

Technical Information OMS, OMT and OMV Orbital Motors

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 available (options)

Speed sensor
 Motor with tachometer connection
 Viton shaft seal
 Painted
 Ultra short

Code Numbers

Code numbers

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

Technical Data

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

Type			OMT OMTW OMTS OMT FX OMT FL OMT FH	OMT OMTW OMTS OMT FX OMT FL OMT FH	OMT OMTW OMTS OMT FX OMT FL OMT FH	OMT OMTW OMTS OMT FX OMT FL OMT FH	OMT OMTW OMTS OMT FX OMT FL OMT FH	OMT OMTW OMTS OMT FX OMT FL OMT FH
Motor size			160	200	250	315	400	500
Geometric displacement	cm ³ [in ³]		161.1 [9.83]	201.4 [12.29]	251.8 [15.37]	326.3 [19.91]	410.9 [25.07]	523.6 [31.95]
Max. speed	min ⁻¹ [rpm]	cont.	625	625	500	380	305	240
		int. ¹⁾	780	750	600	460	365	285
Max. torque	Nm [lbf·in]	cont.	470 [4160]	590 [5220]	730 [6460]	950 [8410]	1080 [9560]	1220 [10800]
		int. ¹⁾	560 [4960]	710 [6280]	880 [7790]	1140 [10090]	1260 [11150]	1370 [12130]
Max. output	kW [hp]	cont.	26.5 [35.5]	33.5 [44.9]	33.5 [44.9]	33.5 [44.9]	30.0 [40.2]	26.5 [35.5]
		int. ¹⁾	32.0 [42.9]	40.0 [53.6]	40.0 [53.6]	40.0 [53.6]	35.0 [46.9]	30.0 [40.2]
Max. pressure drop	bar [psi]	cont.	200 [2900]	200 [2900]	200 [2900]	200 [2900]	180 [2610]	160 [2320]
		int. ¹⁾	240 [3480]	240 [3480]	240 [3480]	240 [3480]	210 [3050]	180 [2610]
		peak ²⁾	280 [4060]	280 [4060]	280 [4060]	280 [4060]	240 [3480]	210 [3050]
Max. oil flow	l/min [USgal/min]	cont.	100 [26.4]	125 [33.0]	125 [33.0]	125 [33.0]	125 [33.0]	125 [33.0]
		int. ¹⁾	125 [33.0]	150 [39.6]	150 [39.6]	150 [39.6]	150 [39.6]	150 [39.6]
Max. starting pressure with unloaded shaft	bar [psi]		10 [145]	10 [145]	10 [145]	10 [145]	10 [145]	10 [145]
Min. starting torque	at max. press. drop cont. Nm [lbf·in]		340 [3010]	430 [3810]	530 [4690]	740 [6550]	840 [7430]	950 [8410]
	at max. press. drop int. ¹⁾ Nm [lbf·in]		410 [3630]	520 [4600]	630 [5580]	890 [7880]	970 [8590]	1060 [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 max. permissible combination of flow and pressure, see function diagram for actual motor.](#)

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

Technical Data
Brake motors

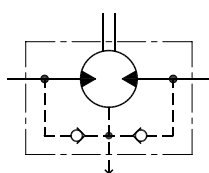
Type	Max. pressure in drain line ³⁾	Holding torque ⁴⁾	Brake-release pressure ³⁾	Max pressure in brake line
OMT FX, OMT FL	5 bar [70 psi]	1200 Nm [10620 lbf-in]	12 bar [170 psi]	30 bar [440 psi]
OMT FH	5 bar [70 psi]	1200 Nm [10620 lbf-in]	30 bar [440 psi]	280 bar [4060 psi]

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

Max. Permissible Shaft Seal Pressure
OMT with check valves and without use of drain connection:

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



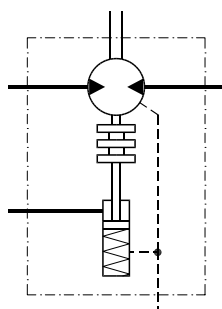
151-320.10

OMT 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.

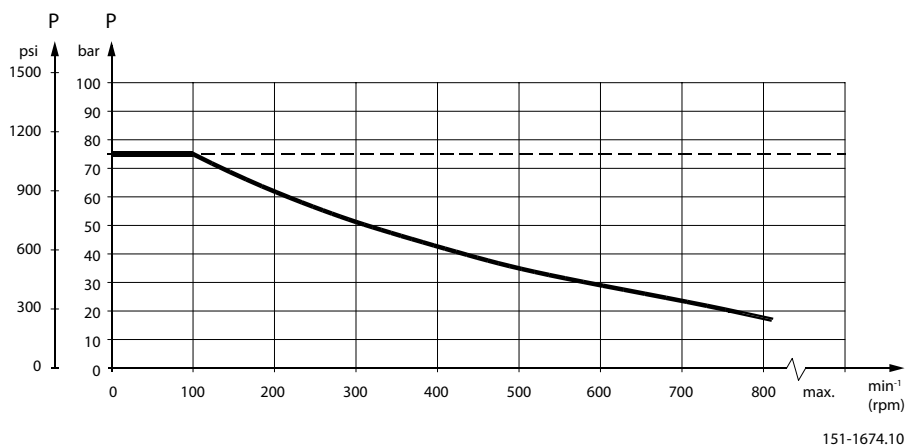
Max. pressure in drain line is 5 bar [75 psi]



151-1405.10

Technical Data

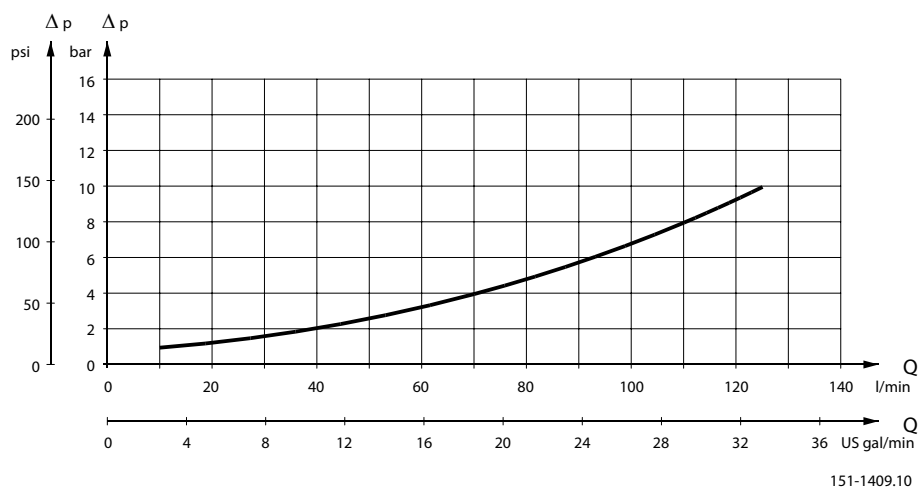
Max. return pressure without drain line or max. pressure in the drain line



----- 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]

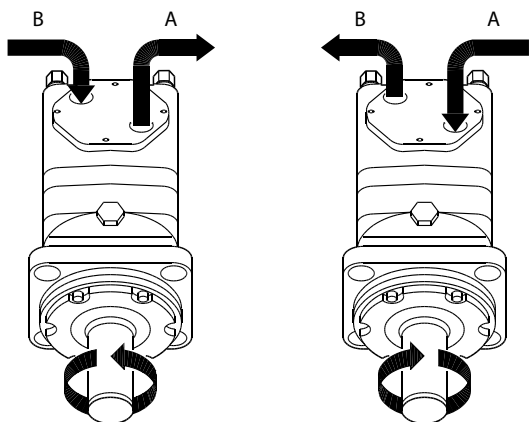
Oil flow in drain line

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]	2.5 [0.66]
	35 [165]	1.5 [0.40]
210 [3050]	20 [100]	5.0 [1.32]
	35 [165]	3.0 [0.79]

Technical Data

Direction of Shaft Rotation



151-1050.10

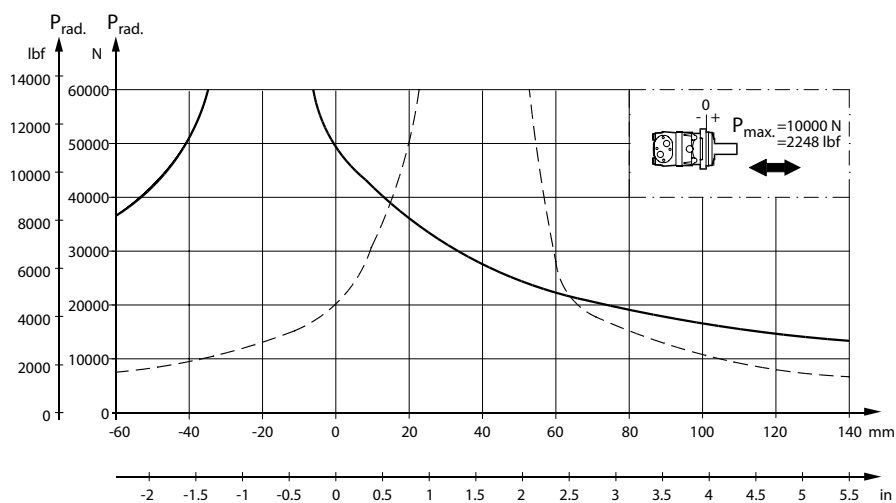
Permissible Shaft Loads for OMT

Mounting flange:

Standard

Shaft:

All shaft types



151-1967.10

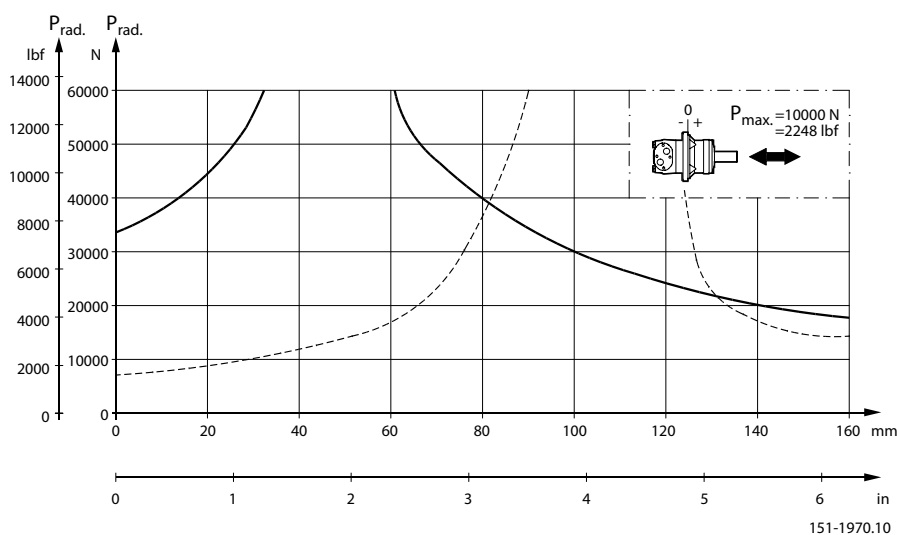
Mounting flange:

Wheel

Shaft:

All shaft types

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.

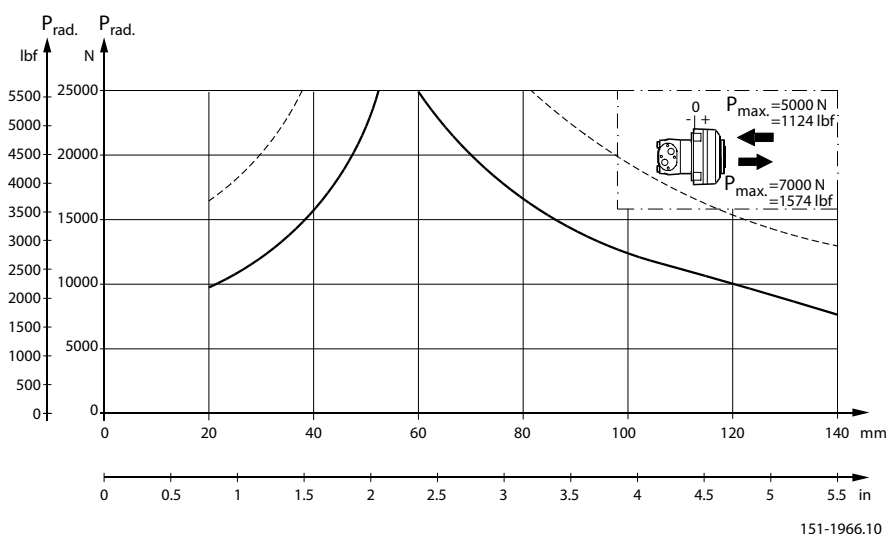
Mounting flange:

Brake-wheel

Shaft:

All shaft types

Technical Data



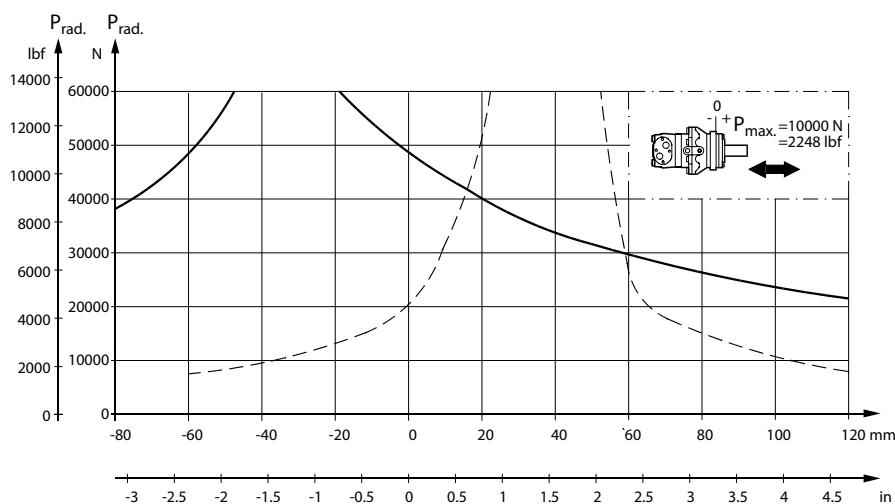
151-1966.10

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 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%.

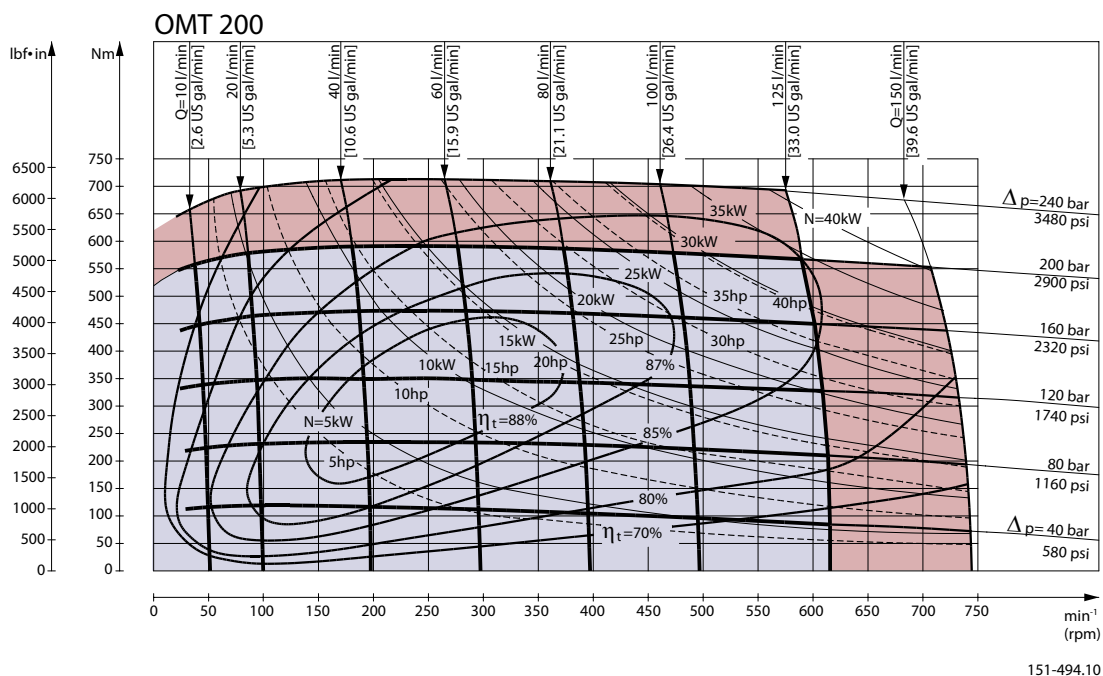
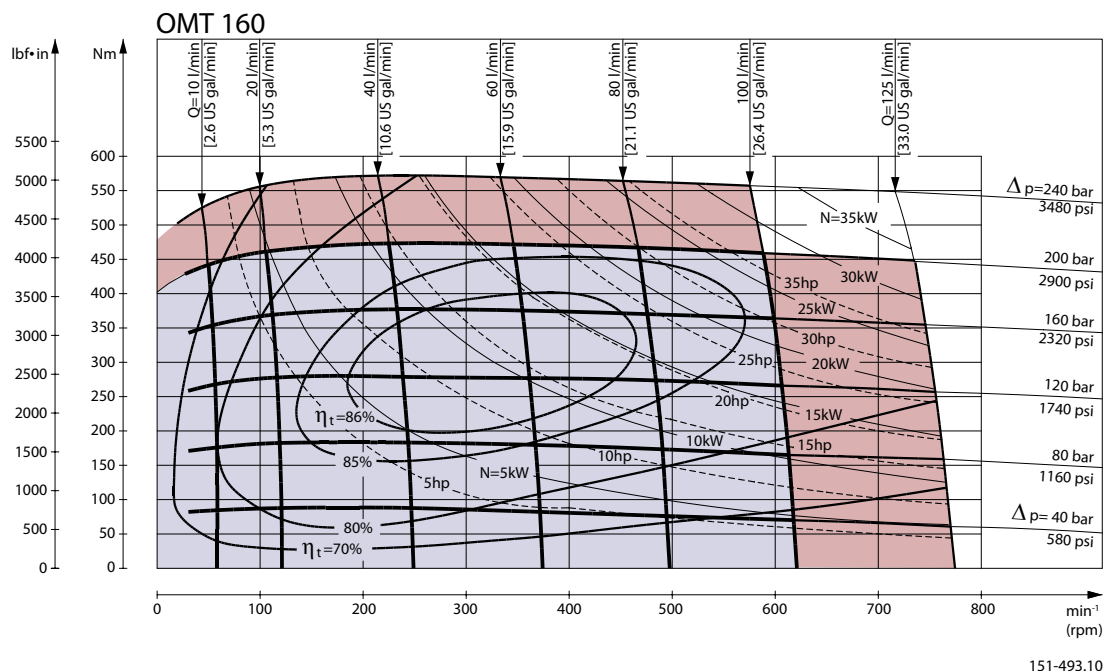
The dash curve shows max. radial shaft load. Any shaft load exceeding the values shown in the curve will involve a risk of breakage.

Technical Data

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.

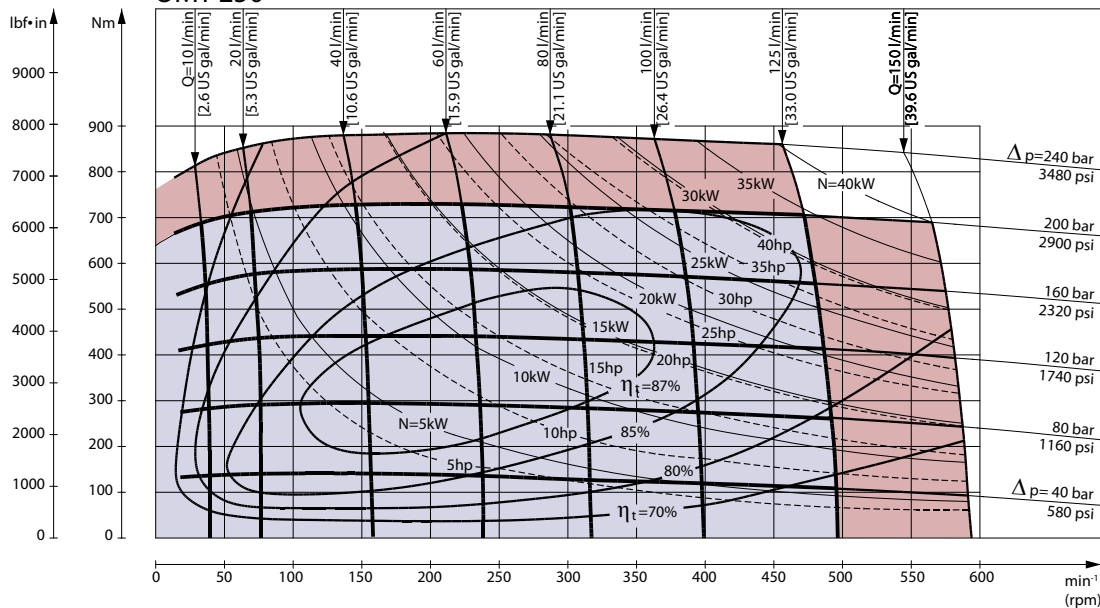
Function Diagrams

Function Diagrams



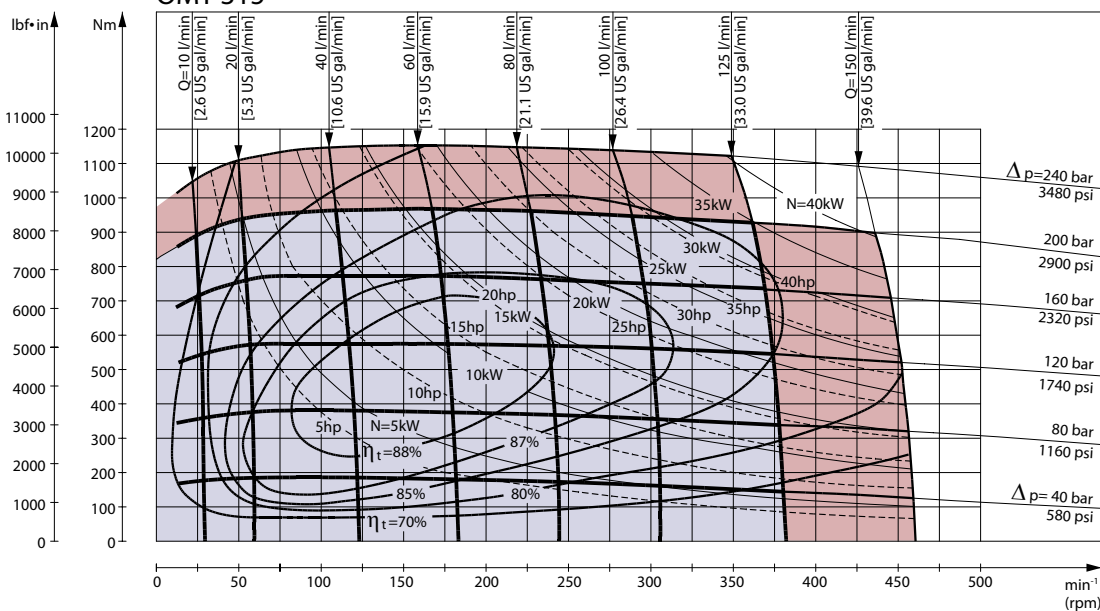
Function Diagrams

OMT 250



151-495.10

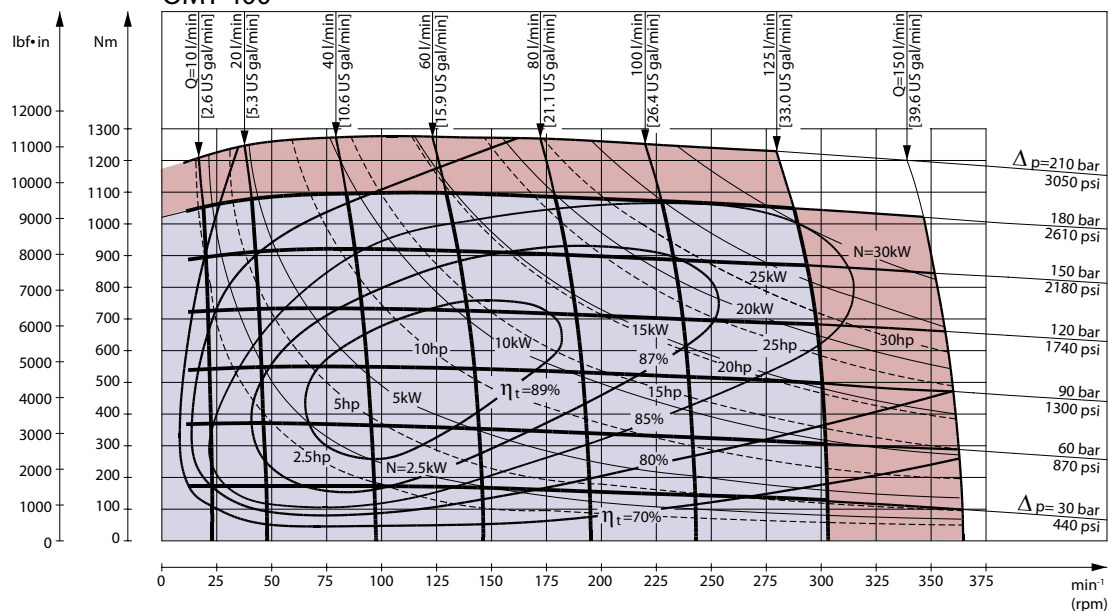
OMT 315



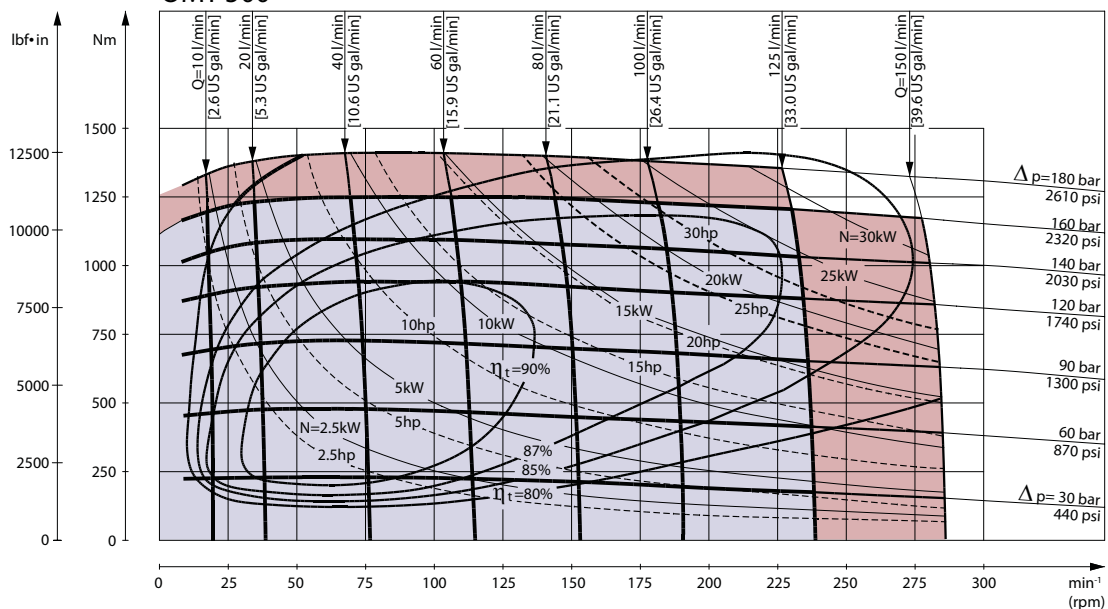
151-869.10

Function Diagrams

OMT 400



OMT 500



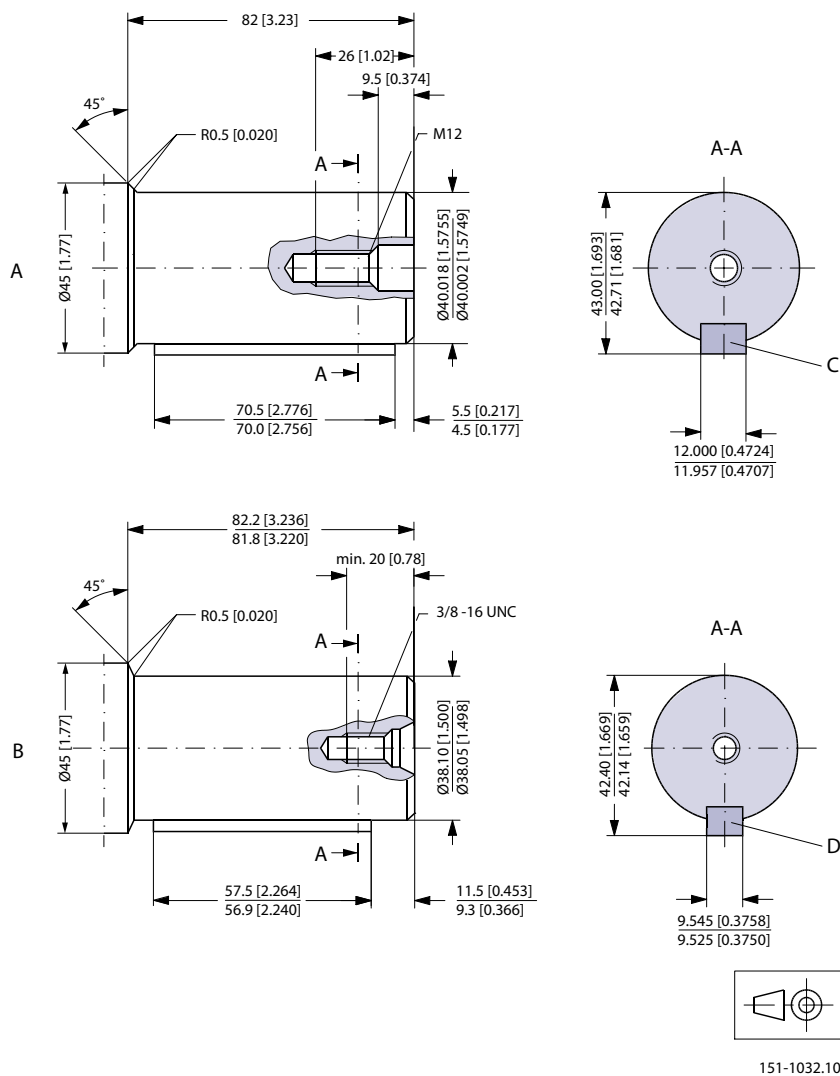
Explanation of function diagram use, basis and conditions, see [OMS, OMT and OMV speed, torque and output](#) on page 8.

- 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 40 mm shaft

C: Parallel key

A12 $\times$ 8 $\times$ 70

DIN 6885

Keyway deviates from standard

B: Cylindrical 1.5 in shaft

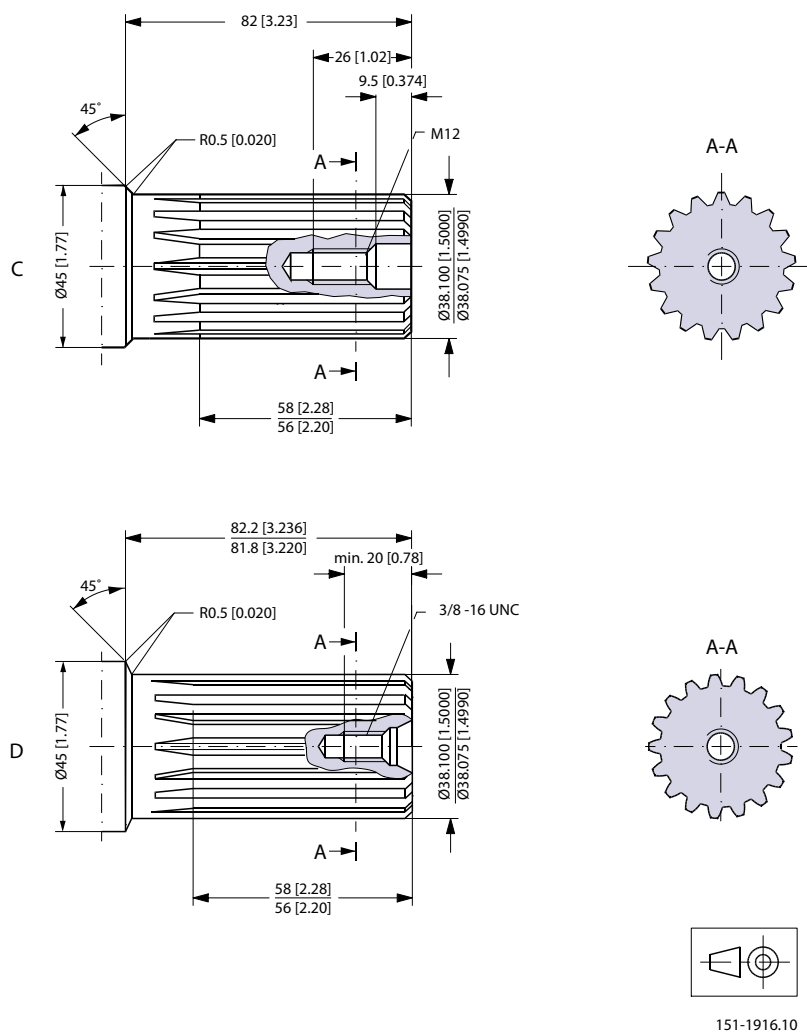
D: Parallel key

3/8 $\times$ 3/8 $\times$ 21/4 in

B.S. 46

Keyway deviates from standard

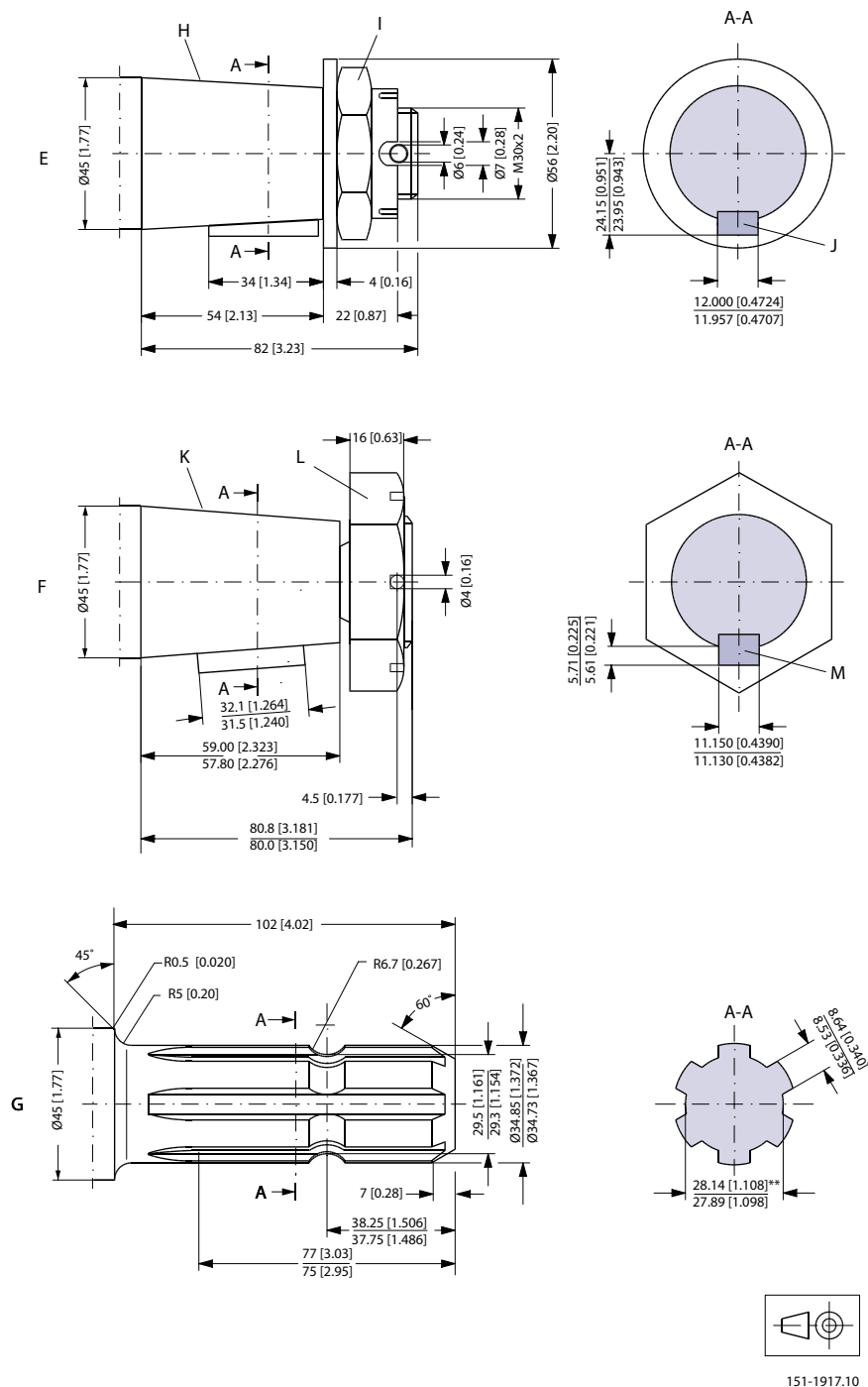
Shaft version



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

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

Shaft version



151-1917.10

E: Tapered 45 mm shaft **F:** Tapered 1.75 in shaft
(ISO/R775)

G: P.T.O. shaft
DIN 9611 Form 1 (ISO/
R500 without pin hole)
** Deviates from DIN
9611

I: DIN 937
Across flats: 46 mm
Tightening torque: 500 $\pm$ 30 Nm
[4430 $\pm$ 270 lbf·in]

H: Taper 1:10

J: Parallel key
B12 $\times$ 8 $\times$ 28
DIN 6885
Keyway deviates from
standard

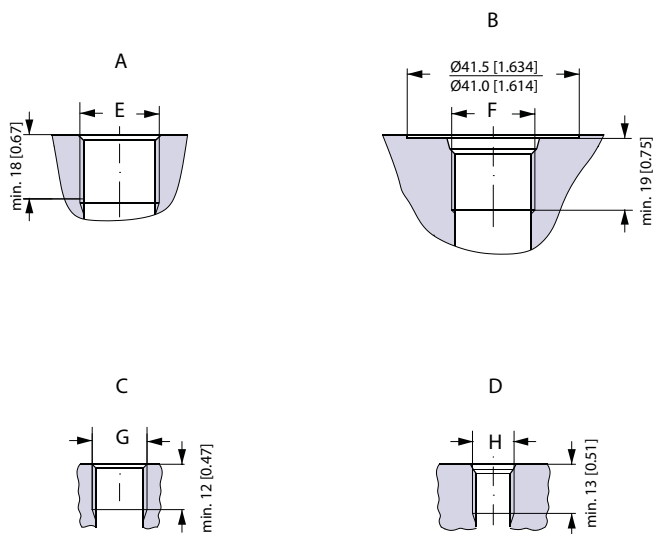
K: Cone 1:8
SAE J501

L: 1 1/4 - 18 UNEF
Across flats 2 3/16 in
Tightening torque: 500 $\pm$ 10
Nm (4425 $\pm$ 90 lbf·in)

M: Parallel key
7/16 $\times$ 7/16 $\times$ 1 1/4
B.S. 46
Keyway deviates from
standard

Shaft version

Port Thread Versions



151-1977.11

A: G main ports
E: ISO 228/1 - G3/4
O-ring boss port

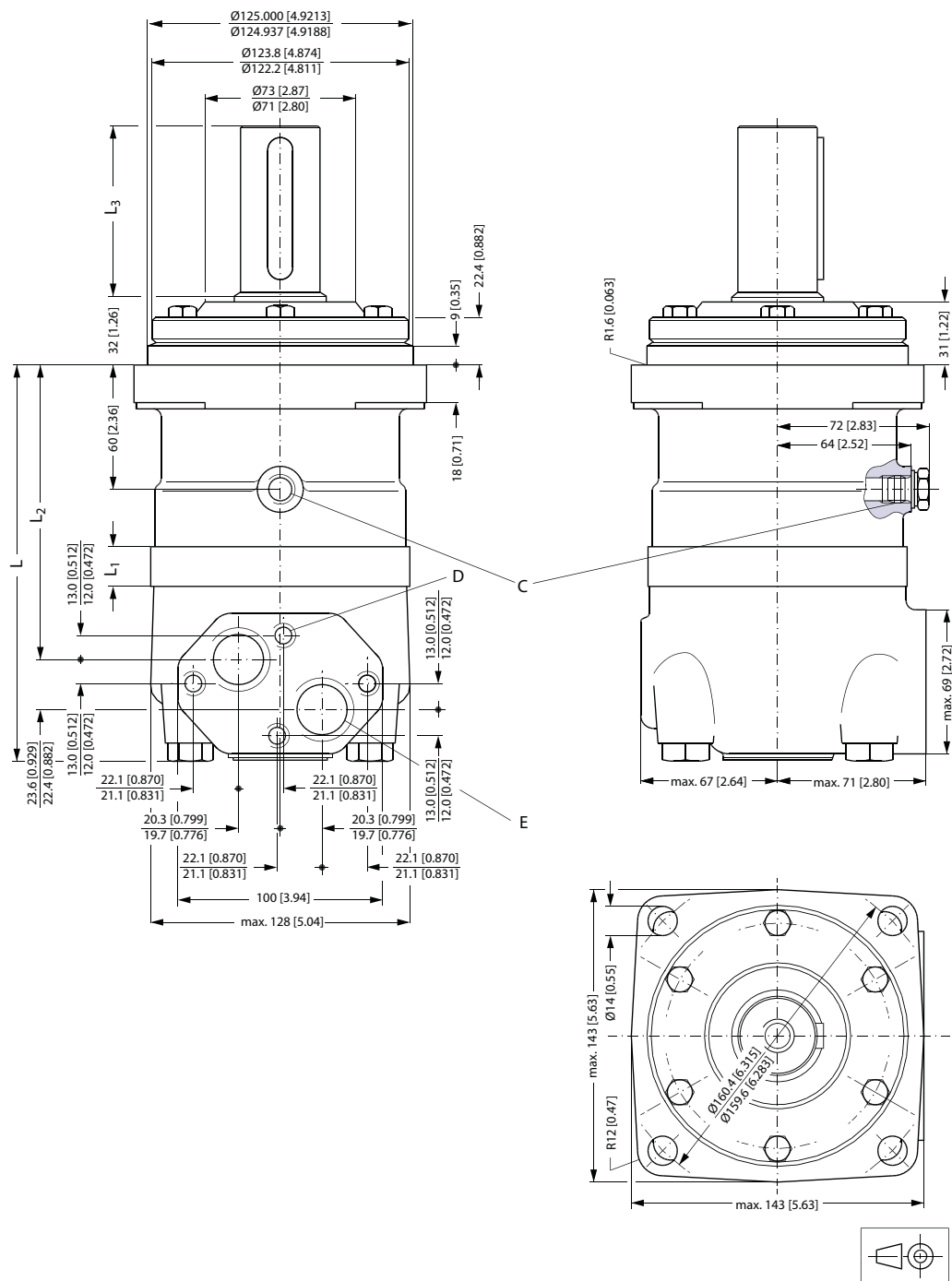
C: G drain port
G: ISO 228/1 - G1/4
O-ring boss port

B: UN main ports
F: 1 1/16 - 12 UN

D: UNF drain port
H: 9/16 - 18 UNF

Dimensions – European Version

Standard Flange



151-889.11

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

D: M10; 10 mm [0.39 in] deep

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

Dimensions – European Version

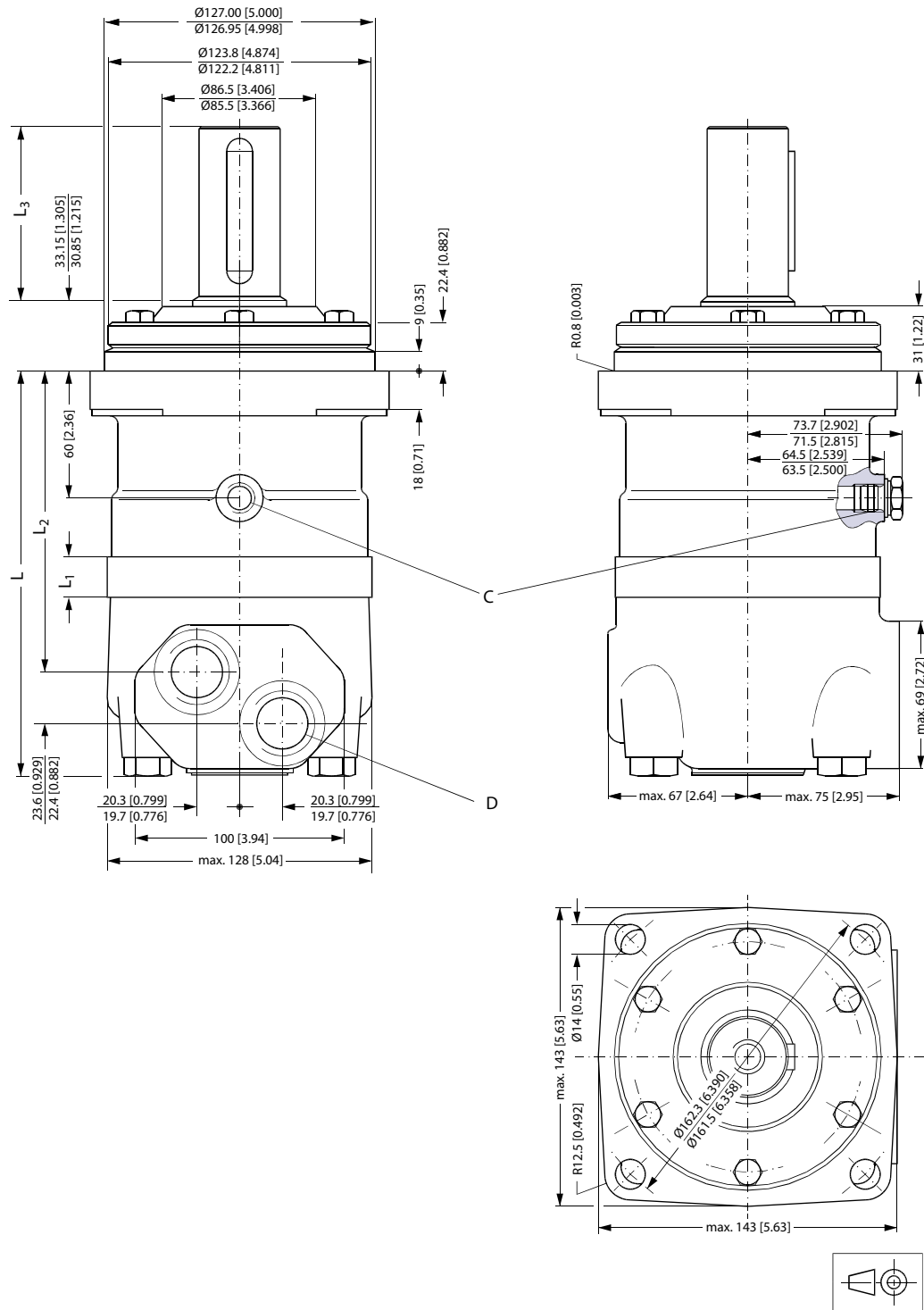
Type	L _{max} mm [in]	L ₁ * mm [in]	L ₂ mm [in]
OMT 160	190 [7.48]	16.5 [0.650]	140 [5.51]
OMT 200	195 [7.68]	21.5 [0.846]	145 [5.71]
OMT 250	201 [7.91]	27.8 [1.094]	151 [5.94]
OMT 315	211 [8.31]	37.0 [1.457]	161 [6.34]
OMT 400	221 [8.70]	47.5 [1.870]	171 [6.73]
OMT 500	235 [9.25]	61.5 [2.421]	185 [7.28]

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

Output shaft		L ₃ mm [in]
All shafts except P.t.o. shaft	max.	82 [3.23]
P.t.o. shaft	max.	102 [4.02]

Dimensions – US Version

Standard Flange



151-889.11.22

Technical Information OMS, OMT and OMV Orbital Motors

Dimensions – US Version

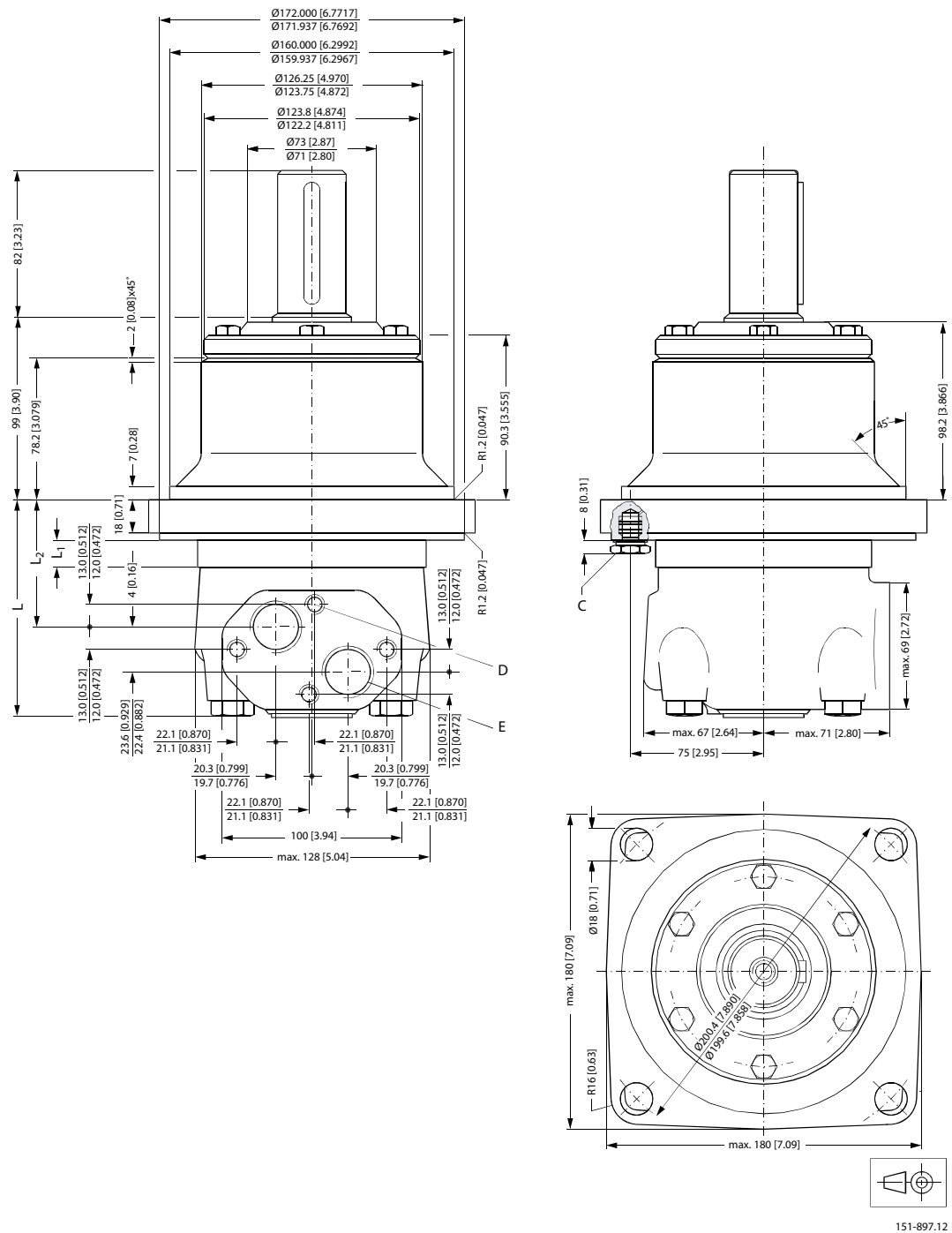
Type	L _{max} mm [in]	L ₁ * mm [in]	L ₂ mm [in]
OMT 160	190 [7.48]	16.5 [0.650]	140 [5.51]
OMT 200	195 [7.68]	21.5 [0.846]	145 [5.71]
OMT 250	201 [7.91]	27.8 [1.094]	151 [5.94]
OMT 315	211 [8.31]	37.0 [1.457]	161 [6.34]
OMT 400	221 [8.70]	47.5 [1.870]	171 [6.73]
OMT 500	235 [9.25]	61.5 [2.421]	185 [7.28]

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

Output shaft	L ₃ mm [in]
Cyl. 1.5 in Splined 1.5 in	82 [3.23]
Tapered 1.75 in	80.4 [3.17]

Dimensions – European Version

Wheel



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

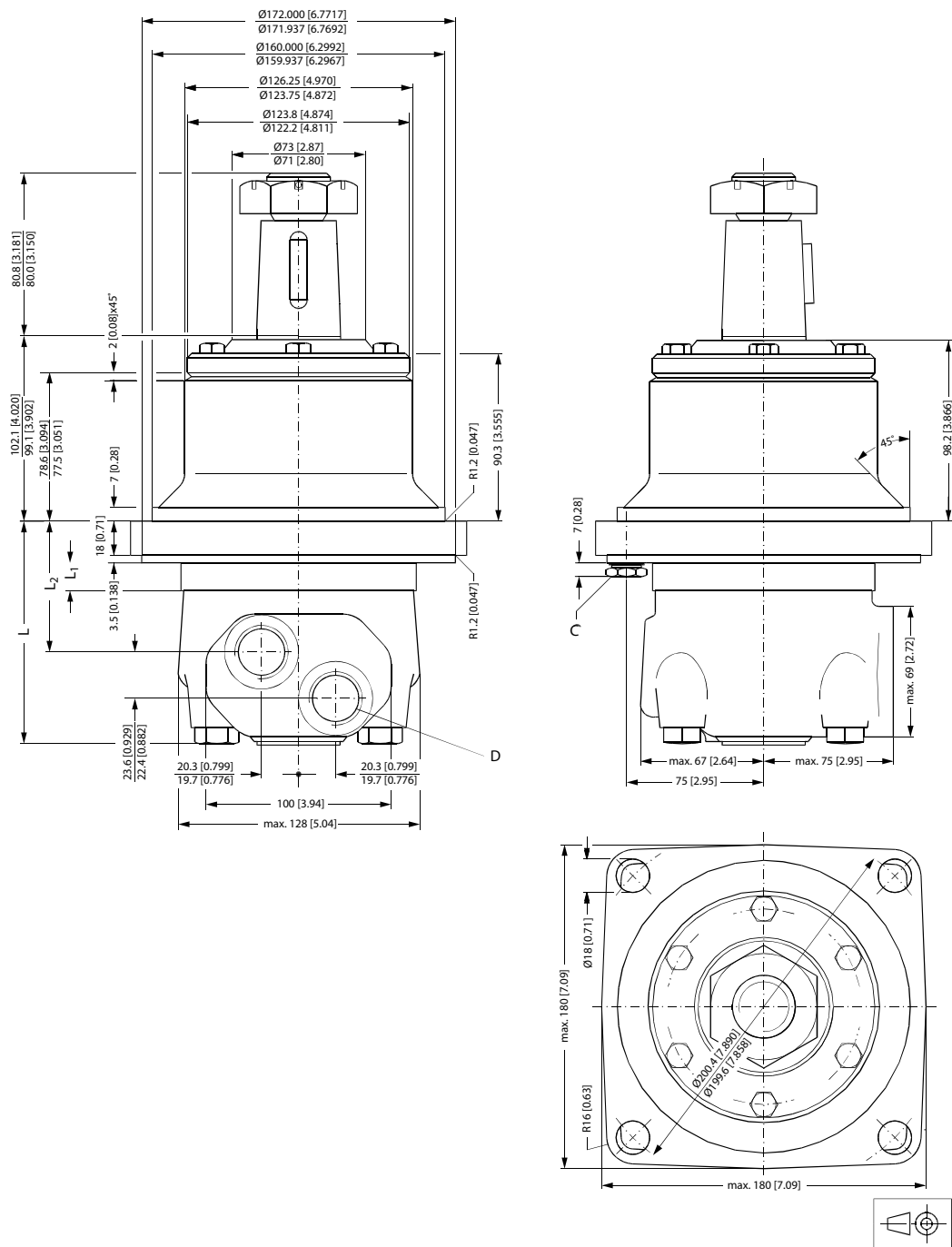
Dimensions – European Version

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

Dimensions – US Version

Wheel



151-897.11.22

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

Technical Information OMS, OMT and OMV Orbital Motors

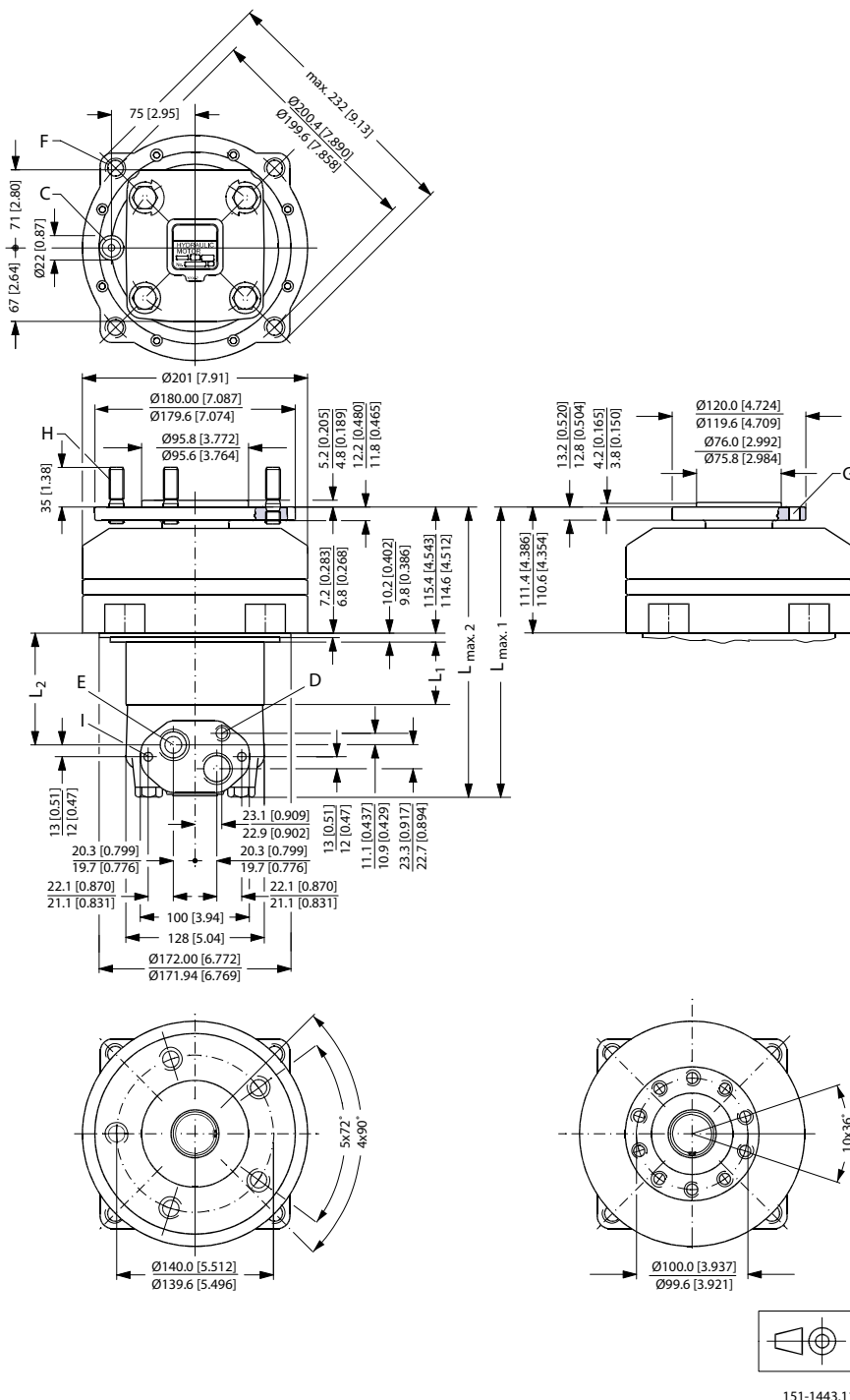
Dimensions – US Version

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

Dimensions – European Version

Brake-Wheel



- 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

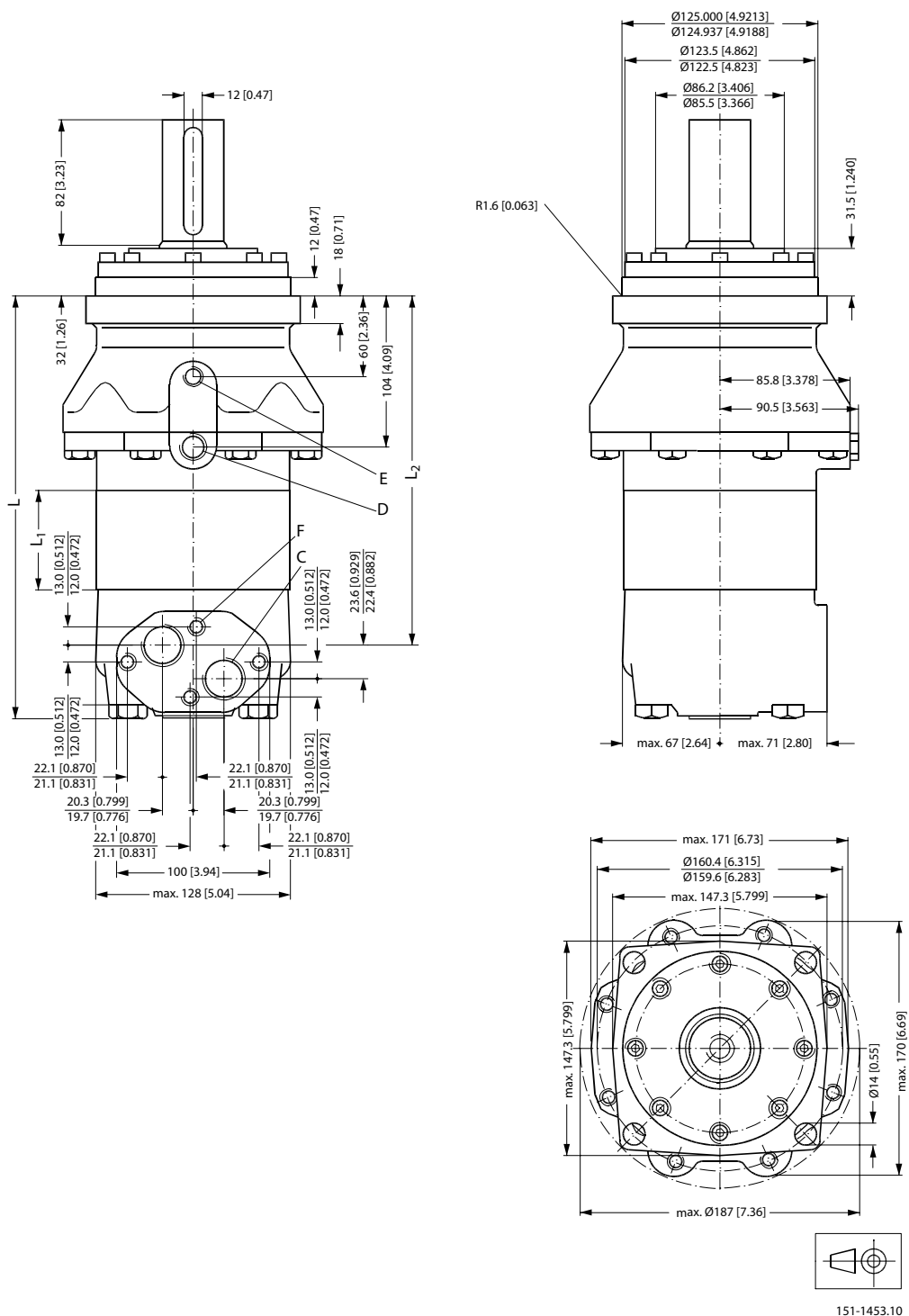
Dimensions – European Version

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

Dimensions – European Version

Brake-Standard



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

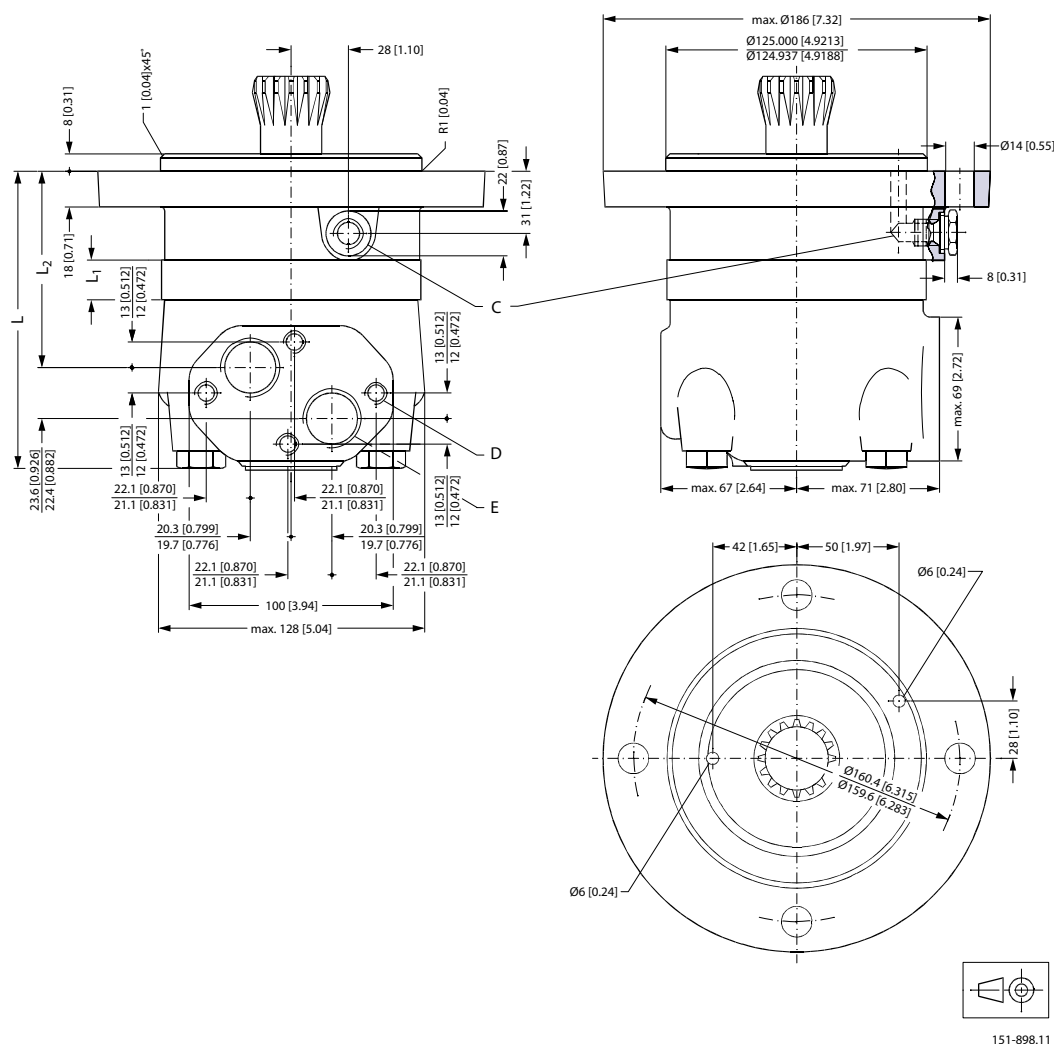
F: M10; 10 mm [0.39 in]
deep

Dimensions – European Version

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

Short



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 _{max} mm [in]	L ₁ * mm [in]	L ₂ mm [in]
OMTS 160	146 [5.75]	16.5 [0.650]	96 [3.78]