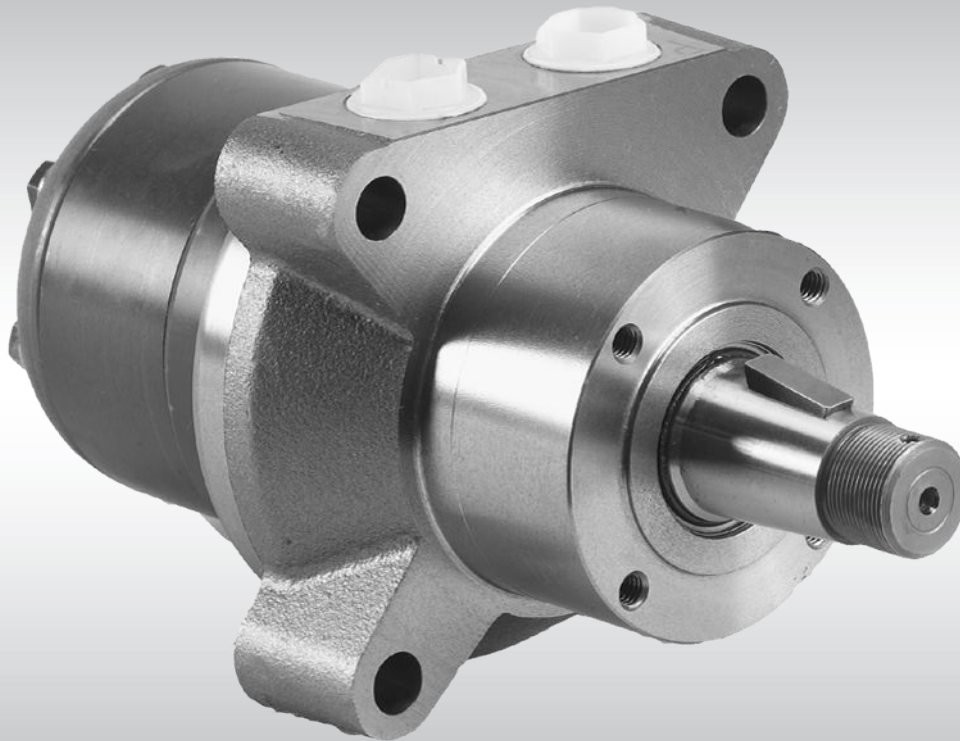




Technical Information

Orbital Motors

OMEW Standard and with Low Speed Option



Revision history*Table of revisions*

Date	Changed	Rev
October 2014	Changed to Danfoss layout	CA
September 2010	New back cover	BC
March 2010	Japan location	BB
January 2009	Major change	BA

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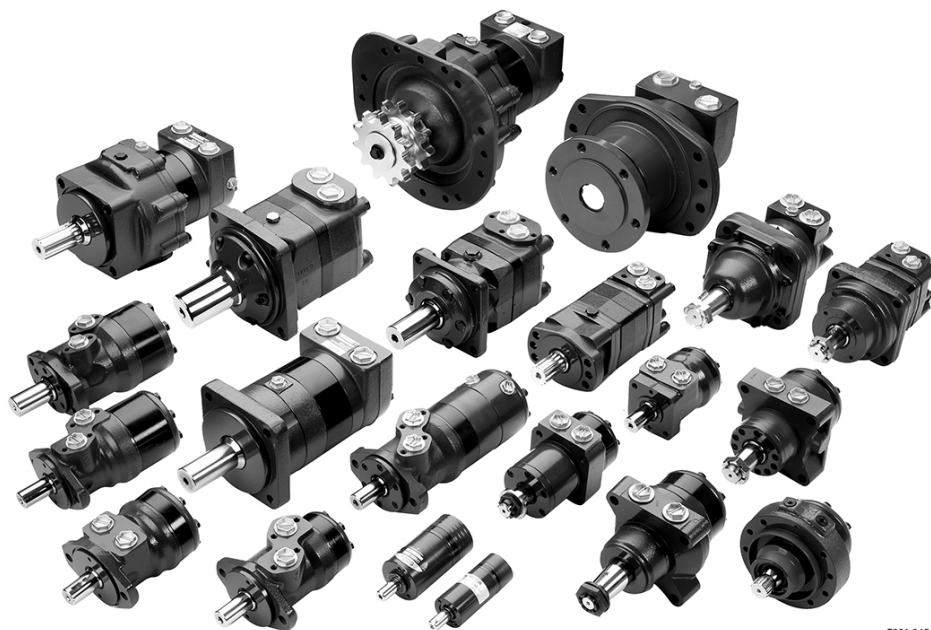
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A wide range of Orbital Motors

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 cm³ [0.50 in³] to 800 cm³ [48.9 in³] per revolution.

Speeds range up to approximate 2,500 min⁻¹ (rpm) for the smallest type and up to approximate 600 min⁻¹ (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:

A wide range of 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

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: TMT
- Technical data on large motors: TMV

A general survey brochure on Danfoss Orbital Motors gives a quick motor reference based on power, torque, speed and capabilities.

Introduction

Danfoss is offering the OMEW motor in two different versions. Both versions are designed mainly for propel applications, but they are optimize for different conditions.

A. OMEW standard version.

The advantage by 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 by 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 Information OMEW Standard and with Low Speed Option Orbital Motors

Versions
Versions

Mounting flange	Shaft	Port size	Pilot	European version	US version	Clock wise shaft rotation (CW version)*	Counter clock wise shaft rotation (CCW version)*	Standard version	Low speed version	Painted black	Main type designation
Wheel, Standard	Tapered 1 1/4 in	7/8 - 14 UNF	3.25 in		X	X		X		Yes	OMEW
		7/8 - 14 UNF	3.25 in		X		X	X		Yes	OMEW
	Tapered 35 mm	G 1/2	82.5 mm	X		X		X		No	OMEW
		G 1/2	82.5 mm	X			X	X		No	OMEW
Wheel, Low Speed	Tapered 1 1/4 in	7/8 - 14 UNF	3.50 in		X	X			X	Yes	OMEW
		7/8 - 14 UNF	3.50 in		X		X		X	Yes	OMEW

* Direction of rotation

In applications that mainly involves operation in one direction, we recommend a corresponding motor with either CW- or CCW-rotation.

High pressure seals

Since all OMEW motors are fitted with a high-pressure shaft seal, there is no need for a drain line.

Technical Information OMEW Standard and with Low Speed Option Orbital Motors

Code numbers*OMEW code numbers*

	Displacement							
Code Numbers	100	125	160	200	250	315	345	400
151H	3108	3109	3110	3111	3112	3113	3114	3115
151H	3118	3119	3120	3121	3122	3123	3124	3125
151H	2002	2003	2004	2005	2006	2007		
151H	2011	2012	2013	2014	2015	2016		
151H	3080	3081	3082	3083	3084	3085	3086	3087
151H	3090	3091	3092	3093	3094	3095	3096	3097

Ordering

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

Example:

151H3084 for an OMEW 250 with 1 1/4 in tapered shaft, port size 7/8 - 14 UNF and clockwise rotation (CW).

Orders will not be accepted without the four digit prefix.

Technical Information OMEW Standard and with Low Speed Option Orbital Motors

Technical data

Technical data for OMEW

Technical Data for OMEW with 35 mm and 1 1/4 in Tapered Shaft

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

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]

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.

Technical data

Maximum permissible shaft seal pressure

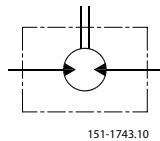
OMEW with high pressure shaft seal

CW version (clockwise rotation)

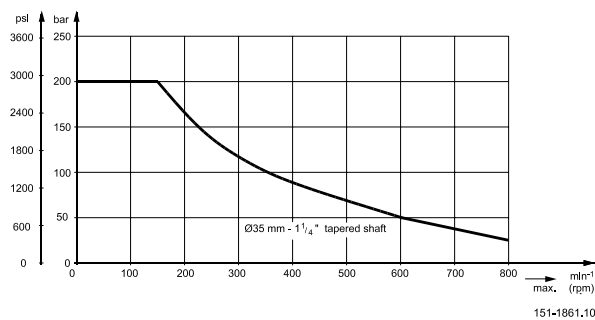
1. By clockwise rotation: The shaft seal pressure equals the return pressure.
2. By counter clockwise rotation: The shaft seal pressure equals the input pressure

CCW version (counter clockwise rotation)

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



Max permissible shaft seal pressure



Pressure drop in motor

Standard

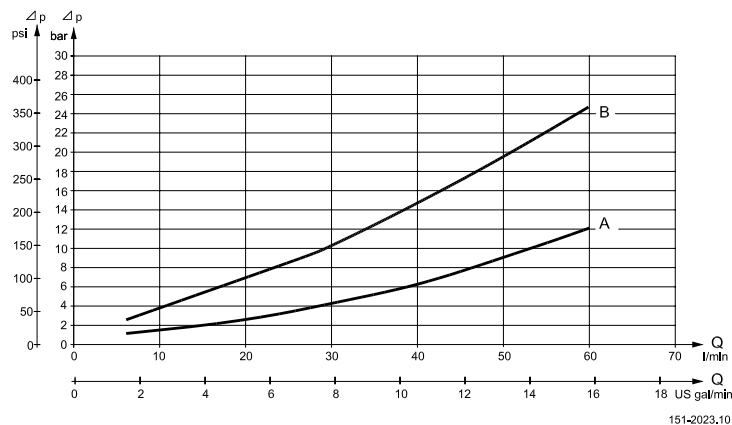
A: OMEW 100 - 400

Low Speed

A: OMEW 100 - 160

B: OMEW 200 - 400

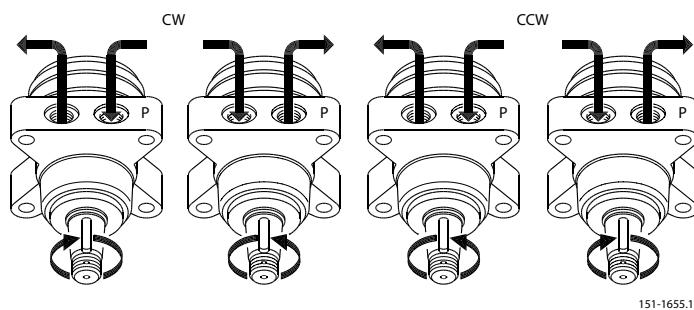
Technical data



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

Direction of shaft rotation

CW - motor / CCW - motor



Permissible shaft loads for OMEW

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

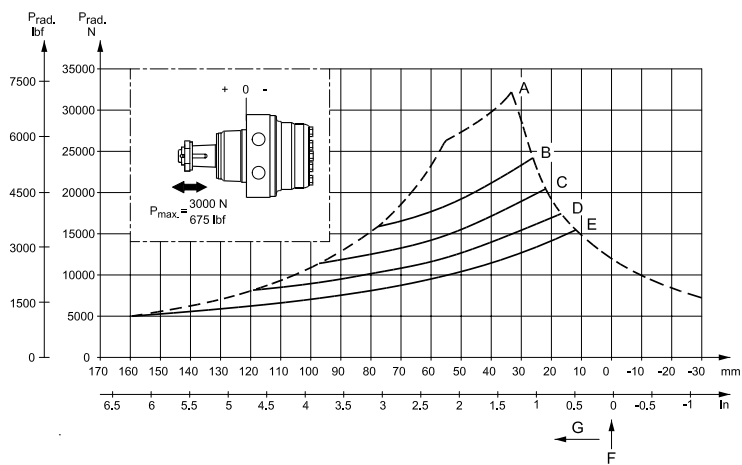
Based upon the requested max. speed and the point of action of the radial load the permissible shaft load can be read from the curved shown below.

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.

The lifetime can also be calculated by means of the "Bearing dimensions" instructions in the technical information »General« 520L0232.

Technical data



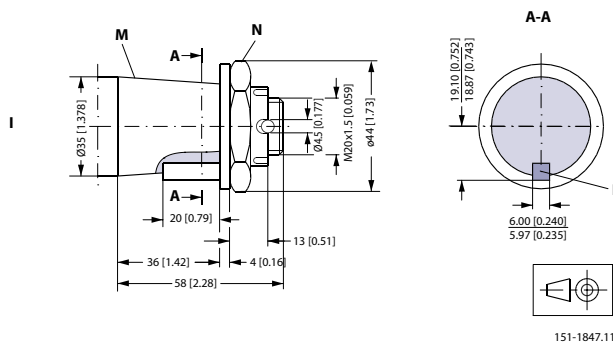
151-1725.10

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

Shaft version

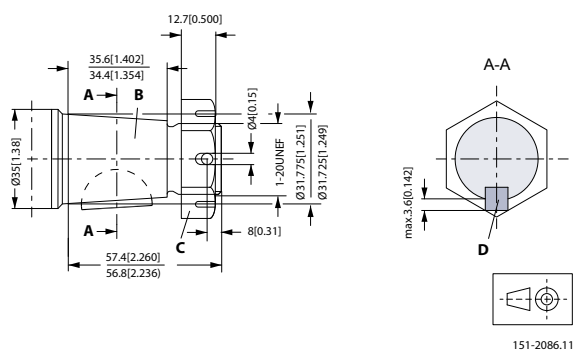
OMEW shaft version

Tapered shaft 35 mm



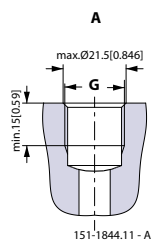
- I:** Tapered shaft 35 mm
- N:** DIN 937, NV 41; Tightening torque: $200 \pm 10 \text{ N}\cdot\text{m}$ [$1770 \pm 85 \text{ lbf}\cdot\text{in}$]
- M:** Taper 1:10
- P:** Parallel key B6 • 6 • 20, DIN 6885

Tapered shaft 1 1/4 in



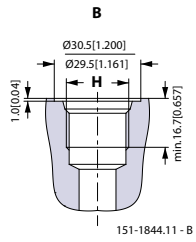
- B:** Cone 1:8, SAE J501
- C:** 1 - 20 UNEF, Across flats 1 7/16; Tightening torque: $400 \pm 10 \text{ N}\cdot\text{m}$ [$3540 \pm 85 \text{ lbf}\cdot\text{in}$]
- D:** Woodruff key 5/16 × 1, SAE J502 1a

OMEW port thread version



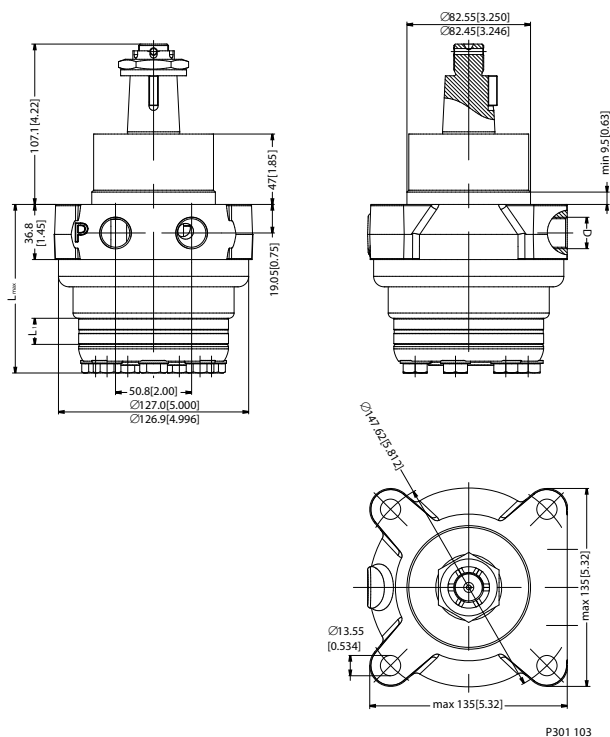
- A:** G main ports
- G:** ISO 228/1-G1/2

Shaft version



B: UNF main ports

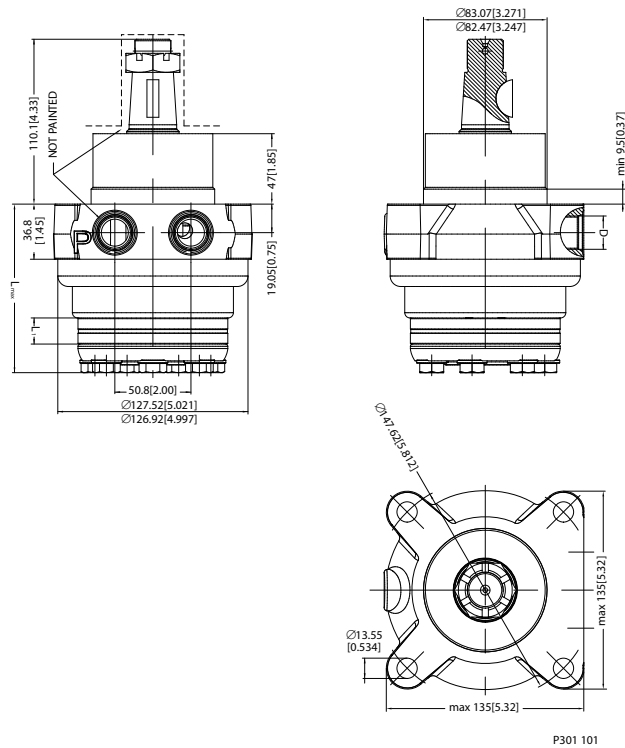
H: 7/8-14 UNF O-ring boss port

Dimensions
OMEW dimensions
European version


D: G 1/2, 15 mm [0.59] deep

OMEW European version

Type	L _{max}		L ₁		Weight	
	mm	[in]	mm	[in]	kg	[lb]
OMEW 100	112.0	[4.41]	14.0	[0.55]	9.3	[20.5]
OMEW 125	115.4	[4.54]	17.4	[0.69]	9.5	[20.9]
OMEW 160	119.8	[4.72]	21.8	[0.86]	9.8	[21.6]
OMEW 200	125.8	[4.95]	27.8	[1.09]	10.3	[22.7]
OMEW 250	132.8	[5.23]	34.8	[1.37]	10.8	[23.8]
OMEW 315	137.4	[5.41]	43.5	[1.71]	11.3	[24.9]

Dimensions


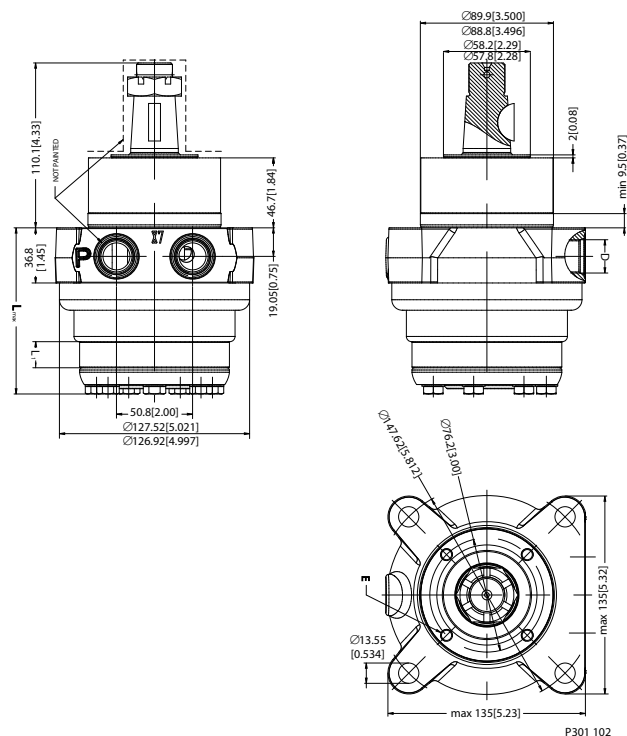
D: 7/8 - 14 UNF, 16.7 [0.66] deep

--- Not painted

The stated dimension is with paint

OMEW European version

Type	L _{max}		L ₁		Weight	
	mm	[in]	mm	[in]	kg	[lb]
OMEW 100	112.0	[4.41]	14.0	[0.55]	9.3	[20.5]
OMEW 125	115.4	[4.54]	17.4	[0.69]	9.5	[20.9]
OMEW 160	119.8	[4.72]	21.8	[0.86]	9.8	[21.6]
OMEW 200	125.8	[4.95]	27.8	[1.09]	10.3	[22.7]
OMEW 250	132.8	[5.23]	34.8	[1.37]	10.8	[23.8]
OMEW 315	141.5	[5.57]	43.5	[1.71]	11.3	[24.9]
OMEW 345	145.9	[5.74]	48.0	[1.89]	11.6	[25.6]
OMEW 400	152.8	[6.02]	54.9	[2.16]	12.0	[26.5]

Dimensions
US version


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

E: Thread for external brake 4 x 5/16-18 UNC, min 20 [0.79] deep

--- Not painted

The stated dimension is with paint

OMEW US version

Type	L _{max}		L ₁		Weight	
	mm	[in]	mm	[in]	kg	[lb]
OMEW 100	110.1	[4.33]	14.0	[0.55]	9.3	[20.5]
OMEW 125	113.5	[4.47]	17.4	[0.69]	9.5	[20.9]
OMEW 160	117.9	[4.64]	21.8	[0.86]	9.8	[21.6]
OMEW 200	123.9	[4.88]	27.8	[1.09]	10.3	[22.7]
OMEW 250	130.9	[5.15]	34.8	[1.37]	10.8	[23.8]
OMEW 315	139.6	[5.50]	43.5	[1.71]	11.3	[24.9]
OMEW 345	144.0	[5.67]	47.9	[1.89]	11.6	[25.6]
OMEW 400	150.9	[5.94]	54.8	[2.16]	12.0	[26.5]



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