

ENGINEERING
TOMORROW



Technical Information

Orbital Motors

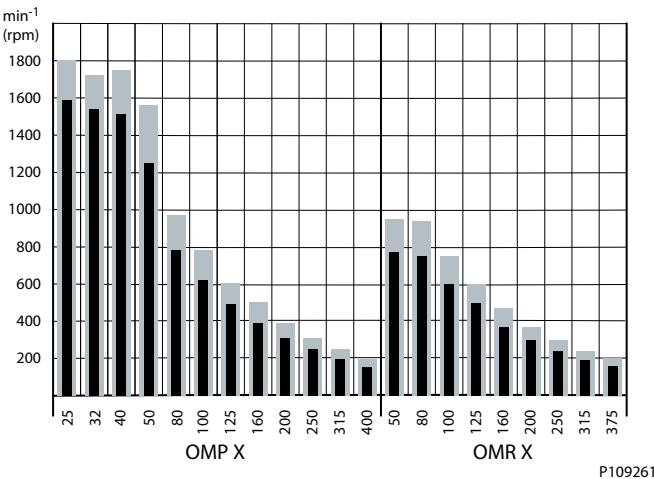
Type OMP X and OMR X



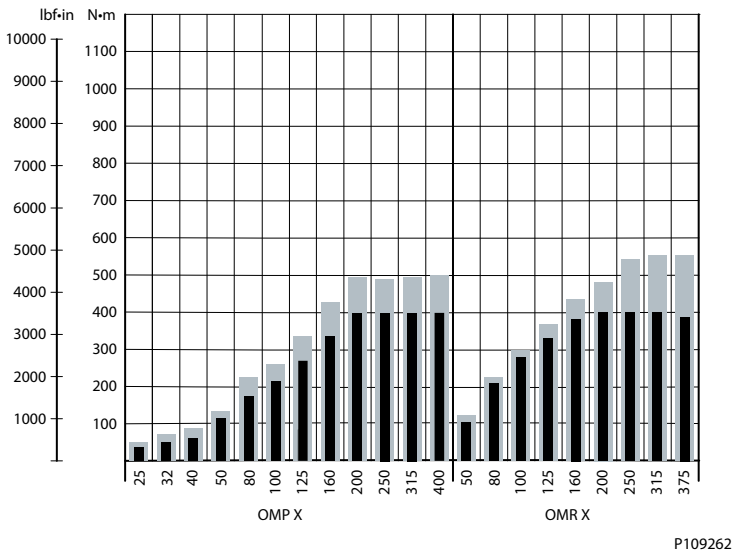
A wide range of Orbital Motors

Speed, torque and output

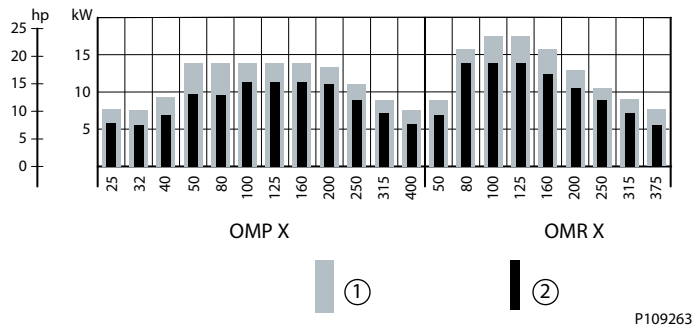
Maximum speed



Maximum torque



Maximum output



A wide range of Orbital Motors**1. Intermitten values****2. Continuous values**

The bar diagrams above are useful for a quick selection of relevant motor size for the application. The final motor size can be determined by using the function diagram for each motor size.

- OMP X and OMPW X: see [OMP function diagrams](#)
- OMR X: see [OMR function diagrams](#)

The function diagrams are based on actual tests on a representative number of motors from our production. The diagrams apply to a return pressure between 5 and 10 bar. [75 and 150 psi] when using mineral based hydraulic oil with a viscosity of 35 mm²/s [165 SUS] and a temperature of 50°C [120°F]. For further explanation concerning how to read and use the function diagrams, please consult the paragraph "Selection of motor size" in the technical information *General Orbital Motors* **520L0232**.

OMP X technical data

OMP X with 1 inch splined 6B and 28.5 mm tapered shaft

OMP 25 cm³ - 100 cm³

Type			OMP X					
Motor size			25	32	40	50	80	100
Geometric displacement	cm ³ [inch]		25.0 [1.53]	32.0 [1.96]	40.0 [2.45]	48.6 [2.97]	77.8 [4.76]	97.3 [5.95]
Max. speed	min ⁻¹ [rpm]	cont.	1600	1560	1500	1230	770	615
		int.*	1800	1720	1750	1550	960	770
Max. torque	N·m [lbf·in]	cont.	40 [355]	50 [445]	52 [460]	110 [975]	170 [1505]	210 [1860]
		int.	50 [445]	70 [620]	90 [795]	125 [1105]	220 [1950]	260 [2300]
Max. output	kW [hp]	cont.	5.4 [7.2]	6.7 [9.0]	7.0 [9.4]	9.8 [13.1]	9.8 [13.1]	11.2 [15.0]
		int.	7.5 [10.0]	9.3 [12.5]	11.2 [15.0]	14.0 [18.8]	14.0 [18.8]	14.0 [18.8]
Max. pressure drop	bar [psi]	cont.	115 [1670]	115 [1670]	115 [1670]	160 [2320]	160 [2320]	160 [2320]
		int.	160 [2320]	160 [2320]	160 [2320]	200 [2900]	200 [2900]	200 [2900]
Max. oil flow	l/min [US gal/min]	cont.	40 [10.6]	50 [13.2]	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]
		int.	45 [11.9]	55 [14.5]	70 [18.5]	75 [19.8]	75 [19.8]	75 [19.8]
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. pressure drop	N·m [lbf·in]	cont.	35 [310]	45 [400]	55 [485]	155 [1370]	135 [1200]	190 [1680]
		int.	50 [440]	65 [575]	75 [660]	190 [1680]	170 [1510]	240 [2125]

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

OMP 125 cm³ - 400 cm³

Type			OMP X					
Motor size			125	160	200	250	315	400
Geometric displacement	cm ³ [inch]		125 [7.65]	155.7 [9.53]	194.6 [11.91]	242.3 [14.83]	306.1 [18.73]	389.2 [23.82]
Max. speed	min ⁻¹ [rpm]	cont.	480	385	310	250	195	155
		int.*	600	480	385	310	245	190
Max. torque	N·m [lbf·in]	cont.	270 [2390]	335 [2965]	400 [3540]	400 [3540]	400 [3540]	400 [3540]
		int.	335 [2965]	425 [3760]	495 [4380]	490 [4335]	495 [4380]	500 [4425]
Max. output	kW [hp]	cont.	11.2 [15.0]	11.2 [15.0]	10.9 [14.5]	8.4 [11.3]	7.0 [9.4]	5.3 [7.0]
		int.	14.0 [18.8]	14.0 [18.8]	13.7 [18.3]	10.9 [14.5]	8.8 [11.7]	6.7 [8.9]

OMP X technical data

OMP 125 cm³ - 400 cm³ (continued)

Type			OMP X					
Motor size			125	160	200	250	315	400
Max. pressure drop	bar [psi]	cont.	160 [2320]	160 [2320]	155 [2250]	120 [1740]	100 [1450]	75 [1090]
		int.	200 [2900]	200 [2900]	195 [2830]	155 [2250]	125 [1810]	95 [1380]
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]
		int.	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]		9 [130]	7 [100]	5 [75]	5 [75]	5 [75]	5 [75]
Min starting torque at max. pressure drop	N·m [lbf·in]	cont.	240 [2125]	320 [2830]	375 [3320]	375 [3320]	380 [3365]	370 [3275]
		int.	300 [2655]	400 [3540]	470 [4160]	480 [4250]	475 [4205]	470 [4160]

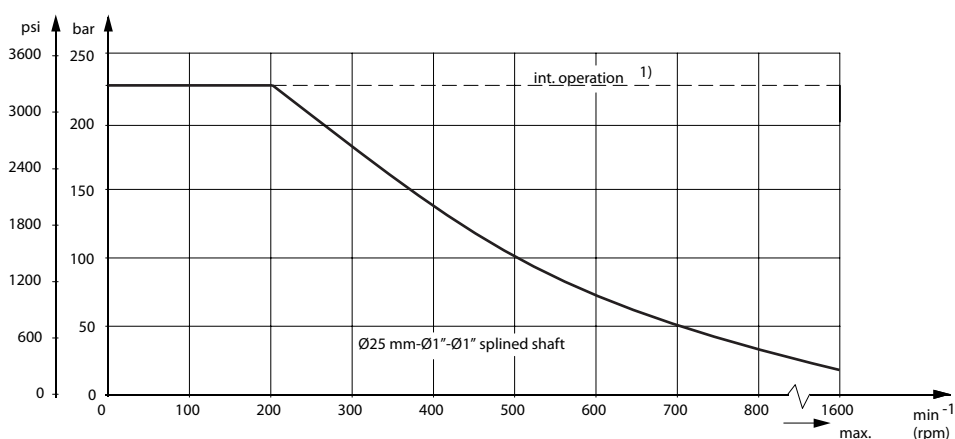
* Intermittent operation: the permissible values may occur for max. 10% of every minute.

Type		Max inlet pressure drop N·m [lbf·in]	Max return pressure with drain line N·m [lbf·in]
OMP X 25 cm ³ - 400 cm ³	cont.	200 [2900]	200 [2900]
	int.	225 [3260]	225 [3260]

Maximum permissible shaft seal pressure

OMP X with High Pressure Shaft Seal (HPS)

Maximum permissible shaft seal pressure

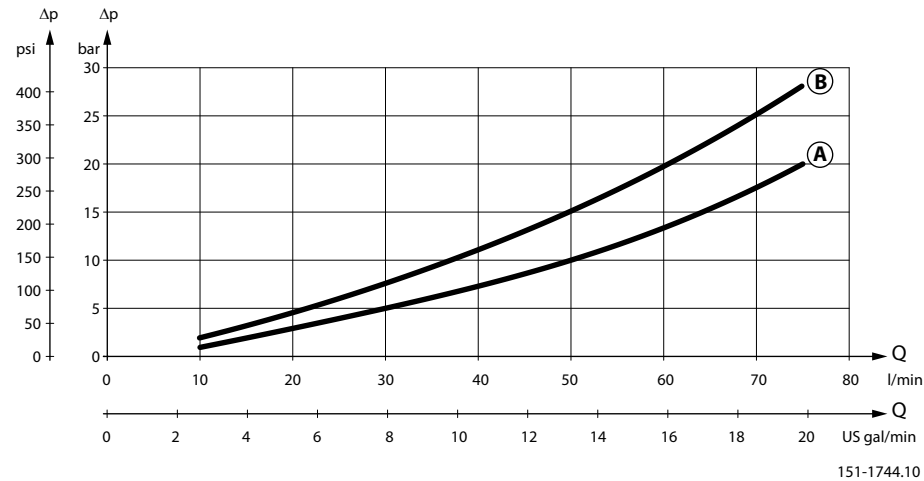


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OMP X technical data

Pressure drop in OMP X motor

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



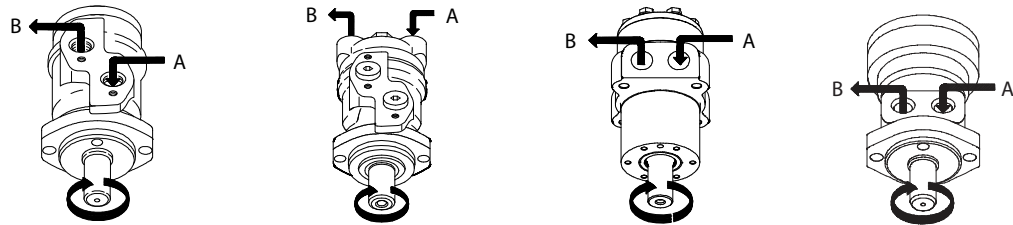
- A:** OMP X 50 - 400
- B:** OMP X 25 - 40 / OMPW X

Oil flow in drain line

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

Pressure drop		Viscosity		Oil flow in drain line	
bar	[psi]	mm ² /s	[SUS]	l/min	[US gal/min]
100	[1450]	20	[100]	2.5	[0.66]
		35	[165]	1.8	[0.78]
140	[2030]	20	[100]	3.5	[0.93]
		35	[165]	2.8	[0.74]

Direction of shaft rotation: clockwise



P109280

Permissible shaft loads

OMP X and OMR X

The permissible radial shaft load (P_R) depends on:

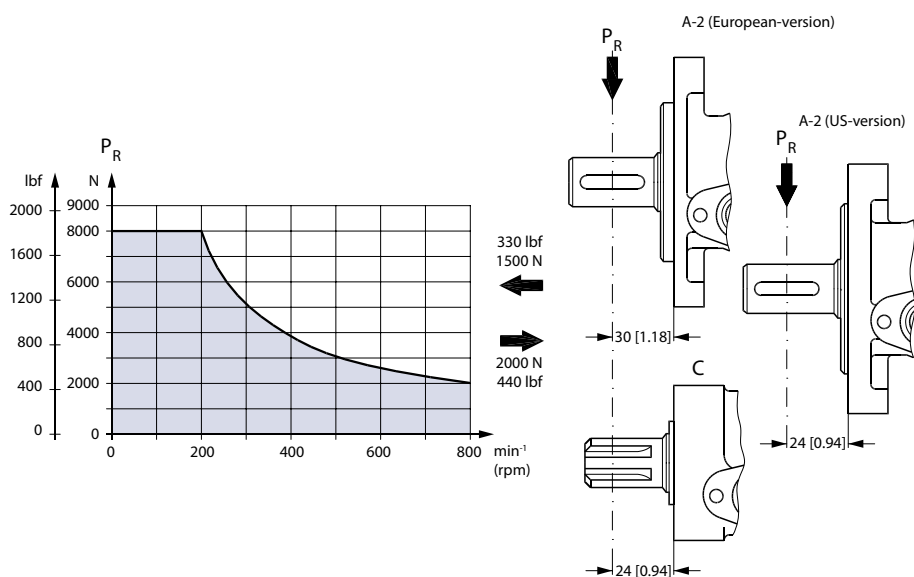
OMP X technical data

- Speed (n)
- Distance (L) from the point of load to the mounting flange
- Mounting flange version
- Shaft version

Mounting flange	2-hole oval flange (European version)	Square flange** 2-hole oval flange (US-version)
Shaft version	25 mm cylindrical shaft 28.5 mm tapered shaft 1 in cylindrical shaft 1 in splined shaft	25 mm cylindrical shaft 1 in splined shaft
Permissible shaft load (P _R) - l in mm	$\frac{800}{n} \cdot \frac{250000}{95 + L} \text{ N}^*$	$\frac{800}{n} \cdot \frac{250000}{101 + L} \text{ N}^*$
Permissible shaft load (P _R) - l in inch	$\frac{800}{n} \cdot \frac{2215}{3.74 + L} \text{ lbf}^*$	$\frac{800}{n} \cdot \frac{2215}{3.98 + L} \text{ lbf}^*$

** For both European and US-version

* $n \geq 200 \text{ min}^{-1} [\text{rpm}]$; $\leq 55 \text{ mm} [2.2 \text{ in}]$. $n < 200 \text{ min}^{-1} [\text{rpm}]$; $\Rightarrow P_{R\text{max}} = 8000 \text{ N} [1800 \text{ lbf}]$



P109266

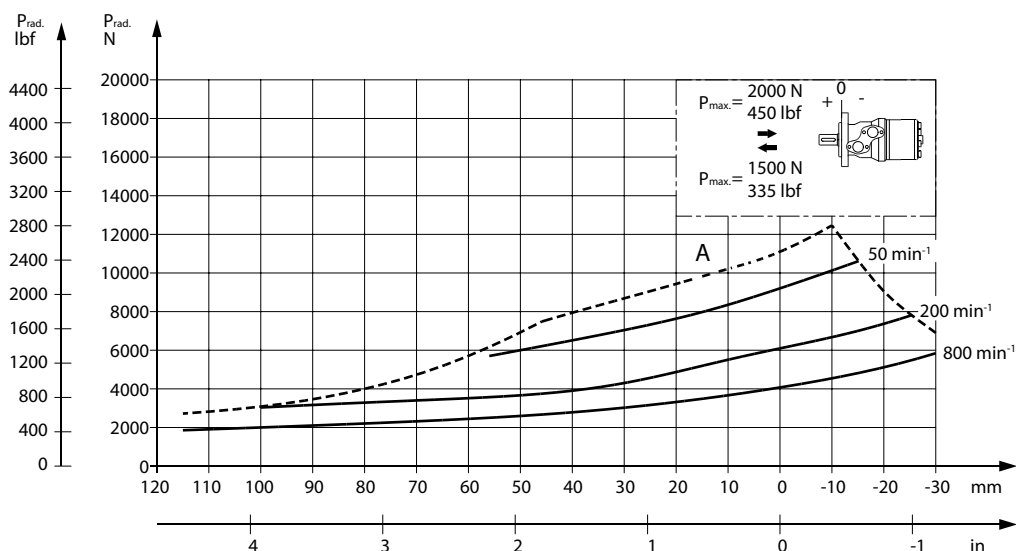
The curve shows the relation between P_R and n

- when $L = 30 \text{ mm} [1.18 \text{ in}]$ for motors with A2 (European version)
- when $L = 24 \text{ mm} [0.94 \text{ in}]$ for motors with square mounting flange and A2 (US version)

For applications with special performance requirements we recommend OMP and OMR with the output shaft running in needle bearings.

OMP X technical data

OMP X N



151-2112.10

The output shaft on OMP X N can be offered in needle bearings. These bearings and the recessed mounting flange allow a higher permissible radial load in comparison to OMP X motors.

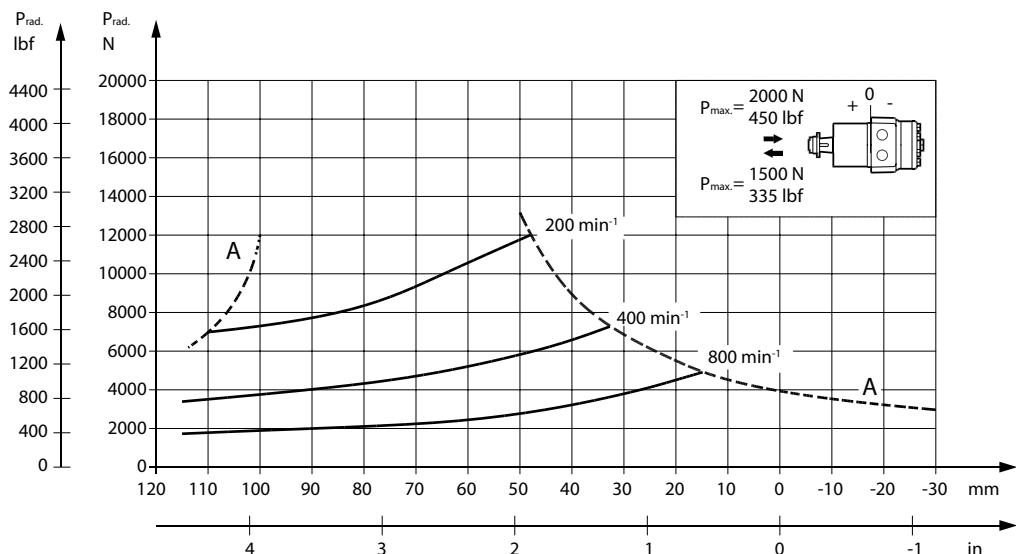
The permissible radial load on the shaft is shown for different speeds as a function of the distance from the mounting flange to the point of load application.

Curve A indicates the max. radial shaft load. Any shaft load exceeding the values quoted in curve A will involve risk of breakage.

The other curves apply to a B10 bearing life of 2000 hours at the number of revolutions indicated by the curve letter. Mineral based hydraulic oil with a sufficient content of anti-wear additives must be used.

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*.

OMPW X N with slide bearings



151-2105.10

OMP X technical data

The output shaft on OMPW X can be offered in slide bearings similar to the other OMP X motors. The permissible higher radial load is therefore due to the recessed mounting flange moving the point of load closer to the motor bearings.

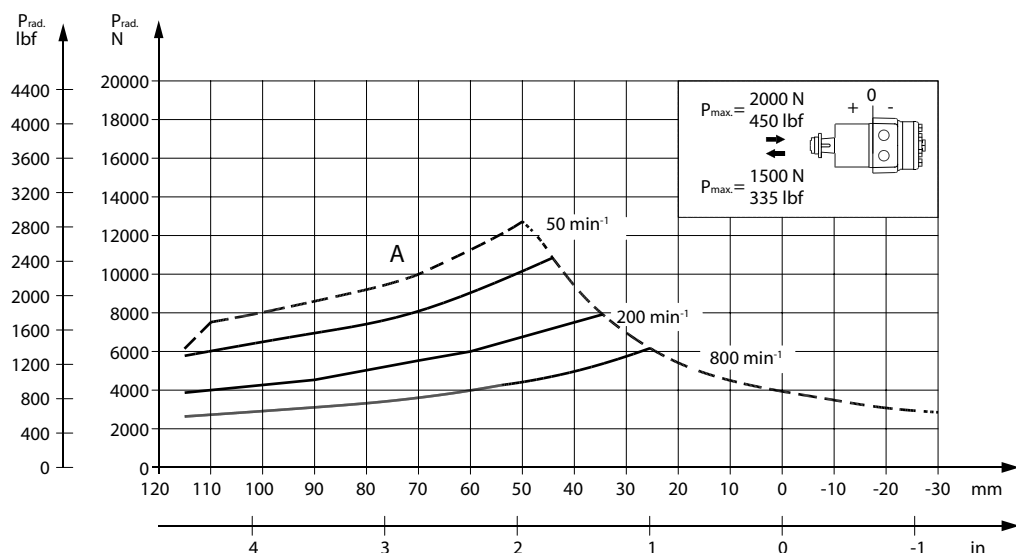
The permissible radial load on the shaft is shown for different speeds as a function of the distance from the mounting flange to the point of load application.

The curves are not based on calculations of B10 bearing life. They represent absolute limits that must not be exceeded.

Curve A indicates the max. radial shaft load. Any shaft load exceeding the values quoted in curve A will involve risk of breakage.

OMP X technical data

OMPW X N with needle bearing



151-2106.10

The output shaft on OMPW X N can be offered in needle bearings. These bearings and the recessed mounting flange allow a higher permissible radial load in comparison to OMP X motors.

The permissible radial load on the shaft is shown for different speeds as a function of the distance from the mounting flange to the point of load application.

Curve A indicates the max. radial shaft load. Any shaft load exceeding the values quoted in curve A will involve risk of breakage.

The other curves apply to a B10 bearing life of 2000 hours at the number of revolutions indicated by the curve letter. Mineral based hydraulic oil with a sufficient content of anti-wear additives must be used.

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*.

OMP X function diagrams

Explanation of function diagram use, basis and conditions can be found in [Speed, torque and output](#) on page 7.

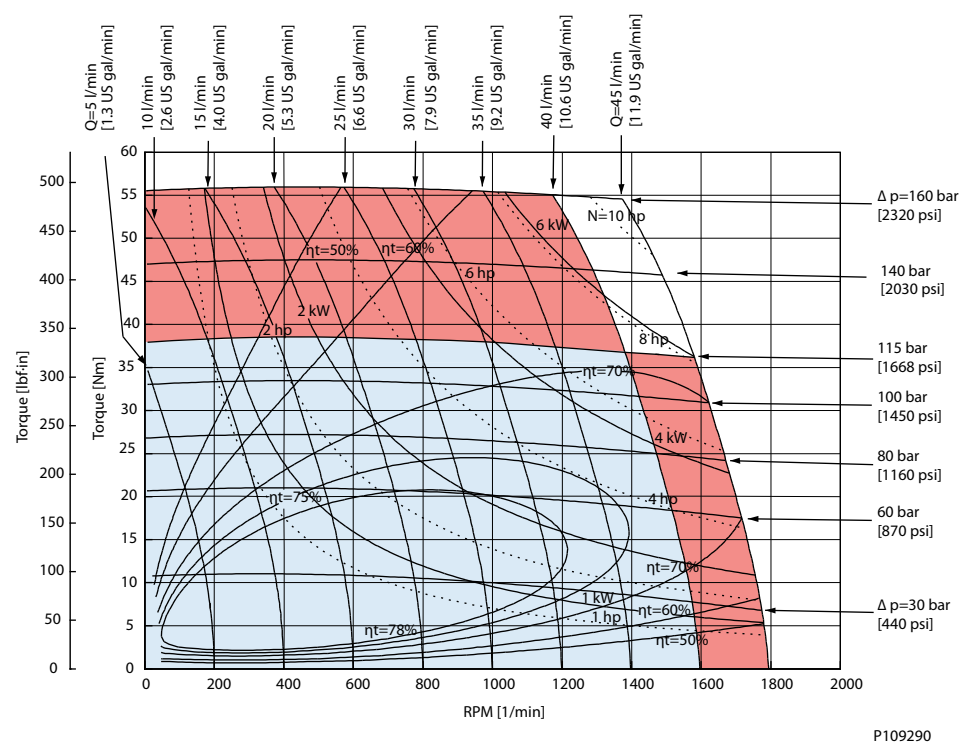
- Continuous range
- Intermittent range (max. 10% operation every minute)

Max. permissible continuous/intermittent pressure drop for the actual shaft version can be found in [OMP X technical data](#) on page 12.

Intermittent pressure drop and oil flow must not occur simultaneously.

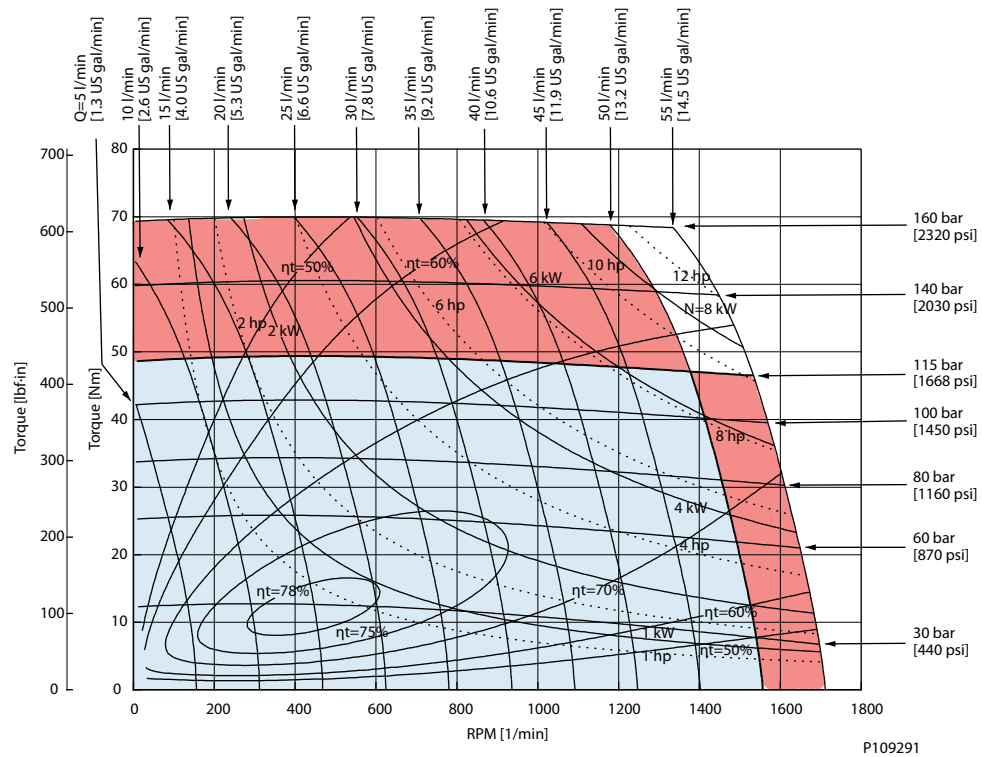
OMP X function diagrams

OMP X 25

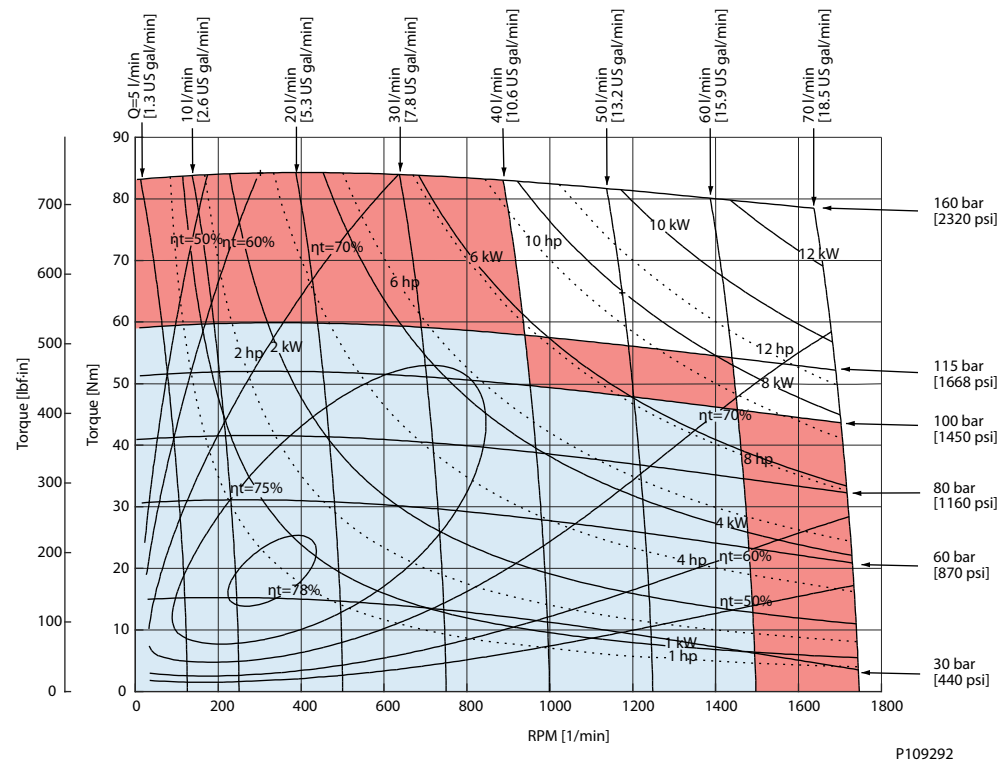


OMP X function diagrams

OMP X 32

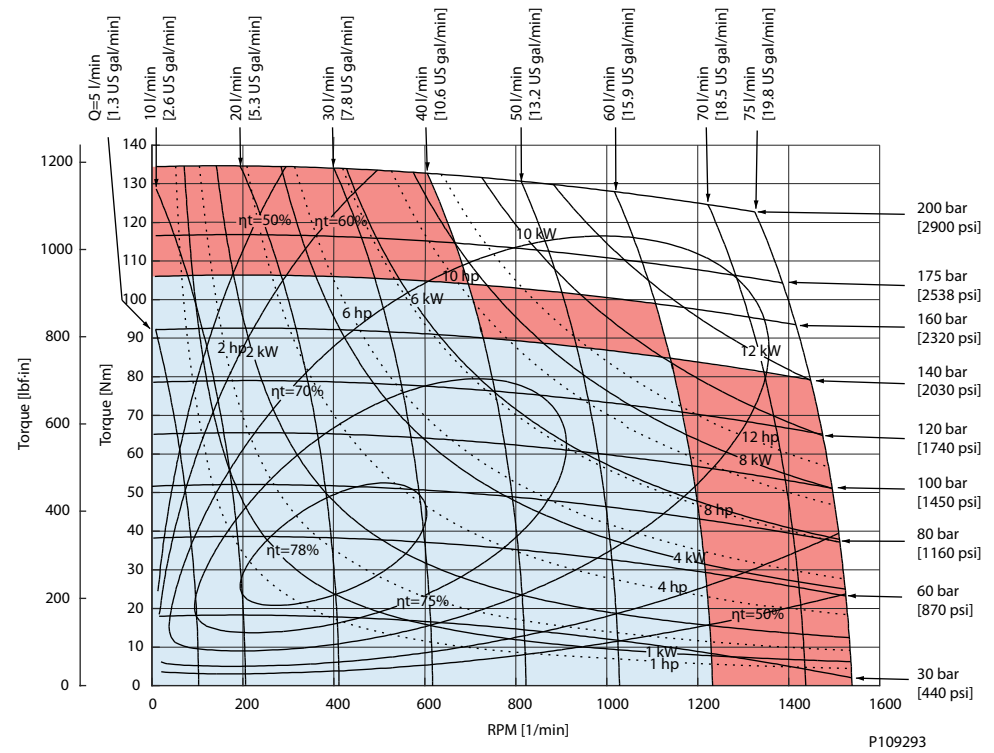


OMP X 40

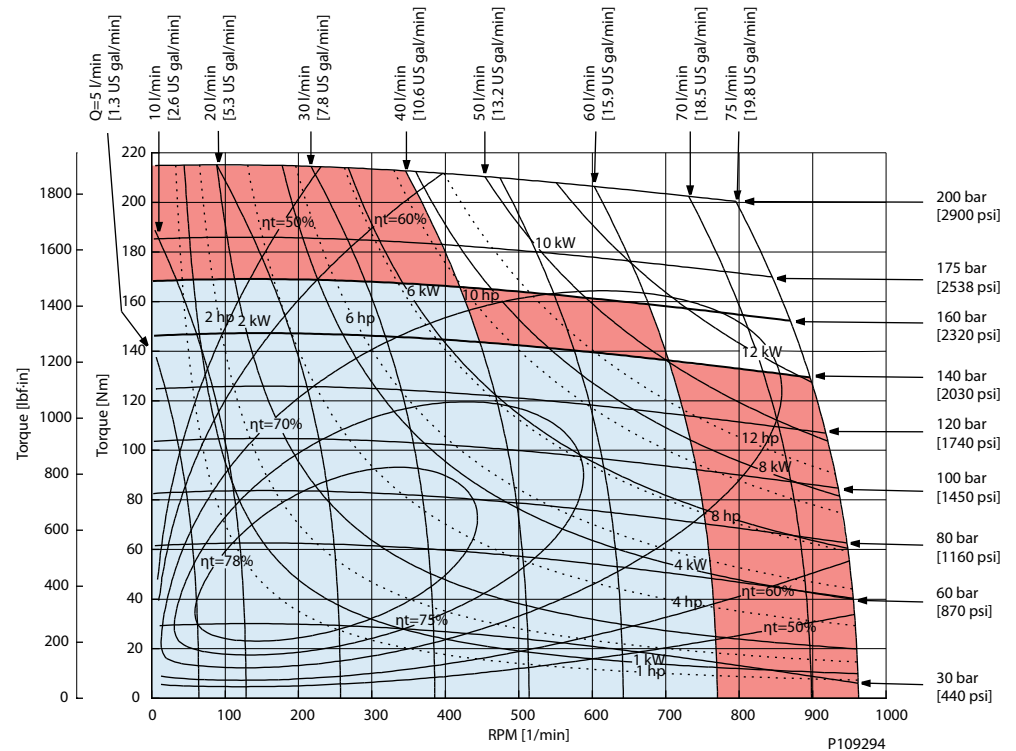


OMP X function diagrams

OMP X 50

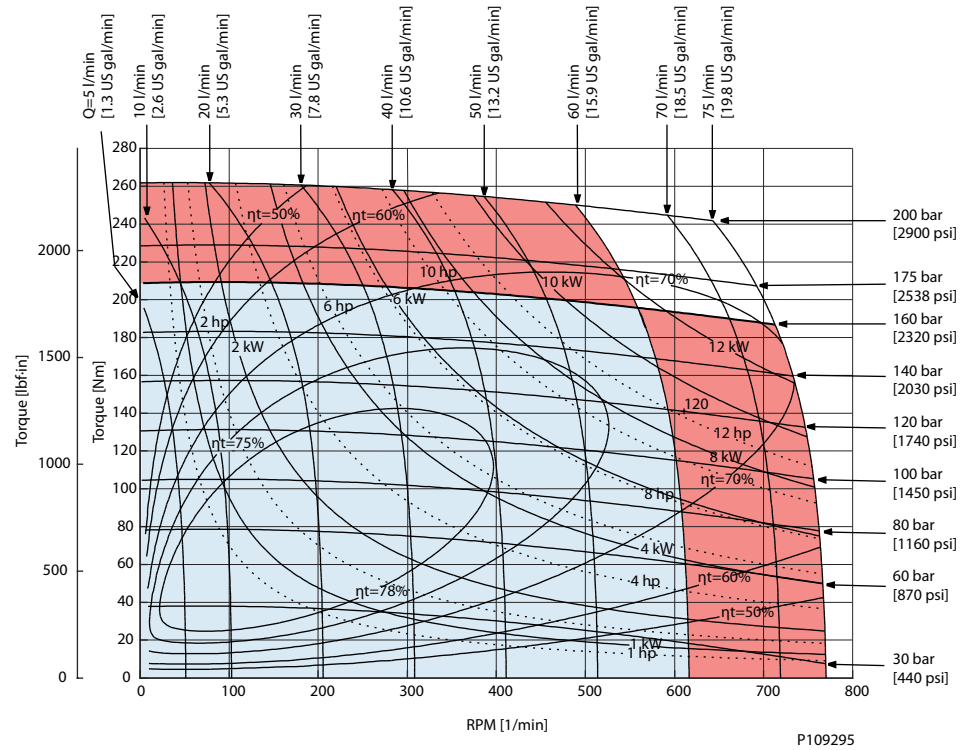


OMP X 80

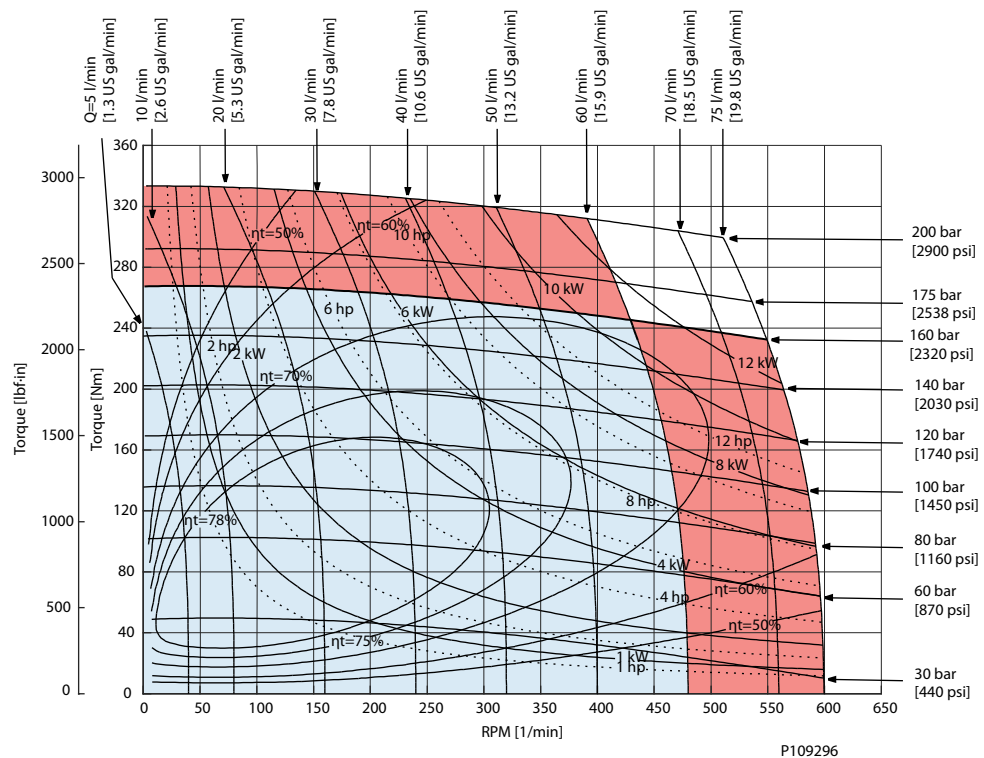


OMP X function diagrams

OMP X 100

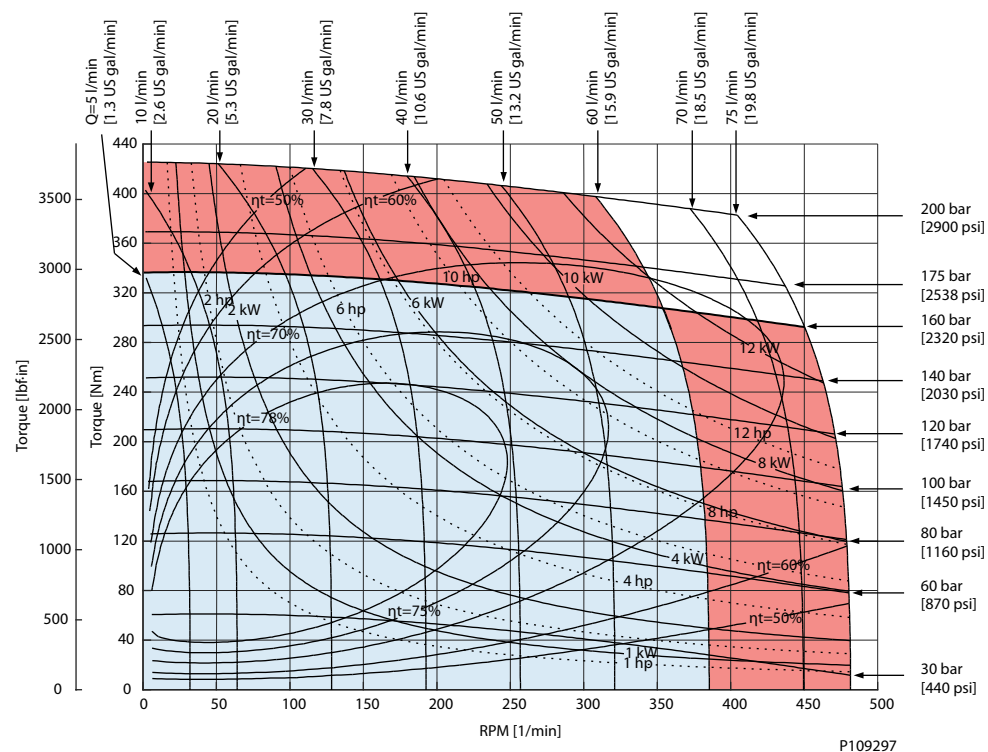


OMP X 125

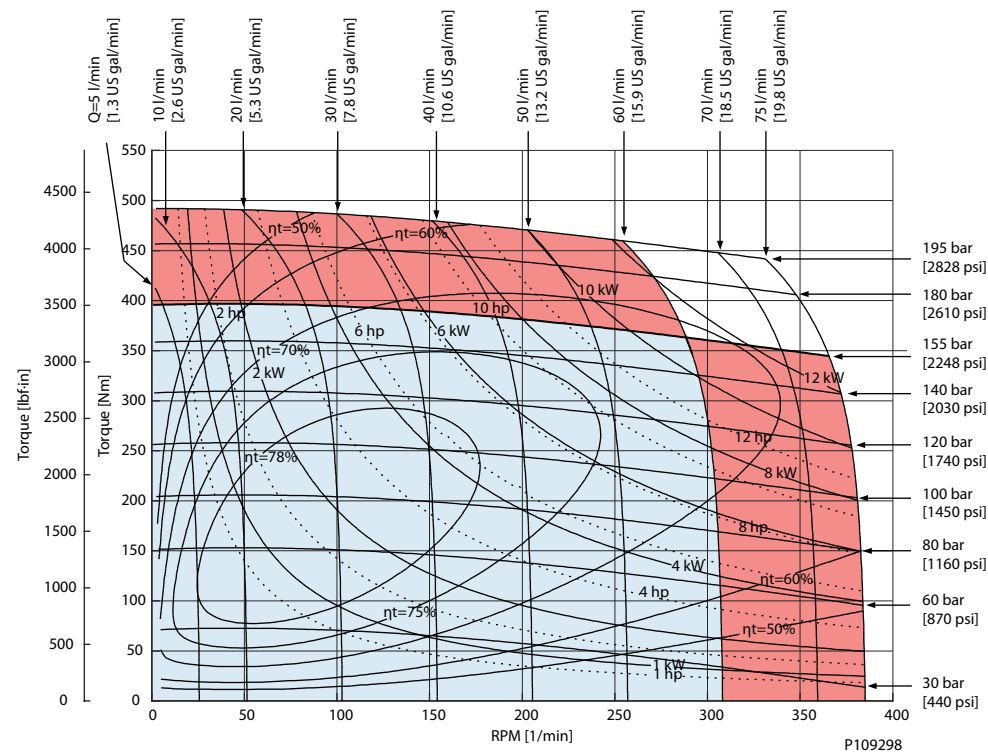


OMP X function diagrams

OMP X 160

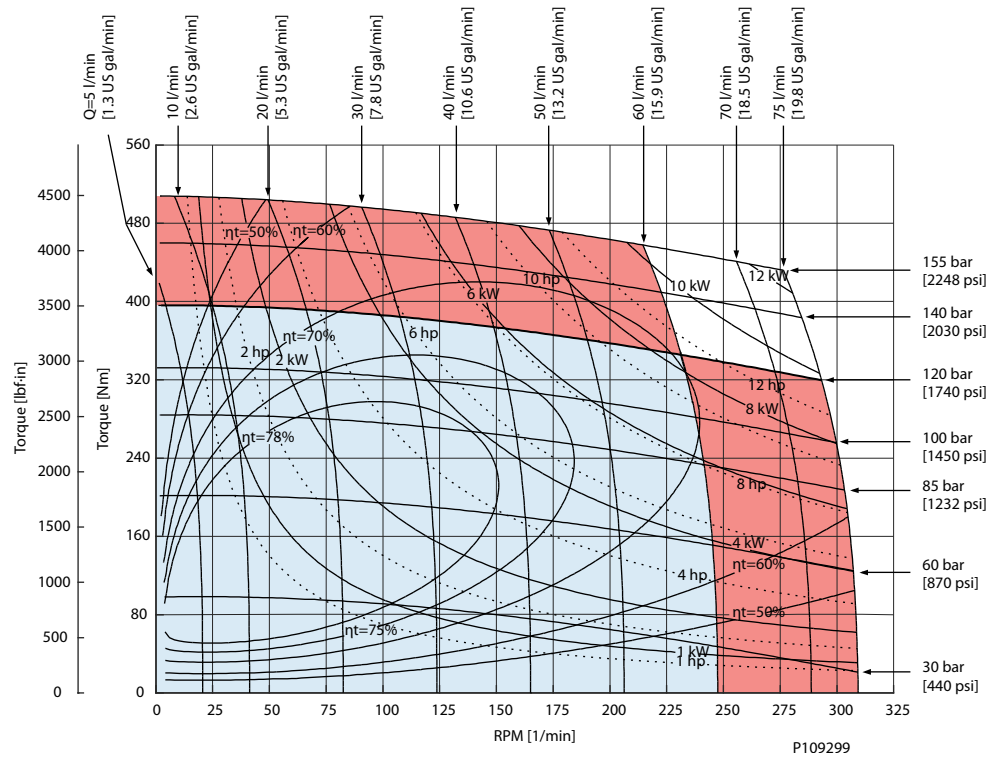


OMP X 200

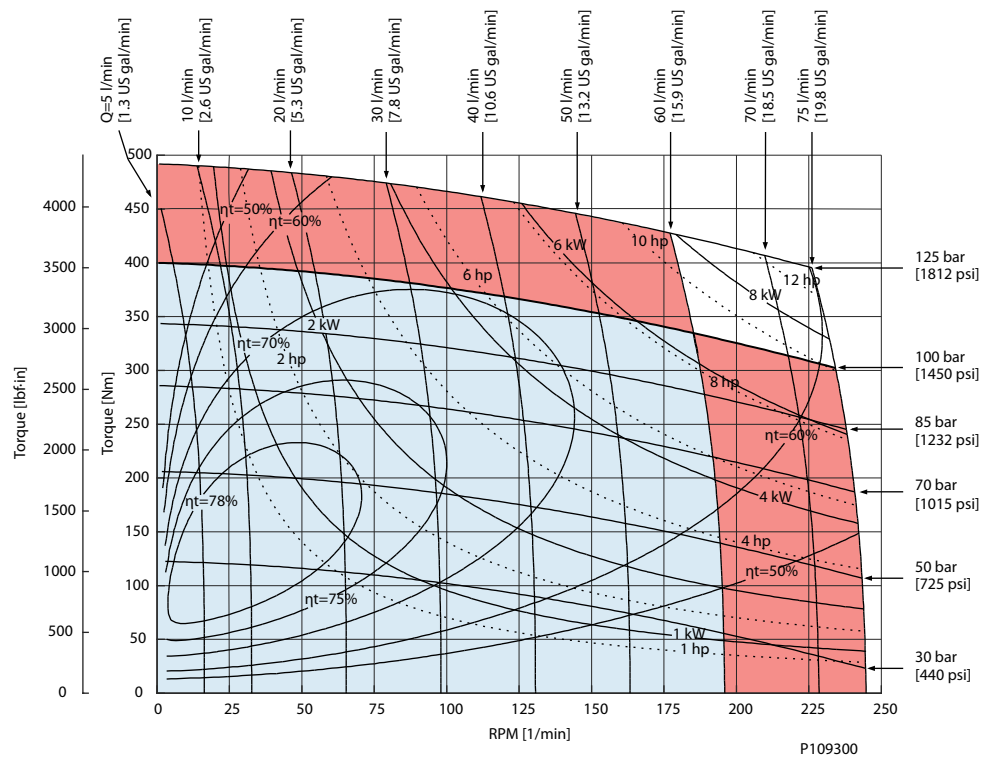


OMP X function diagrams

OMP X 250

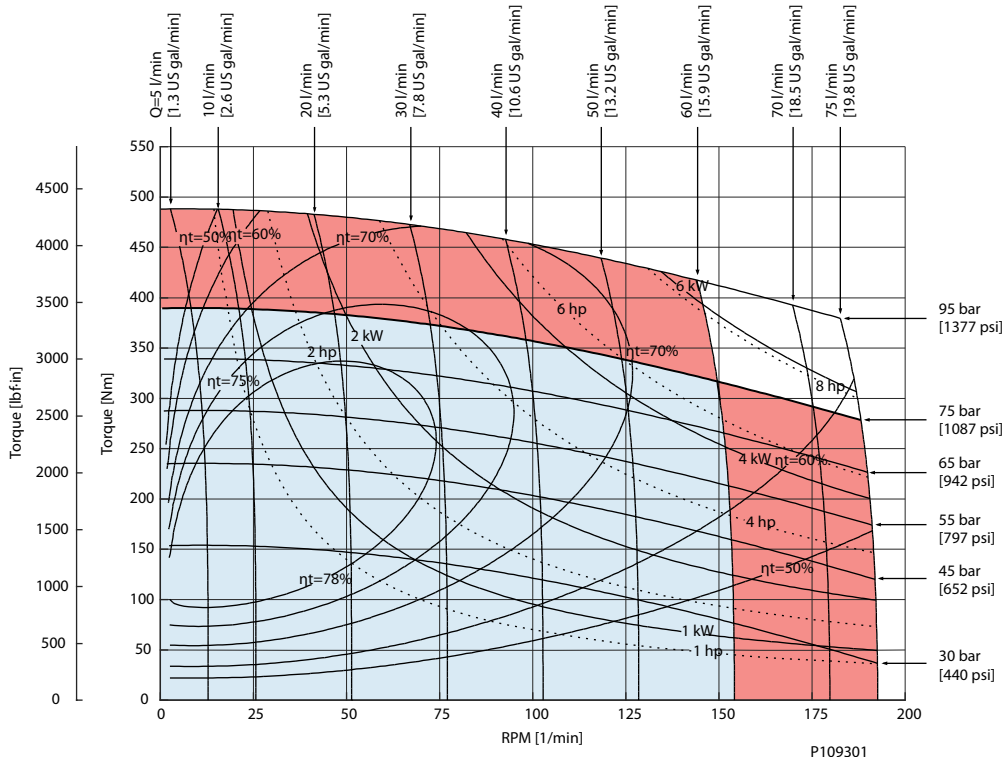


OMP X 315



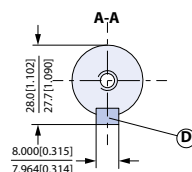
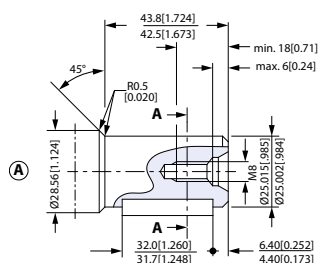
OMP X function diagrams

OMP X 400



OMP X shaft version

OMP X shaft version



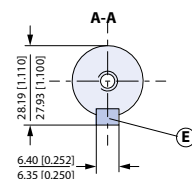
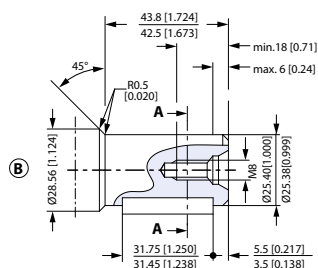
151-1842.12_A

A: Cylindrical shaft 25 mm

D: Parallel key A8 • 7 • 32 DIN 6885

Max cont. torque: 340 Nm [3010 lbf-in]

Max int. torque 450 Nm [3980 lbf-in]



151-1842.12_B

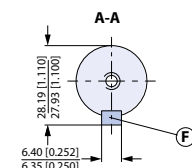
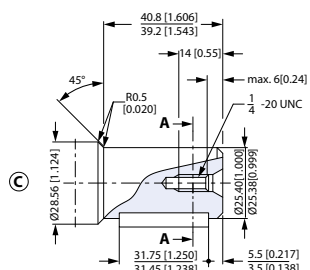
B: Cylindrical shaft 1 in

E: Parallel key 1/4 • 1/4 • 11/4 in B.S. 46

Max cont. torque: 340 Nm [3010 lbf-in]

Max int. torque: 450 Nm [3980 lbf-in]

US version



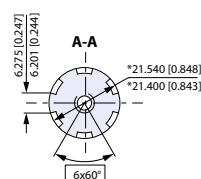
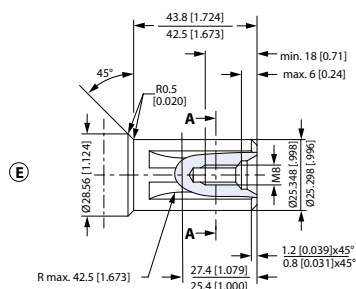
151-1842.12

C: Cylindrical shaft 1 in

F: Parallel key 1/4 • 1/4 • 11/4 in B.S. 46

Max cont. torque: 340 Nm [3010 lbf-in]

Max int. torque 450 Nm [3980 lbf-in]



151-1843.11_E

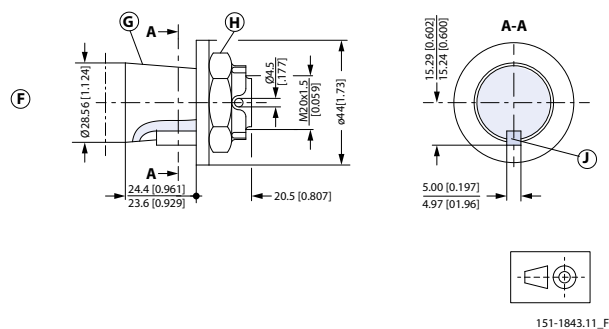
E: Splined shaft B.S. 2059 (SAE 6 B)

Straight-sided, bottom fitting, dep. Fit 2 Nom. size 1 in

* Deviates from BS 2059 (SAE 6B)

Max cont. torque: 400 Nm [3540 lbf-in]

OMP X shaft version



F: Tapered shaft

H: DIN 937 NV 30. Tightening torque:
100 ± 10 N•m [885 ± 88.50 lbf•in]

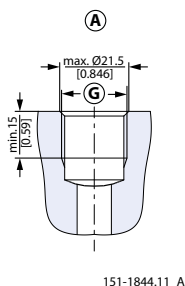
G: Taper 1:10

J: Parallel key B5 5 14 DIN 6885

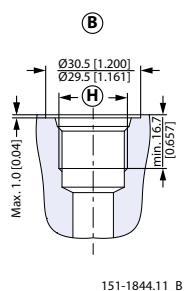
Max cont. torque: 400 Nm [3540 lbf·in]

OMP X port thread versions

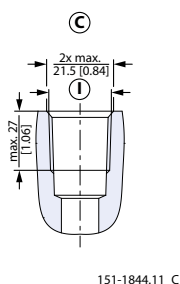
Port thread versions



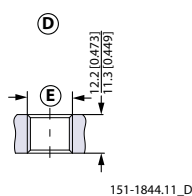
- A:** G main ports
G: ISO 228/1 - G1/2



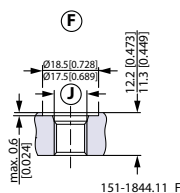
- B:** UNF main ports
H: 7/8 - 14 UNF O-ring boss port



- C:** NPTF main ports
I: 1/2 - 14 NPTF



- D:** G drain port
E: ISO 228/1 - G1/4

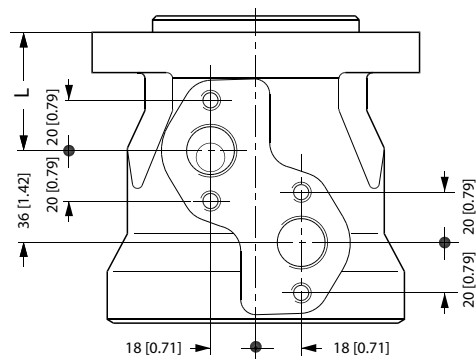


- F:** UNF drain port
J: 7/16 - 20 UNF O-ring boss port

OMP X port thread versions

OMP X manifold mount

European version



151-2135.10

L: see dimensional drawing for given OMP X motor:

- [OMP X dimensions - European version](#) on page 30
- [OMP X dimensions - US version](#) on page 35

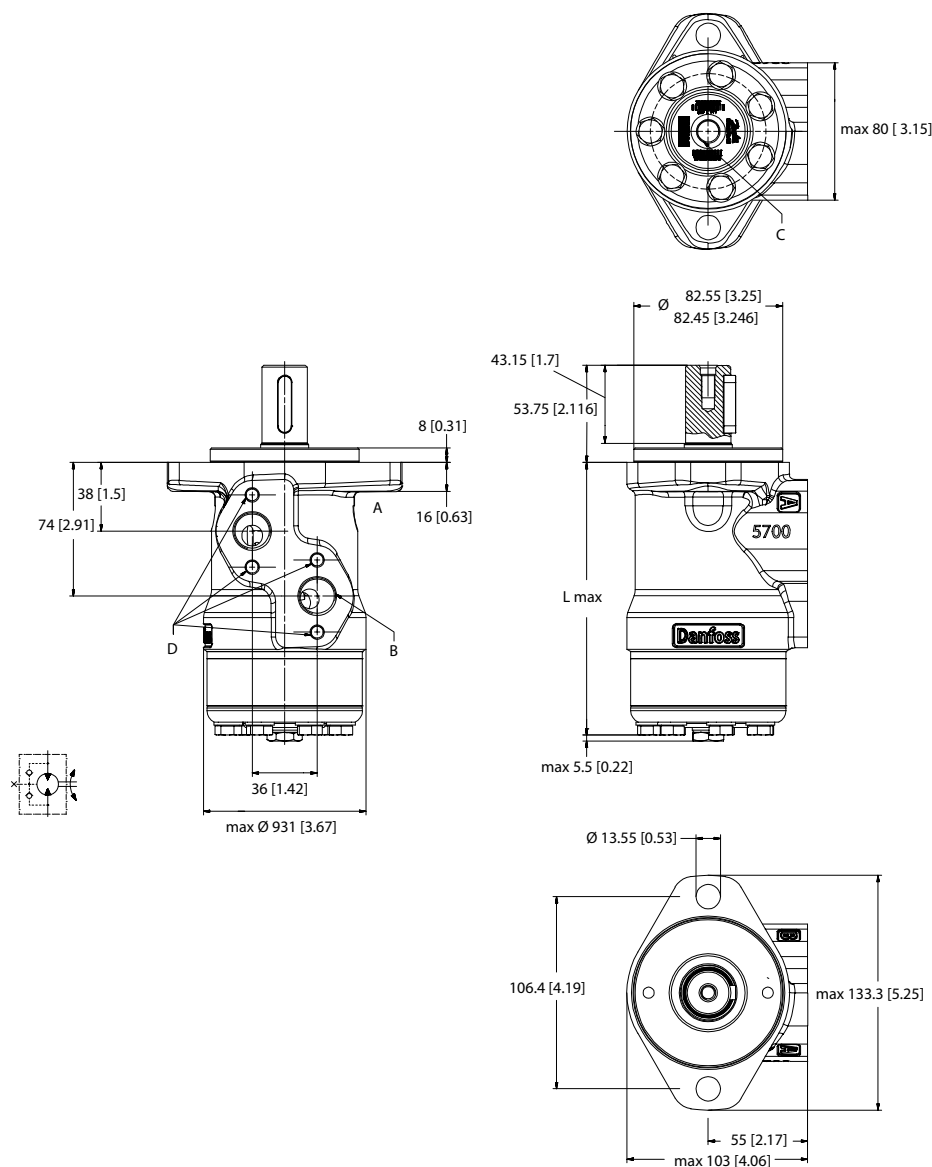
L: see dimensional drawing for given OMR X motor:

- [OMR X dimensions - European version](#) on page 57
- [OMR X dimensions - US version](#) on page 61

OMP X dimensions

OMP X dimensions - European version

Side port offset version with 2 hole oval mounting flange (A2-flange).



P109273

Port connections A, B

G 1/2; min 15 [0.599] deep

Drain connection: C

G 1/4; 11.5 [0.45]

Threaded connection holes: D

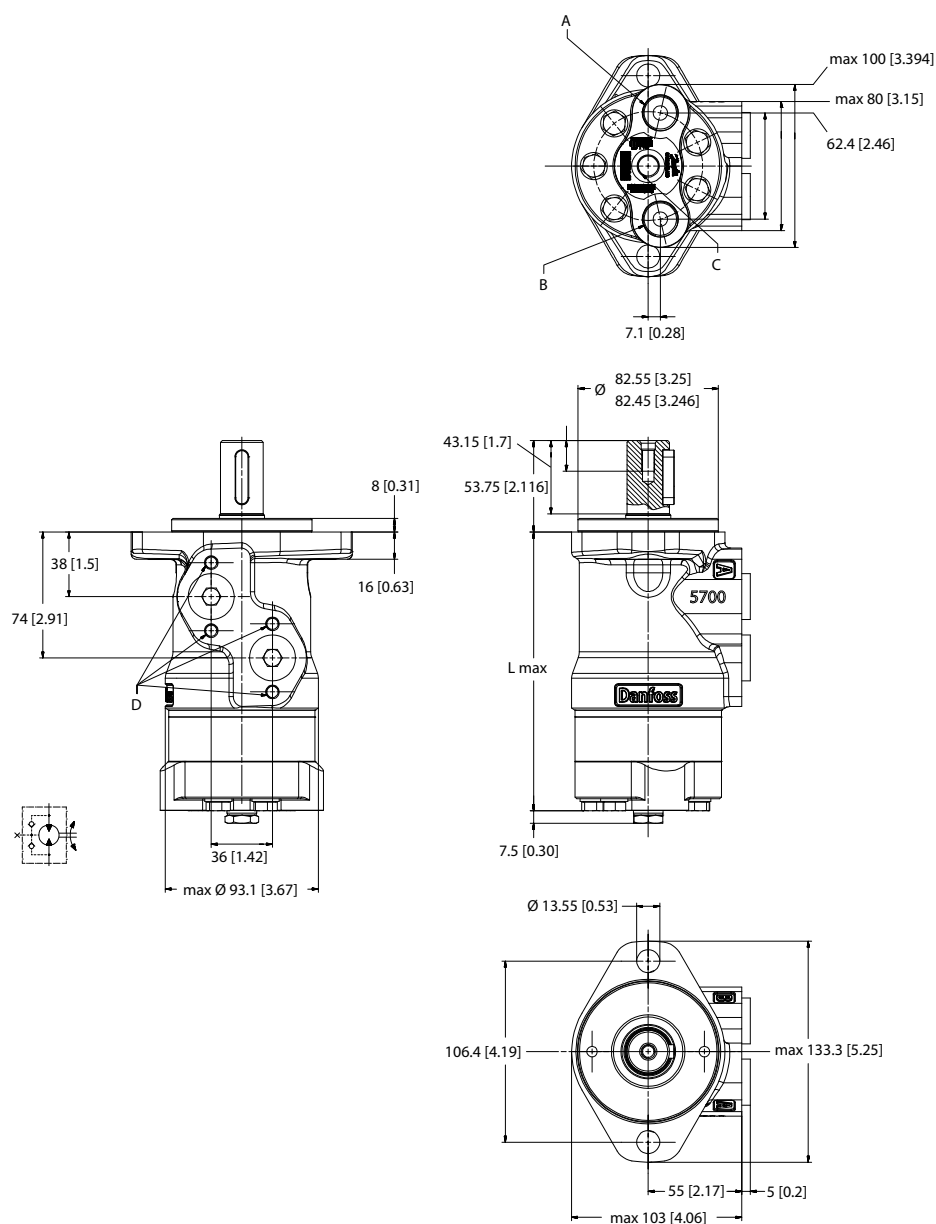
M8; 13 [0.51] deep

OMP X dimensions

Type	Displacement	L max: mm [in]
OMP X	25	130.8 [5.15]
	32	131.9 [5.22]
	40	133.2 [5.25]
	50	133.2 [5.25]
	60	134.6 [5.3]
	80	137.1 [5.4]
	100	139.7 [5.5]
	125	143.4 [5.65]
	160	147.5 [5.81]
	200	152.7 [6.02]
	250	159.2 [6.27]
	315	167.6 [6.6]
	400	178.7 [7.04]

OMP X dimensions

End port version with 2 hole oval mounting flange (A2-flange)



P109275

Port connections: A, B

G 1/2; min 15 [0.59] deep

Drain connection: C

G 1/4; 12 [0.47] deep

Threaded connection holes: D

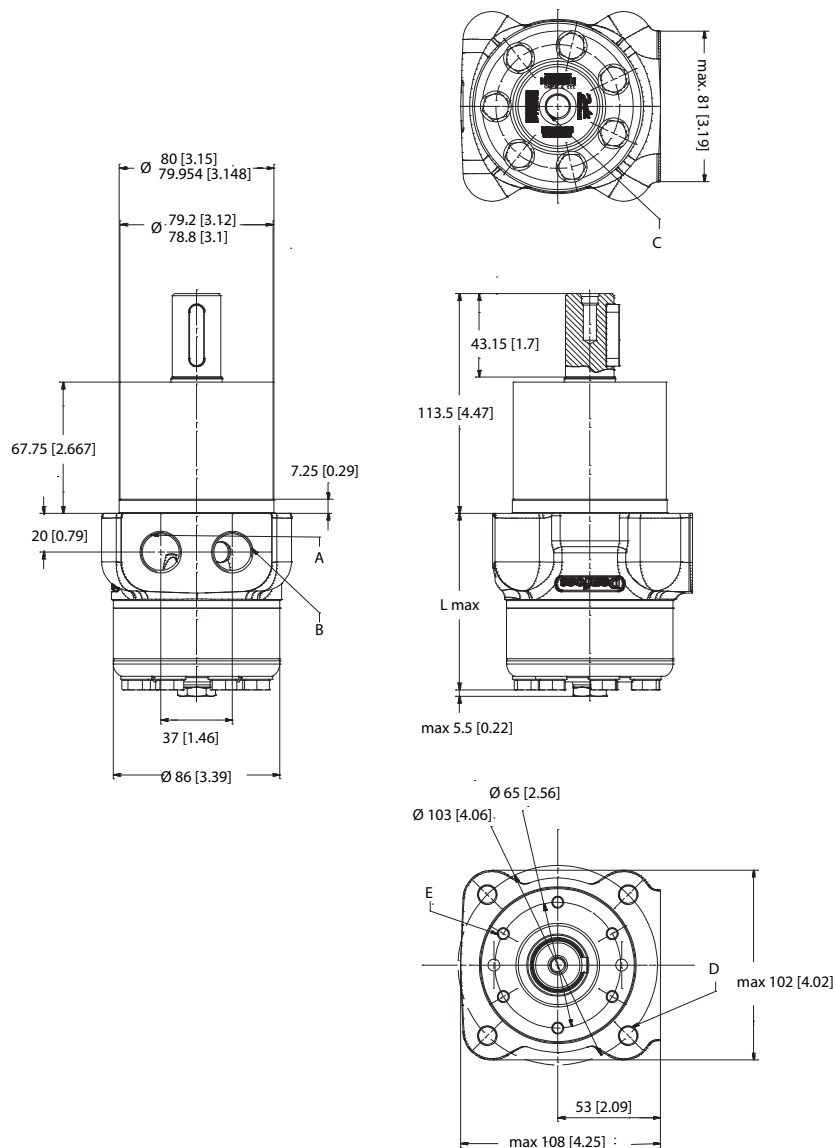
M8; 13 [0.51] deep

OMP X dimensions

Code number	Displacement	L max: mm [in]
OMP X	40	146.8 [5.78]
	50	146.8 [5.78]
	80	150.7 [5.94]
	100	153.3 [6.04]
	160	161.1 [6.35]
	200	166.3 [6.55]
	250	172.8 [6.81]
	315	181.2 [7.14]
	400	192.2 [7.58]

OMP X dimensions

OMPW X and OMPW X N wheel motor



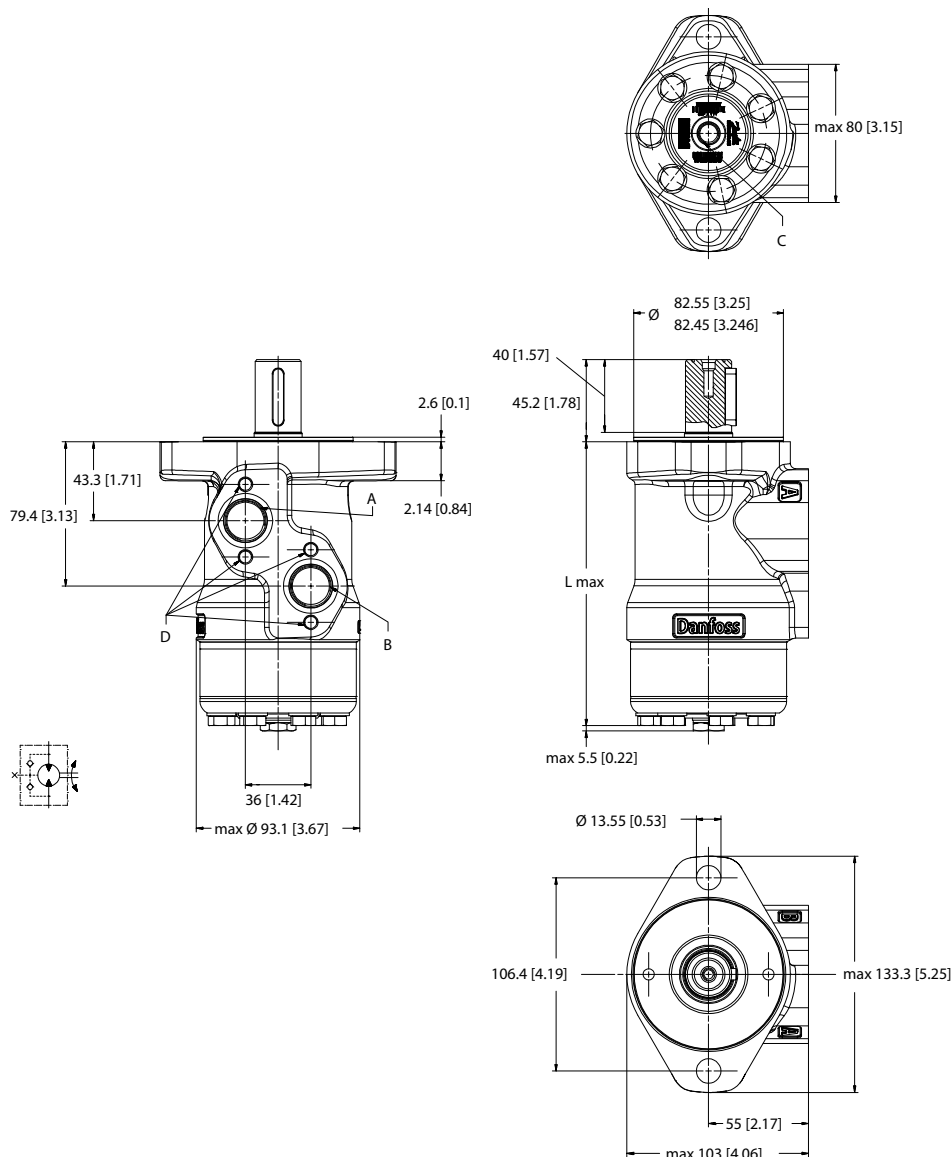
P109267

Type	Displacement	L max: mm [in]
OMP X	50	73.4 [2.89]
	80	77.3 [3.05]
	100	79.9 [3.15]
	125	83.7 [3.3]
	160	87.7 [3.46]
	200	92.9 [3.66]
	250	99.4 [3.92]
	315	107.8 [4.25]
	400	118.9 [4.69]

OMP X dimensions

OMP X dimensions - US version

Side port offset version with 2 hole oval mounting flange (A2-flange)



P109277

Port Connections: A, B

7/8 - 14 UNF; min 16.7 [0.660] deep

Drain connection: C

7/16 - 20 UNF; 11.5 [0.51] deep

Threaded connection holes: D

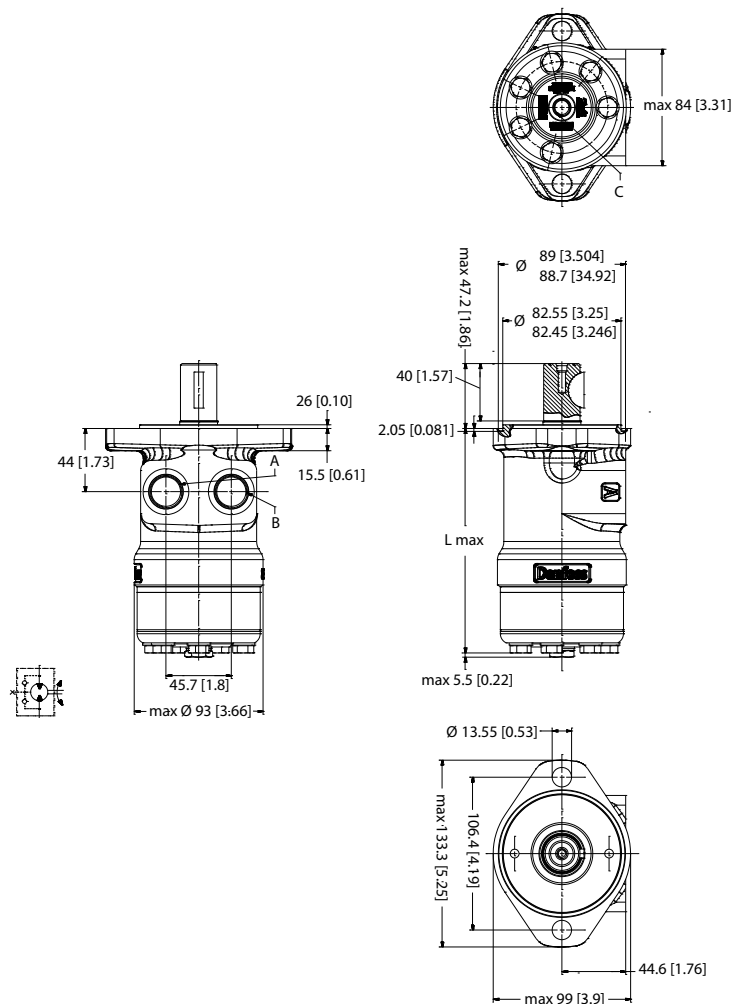
M8; 13 [0.51] deep

OMP X dimensions

Type	Displacement	L max: mm [in]
OMP X	25	136.2 [5.37]
	32	137.3 [5.41]
	40	138.6 [5.46]
	50	138.6 [5.46]
	80	142.5 [5.62]
	100	145.1 [5.72]
	160	152.9 [6.02]
	200	158.1 [6.82]
	400	173.0 [6.82]
	400	184.1 [7.25]

OMP X dimensions

Sideport aligned with 2 hole oval mounting flange (A2)



P109282

Port connections: A, B

7/8 - 14 UNF; min 16.7 [0.66] deep

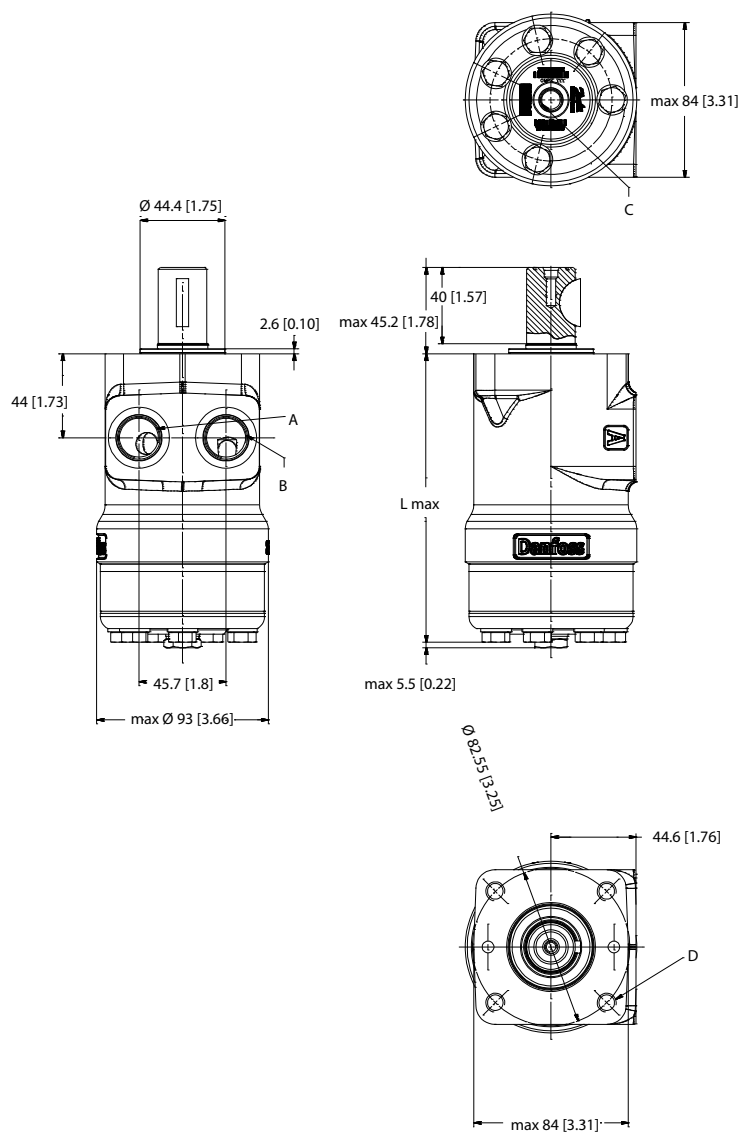
Drain connection: C

7/16 - 20 UNF; 11.5 [0.45] deep

Type	Displacement	L max mm [in]
OMR X	36	137.9 [5.43]
	50	138.6 [5.46]
	80	142.5 [5.62]
	100	145.1 [5.72]
	125	148.8 [5.86]
	160	152.9 [6.02]
	200	158.1 [6.23]
	250	164.6 [6.49]
	315	173 [6.82]
	400	184.1 [7.25]

OMP X dimensions

Side port aligned offset with square mounting flange (C-flange)



P109283

Port connections: A, B

7/8 - 14 UNF; 11.5 mm [0.45 in]

Drain connection: C

7/16 - 20 UNF; 11.5 mm [0.45 in] deep

Threaded connection holes: D

3/8 - 19 UNC; 15 mm [0.59 in] deep

OMP X dimensions

Type	Displacement	L max: mm [in]
OMP X	36	137.9 [5.43]
	50	138.6 [5.46]
	80	142.5 [5.62]
	100	145.1 [5.72]
	125	148.8 [5.86]
	160	152.9 [6.02]
	200	158.1 [6.23]
	250	164.6 [6.49]
	315	173 [6.82]
	400	184.1 [7.25]