MOTORS

Technical Information

OMEW Orbital Motors

WHITE

together in motion

White is a leading global provider of motor and steering solutions that power the evolution of mobile and industrial applications around the world.

Contents

Chapter 1
Introduction

Topics:

- *Introduction*
- *Technical Features*

Introduction

The OMEW motor comes in two different versions. Both versions are designed mainly for propel applications, but they are optimized for different conditions.

A. **OMEW standard version.**

The advantage of this motor lies in the high-speed area. When the flow exceeds 40 l/min this motor is to prefer due to a lower pressure drop.

B. **OMEW with low-speed option.**

The advantage of this motor lies in the low speed area. This motor has higher efficiency at low speed / medium pressure. When the flow is below 40 l/min this motor is to prefer.

This motor also has the Brake nose which makes it possible to add a drum brake to the motor.

Although the OMEW transmission motor was mainly designed for vehicles such as

- Walk-behind mowers
- Ride on mowers
- Scissor lifts
- Sweepers
- Road rollers

It is also suitable for a wide range of other applications that require a motor that is both compact and gives high efficiency.

Characteristic features that distinguish the OMEW motor are

- Compact design
- Low weight
- High total efficiency
- High starting torque
- Smooth low speed performance
- Larger bearing capacity
- High pressure shaft seal
- No drain line

Technical Features

- 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
- High radial and axial bearing capacity
- Long life under extreme operating conditions
- Robust and compact design
- For applications in both open and closed loop hydraulic systems
- Suitable for a wide variety of hydraulics fluids

Chapter 2
Technical Data

Topics:

- *Technical data for OMEW*
- *Maximum permissible shaft seal pressure*
- *Pressure drop*
- *Direction of shaft rotation*
- *Permissible shaft loads*

Permissible shaft loadsTechnical data for OMEW

Type			OMEW							
Motor Size			100	125	160	200	250	315	345	400
Geometric displacement	cm^3 [in^3]		99.8	124.1	155.4	198.2	248.1	310.1	341.8	390.7
			[6.11]	*[7.60]*	*[9.51]*	*[12.13]*	*[15.18]*	*[18.98]*	*[20.86]*	*[23.83]*
Max speed	min^{-1} [rpm]	cont.	600	475	375	300	240	190	175	150
		int.	750	695	470	375	300	240	220	190
Max torque	N•m	cont.	250	320	410	400	470	550	610	700
	[lbf•in]		*[2210]*	*[2830]*	*[3630]*	*[3540]*	*[4160]*	*[4868]*	*[5400]*	*[6195]*
		int.[1)]	270	340	430	570	710	850	860	870
			[2390]	*[3010]*	*[3810]*	*[5045]*	*[6284]*	*[7523]*	*[7612]*	*[7700]*
Max output	kW [hp]	cont.	12	12	12	11	10	9	9	9
			[16.1]	*[16.1]*	*[16.1]*	*[14.75]*	*[13.41]*	*[12.07]*	*[12.07]*	*[12.07]*
		int.[1)]	15	15	15	16	16	15	14	12
			[20.1]	*[20.1]*	*[20.1]*	*[21.5]*	*[21.5]*	*[20.1]*	*[18.8]*	*[16.1]*
Max pressure drop	bar [psi]	cont.	200	200	200	150	140	130	130	130
			[2900]	*[2900]*	*[2900]*	*[2175]*	*[2030]*	*[1885]*	*[1885]*	*[1885]*
		int.[1)]	210	210	210	210	210	200	185	160
			[3045]	*[3045]*	*[3045]*	*[3045]*	*[3045]*	*[2900]*	*[2683]*	*[2320]*
Max oil flow	l/min [US gal/min]	cont.	60	60	60	60	60	60	60	60
			[15.9]	*[15.9]*	*[15.9]*	*[15.9]*	*[15.9]*	*[15.9]*	*[15.9]*	*[15.9]*
		int.[1)]	75	75	75	75	75	75	75	75
			[19.8]	*[19.8]*	*[19.8]*	*[19.8]*	*[19.8]*	*[19.8]*	*[19.8]*	*[19.8]*
Max starting pressure with unloaded shaft	bar [psi]		10	7	7	7	7	7	7	7
			[145]	*[100]*	*[100]*	*[100]*	*[100]*	*[100]*	*[100]*	*[100]*
Min starting torque	N•m [lbf•in]	at max press drop cont.	230	290	360	330	390	460	500	580
			[2040]	*[2570]*	*[3190]*	*[2920]*	*[3451]*	*[4071]*	*[4425]*	*[5133]*
		at max press drop int.[1)]	240	300	380	470	580	700	710	710
			[2120]	*[2660]*	*[3360]*	*[4160]*	*[5133]*	*[6195]*	*[6284]*	*[6284]*

Table 1 Technical Data for OMEW

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

Type			Max Inlet Pressure	Max Return Pressure
OMEW 100 - 400	bar	cont.	200	200
	[psi]		[2900]	[2900]
	bar	int.[1)]	210	210
	[psi]		[3050]	[3050]
	bar	peak [2)]	225	225
	[psi]		[3260]	[3260]

Table 2 Max. Pressure

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.

Maximum permissible shaft seal pressure

OMEW with high pressure shaft seal

CW version (clockwise rotation)

1. By clockwise rotation: The shaft seal pressure equals the return pressure.
2. By counterclockwise rotation: The shaft seal pressure equals the input pressure

CCW version (counterclockwise rotation)

1. By counterclockwise rotation: The shaft seal pressure equals the return pressure.
2. By clockwise rotation: The shaft seal pressure equals the input pressure

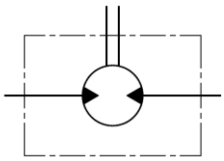


Figure 1 OMEW with high pressure shaft seal

Max. Permissible shaft seal pressure

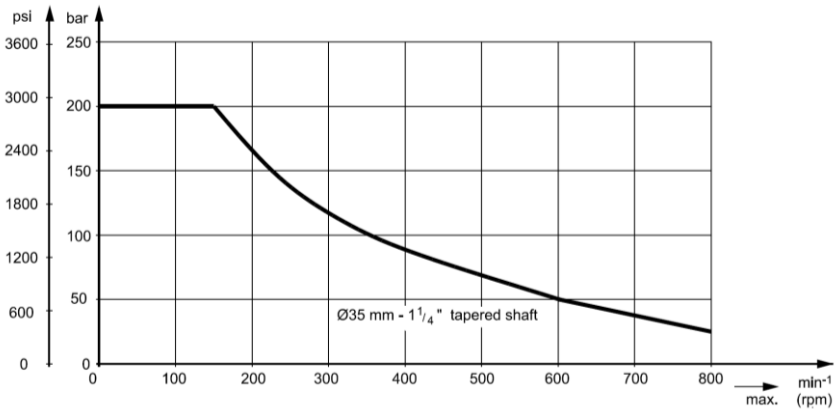
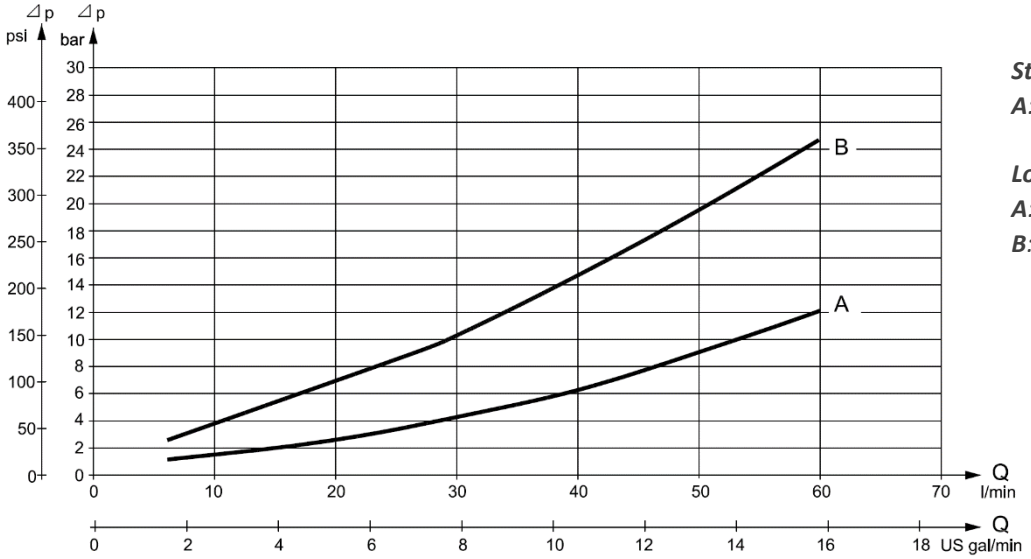


Figure 2 Max. permissible shaft seal pressure

Pressure drop

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



Standard

***A**: OMEW 100 - 400*

Low Speed

***A**: OMEW 100 - 160*

***B**: OMEW 200 – 400*

Figure 3 Pressure Drop

Direction of shaft rotation

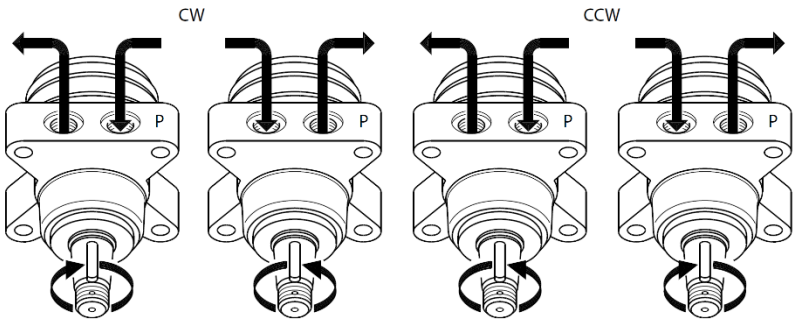


Figure 4 Direction of shaft rotation

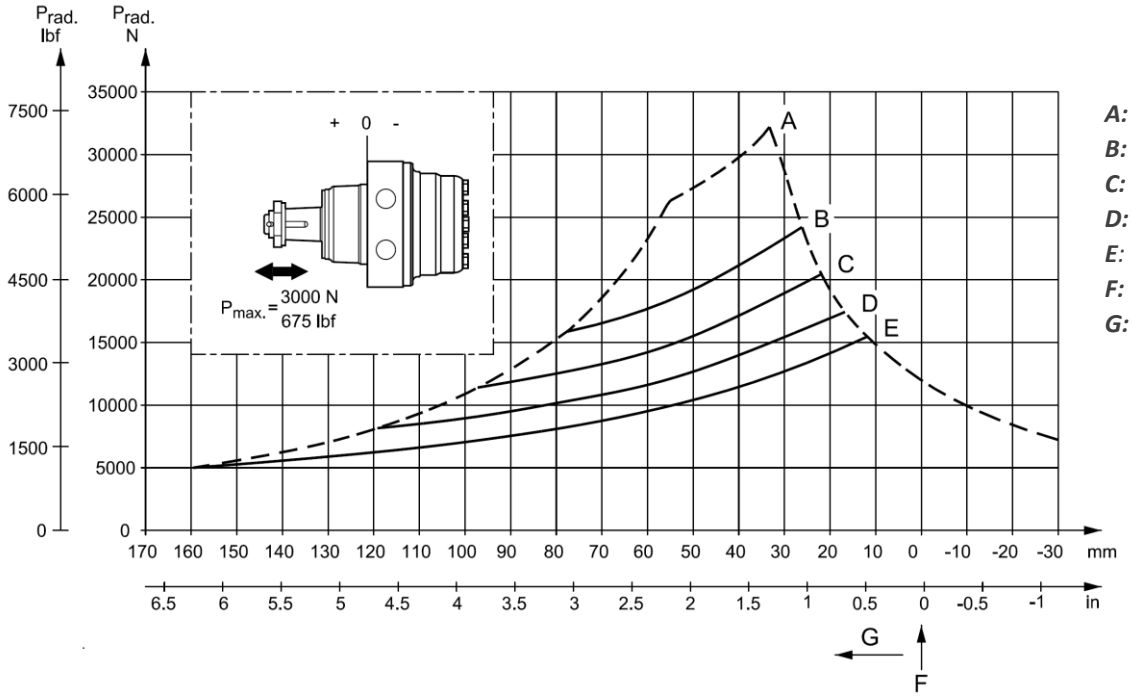
Permissible shaft loads

As the OMEW output shaft is embedded in needle bearings and the mounting flange is recessed it is possible to fit a wheel hub directly onto the shaft so that the radial load acts midway between the needle bearings.

Based upon the requested max. speed and the point of action of the radial load the permissible shaft load can be read from the curve shown below.

Curve A shows the max. radial load. If the radial load exceeds these values there is a potential risk of breakdown.

The other curves apply to a B10 bearing life of 2000 hours at the indicated speed when applying a hydraulic mineral oil with an adequate content of anti-wear additives.



A: *Max. radial load*
B: *n = 50 min-1 (rpm)*
C: *n = 100 min-1 (rpm)*
D: *n = 200 min-1 (rpm)*
E: *n = 400 min-1 (rpm)*
F: *Front flange*
G: *Direction toward shaft*

Figure 5 Permissible shaft loads

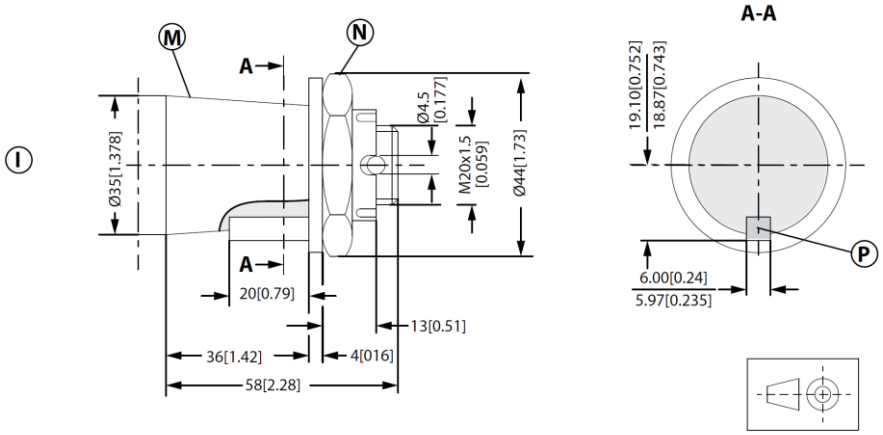
Chapter 3
Shaft version

Topics:

- *OMEW shaft version*
- *OMEW port thread version*

OMEW shaft version

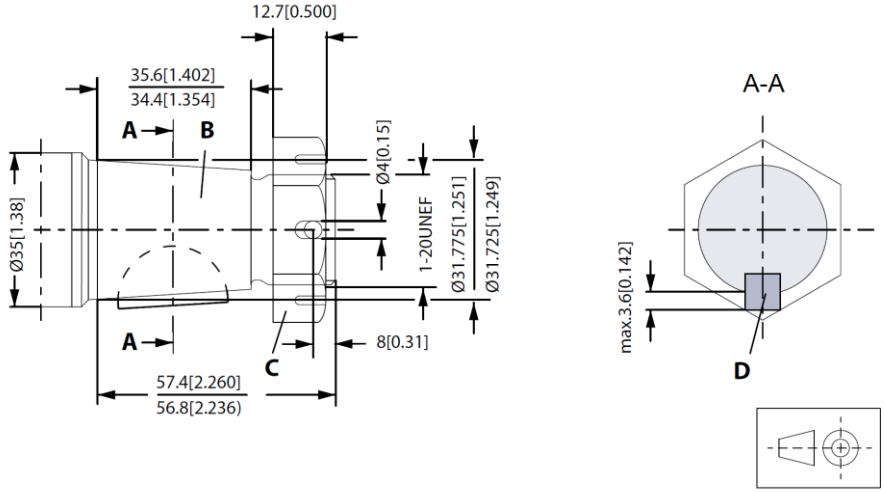
Tapered shaft 35 mm



I: Tapered shaft 35 mm
***N**: DIN 937, NV 41;*
Tightening torque: 200 ± 10 N•m [1770 ± 85 lbf•in]
***M:** Taper 1:10*
***P**: Parallel key B6 • 6 • 20, DIN 6885*

Figure 6 Tapered shaft 35 mm

Tapered shaft 1 ¼ in



***B**: Cone 1:8, SAE J501*
***C:** 1 - 20 UNEF, Across flats 1 7/16;*
Tightening torque: 400 ± 10 N•m [3540 ±85 lbf•in]
***D**: Woodruff key 5/16 × 1, SAE J502 1a*

Figure 7 Tapered shaft 1 ¼ in

OMEW port thread version

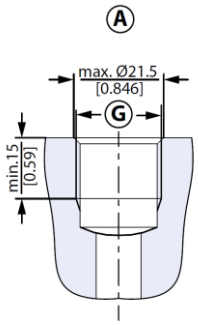
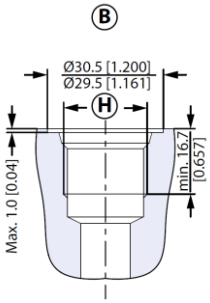
G main ports	
 *Figure 8 G main port*	*A: G main ports* *G: G1/2 - ISO 228/1*
UNF main ports	
 *Figure 9 UNF main port*	*B: UNF main ports* *H: 7/8-14 UNF O-ring boss port*

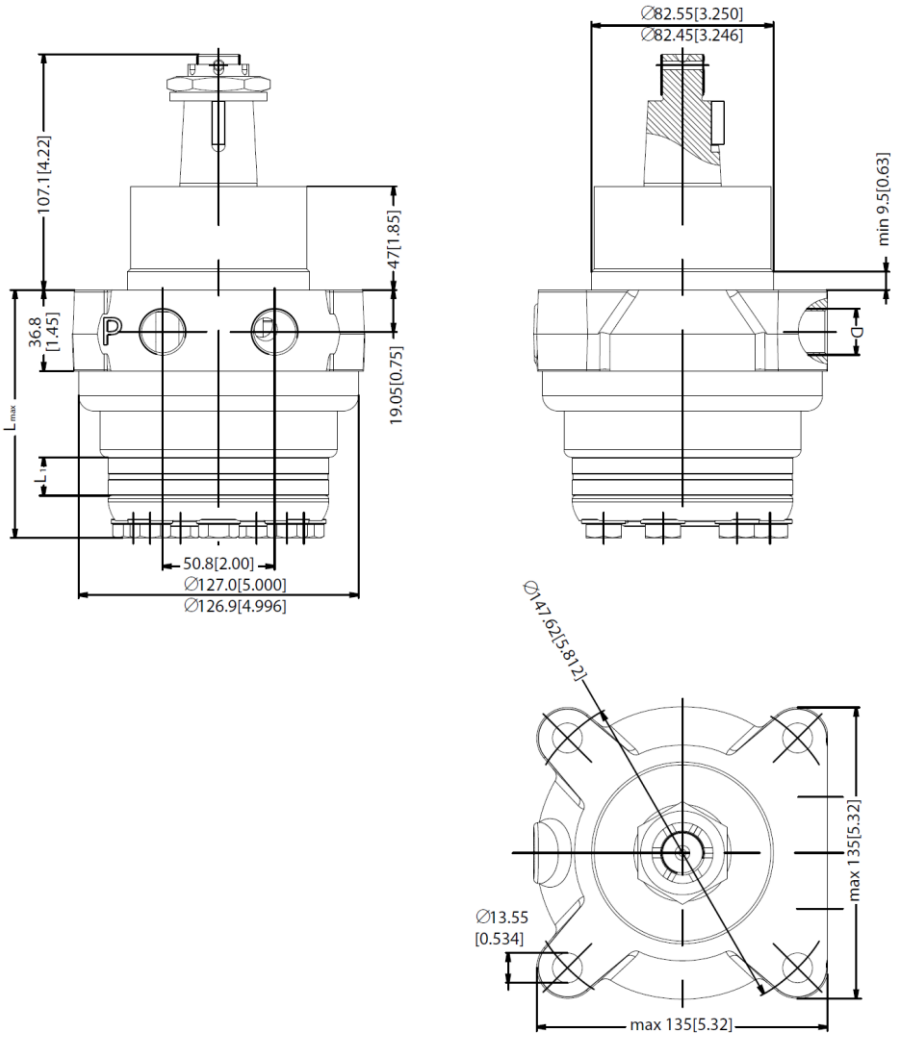
Table 3 OMEW port thread version

Chapter 4
Dimensions

Topics:

- *European version*
- *European version*
- *US version*

European version



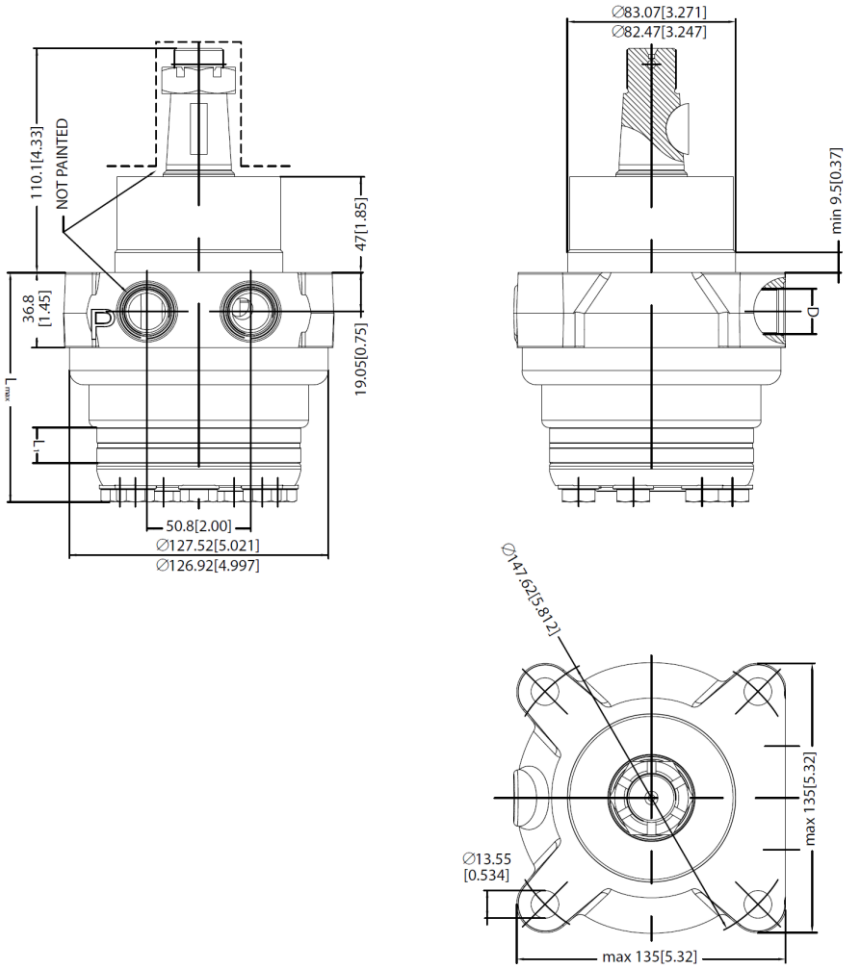
D: *G ½ , 15 mm [0.59] deep*

Figure 10 OMEW EU version

Type		**L_{max}** mm *[in]*	**L_1** mm *[in]*	**Weight** kg [*lbs]*
OMEW	**100**	112.0 *[4.41]*	14.0 *[0.55]*	9.3 *[20.5]*
	125	115.4 *[4.54]*	17.4 *[0.69]*	9.5 *[20.9]*
	160	119.8 *[4.72]*	21.8 *[0.86]*	9.8 *[21.6]*
	200	125.8 *[4.95]*	27.8 *[1.09]*	10.3 *[22.7]*
	250	132.8 *[5.23]*	34.8 *[1.37]*	10.8 *[23.8]*
	315	137.4 *[5.41]*	43.5 *[1.71]*	11.3 *[24.9]*

Table 4 OMEW EU version dimensions

European version



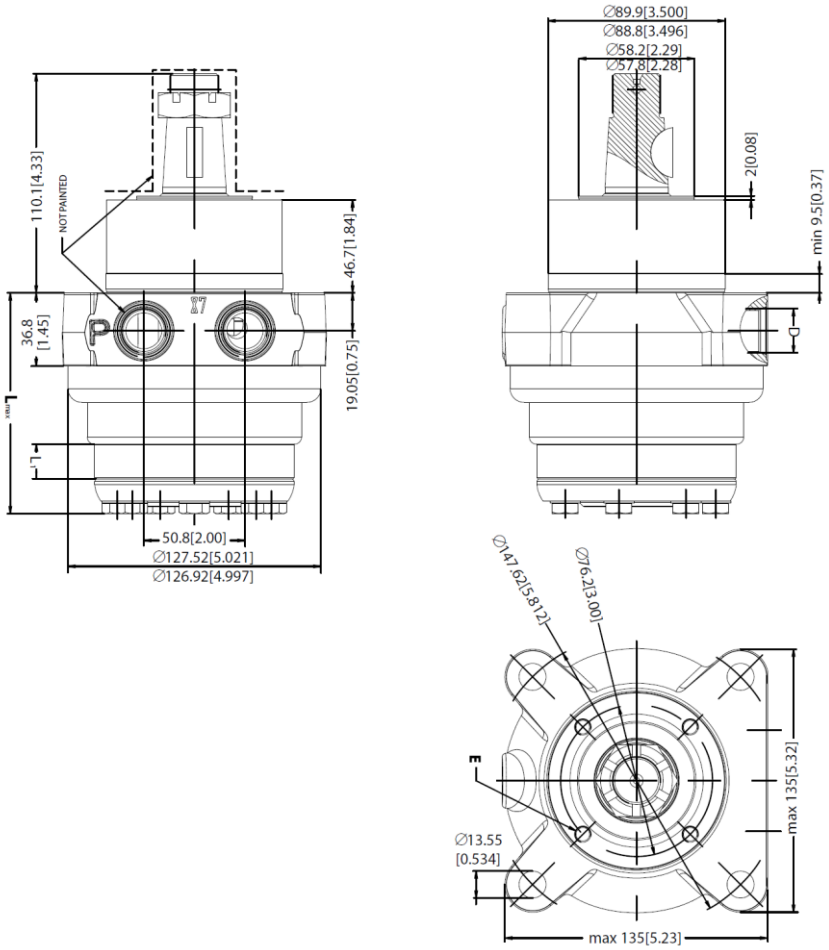
D: *7/8 - 14 UNF, 16.7 [0.66] deep*
- - - Not painted

Figure 11 OMEW US version

Type		L_{max} mm *[in]*	L_1 mm *[in]*	Weight kg [*lbs*]
OMEW	100	112.0 *[4.41]*	14.0 *[0.55]*	9.3 *[20.5]*
	125	115.4 *[4.54]*	17.4 *[0.69]*	9.5 *[20.9]*
	160	119.8 *[4.72]*	21.8 *[0.86]*	9.8 *[21.6]*
	200	125.8 *[4.95]*	27.8 *[1.09]*	10.3 *[22.7]*
	250	132.8 *[5.23]*	34.8 *[1.37]*	10.8 *[23.8]*
	315	141.5 *[5.57]*	43.5 *[1.71]*	11.3 *[24.9]*
	345	145.9 *[5.74]*	48.0 *[1.89]*	11.6 *[25.6]*
	400	152.8 *[6.02]*	54.9 *[2.19]*	12.0 *[26.5]*

Table 5 OMEW US version dimensions

US version



D: *7/8 - 14 UNF, 16.7 [0.66] deep*

- - - Not painted

Figure 12 OMEW US version

Type		L_{max} mm *[in]*	L_1 mm *[in]*	Weight kg [*lbs*]
OMEW	**100**	110.1 *[4.33]*	14.0 *[0.55]*	9.3 *[20.5]*
	125	113.5 *[4.47]*	17.4 *[0.69]*	9.5 *[20.9]*
	160	117.9 *[4.64]*	21.8 *[0.86]*	9.8 *[21.6]*
	200	123.9 *[4.88]*	27.8 *[1.09]*	10.3 *[22.7]*
	250	130.9 *[5.15]*	34.8 *[1.37]*	10.8 *[23.8]*
	315	139.6 *[5.50]*	43.5 *[1.71]*	11.3 *[24.9]*
	345	144.0 *[5.67]*	47.9 *[1.89]*	11.6 *[25.6]*
	400	150.9 *[5.94]*	54.8 *[2.19]*	12.0 *[26.5]*

Table 6 OMEW US version dimensions

Figures

Tables

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