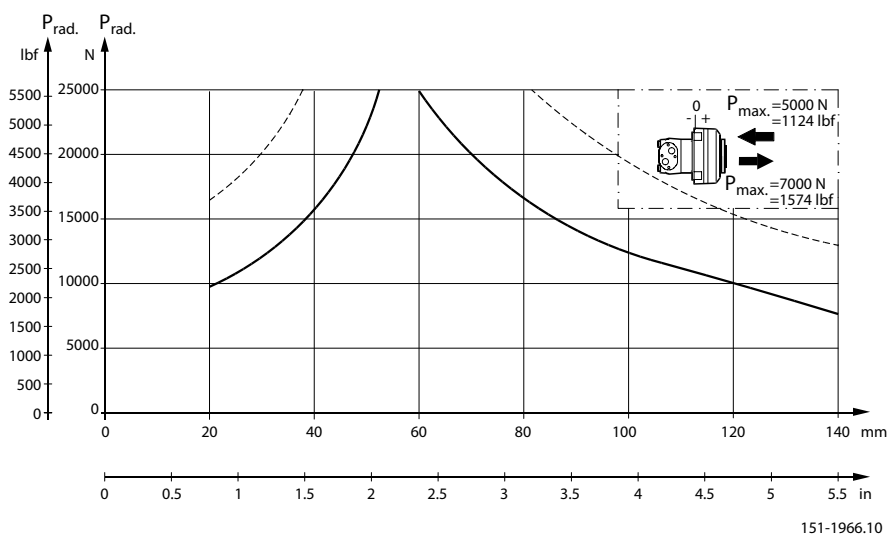
**Mounting flange:**

Brake-wheel

**Shaft:**

All shaft types

OMT



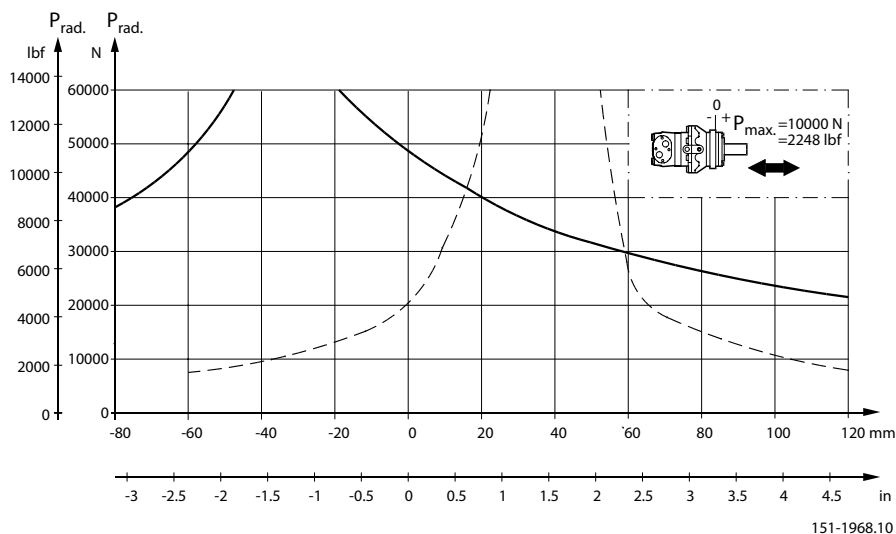
151-1966.10

**Mounting flange:**

Brake-standard

**Shaft:**

All shaft types



151-1968.10

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  $100 \text{ min}^{-1}$ ) 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.

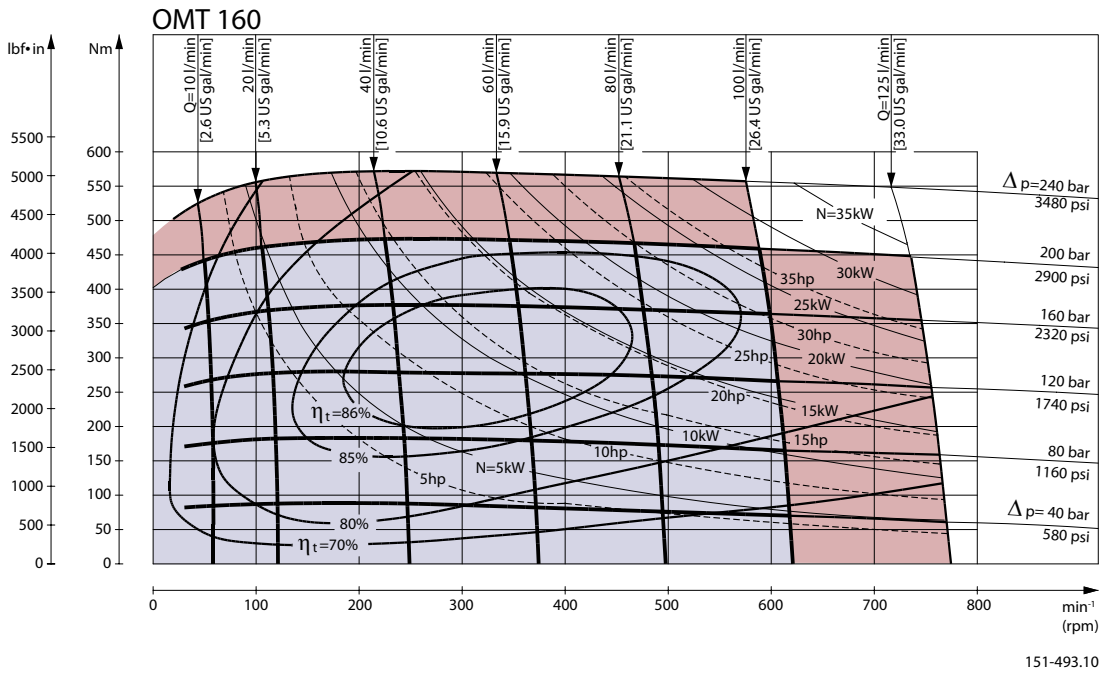
**OMT**

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.

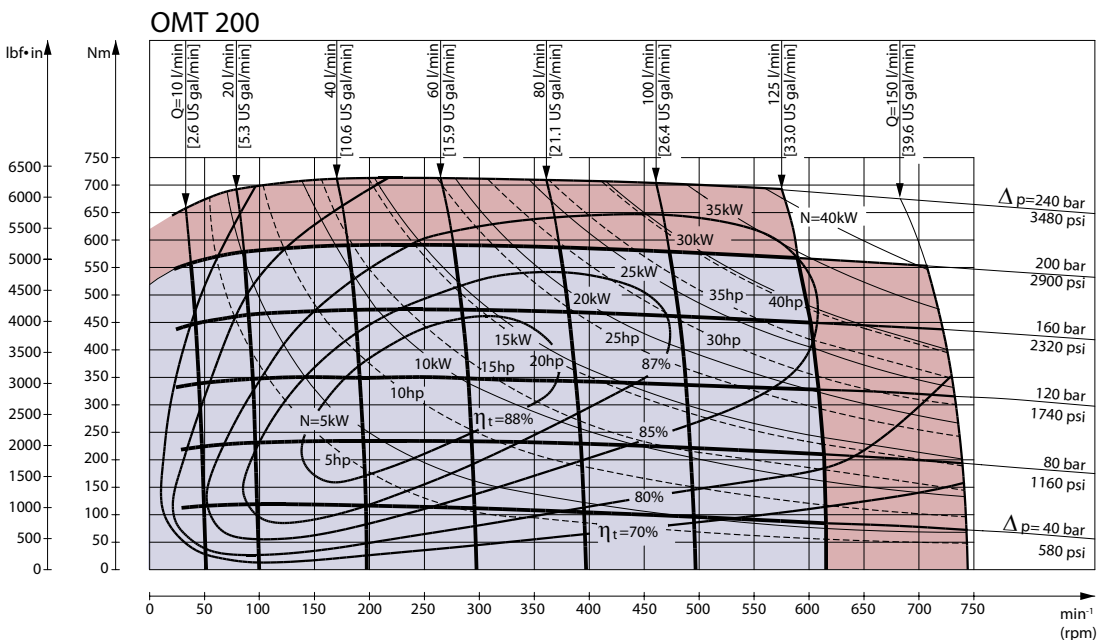
**Function diagrams**

**Continuous range**

**Intermittent range (maximum 10% operation every minute)**



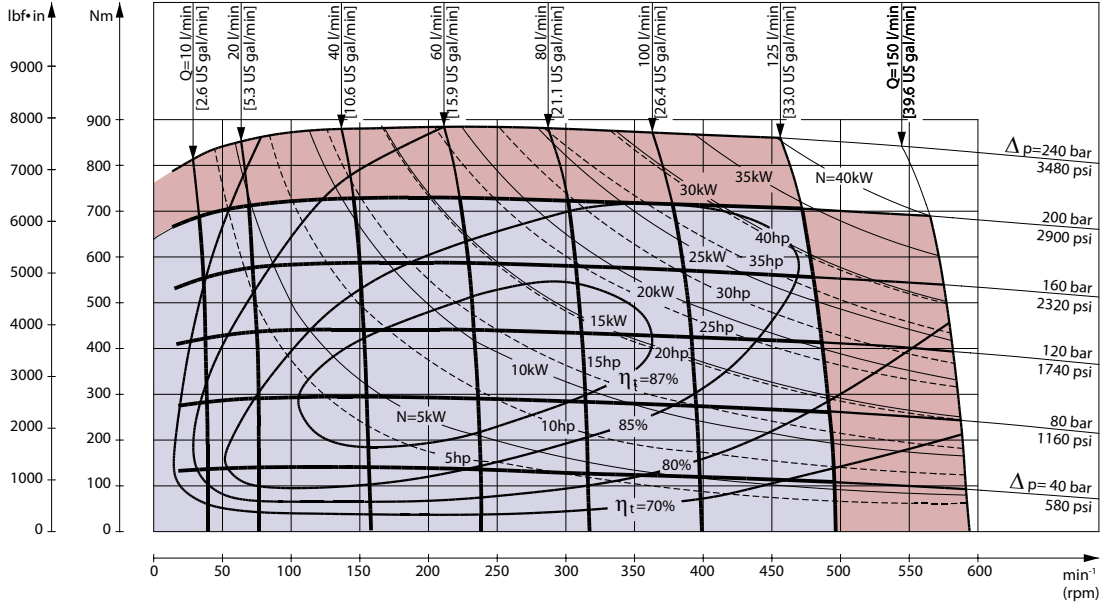
151-493.10



151-494.10

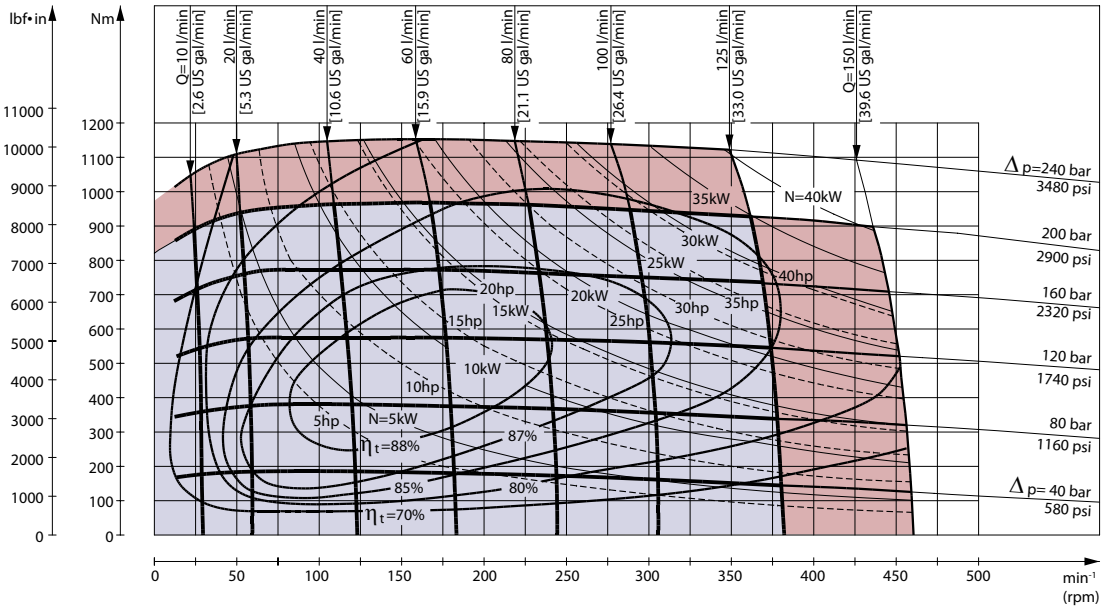
OMT

OMT 250



151-495.10

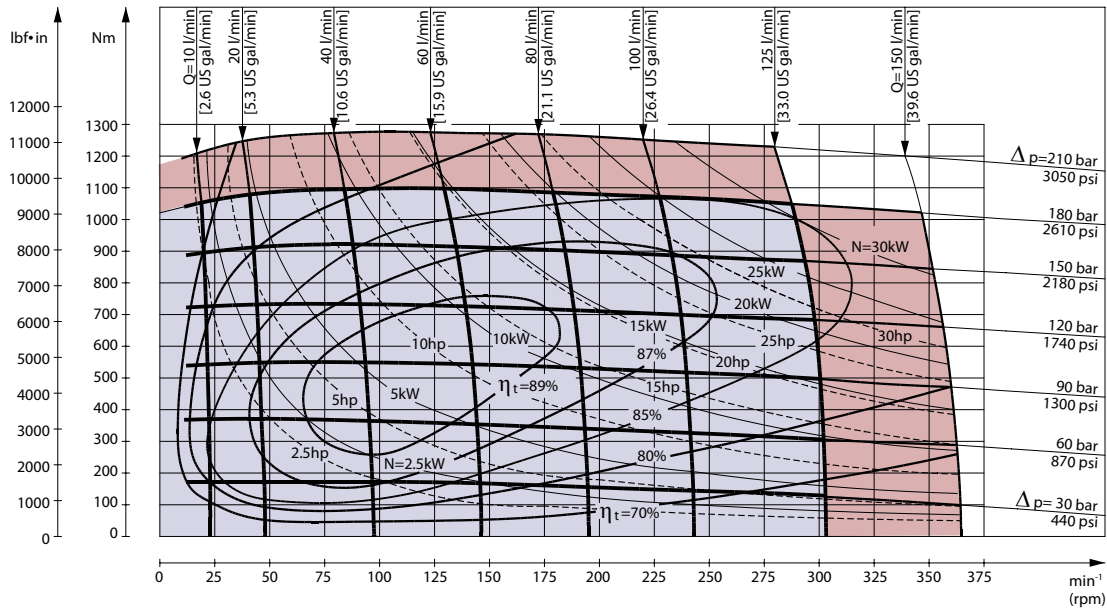
OMT 315



151-869.10

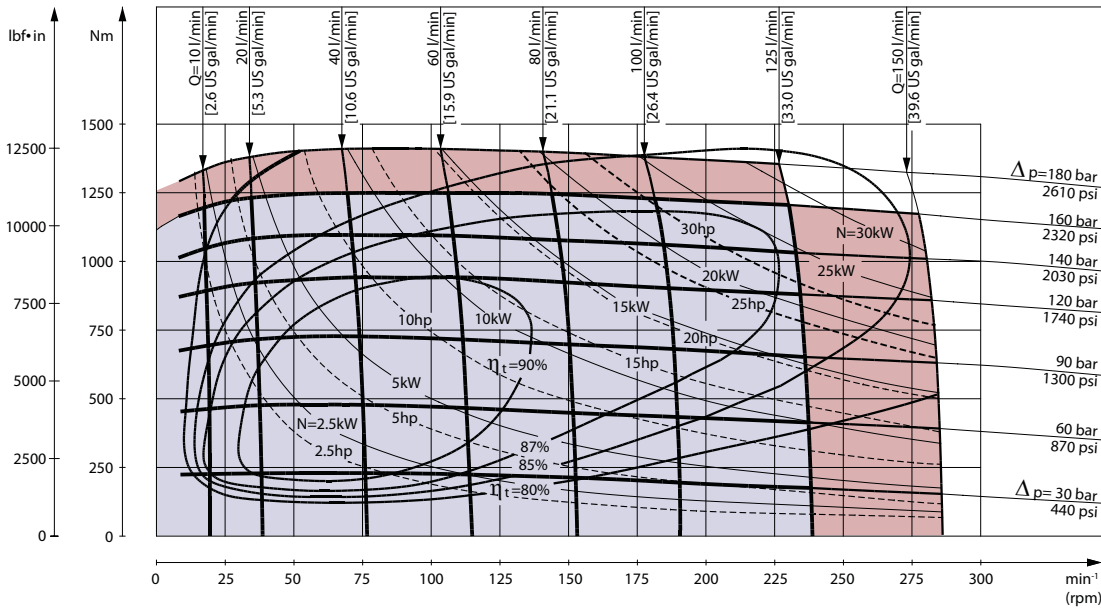
OMT

OMT 400



151-1058.10

OMT 500



151-1116.10

**Function diagram use**

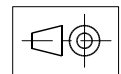
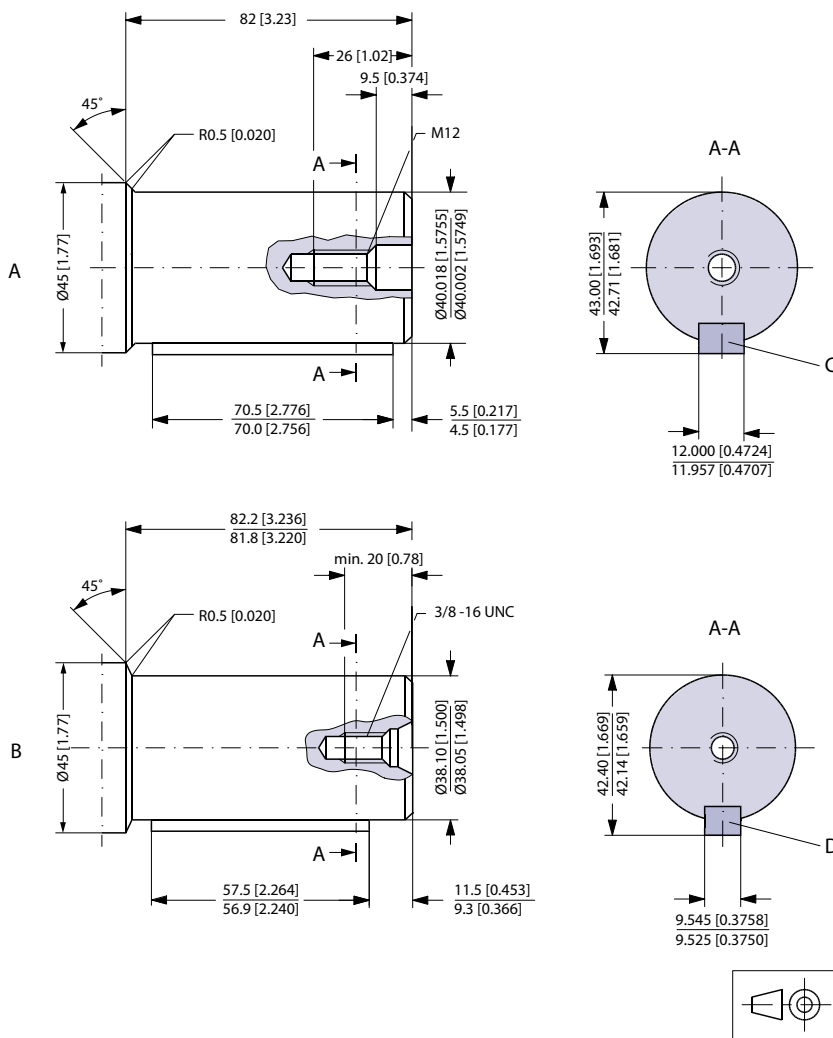
Explanation of function diagram use, basis and conditions, see [Speed, torque and output](#) on page 7.

[Intermittent pressure drop and oil flow must not occur simultaneously.](#)



OMT

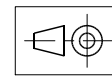
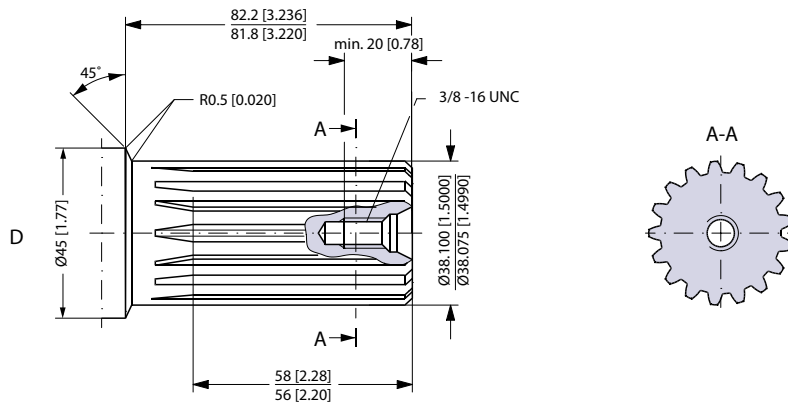
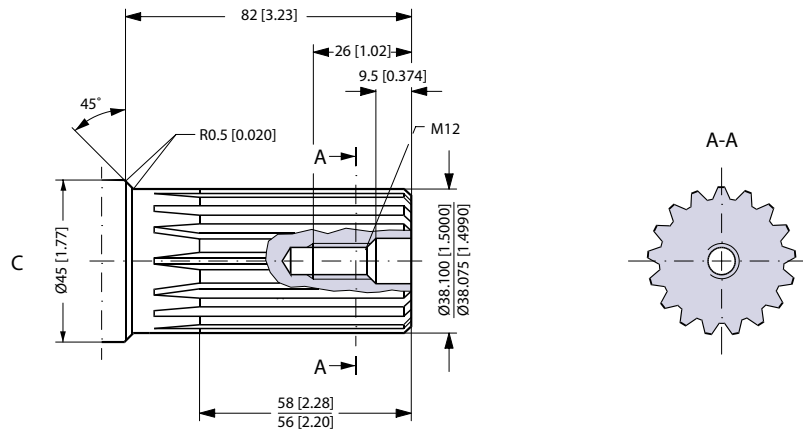
Shaft version



151-1032.10

- |                                                                                                                                      |                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>A</b> Cylindrical 40 mm shaft</p> <p><b>C</b> Parallel key<br/>A12 × 8 × 70<br/>DIN 6885<br/>Keyway deviates from standard</p> | <p><b>B</b> Cylindrical 1.5 in shaft</p> <p><b>D</b> Parallel key<br/>3/8 × 3/8 × 21/4 in<br/>B.S. 46<br/>Keyway deviates from standard</p> |
|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|

OMT



151-1916.10

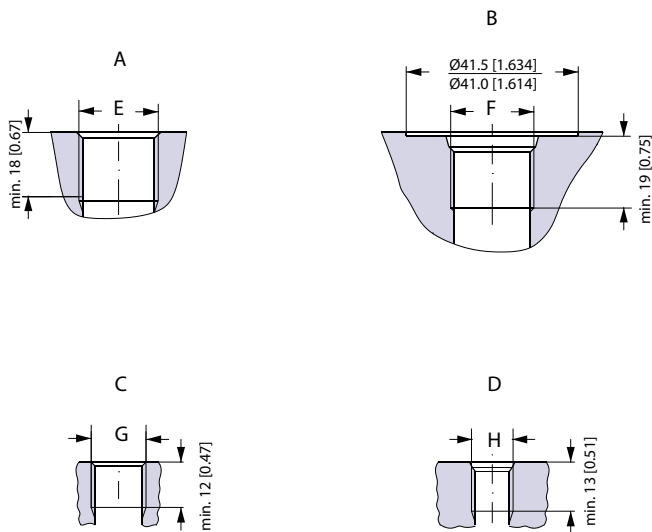
- C** Involute splined shaft  
ANS B92.1 - 1970 standard  
Flat root side fit  
Pitch 12/24  
Teeth 17  
Major diameter 1.50 in  
Pressure angle 30°

- 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



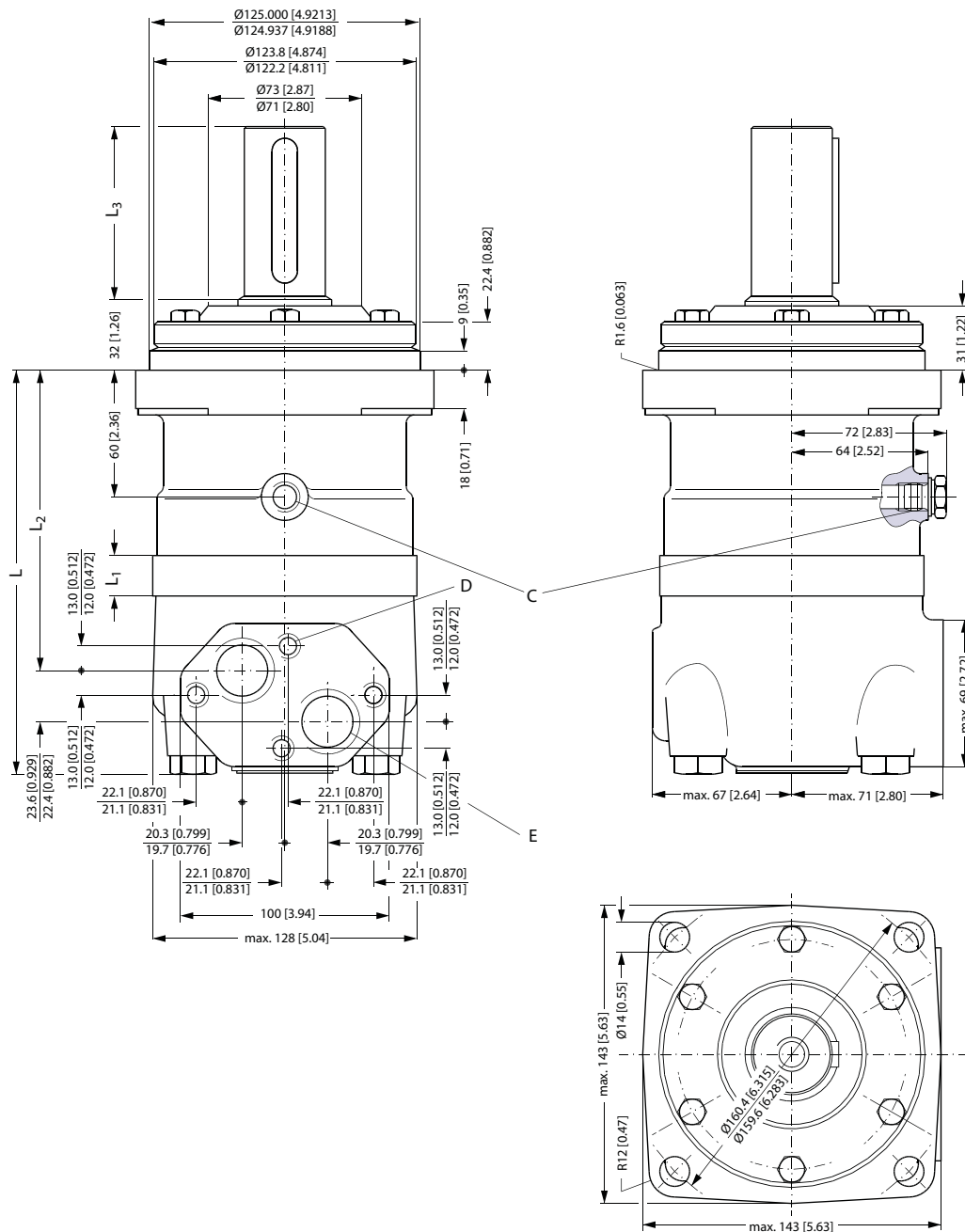
151-1977.11

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

OMT

Dimensions

Standard flange—European version



**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**

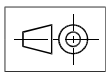
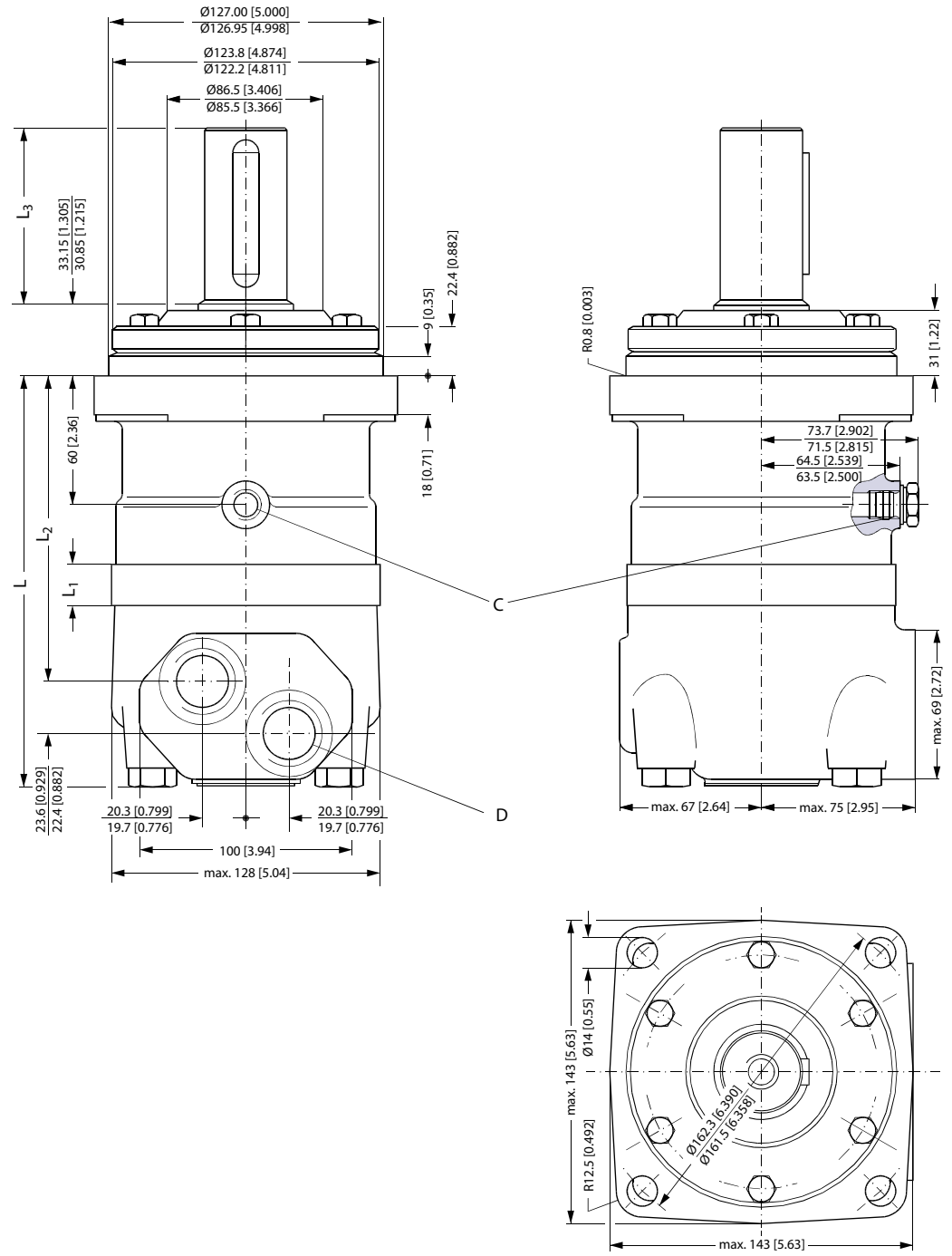
| Type    | L <sub>max</sub> mm [in] | L <sub>1</sub> * mm [in] | L <sub>2</sub> mm [in] |
|---------|--------------------------|--------------------------|------------------------|
| OMT 160 | 190 [7.48]               | 16.5 [0.650]             | 140 [5.51]             |
| OMT 200 | 195 [7.68]               | 21.5 [0.846]             | 145 [5.71]             |
| OMT 250 | 201 [7.91]               | 27.8 [1.094]             | 151 [5.94]             |
| OMT 315 | 211 [8.31]               | 37.0 [1.457]             | 161 [6.34]             |
| OMT 400 | 221 [8.70]               | 47.5 [1.870]             | 171 [6.73]             |
| OMT 500 | 235 [9.25]               | 61.5 [2.421]             | 185 [7.28]             |

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

| Output shaft                   |      | L <sub>3</sub> mm [in] |
|--------------------------------|------|------------------------|
| All shafts except P.t.o. shaft | max. | 82 [3.23]              |
| P.t.o. shaft                   | max. | 102 [4.02]             |

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    | L <sub>max</sub> mm [in] | L <sub>1</sub> * mm [in] | L <sub>2</sub> mm [in] |
|---------|--------------------------|--------------------------|------------------------|
| OMT 160 | 190 [7.48]               | 16.5 [0.650]             | 140 [5.51]             |
| OMT 200 | 195 [7.68]               | 21.5 [0.846]             | 145 [5.71]             |
| OMT 250 | 201 [7.91]               | 27.8 [1.094]             | 151 [5.94]             |
| OMT 315 | 211 [8.31]               | 37.0 [1.457]             | 161 [6.34]             |
| OMT 400 | 221 [8.70]               | 47.5 [1.870]             | 171 [6.73]             |
| OMT 500 | 235 [9.25]               | 61.5 [2.421]             | 185 [7.28]             |

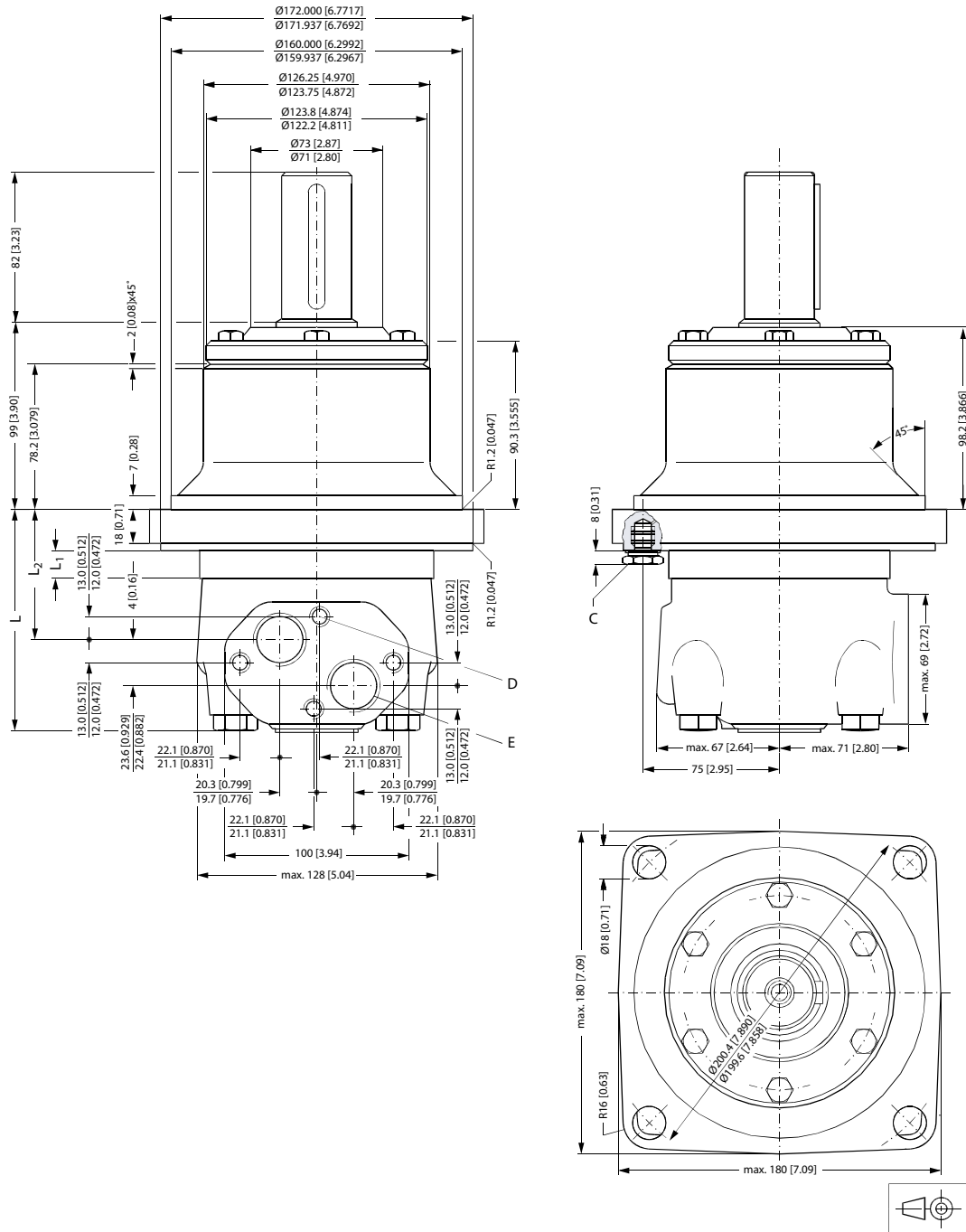
\* The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L1 dimensions

| Output shaft                  | L <sub>3</sub> mm [in] |
|-------------------------------|------------------------|
| Cyl. 1.5 in<br>Splined 1.5 in | 82 [3.23]              |
| Tapered 1.75 in               | 80.4 [3.17]            |



OMT

Wheel—European version



151-897.12

**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

| Type     | L <sub>max</sub> mm [in] | L <sub>1</sub> * mm [in] | L <sub>2</sub> mm [in] |
|----------|--------------------------|--------------------------|------------------------|
| OMTW 160 | 123 [4.84]               | 16.5 [0.650]             | 73 [2.87]              |
| OMTW 200 | 128 [5.04]               | 21.5 [0.846]             | 78 [3.07]              |

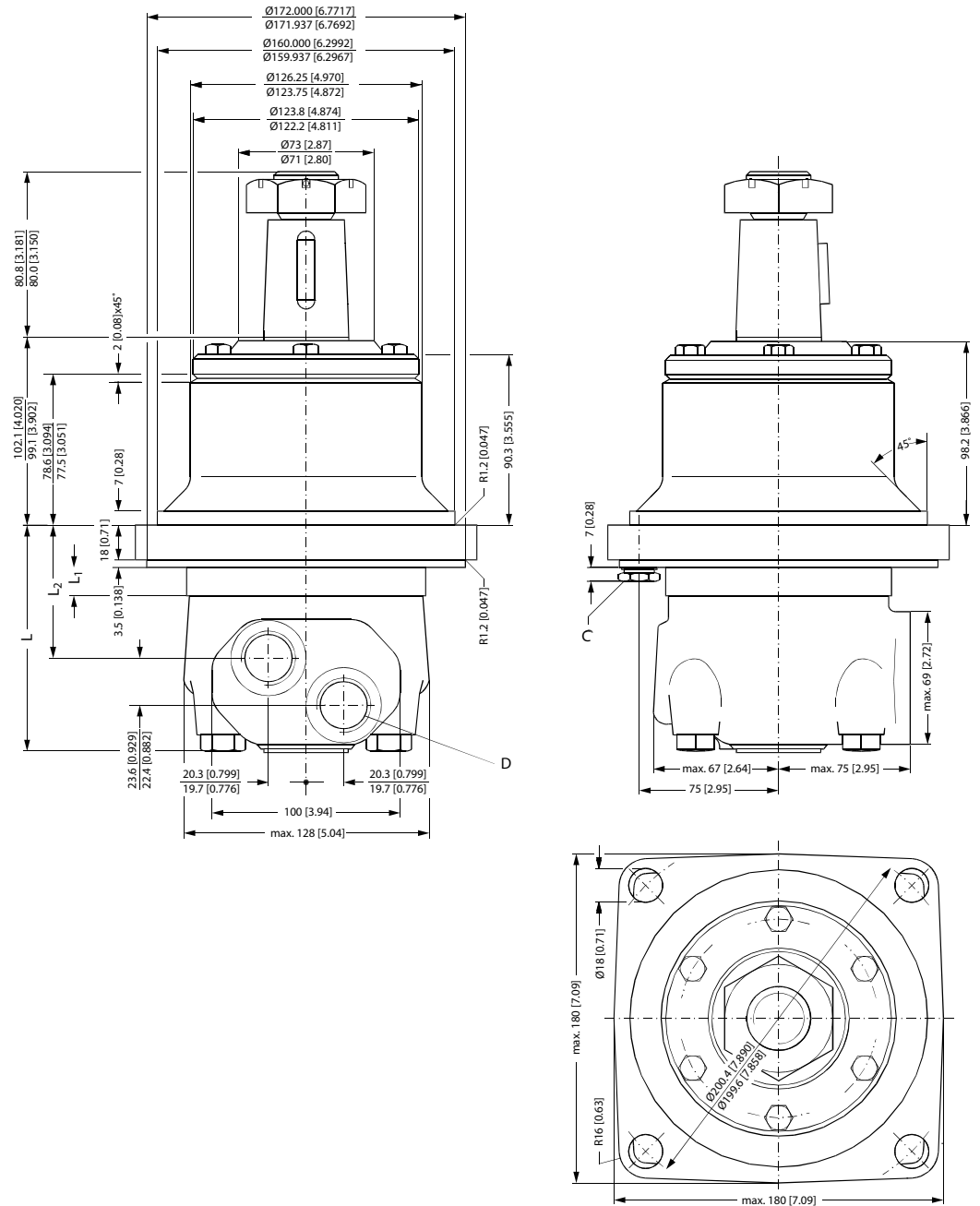
**OMT**

| <b>Type</b> | <b>L<sub>max</sub> mm [in]</b> | <b>L<sub>1</sub> *mm [in]</b> | <b>L<sub>2</sub> mm [in]</b> |
|-------------|--------------------------------|-------------------------------|------------------------------|
| OMTW 250    | 134 [5.28]                     | 27.8 [1.094]                  | 84 [3.31]                    |
| OMTW 315    | 144 [5.67]                     | 37.0 [1.457]                  | 94 [3.70]                    |
| OMTW 400    | 154 [6.06]                     | 47.5 [1.870]                  | 104 [4.09]                   |
| OMTW 500    | 168 [6.61]                     | 61.5 [2.421]                  | 118 [4.65]                   |

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

OMT

Wheel—US version



**C:** Drain connection  
 916 - 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



151-897.11.22

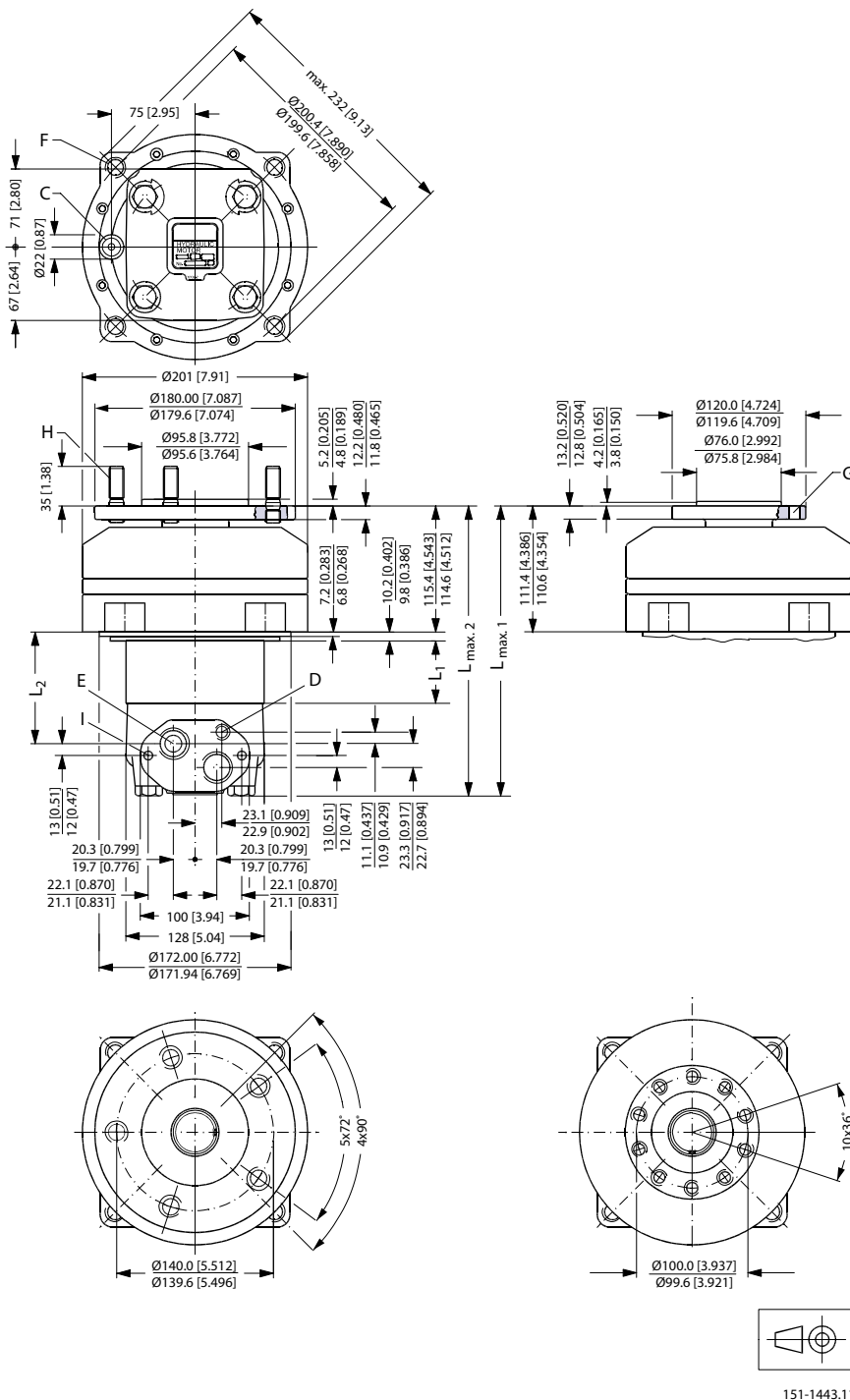
**OMT**

| Type     | L <sub>max</sub> mm [in] | L <sub>1</sub> * mm [in] | L <sub>2</sub> mm [in] |
|----------|--------------------------|--------------------------|------------------------|
| OMTW 160 | 123 [4.84]               | 16.5 [0.650]             | 73 [2.87]              |
| OMTW 200 | 128 [5.04]               | 21.5 [0.846]             | 78 [3.07]              |
| OMTW 250 | 134 [5.28]               | 27.8 [1.094]             | 84 [3.31]              |
| OMTW 315 | 144 [5.67]               | 37.0 [1.457]             | 94 [3.70]              |
| OMTW 400 | 154 [6.06]               | 47.5 [1.870]             | 104 [4.09]             |
| OMTW 500 | 168 [6.61]               | 61.5 [2.421]             | 118 [4.65]             |

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

OMT

Brake-wheel—European version



**C:** Brake-release port G 1/4; 12 mm [0.47 in] deep (BS/ISO 228/1)

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

**E:** G 3/4; 17 mm [0.67 in] deep

**F:** 4 × M12; 27 mm [1.06 in] deep

**G:** 10 × M12

**H:** Wheel bolts 5 × M14 × 1.5

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

151-1443.11

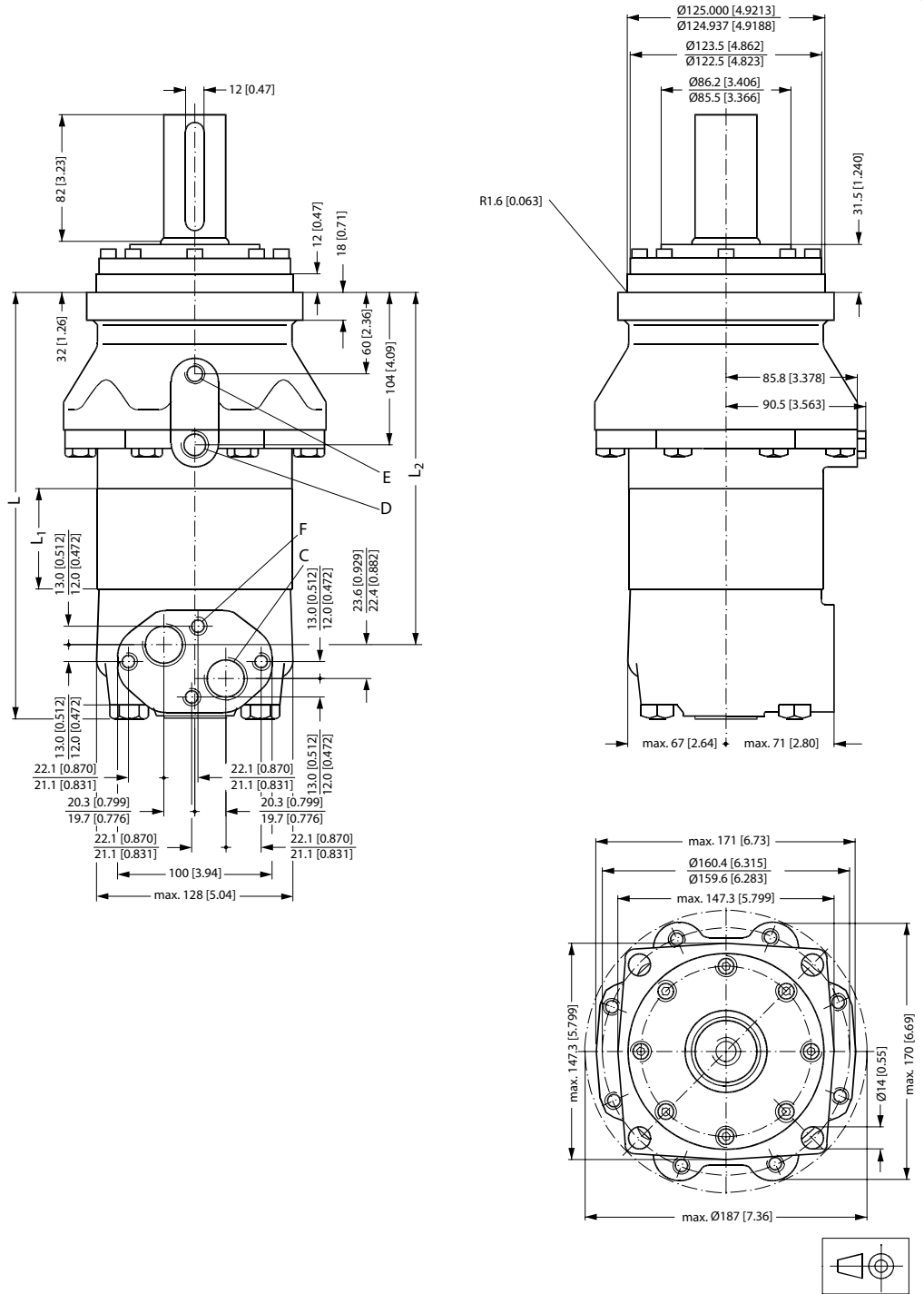
**OMT**

| Type       | L <sub>max 1</sub> mm [in] | L <sub>max 2</sub> mm [in] | L <sub>1</sub> * mm [in] | L <sub>2</sub> mm [in] |
|------------|----------------------------|----------------------------|--------------------------|------------------------|
| OMT 160 FX | 223 [8.78]                 | 227 [8.94]                 | 16.5 [0.650]             | 62 [2.45]              |
| OMT 200 FX | 228 [8.98]                 | 232 [9.13]                 | 21.5 [0.846]             | 67 [2.65]              |
| OMT 250 FX | 234 [9.21]                 | 238 [9.37]                 | 27.8 [1.094]             | 74 [2.89]              |
| OMT 315 FX | 243 [9.57]                 | 247 [9.72]                 | 37.0 [1.457]             | 83 [3.26]              |
| OMT 400 FX | 254 [10.00]                | 258 [10.16]                | 47.5 [1.870]             | 93 [3.67]              |
| OMT 500 FX | 268 [10.55]                | 272 [10.71]                | 61.5 [2.421]             | 107 [4.22]             |

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

OMT

Brake-standard—European version



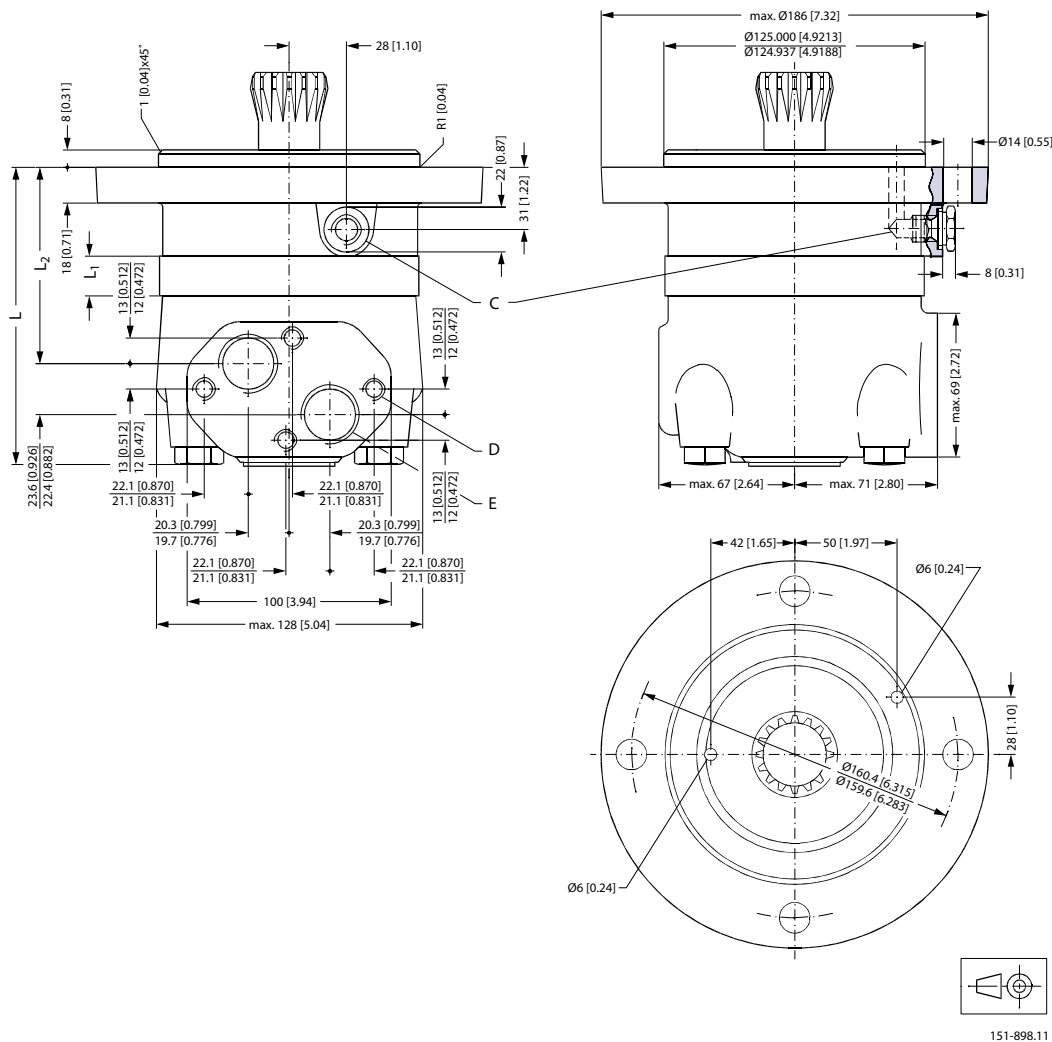
151-1453.10

- C:** G 3/4; 17 mm [0.67 in] deep (BS/ISO 228/1)
- D:** Drain connection G 3/8; 14 mm [0.55 in] deep
- E:** Brake-release port G 1/4; 12 mm [0.47 in] deep
- F:** M10; 10 mm [0.39 in] deep

**OMT**

| Type          | L <sub>max</sub> mm [in] | L <sub>1</sub> * mm [in] | L <sub>2</sub> mm [in] |
|---------------|--------------------------|--------------------------|------------------------|
| OMT 160 FL/FH | 228 [8.98]               | 16.5 [0.650]             | 178 [7.01]             |
| OMT 200 FL/FH | 233 [9.17]               | 21.5 [0.846]             | 183 [7.20]             |
| OMT 250 FL/FH | 239 [9.41]               | 27.8 [1.094]             | 189 [7.44]             |
| OMT 315 FL/FH | 248 [9.76]               | 37.0 [1.457]             | 199 [7.83]             |
| OMT 400 FL/FH | 259 [10.20]              | 47.5 [1.870]             | 209 [8.23]             |
| OMT 500 FL/FH | 273 [10.75]              | 61.5 [2.421]             | 223 [8.78]             |

\*The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L<sub>1</sub> dimensions

**Short—European version**


**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

| Type     | L <sub>max</sub> mm [in] | L <sub>1</sub> * mm [in] | L <sub>2</sub> mm [in] |
|----------|--------------------------|--------------------------|------------------------|
| OMTS 160 | 146 [5.75]               | 16.5 [0.650]             | 96 [3.78]              |
| OMTS 200 | 151 [5.94]               | 21.5 [0.846]             | 101 [3.98]             |



**OMT**

| Type     | L <sub>max</sub> mm [in] | L <sub>1</sub> * mm [in] | L <sub>2</sub> mm [in] |
|----------|--------------------------|--------------------------|------------------------|
| OMTS 250 | 157 [6.18]               | 27.8 [1.094]             | 107 [4.21]             |
| OMTS 315 | 166 [6.54]               | 37.0 [1.457]             | 116 [4.57]             |
| OMTS 400 | 177 [6.97]               | 47.5 [1.870]             | 127 [5.00]             |
| OMTS 500 | 191 [7.52]               | 61.5 [2.421]             | 142 [5.59]             |

\* The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L<sub>1</sub> dimensions

**OMTS**
**Installation**

The cardan shaft of the OMTS 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 OMT.

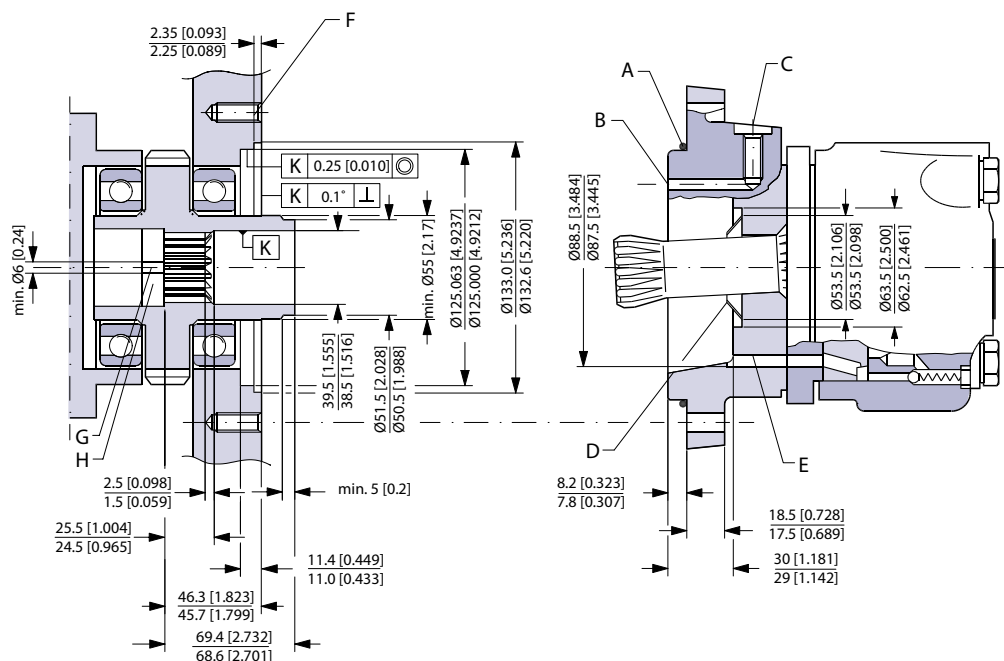
The conical sealing ring (code. no. 633B9022) is supplied with the motor.

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. 151B1040) 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**

*OMTS dimensions of the attached component in millimeter [inches]*



151-452.10

**OMT**

- |          |                                                 |          |                                |
|----------|-------------------------------------------------|----------|--------------------------------|
| <b>A</b> | O-ring: 125 × 3 mm                              | <b>B</b> | External drain channel         |
| <b>C</b> | Drain connection<br>G 1/4; 12 mm [0.47 in] deep | <b>D</b> | Conical seal ring              |
| <b>E</b> | Internal drain channel                          | <b>F</b> | M12; min. 18 mm [0.71 in] deep |
| <b>G</b> | Oil circulation hole                            | <b>H</b> | Hardened stop plate            |

**Attached component internal splines**

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

**Material:**

Case hardening steel with a tensile strength corresponding at least to 20 MoCr4 (900 N/mm<sup>2</sup>) or SAE 8620.

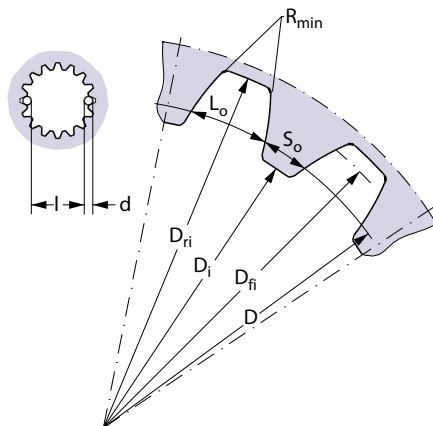
**Hardening specification:**

- 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  $m \cdot X = 1$ ;  $m = 2.1166$ )*

| Flat root side fit             |                   | mm                                   | in                                      |
|--------------------------------|-------------------|--------------------------------------|-----------------------------------------|
| Number of teeth                | z                 | 16                                   | 16                                      |
| Pitch                          | DP                | 12/24                                | 12/24                                   |
| Pressure angle                 |                   | 30°                                  | 30°                                     |
| Pitch dia.                     | D                 | 33.8656                              | 1.3333                                  |
| Major dia.                     | D <sub>ri</sub>   | 38.4 <sub>0</sub> <sup>+0.4</sup>    | 1.5118 <sub>0</sub> <sup>+0.0157</sup>  |
| Form dia. (min.)               | D <sub>fi</sub>   | 37.6                                 | 1.4803                                  |
| Minor dia.                     | D <sub>i</sub>    | 32.150 <sub>0</sub> <sup>+0.04</sup> | 1.2657 <sub>0</sub> <sup>+0.00157</sup> |
| Space width (circular)         | L <sub>o</sub>    | 4.516 <sup>±0.037</sup>              | 0.1777 <sup>±0.0014</sup>               |
| Tooth thickness (circular)     | S <sub>o</sub>    | 2.170                                | 0.0854                                  |
| Fillet radius                  | R <sub>min.</sub> | 0.5                                  | 0.02                                    |
| Max. measurement between pins* | l                 | 26.9 <sub>0</sub> <sup>+0.1</sup>    | 1.059 <sub>0</sub> <sup>+0.004</sup>    |
| Pin dia.                       | d                 | 4.834 <sup>±0.001</sup>              | 0.1903 <sup>±0.00004</sup>              |

\* Finished dimensions (when hardened).

**OMT**


151-455.10

**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.

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.

**OMV**
**Versions**
*OMV versions*

| Mounting flange | Shaft            | Port size    | European version | US version | Drain connection | Check valve | Main type designation |
|-----------------|------------------|--------------|------------------|------------|------------------|-------------|-----------------------|
| Standard flange | Cyl. 50 mm       | G1           | X                |            | Yes              | Yes         | OMV                   |
|                 | Cyl. 2.25 in     | 1 5/16-12 UN |                  | X          | Yes              | Yes         | OMV                   |
|                 | Splined 2.125 in | G1           | X                |            | Yes              | Yes         | OMV                   |
|                 |                  | 1 5/16-12 UN |                  | X          | Yes              | Yes         | OMV                   |
|                 | Tapered 60 mm    | G1           | X                |            | Yes              | Yes         | OMV                   |
| Tapered 2.25 in | 1 5/16-12 UN     |              | X                | Yes        | Yes              | OMV         |                       |
| SAE-C flange    | Cyl. 2.25 in     | 1 5/16-12 UN |                  | X          | Yes              | Yes         | OMV                   |
|                 | Splined 2.125 in | 1 5/16-12 UN |                  | X          | Yes              | Yes         | OMV                   |
| Wheel           | Cyl. 50 mm       | G1           | X                |            | Yes              | Yes         | OMVW                  |
|                 | Tapered 60 mm    | G1           | X                |            | Yes              | Yes         | OMVW                  |
|                 | Tapered 2.25 in  | 1 5/16-12 UN |                  | X          | Yes              | Yes         | OMVW                  |
| Short           | No output shaft  | G1           | X                |            | Yes              | Yes         | OMVS                  |

**Features**

Features available (options):

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

**Code numbers**
*OMV code numbers*

| Code Numbers | Displacement [cm <sup>3</sup> ] |      |      |      |      |
|--------------|---------------------------------|------|------|------|------|
|              | 315                             | 400  | 500  | 630  | 800  |
| <b>151B</b>  | 3100                            | 3101 | 3102 | 3103 | 3104 |
| <b>151B</b>  | 2150                            | 2151 | 2152 | 2153 | 2154 |
| <b>151B</b>  | 3105                            | 3106 | 3107 | 3108 | 3109 |
| <b>151B</b>  | 2155                            | 2156 | 2157 | 2158 | 2159 |
| <b>151B</b>  | 3110                            | 3111 | 3112 | 3113 | 3114 |
| <b>151B</b>  | 2160                            | 2161 | 2162 | 2163 | 2164 |
| <b>151B</b>  | 2183                            | 2184 | 2185 | 2186 | 2187 |
| <b>151B</b>  | 2188                            | 2189 | 2190 | 2191 | 2192 |
| <b>151B</b>  | 3115                            | 3116 | 3117 | 3118 | 3119 |
| <b>151B</b>  | 3120                            | 3121 | 3122 | 3123 | 3124 |
| <b>151B</b>  | 2170                            | 2171 | 2172 | 2173 | 2174 |
| <b>151B</b>  | 3125                            | 3126 | 3127 | 3128 | 3129 |

**OMV**
**Ordering**

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

Example:

151B3101 for an OMV 400 with standard flange, cyl. 50 mm shaft and port size G 1.

Orders will not be accepted without the four digit prefix.

**Technical data**
**Technical data for OMV, OMVW and OMVS**

| Type                                       |                                                       |                    | OMV<br>OMVW<br>OMVS | OMV<br>OMVW<br>OMVS | OMV<br>OMVW<br>OMVS | OMV<br>OMVW<br>OMVS | OMV<br>OMVW<br>OMVS |
|--------------------------------------------|-------------------------------------------------------|--------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Motor size                                 |                                                       |                    | 315                 | 400                 | 500                 | 630                 | 800                 |
| Geometric displacement                     | cm <sup>3</sup> [in <sup>3</sup> ]                    |                    | 314.5 [19.19]       | 400.9 [24.46]       | 499.6 [30.49]       | 629.1 [38.39]       | 801.8 [48.93]       |
| Max. speed                                 | min <sup>-1</sup> [rpm]                               | cont.              | 510                 | 500                 | 400                 | 315                 | 250                 |
|                                            |                                                       | int. <sup>1)</sup> | 630                 | 600                 | 480                 | 380                 | 300                 |
| Max. torque                                | Nm [lbf-in]                                           | cont.              | 920 [8140]          | 1180 [10440]        | 1460 [12920]        | 1660 [14690]        | 1880 [16640]        |
|                                            |                                                       | int. <sup>1)</sup> | 1110 [9820]         | 1410 [12480]        | 1760 [15580]        | 1940 [17170]        | 2110 [18680]        |
| Max. output                                | kW [hp]                                               | cont.              | 42.5 [57.0]         | 53.5 [71.7]         | 53.5 [71.7]         | 48.0 [64.4]         | 42.5 [57.0]         |
|                                            |                                                       | int. <sup>1)</sup> | 51.0 [68.4]         | 64.0 [85.8]         | 64.0 [85.8]         | 56.0 [75.1]         | 48.0 [64.4]         |
| Max. pressure drop                         | bar [psi]                                             | cont.              | 200 [2900]          | 200 [2900]          | 200 [2900]          | 180 [2610]          | 160 [2320]          |
|                                            |                                                       | int. <sup>1)</sup> | 240 [3480]          | 240 [3480]          | 240 [3480]          | 210 [3050]          | 180 [2610]          |
|                                            |                                                       | peak <sup>2)</sup> | 280 [4060]          | 280 [4060]          | 280 [4060]          | 240 [3480]          | 210 [3050]          |
| Max. oil flow                              | l/min<br>[USgal/<br>min]                              | cont.              | 160 [42.3]          | 200 [52.8]          | 200 [52.8]          | 200 [52.8]          | 200 [52.8]          |
|                                            |                                                       | int. <sup>1)</sup> | 200 [52.8]          | 240 [63.4]          | 240 [63.4]          | 240 [63.4]          | 240 [63.4]          |
| Max. starting pressure with unloaded shaft | bar [psi]                                             |                    | 8 [116]             | 8 [116]             | 8 [116]             | 8 [116]             | 8 [116]             |
| Min. starting torque                       | at max. press. drop cont.<br>Nm [lbf-in]              |                    | 710 [6280]          | 910 [8050]          | 1130 [10000]        | 1330 [11770]        | 1510 [13360]        |
|                                            | at max. press. drop int. <sup>1)</sup><br>Nm [lbf-in] |                    | 850 [7520]          | 1090 [9650]         | 1360 [12040]        | 1550 [13720]        | 1700 [15050]        |

| Type                |           |                    | Max. inlet pressure | Max. return pressure with drain line |
|---------------------|-----------|--------------------|---------------------|--------------------------------------|
| OMV<br>OMVW<br>OMVS | bar [psi] | cont.              | 210 [3050]          | 140 [2030]                           |
|                     | bar [psi] | int. <sup>1)</sup> | 250 [3630]          | 175 [2540]                           |
|                     | bar [psi] | peak <sup>2)</sup> | 300 [4350]          | 210 [3050]                           |

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

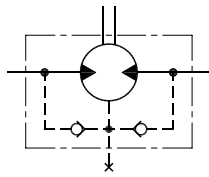
<sup>2)</sup> Peak load: The permissible values may occur for max. 1% of every minute.

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

**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.

OMV

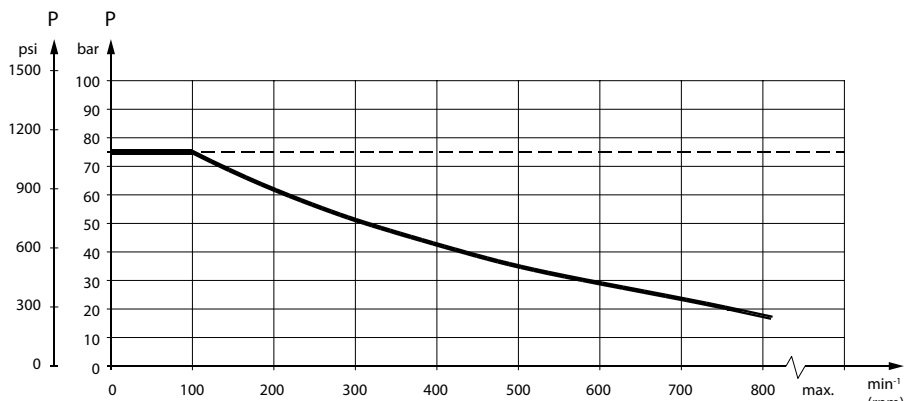


151-320.10

**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

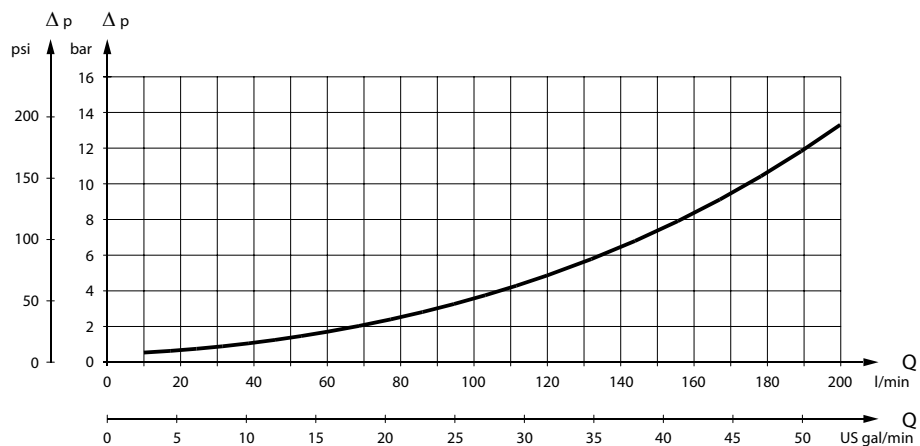


151-1674.10

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

— Continuous operation

**Pressure drop in motor**



151-1410.10

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

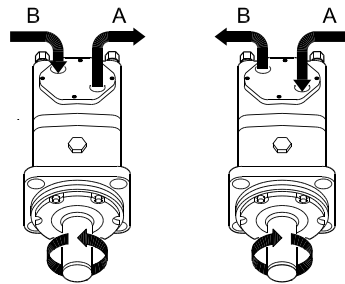
OMV

**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<br>bar [psi] | Viscosity<br>mm <sup>2</sup> /s [SUS] | Oil flow in drain line<br>l/min [US gal/min] |
|----------------------------|---------------------------------------|----------------------------------------------|
| 140 [2030]                 | 20 [100]                              | 3.0 [0.79]                                   |
|                            | 35 [165]                              | 2.0 [0.53]                                   |
| 210 [3050]                 | 20 [100]                              | 6.0 [1.59]                                   |
|                            | 35 [165]                              | 4.0 [1.06]                                   |

**Direction of shaft rotation**



151-394.10

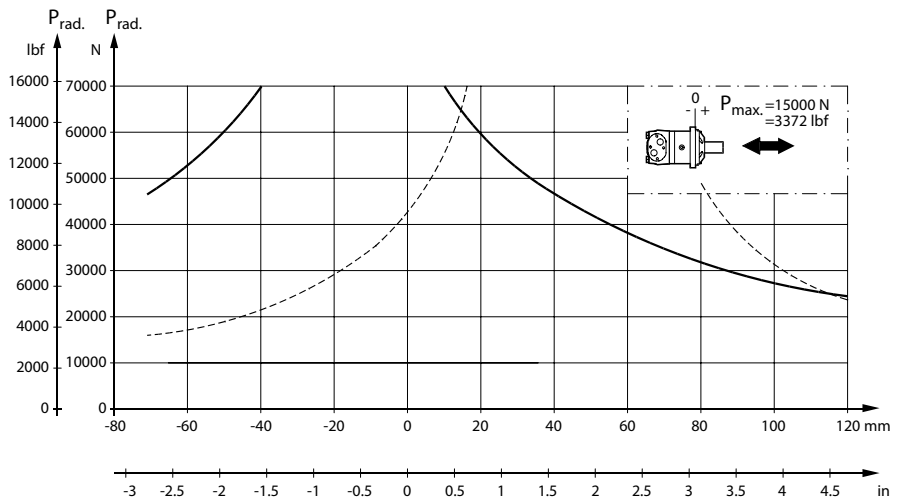
**Permissible shaft loads for OMV**

**Mounting flange:**

Standard

**Shaft:**

All shaft types



151-1973.10

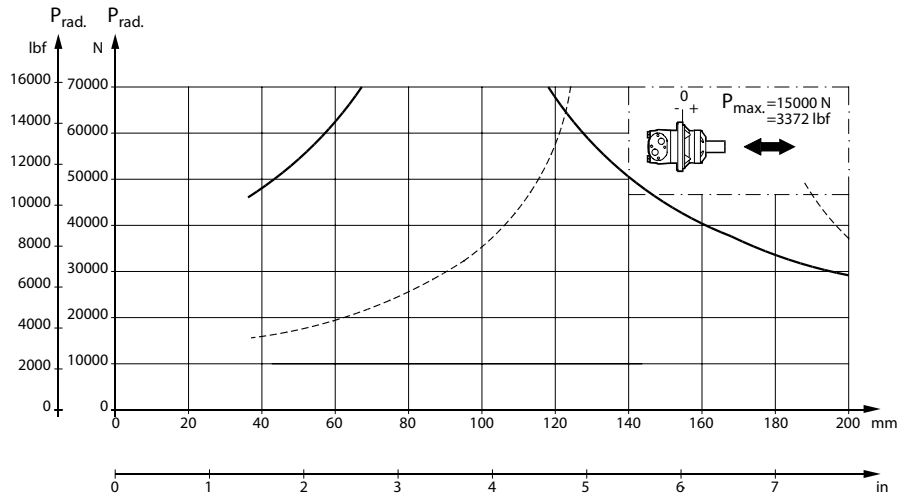
OMV

**Mounting flange:**

Wheel

**Shaft:**

All shaft types



151-1969.10

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<sup>-1</sup>) 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:**

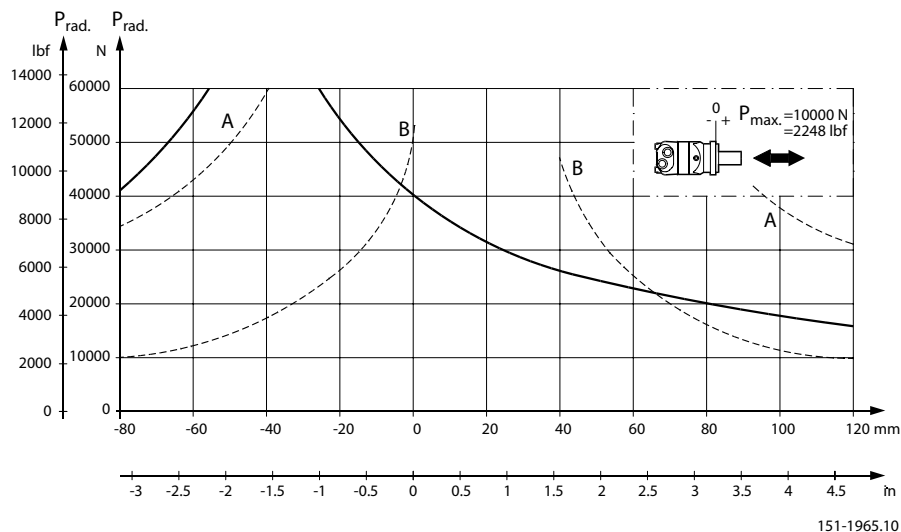
SAE-C

**Shaft:**

All shaft types



OMV



- A** Cyl. 2.25 in shaft
- B** Splined 2.125 in shaft

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<sup>-1</sup>) 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.

Function diagrams

**Continuous range**

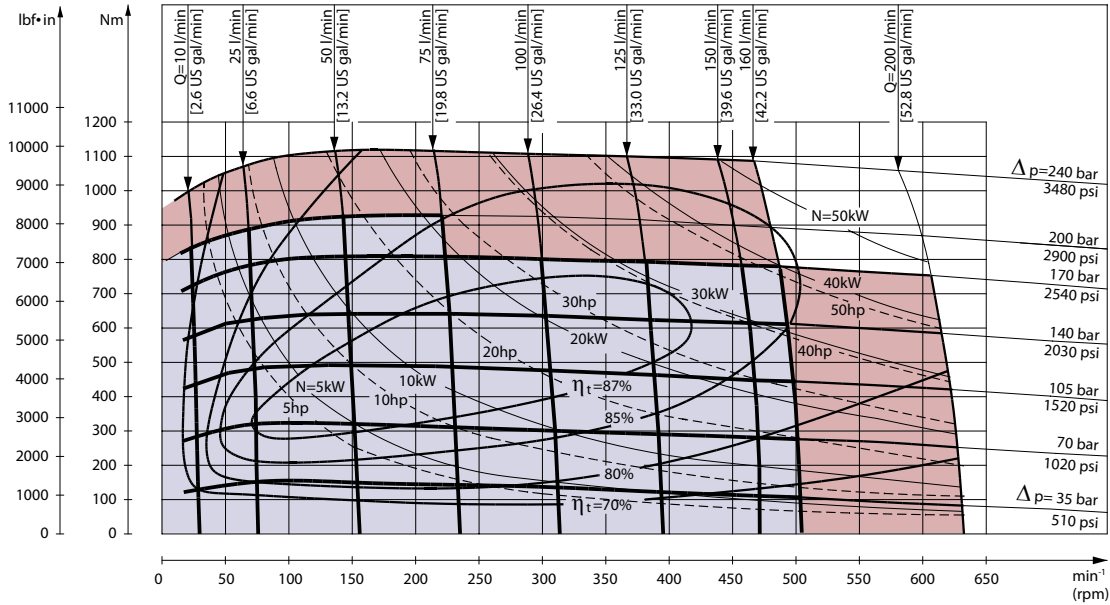


**Intermittent range (maximum 10% operation every minute)**



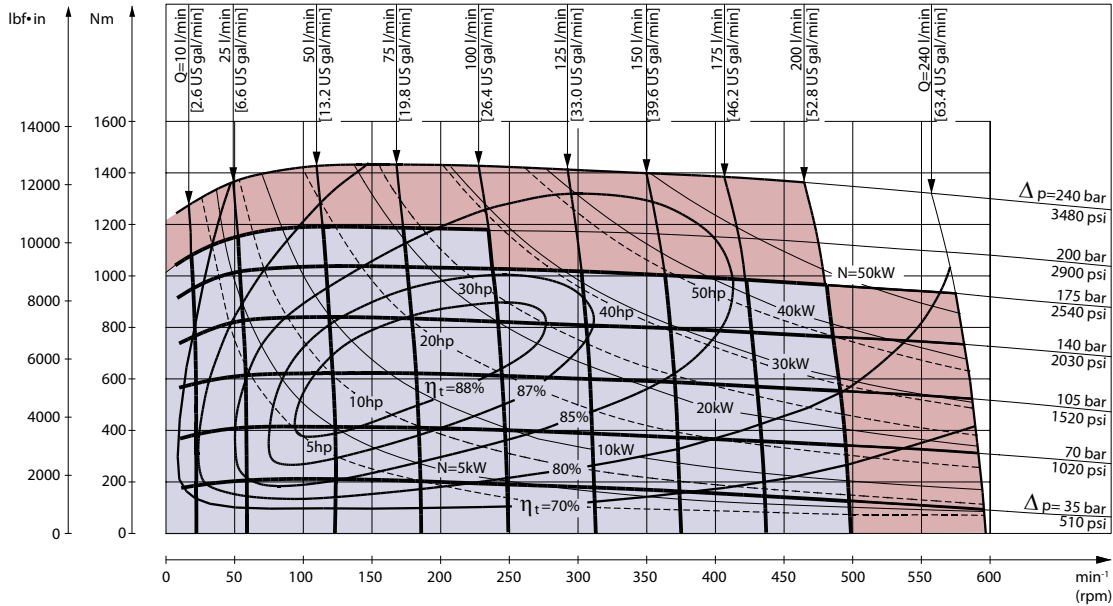
OMV

OMV 315



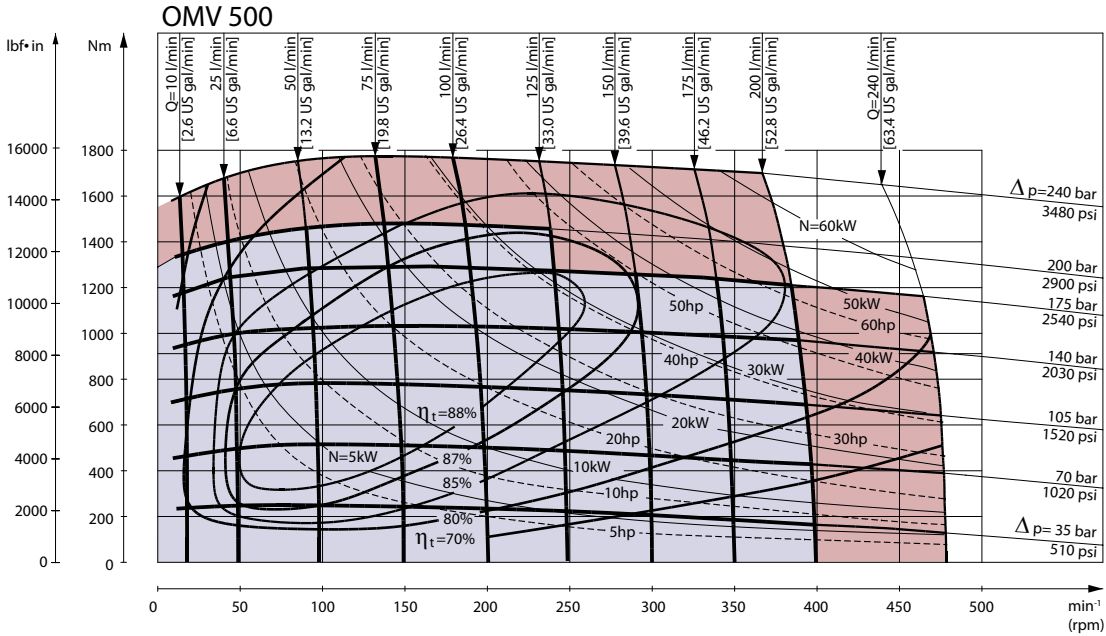
151-870.10

OMV 400

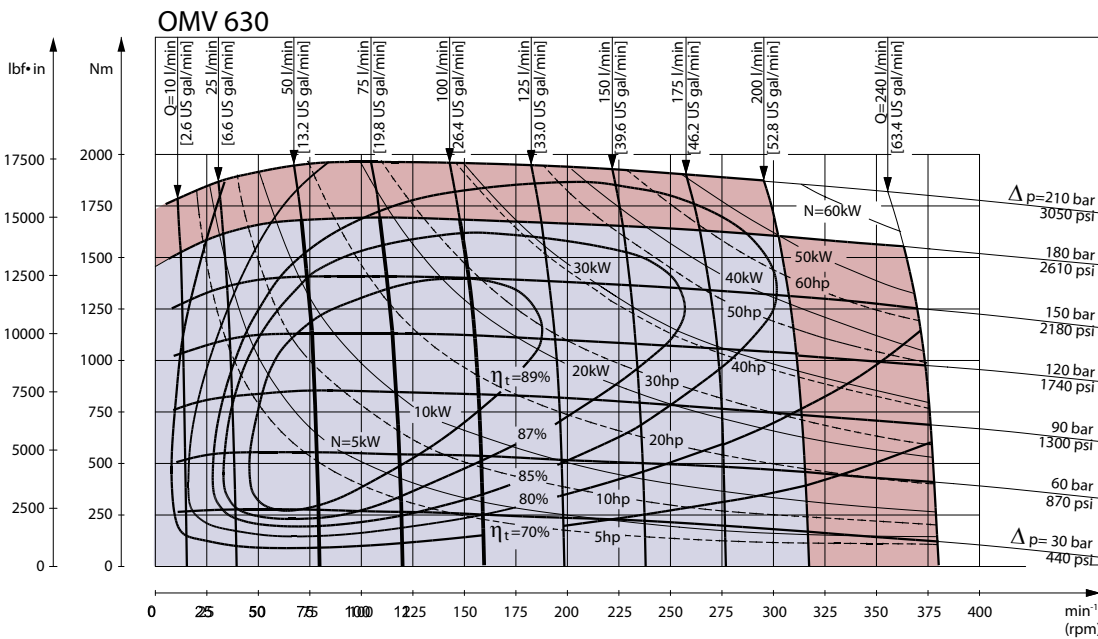


151-871.10

OMV

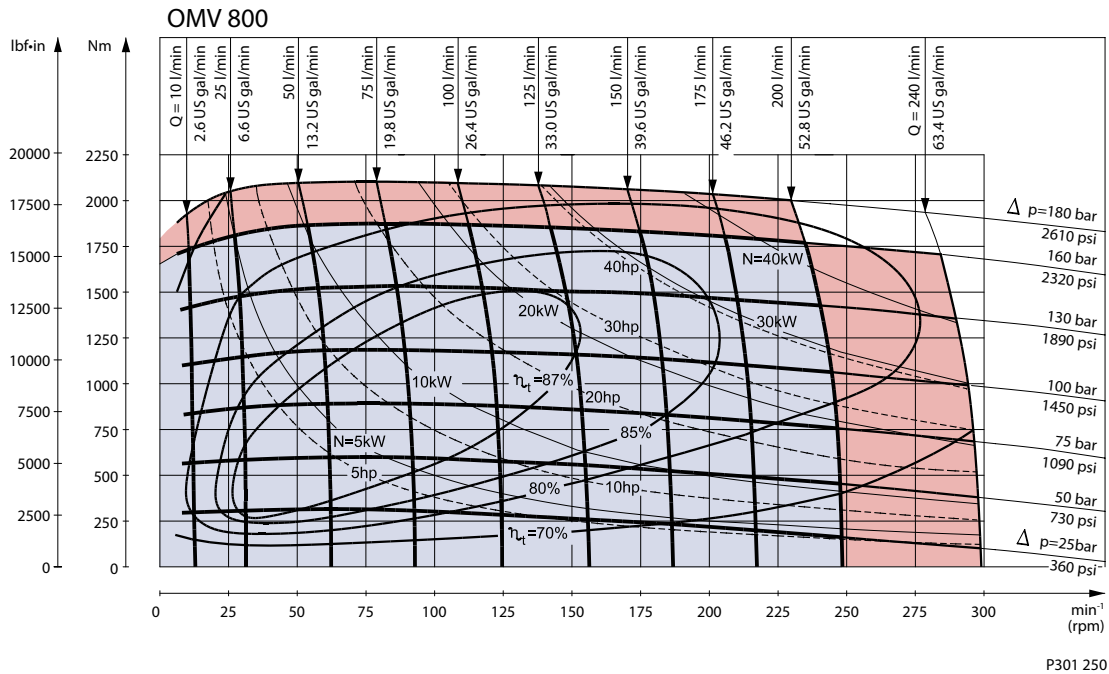


151-872.10



151-879.10

**OMV**



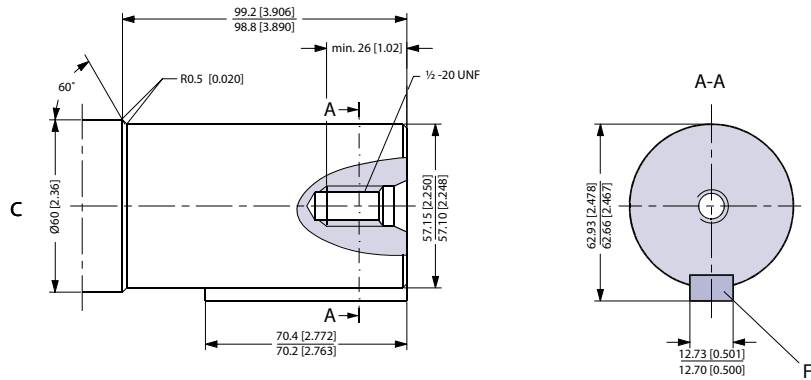
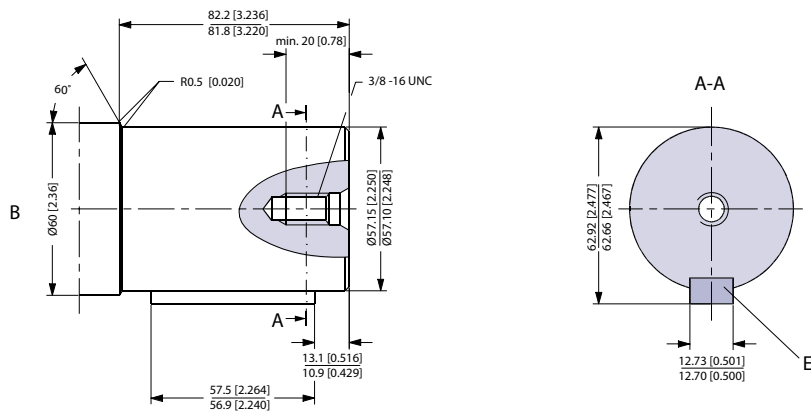
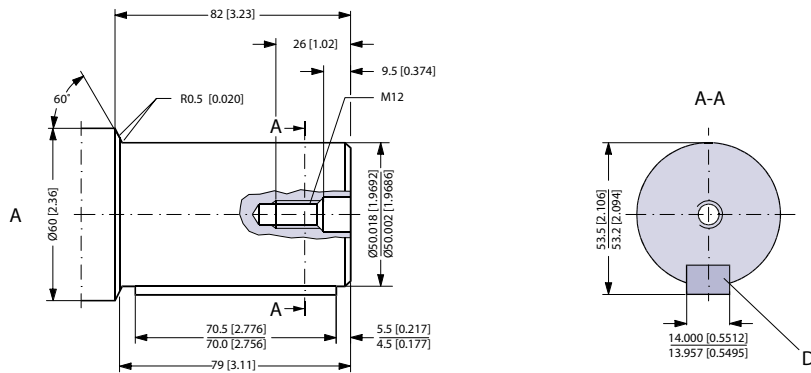
**Function diagram use**

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

Intermittent pressure drop and oil flow must not occur simultaneously.

OMV

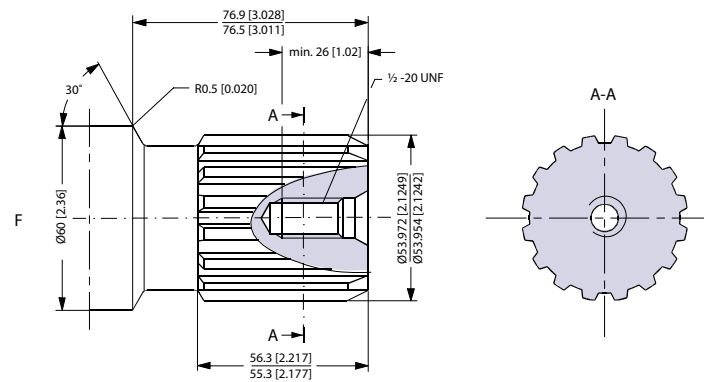
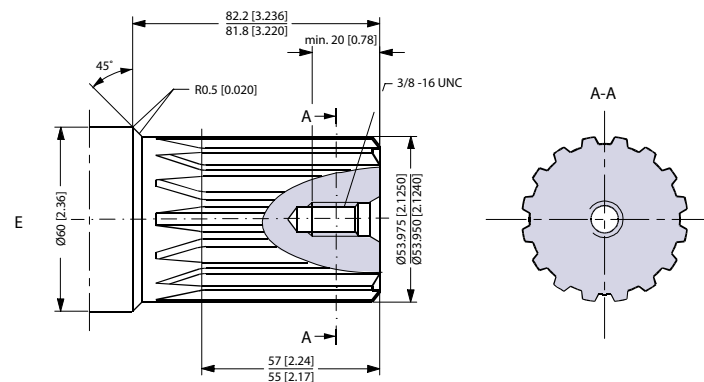
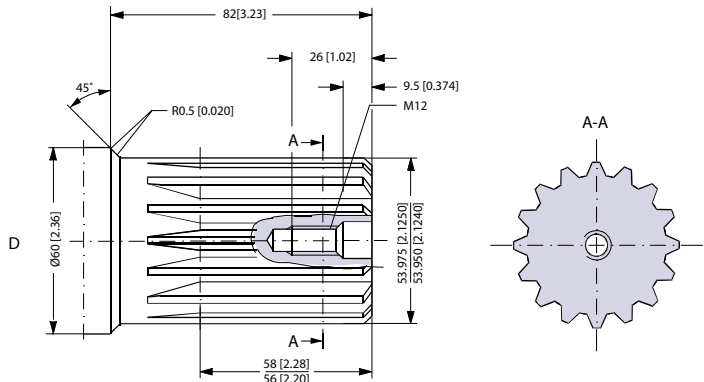
Shaft version



151-878.12

- |                                                                                                                                   |                                                                                                                                                                                  |                                                                                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>A</b> Cylindrical 50 mm shaft</p> <p><b>D</b> Parallel key<br/>A14 × 9 × 70; DIN 6885<br/>Keyway deviates from standard</p> | <p><b>B</b> Cylindrical 2.25 in shaft for OMV with standard mounting flange</p> <p><b>E</b> Parallel key<br/>1/2 × 1/2 × 2 1/4 in; B.S. 46<br/>Keyway deviates from standard</p> | <p><b>C</b> Cylindrical 2.25 in shaft for OMV with mounting flange SAE-C</p> <p><b>F</b> Parallel key<br/>1/2 × 1/2 × 2 1/4 in; B.S. 46<br/>Keyway deviates from standard</p> |
|-----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

OMV



151-1918.10

**D** Involute splined shaft ANS B92.1 - 1970 standard

- Flat root side fit
- Pitch 8/16; Teeth 16
- Major dia. 2.125 in
- Pressure angle 30°

**E US version**

- Involute splined shaft for OMV with standard mounting flange ANS B92.1 - 1970 standard
- Flat root side fit
- Pitch 8/16; Teeth 16
- Major dia. 2.125 in

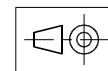
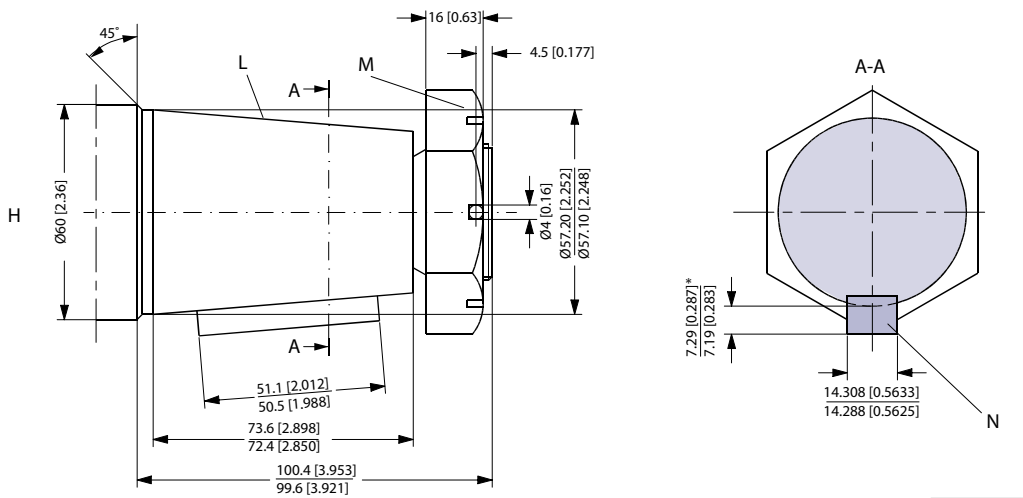
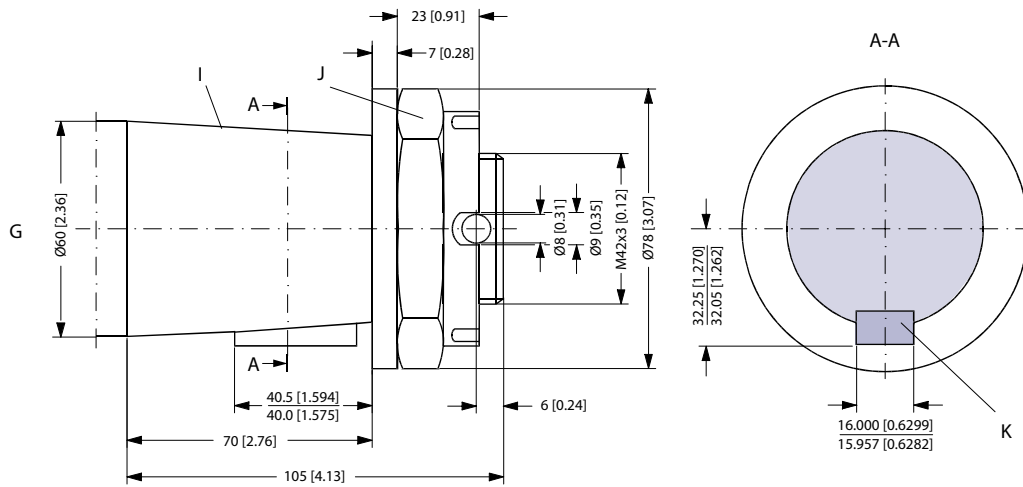
**F (US version)**

- Involute splined shaft for OMV with mounting flange SAE-C ANS B92.1 - 1970 standard
- Flat root side fit
- Pitch 8/16; Teeth 16
- Major dia. 2.125 in

OMV

Pressure angle 30°

Pressure angle 30°



151-1919.10

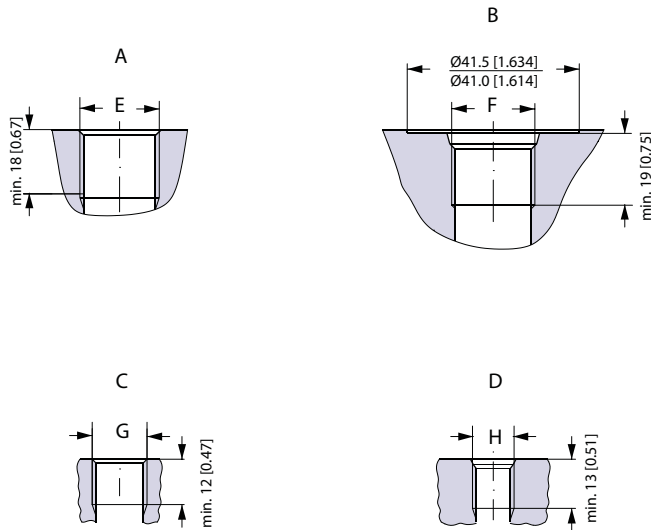
- G** Tapered 60 mm shaft (ISO/R775)
- J** DIN 937  
Across flats: 65 mm  
Tightening torque: 750 ±50 Nm [6640 ±440 lbf-in]
- I** Taper 1:10
- K** Parallel key B16 × 10 × 32  
DIN 6885  
Keyway deviates from standard

- H** Tapered 2.25 in shaft
- L** Cone 1:8  
SAE J501
- M** 11/2 - 18 UNEF  
Across flats: 23/8 in  
Tightening torque: 750 ±50 Nm [6640 ±440 lbf-in]
- N** Parallel key  
9/16 × 9/16 × 2 in  
B.S. 46

OMV

Keyway deviates from standard

Port thread versions



151-1977.11

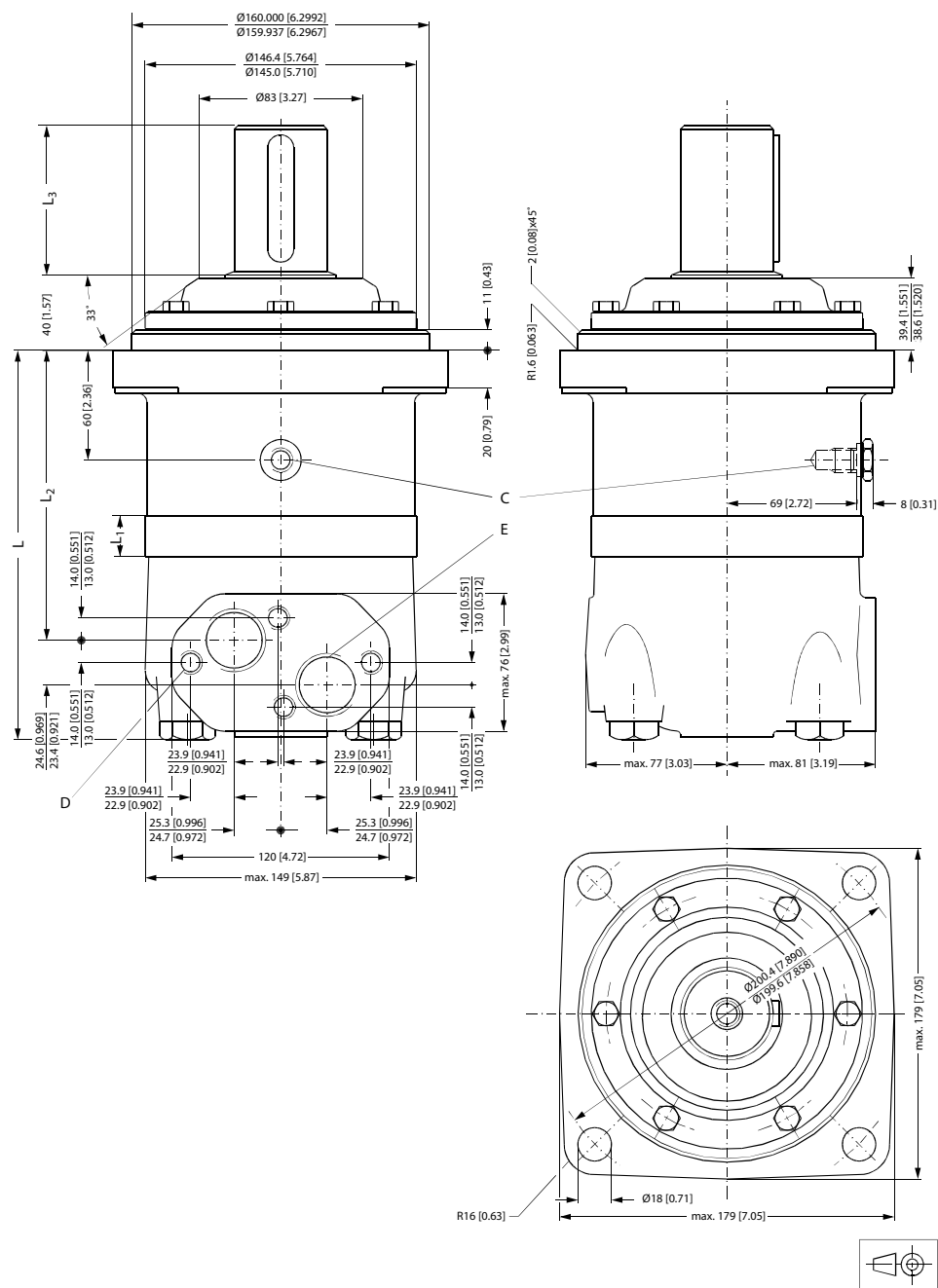
- |          |                                   |          |                |
|----------|-----------------------------------|----------|----------------|
| <b>A</b> | G main ports                      | <b>B</b> | UN main ports  |
| <b>E</b> | ISO 228/1 - G1 O-ring boss port   | <b>F</b> | 1 5/16 - 12 UN |
| <b>C</b> | G drain port                      | <b>D</b> | UNF drain port |
| <b>G</b> | ISO 228/1 - G1/4 O-ring boss port | <b>H</b> | 9/16 - 18 UNF  |



OMV

Dimensions

Standard flange—European version



151-890.11

- C:** Drain connection G 1/4; 12 mm [0.47 in] deep
- D:** M12; 12 mm [0.47 in] deep
- E:** G 1; 18 mm [0.71 in] deep

**OMV**

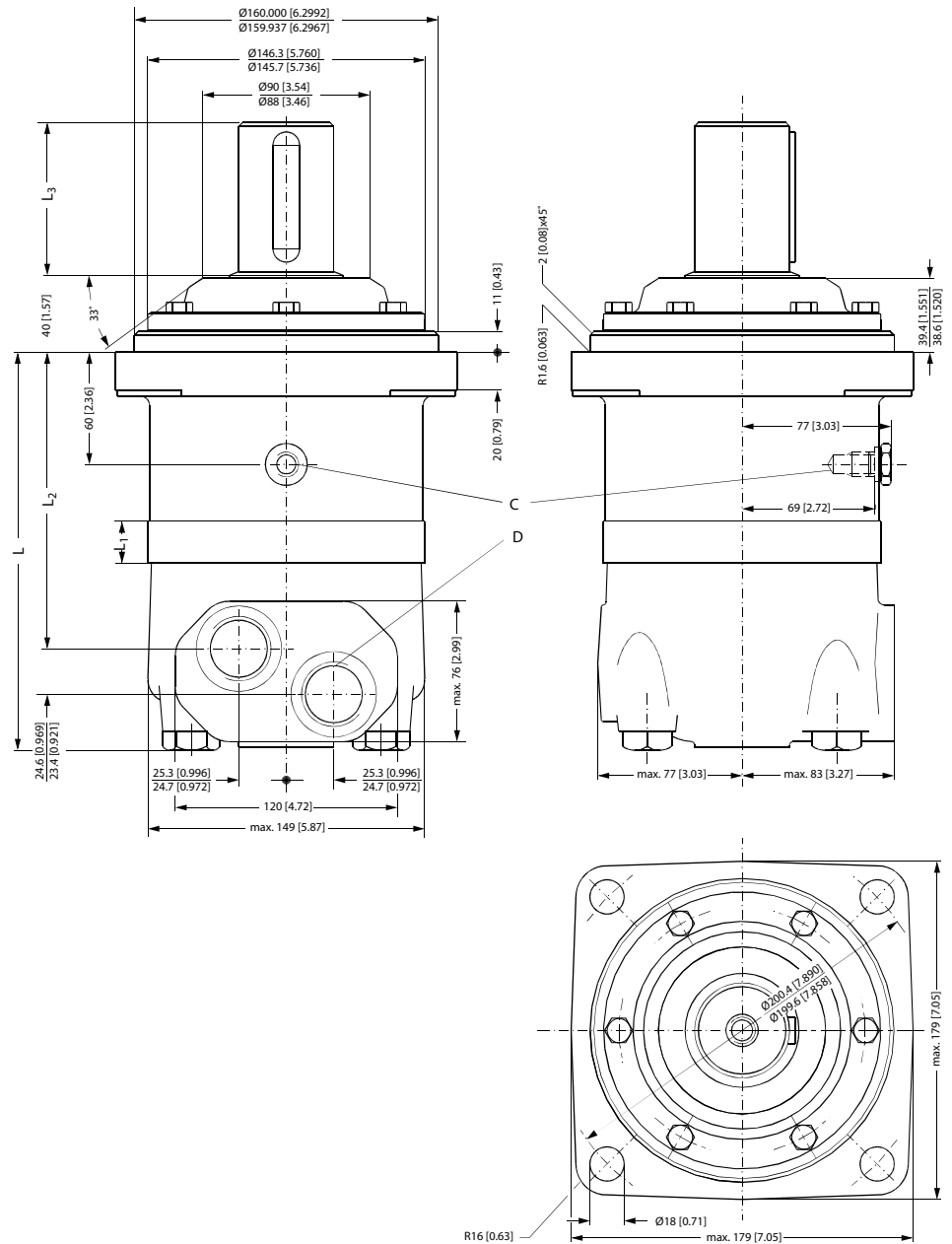
| Type    | L <sub>max</sub> mm [in] | L <sub>1</sub> * mm [in] | L <sub>2</sub> mm [in] |
|---------|--------------------------|--------------------------|------------------------|
| OMV 315 | 215 [8.46]               | 22.0 [0.866]             | 160 [6.30]             |
| OMV 400 | 222 [8.74]               | 29.0 [1.142]             | 167 [6.57]             |
| OMV 500 | 230 [9.05]               | 37.0 [1.457]             | 175 [6.89]             |
| OMV 630 | 240 [9.45]               | 47.5 [1.870]             | 186 [7.32]             |
| OMV 800 | 254 [10.00]              | 61.5 [2.421]             | 200 [7.87]             |

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

| Output shaft                | L <sub>3</sub> mm [in] |
|-----------------------------|------------------------|
| Cyl. 50 mm Splined 2.125 in | 82 [3.23]              |
| Tapered 60 mm               | 105 [4.13]             |

OMV

Standard flange—US version



151-890.11.22

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

**D:** 1 5/16 - 12 UN; 19 mm [0.75 in] deep O-ring boss port

| Type    | L <sub>max</sub> mm [in] | L <sub>1</sub> *mm [in] | L <sub>2</sub> mm [in] |
|---------|--------------------------|-------------------------|------------------------|
| OMV 315 | 215 [8.46]               | 22.0 [0.866]            | 160 [6.30]             |
| OMV 400 | 222 [8.74]               | 29.0 [1.142]            | 167 [6.57]             |
| OMV 500 | 230 [9.05]               | 37.0 [1.457]            | 175 [6.89]             |

**OMV**

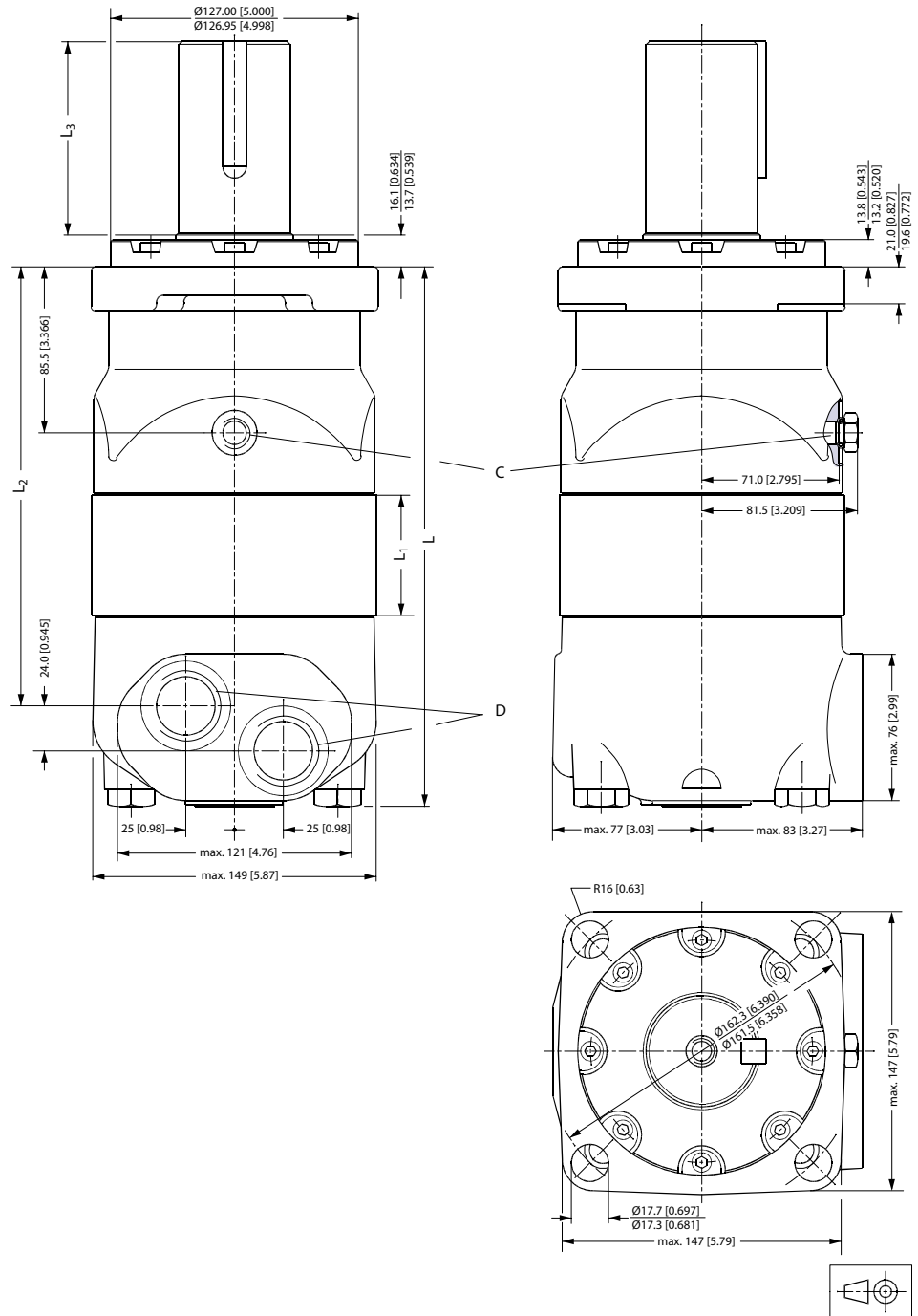
| <b>Type</b> | <b>L<sub>max</sub> mm [in]</b> | <b>L<sub>1</sub> *mm [in]</b> | <b>L<sub>2</sub> mm [in]</b> |
|-------------|--------------------------------|-------------------------------|------------------------------|
| OMV 630     | 240 [9.45]                     | 47.5 [1.870]                  | 186 [7.32]                   |
| OMV 800     | 254 [10.00]                    | 61.5 [2.421]                  | 200 [7.87]                   |

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

| <b>Output shaft</b>           | <b>L<sub>3</sub> mm [in]</b> |
|-------------------------------|------------------------------|
| Cyl. 2.25 in Splined 2.125 in | 82 [3.23]                    |
| Tapered 2.25 in               | 100 [3.94]                   |

OMV

SAE-C flange—US version



151-1485.10

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

**D:** 1 5/16 - 12 UN; 19 mm [0.75 in] deep O-ring boss port

**OMV**

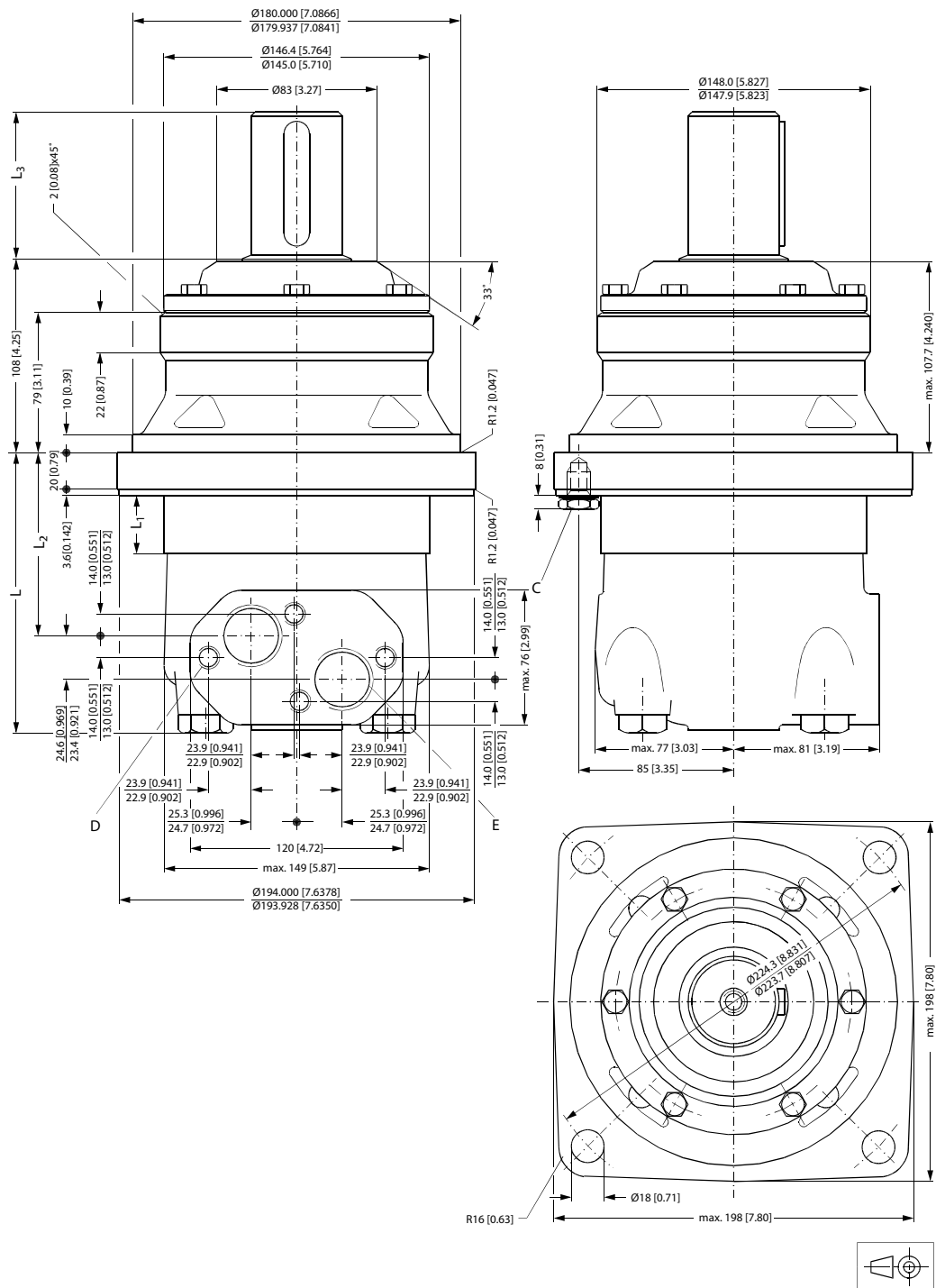
| Type    | L <sub>max</sub> mm [in] | L <sub>1</sub> *mm [in] | L <sub>2</sub> mm [in] |
|---------|--------------------------|-------------------------|------------------------|
| OMV 315 | 239 [9.41]               | 22.0 [0.866]            | 185 [7.28]             |
| OMV 400 | 246 [9.69]               | 29.0 [1.142]            | 192 [7.56]             |
| OMV 500 | 254 [10.00]              | 37.0 [1.457]            | 200 [7.87]             |
| OMV 630 | 265 [10.43]              | 47.5 [1.870]            | 211 [8.31]             |
| OMV 800 | 279 [10.98]              | 61.5 [2.421]            | 225 [8.86]             |

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

| Output shaft     | L <sub>3</sub> mm [in] |
|------------------|------------------------|
| Cyl. 2.25 in     | 99 [3.90]              |
| Splined 2.125 in | 76.7 [3.02]            |

OMV

Wheel—European version



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

**D:** M12; 12 mm [0.47 in] deep

**E:** G 1; 18 mm [0.71 in] deep



151-899.11

**OMV**

| Type     | L <sub>max</sub> mm [in] | L <sub>1</sub> *mm [in] | L <sub>2</sub> mm [in] |
|----------|--------------------------|-------------------------|------------------------|
| OMVW 315 | 146 [5.75]               | 22.0 [0.866]            | 92 [3.62]              |
| OMVW 400 | 153 [6.02]               | 29.0 [1.142]            | 99 [3.90]              |
| OMVW 500 | 161 [6.34]               | 37.0 [1.457]            | 107 [4.21]             |
| OMVW 630 | 172 [6.77]               | 47.5 [1.870]            | 118 [4.65]             |
| OMVW 800 | 185 [7.28]               | 61.5 [2.421]            | 132 [5.20]             |

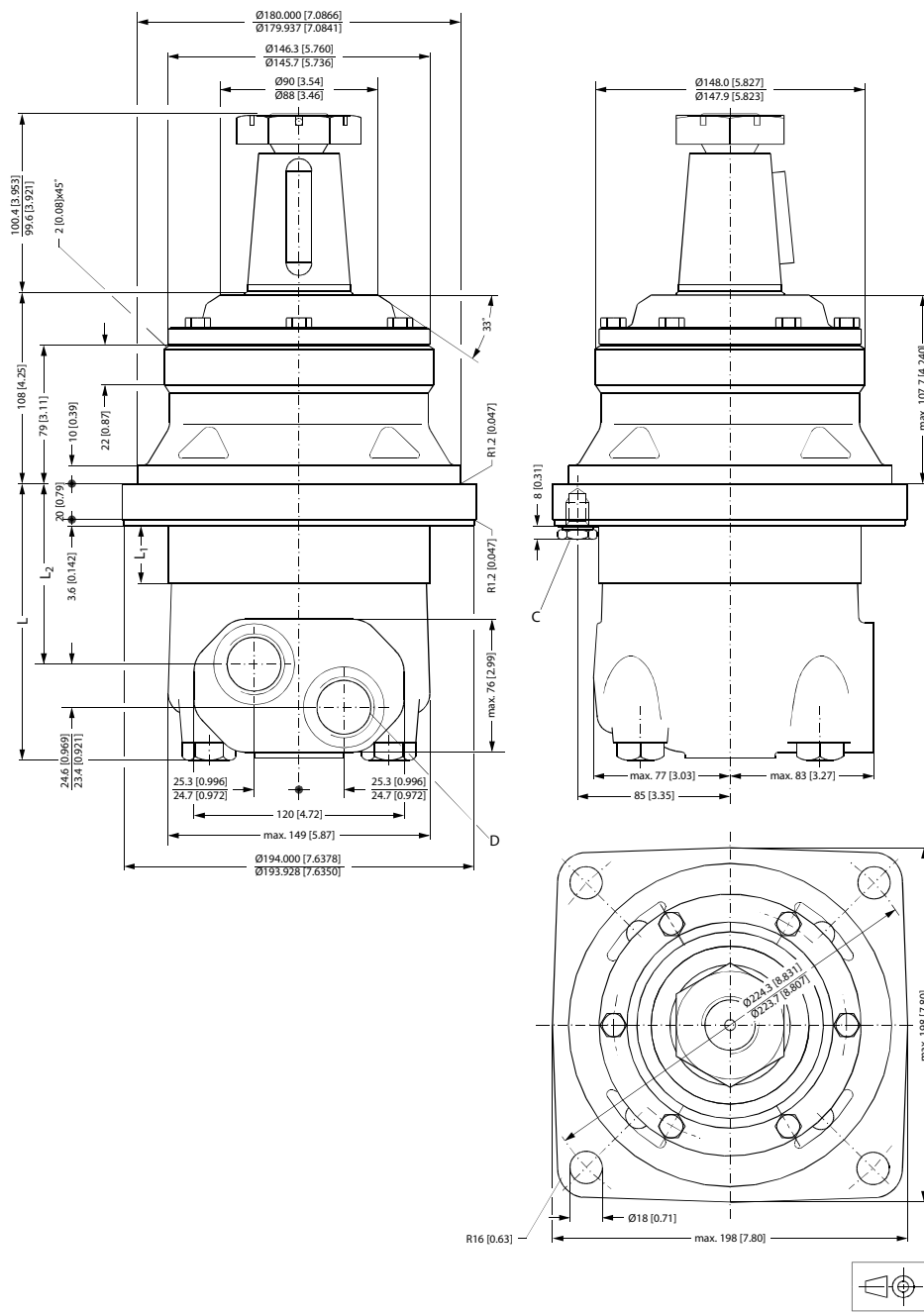
\*The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L1 dimensions

| Output shaft  | L <sub>3</sub> mm [in] |
|---------------|------------------------|
| Cyl. 50 mm    | 82 [3.23]              |
| Tapered 60 mm | 105 [4.13]             |



**OMV**

**Wheel—US version**



151-899.11.22

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

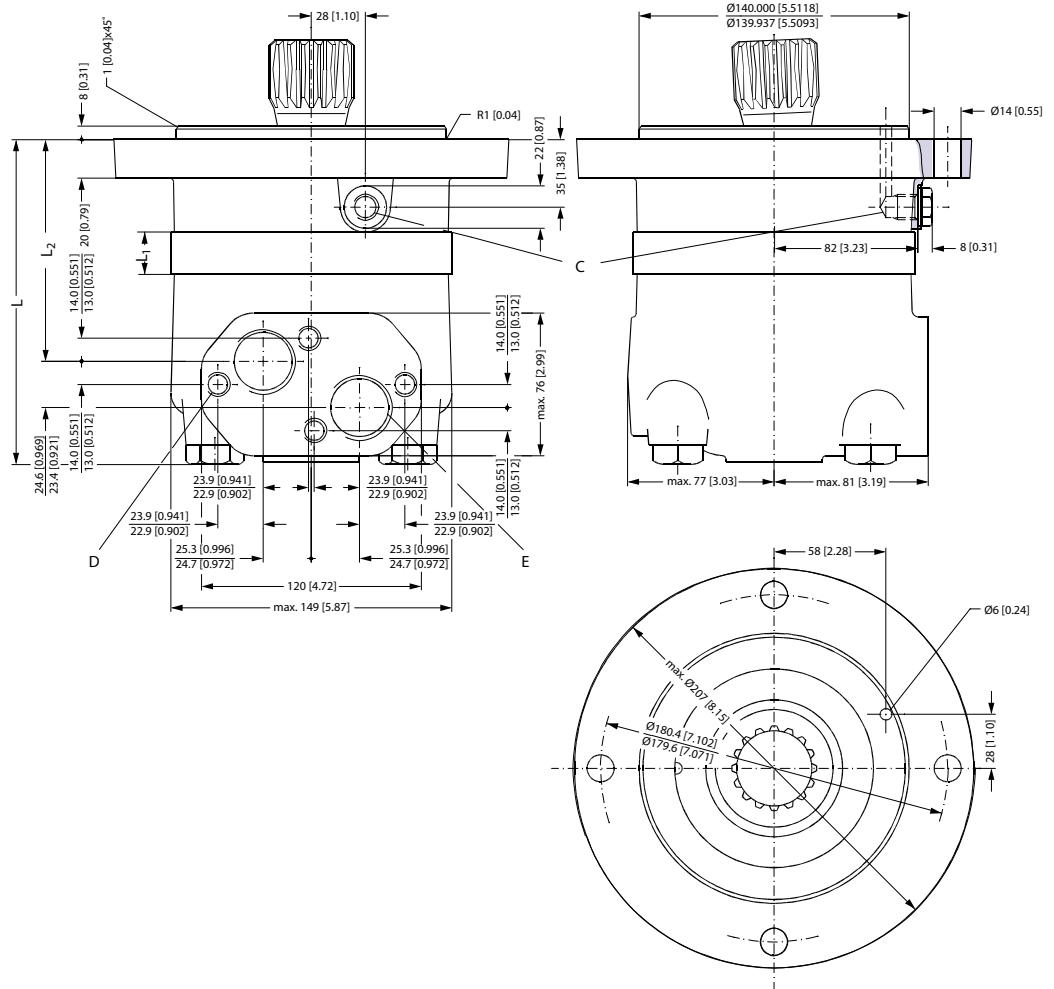
**D:** 1 5/16 - 12 UN; 19 mm [0.75 in] deep O-ring boss port

| Type     | L <sub>max</sub> mm [in] | L <sub>1</sub> * mm [in] | L <sub>2</sub> mm [in] |
|----------|--------------------------|--------------------------|------------------------|
| OMVW 315 | 147 [5.79]               | 22.0 [0.866]             | 92 [3.62]              |
| OMVW 400 | 154 [6.06]               | 29.0 [1.142]             | 99 [3.90]              |
| OMVW 500 | 162 [6.38]               | 37.0 [1.457]             | 107 [4.21]             |

**OMV**

| Type     | L <sub>max</sub> mm [in] | L <sub>1</sub> * mm [in] | L <sub>2</sub> mm [in] |
|----------|--------------------------|--------------------------|------------------------|
| OMVW 630 | 172 [6.77]               | 47.5 [1.870]             | 118 [4.65]             |
| OMVW 800 | 187 [7.36]               | 61.5 [2.421]             | 132 [5.20]             |

\* The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L<sub>1</sub> dimensions

**Short—European version**


151-900.10

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

**D:** M12; 12 mm [0.47 in] deep

**E:** G 1; 18 mm [0.71 in] deep

| Type     | L <sub>max</sub> mm [in] | L <sub>1</sub> * mm [in] | L <sub>2</sub> mm [in] |
|----------|--------------------------|--------------------------|------------------------|
| OMVS 315 | 171 [6.73]               | 22.0 [0.866]             | 117 [4.61]             |
| OMVS 400 | 179 [7.05]               | 29.0 [1.142]             | 124 [4.88]             |
| OMVS 500 | 186 [7.32]               | 37.0 [1.457]             | 132 [5.20]             |

**OMV**

| Type     | L <sub>max</sub> mm [in] | L <sub>1</sub> * mm [in] | L <sub>2</sub> mm [in] |
|----------|--------------------------|--------------------------|------------------------|
| OMVS 630 | 197 [7.76]               | 47.5 [1.870]             | 143 [5.63]             |
| OMVS 800 | 211 [8.31]               | 61.5 [2.421]             | 157 [6.18]             |

\* The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L<sub>1</sub> dimensions

**OMVS**
**Installation**

The cardan shaft of the OMVS 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 OMV.

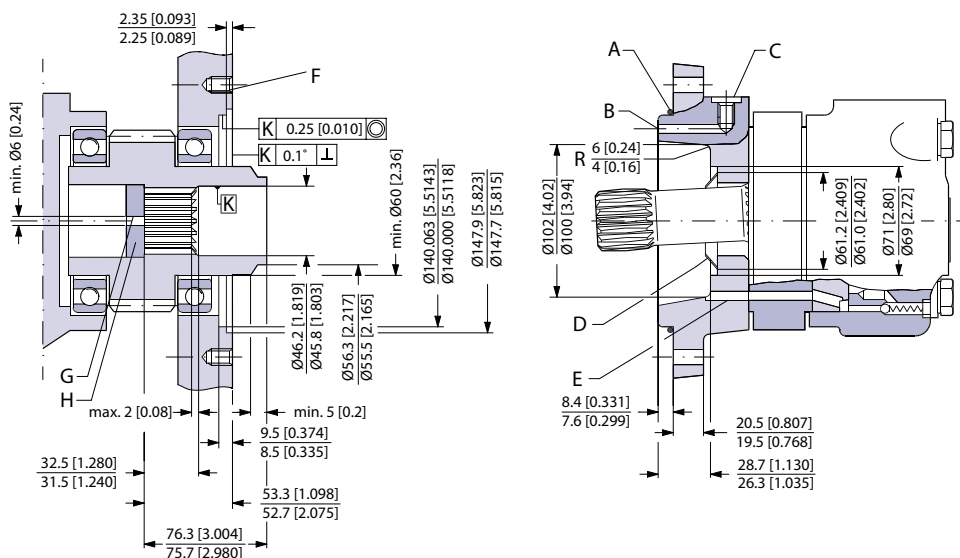
The conical sealing ring (code. no. 633B9021) is supplied with the motor.

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. 151B1041) 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**

OMVS dimensions of the attached component in millimeter [inches]



151-815.10

- A** O-ring: 140 × 3 mm
- B** External drain channel
- C** Drain connection G 1/4; 12 mm [0.47 in] deep
- E** Internal drain channel
- F** M12; minimum 18 mm [0.71 in] deep
- G** Oil circulation hole

**OMV**
**D** Conical seal ring

**H** Hardened stop plate

**Attached component internal splines**

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

**Material:**

Case hardening steel with a tensile strength corresponding at least to 20 MoCr4 (900 N/mm<sup>2</sup>) or SAE 8620.

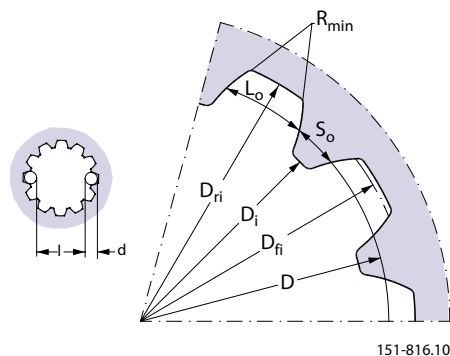
**Hardening specification:**

- 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  $m \cdot X = 1$ ;  $m = 2.54$ )*

| Flat root side fit                |                   | mm                      | in                       |
|-----------------------------------|-------------------|-------------------------|--------------------------|
| Number of teeth                   | z                 | 16                      | 16                       |
| Pitch                             | DP                | 10/20                   | 10/20                    |
| Pressure angle                    |                   | 30°                     | 30°                      |
| Pitch diameter                    | D                 | 40.640                  | 1.6                      |
| Major diameter                    | D <sub>fi</sub>   | 45.2 <sup>+0.4</sup>    | 1.780 <sup>+0.016</sup>  |
| Form diameter (minimum)           | D <sub>fi</sub>   | 44.6                    | 1.756                    |
| Minor diameter                    | D <sub>i</sub>    | 38.5 <sup>+0.039</sup>  | 1.516 <sup>+0.0015</sup> |
| Space width (circular)            | L <sub>o</sub>    | 5.180 <sup>±0.037</sup> | 0.204 <sup>±0.0015</sup> |
| Tooth thickness (circular)        | S <sub>o</sub>    | 2.835                   | 0.1116                   |
| Fillet radius                     | R <sub>min.</sub> | 0.4                     | 0.015                    |
| Maximum measurement between pins* | l                 | 32.47 <sup>+0.15</sup>  | 1.278 <sup>+0.006</sup>  |
| Pin diameter                      | d                 | 5.6 <sup>±0.001</sup>   | 0.22 <sup>±0.00004</sup> |

\* Finished dimensions (when hardened)



**OMV****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.

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.

**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 |

**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 |

**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 |



**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 |

**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 |

**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 |

**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 |

**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 |

**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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