

VERSIONS

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

Function diagram - see page : →

Features available (options) :

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

CODE NUMBERS

| CODE NUMBERS | Displacement [cm ³] | | | | | Technical data – Page | Shaft loads – Page | Dimensions – Page |
|--------------|---------------------------------|------|------|------|------|-----------------------|--------------------|-------------------|
| | 315 | 400 | 500 | 630 | 800 | | | |
| 151B | 3100 | 3101 | 3102 | 3103 | 3104 | 60 | 63 | 72 |
| 151B | 2150 | 2151 | 2152 | 2153 | 2154 | 60 | 63 | 73 |
| 151B | 3105 | 3106 | 3107 | 3108 | 3109 | 60 | 63 | 72 |
| 151B | 2155 | 2156 | 2157 | 2158 | 2159 | 60 | 63 | 73 |
| 151B | 3110 | 3111 | 3112 | 3113 | 3114 | 60 | 63 | 72 |
| 151B | 2160 | 2161 | 2162 | 2163 | 2164 | 60 | 63 | 73 |
| 151B | 2183 | 2184 | 2185 | 2186 | 2187 | 60 | 64 | 74 |
| 151B | 2188 | 2189 | 2190 | 2191 | 2192 | 60 | 64 | 74 |
| 151B | 3115 | 3116 | 3117 | 3118 | 3119 | 60 | 63 | 75 |
| 151B | 3120 | 3121 | 3122 | 3123 | 3124 | 60 | 63 | 75 |
| 151B | 2170 | 2171 | 2172 | 2173 | 2174 | 60 | 63 | 76 |
| 151B | 3125 | 3126 | 3127 | 3128 | 3129 | 60 | - | 77 |
| | 65 | 65 | 66 | 66 | 67 | | | |

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.

Note: Orders will not be accepted without the four digit prefix.

TECHNICAL DATA FOR OMV, OMVW AND OMVS

| Type | | | OMV OMVW OMVS | OMV OMVW OMVS | OMV OMVW OMVS | OMV OMVW OMVS | OMV OMVW OMVS |
|--|--|--------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Motor size | | | 315 | 400 | 500 | 630 | 800 |
| Geometric displacement | cm ³ [in ³] | | 314.5 [19.19] | 400.9 [24.46] | 499.6 [30.49] | 629.1 [38.39] | 801.8 [48.93] |
| Max. speed | min ⁻¹ [rpm] | cont. | 510 | 500 | 400 | 315 | 250 |
| | | int. ¹⁾ | 630 | 600 | 480 | 380 | 300 |
| Max. torque | Nm [lbf-in] | cont. | 920 [8140] | 1180 [10440] | 1460 [12920] | 1660 [14690] | 1880 [16640] |
| | | int. ¹⁾ | 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. ¹⁾ | 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. ¹⁾ | 240 [3480] | 240 [3480] | 240 [3480] | 210 [3050] | 180 [2610] |
| | | peak ²⁾ | 280 [4060] | 280 [4060] | 280 [4060] | 240 [3480] | 210 [3050] |
| Max. oil flow | l/min [USgal/min] | cont. | 160 [42.3] | 200 [52.8] | 200 [52.8] | 200 [52.8] | 200 [52.8] |
| | | int. ¹⁾ | 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. | | 710 [6280] | 910 [8050] | 1130 [10000] | 1330 [11770] | 1510 [13360] |
| | at max. press. drop int. ¹⁾ | | 850 [7520] | 1090 [9650] | 1360 [12040] | 1550 [13720] | 1700 [15050] |
| | Nm [lbf-in] | | | | | | |

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

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

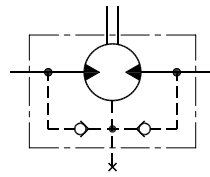
²⁾ Peak load: The permissible values may occur for max. 1% of every minute.

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

**MAX. PERMISSIBLE
 SHAFT SEAL PRESSURE**

**OMV with check valves
 and without use of
 drain connection:**

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

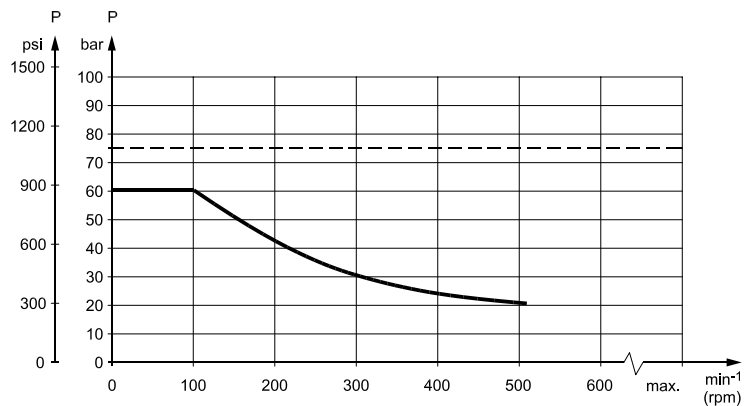


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**OMV with check valves
 and with
 drain connection:**

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

Max. return pressure without drain line or max. pressure in the drain line

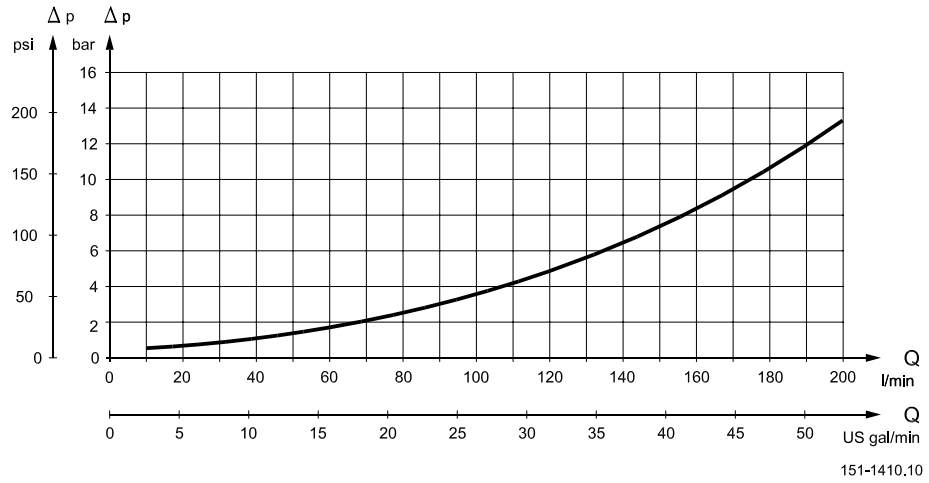


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----- Intermittent operation: the permissible values may occur for max. 10% of every minute.

———— Continuous operation

PRESSURE DROP IN MOTOR



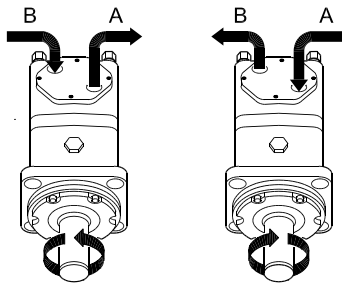
The curve applies to an unloaded motor shaft and an oil viscosity of 35 mm²/s (165 SUS)

OIL FLOW IN DRAIN LINE

The table shows the max. oil flow in the drain line at a return pressure less than 5-10 bar [75-150 psi].

| Pressure drop bar [psi] | Viscosity mm ² /s [SUS] | Oil flow in drain line l/min [US gal/min] |
|-------------------------------|--|--|
| 140 [2030] | 20 [100] | 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

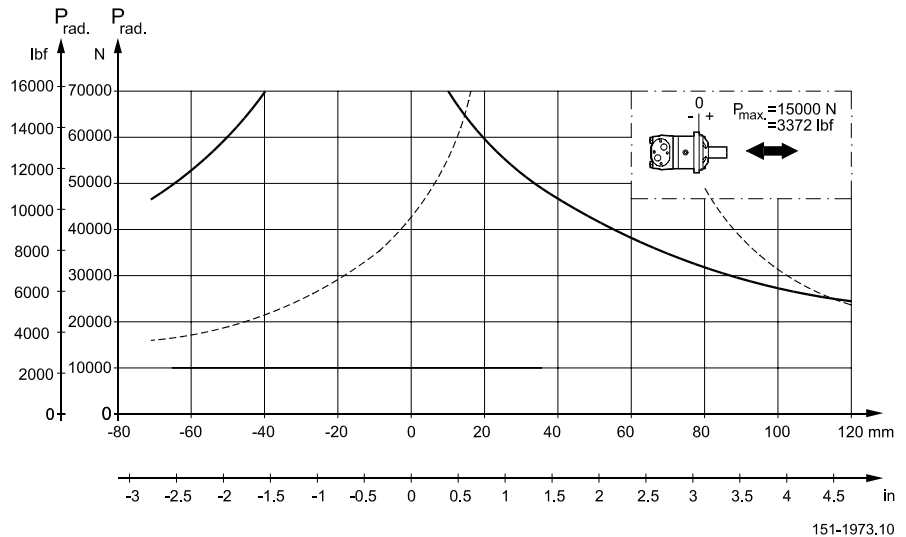


151-394.10

PERMISSIBLE SHAFT LOADS FOR OMV

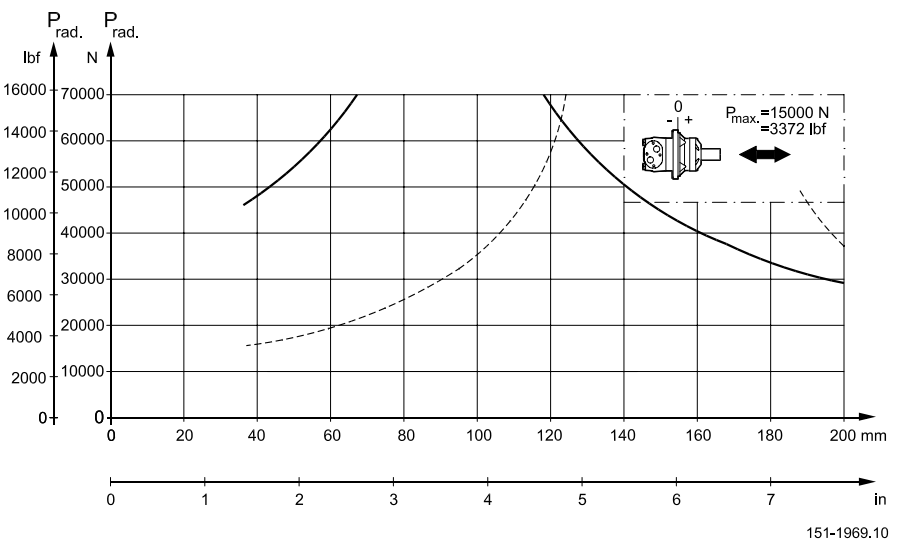
Mounting flange:
 Standard

Shaft:
 All shaft types



Mounting flange:
 Wheel

Shaft:
 All shaft types

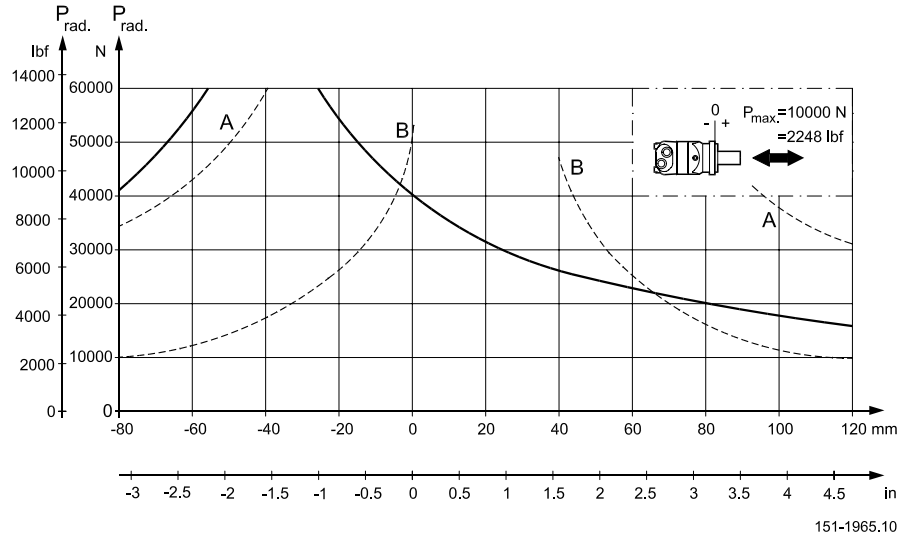


The output shaft runs in tapered roller bearings that permit high axial and radial forces. The permissible radial load on the shaft is shown for an axial load of 0 N as a function of the distance from the mounting flange to the point of load application. The curve is based on B10 bearing life (2000 hours or 12,000,000 shaft revolutions at 100 min⁻¹) at rated output torque, when mineral-based hydraulic oil with a sufficient content of anti-wear additives, is used. For 3,000,000 shaft revolutions or 500 hours – increase these shaft loads with 52%. The dash curve shows max. radial shaft load. Any shaft load exceeding the values shown in the curve will involve a risk of breakage. Bearing life calculations can be made using the explanation and formula provided in the chapter "Bearing dimensioning" in the technical information "General Orbital motors" DHMH.PK.100.G2.02 520L0232.

PERMISSIBLE SHAFT LOADS FOR OMV

Mounting flange:
 SAE-C

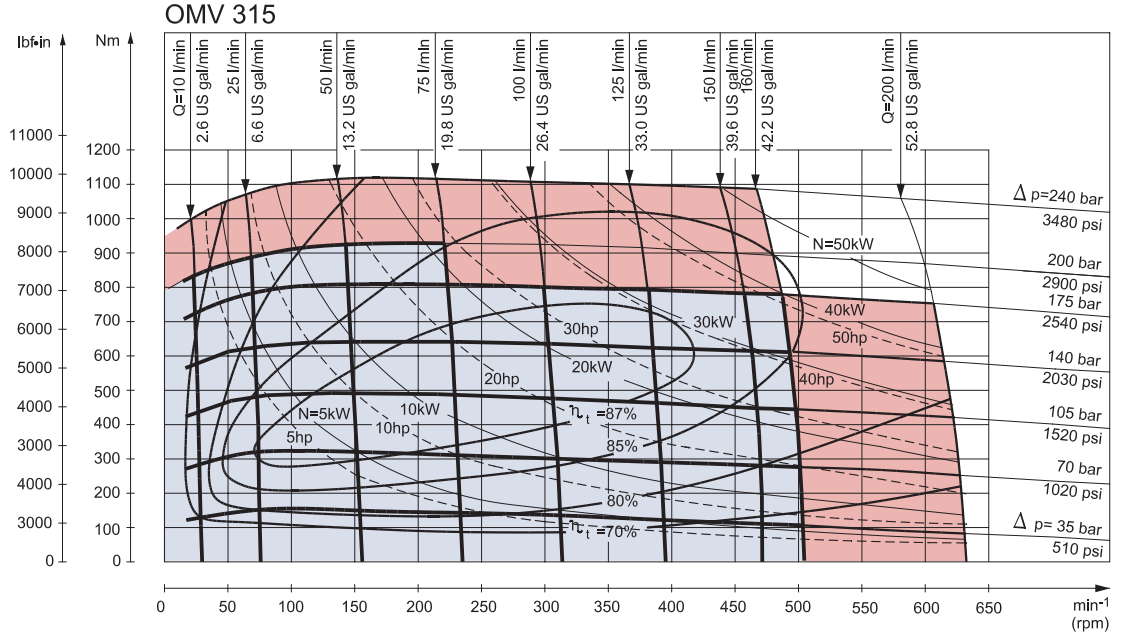
Shaft:
 All shaft types



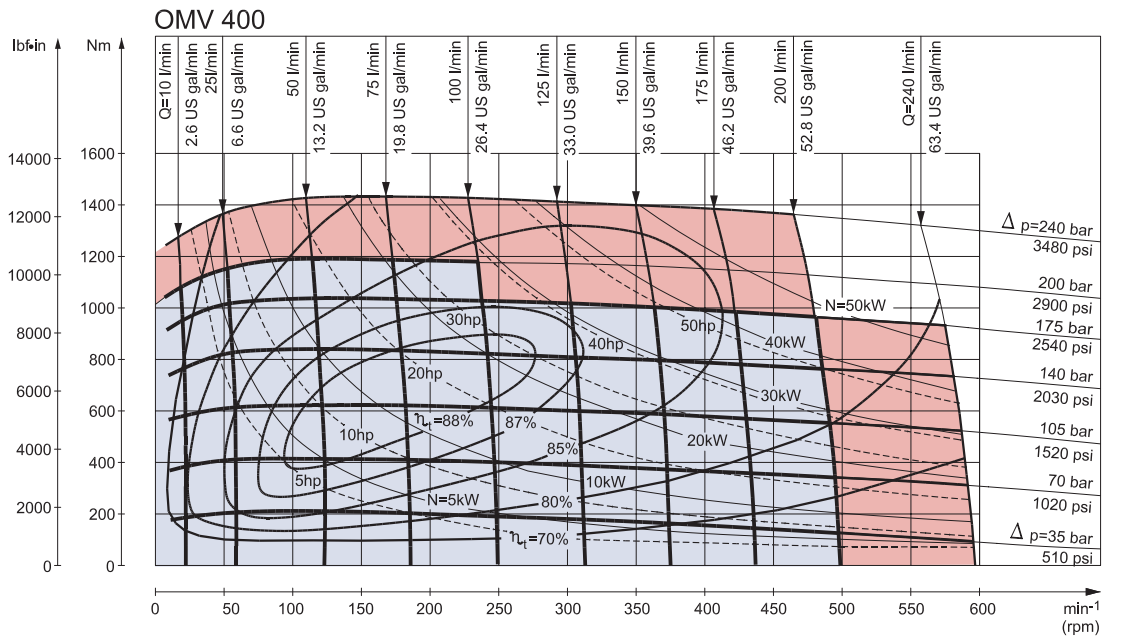
- A: Cyl. 2.25 in shaft
- B: Splined 2.125 in shaft

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^{-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" DHMH.PK.100.G2.02 520L0232.

FUNCTION DIAGRAMS



151-870.10



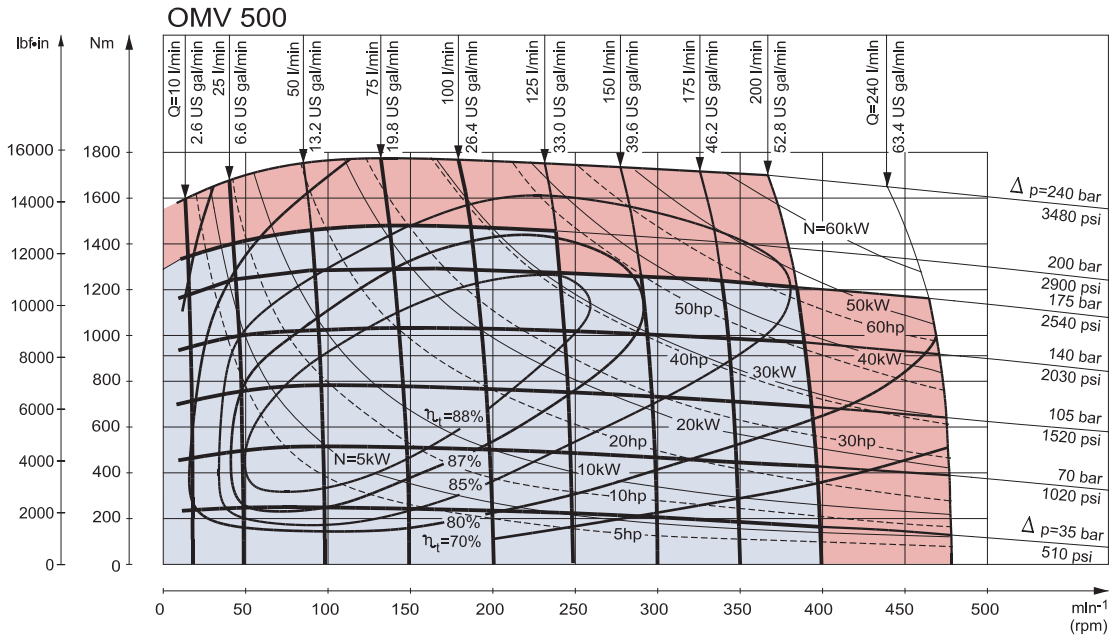
151-871.10

Explanation of function diagram use, basis and conditions can be found on page 5.

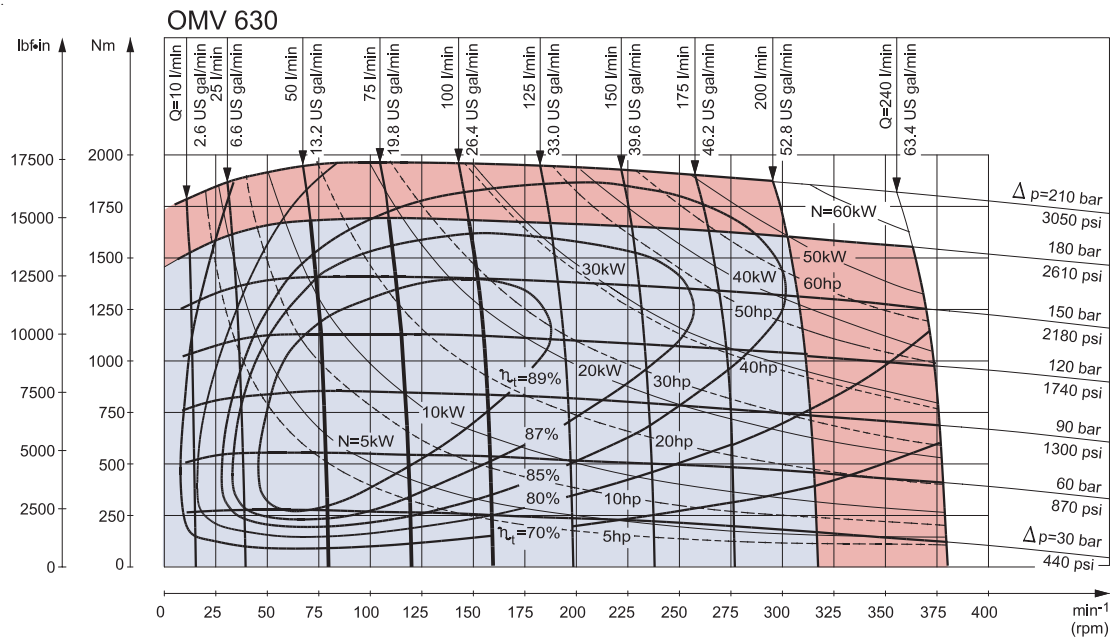
- Continuous range
- Intermittent range (max. 10% operation every minute)

Note: Intermittent pressure drop and oil flow must not occur simultaneously.

FUNCTION DIAGRAMS



151-872.10



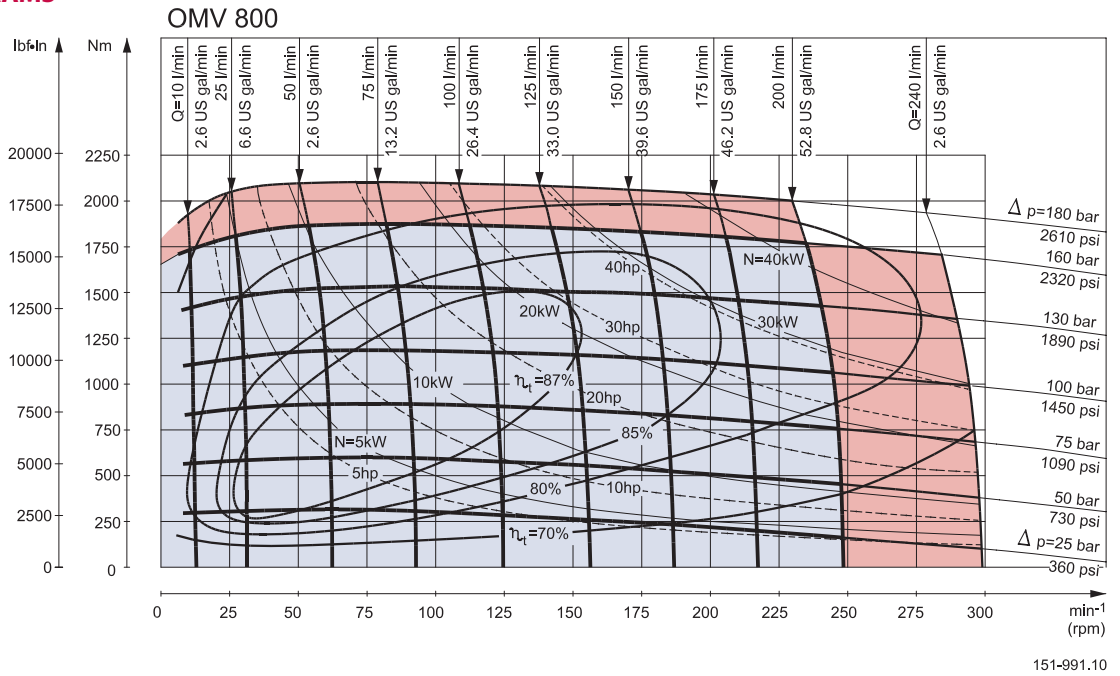
151-879.10

Explanation of function diagram use, basis and conditions can be found on page 5.

- Continuous range
- Intermittent range (max. 10% operation every minute)

Note: Intermittent pressure drop and oil flow must not occur simultaneously.

FUNCTION DIAGRAMS



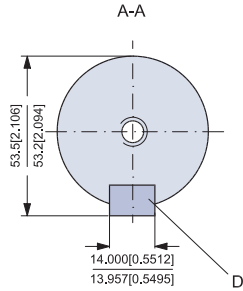
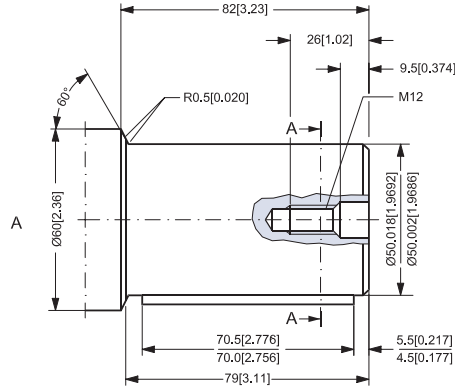
Explanation of function diagram use, basis and conditions can be found on page 5.

- Continuous range
- Intermittent range (max. 10% operation every minute)

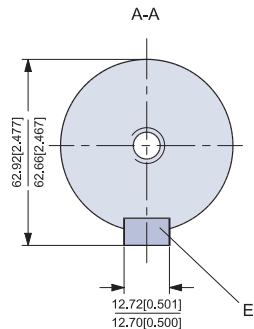
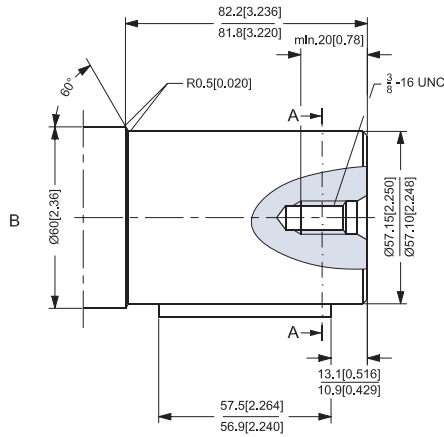
Note: Intermittent pressure drop and oil flow must not occur simultaneously.

SHAFT VERSION

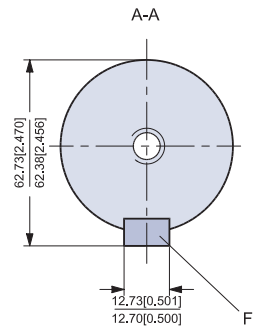
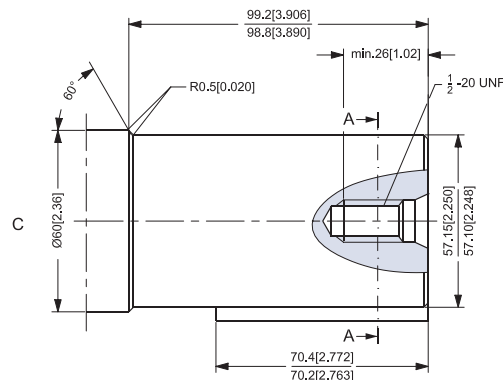
A: Cylindrical 50 mm shaft
D: Parallel key
A14 × 9 × 70
DIN 6885
Keyway deviates from standard



B: Cylindrical 2.25 in shaft for OMV with standard mounting flange
E: Parallel key
 $\frac{1}{2} \times \frac{1}{2} \times 2\frac{1}{4}$ in
B.S.46
Keyway deviates from standard



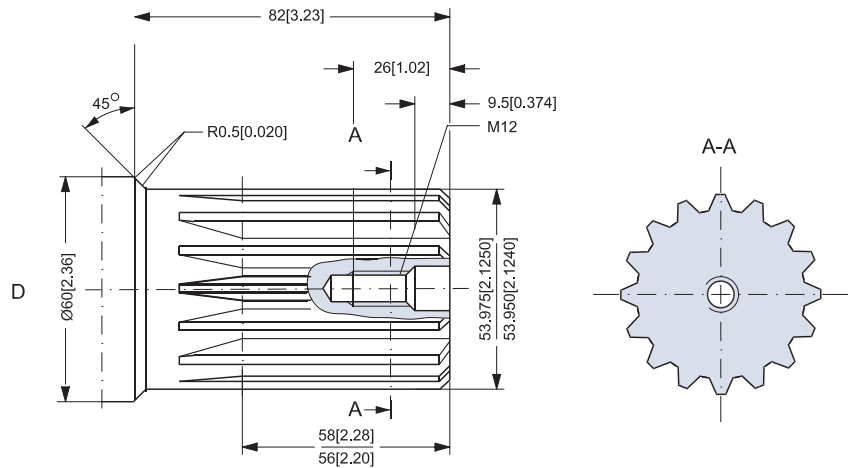
C: Cylindrical 2.25 in shaft for OMV with mounting flange SAE-C
F: Parallel key
 $\frac{1}{2} \times \frac{1}{2} \times 2\frac{1}{4}$ in
B.S.46
Keyway deviates from standard



151-878.11

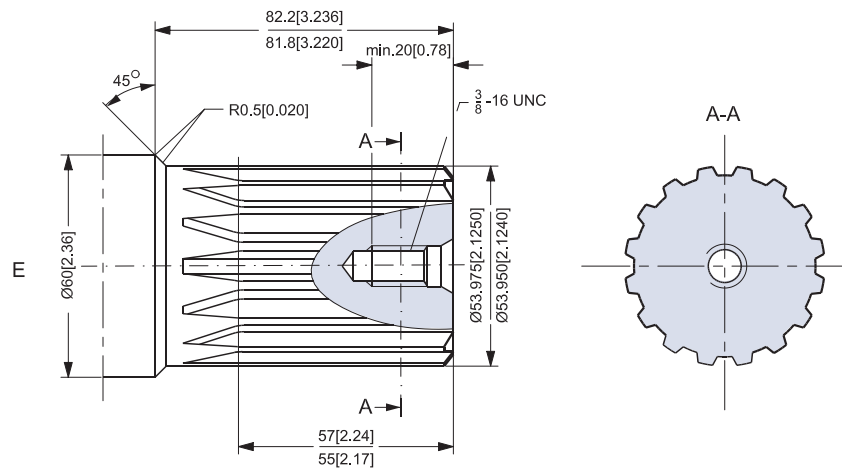
SHAFT VERSION

D: Involute splined shaft
ANS B92.1 - 1970 standard
Flat root side fit
Pitch $\frac{8}{16}$
Teeth 16
Major dia. 2.125 in
Pressure angle 30°



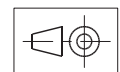
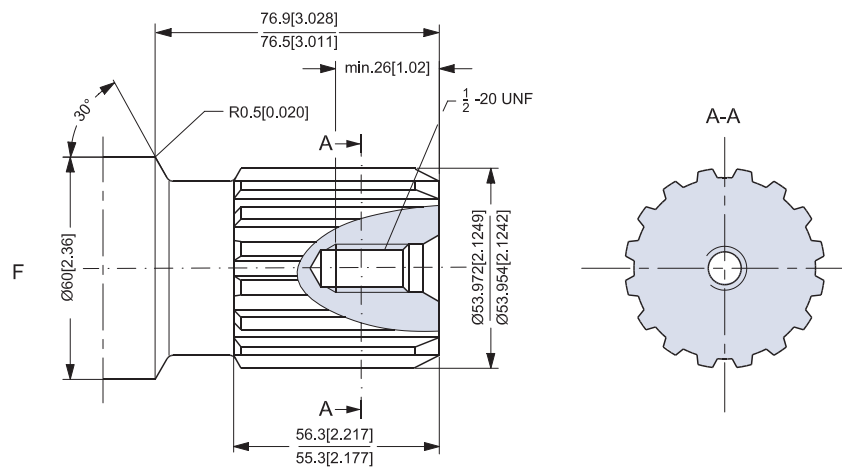
US Version

E: Involute splined shaft
for OMV with standard
mounting flange
ANS B92.1 - 1970 standard
Flat root side fit
Pitch $\frac{8}{16}$
Teeth 16
Major dia. 2.125 in
Pressure angle 30°



US Version

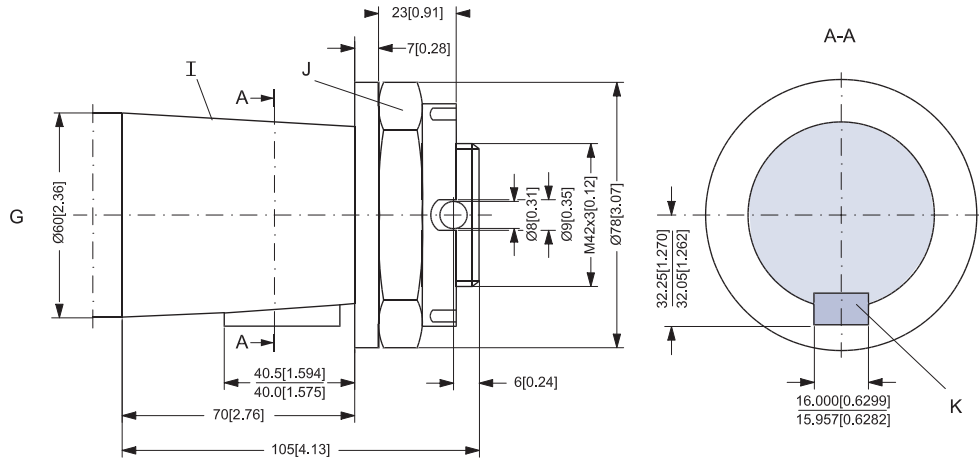
F: Involute splined shaft
for OMV with mounting
flange SAE-C
ANS B92.1 - 1970 standard
Flat root side fit
Pitch $\frac{8}{16}$
Teeth 16
Major dia. 2.125 in
Pressure angle 30°



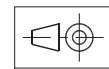
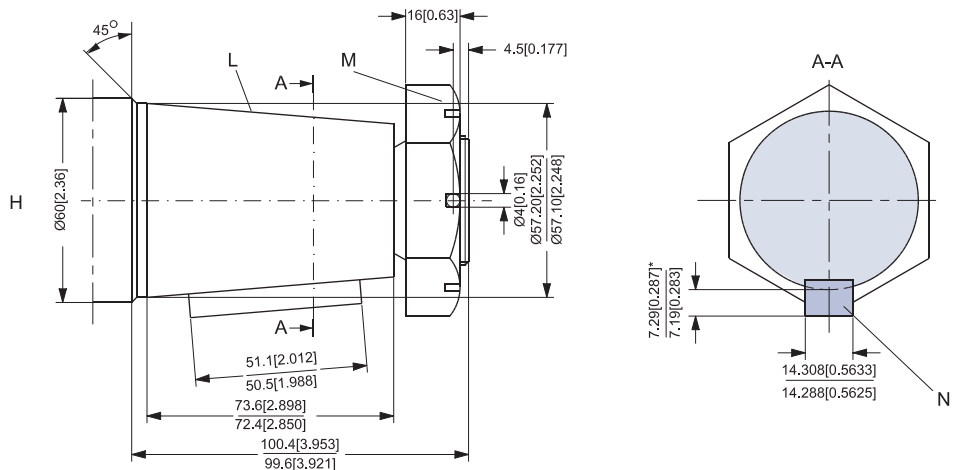
151-1918,10

SHAFT VERSION

- 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

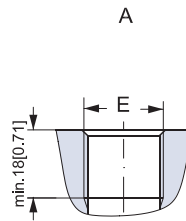


- H: Tapered 2.25 in shaft
- L: Cone 1:8
 SAE J501
- M: 1 1/2 - 18 UNEF
 Across flats: 2 3/8 in
 Tightening torque:
 750 ±50 Nm [6640 ±440 lbf·in]
- N: Parallel key
 9/16 × 9/16 × 2 in
 B.S. 46
 Keyway deviates from standard

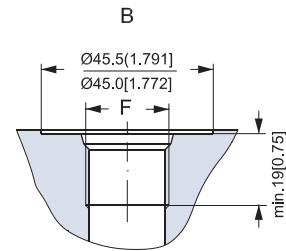


151-1919.10

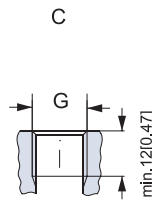
PORT THREAD VERSIONS



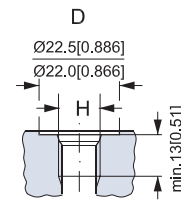
A: G main ports
E: ISO 228/1 - G1



B: UN main ports
F: 1 5/16 - 12 UN
O-ring boss port



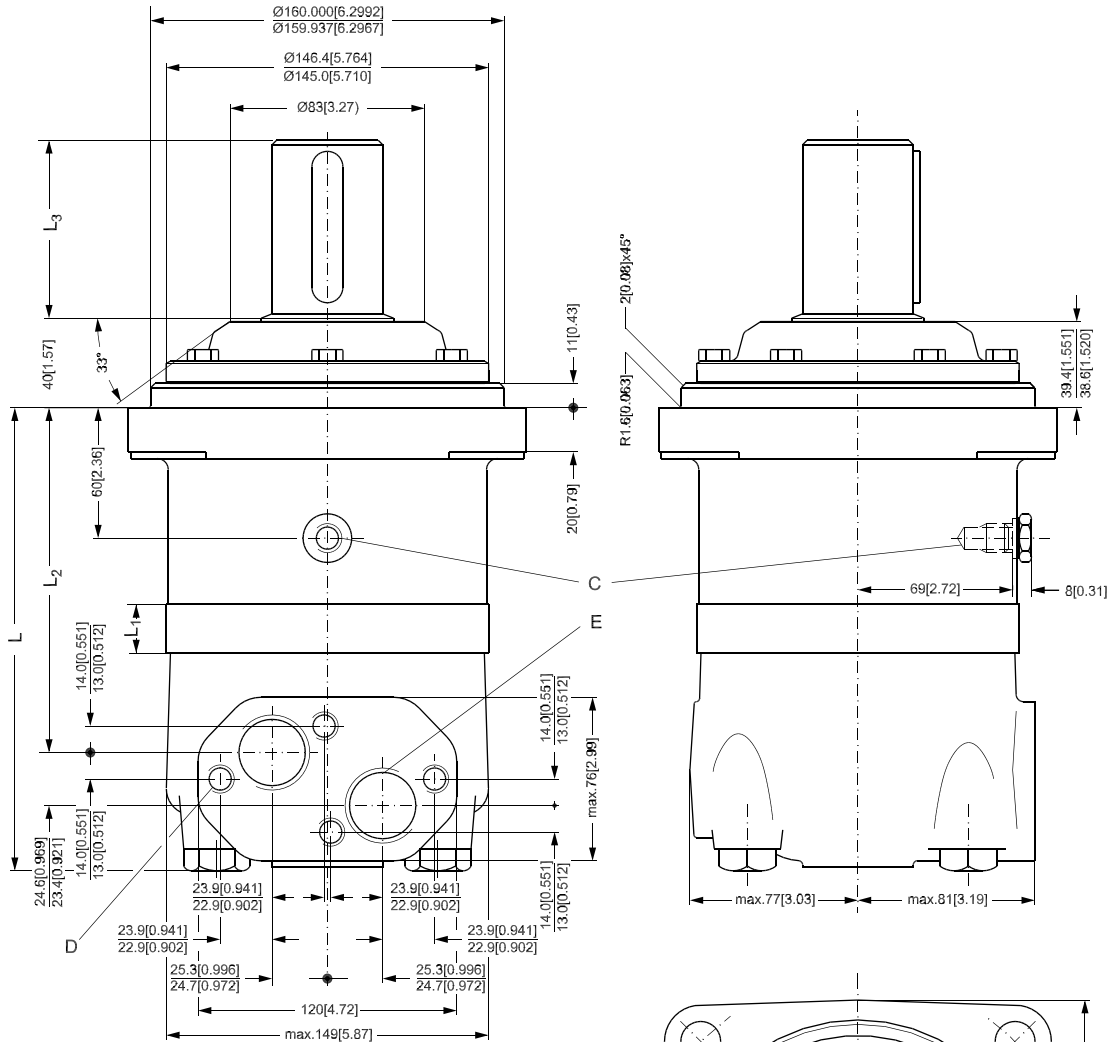
C: G drain port
G: ISO 228/1 - G1/4



D: UNF drain port
H: 9/16 - 18 UNF
O-ring boss port

151-1978.10

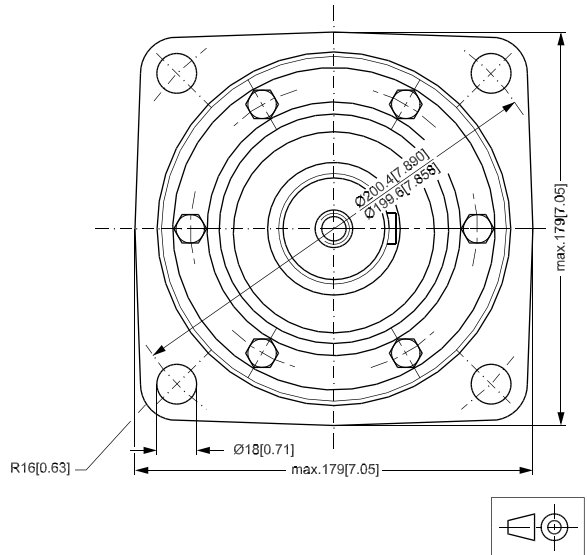
STANDARD FLANGE



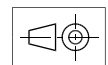
| Type | L _{max.} mm [in] | L ₁ [*] mm [in] | L ₂ mm [in] |
|---------|---------------------------------|---|------------------------------|
| OMV 315 | 215 [8.46] | 22.0 [0.866] | 160 [6.30] |
| OMV 400 | 222 [8.74] | 29.0 [1.142] | 167 [6.57] |
| OMV 500 | 230 [9.05] | 37.0 [1.457] | 175 [6.89] |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

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

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

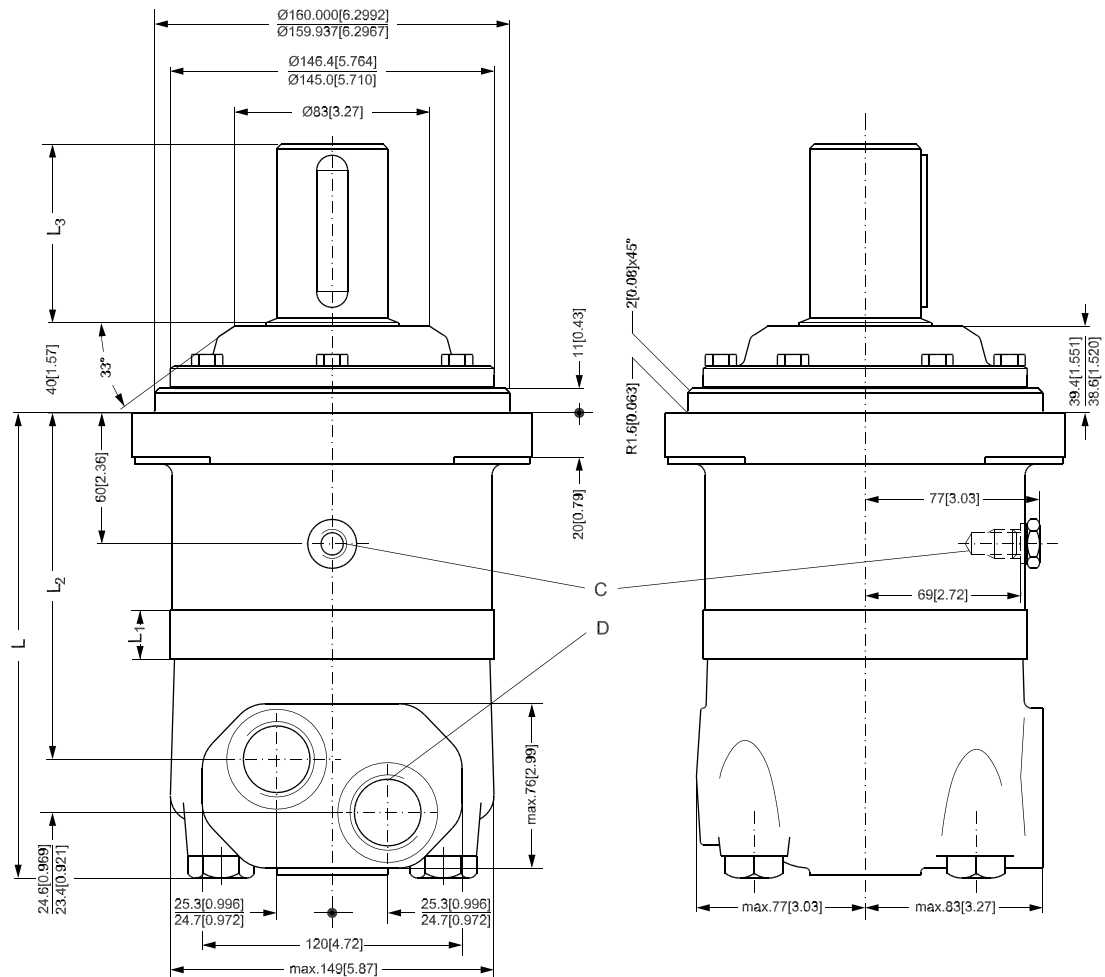


*) The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L₁ dimensions



151-890.11

STANDARD FLANGE

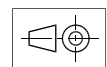
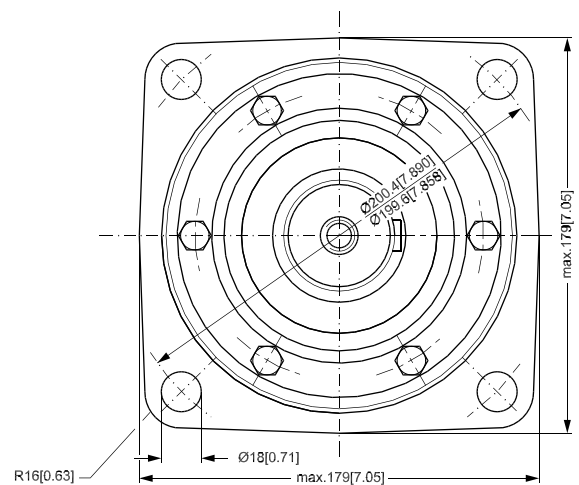


| Type | L_{max} mm [in] | L_{1*} mm [in] | L_2 mm [in] |
|---------|-------------------------|------------------------|---------------------|
| OMV 315 | 215 [8.46] | 22.0 [0.866] | 160 [6.30] |
| OMV 400 | 222 [8.74] | 29.0 [1.142] | 167 [6.57] |
| OMV 500 | 230 [9.05] | 37.0 [1.457] | 175 [6.89] |
| OMV 630 | 240 [9.45] | 47.5 [1.870] | 186 [7.32] |
| OMV 800 | 254 [10.00] | 61.5 [2.421] | 200 [7.87] |

| Output shaft | L_3 mm [in] |
|------------------|---------------------|
| Cyl. 2.25 in | 82 [3.23] |
| Splined 2.125 in | 100 [3.94] |
| Tapered 2.25 in | |

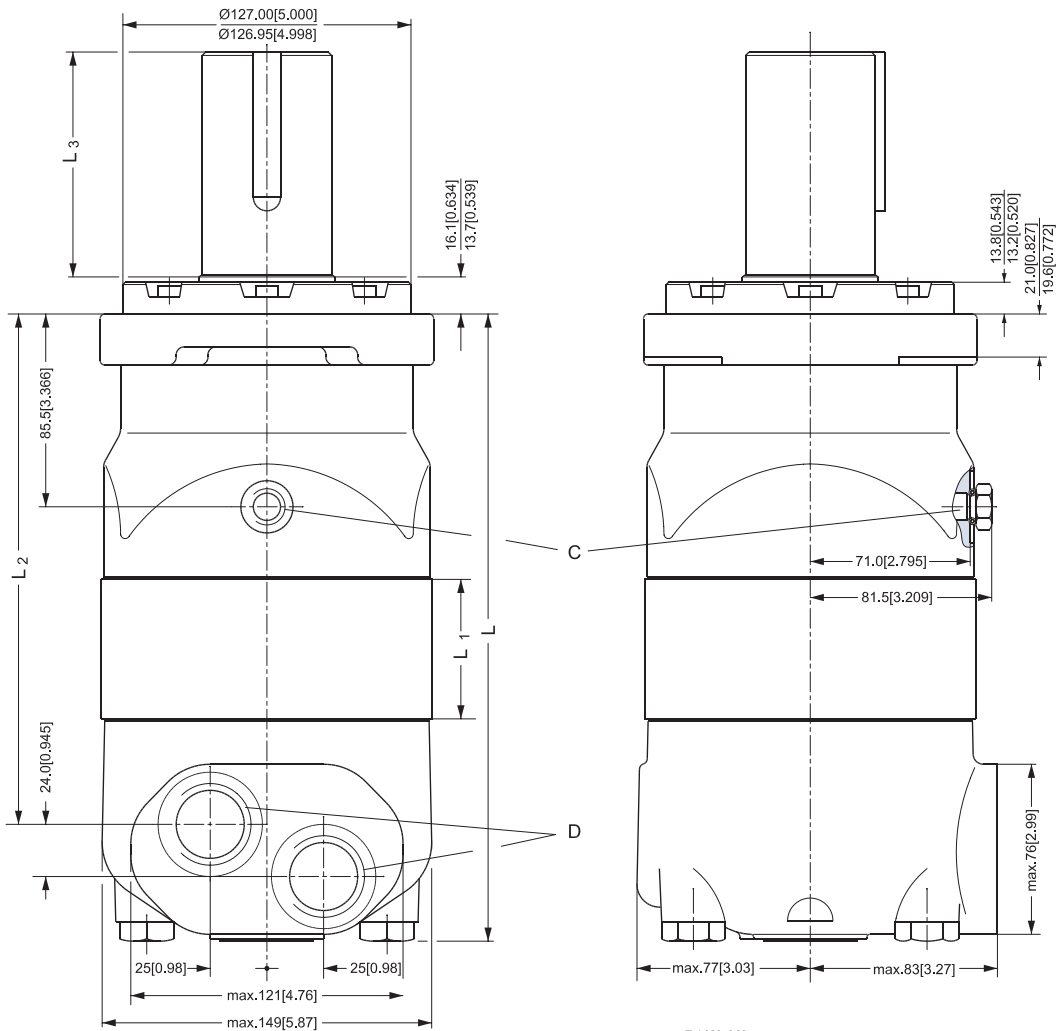
- C: Drain connection
 $\frac{9}{16}$ - 18 UNF;
 13 mm [0.51 in] deep
 O-ring boss port
- D: $1\frac{5}{16}$ - 12 UN;
 19 mm [0.75 in] deep
 O-ring boss port

*) The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L_1 dimensions



151-890.11.22

SAE-C FLANGE



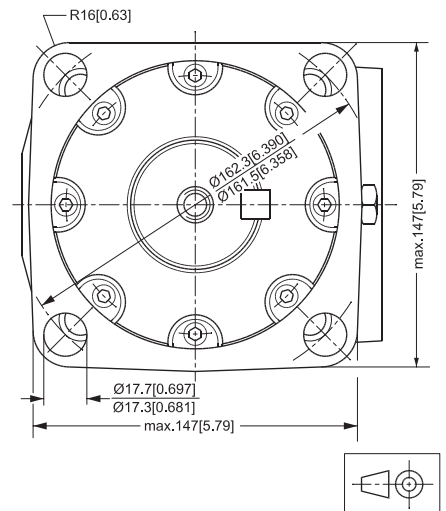
| Type | L _{max.} mm [in] | L _{1*} mm [in] | L ₂ mm [in] |
|---------|---------------------------------|-------------------------------|------------------------------|
| OMV 315 | 239 [9.41] | 22.0 [0.866] | 185 [7.28] |
| OMV 400 | 246 [9.69] | 29.0 [1.142] | 192 [7.56] |
| OMV 500 | 254 [10.00] | 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] |

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

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

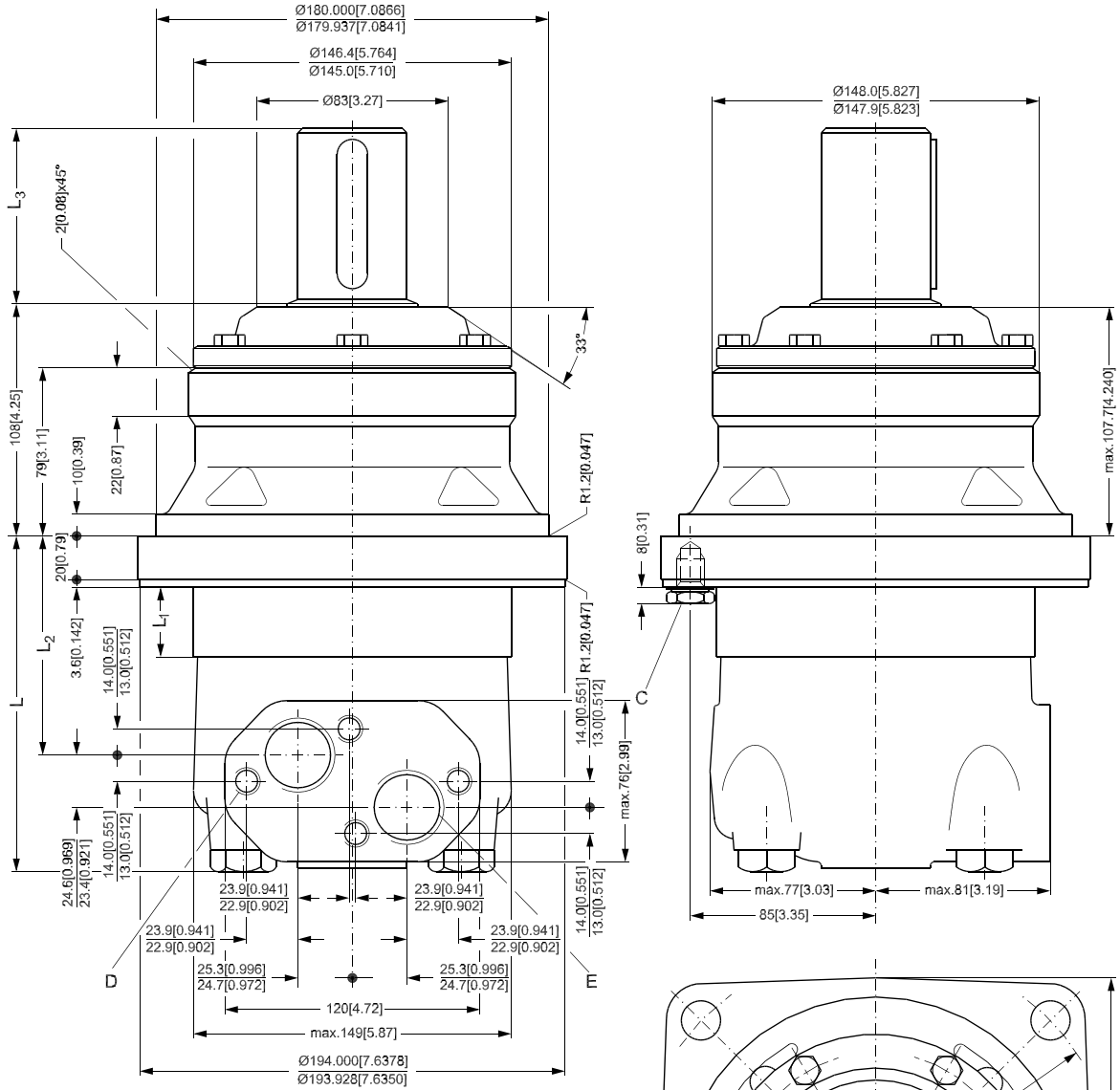
D: 1 5/16 - 12 UN;
 19 mm [0.75 in] deep
 O-ring boss port

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



151-1485.10

WHEEL

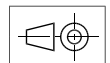
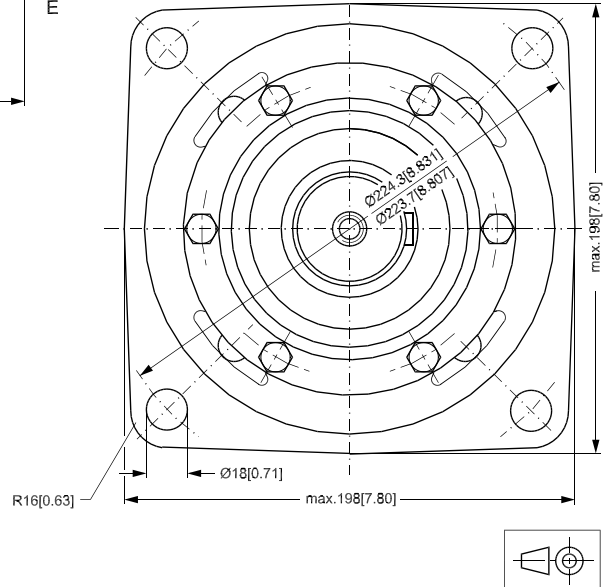


| Type | L_{max} mm [in] | L_{1+} mm [in] | L_2 mm [in] |
|----------|-------------------------|------------------------|---------------------|
| OMVW 315 | 146 [5.75] | 22.0 [0.866] | 92 [3.62] |
| OMVW 400 | 153 [6.02] | 29.0 [1.142] | 99 [3.90] |
| OMVW 500 | 161 [6.34] | 37.0 [1.457] | 107 [4.21] |
| OMVW 630 | 172 [6.77] | 47.5 [1.870] | 118 [4.65] |
| OMVW 800 | 185 [7.28] | 61.5 [2.421] | 132 [5.20] |

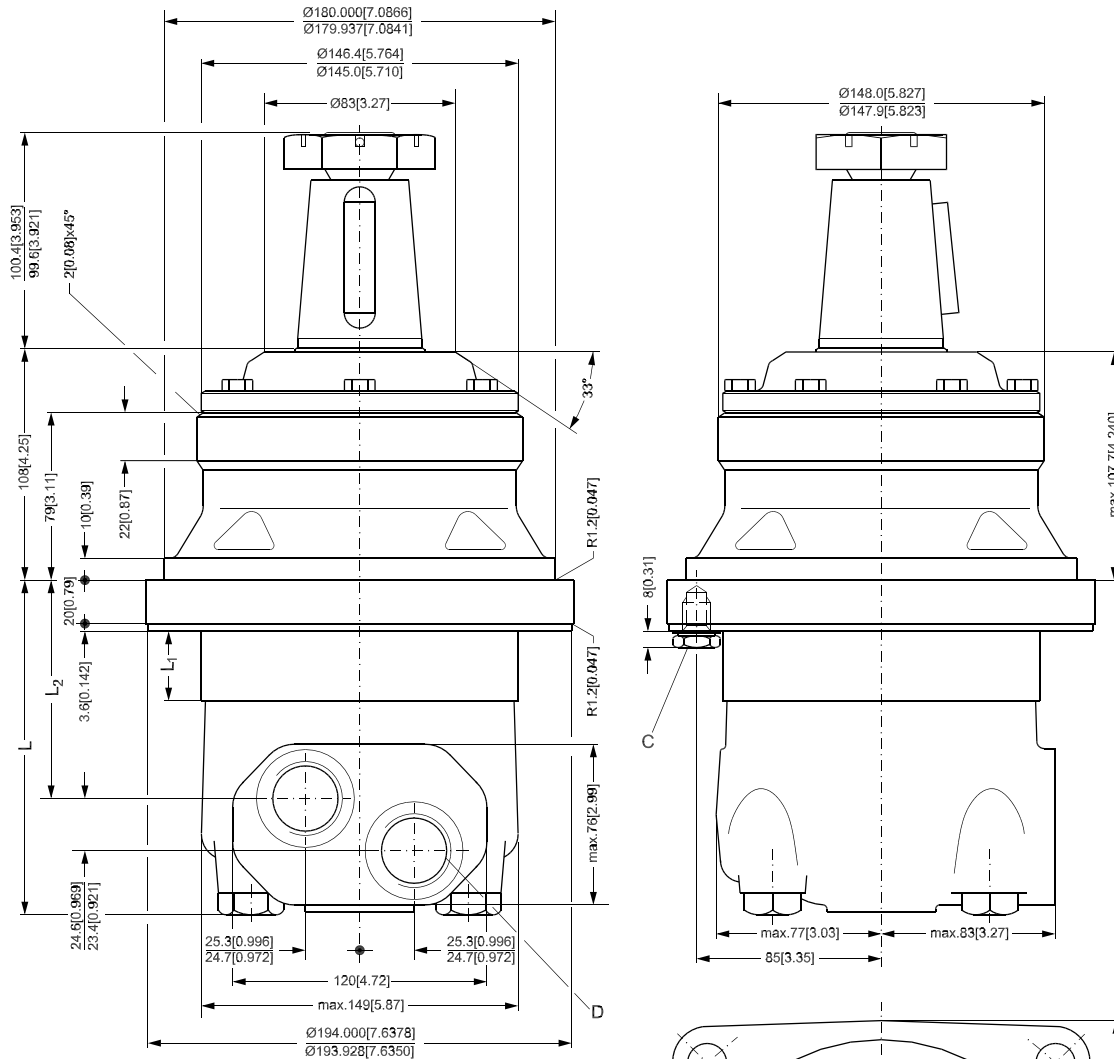
| Output shaft | L_3 mm [in] |
|---------------|---------------------|
| Cyl. 50 mm | 82 [3.23] |
| Tapered 60 mm | 105 [4.13] |

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

*) The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L_1 dimensions



WHEEL



| Type | L _{max.} mm [in] | L _{1*} mm [in] | L ₂ 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] |
| OMVW 630 | 172 [6.77] | 47.5 [1.870] | 118 [4.65] |
| OMVW 800 | 187 [7.36] | 61.5 [2.421] | 132 [5.20] |

C: Drain connection
 $\frac{9}{16}$ - 18 UNF;
 13 mm [0.51 in] deep
 O-ring boss port

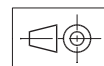
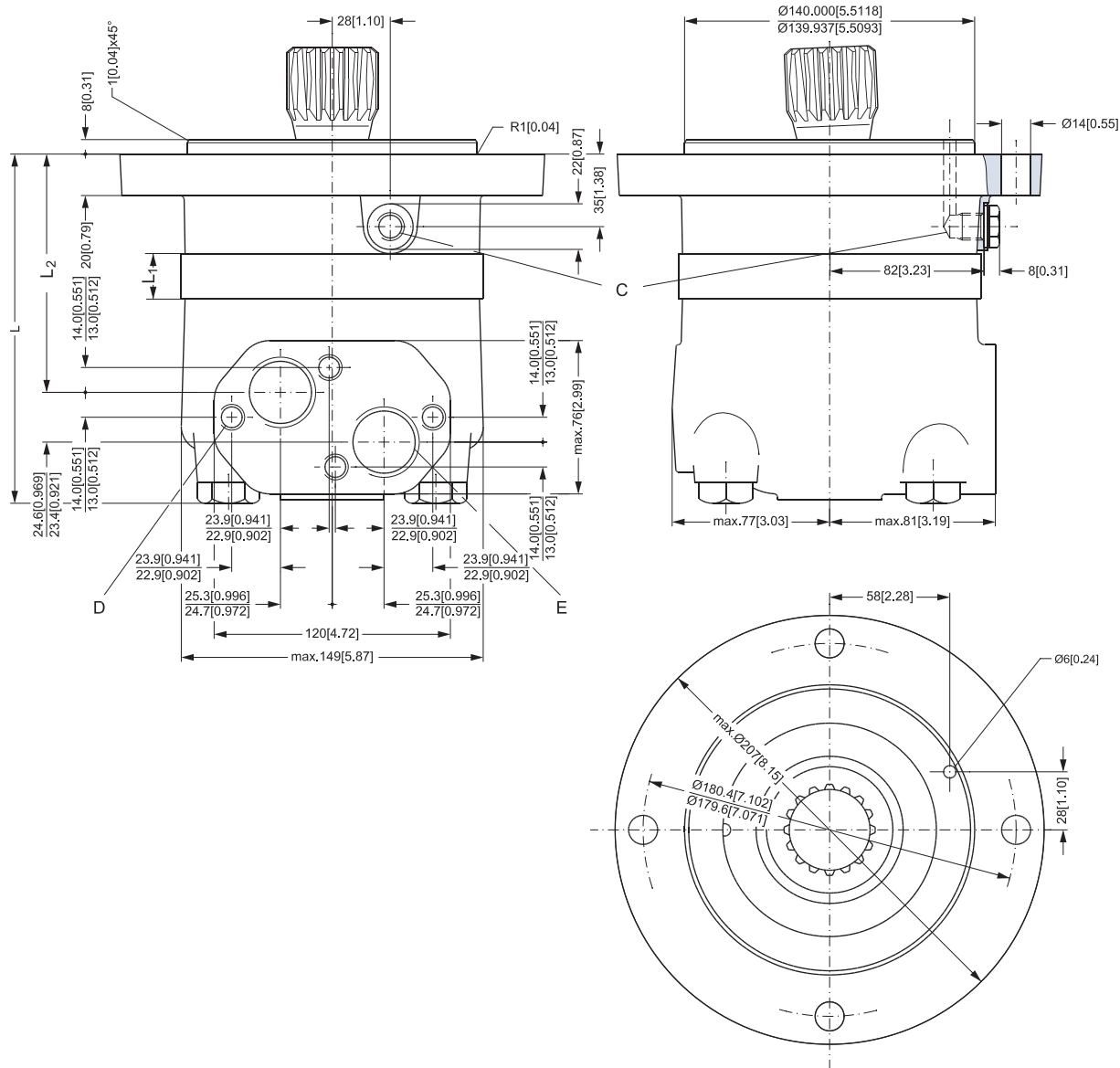
D: $1\frac{5}{16}$ - 12 UN;
 19 mm [0.75 in] deep
 O-ring boss port

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



151-899.11.22

SHORT



151-900.10

| Type | L _{max.} mm [in] | L ₁ * mm [in] | L ₂ mm [in] |
|------|---------------------------------|--------------------------------|------------------------------|
| OMVS | 171 | 22.0 | 117 |
| 315 | [6.73] | [0.866] | [4.61] |
| OMVS | 179 | 29.0 | 124 |
| 400 | [7.05] | [1.142] | [4.88] |
| OMVS | 186 | 37.0 | 132 |
| 500 | [7.32] | [1.457] | [5.20] |
| OMVS | 197 | 47.5 | 143 |
| 630 | [7.76] | [1.870] | [5.63] |
| OMVS | 211 | 61.5 | 157 |
| 800 | [8.31] | [2.421] | [6.18] |

- 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

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

INSTALLING THE OMVS

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.

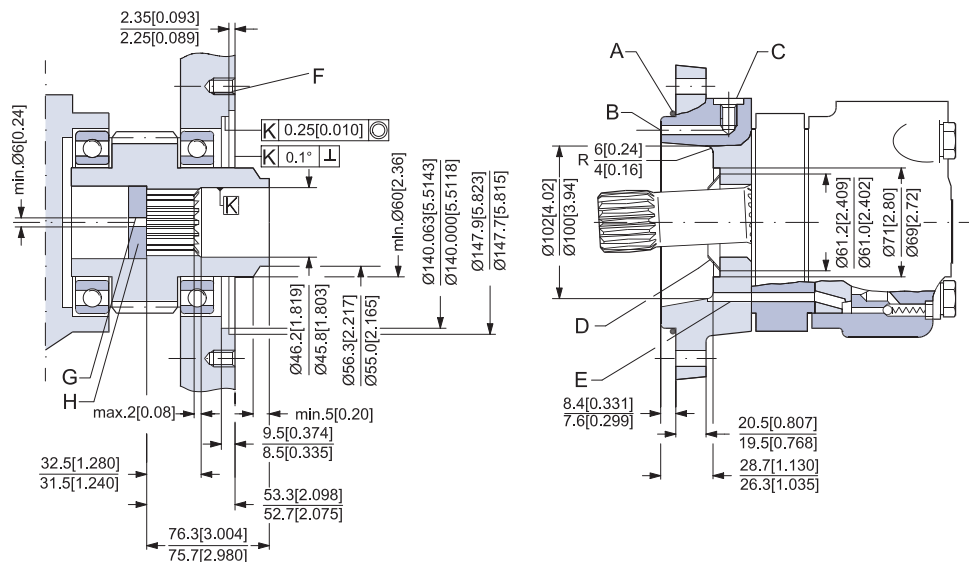
During start and operation it is important that the spline connection and the bearings in the attached component receive oil and are adequately lubricated. To ensure that the spline connection receives sufficient oil, a conical sealing ring between the shaft of the attached component and the motor intermediate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

**OMVS
 DIMENSIONS OF THE
 ATTACHED COMPONENT**



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
- D: Conical seal ring

- E: Internal drain channel
- F: M12; min. 18 mm [0.71 in] deep
- H: Hardened stop plate

**INTERNAL SPLINE DATA
 FOR THE COMPONENT TO
 BE ATTACHED**

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

Material:

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

Hardening specification:

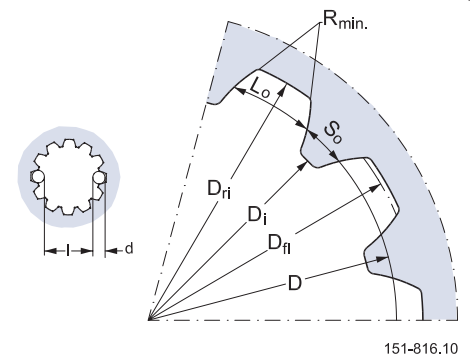
- On the surface: HV = 750 ± 50
- 0.7 ± 0.2 mm under the surface: HV = 560

Internal involute spline data

Standard ANS B92.1-1970, class 5 (corrected $m \cdot X = 1$; $m = 2.54$)

| Flat root side fit | | mm | in |
|--------------------------------|-------------------|-------------------------------------|---------------------------------------|
| Number of teeth | z | 16 | 16 |
| Pitch | DP | 10/20 | 10/20 |
| Pressure angle | | 30° | 30° |
| Pitch dia. | D | 40.640 | 1.6 |
| Major dia. | D _{ri} | 45.2 ^{+0.4} ₀ | 1.780 ^{+0.016} ₀ |
| Form dia. (min.) | D _{fi} | 44.6 | 1.756 |
| Minor dia. | D _i | 38.5 ^{+0.039} ₀ | 1.516 ^{+0.0015} ₀ |
| Space width (circular) | L _o | 5.180 ^{±0.037} | 0.204 ^{±0.0015} |
| Tooth thickness (circular) | S _o | 2.835 | 0.1116 |
| Fillet radius | R _{min.} | 0.4 | 0.015 |
| Max. measurement between pins* | l | 32.47 ^{+0.15} ₀ | 1.278 ^{+0.006} ₀ |
| Pin dia. | d | 5.6 ^{±0.001} | 0.22 ^{±0.00004} |

* Finished dimensions (when hardened)



**DRAIN CONNECTION ON
 OMVS OR ATTACHED
 COMPONENT**

A drain line ought to be used when pressure in the return line can exceed the permissible pressure on the shaft seal of the attached component.

The drain line can be connected at two different points:

- 1) at the motor drain connection
- 2) at the 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.