

Technical Information OMS, OMT and OMV Orbital Motors

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 available (options)

Speed sensor

Motor with tachometer connection

Viton shaft seal

Painted

Ultra short

Code numbers
Code numbers

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

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 Information OMS, OMT and OMV Orbital Motors

Technical data

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. Nm [lbf-in]		710 [6280]	910 [8050]	1130 [10000]	1330 [11770]	1510 [13360]
	at max. press. drop int. ¹⁾ Nm [lbf-in]		850 [7520]	1090 [9650]	1360 [12040]	1550 [13720]	1700 [15050]

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

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

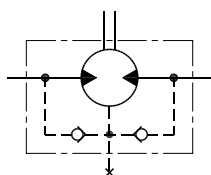
²⁾ Peak load: The permissible values may occur for max. 1% of every minute.

[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



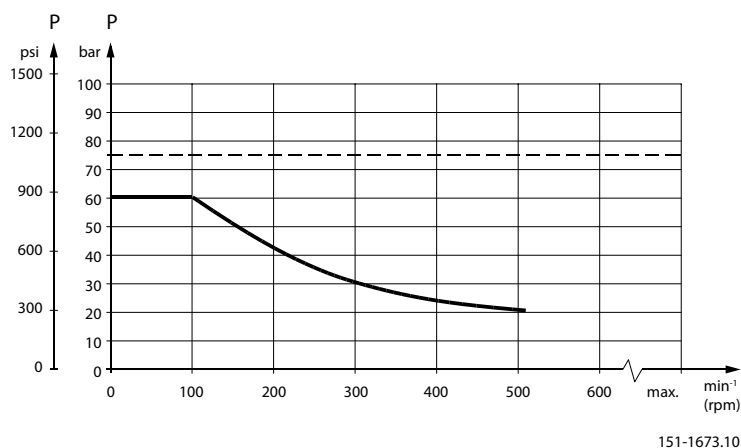
151-320.10

Technical data

OMV with check valves and with drain connection:

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

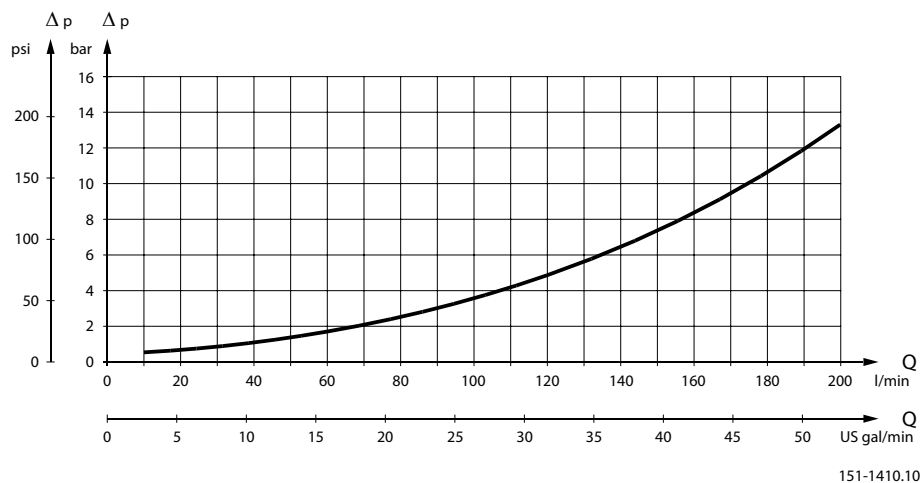
Max. return pressure without drain line or max. pressure in the drain line



--- 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)

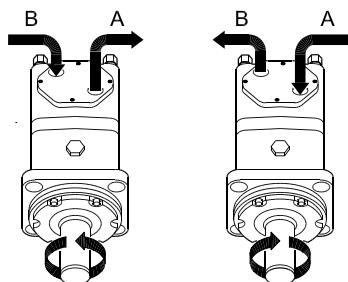
Oil flow in drain line

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]

Technical data

Direction of shaft rotation



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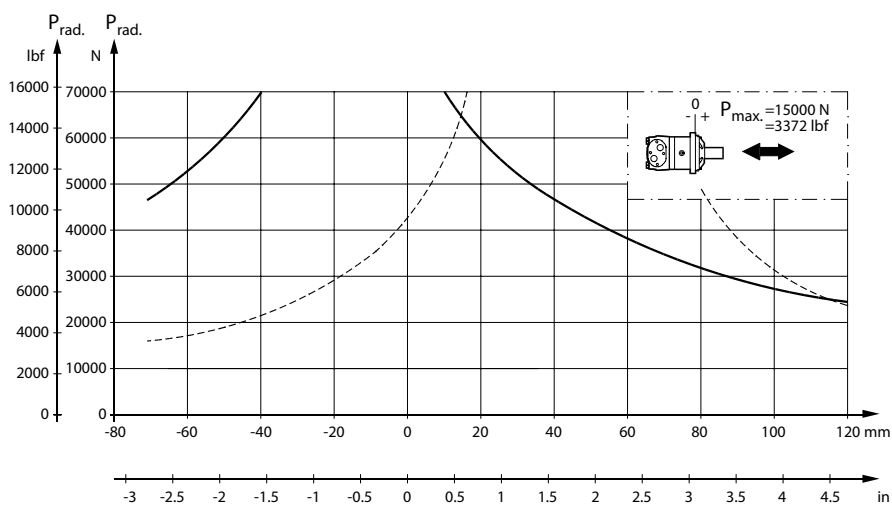
Permissible shaft loads for OMV

Mounting flange:

Standard

Shaft:

All shaft types



151-1973.10

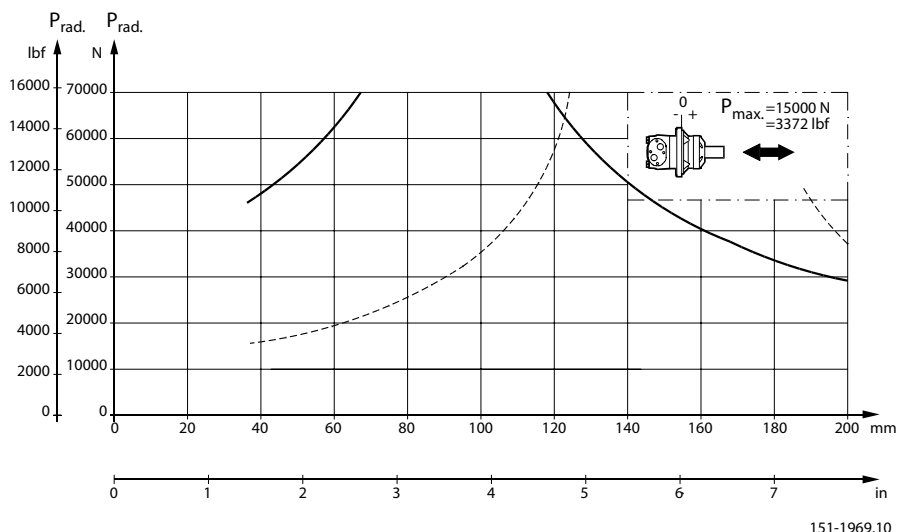
Mounting flange:

Wheel

Shaft:

All shaft types

Technical data



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

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

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

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

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

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

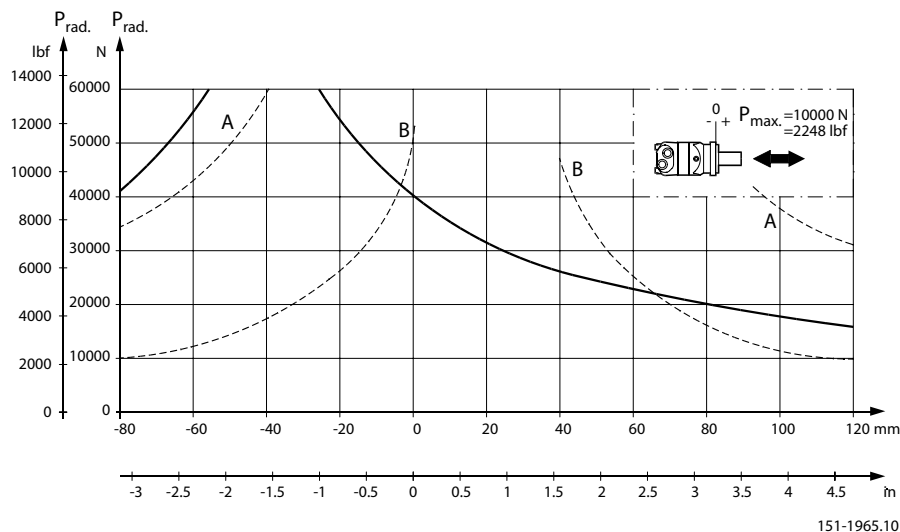
Mounting flange:

SAE-C

Shaft:

All shaft types

Technical data



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.

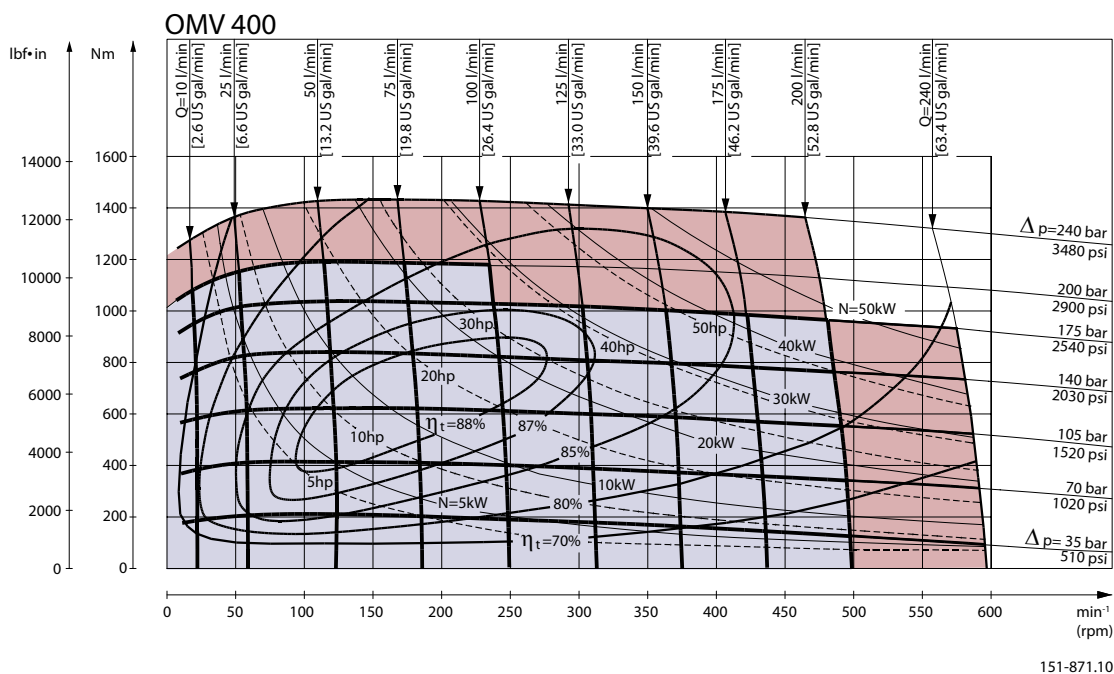
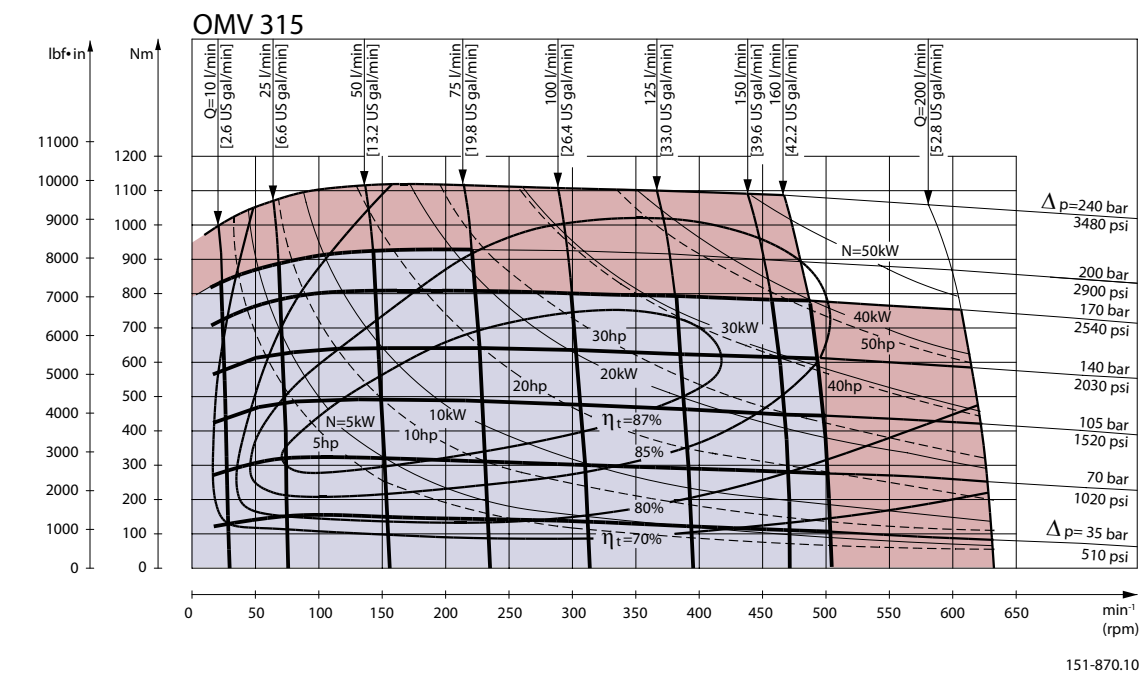
For 3,000,000 shaft revolutions or 500 hours – increase these shaft loads with 52%.

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

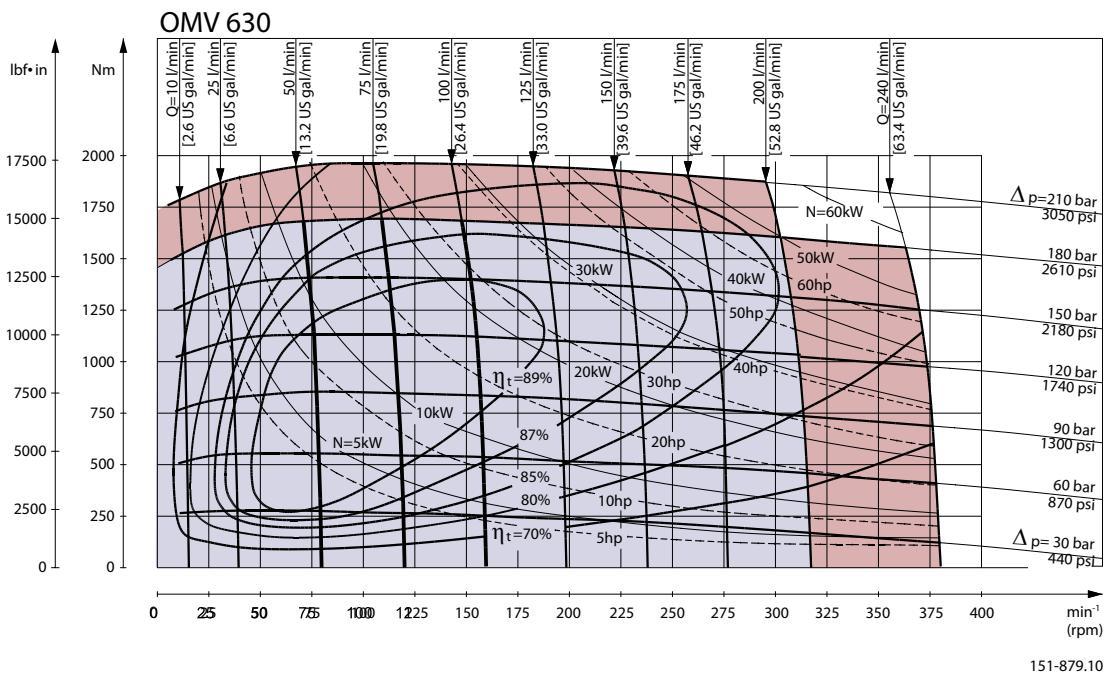
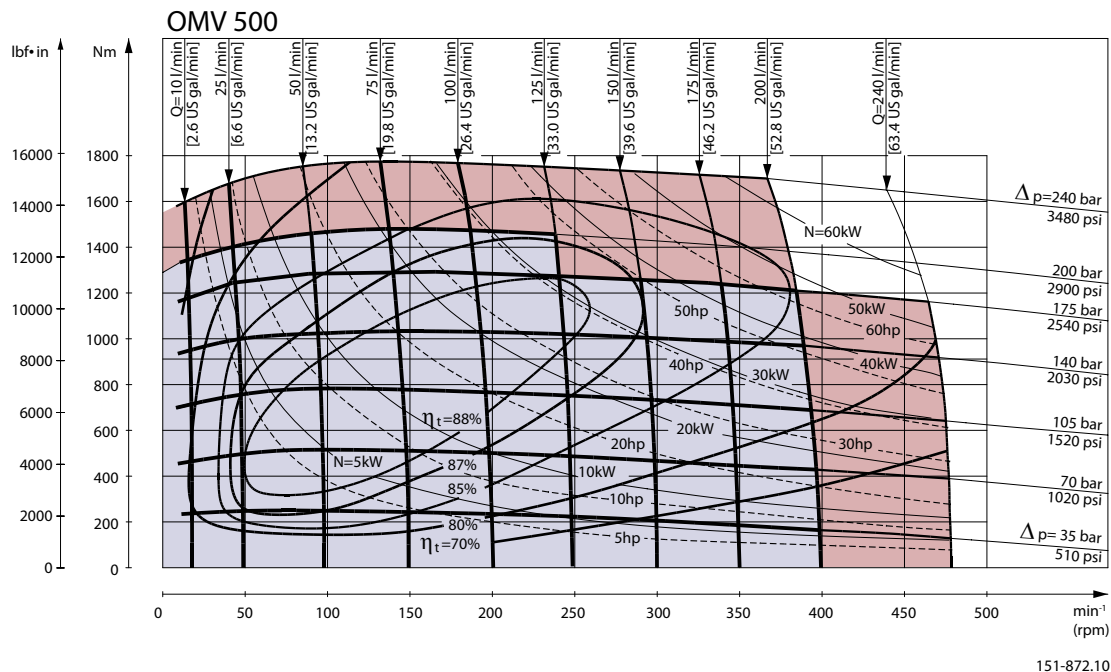
Bearing life calculations can be made using the explanation and formula provided in the chapter "Bearing dimensioning" in the technical information "General Orbital motors" 520L0232.

Function diagrams

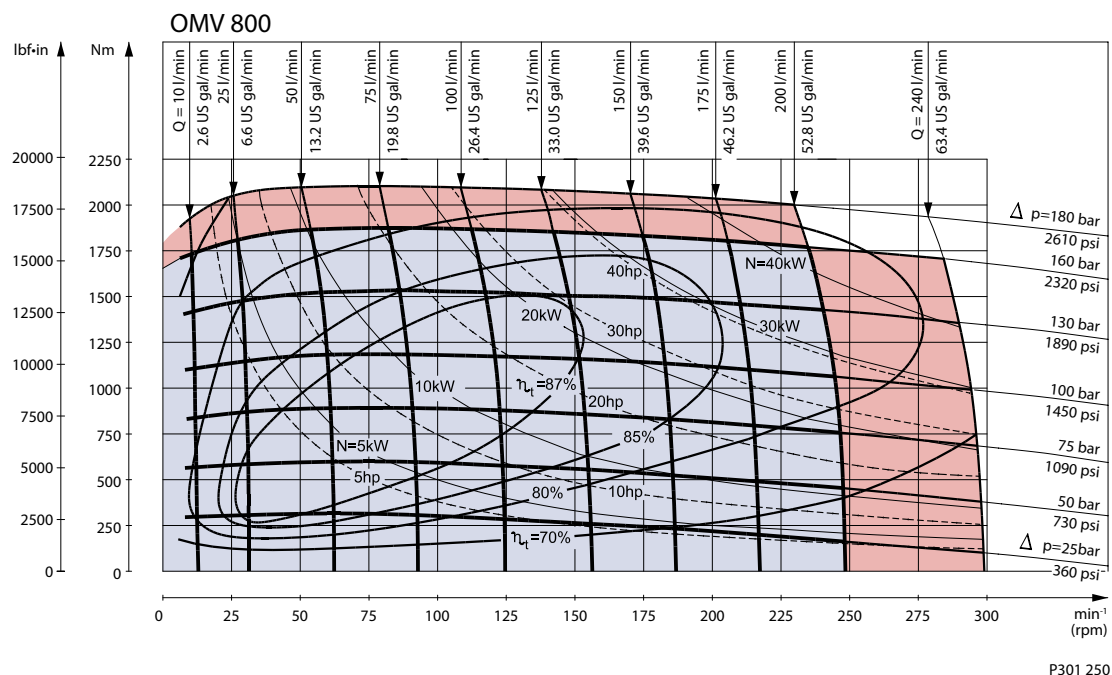
Function diagrams



Function diagrams



Function diagrams



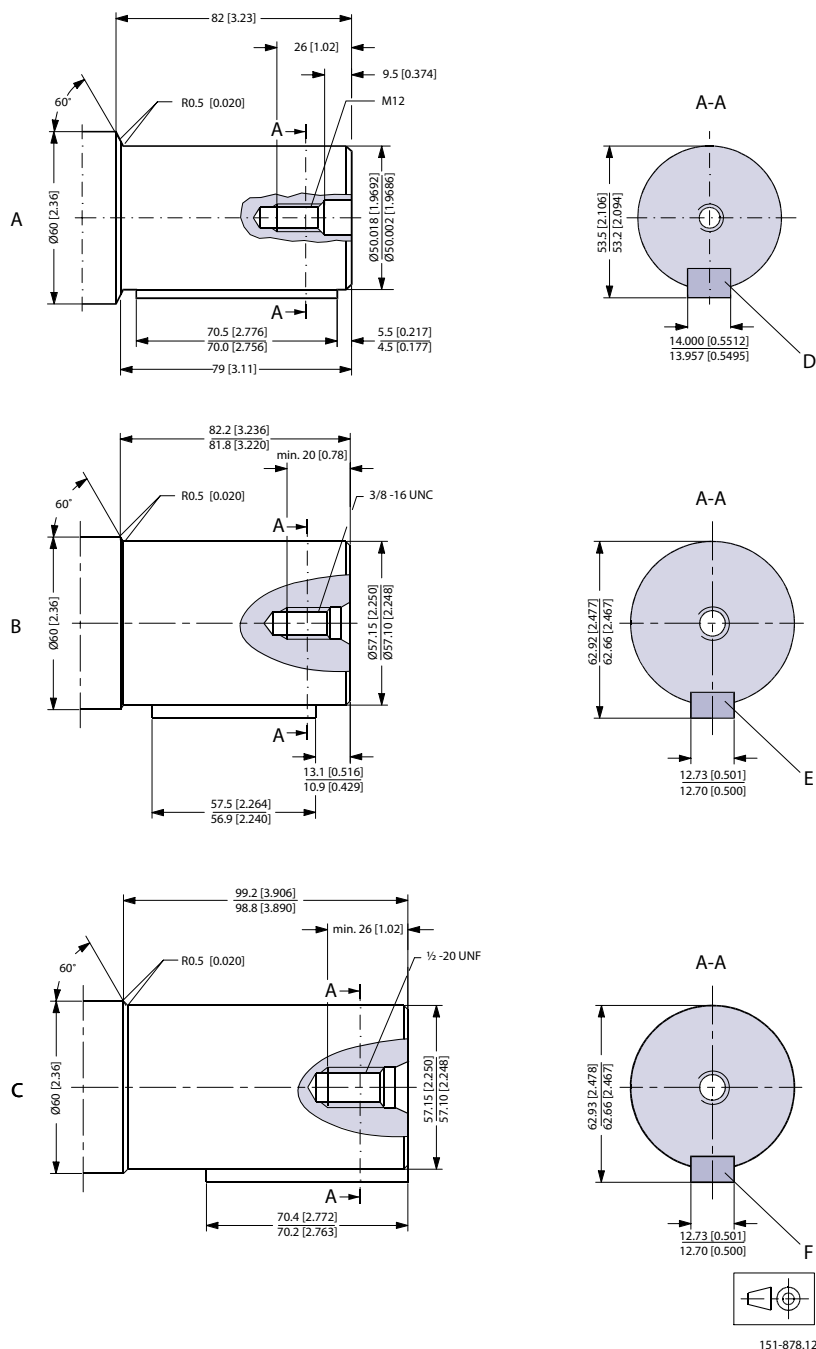
Explanation of function diagram use, basis and conditions, see [OMS, OMT and OMV speed, torque and output](#) on page 8.

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

Intermittent pressure drop and oil flow must not occur simultaneously.

Shaft version

Shaft Version



A: Cylindrical 50 mm shaft

B: Cylindrical 2.25 in shaft for OMV with standard mounting flange

C: Cylindrical 2.25 in shaft for OMV with mounting flange SAE-C

D: Parallel key

A14 × 9 × 70; DIN 6885

Keyway deviates from standard

E: Parallel key

1/2 × 1/2 × 2 1/4 in; B.S. 46

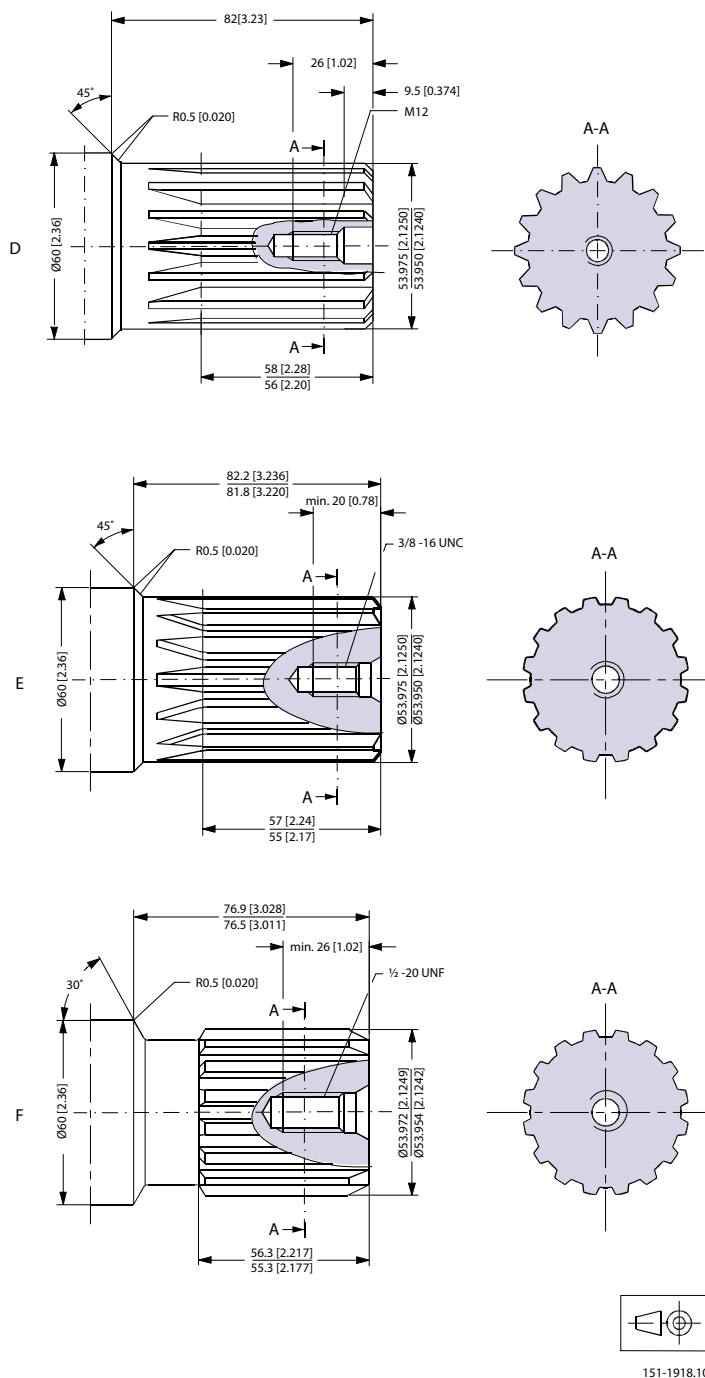
Keyway deviates from standard

F: Parallel key

1/2 × 1/2 × 2 1/4 in; B.S. 46

Keyway deviates from standard

Shaft version

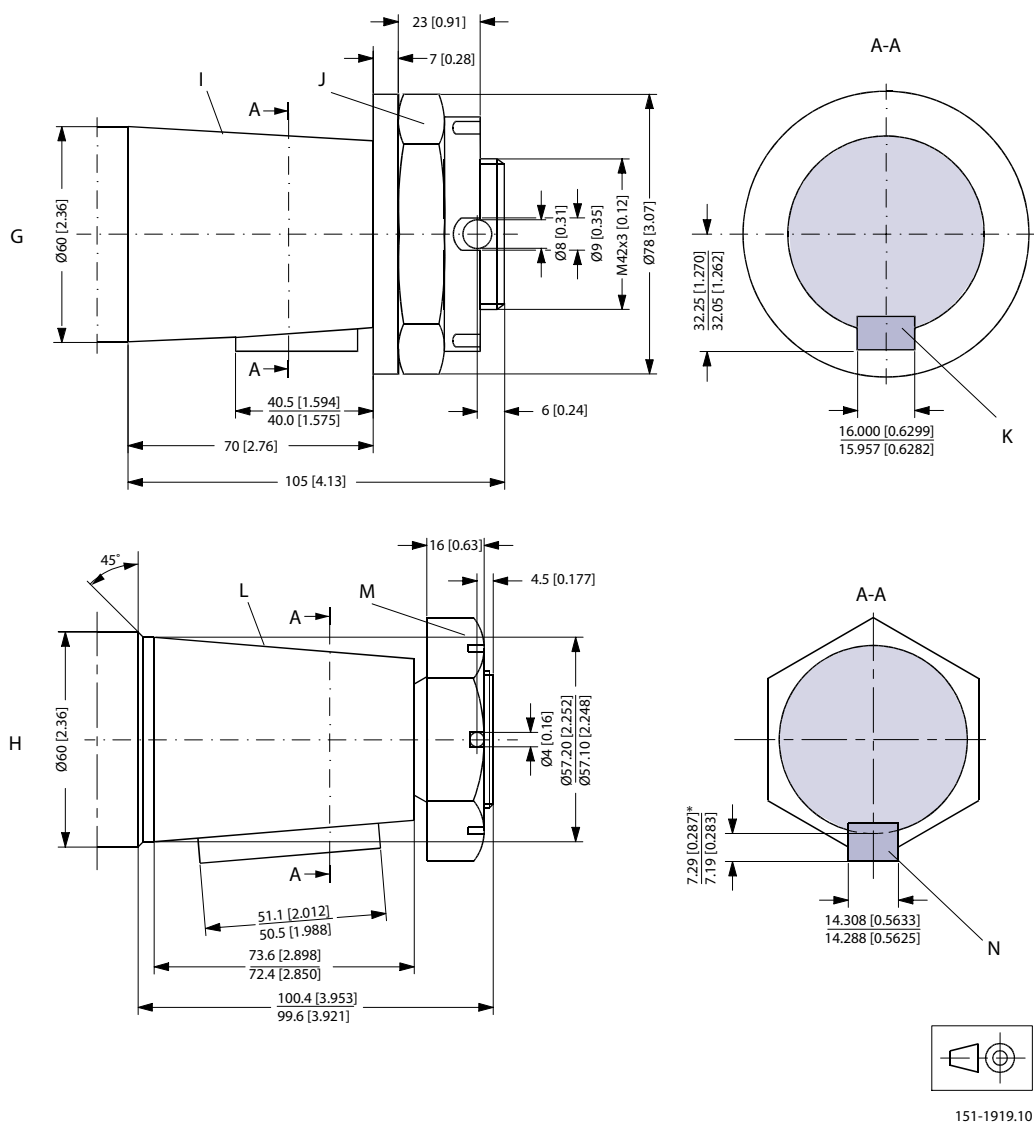


D: Involute splined shaft ANSI B92.1 - 1970 standard
Flat root side fit
Pitch 8/16; Teeth 16
Major dia. 2.125 in
Pressure angle 30°

US Version
E: Involute splined shaft for OMV with standard mounting flange ANSI B92.1 - 1970 standard
Flat root side fit
Pitch 8/16; Teeth 16
Major dia. 2.125 in
Pressure angle 30°

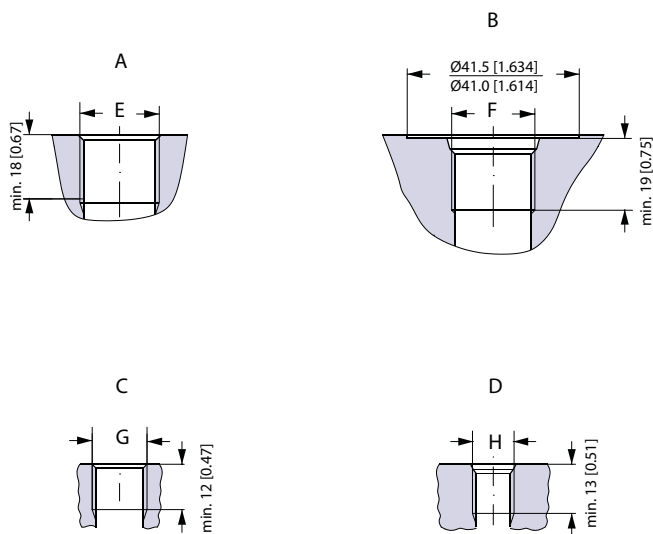
US Version
F: Involute splined shaft for OMV with mounting flange SAE-C ANSI B92.1 - 1970 standard
Flat root side fit
Pitch 8/16; Teeth 16
Major dia. 2.125 in
Pressure angle 30°

Shaft version



Shaft version

Port thread versions



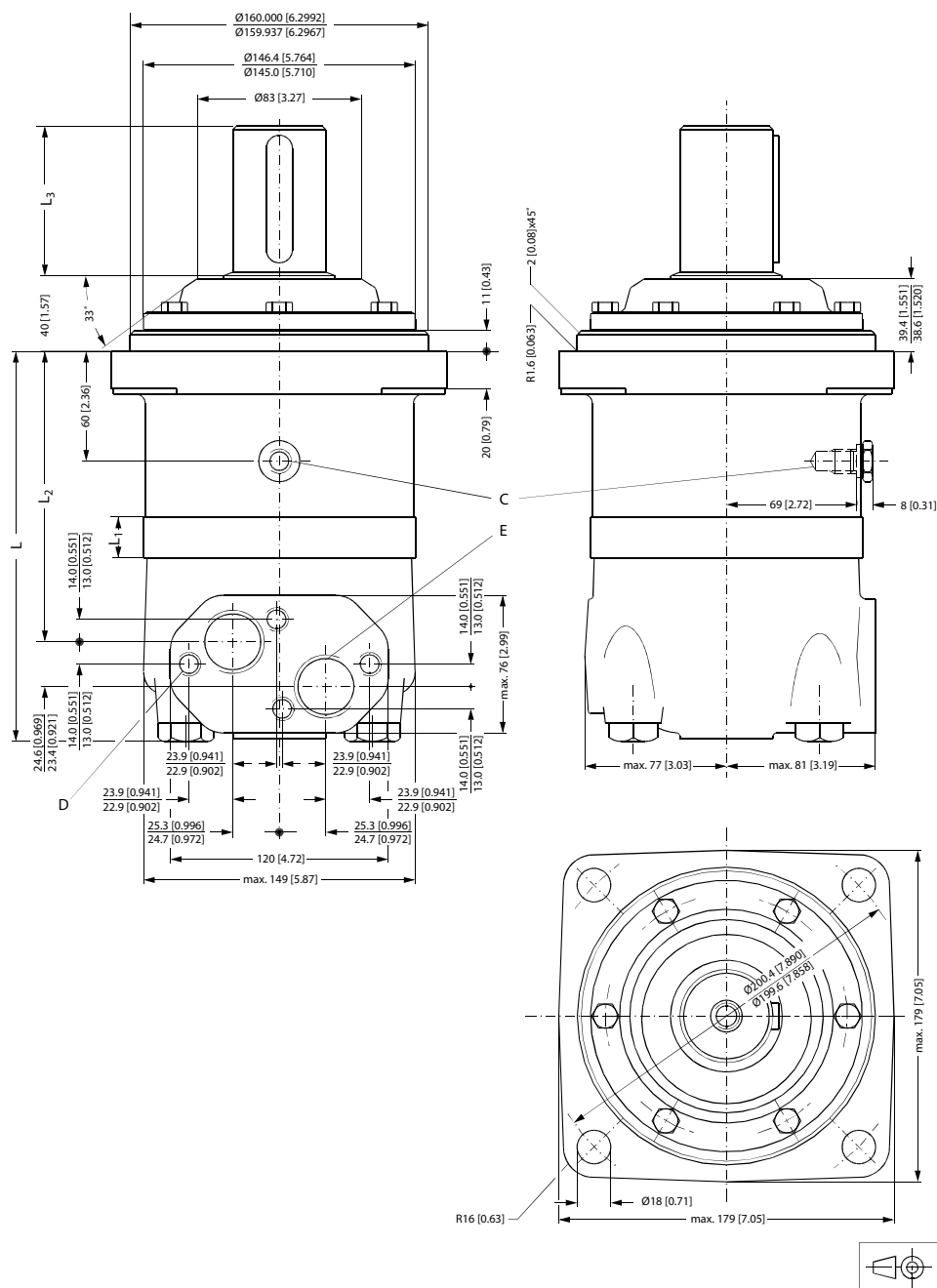
151-1977.11

A: G main ports
E: ISO 228/1 - G1 O-ring boss port
C: G drain port
G: ISO 228/1 - G1/4 O-ring boss port

B: UN main ports
F: 1 5/16 - 12 UN
D: UNF drain port
H: 9/16 - 18 UNF

Dimensions – European version

Standard flange



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 _{max} mm [in]	L ₁ * mm [in]	L ₂ mm [in]
OMV 315	215 [8.46]	22.0 [0.866]	160 [6.30]

Technical Information OMS, OMT and OMV Orbital Motors

Dimensions – European version

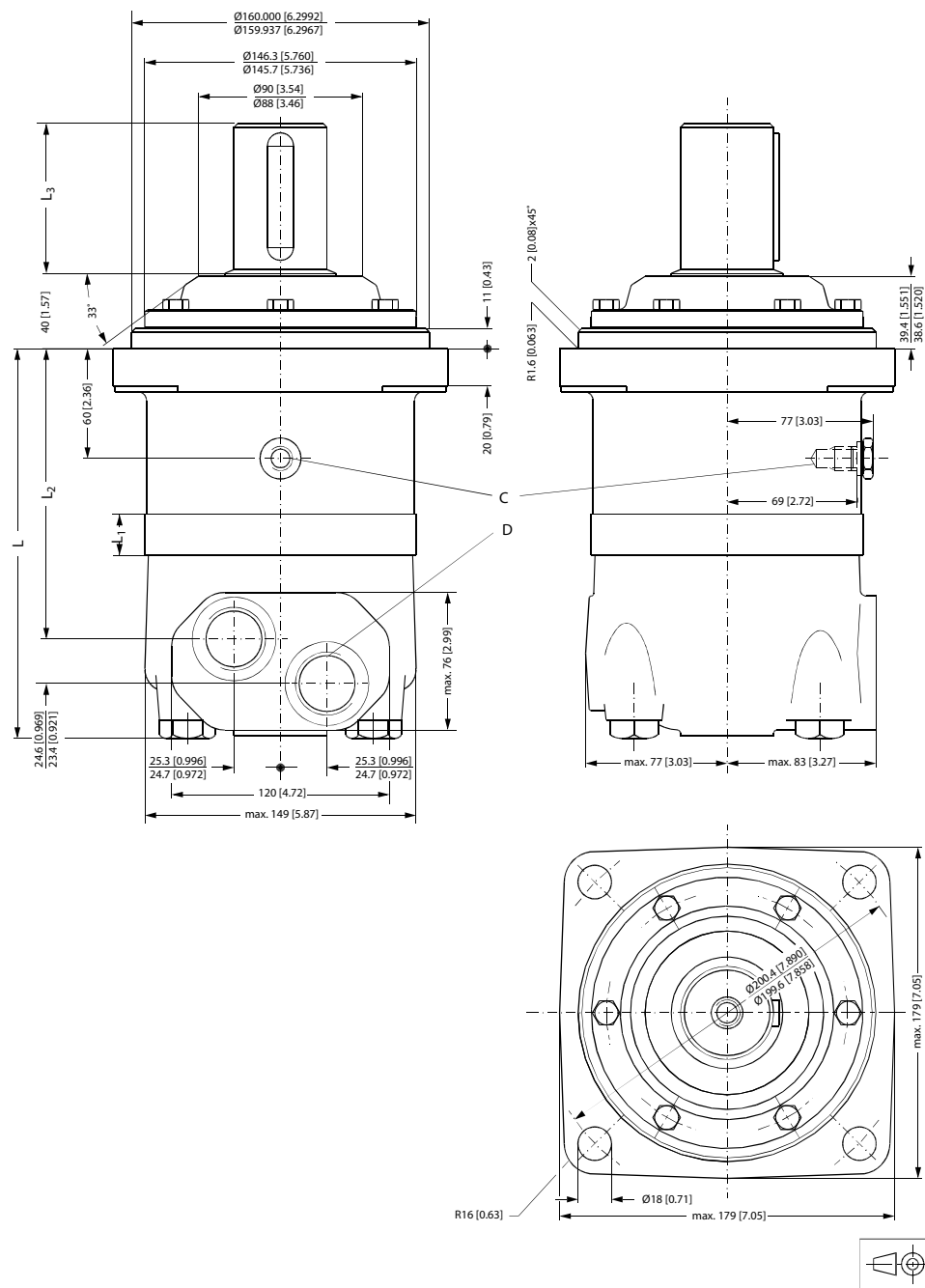
Type	L _{max} mm [in]	L ₁ * mm [in]	L ₂ mm [in]
OMV 400	222 [8.74]	29.0 [1.142]	167 [6.57]
OMV 500	230 [9.05]	37.0 [1.457]	175 [6.89]
OMV 630	240 [9.45]	47.5 [1.870]	186 [7.32]
OMV 800	254 [10.00]	61.5 [2.421]	200 [7.87]

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

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

Dimensions – US version

Standard flange



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 _{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]

Technical Information OMS, OMT and OMV Orbital Motors

Dimensions – US version

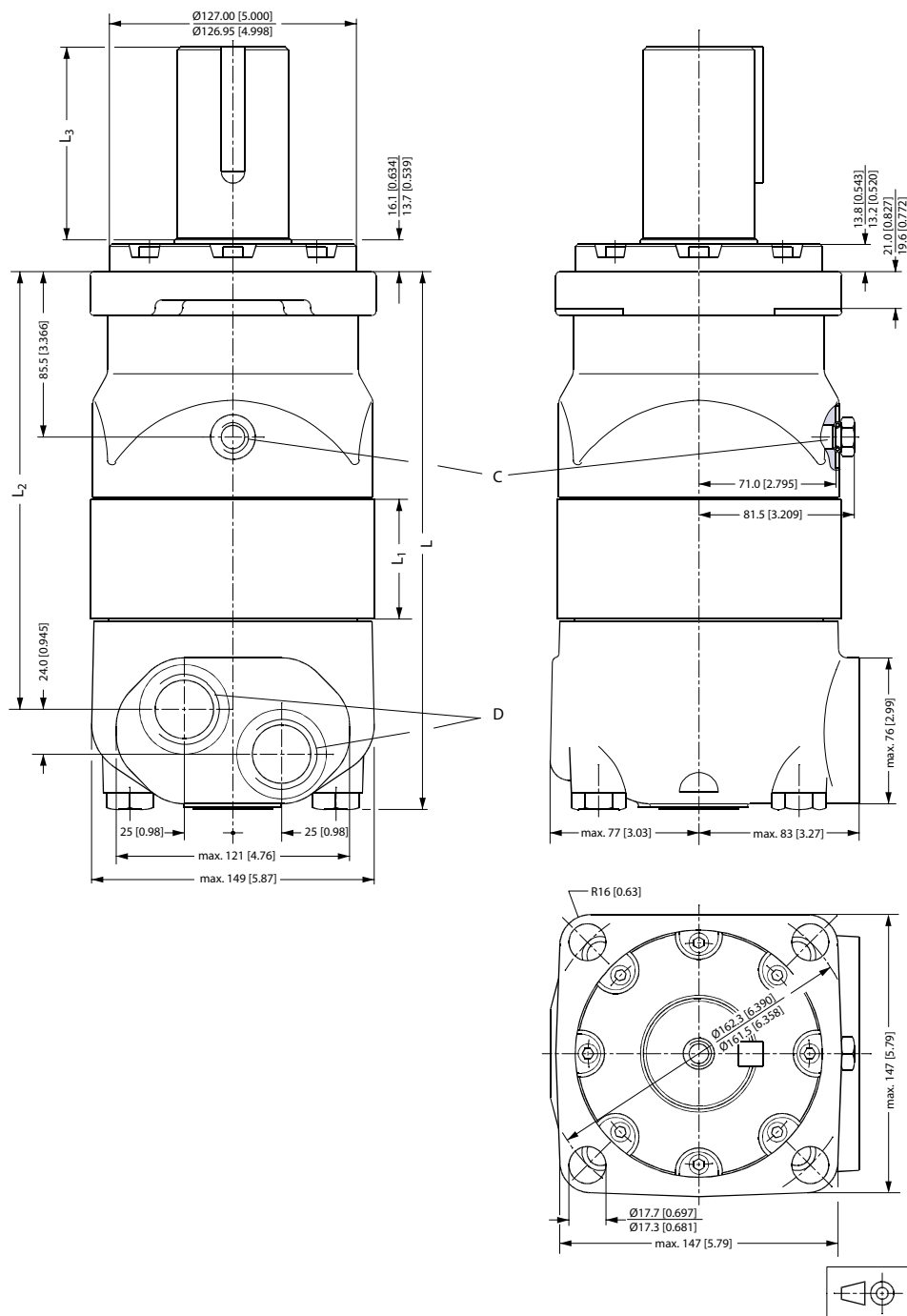
Type	L _{max} mm [in]	L ₁ *mm [in]	L ₂ mm [in]
OMV 500	230 [9.05]	37.0 [1.457]	175 [6.89]
OMV 630	240 [9.45]	47.5 [1.870]	186 [7.32]
OMV 800	254 [10.00]	61.5 [2.421]	200 [7.87]

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

Output shaft	L ₃ mm [in]
Cyl. 2.25 in Splined 2.125 in	82 [3.23]
Tapered 2.25 in	100 [3.94]

Dimensions – US version

SAE-C Flange



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

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]

Technical Information OMS, OMT and OMV Orbital Motors

Dimensions – US version

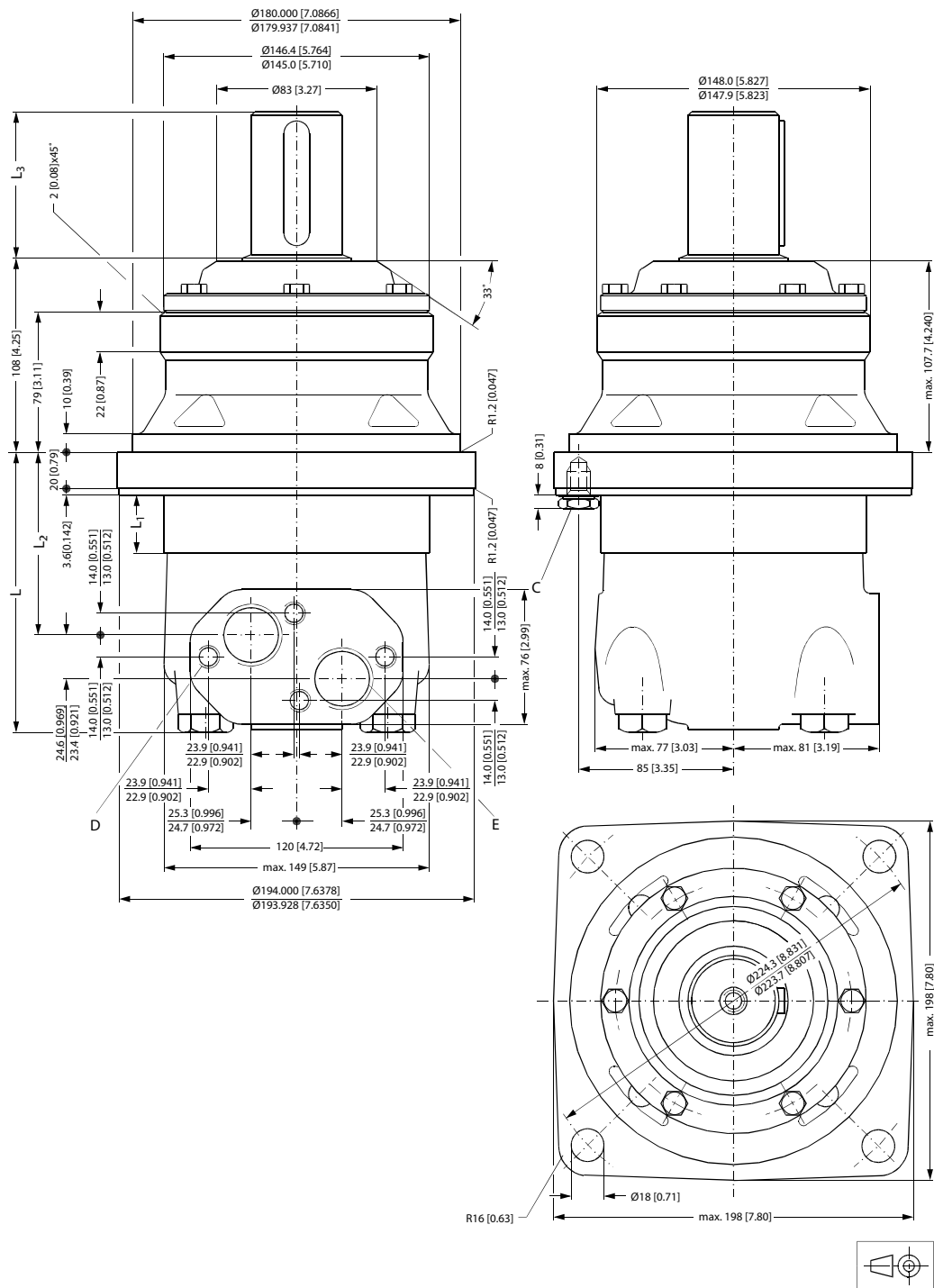
Type	L _{max} mm [in]	L ₁ *mm [in]	L ₂ mm [in]
OMV 400	246 [9.69]	29.0 [1.142]	192 [7.56]
OMV 500	254 [10.00]	37.0 [1.457]	200 [7.87]
OMV 630	265 [10.43]	47.5 [1.870]	211 [8.31]
OMV 800	279 [10.98]	61.5 [2.421]	225 [8.86]

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

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

Dimensions – European version

Wheel



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

Dimensions – European version

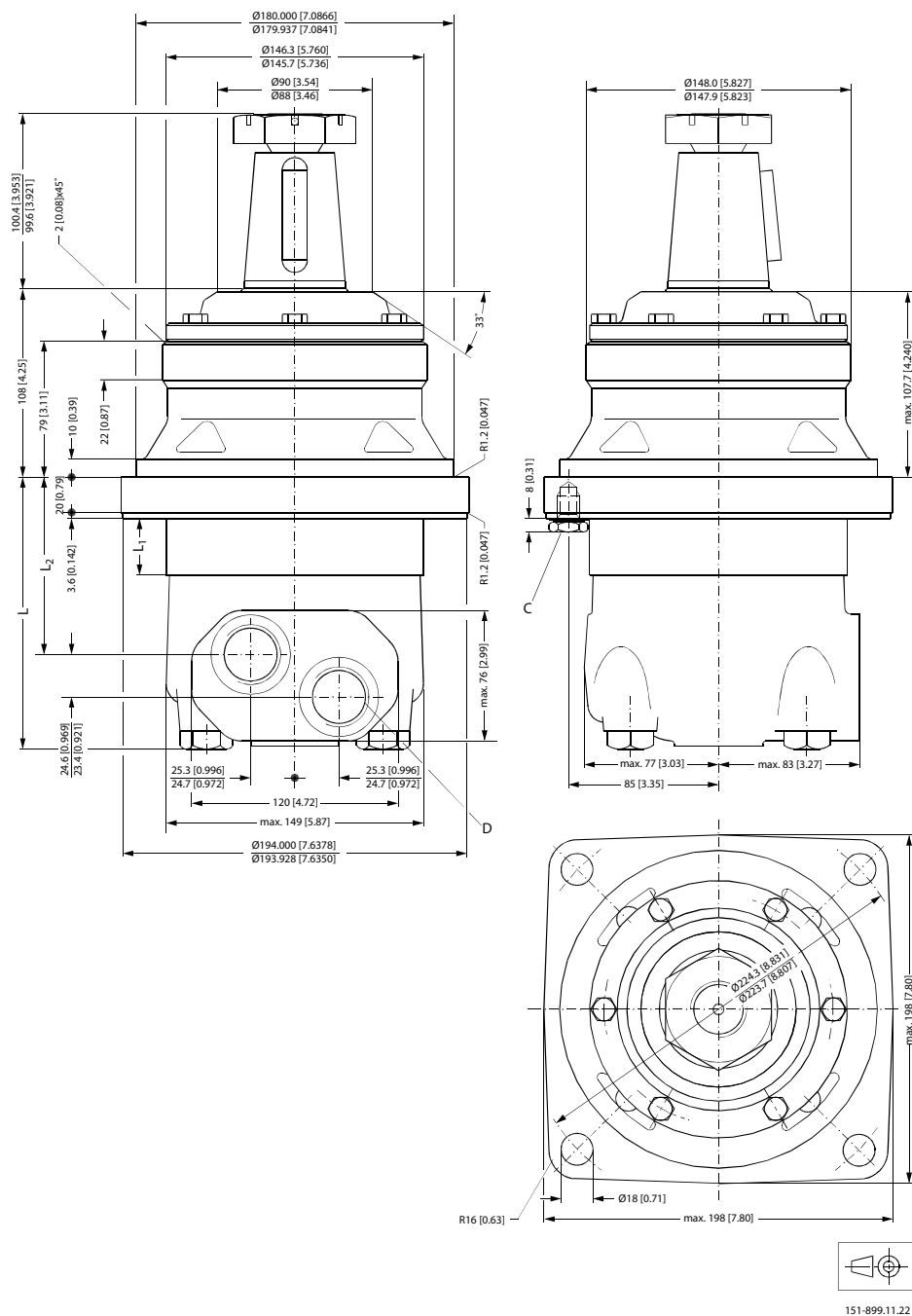
Type	L _{max} mm [in]	L ₁ *mm [in]	L ₂ mm [in]
OMVW 315	146 [5.75]	22.0 [0.866]	92 [3.62]
OMVW 400	153 [6.02]	29.0 [1.142]	99 [3.90]
OMVW 500	161 [6.34]	37.0 [1.457]	107 [4.21]
OMVW 630	172 [6.77]	47.5 [1.870]	118 [4.65]
OMVW 800	185 [7.28]	61.5 [2.421]	132 [5.20]

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

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

Dimensions – US version

Wheel



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 _{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]

Technical Information OMS, OMT and OMV Orbital Motors

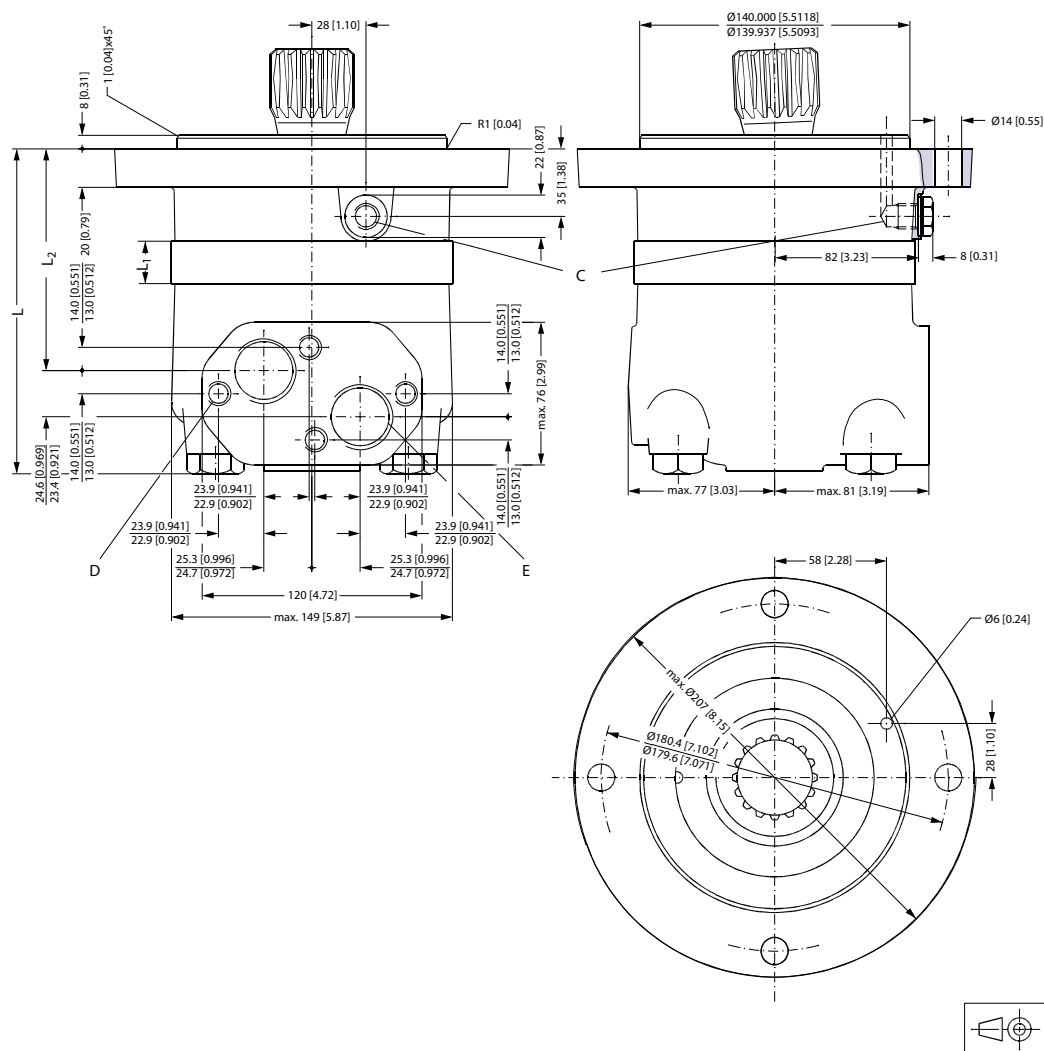
Dimensions – US version

Type	L _{max} mm [in]	L ₁ * mm [in]	L ₂ mm [in]
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]

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

Dimensions – European version

Short



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 _{max} mm [in]	L ₁ * mm [in]	L ₂ 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]
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 L₁ dimensions