Technical Information
Orbital Motors Type OMP X and OMR X

Contents

Chapter 1

General Information

Topics:

Orbital Motors 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

Technical Features

The program is characterized by technical features appealing to a large number of applications and by motors that can be adapted to a given application.

Adaptions comprise the following variants:

- Motors with:
  - corrosion resistant parts
  - needle bearing (OMPW X N, OMR X N)
  - low leakage version or super low leakage version (OMR, OMR X)
  - integrated negative holding brake
  - integrated flushing valve
  - speed sensor
  - tachometer connection
  - black finish paint
- Short motors without bearings or Ultra short motors
- Wheel motors with recessed mounting flange

Orbital Motors Application Areas

The orbital motors are used in the following application areas:

- Construction equipment
- Agricultural equipment
- Material handling & Lifting equipment
- Forestry equipment
- Lawn and turf equipment
- Machine tools and stationary equipment
- Marine equipment
- Special purpose

Operating Parameters Diagrams

The bar diagrams 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.

Note: 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 mm^2/s [165 SUS] and a temperature of 50°C [120°F].

Speed

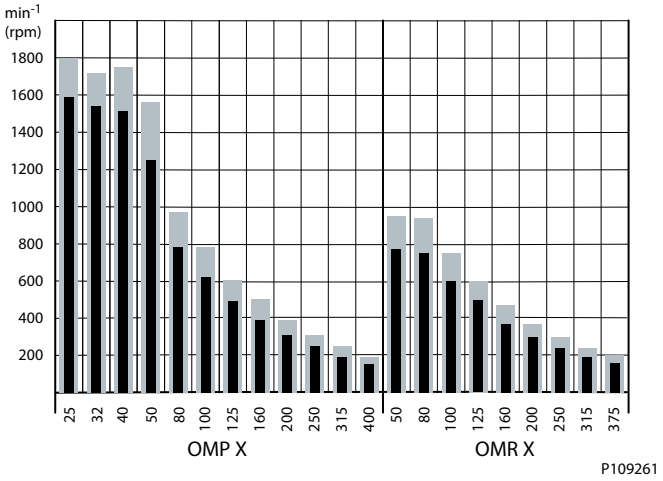


Figure 1: Maximum speed

Torque

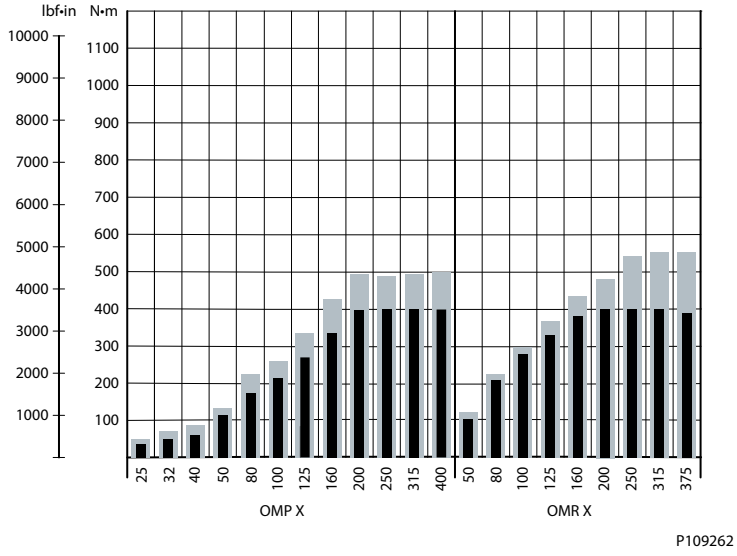
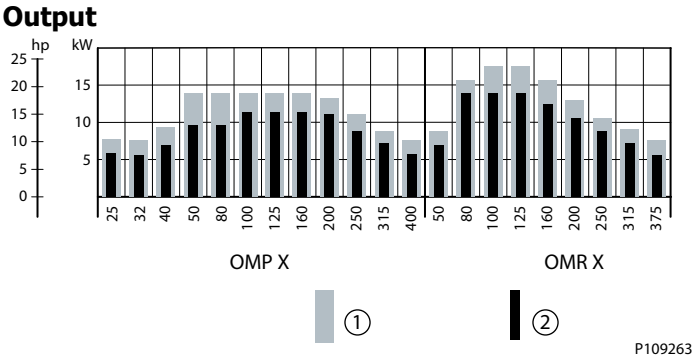


Figure 2: Maximum torque



1. Intermittent values
2. Continuous values

Figure 3: OMP X and OMR X maximum output

For more information about how to read and use the function diagrams, please see the paragraph "Selection of motor size" in the general technical information *Orbital Motors*.

For more information about OMP X and OMPW X, see *OMP function diagrams*
For more information about OMR X, see *OMR function diagrams*

Chapter 2

OMP X configuration versions overview with codes numbers

Topics:

The following tables show the different versions configuration codes.

- OMP X standard motors:
  - *Side port offset 2-hole oval mounting flange (A2 flange)* on page 12
  - *Side port aligned 2-hole oval mounting flange (A2 flange)* on page 13
  - *Side port aligned with square mounting flange (C-flange)* on page 14
  - *Wheel mounting flange type* on page 14
- OMPW X N motors with needle bearings: *Wheel mounting flange type* on page 15
- OMP X motors with free running gerotor: *Side port offset with 2-hole oval mounting flange (A2 flange)* on page 16

If the desired OMP X could not be found please use the *OMP X Model Code* on page 17.

OMP X standard motors

For ordering please use the code numbers shown in the table on the following pages.

For OMP X motors with a configuration which is not available in the code number tables please use the model code number system in the *OMP X Model Code* on page 17 to specify the OMP X motor on detail.

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

Configuration code numbers are set according to OMP X motor mounting flange type.

Table 1: Configuration codes A1 – A5 description

Pilot diameter	**Ø 82.5 mm [3.25 in]**				
Bolt circle dia.	**Ø 106.4 mm [4.20 in]**				
Conf. code	**A2**	**A1**	**A3**	**A4**	**A5**
Shaft	Cyl. Ø25 mm	Cyl. Ø25 mm	Cyl. 1 in	Cyl. 1 in	Splined 1 in
Main port	G1/2	G1/2	G1/2	7/8 -14 UNF	G1/2
Drain port	G1/4	G1/4	G1/4	7/16-20 UNF	G1/4
Port type	End port	Side port offset			
Check valve	Yes				
Shaft seal	High pressure shaft seal				
Designation	Main type designation: **OMP X**				

Table 2: Code numbers for configuration codes A1 – A5

Code	**Displacement**											
	25	**32**	**40**	**50**	**80**	**100**	**125***	**160**	**200**	**250**	**315**	**400**
A1	11185769	11185775	11186719	11185771	11186721	11186725	11185743	11186705	11186708	11186711	11186712	11186714
A2	–	–	11185711	11185710	11185713	11185714	–	11185704	11185705	11185706	11185707	11185708
A3	–	–	–	11186729	11185808	11186730	11185792	11186726	11185796	11185798	11186728	11185802
A4	11185720	11185721	11185723	11185722	11185724	11185726	11185725	11185715	11185716	–	11185718	11185719
A5	–	–	–	11186738	11186739	11186740	11186731	11186732	11185819	11186820	11185827	11186737

* **Motor 11185725 is painted black.**

Side port aligned 2-hole oval mounting flange (A2 flange)

Configuration code numbers are set according to OMP X motor mounting flange type.

Table 3: Configuration codes A6 – A10 description

Pilot diameter	**Ø 82.5 mm [3.25 in]**				
Bolt circle dia.	**Ø 106.4 mm [4.20 in]**				
Conf. code	**A6**	**A7**	**A8**	**A9**	**A10**
Shaft	Cyl. 1 in	Cyl. 1 in	Splined 1 in	Cyl. 1 in; CH 8	Cyl. 1 in; CH 10.3
Main port	7/8–14 UNF	1/2–14 UNF	7/8–14 UNF	7/8–14 UNF	7/8–14 UNF
Drain port	7/16-20 UNF				
Port type	Side port offset				
Check valve	Yes				
Shaft seal	High pressure shaft seal				
Designation	Main type designation: **OMP X**				

Table 4: Code numbers for codes A6 – A10 (Size 25 — 80 cm^3)

Code	**Displacement**						
	25	**32**	**36**	**40**	**50**	**60**	**80**
A6	–	–	11186086	11186085	11186695	11186086	11186085
A7	–	–	11186116	11186115	11186117	11186116	11186115
A8	–	–	11186071	11186069	11186072	11186071	11186069
A9	83062875	83062884	83062885	83062886	83062887	83062888	11186092
A10	83062939	83062940	83062941	83062942	11186091	83062943	83062944

Table 5: Code numbers for codes A6 – A10 (Size 100 — 400 cm^3)

Code	**Displacement**						
	100	**125**	**160**	**200**	**250**	**315**	**400**
A6	11186090	11186075	11186076	11186077	11186079	11186081	11186083
A7	11186118	—	11186110	11186111	11186112	11186113	11186818
A8	11186073	—	11186064	11186065	11186066	11186067	11186068
A9	11186093	83062889	83062890	83062891	83062902	83062903	83062904
A10	83062945	83062946	83062947	83062948	83062949	83062950	83062951

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

Configuration code numbers are set according to OMP X motor mounting flange type.

Table 6: Configuration codes B1 – B4 description

Pilot diameter	**Ø 44.4 mm [1.75 in]**			
Bolt circle diameter	**Ø 106.4 mm [4.20 in]**			
Conf. code	**B1**	**B2**	**B3**	**B4**
Shaft	Cylindrical 1 in	Cylindrical 1 in	Cyl. 1 in, CH8	Cyl. 1 in, CH10.3
Main port size	7/8–14 UNF	1/2–14 NPTF	7/8–14 UNF	
Drain port size	7/16–20 UNF			
Port type	Side port aligned			
Check valve	Yes			
Shaft seal	High pressure shaft seal			
Designation	Main type designation: **OMP X**			

Table 7: Code numbers for B1 – B4 (Size 25 — 80 cm^3)

Code	**Displacement**						
	25	**32**	**36**	**40**	**50**	**60**	**80**
B1	–	–	11186056	–	11186054	–	11186693
B2	–	–	11186132	–	11186131	–	11186133
B3	83062956	83062957	83062958	83062959	83062960	83062961	83062992
B4	83063000	83063001	83063002	83063003	11186060	83063004	11186061

Table 8: Code numbers for B1 – B4 (Size 100 — 400 cm^3)

Code	**Displacement**						
	100	**125**	**160**	**200**	**250**	**315**	**400**
B1	11186059	11186691	11186044	11186046	11186047	11186049	11186052
B2	11186134	11186125	11186126	11186127	11186128	11186129	11186130
B3	83062993	83062994	83062995	83062996	83062997	83062998	83062999
B4	11186062	83063005	83063006	83063007	83063008	83063009	83063010

Wheel mounting flange type

Configuration code number is set according to OMPW X motor mounting flange **Wheel** type.

Table 9: Configuration code C1 description

Configuration code	**C1**
Pilot diameter	**Ø 80 mm [3.15 in]**
Bolt circle diameter	**Ø 103 mm [4.06 in]**
Shaft	Cylindrical Ø 25 mm [Dia 0.984 in]

Configuration code	**C1**
Pilot diameter	**Ø 80 mm [3.15 in]**
Bolt circle diameter	**Ø 103 mm [4.06 in]**
Main port size	G1/2
Drain port size	G1/4
Port type	Side port
Check valve	Yes
Shaft seal	High pressure shaft seal
Designation	Main type designation: **OMPW X**

Table 10: Code numbers for C1

Code	Displacement									
	40	**50**	**80**	**100**	**125**	**160**	**200**	**250**	**315**	**400**
C1	1118587 4	1118587 3	1118587 5	1118587 7	1118587 6	1118674 6	1118674 7	1118587 0	1118587 1	1118587 2

OMPW X N motors with needle bearings

Wheel mounting flange type

Configuration code number is set according to OMPW X N motor mounting flange **Wheel** type.

Table 11: Configuration code E1 description

Configuration code	**E1**
Pilot diameter	**Ø 80 mm [3.15 in]**
Bolt circle diameter	**Ø 103 mm [4.06 in]**
Shaft	Tapered Ø 28.5 mm [Dia 1.122 in]
Main port size	G1/2
Drain port size	G1/4
Port type	Side port
Check valve	Yes
Shaft seal	High pressure shaft seal
Designation	Main type designation: **OMPW X N**

Table 12: Code numbers for E1

Code	Displacement										
	25	**40**	**50**	**80**	**100**	**125**	**160**	**200**	**250**	**315**	**400**
E1	111858 87	111858 89	111858 88	111858 90	111858 92	111867 50	111858 82	111867 48	111858 84	111858 85	111858 86

OMP X motors with free running gerotor

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

Configuration code **F1** is set according to OMP X motor mounting flange type: Side port offset with 2-hole oval mounting flange (A2-flange).

Table 13: Configuration code F1 description

Configuration code	**F1**
Pilot diameter	**Ø 82.5 mm [3.25 in]**
Bolt circle diameter	**Ø 106.4 mm [4.20 in]**
Shaft	Cylindrical Ø 25 mm [Dia 0.984 in]
Main port size	G1/2
Drain port size	G1/4
Port type	Side port offset
Check valve	Yes
Shaft seal	High pressure shaft seal
Designation	Main type designation: **OMP X**

Table 14: Code numbers for F1

Code	**Displacement**				
	100	**125**	**160**	**200**	**315**
F1	11185790	11185746	11186707	11185751	11185761

Chapter
3

OMP X Model Code

The coding system has been developed to identify the configuration options for the OMP X motors. The model code begins with the motor family and the remaining fields are filled in to configure the motor with the desired features, all fields must be filled in. *Example:* **OMPX-200-NNN-B11-SO**-A3-A11-C-E-B-1-N-N-NN-NNN-NNN-NNN-A-NN.

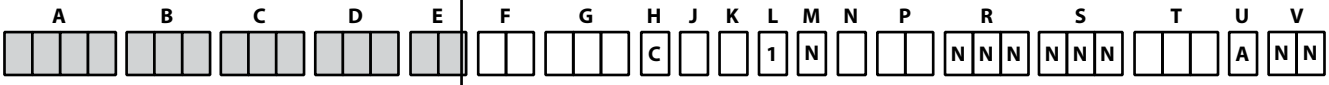


Table 15: A – Main motor family

OMPX	OMP X motor series

Table 16: B – Motor displacement

Code	Displacement, cm^3/rev [in^3/rev]	Code	Displacement, cm^3/rev [in^3/rev]
025	25.0 [1.53]	**100**	97.3 [5.94]
032	32.0 [1.95]	**125**	125.0 [7.63]
036	36.0 [2.20]	**160**	155.7 [9.50]
040	40.0 [2.44]	**200**	194.6 [11.88]
050	48.6 [2.97]	**250**	242.3 [14.79]
060	59.1 [3.61]	**315**	306,1 [18.68]
080	77.8 [4.75]	**400**	389.1 [23.74]

Table 17: C – Motor type (Align with options: D, E and F)

Code	Description
NNN	Standard motor
A10	Wheel motor
B13	Standard motor with needle bearing
L11	Wheel motor with needle bearing

Table 18: D – Mounting type (Align with options: E and F)

Code	Description
B11	A2 flange; 82.5 Dia x 8 Pilot; 106.4 Dia. B.C.
B12	A2 flange; 82.5 Dia x 2.6 Pilot; 106.4 Dia. B.C.

Code	Description
C10	C flange; 44 Dia x 2.6 Pilot; 83 Dia. B.C.; 3/8-16 mounting
C11	C flange int.; PD44-BC83-met
C20	W flange; PD80-BC103

Table 19: E – Port type (Align with options: D, F and G)

Code	Description
SO	Side port – Offset
SA	Side port – Aligned
EA	End port

Chapter 4

OMP X Model Code

Example: OMPX-200-NNN-B11-SO-**A3-A11-C-E-B**-1-N-N-NN-NNN-NNN-NNN-NNN-A-NN.

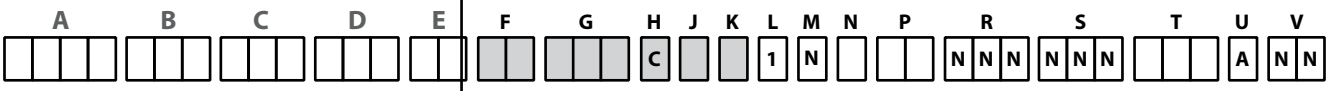


Table 20: F – Main ports thread type

Code	Description
A3	G 1/2
A8	7/8-14 UNF
A9	1/2-14 NPTF
B7	M22 x 1,5 according to ISO 6149
C1	Manifold

Table 21: G – Shaft type (Align with options: C, F and K)

Code	Description
A11	Cylindrical 25 mm with 8 mm key; M8 hole in shaft end
B11	Cylindrical 1 inch with 1/4 in key; M8 hole in shaft end
B12	Cylindrical 1 inch with 1/4 in key; 1/4-20UNC hole in shaft end
B13	Cylindrical 1 inch with Woodruff key; 1/4-20UNC hole in shaft end
B14	Cylindrical 1 inch with cross hole 10.3; 1/4-20UNC hole in shaft end
B15	Cylindrical 1 inch with cross hole 8.0
C11	Spline 7/8" – 13T
C13	1 inch 6B Spline; M8 hole in shaft end
C14	1 inch 6B Spline; 1/4-20UNC hole in shaft end
E10	Tapered 28.5 mm – 1:10
F10	Tapered 1" – 1:8, WK3/16x3/4

Table 22: H – Shaft seal

C	High pressure shaft seal - NBR

Table 23: J – Dust seal

Code	Description
B	Dust seal integrated in shaft seal plus seal guard
E	Dust seal integrated in shaft seal

Table 24: K – Drain port (Align with options: F and G)

Code	Description
B	G1/4
D	7/16 – 20 UNF
K	M12 x 1,5 according to ISO 6149
M	No drain port due to EMD

Chapter 5

OMP X Model Code

Example: OMPX-200-NNN-B11-SO-A3-A11-C-E-B-**1-N-N-NN-NNN-NNN-NNN-A-NN**.

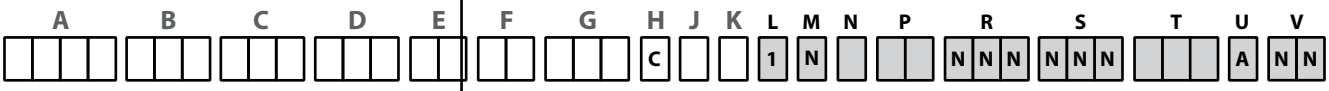


Table 25: L – Check Valve

1	Yes

Table 26: M – Brake release port

N	None

Table 27: N – Speed sensor

N	None
A	Prepared for EMD speed sensor

Table 28: P – Painting

Code	Description
NN	No paint
AA	Black, 9005; Corr. class C3; Standard covering
AB	Black, 9005; Corr. class C3; Surface covering

Table 29: R – Valve option

NNN	None

Table 30: S – Specific visible features

NNN	None

Table 31: T – Specific non-visible features

NNN	None
G10	Gear set – Free running

Table 32: U – Packaging

A	Single pack

Table 33: V – Name tags: Motor and box

NN	Name tag

Chapter

6

OMP X technical data

Topics:

OMP X motor specification

Table 34: OMP X motors, sizes: 25 – 100 cm³

Description		Unit	25	32	40	50	80	100
Geometric displacement		cm³ [in]	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	cont.	min^{-1} (rpm)	1600	1560	1500	1230	770	615
	int.[2)]		1800	1720	1750	1550	960	770
Max. torque[1)]	cont.	N•m [lb•in]	40 [355]	50 [445]	52 [460]	110 [975]	170 [1505]	210 [1860]
	int.[2)]		50 [445]	70 [620]	90 [795]	125 [1105]	220 [1950]	260 [2300]
Max. output	cont.	kW [hp]	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.[2)]		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	cont.	bar [psi]	115 [1670]	115 [1670]	115 [1670]	160 [2320]	160 [2320]	160 [2320]
	int.[2)]		160 [2320]	160 [2320]	160 [2320]	200 [2900]	200 [2900]	200 [2900]
Max. starting pressure with unloaded shaft		bar [psi]	10 [145]	10 [145]	10 [145]	10 [145]	10 [145]	10 [145]
Max. oil flow	cont.	l/min [US gal/ min]	40 [10.6]	50 [13.2]	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]
	int.[2)]		45 [11.9]	55 [14.5]	70 [18.5]	75 [19.8]	75 [19.8]	75 [19.8]
Min starting torque at max. pressure drop	cont.	N•m [lb•in]	35 [310]	45 [400]	55 [485]	155 [1370]	135 [1200]	190 [1680]
	int.[2)]		50 [440]	65 [575]	75 [660]	190 [1680]	170 [1510]	240 [2125]

Table 35: OMP X motors, sizes: 125 – 400 cm³

Description		Unit	125	160	200	250	315	400
Geometric displacement		cm³ [in]	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	cont.	min^{-1} (rpm)	480	385	310	250	195	155
	int.[2)]		600	480	385	310	245	190
Max. torque	cont.	N•m [lb•in]	270 [2390]	335 [2965]	400 [3540]	400 [3540]	400 [3540]	400 [3540]
	int.[2)]		335 [2965]	425 [3760]	495 [4380]	490 [4335]	495 [4380]	500 [4425]
Max. output	cont.	kW [hp]	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.[2)]		14.0 [18.8]	14.0 [18.8]	13.7 [18.3]	10.9 [14.5]	8.8 [11.7]	6.7 [8.9]
Max. pressure drop	cont.	bar [psi]	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]

1) Maximum torque values for the different output shafts can be found in *OMP X shaft version* on page 39.
2) Intermittent operation, permissible values may occur for max. 10% of every minute.

Description		Unit	125	160	200	250	315	400
Max. starting pressure with unloaded shaft		bar [psi]	9 [130]	7 [100]	5 [75]	5 [75]	5 [75]	5 [75]
Max. oil flow	cont.	l/min	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]
	int.[2)]	[US gal/ min]	75 [19.8]	75 [19.8]	75 [19.8]	75 [19.8]	75 [19.8]	75 [19.8]
Min starting torque at max. pressure drop	cont.	N•m [lb•in]	240 [2125]	320 [2830]	375 [3320]	375 [3320]	380 [3365]	370 [3275]
	int.[2)]		300 [2655]	400 [3540]	470 [4160]	480 [4250]	475 [4205]	470 [4160]

Table 36: Pressure limits

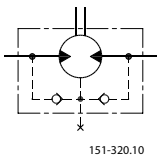
Description		All sizes
Max. inlet pressure drop	Continuous	200 bar [2900 psi]
	Intermittent	225 bar [3260 psi]
Max. return pressure with drain line	Continuous	200 bar [2900 psi]
	Intermittent	225 bar [3260 psi]

High Pressure Shaft Seal in OMP X and OMR X motors

OMP X and OMR X motors feature options with High Pressure Shaft Seal (HPS), with check valves and with or without drain connection.

Table 37: HPS pressure in the drain connection

OMP X/OMR X with drain connection	OMP X/OMR X without drain connection
The shaft seal pressure equals the pressure in the drain line	The shaft seal pressure **never exceeds** the pressure in the return line



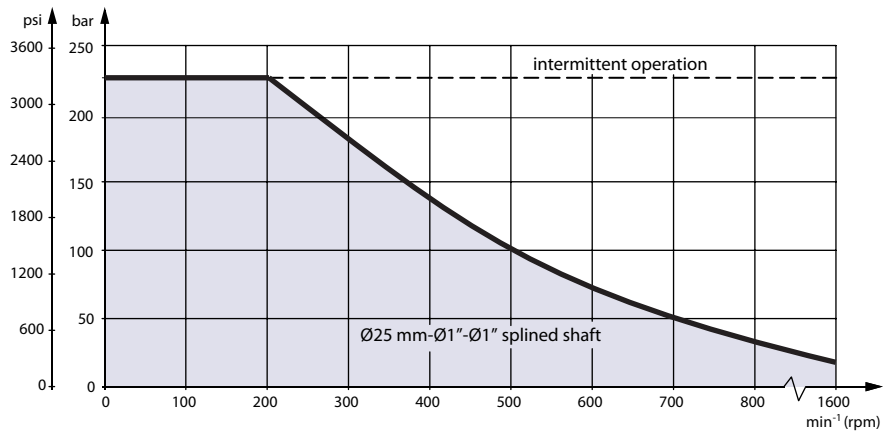
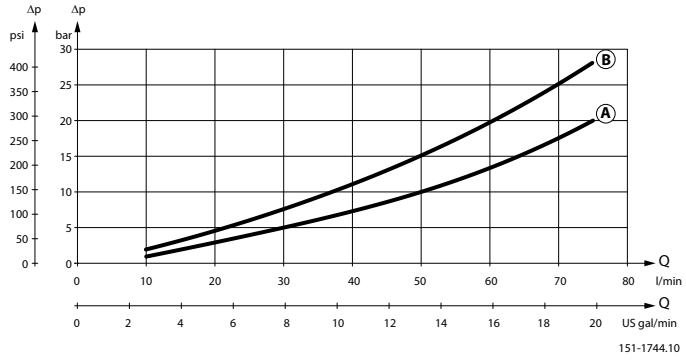


Figure 4: Maximum permissible shaft seal pressure

Pressure drop in OMP X motor



A: OMP X 50 - 400

B: OMP X 25 - 40 / OMPW X

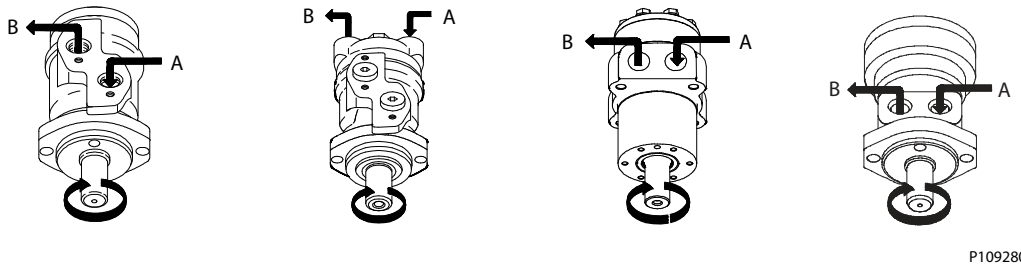
Figure 5: The curve applies to an unloaded motor shaft and an oil viscosity of 35 mm²/s [165 SUS]

Oil flow in drain line

Table 38: Max. oil flow in the drain line at return pressure less 5-10 bar

Pressure drop	**100 bar [1450 psi]**		**140 bar [2030 psi]**	
Viscosity	**20 mm²/s [100 SUS]**	**35 mm²/s [165 SUS]**	**20 mm²/s [100 SUS]**	**35 mm²/s [165 SUS]**
Max. oil flow	2.5 l/min [0.66 US gal/min]	1.8 l/min [0.78 US gal/min]	3.5 l/min [0.93 US gal/min]	2.8 l/min [0.74 US gal/min]

Direction of shaft rotation: clockwise



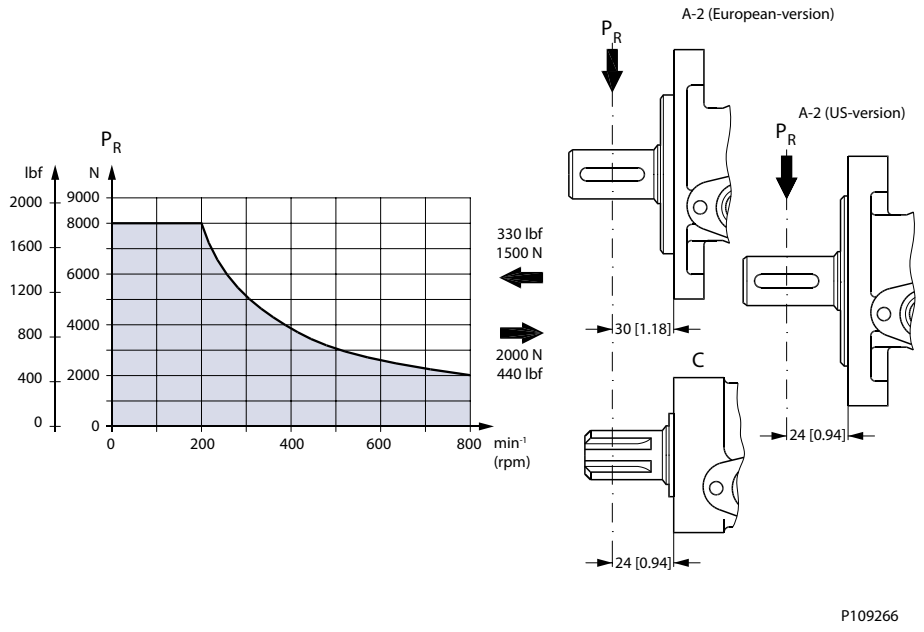
OMP X and OMR X shaft loads

The permissible radial shaft load (P_R) depends on: a distance from the point of load to the mounting flange (L), speed (n), mounting flange and shaft version.

Table 39: Permissible shaft load (P_R) in N [lbf]

Mounting flange	Shaft version	Metric formula	Imperial formula
2-hole oval flange (European version)	25 mm cylindrical 28.5 mm tapered 1 in cylindrical 1 in splined	$\frac{800}{n} \cdot \frac{250000\ N^*}{95 + L}$	$\frac{800}{n} \cdot \frac{2215\ lbf^*}{3.74 + L}$
Square flange 2-hole oval flange (US)	25 mm cylindrical 1 in splined	$\frac{800}{n} \cdot \frac{250000\ N^*}{101 + L}$	$\frac{800}{n} \cdot \frac{2215\ lbf^*}{3.98 + L}$

* $n \geq 200\ min^{-1}$ [rpm]; ≤ 55 mm [2.2 in]. $n < 200\ min^{-1}$ [rpm]; = > P_{Rmax} = 8000 N [1800 lbf]



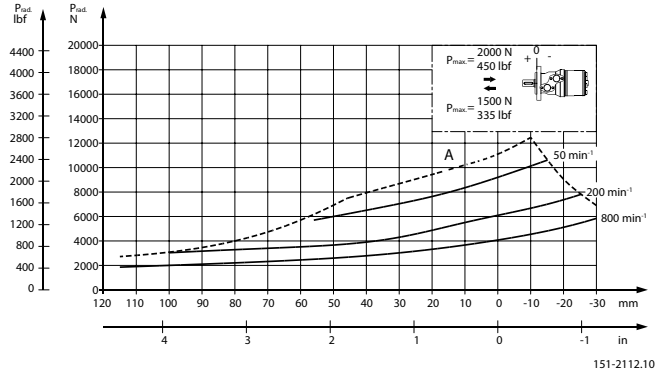
** For both European and US-version

The curve shows the relation between P_R and n:

- when l = 30 mm [1.18 in] for motors with A2 (European version)
- when l = 24 mm [0.94 in] for motors with square mounting flange and A2 (US version)

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

OMP X N shaft loads



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.

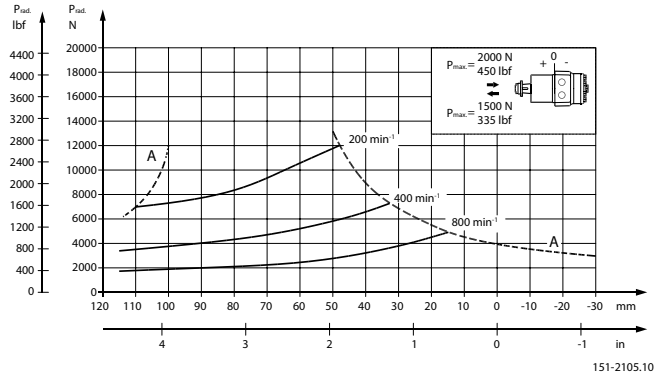
The permissible radial load on the shaft is shown for different speeds as a function of the distance from the mounting flange to the point of load application.

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 B_{10} 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,* **BC152886483554**.

OMPW X with slide bearings shaft loads



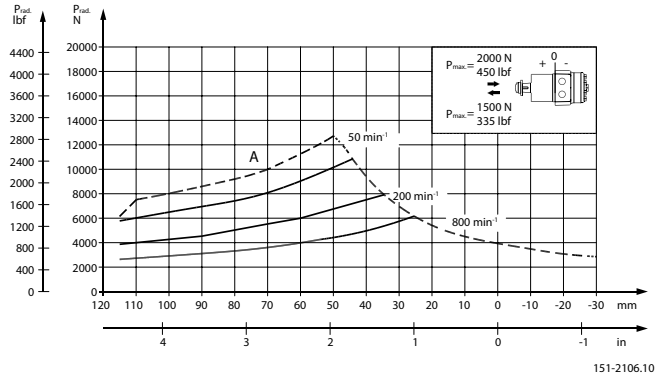
The output shaft on OMPW X can be offered in slide bearings similar to the other OMP X motors. The permissible higher radial load is therefore due to the recessed mounting flange moving the point of load closer to the motor bearings.

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.

OMPW X N with needle bearing shaft loads



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 B_{10} 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,* **BC152886483554**.

Chapter 7

OMP X function diagrams

Topics:

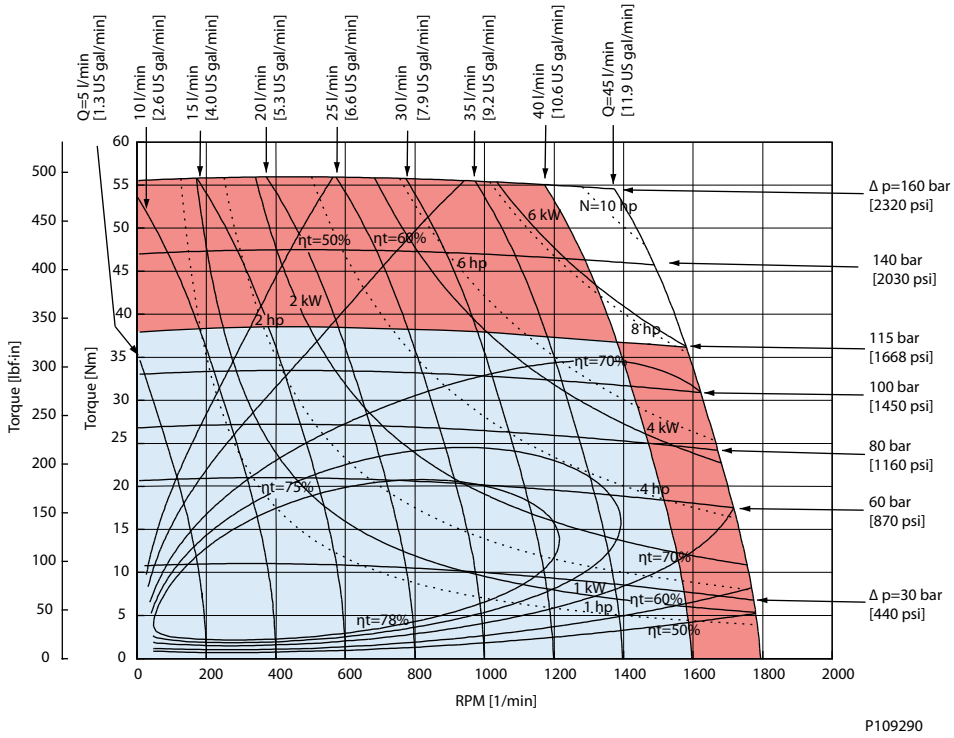
Explanation of function diagram use, basis and conditions can be found in *Operating Parameters Diagrams* on page 9.

- 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 23.

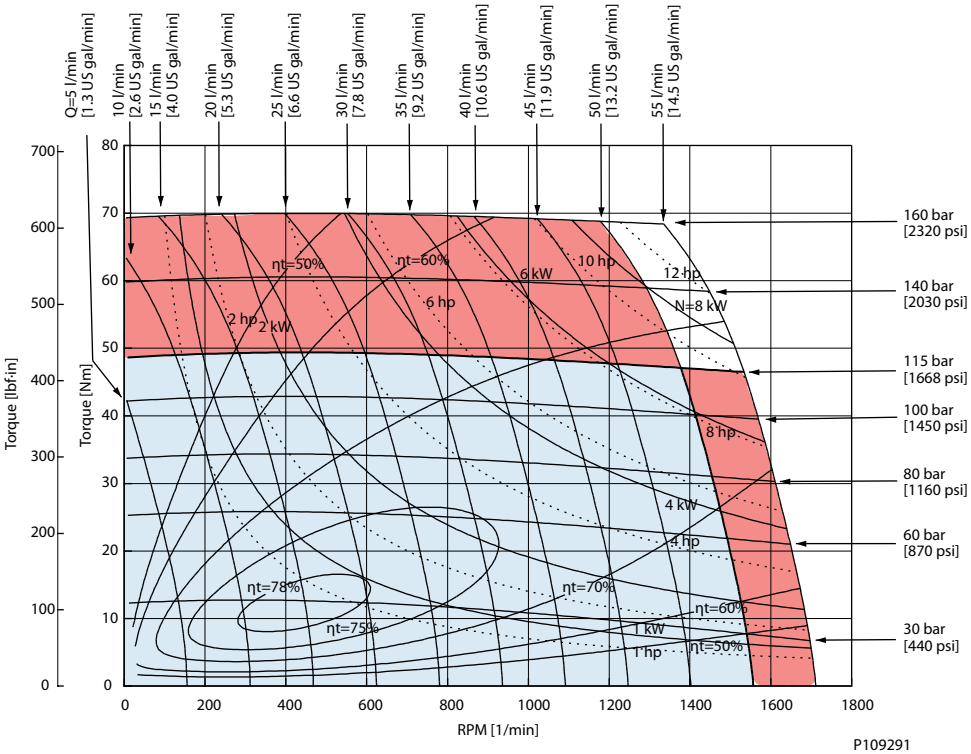
Note: Intermittent pressure drop and oil flow must not occur simultaneously.

OMP X 25



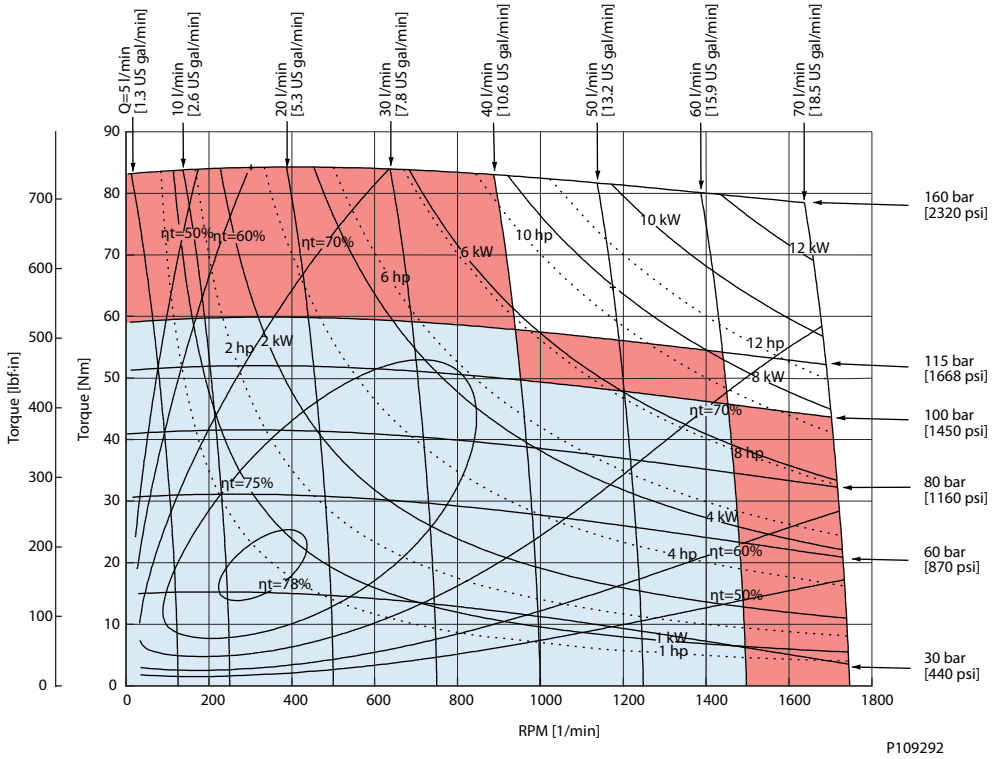
P109290

OMP X 32

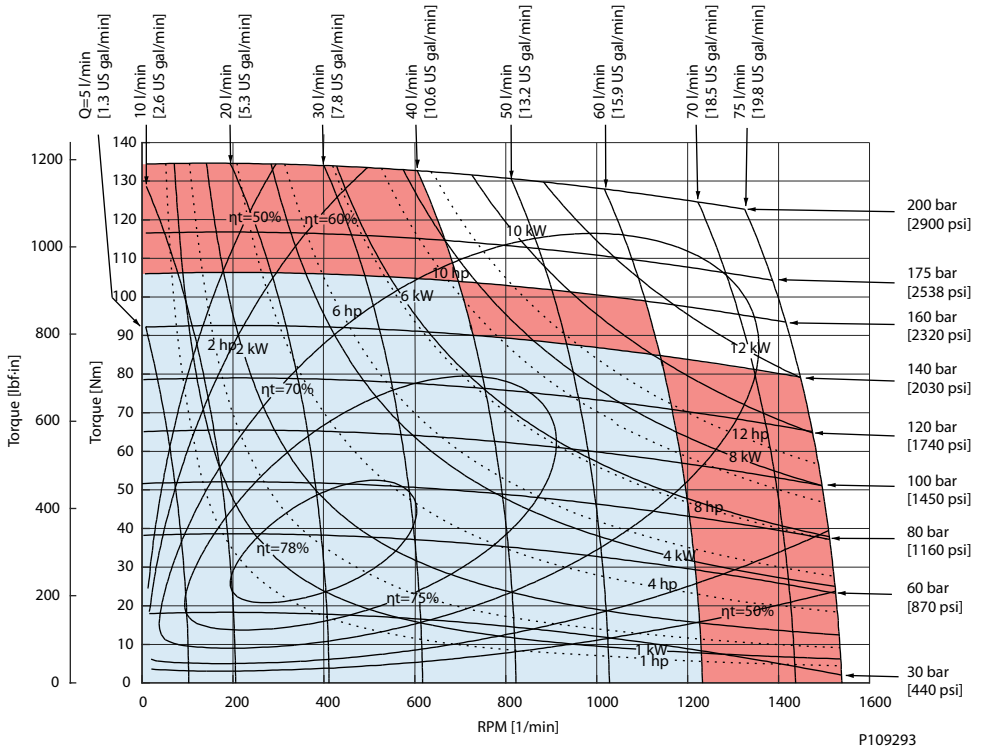


P109291

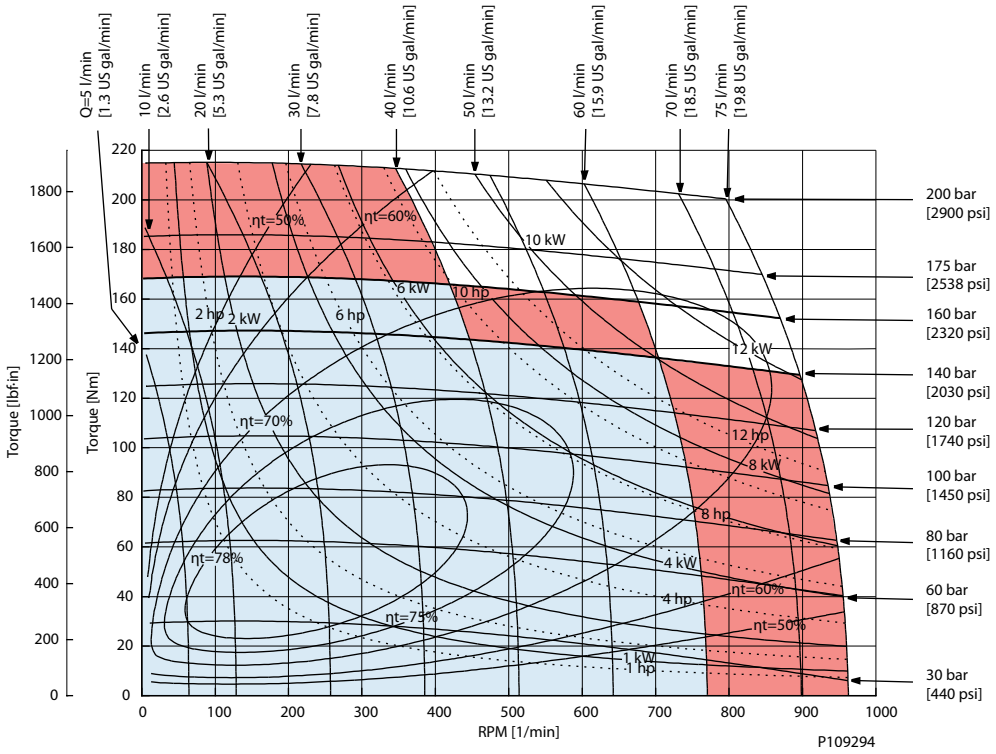
OMP X 40



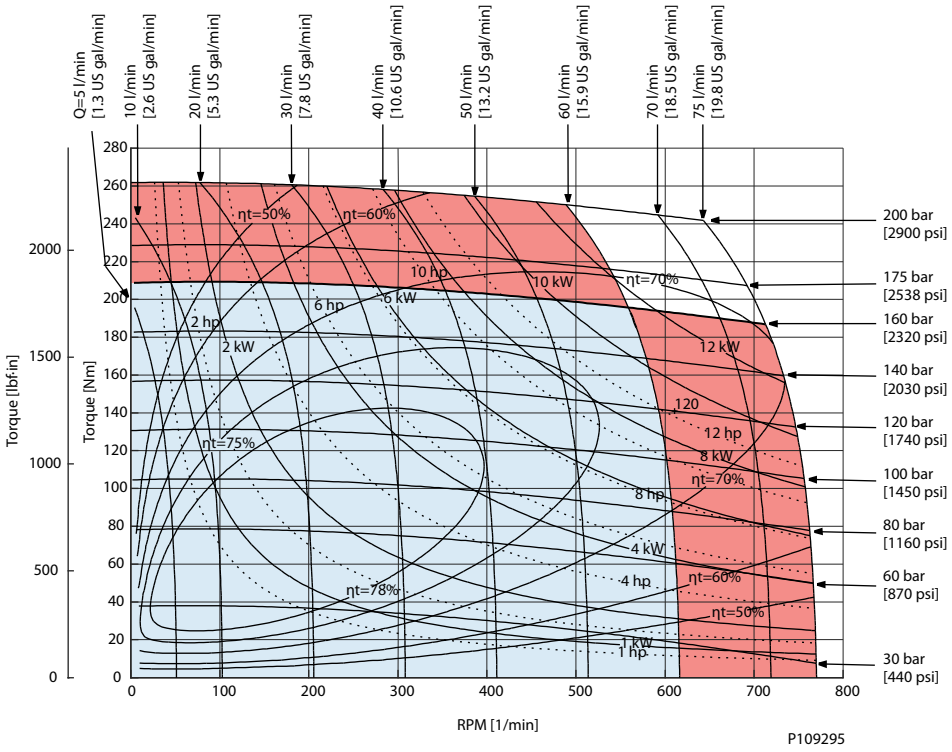
OMP X 50



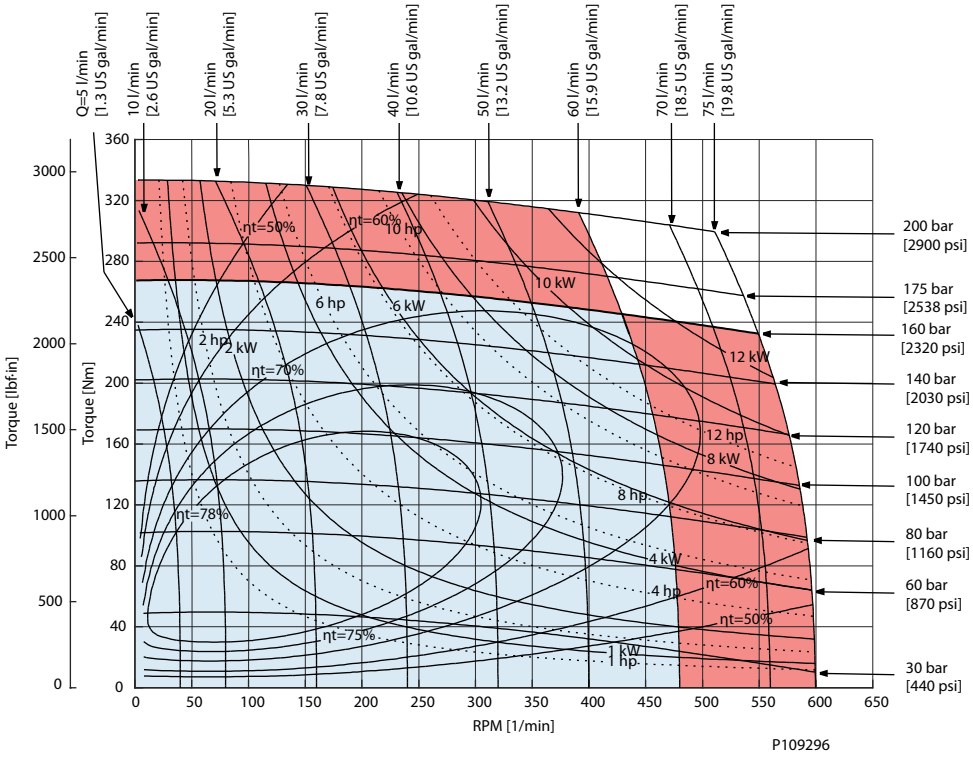
OMP X 80



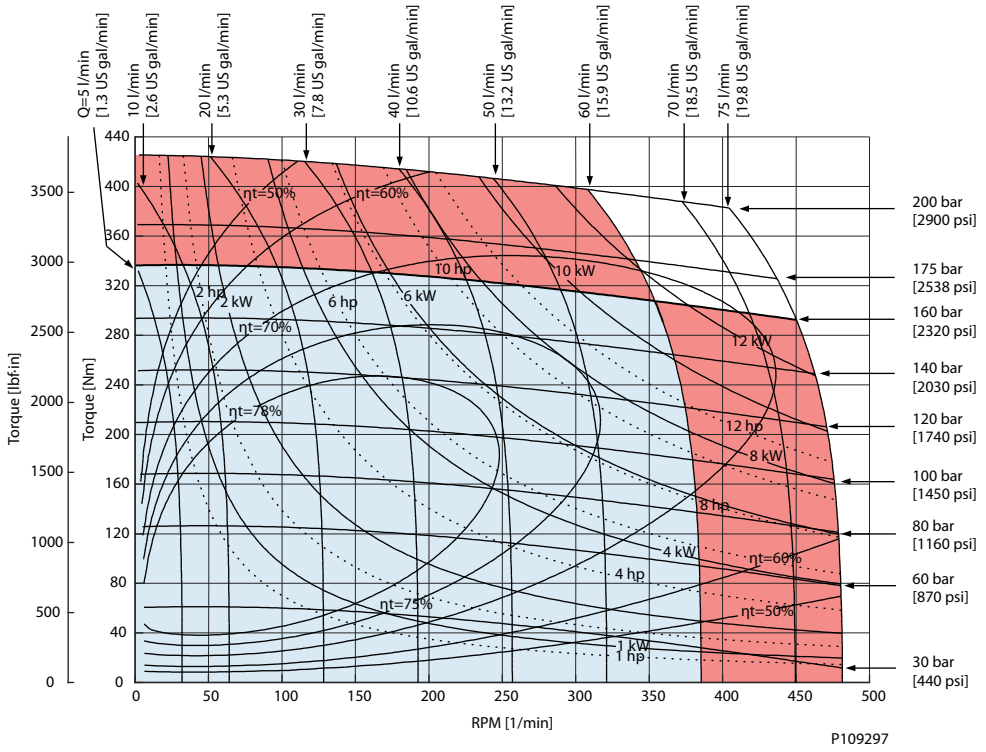
OMP X 100



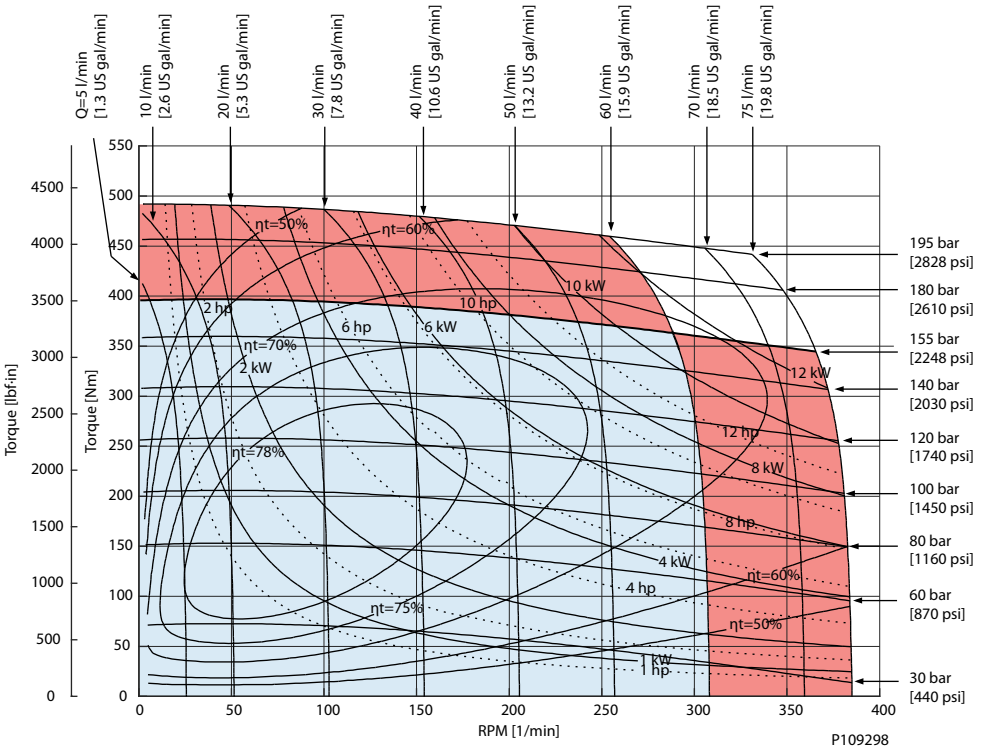
OMP X 125



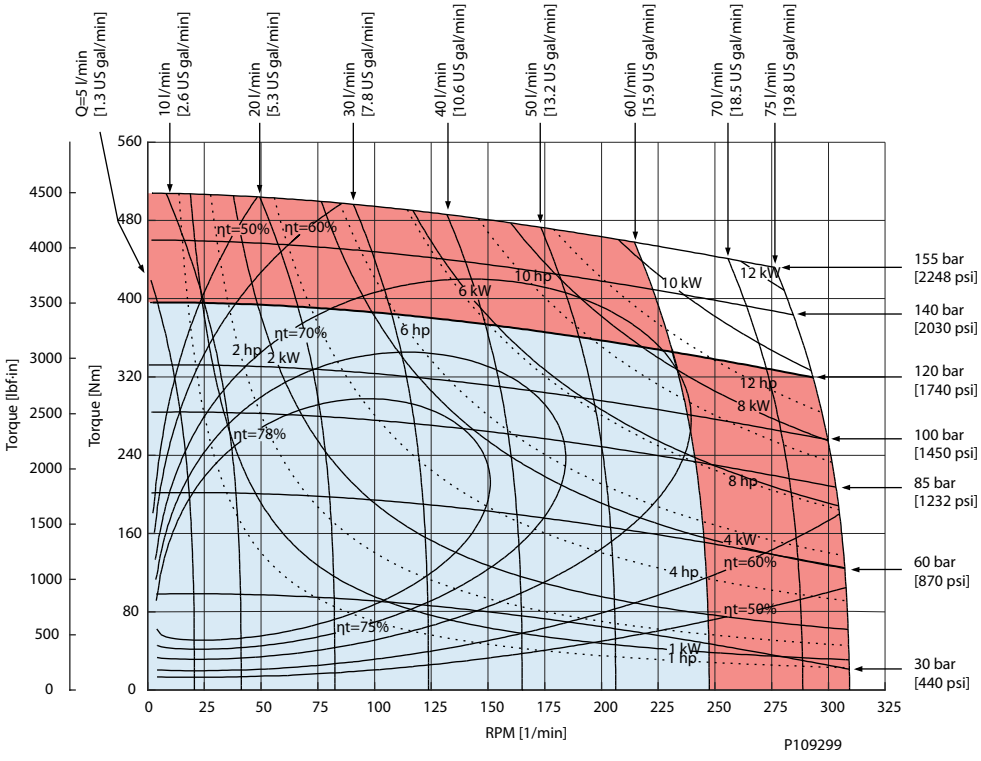
OMP X 160



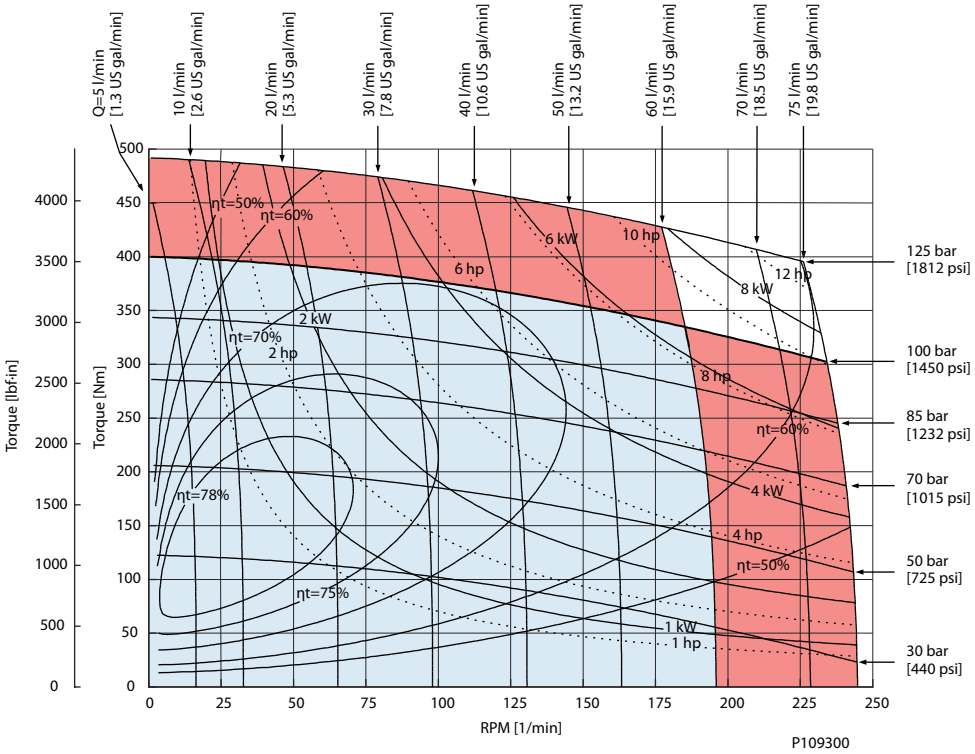
OMP X 200



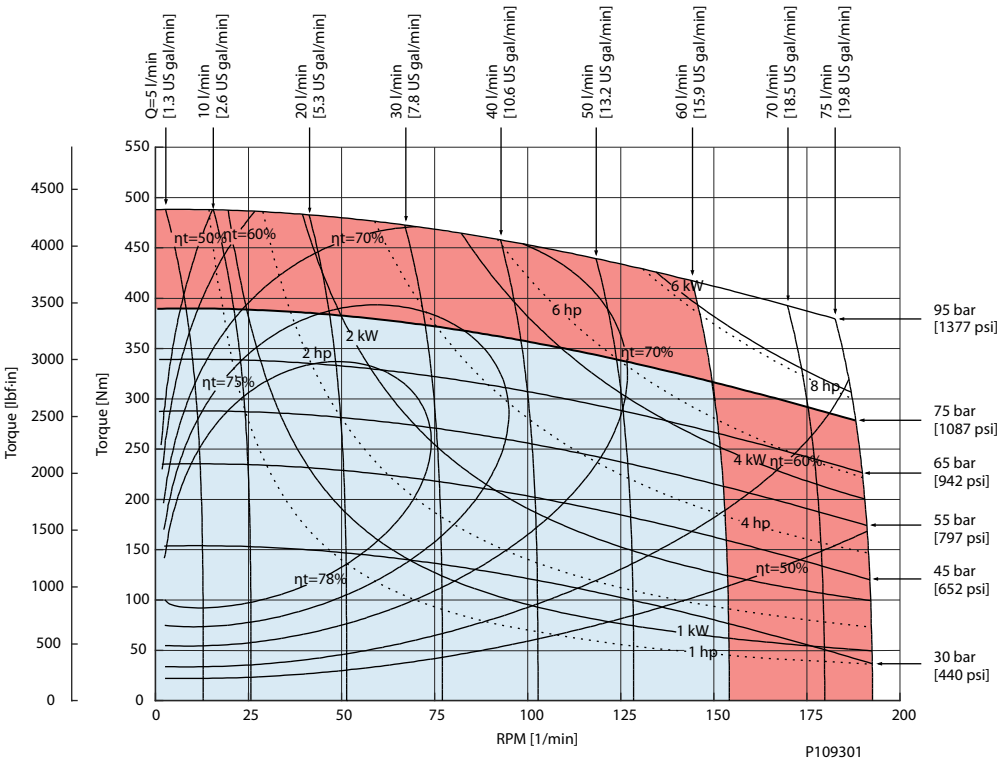
OMP X 250



OMP X 315



OMP X 400



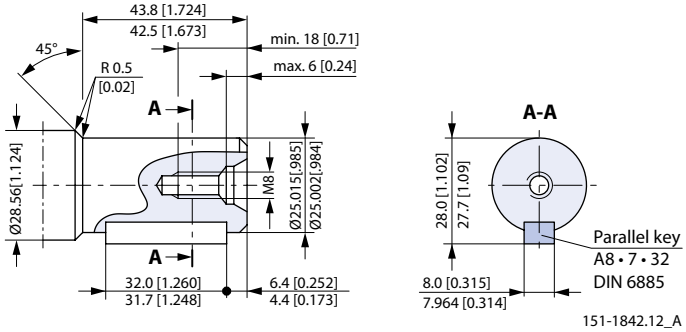
Chapter 8

OMP X shaft version

Topics:

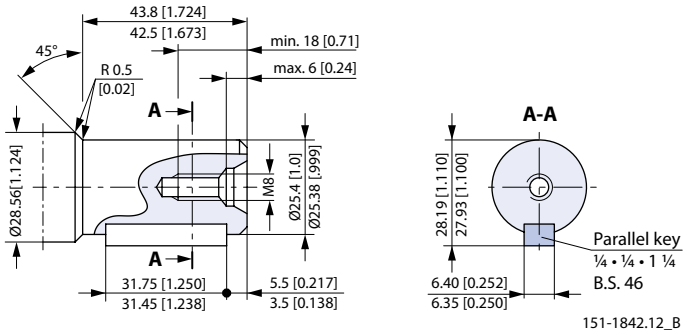
OMP X and OMR X shaft versions

Cylindrical shaft 25 mm; Parallel key DIN 6885



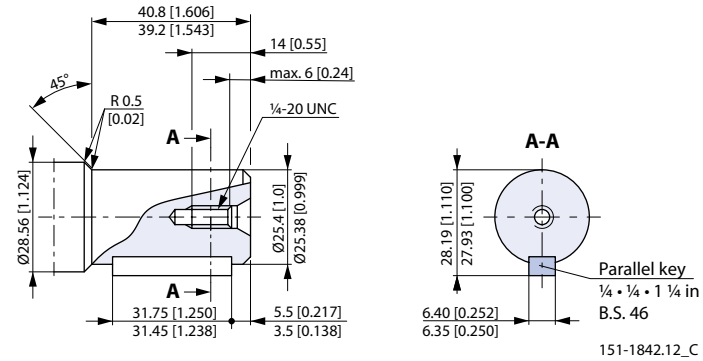
Max. cont. torque: 340 N•m [3010 lb•in]; Max. int. torque 450 N•m [3980 lb•in]

Cylindrical shaft 1 in; Parallel key B.S. 46



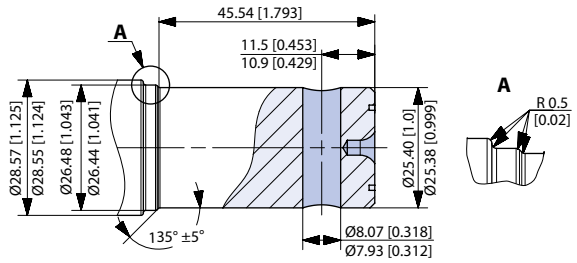
Max. cont. torque: 340 N•m [3010 lb•in]; Max. int. torque 450 N•m [3980 lb•in]

Cylindrical shaft 1 in; Parallel key B.S. 46 (US version)



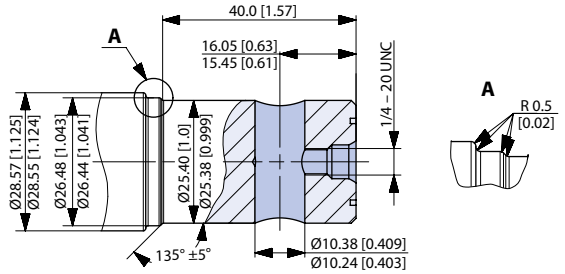
Max. cont. torque: 340 N•m [3010 lb•in]; Max. int. torque 450 N•m [3980 lb•in]

Cylindrical shaft 1 in; Cross hole 8 mm



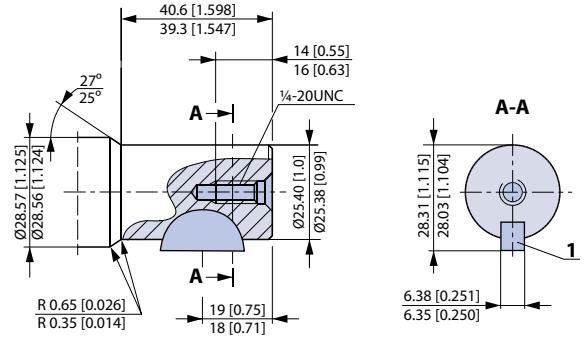
Max. torque: 200 N•m [1770 lb•in]

Cylindrical shaft 1 in; Cross hole 10.3 mm



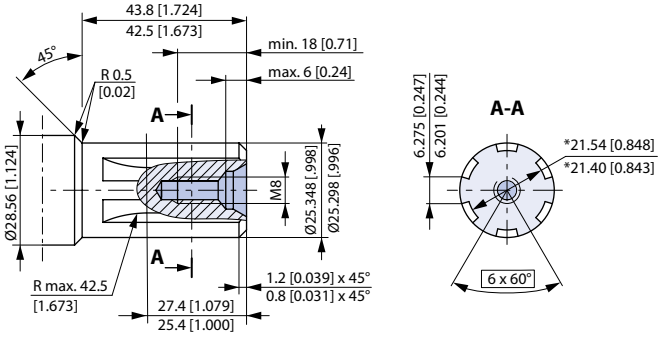
Max. torque: 200 N•m [1770 lb•in]

Cylindrical shaft 1 in (US version); SAE J502



1 Woodruff key ¼ x 1 in SAE J502

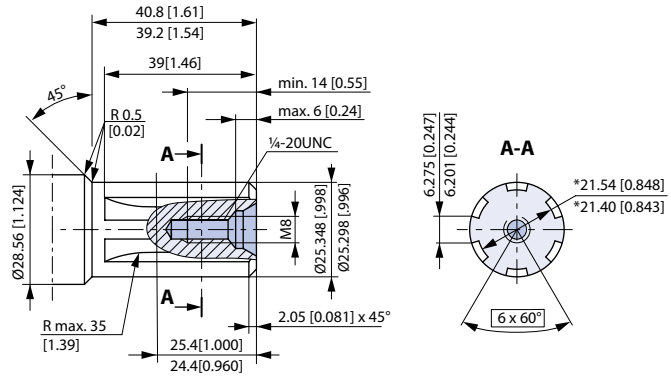
Splined shaft B.S. 2059 (SAE 6B)



Straight-sided, bottom fitting, dep. Fit 2, Nom. size 1 in; * Deviates from B.S. 2059 (SAE 6B)

Max. cont. torque: 400 N•m [3540 lb•in]

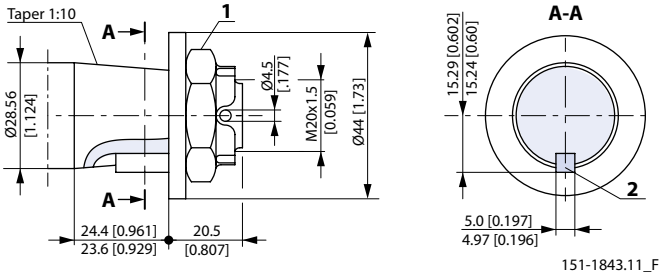
Splined shaft B.S. 2059 (SAE 6B); US version



Straight-sided, bottom fitting, deep. Fit 2; Nom. size 1 in, *Deviates from B.S. 2059 (SAE 6B)

Max. cont. torque 400 N•m [3540 lb•in]

Tapered shaft (taper 1:10); Parallel key DIN 6885



1. DIN 937 NV 30; Tightening torque: 100 ± 10 N•m [885 ± 88.5 lb•in]
2. Parallel key B5 • 5 • 14; DIN 6885

Max. cont. torque: 400 N•m [3540 lb•in]

Chapter

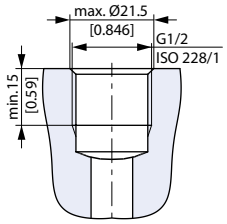
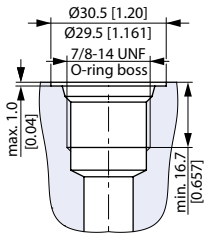
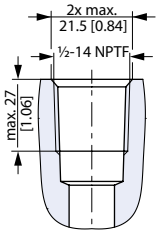
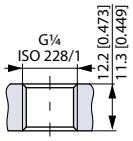
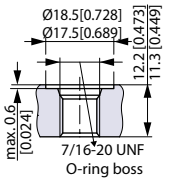
9

OMP X port thread versions

Topics:

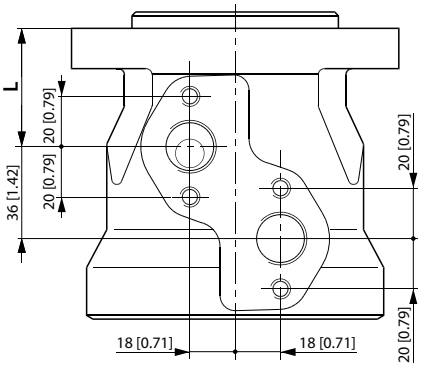
Main port thread versions

Table 40: Main ports overview

G ISO 228/1 – G1/2	UNF 7/8–14 UNF O-ring boss	NPTF 1/2–14 NPTF	G drain ISO 228/1 – G1/4	UNF drain 7/16–20 UNF O-ring boss
				

OMP X manifold mount

For OMP X manifold mounting versions please see the dimension drawings for given OMP X motors listed below:



For **L** dimension please see the tables in the topics below:

- *EU version side port offset with 2-hole oval mounting flange (A2-flange)* on page 46
- *EU version end port with 2-hole oval mounting flange (A2-flange)* on page 47
- *EU version OMPW X and OMPW X N motors wheel type* on page 48
- *US version side port offset with 2-hole oval mounting flange (A2-flange)* on page 49
- *US version side port aligned with 2-hole oval mounting flange (A2-flange)* on page 50
- *US version side port aligned with square mounting flange (C-flange)* on page 51

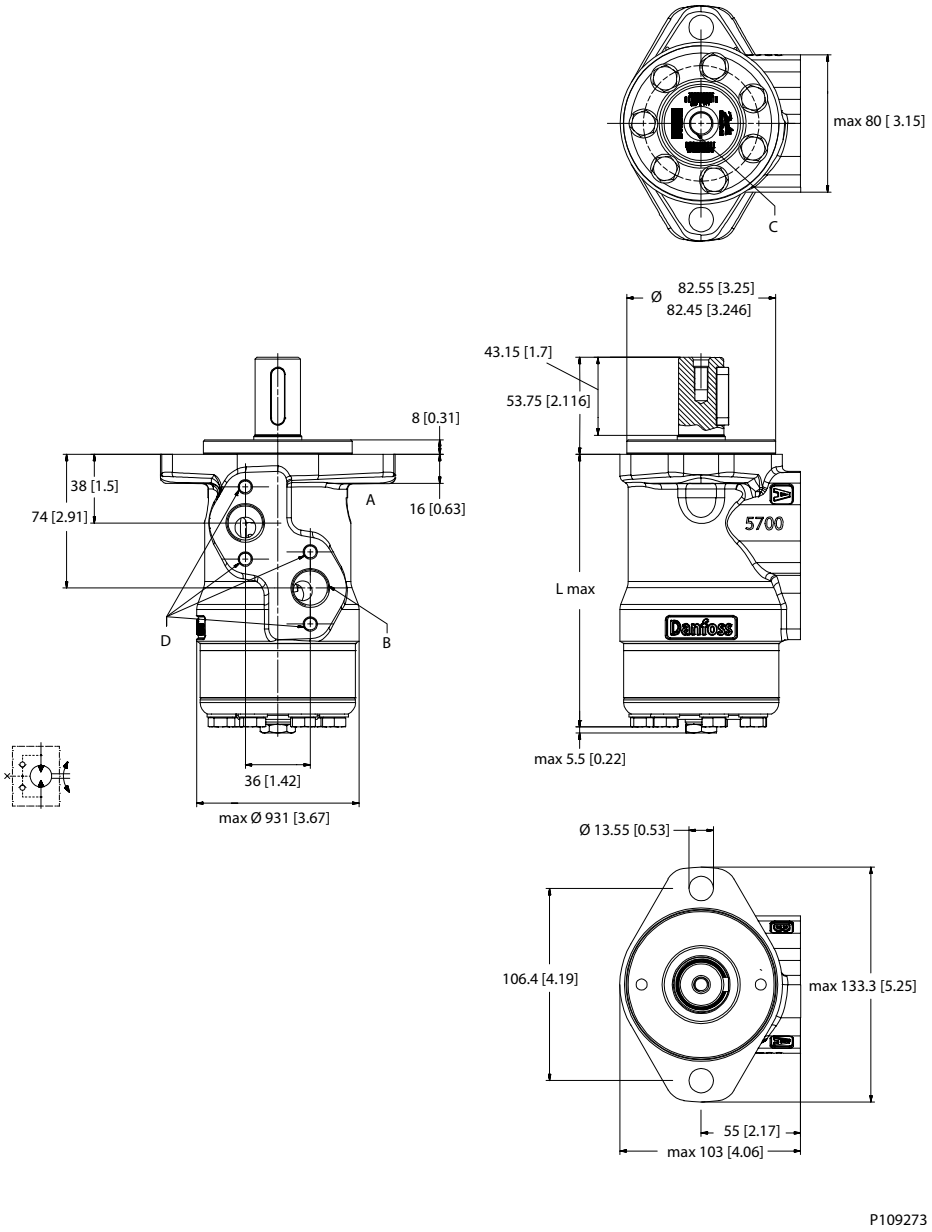
Chapter

10

OMP X dimensions

Topics:

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



Port connections:

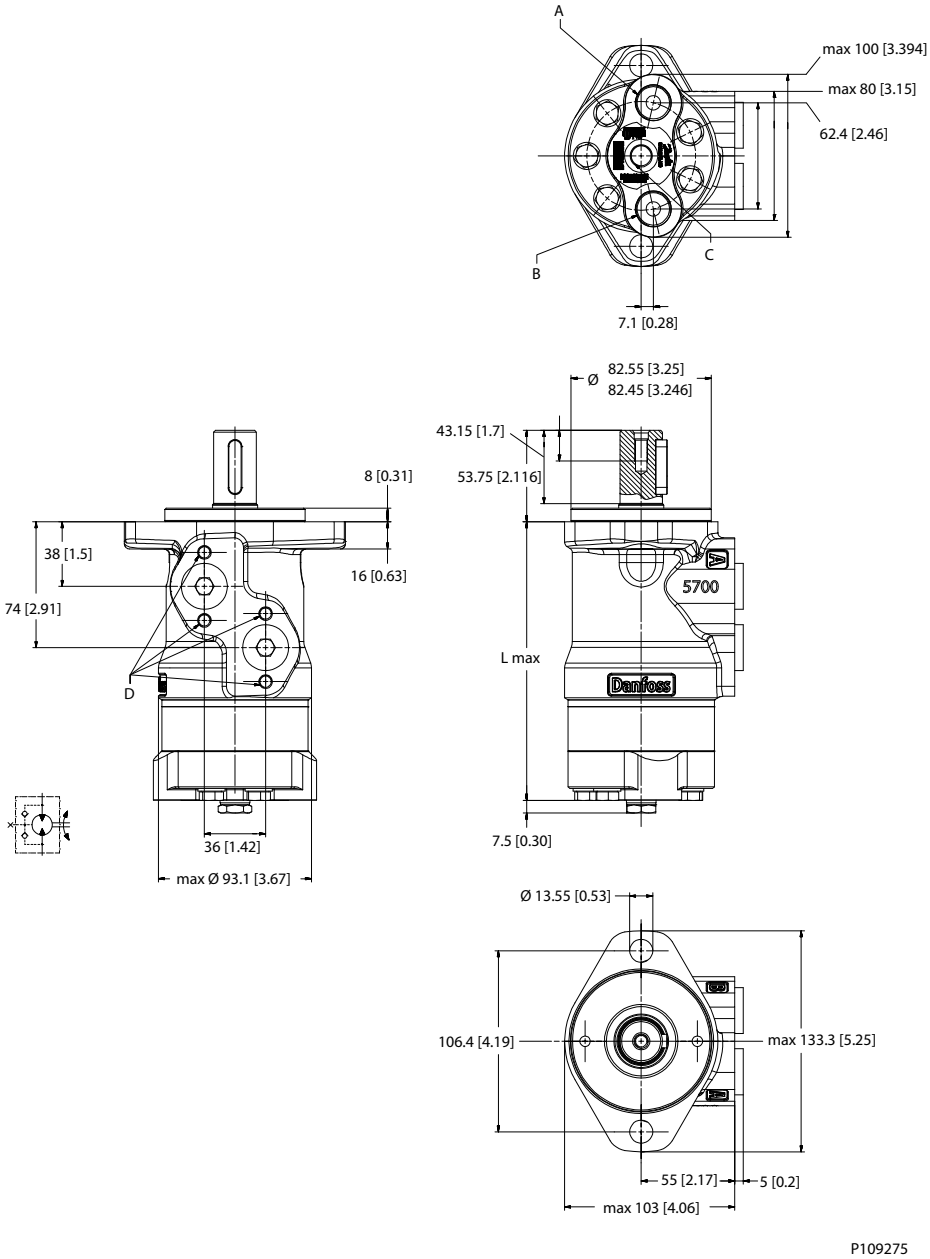
A, B Main ports: G 1/2; min 15 mm [0.59 in] deep

C Drain port: G 1/4; 11.5 mm [0.45 in]

D Thread: M8; 13 mm [0.51 in] deep

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

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



Port connections:

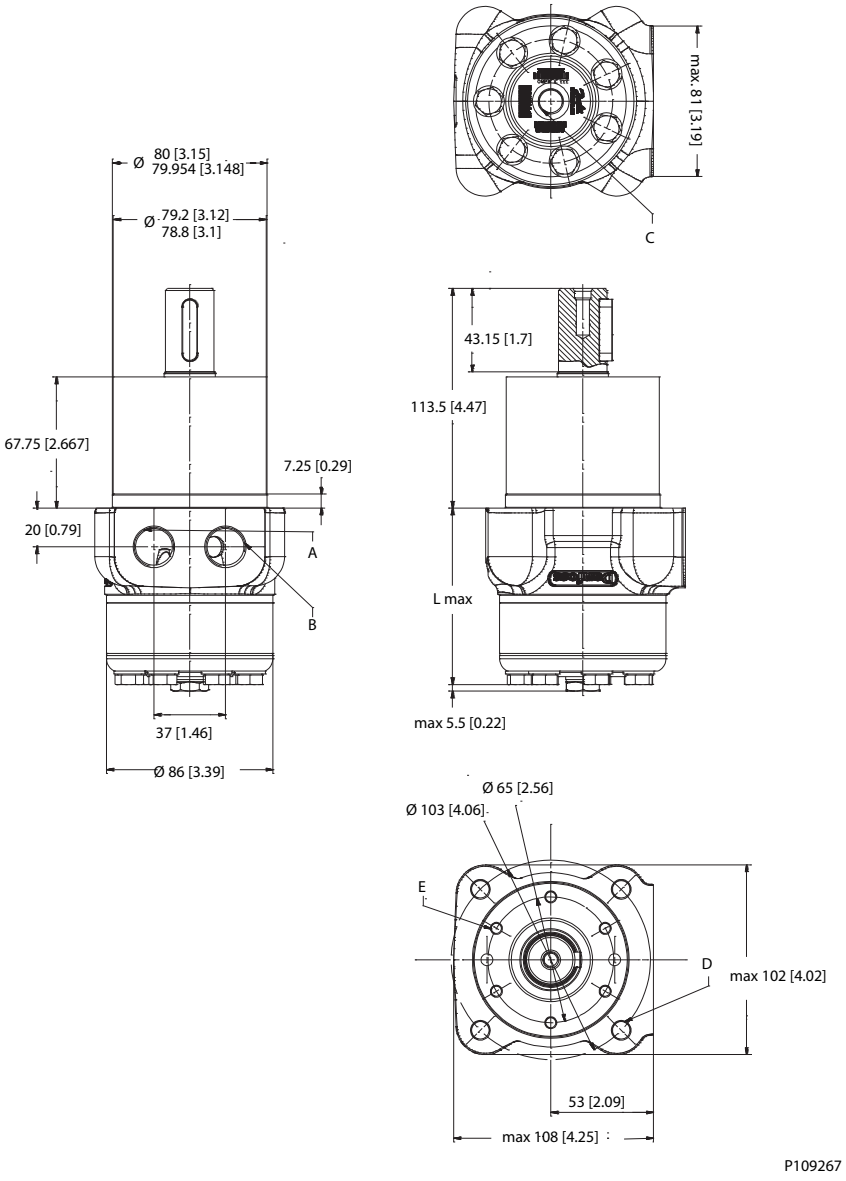
A, B Main ports: G 1/2; min 15 mm [0.59 in] deep

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

D Thread: M8; 13 mm [0.51 in] deep

Size	**40**	**50**	**80**	**100**	**160**	**200**	**250**	**315**	**400**
L max. mm [in]	146.8 [5.78]	146.8 [5.78]	150.7 [5.94]	153.3 [6.04]	161.1 [6.35]	166.3 [6.55]	172.8 [6.81]	181.2 [7.14]	192.2 [7.58]

EU version OMPW X and OMPW X N motors wheel type



Port connections:

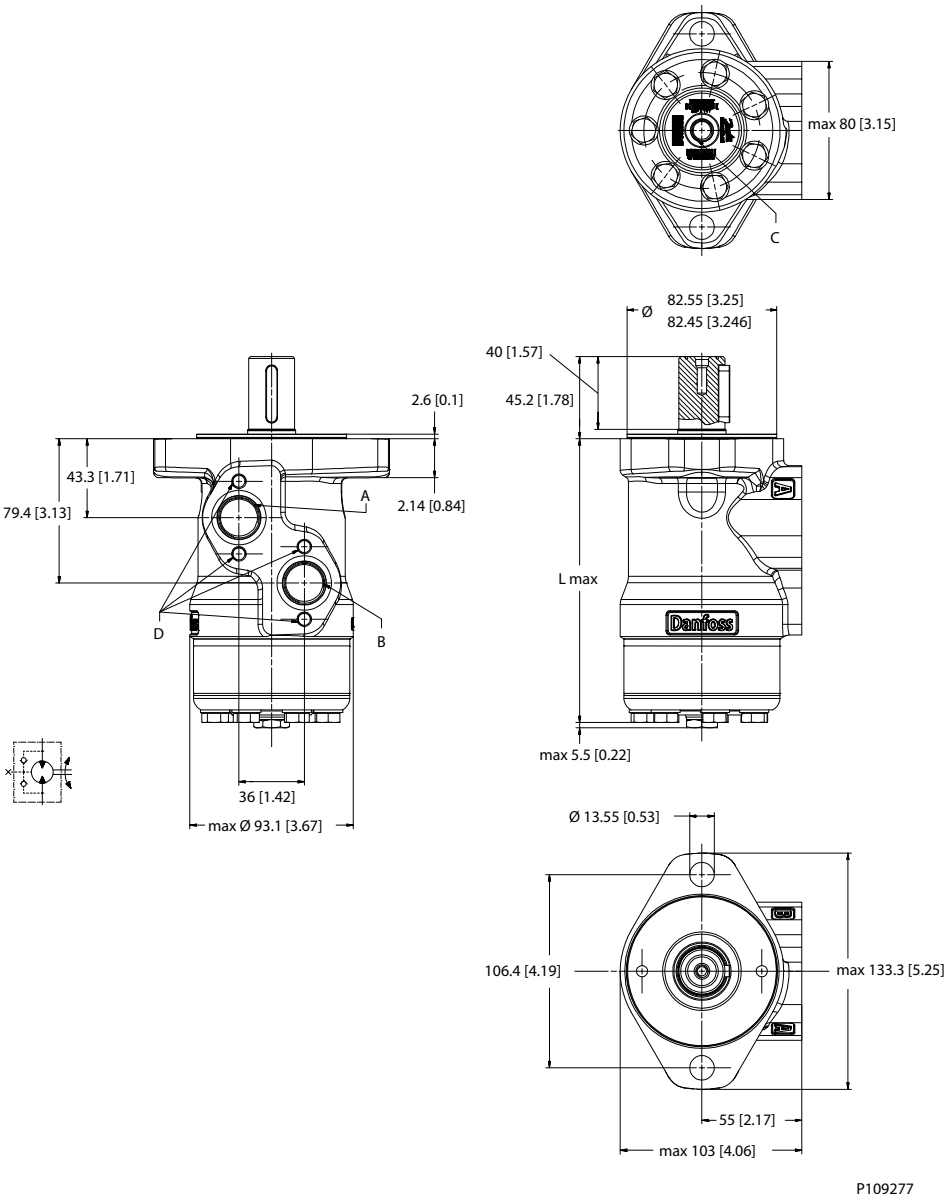
A, B Main ports: G 1/2; min 15 mm [0.59 in] deep

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

D Thread: M10, 20 mm [0.78 in] deep

Size	**50**	**80**	**100**	**125**	**160**	**200**	**250**	**315**	**400**
L max. mm [in]	73.4 [2.89]	77.3 [3.05]	79.9 [3.15]	83.7 [3.30]	87.7 [3.46]	92.9 [3.66]	99.4 [3.92]	107.8 [4.25]	118.9 [4.69]

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



Port connections:

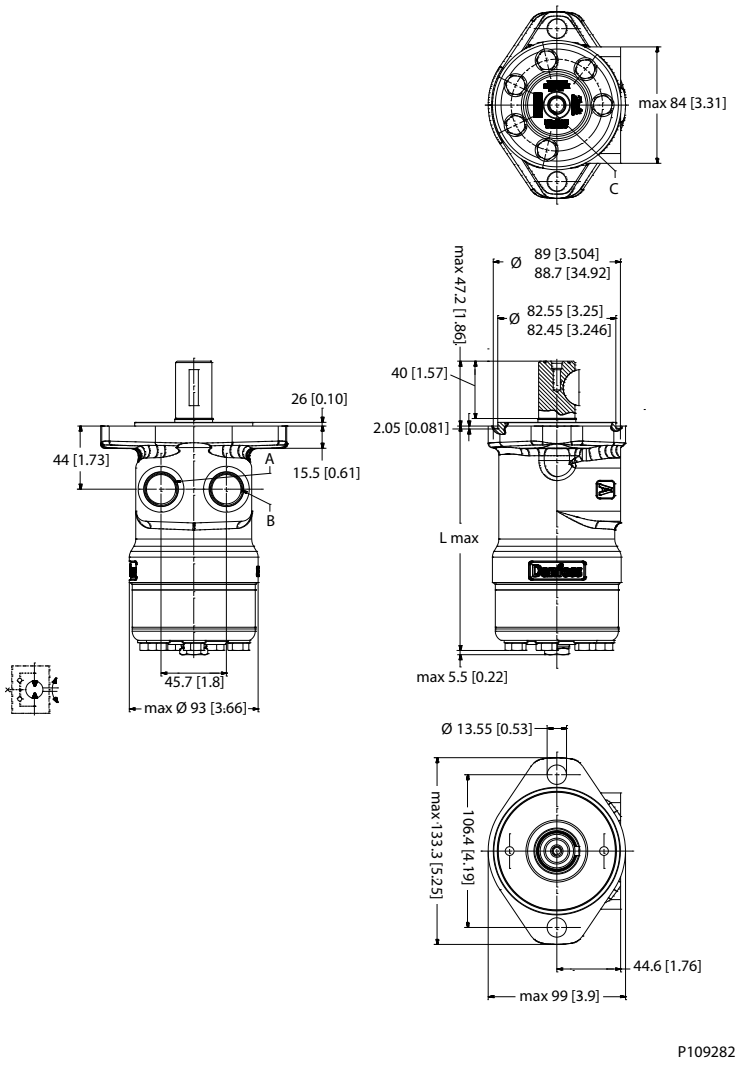
A, B Main ports: 7/8 - 14 UNF; min. 16.7 mm [0.66 in] deep

C Drain port: 7/16 - 20 UNF; 11.5 mm [0.45 in] deep

D Thread: M8; 13 mm [0.51 in] deep

Size	**25**	**32**	**40**	**50**	**80**	**100**	**160**	**200**	**315**	**400**
L max. mm [in]	136.2 [5.37]	137.3 [5.41]	138.6 [5.46]	138.6 [5.46]	142.5 [5.62]	145.1 [5.72]	152.9 [6.02]	158.1 [6.82]	173.0 [6.82]	184.1 [7.25]

US version side port aligned with 2-hole oval mounting flange (A2-flange)



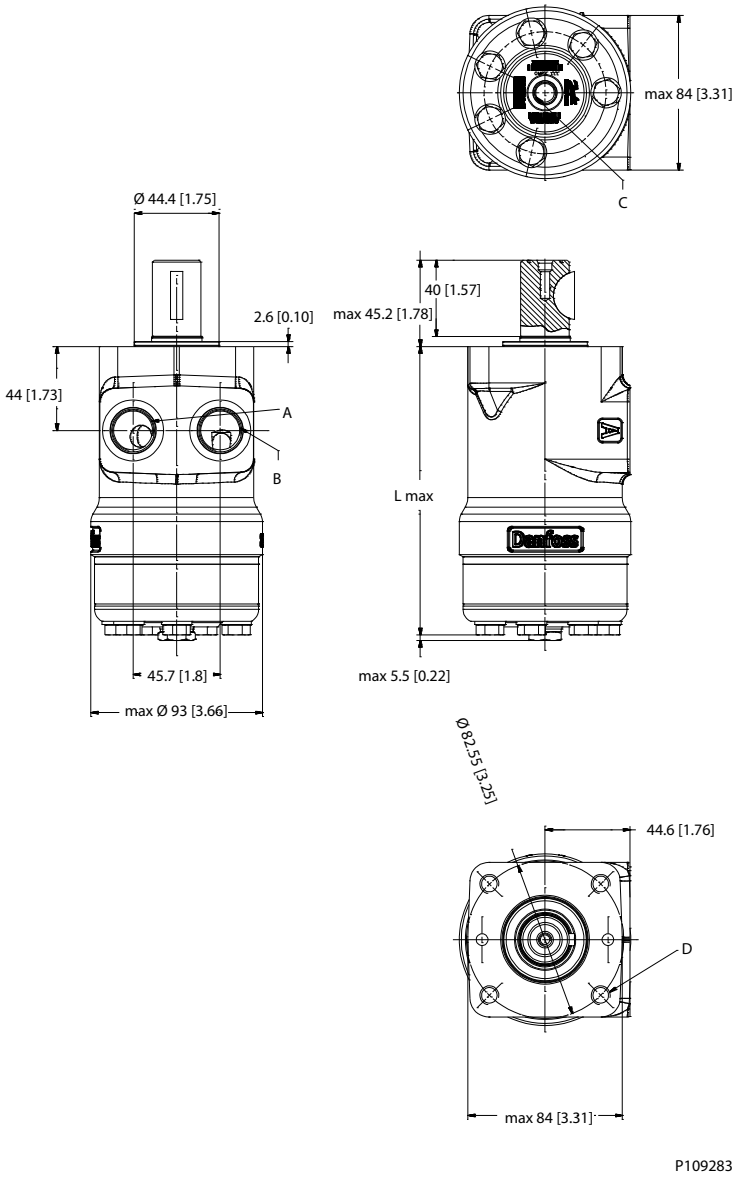
Port connections:

A, B Main ports: 7/8 - 14 UNF; min. 16.7 mm [0.66 in] deep

C Drain port: 7/16 - 20 UNF; 11.5 mm [0.45 in] deep

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

US version side port aligned with square mounting flange (C-flange)



Port connections:

A, B Main ports: 7/8 - 14 UNF; min. 11.5 mm [0.45 in] deep

C Drain port: 7/16 - 20 UNF; 11.5 mm [0.45 in] deep

D Thread: 3/8 - 16 UNC; 15 mm [0.59 in] deep

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

Chapter 11

OMR X configuration versions overview with codes numbers

Topics:

The following tables show the different versions configuration codes.

- OMR X standard motors:
  - *Side port offset 2-hole oval mounting flange (A2 flange)* on page 54
  - *Side port aligned with 2-hole oval mounting flange (A2 flange)* on page 55
  - *Side port aligned with square mounting flange (C flange)* on page 55
- OMR X N motors with needle bearings: *Side port offset 2-hole oval mounting flange (A2-flange)* on page 56

If the desired OMR X could not be found please use the *OMR X Model Code* on page 59.

OMR X standard motors

For OMR X motors with a configuration which is not available in the code number tables please use the model code number system in the *OMR X Model Code* on page 59 to specify the OMP X motor on detail.

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

Configuration code numbers are set according to OMR X motor mounting flange type.

Table 41: Configuration codes A1 – A7 description

Pilot dia.	**Ø 82.5 mm [3.25 in]**						
Bolt circle dia.	**Ø 106.4 mm [4.20 in]**						
Conf. code	**A2**	**A1**	**A3**	**A4**	**A5**	**A6**	**A7**
Shaft	Cyl. Ø25 mm	Cyl. Ø25 mm	Cyl. 1 in	Cyl. 1 in	Splined 1 in	Splined 1 in	Tap. Ø28.5 mm
Main port	G1/2	G1/2	G1/2	7/8 -14 UNF	G1/2	7/8 -14 UNF	G1/2
Drain port	G1/4	G1/4	G1/4	7/16-20 UNF	G1/4	7/16-20 UNF	G1/4
Port type	End	Side offset					
Check valve	Yes						
Shaft seal	High pressure shaft seal						
Designation	Main type designation: **OMR X**						

Table 42: Code numbers for OMR X: A1 — A7

Code	Displacement								
	50	**80**	**100**	**125**	**160**	**200**	**250**	**315**	**375**
A1	11185537	11186671	11186674	11186655	11186658	11186665	11186667	11186652	11185531
A2	11185473	11185474	11186645	11185468	11185469	11186642	11185471	11185467	11186644
A3	11185558	11185560	11185562	11185548	11185549	11185551	11185554	11185545	11185556
A4	11185488	11185489	11185490	11185483	11185484	11185485	11185486	11185482	11185487
A5	11185584	11185585	11185588	11185567	11185570	11185573	11185576	11185564	11185580
A6	11185497	11185498	11185499	11185492	11185493	11185494	11185495	11185491	11185496
A7	11185609	11185610	11185611	11185604	11185605	11185606	11185607	11185603	11185608

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

Configuration codes **B1–B5** description according to OMR X motor mounting flange type: Side port aligned with 2-hole oval mounting flange (A2 flange).

Table 43: Configuration codes B1 – B5 description

Pilot diameter	**Ø 82.5 mm [3.25 in]**				
Bolt circle dia.	**Ø 106.4 mm [4.20 in]**				
Configuration code	**B2**	**B1**	**B3**	**B4**	**B5**
Shaft	Cylindrical 1 in	Cylindrical 1 in	Splined 1 in	Cyl. 1 in, CH8	Cyl. 1 in, CH10.3
Main port size	1/2–14 NPTF	7/8–14 UNF			
Drain port size	7/16–20 UNF				
Port type	Side port aligned				
Check valve	Yes				
Shaft seal	High pressure shaft seal				
Designation	Main type designation: **OMR X**				

Table 44: Code numbers for OMR X: B1 – B5

Code	**Displacement**										
	36	**50**	**80**	**100**	**125**	**160**	**200**	**250**	**315**	**375**	**400**
B1	—	11186162	11186163	11186164	11186157	11186158	11186159	11186160	11186156	—	11186161
B2	—	—	11186189	11186190	—	11186185	11186186	11186187	—	—	11186188
B3	—	—	11186154	11186155	11186151	—	11186152	—	11186150	—	11186153
B4	83062987	83062988	83062989	83062990	83062991	83063012	83063013	83063014	83063015	83063016	83063017
B5	83063057	83063058	83063059	83063060	83063061	83063082	83063083	83063084	83063085	83063086	83063087

Side port aligned with square mounting flange (C flange)

Configuration codes **C1–C4** description according to OMR X motor mounting flange type (C flange, 4 x 3/8-16 UNC mounting threads).

Table 45: Configuration codes C1 – C4 description

Pilot diameter	**Ø 44.4 mm [1.75 in]**			
Bolt circle dia.	**Ø 82.5 mm [3.25 in]**			
Configuration code	**C2**	**C1**	**C3**	**C4**
Shaft	Cylindrical 1 in	Cylindrical 1 in	Cyl. 1 in, CH8	Cyl. 1 in, CH10.3
Main port size	1/2–14 NPTF	7/8–14 UNF		

Pilot diameter	**Ø 44.4 mm [1.75 in]**			
Bolt circle dia.	**Ø 82.5 mm [3.25 in]**			
Configuration code	**C2**	**C1**	**C3**	**C4**
Drain port size	7/16–20 UNF			
Port type	Side port aligned			
Check valve	Yes			
Shaft seal	High pressure shaft seal			
Designation	Main type designation: **OMR X**			

Table 46: Code numbers for OMR X: C1 – C4

Code	Displacement										
	36	**50**	**80**	**100**	**125**	**160**	**200**	**250**	**315**	**375**	**400**
C1	–	11186146	11186147	11186148	11186646	11186647	11186143	11186144	11185479	–	11186145
C2	–	11186197	–	11186198	–	11186193	11186194	11186195	–	–	11186196
C3	83063079	83063080	83063081	83063102	83063103	83063104	83063105	83063106	83063108	83063109	83063110
C4	83063731	83063742	11186149	83063743	83063744	83063745	83063746	83063747	83063748	83063749	83063750

OMR X N motors with needle bearings

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

Configuration code **D1** description according to OMR X N motor mounting flange: Side port offset with 2-hole oval mounting flange (A2-flange).

Table 47: Configuration code D1 description

Configuration code	**D1**
Pilot diameter	**Ø 82.5 mm [3.25 in]**
Bolt circle diameter	**Ø 106.4 mm [4.20 in]**
Shaft	Cylindrical Ø 25 mm [Dia 0.984 in]
Main port size	G1/2
Drain port size	G1/4
Port type	Side offset
Check valve	Yes
Shaft seal	High pressure shaft seal
Main type designation	**OMR X N**

Table 48: Code numbers for D1

Code	Displacement							
	50	**80**	**125**	**160**	**200**	**250**	**315**	**375**
D1	11185526	11185601	11185594	11185595	11185596	11185598	11185593	11185599

Chapter 12

OMR X Model Code

The coding system has been developed to identify the configuration options for the OMP X motors. The model code begins with the motor family and the remaining fields are filled in to configure the motor with the desired features, all fields must be filled in. *Example:* **OMRX-200-NNN-B11-SO**-A3-A11-C-E-B-1-N-N-NN-NNN-NNN-NNN-A-NN.

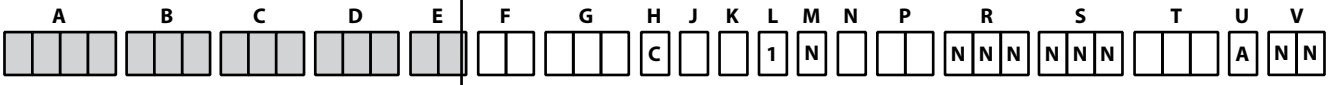


Table 49: A – Main motor family

OMRX	OMR X motor series

Table 50: B – Motor displacement

Code	Displacement, cm^3/rev [in^3/rev]
036	36.9 [2.25]
050	51.6 [3.15]
080	80.3 [4.90]
100	99.8 [6.09]
125	124.1 [7.57]
160	155.4 [9.48]
200	198.2 [12.09]
250	248.1 [15.14]
315	310.1 [18.92]
375	363.5 [22.18]
400	390.7 [23.84]

Table 51: C – Motor type (Align with options: D, E and F)

Code	Description
NNN	Standard motor
B13	Standard motor with needle bearing

Table 52: D – Mounting type (Align with options: E and F)

Code	Description
B11	A2 flange; 82.5 Dia x 8 Pilot; 106.4 Dia B.C.

Code	Description
B12	A2 flange; 82.5 Dia x 2.6 Pilot; 106.4 Dia B.C.
C10	C4 flange; 44 Dia x 2.6 Pilot; 83 Dia B.C.; 3/8-16 mounting

Table 53: E – Port type (Align with options: D, F and G)

Code	Description
SO	Side port – Offset
SA	Side port – Aligned
EA	End port

Chapter 13

OMR X Model Code

Example: OMRX-200-NNN-B11-SO-**A3-A11-C-E-B**-1-N-N-NN-NNN-NNN-NNN-NNN-A-NN.

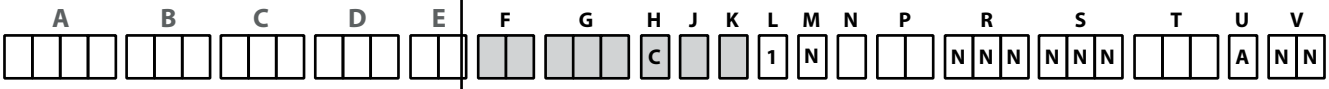


Table 54: F – Main ports thread type

Code	Description
A3	G 1/2
A8	7/8-14 UNF
A9	1/2-14 NPTF
B7	M22 x 1,5 according to ISO 6149
C1	Manifold

Table 55: G – Shaft type (Align with options: C, F and K)

Code	Description
A11	Cylindrical 25 mm with 8 mm key; M8 hole in shaft end
B11	Cylindrical 1 inch with 1/4 in key; M8 hole in shaft end
B12	Cylindrical 1 inch with 1/4 in key; 1/4-20UNC hole in shaft end
B13	Cylindrical 1 inch with Woodruff key; 1/4-20UNC hole in shaft end
B14	Cylindrical 1 inch with cross hole 10.3; 1/4-20UNC hole in shaft end
B15	Cylindrical 1 inch with cross hole 8.0
C11	Spline 7/8" – 13T
C13	1 inch 6B Spline; M8 hole in shaft end
C14	1 inch 6B Spline; 1/4-20UNC hole in shaft end
E10	Tapered 28.5 mm – 1:10
F10	Tapered 1" – 1:8, WK3/16x3/4

Table 56: H – Shaft seal

C	High pressure shaft seal - NBR

Table 57: J – Dust seal

Code	Description
B	Dust seal integrated in shaft seal plus seal guard
E	Dust seal integrated in shaft seal

Table 58: K – Drain port (Align with options: F and G)

Code	Description
B	G1/4
D	7/16 – 20 UNF
K	M12 x 1,5 according to ISO 6149
M	No drain port due to EMD

Chapter 14

OMR X Model Code

Example: OMRX-200-NNN-B11-SO-A3-A11-C-E-B-**1-N-N-NN-NNN-NNN-NNN-NNN-A-NN**.

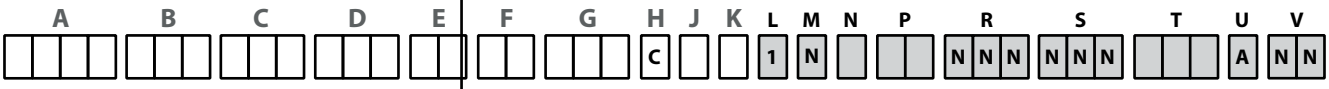


Table 59: L – Check Valve

1	Yes

Table 60: M – Brake release port

N	None

Table 61: N – Speed sensor

N	None
A	Prepared for EMD speed sensor

Table 62: P – Painting

Code	Description
NN	No paint
AA	Black, 9005; Corr. class C3; Standard covering
AB	Black, 9005; Corr. class C3; Surface covering

Table 63: R – Valve option

NNN	None

Table 64: S – Specific visible features

NNN	None

Table 65: T – Specific non-visible features

NNN	None

Table 66: U – Packaging

A	Single pack

Table 67: V – Name tags: Motor and box

NN	Name tag

Chapter

15

OMR X technical data

Topics:

OMR X motor specification

Table 68: OMR X motors, sizes: 50 – 160 cm³

Description		Unit	50	80	100	125	160
Geometric displacement		cm³ [in]	51.6 [3.16]	80.3 [4.91]	99.8 [6.11]	124.1 [7.57]	155.4 [9.48]
Max. speed	cont.	min^{-1} (rpm)	775	750	600	475	385
	int.[2)]		970	940	750	600	480
Max. torque[1)]	cont.	N•m [lb•in]	100 [890]	215 [1900]	275 [2435]	330 [2920]	380 [3365]
	int.[2)]		120 [1060]	235 [2080]	300 [2655]	360 [3185]	435 [3580]
Max. output	cont.	kW [hp]	7.0 [9.4]	14.0 [18.8]	14.0 [18.8]	14.0 [18.8]	12.6 [16.9]
	int.[2)]		8.8 [11.7]	15.8 [21.1]	17.5 [23.5]	17.5 [23.5]	15.8 [21.1]
Max. pressure drop	cont.	bar [psi]	150 [2175]	200 [2900]	200 [2900]	200 [2900]	180 [2610]
	int.[2)]		175 [2540]	225 [3260]	225 [3260]	225 [3260]	215 [3120]
Max. starting pressure with unloaded shaft		bar [psi]	10 [145]	10 [145]	10 [145]	10 [145]	10 [145]
Max. oil flow	cont.	l/min	40 [10.6]	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]
	int.[2)]	[US gal/ min]	50 [13.2]	75 [19.8]	75 [19.8]	75 [19.8]	75 [19.8]
Min starting torque at max. pressure drop	cont.	N•m [lb•in]	85 [750]	190 [1680]	230 [2035]	295 [2610]	335 [2965]
	int.[2)]		100 [890]	215 [1900]	255 [2255]	335 [2965]	400 [3540]

Table 69: OMR X motors, sizes: 200 – 400 cm³

Description		Unit	200	250	315	375	400
Geometric displacement		cm³ [in]	198.2 [12.09]	248.1 [15.14]	310.1 [18.92]	363.5 [22.18]	390.7 [23.84]
Max. speed	cont.	min^{-1} (rpm)	305	240	195	165	155
	int.[2)]		380	300	245	205	195
Max. torque	cont.	N•m [lb•in]	400 [3540]	400 [3540]	400 [3540]	390 [3450]	400 [3540]
	int.[2)]		480 [4250]	540 [4780]	550 [4870]	550 [4870]	480 [4250]
Max. output	cont.	kW [hp]	10.5 [14]	8.8 [11.7]	7.0 [9.4]	5.6 [7.5]	4.9 [6.6]
	int.		13.1 [17.5]	10.5 [14.1]	8.9 [11.9]	.8 [10.5]	6.1 [8.2]
Max. pressure drop	cont.	bar [psi]	150 [2175]	125 [1815]	100 [1450]	80 [1160]	70 [1015]
	int.[2)]		195 [2830]	170 [2465]	140 [2030]	115 [1670]	90 [1305]
Max. starting pressure with unloaded shaft		bar [psi]	10 [145]	7 [100]	7 [100]	7 [100]	5 [75]

1) Maximum torque values for the different output shafts can be found in *OMP X shaft version* on page 39.
2) Intermittent operation: the permissible values may occur for max. 10% of every minute.

Description		Unit	200	250	315	375	400
Max. oil flow	cont.	l/min	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]	60 [15.9]
	int.[2)]	[US gal/ min]	75 [19.8]	75 [19.8]	75 [19.8]	75 [19.8]	75 [19.8]
Min starting torque at max. pressure drop	cont.	N•m [lb•in]	350 [3100]	370 [3275]	370 [3275]	335 [2965]	325 [2875]
	int.[2)]		460 [4070]	500 [4425]	515 [4560]	480 [4250]	420 [3715]

Table 70: Pressure limits

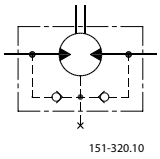
Description		All sizes
Max. inlet pressure drop	Continuous	200 bar [2900 psi]
	Intermittent	225 bar [3260 psi]
Max. return pressure with drain line	Continuous	200 bar [2900 psi]
	Intermittent	225 bar [3260 psi]

High Pressure Shaft Seal in OMP X and OMR X motors

OMP X and OMR X motors feature options with High Pressure Shaft Seal (HPS), with check valves and with or without drain connection.

Table 71: HPS pressure in the drain connection

OMP X/OMR X with drain connection	OMP X/OMR X without drain connection
The shaft seal pressure equals the pressure in the drain line	The shaft seal pressure **never exceeds** the pressure in the return line



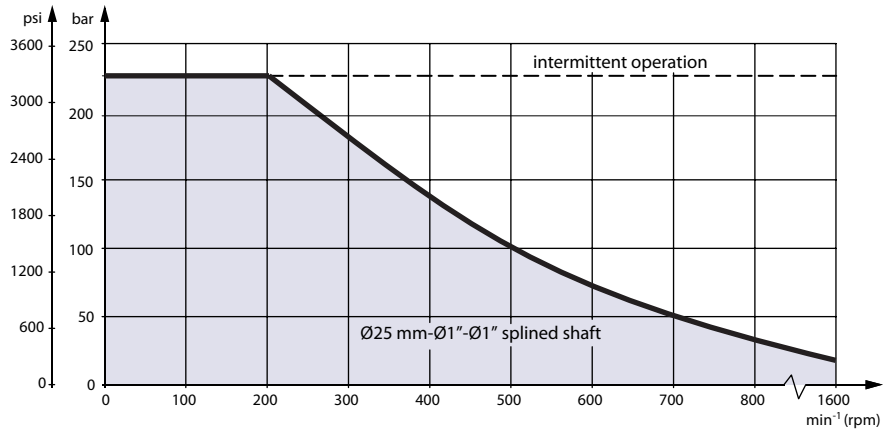


Figure 6: Maximum permissible shaft seal pressure

Pressure drop in motor

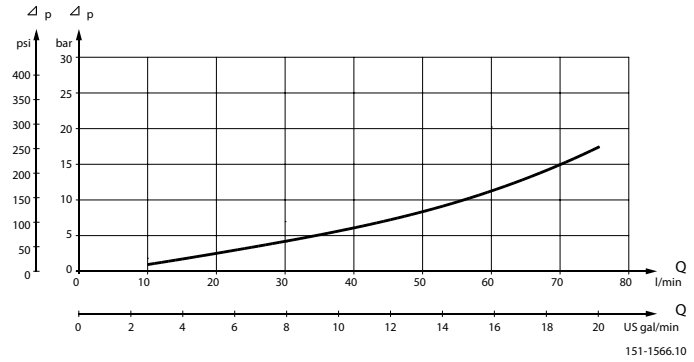


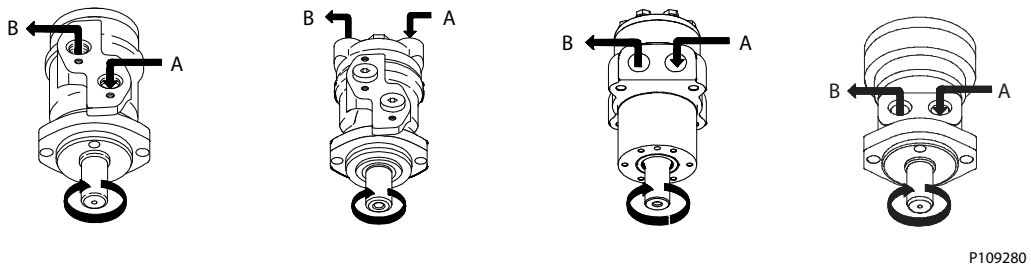
Figure 7: The curve applies to an unloaded motor shaft and an oil viscosity of 35 mm²/s [165 SUS]

Oil flow in drain line

Table 72: Max. oil flow in the drain line at return pressure less 5-10 bar

Pressure drop	100 bar [1450 psi]		140 bar [2030 psi]	
Viscosity	20 mm²/s [100 SUS]	35 mm²/s [165 SUS]	20 mm²/s [100 SUS]	35 mm²/s [165 SUS]
Max. oil flow	2.5 l/min [0.66 US gal/min]	1.8 l/min [0.78 US gal/min]	3.5 l/min [0.93 US gal/min]	2.8 l/min [0.74 US gal/min]

Direction of shaft rotation: clockwise



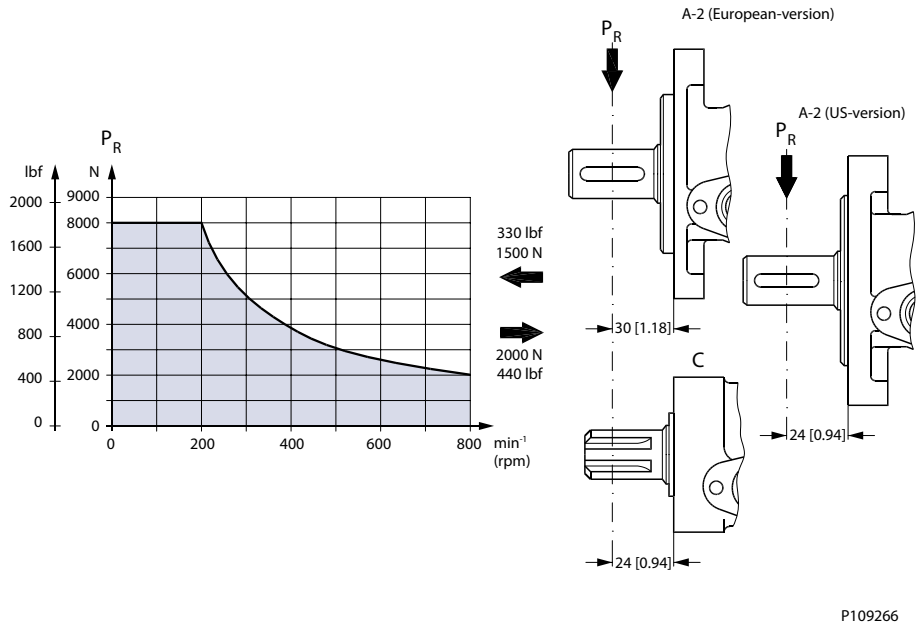
OMP X and OMR X shaft loads

The permissible radial shaft load (P_R) depends on: a distance from the point of load to the mounting flange (L), speed (n), mounting flange and shaft version.

Table 73: Permissible shaft load (P_R) in N [lbf]

Mounting flange	Shaft version	Metric formula	Imperial formula
2-hole oval flange (European version)	25 mm cylindrical 28.5 mm tapered 1 in cylindrical 1 in splined	$\frac{800}{n} \cdot \frac{250000\ N^*}{95 + L}$	$\frac{800}{n} \cdot \frac{2215\ lbf^*}{3.74 + L}$
Square flange 2-hole oval flange (US)	25 mm cylindrical 1 in splined	$\frac{800}{n} \cdot \frac{250000\ N^*}{101 + L}$	$\frac{800}{n} \cdot \frac{2215\ lbf^*}{3.98 + L}$

* $n \geq 200$ min^{-1} [rpm]; ≤ 55 mm [2.2 in]. $n < 200$ min^{-1} [rpm]; = > P_{Rmax} = 8000 N [1800 lbf]



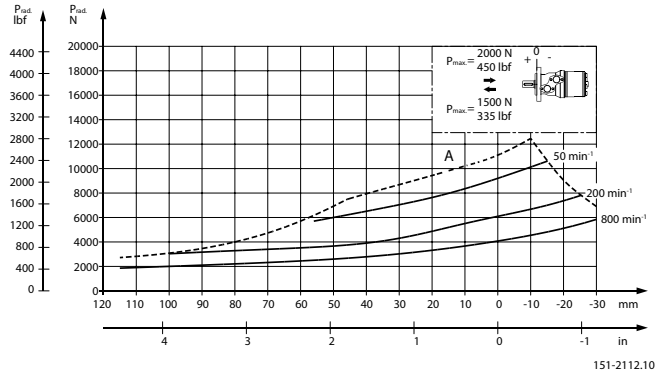
The curve shows the relation between P_R and n:

- when l = 30 mm [1.18 in] for motors with A2 (European version)
- when l = 24 mm [0.94 in] for motors with square mounting flange and A2 (US version)

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

** For both European and US-version

OMR X N with needle bearings shaft loads



The output shaft on OMR X N runs in needle bearings. These bearings and the recessed mounting flange allow a higher permissible radial load in comparison to OMR X motors with slide 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.

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 B_{10} 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,* **BC152886483554**.

Chapter 16

OMR X function diagrams

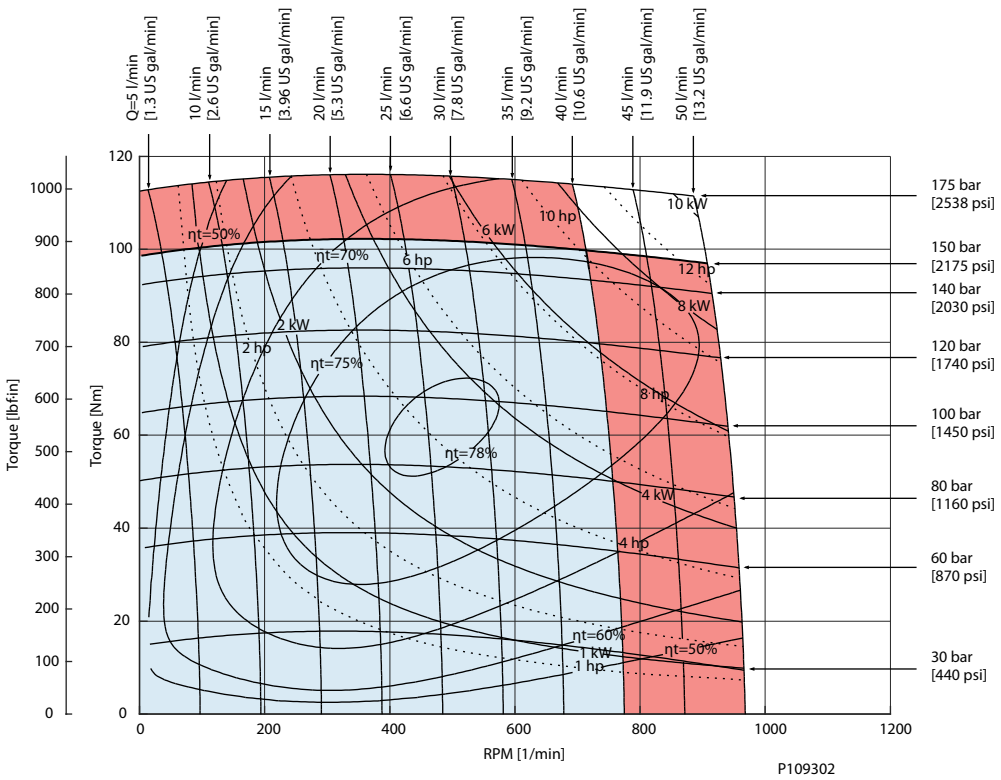
Topics:

Performance graphs for OMR X motors according to the displacement. Blue area shows continuous range and red area shows intermittent range (max. 10% operation every minute).

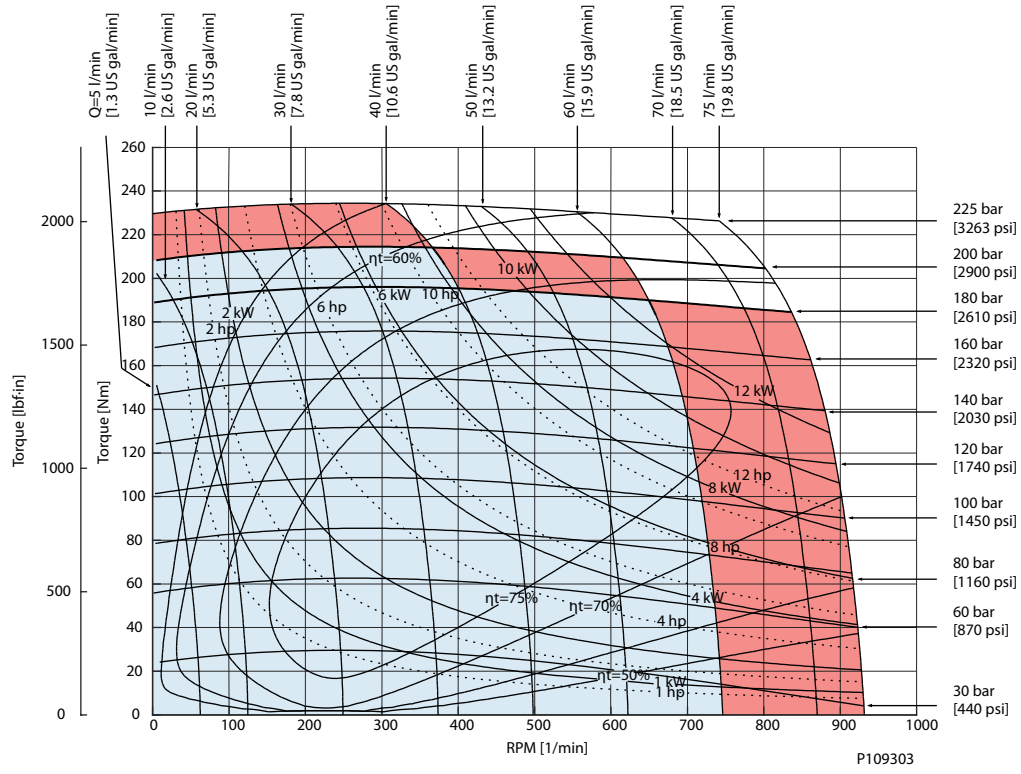
Explanation of function diagram use, basis and conditions can be found in *Operating Parameters Diagrams* on page 9.

Intermittent pressure drop and oil flow must not occur simultaneously. Max. permissible continuous/intermittent pressure drop for the actual shaft version can be found in *OMR X technical data* on page 65.

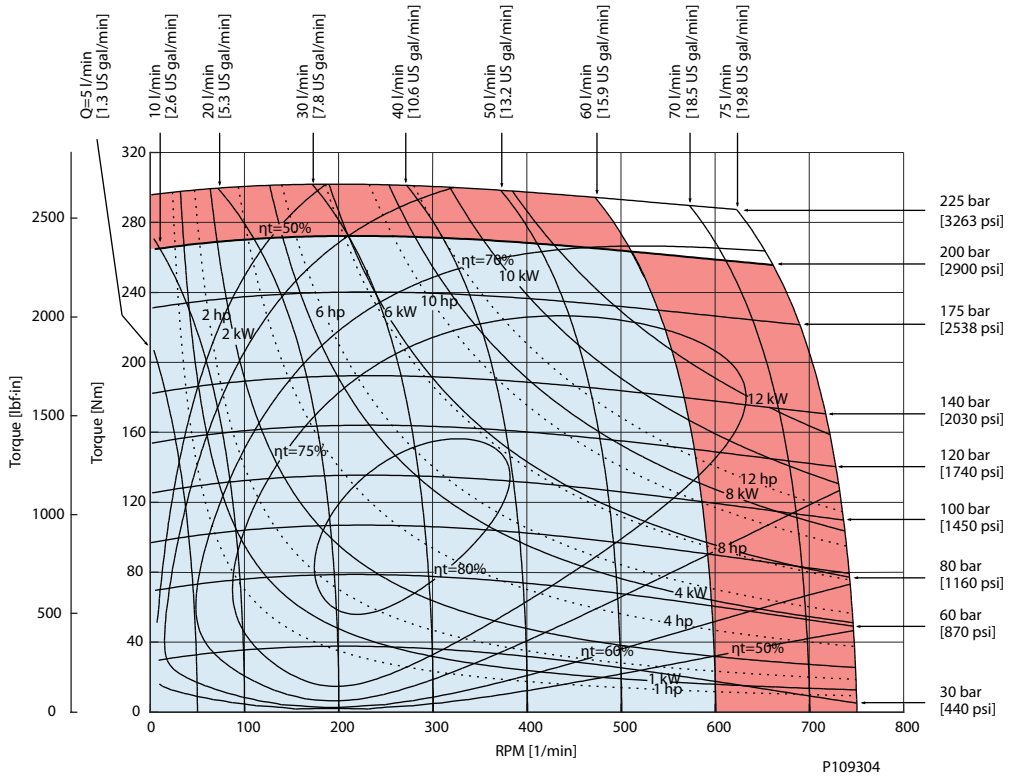
OMR X 50



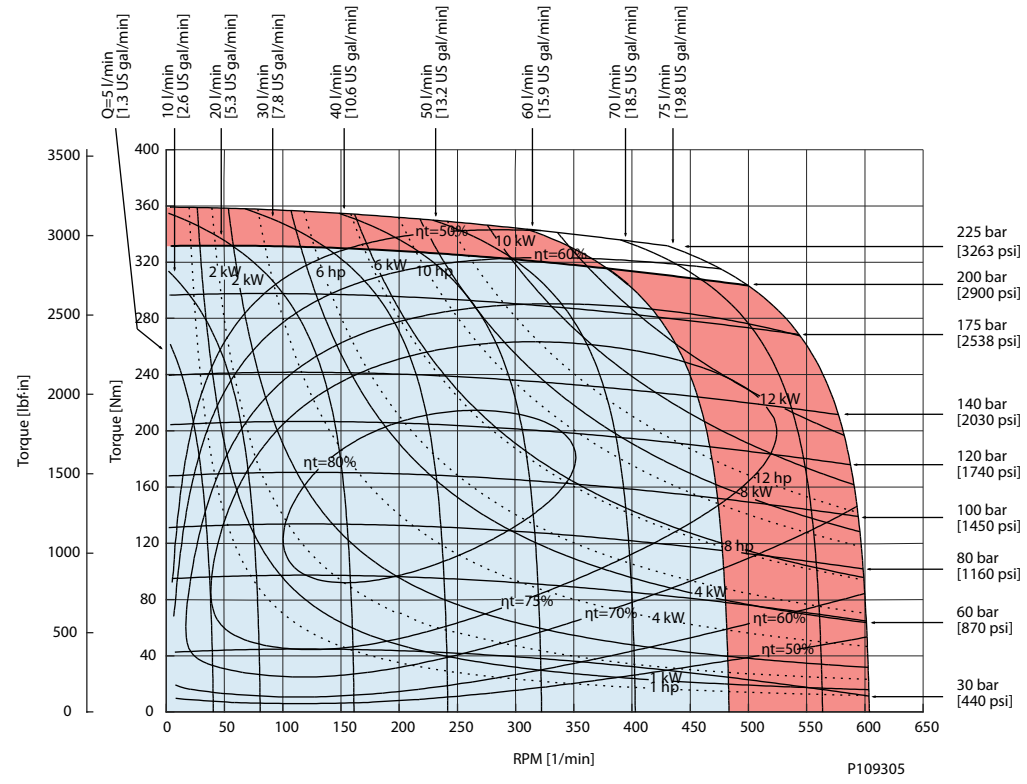
OMR X 80



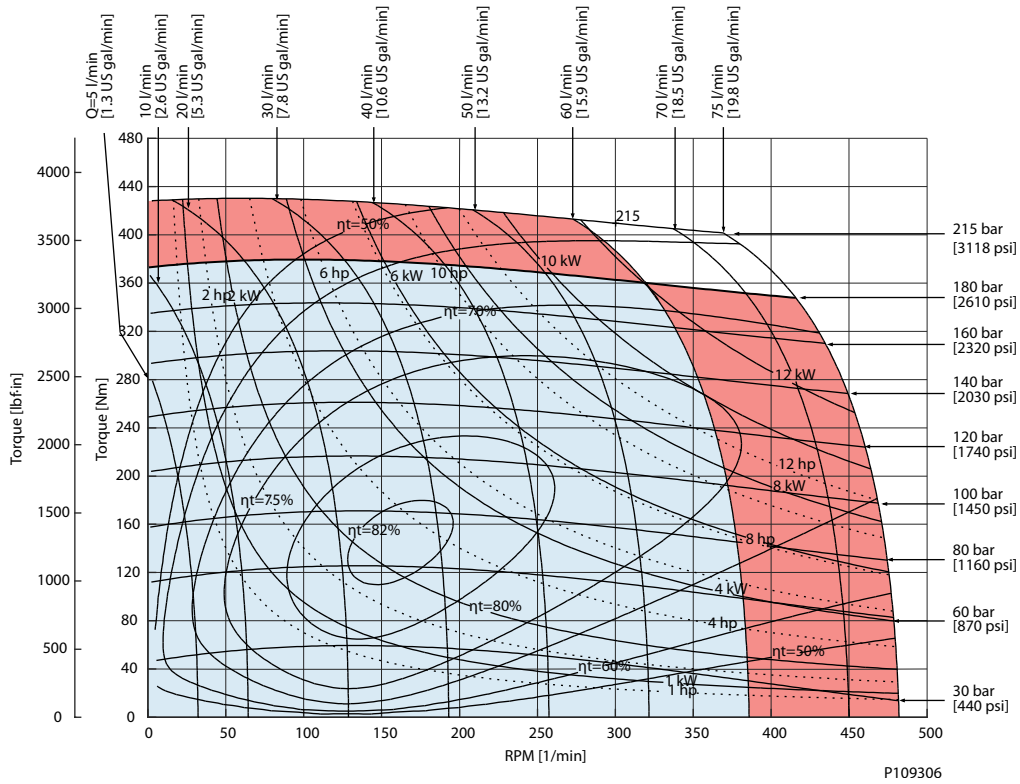
OMR X 100



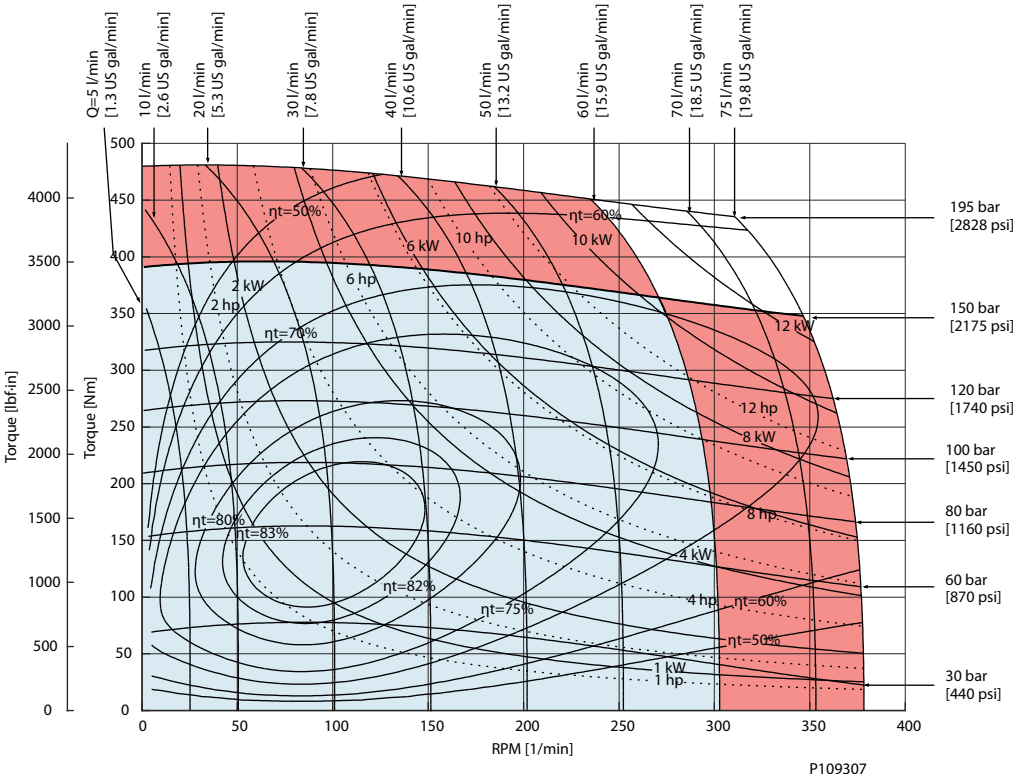
OMR X 125



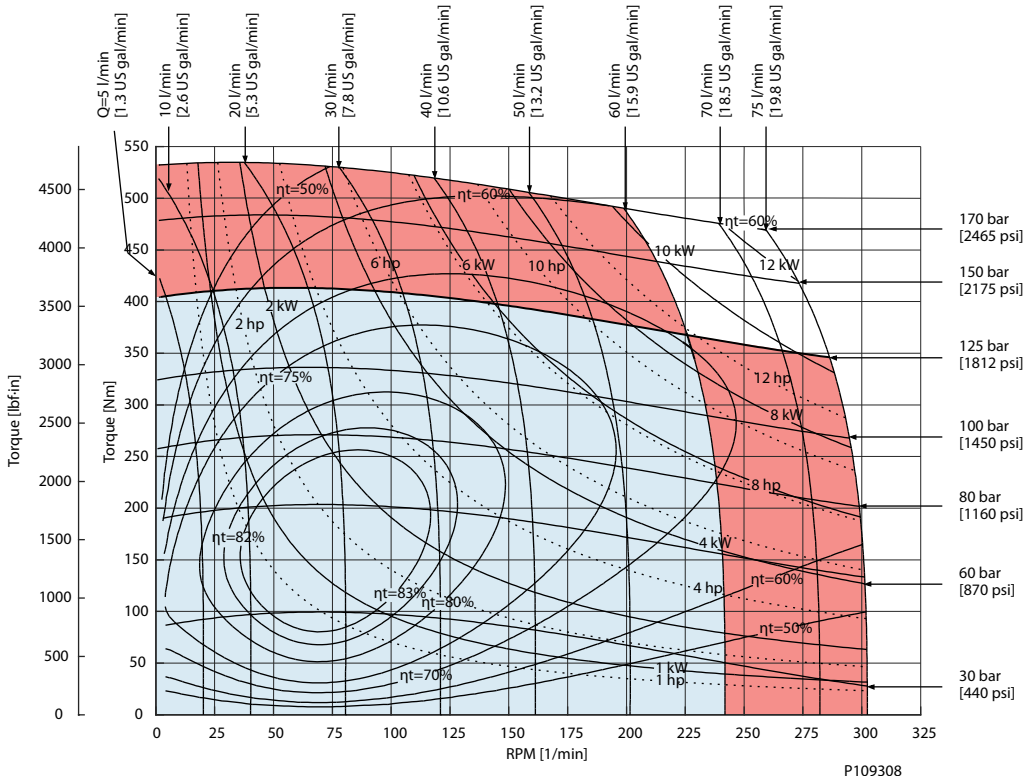
OMR X 160



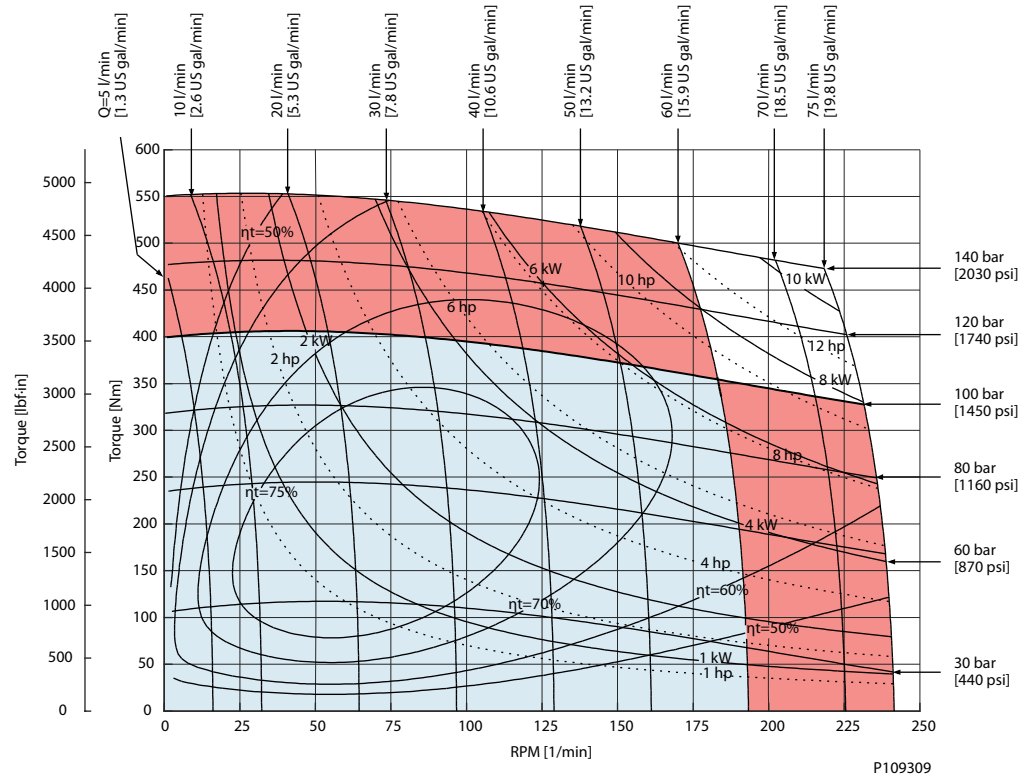
OMR X 200



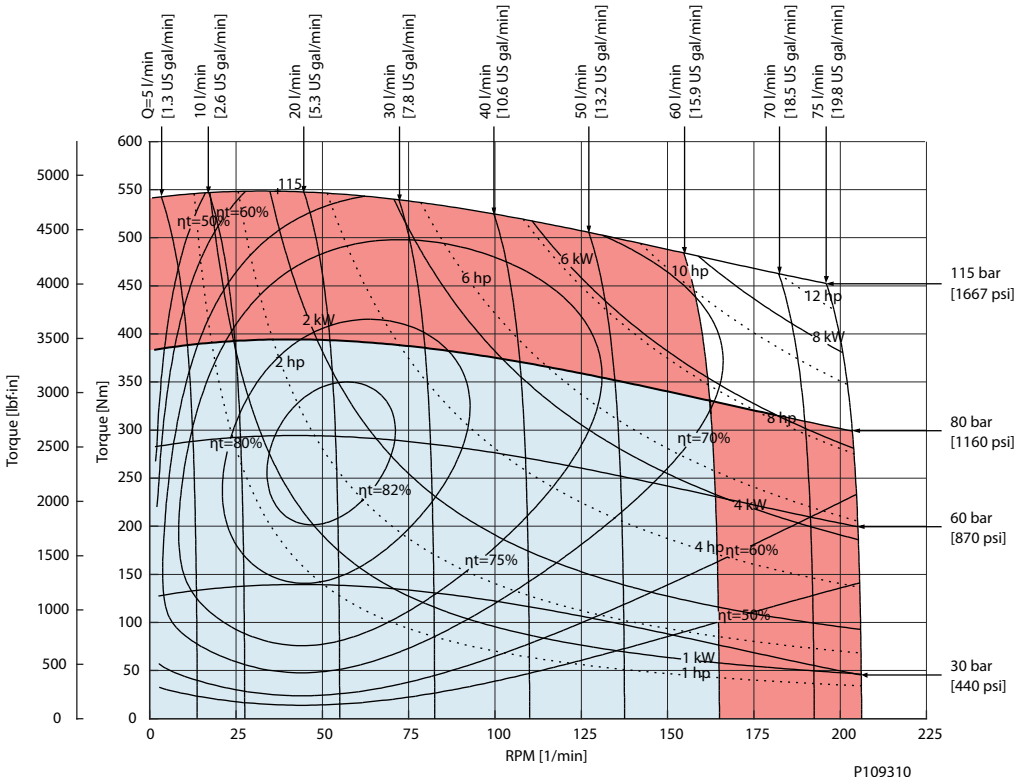
OMR X 250



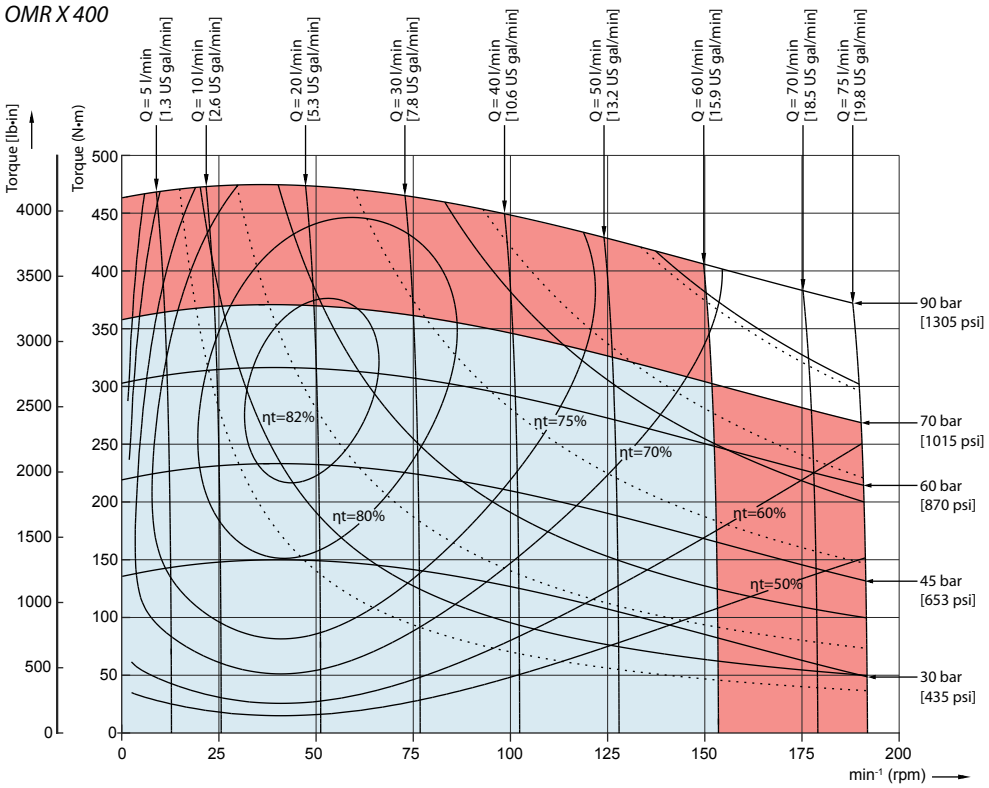
OMR X 315



OMR X 375


Q=5 l/min [1.3 US gal/min]
10 l/min [2.6 US gal/min]
20 l/min [5.3 US gal/min]
30 l/min [7.8 US gal/min]
40 l/min [10.6 US gal/min]
50 l/min [13.2 US gal/min]
60 l/min [15.9 US gal/min]
70 l/min [18.5 US gal/min]
75 l/min [19.8 US gal/min]
Torque [lbf·in]
Torque [Nm]
RPM [1/min]
115
ηt=50%
ηt=60%
6 kW
6 hp
10 hp
12 hp
8 kW
2 kW
2 hp
8 hp
ηt=80%
ηt=70%
ηt=82%
4 kW
4 hp
ηt=60%
ηt=75%
ηt=50%
1 kW
1 hp
115 bar [1667 psi]
80 bar [1160 psi]
60 bar [870 psi]
30 bar [440 psi]
P109310

OMR X 400


OMR X 400
Q = 5 l/min [1.3 US gal/min]
Q = 10 l/min [2.6 US gal/min]
Q = 20 l/min [5.3 US gal/min]
Q = 30 l/min [7.8 US gal/min]
Q = 40 l/min [10.6 US gal/min]
Q = 50 l/min [13.2 US gal/min]
Q = 60 l/min [15.9 US gal/min]
Q = 70 l/min [18.5 US gal/min]
Q = 75 l/min [19.8 US gal/min]
Torque [lb•in]
Torque (N•m)
4000
3500
3000
2500
2000
1500
1000
500
0
500
450
400
350
300
250
200
150
100
50
0
ηt=82%
ηt=80%
ηt=75%
ηt=70%
ηt=60%
ηt=50%
90 bar [1305 psi]
70 bar [1015 psi]
60 bar [870 psi]
45 bar [653 psi]
30 bar [435 psi]
0
25
50
75
100
125
150
175
200
min-1 (rpm)

Chapter

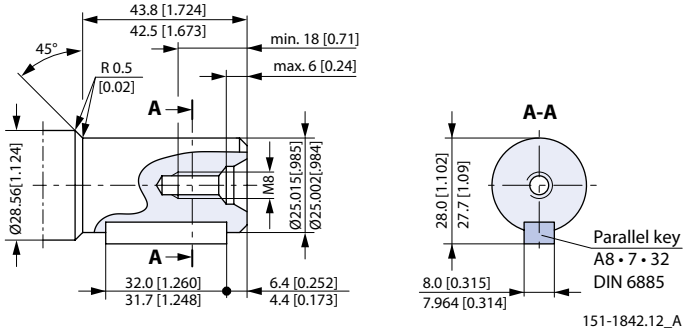
17

OMR X Shaft version

Topics:

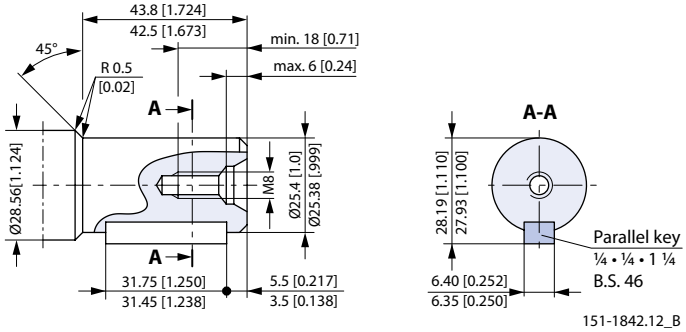
OMP X and OMR X shaft versions

Cylindrical shaft 25 mm; Parallel key DIN 6885



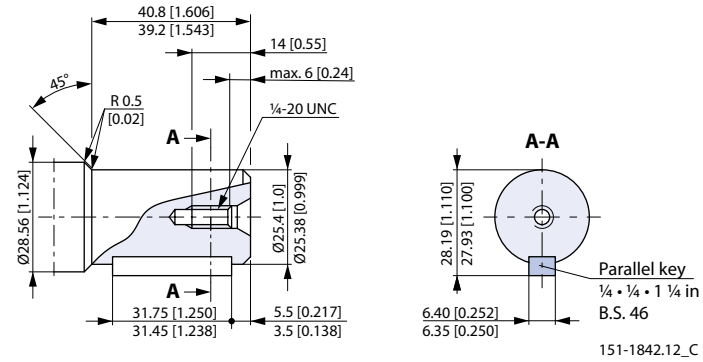
Max. cont. torque: 340 N•m [3010 lb•in]; Max. int. torque 450 N•m [3980 lb•in]

Cylindrical shaft 1 in; Parallel key B.S. 46



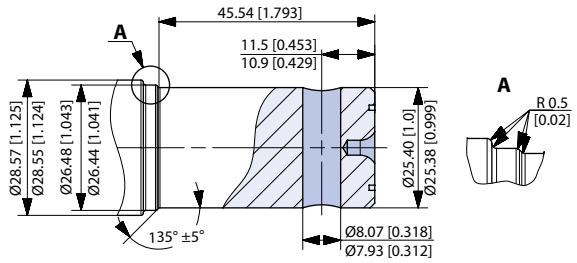
Max. cont. torque: 340 N•m [3010 lb•in]; Max. int. torque 450 N•m [3980 lb•in]

Cylindrical shaft 1 in; Parallel key B.S. 46 (US version)



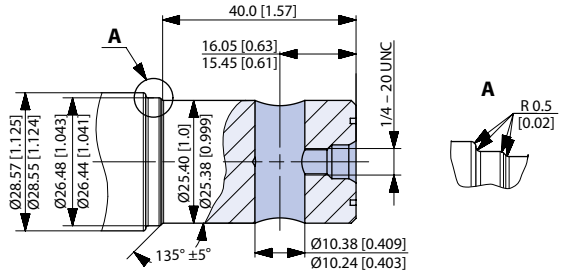
Max. cont. torque: 340 N•m [3010 lb•in]; Max. int. torque 450 N•m [3980 lb•in]

Cylindrical shaft 1 in; Cross hole 8 mm



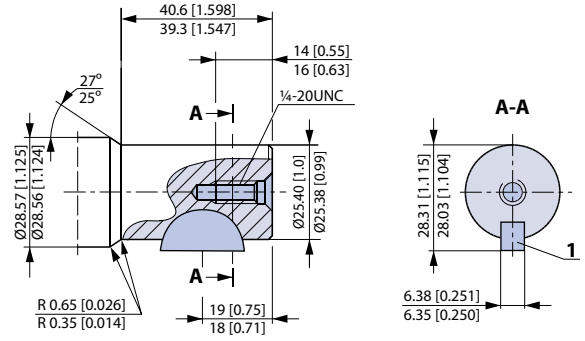
Max. torque: 200 N•m [1770 lb•in]

Cylindrical shaft 1 in; Cross hole 10.3 mm



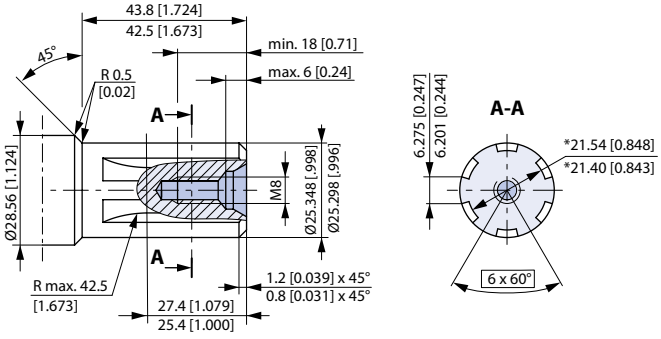
Max. torque: 200 N•m [1770 lb•in]

Cylindrical shaft 1 in (US version); SAE J502



1 Woodruff key ¼ x 1 in SAE J502

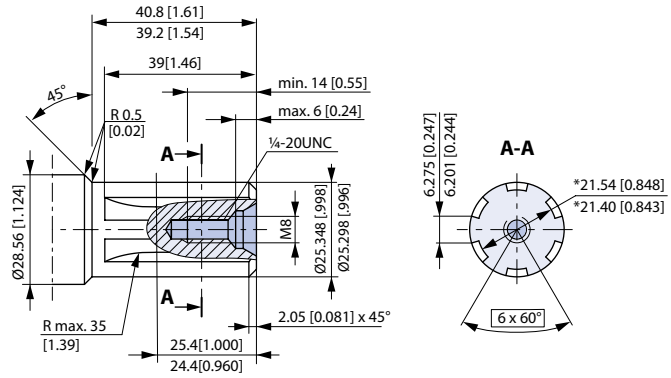
Splined shaft B.S. 2059 (SAE 6B)



Straight-sided, bottom fitting, dep. Fit 2, Nom. size 1 in; * Deviates from B.S. 2059 (SAE 6B)

Max. cont. torque: 400 N•m [3540 lb•in]

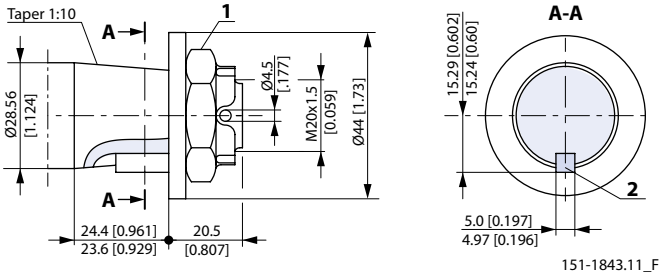
Splined shaft B.S. 2059 (SAE 6B); US version



Straight-sided, bottom fitting, deep. Fit 2; Nom. size 1 in, *Deviates from B.S. 2059 (SAE 6B)

Max. cont. torque 400 N•m [3540 lb•in]

Tapered shaft (taper 1:10); Parallel key DIN 6885



1. DIN 937 NV 30; Tightening torque: 100 ± 10 N•m [885 ± 88.5 lb•in]
2. Parallel key B5 • 5 • 14; DIN 6885

Max. cont. torque: 400 N•m [3540 lb•in]

Chapter

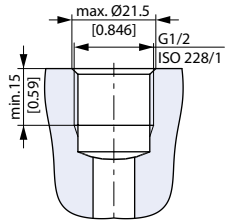
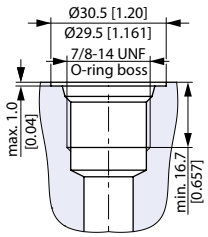
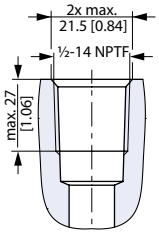
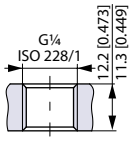
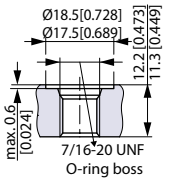
18

OMR X port thread versions

Topics:

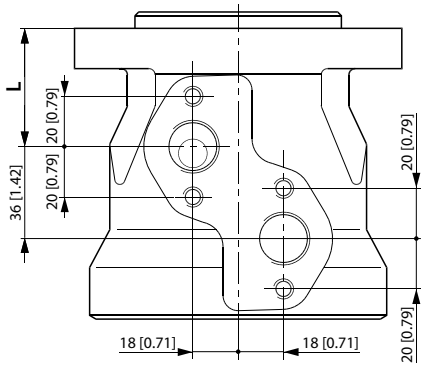
Main port thread versions

Table 74: Main ports overview

G ISO 228/1 – G1/2	UNF 7/8–14 UNF O-ring boss	NPTF 1/2–14 NPTF	G drain ISO 228/1 – G1/4	UNF drain 7/16–20 UNF O-ring boss
				

OMR X manifold mount

For OMR X manifold mounting versions please see the dimension drawings for given OMR X motors listed below:



For **L** dimension please see the tables in the topics below:

- *EU version side port offset with 2-hole oval mounting flange (A2-flange)* on page 86
- *EU version end port version with 2-hole oval mounting flange (A2-flange)* on page 87
- *US version side port offset with 2-hole oval mounting flange (A2-flange)* on page 88
- *US version side port aligned with 2 hole oval mounting flange (A2)* on page 89
- *US version side port aligned with square mounting flange (C-flange)* on page 90

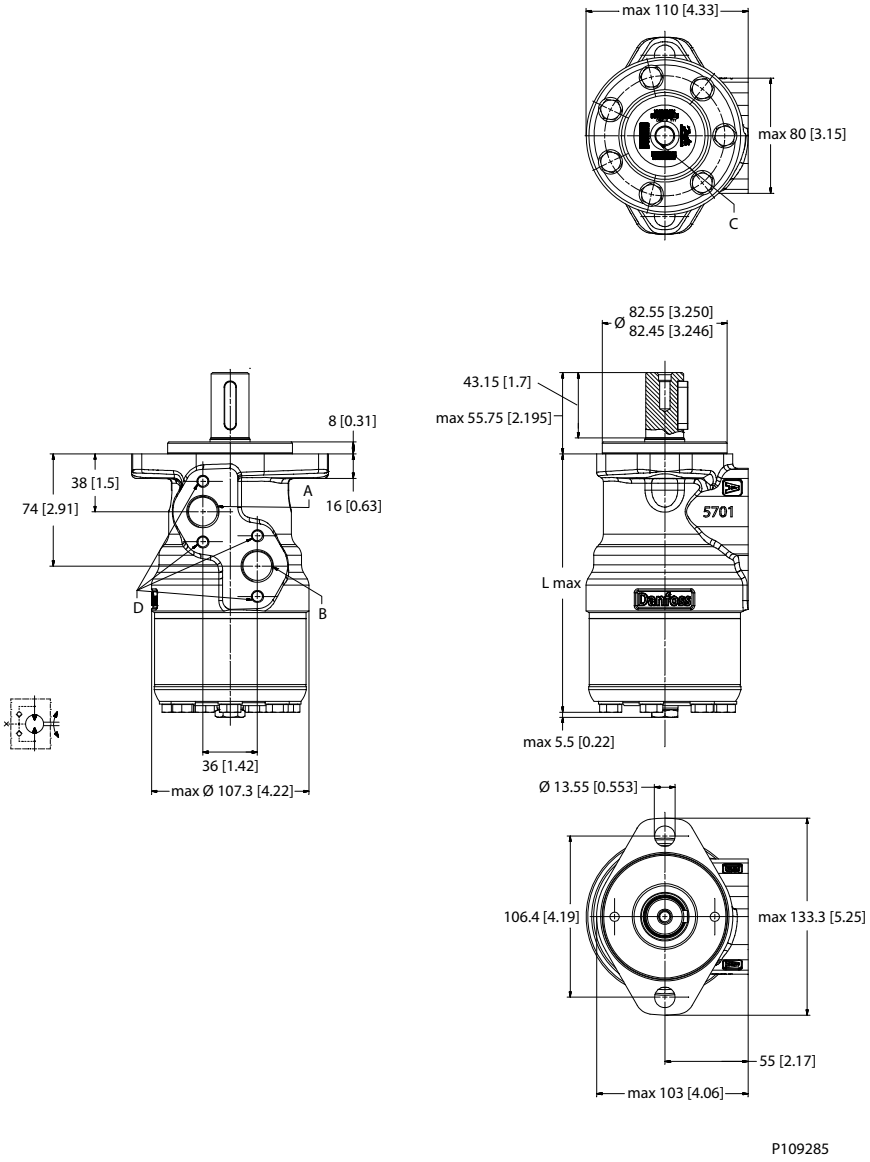
Chapter

19

OMR X dimensions

Topics:

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



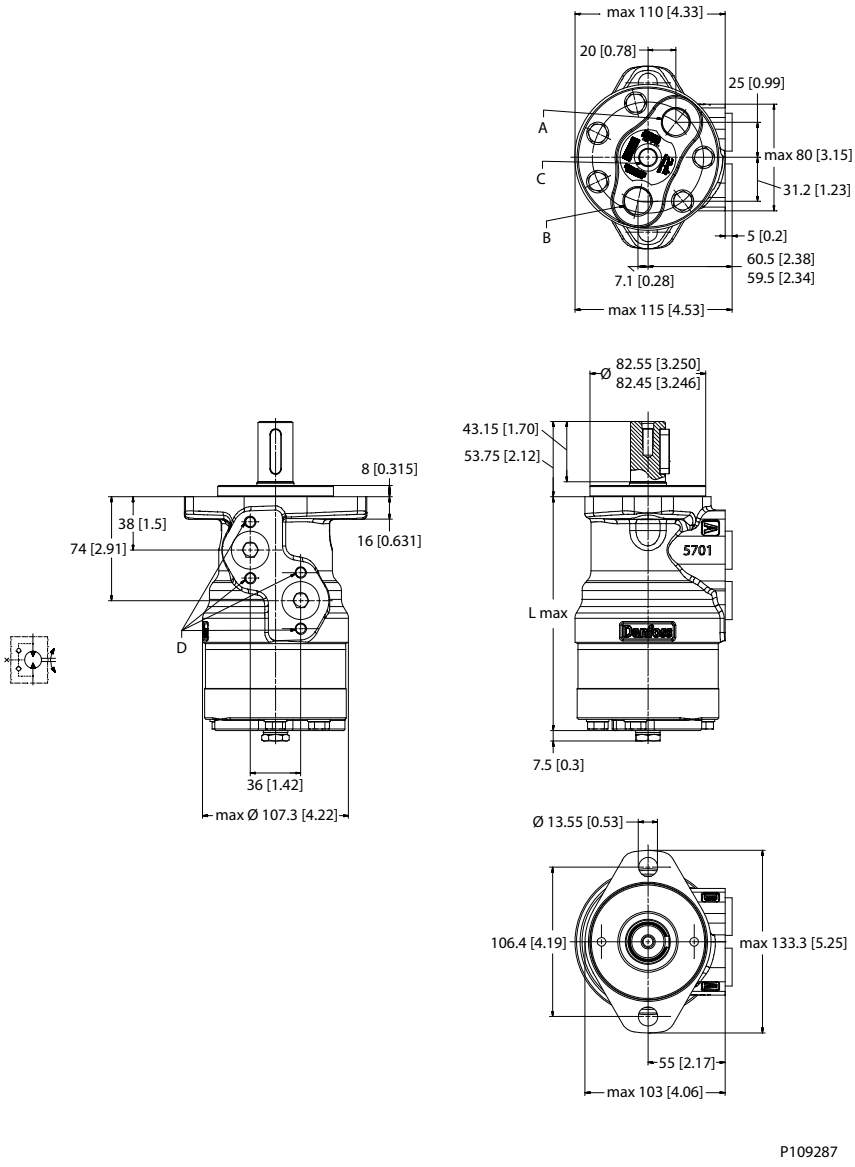
Port connections:

A, B Main ports: G 1/2; min 15 mm [0.59 in] deep

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

Size	**50**	**80**	**100**	**125**	**160**	**200**	**250**	**315**	**375**	**400**
L max. mm [in]	137.8 [5.43]	142.8 [5.63]	142.8 [5.63]	146.2 [5.76]	150.6 [5.93]	156.6 [6.17]	163.6 [6.45]	172.3 [6.79]	179.8 [7.08]	183.6 [7.23]

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



Port connections:

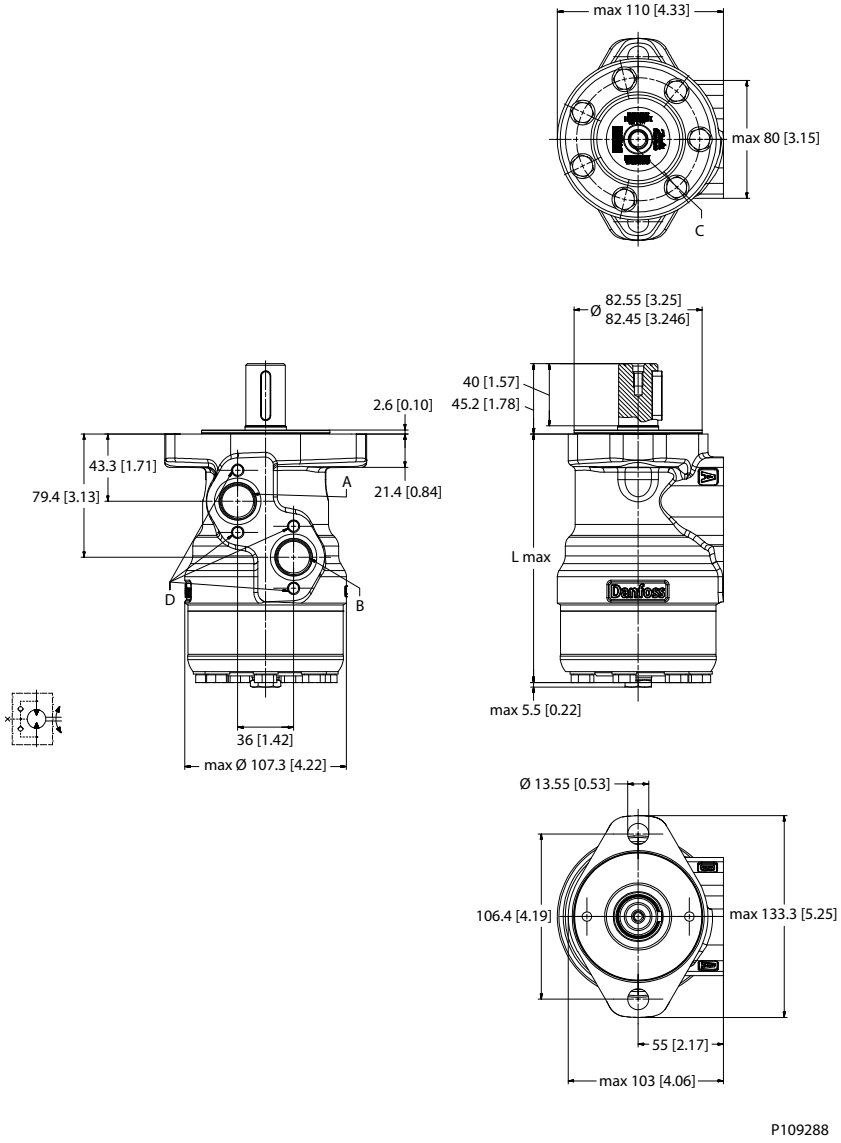
A, B Main ports: G 1/2; min 15 mm [0.59 in] deep

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

D Thread: M8; 13 mm [0.51 in] deep

Size	**50**	**80**	**100**	**125**	**160**	**200**	**250**	**315**	**375**
L max. mm [in]	150.3 [5.82]	155.3 [6.12]	155.3 [6.12]	158.7 [6.25]	163.1 [6.43]	169.1 [6.66]	176.1 [6.94]	184.6 [7.28]	192.3 [7.58]

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



Port connections:

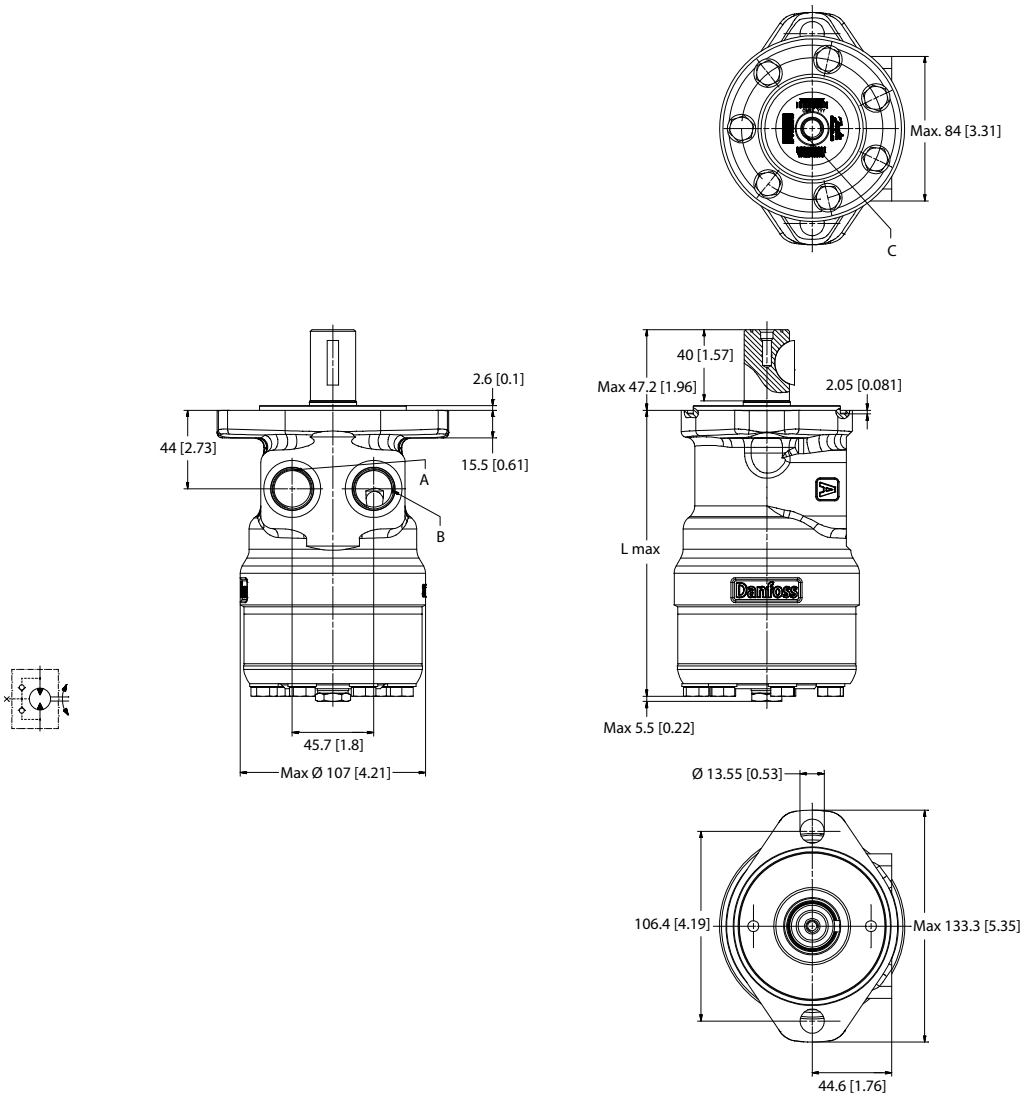
A, B Main ports: 7/8 - 14 UNF; min. 16.7 mm [0.66 in] deep

C Drain port: 7/16 - 20 UNF; 12 mm [0.47 in] deep

D Thread: M8; 13 mm [0.51 in] deep

Size	**50**	**80**	**100**	**125**	**160**	**200**	**250**	**315**	**375**
L max. mm [in]	143.2 [5.64]	148.2 [5.84]	148.2 [5.84]	151.6 [5.97]	156.0 [6.15]	162.0 [6.38]	169.0 [6.66]	177.7 [7.00]	185.2 [7.30]

US version side port aligned with 2 hole oval mounting flange (A2)



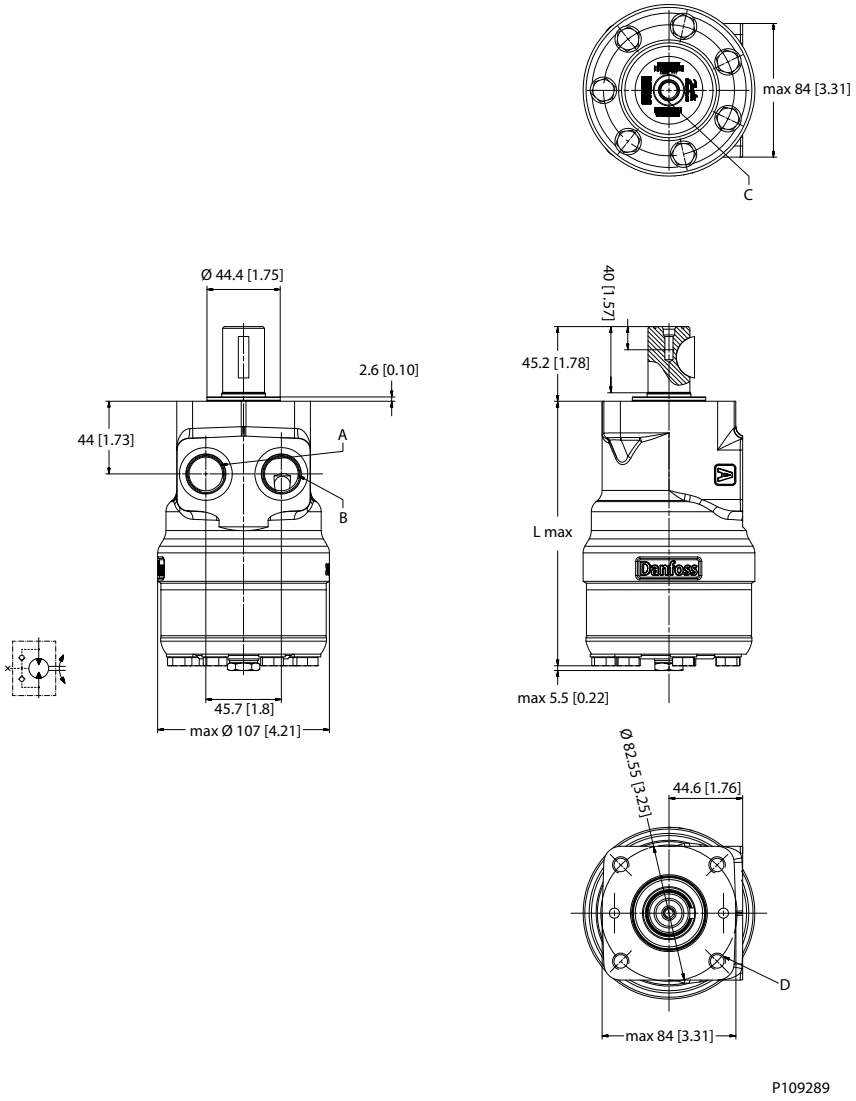
Port connections:

A, B Main ports: 7/8 - 14 UNF; min. 16.7 mm [0.66 in] deep

C Drain port: 7/16 - 20 UNF; 12 mm [0.47 in] deep

Size	**50**	**80**	**100**	**125**	**160**	**200**	**250**	**315**	**375**	**400**
L max. mm [in]	137.8 [5.43]	142.8 [5.63]	142.8 [5.63]	146.2 [5.76]	150.6 [5.93]	156.6 [6.17]	163.6 [6.45]	172.3 [6.79]	179.8 [7.08]	183.6 [7.23]

US version side port aligned with square mounting flange (C-flange)



Port connections:

A, B Main ports: 7/8 - 14 UNF; min. 16.7 mm [0.66 in] deep

C Drain port: 7/16 - 20 UNF; 12 mm [0.47 in] deep

D Thread: 3/8 - 16 UNC; 15 mm [0.59 in] deep

Size	**80**	**100**	**125**	**160**	**200**	**250**	**315**	**375**
L max.	148.2	148.2	151.6	156.0	162.0	169.0	177.7	189.0
mm [in]	[5.84]	[5.84]	[5.97]	[6.15]	[6.38]	[6.66]	[7.0]	[7.45]

Chapter

20

Weight of motors

Topics:

Weight of OMP X and OMR X motors

The large table of OMP X and OMR X motors weight according to ordering code number (see in bold font).

Table 75: OMP X and OMR X weight

Code No.	kg	lb	Code No.	kg	lb	Code No.	kg	lb	Code No.	kg	lb
11185412	8,1	17,9	**11185632**	7,6	16,7	**11185874**	5,6	12,4	**11186173**	7,2	15,9
11185460	8,4	18,4	**11185633**	9,1	20,1	**11185875**	5,8	12,7	**11186174**	7,5	16,6
11185461	8,7	19,1	**11185634**	7,5	16,6	**11185876**	6,1	13,4	**11186175**	6,8	15,0
11185462	9,0	19,9	**11185635**	6,3	13,9	**11185877**	5,9	13,1	**11186176**	7,1	15,6
11185463	9,9	21,7	**11185636**	7,8	17,2	**11185878**	7,0	15,5	**11186177**	7,4	16,3
11185464	7,7	16,9	**11185637**	8,8	19,3	**11185879**	5,6	12,4	**11186178**	7,9	17,5
11185465	7,9	17,5	**11185638**	7,6	16,8	**11185880**	6,1	13,4	**11186179**	8,3	18,2
11185466	7,9	17,5	**11185639**	7,2	15,9	**11185881**	5,9	13,1	**11186180**	9,3	20,5
11185467	9,5	20,9	**11185640**	9,5	21,0	**11185882**	6,3	13,9	**11186181**	7,2	15,8
11185468	8,1	17,9	**11185641**	8,4	18,6	**11185883**	6,5	14,4	**11186183**	8,7	19,3
11185469	8,4	18,4	**11185642**	9,9	21,8	**11185884**	6,8	14,9	**11186184**	9,3	20,6
11185470	8,7	19,1	**11185643**	8,0	17,6	**11185885**	7,1	15,7	**11186185**	7,6	16,8
11185471	9,0	19,9	**11185644**	9,5	21,0	**11185886**	7,5	16,6	**11186186**	7,9	17,5
11185472	9,9	21,7	**11185645**	9,1	20,0	**11185887**	5,6	12,4	**11186187**	8,3	18,3
11185473	7,7	16,9	**11185648**	8,7	19,1	**11185888**	5,7	12,6	**11186188**	9,3	20,6
11185474	7,9	17,5	**11185649**	7,3	16,1	**11185889**	5,7	12,6	**11186189**	7,2	15,9
11185475	7,9	17,5	**11185650**	7,3	16,1	**11185890**	5,8	12,9	**11186190**	7,2	15,9
11185476	8,7	19,1	**11185651**	7,5	16,6	**11185891**	6,1	13,5	**11186191**	7,2	16,0
11185477	7,9	17,5	**11185672**	7,8	17,3	**11185892**	6,0	13,2	**11186192**	7,2	15,9
11185478	7,5	16,5	**11185673**	8,2	18,1	**11185893**	6,3	13,8	**11186193**	7,3	16,2
11185479	8,4	18,6	**11185674**	6,8	15,1	**11185894**	6,5	14,2	**11186194**	7,7	16,9
11185480	7,1	15,6	**11185675**	6,8	15,1	**11185895**	6,7	14,8	**11186195**	8,0	17,7
11185481	7,3	16,1	**11185676**	7,1	15,7	**11185896**	6,1	13,4	**11186196**	9,1	20,0
11185482	8,7	19,3	**11185677**	8,7	19,1	**11185897**	6,3	13,8	**11186197**	6,6	14,7
11185483	7,4	16,3	**11185678**	7,5	16,6	**11185898**	6,5	14,2	**11186198**	6,9	15,3
11185484	7,6	16,8	**11185679**	7,1	15,7	**11185899**	6,7	14,8	**11186199**	6,9	15,2
11185485	7,9	17,5	**11185703**	7,2	15,9	**11185900**	6,1	13,4	**11186611**	8,4	18,4
11185486	8,3	18,3	**11185704**	7,0	15,5	**11185902**	6,2	13,6	**11186642**	8,7	19,1
11185487	9,1	20,1	**11185705**	7,2	15,9	**11185903**	6,4	14,0	**11186643**	8,7	19,1
11185488	6,9	15,2	**11185706**	7,5	16,5	**11185904**	7,5	16,6	**11186644**	9,9	21,7
11185489	7,2	15,8	**11185707**	7,8	17,2	**11185905**	5,7	12,5	**11186645**	7,9	17,5
11185490	7,2	15,9	**11185708**	8,2	18,2	**11185906**	5,7	12,6	**11186646**	7,1	15,6

Code No.	kg	lb	Code No.	kg	lb	Code No.	kg	lb	Code No.	kg	lb
11185491	8,7	19,2	**11185710**	6,4	14,1	**11185907**	5,9	13,1	**11186647**	7,3	16,1
11185492	7,4	16,3	**11185711**	6,4	14,1	**11185908**	6,0	13,3	**11186648**	8,7	19,2
11185493	7,6	16,8	**11185713**	6,6	14,5	**11185909**	6,9	15,3	**11186649**	7,4	16,3
11185494	7,9	17,5	**11185714**	6,7	14,8	**11185910**	6,3	14,0	**11186650**	8,3	18,2
11185495	8,3	18,2	**11185715**	6,4	14,2	**11185911**	6,5	14,4	**11186651**	6,9	15,2
11185496	9,1	20,1	**11185716**	6,6	14,6	**11185912**	7,3	16,1	**11186652**	8,7	19,1
11185497	6,9	15,2	**11185717**	6,9	15,2	**11185913**	7,3	16,1	**11186653**	8,7	19,1
11185498	7,2	15,8	**11185718**	7,2	15,9	**11185914**	7,9	17,4	**11186655**	7,3	16,1
11185499	7,2	15,9	**11185719**	7,6	16,8	**11186040**	6,0	13,3	**11186657**	7,3	16,1
11185500	7,9	17,5	**11185720**	5,7	12,6	**11186041**	5,3	11,7	**11186658**	7,5	16,6
11185501	8,7	19,3	**11185721**	5,8	12,8	**11186042**	6,6	14,6	**11186659**	7,5	16,6
11185502	7,4	16,3	**11185722**	5,8	12,8	**11186043**	5,7	12,5	**11186660**	7,5	16,6
11185503	7,6	16,8	**11185723**	5,8	12,8	**11186044**	5,8	12,9	**11186662**	7,5	16,6
11185504	7,9	17,5	**11185724**	6,0	13,2	**11186046**	6,0	13,3	**11186664**	7,5	16,6
11185505	8,3	18,3	**11185725**	6,3	13,8	**11186047**	6,3	13,9	**11186665**	7,8	17,3
11185506	9,1	20,1	**11185726**	6,1	13,5	**11186049**	6,6	14,6	**11186667**	8,2	18,1
11185507	6,9	15,3	**11185727**	5,8	12,8	**11186050**	6,6	14,6	**11186670**	6,8	15,1
11185508	7,2	15,9	**11185728**	6,4	14,2	**11186052**	7,0	15,5	**11186671**	7,1	15,7
11185509	7,2	15,9	**11185729**	6,9	15,1	**11186054**	5,2	11,5	**11186673**	7,1	15,7
11185510	6,8	15,1	**11185730**	5,7	12,6	**11186056**	5,2	11,6	**11186674**	7,1	15,7
11185511	7,1	15,7	**11185731**	5,8	12,8	**11186057**	5,4	12,0	**11186675**	7,1	15,7
11185512	7,1	15,7	**11185732**	6,3	13,8	**11186059**	5,5	12,2	**11186677**	7,5	16,6
11185513	8,7	19,1	**11185733**	6,4	14,2	**11186060**	5,2	11,5	**11186680**	7,1	15,7
11185514	8,7	19,1	**11185734**	6,6	14,6	**11186061**	5,4	11,9	**11186681**	7,1	15,7
11185515	7,5	16,6	**11185735**	7,2	15,9	**11186062**	5,5	12,2	**11186682**	7,5	16,6
11185516	8,7	19,1	**11185736**	6,9	15,2	**11186063**	5,5	12,2	**11186684**	6,8	15,1
11185517	7,3	16,1	**11185737**	5,8	12,8	**11186064**	6,1	13,5	**11186685**	7,8	17,3
11185518	7,3	16,1	**11185738**	6,0	13,2	**11186065**	6,3	13,9	**11186686**	7,5	16,6
11185519	7,3	16,1	**11185739**	6,1	13,5	**11186066**	6,5	14,4	**11186687**	7,0	15,5
11185520	7,5	16,6	**11185740**	5,7	12,5	**11186067**	6,9	15,2	**11186688**	7,5	16,5
11185521	7,1	15,7	**11185742**	5,8	12,7	**11186068**	7,3	16,1	**11186691**	5,7	12,5
11185522	7,5	16,6	**11185743**	6,2	13,6	**11186069**	5,5	12,1	**11186692**	5,8	12,9
11185523	7,5	16,6	**11185745**	6,2	13,6	**11186071**	5,5	12,1	**11186693**	5,4	12,0
11185524	7,5	16,6	**11185746**	6,2	13,6	**11186072**	5,7	12,5	**11186694**	6,1	13,5
11185525	7,8	17,3	**11185748**	6,3	14,0	**11186073**	5,8	12,8	**11186695**	5,7	12,6
11185526	6,8	15,0	**11185749**	6,4	14,0	**11186074**	5,6	12,3	**11186696**	5,8	12,8

Code No.	kg	lb	Code No.	kg	lb	Code No.	kg	lb	Code No.	kg	lb
11185527	7,9	17,3	**11185750**	6,3	14,0	**11186075**	5,9	13,1	**11186697**	6,4	14,2
11185528	8,2	18,1	**11185751**	6,5	14,4	**11186076**	6,1	13,5	**11186698**	6,6	14,6
11185530	8,2	18,1	**11185752**	6,6	14,4	**11186077**	6,3	13,9	**11186699**	5,8	12,7
11185531	9,0	19,9	**11185753**	6,6	14,4	**11186079**	6,6	14,5	**11186702**	6,2	13,6
11185533	9,0	19,9	**11185755**	6,5	14,4	**11186081**	6,9	15,2	**11186705**	6,3	14,0
11185534	9,0	19,9	**11185756**	6,6	14,4	**11186083**	7,3	16,1	**11186706**	6,3	14,0
11185535	9,2	20,4	**11185757**	6,5	14,4	**11186085**	5,5	12,2	**11186707**	6,3	14,0
11185536	6,8	15,1	**11185758**	6,8	15,0	**11186086**	5,5	12,2	**11186708**	6,5	14,4
11185537	6,8	15,1	**11185760**	6,8	15,0	**11186088**	5,7	12,6	**11186710**	6,8	15,0
11185538	6,8	15,1	**11185761**	7,1	15,7	**11186090**	5,8	12,8	**11186711**	6,8	15,0
11185539	7,1	15,7	**11185764**	7,1	15,7	**11186091**	5,5	12,1	**11186712**	7,1	15,7
11185541	7,1	15,7	**11185765**	6,8	15,0	**11186092**	5,7	12,6	**11186713**	7,1	15,7
11185542	7,1	15,7	**11185767**	7,6	16,7	**11186093**	5,8	12,8	**11186714**	7,6	16,7
11185544	7,1	15,7	**11185769**	5,7	12,5	**11186094**	5,4	12,0	**11186715**	5,7	12,5
11185545	8,7	19,1	**11185770**	6,0	13,3	**11186095**	6,2	13,6	**11186717**	5,7	12,6
11185547	8,7	19,1	**11185771**	5,7	12,6	**11186096**	6,6	14,6	**11186718**	5,7	12,6
11185548	7,3	16,1	**11185773**	5,7	12,6	**11186097**	6,9	15,3	**11186719**	5,7	12,6
11185549	7,5	16,6	**11185775**	5,7	12,6	**11186098**	7,4	16,2	**11186720**	5,7	12,6
11185551	7,9	17,3	**11185776**	5,7	12,6	**11186099**	5,6	12,3	**11186721**	5,9	13,0
11185553	7,9	17,3	**11185779**	5,7	12,6	**11186100**	5,6	12,3	**11186722**	5,9	13,0
11185554	8,2	18,1	**11185780**	5,7	12,6	**11186101**	5,7	12,7	**11186723**	5,9	13,0
11185556	9,0	19,9	**11185781**	5,7	12,6	**11186103**	6,0	13,2	**11186725**	6,0	13,3
11185558	6,8	15,1	**11185784**	5,9	13,0	**11186104**	6,4	14,0	**11186726**	6,4	14,0
11185560	7,1	15,7	**11185786**	6,0	13,3	**11186105**	5,7	12,7	**11186727**	6,6	14,5
11185562	7,1	15,7	**11185787**	6,0	13,3	**11186106**	5,9	12,9	**11186728**	7,1	15,7
11185564	8,7	19,1	**11185788**	6,0	13,3	**11186107**	5,6	12,3	**11186729**	5,7	12,6
11185566	8,7	19,1	**11185789**	6,0	13,3	**11186108**	5,8	12,7	**11186730**	6,0	13,3
11185567	7,3	16,1	**11185790**	6,0	13,3	**11186109**	5,9	12,9	**11186731**	6,2	13,6
11185569	7,3	16,1	**11185792**	6,2	13,6	**11186110**	6,1	13,6	**11186732**	6,3	14,0
11185570	7,5	16,6	**11185794**	6,4	14,0	**11186111**	6,3	14,0	**11186734**	6,8	15,0
11185572	7,5	16,6	**11185796**	6,6	14,4	**11186112**	6,6	14,5	**11186735**	7,1	15,7
11185573	7,8	17,3	**11185798**	6,8	15,0	**11186113**	6,9	15,3	**11186736**	7,1	15,7
11185575	7,8	17,3	**11185800**	7,1	15,7	**11186115**	5,5	12,2	**11186737**	7,6	16,7
11185576	8,2	18,1	**11185802**	7,6	16,7	**11186116**	5,5	12,2	**11186738**	5,7	12,6
11185578	8,2	18,1	**11185805**	5,7	12,6	**11186117**	5,7	12,6	**11186739**	5,9	13,0
11185579	8,2	18,1	**11185806**	5,7	12,6	**11186118**	5,8	12,8	**11186740**	6,0	13,3

Code No.	kg	lb	Code No.	kg	lb	Code No.	kg	lb	Code No.	kg	lb
11185580	9,0	19,9	**11185808**	5,9	13,0	**11186119**	5,5	12,1	**11186742**	5,7	12,6
11185581	9,0	19,9	**11185810**	6,0	13,3	**11186120**	6,4	14,0	**11186743**	5,7	12,6
11185582	6,8	15,1	**11185811**	6,9	15,3	**11186121**	7,1	15,7	**11186744**	5,9	12,9
11185583	6,8	15,1	**11185814**	6,2	13,6	**11186122**	5,3	11,7	**11186745**	6,1	13,4
11185584	6,8	15,1	**11185815**	6,2	13,6	**11186123**	5,5	12,1	**11186746**	6,3	13,8
11185585	7,1	15,7	**11185817**	6,3	14,0	**11186124**	5,5	12,0	**11186747**	6,5	14,2
11185587	7,1	15,7	**11185819**	6,5	14,4	**11186125**	5,7	12,6	**11186748**	6,5	14,4
11185588	7,1	15,7	**11185820**	6,5	14,4	**11186126**	5,9	12,9	**11186749**	6,5	14,4
11185590	7,1	15,7	**11185821**	6,5	14,4	**11186127**	6,1	13,4	**11186750**	6,1	13,5
11185592	8,6	19,1	**11185824**	6,8	15,0	**11186128**	6,3	13,9	**11186751**	6,3	13,8
11185593	8,6	19,1	**11185825**	7,9	17,4	**11186129**	6,6	14,6	**11186816**	5,2	11,5
11185594	7,3	16,1	**11185827**	7,1	15,7	**11186130**	7,1	15,6	**11186817**	6,2	13,8
11185595	7,5	16,6	**11185828**	7,6	16,7	**11186131**	5,3	11,6	**11186818**	7,3	16,2
11185596	7,8	17,3	**11185829**	5,7	12,5	**11186132**	5,3	11,6	**11186819**	7,1	15,7
11185598	8,2	18,1	**11185831**	5,7	12,6	**11186133**	5,4	12,0	**11186820**	6,8	15,0
11185599	9,0	19,9	**11185832**	5,7	12,6	**11186134**	5,6	12,2	**11186842**	7,5	16,6
11185600	6,8	15,0	**11185833**	5,7	12,6	**11186135**	5,3	11,6	**11186843**	6,5	14,2
11185601	7,1	15,6	**11185835**	5,9	13,0	**11186136**	5,4	12,0	**11186844**	6,7	14,8
11185602	7,1	15,7	**11185837**	6,0	13,3	**11186137**	5,3	11,6	**11187718**	6,3	13,8
11185603	8,7	19,2	**11185844**	6,5	14,4	**11186138**	5,5	12,0	**11187798**	7,3	16,2
11185604	7,4	16,3	**11185846**	7,1	15,7	**11186142**	6,1	13,5	**11189074**	6,0	13,3
11185605	7,6	16,7	**11185847**	5,7	12,5	**11186143**	7,6	16,8	**11189749**	5,2	11,5
11185606	7,9	17,4	**11185848**	5,7	12,6	**11186144**	8,0	17,6	**11189752**	5,3	11,6
11185607	8,3	18,2	**11185849**	5,7	12,6	**11186145**	9,0	19,9	**11191475**	6,8	15,1
11185608	9,1	20,1	**11185850**	5,7	12,6	**11186146**	6,6	14,6	**11191997**	6,9	15,2
11185609	6,9	15,2	**11185851**	6,0	13,3	**11186147**	6,9	15,2	**11192079**	5,2	11,5
11185610	7,2	15,8	**11185852**	5,7	12,6	**11186148**	6,9	15,2	**11192444**	6,0	13,3
11185611	7,2	15,8	**11185856**	6,8	14,9	**11186149**	6,9	15,2	**11192482**	5,8	12,7
11185612	7,3	16,1	**11185857**	6,3	13,9	**11186150**	8,7	19,2	**11192738**	5,7	12,6
11185613	7,5	16,6	**11185858**	5,9	13,0	**11186151**	7,4	16,2	**11192763**	5,3	11,7
11185614	8,2	18,1	**11185859**	5,9	13,0	**11186152**	7,9	17,4	**11192764**	5,3	11,7
11185615	7,3	16,1	**11185860**	5,7	12,6	**11186153**	9,3	20,5	**11192766**	5,2	11,6
11185616	7,5	16,6	**11185861**	6,0	13,2	**11186154**	7,2	15,8	**11192811**	5,9	13,1
11185617	7,5	16,6	**11185862**	6,1	13,5	**11186155**	7,2	15,8	**11192942**	6,9	15,2
11185618	7,8	17,3	**11185863**	6,8	15,1	**11186156**	8,7	19,2	**11192943**	7,6	16,7
11185620	8,2	18,1	**11185864**	6,1	13,5	**11186157**	7,4	16,3	**11192967**	5,8	12,8

Code No.	kg	lb	Code No.	kg	lb	Code No.	kg	lb	Code No.	kg	lb
11185621	6,8	15,1	**11185865**	6,4	14,2	**11186158**	7,6	16,8	**11192987**	6,0	13,2
11185622	7,1	15,7	**11185866**	6,3	13,8	**11186159**	7,9	17,5	**11193171**	6,5	14,4
11185624	7,1	15,7	**11185867**	6,5	14,3	**11186160**	8,3	18,2	**11193431**	8,5	18,7
11185626	7,1	15,7	**11185868**	6,3	13,8	**11186161**	9,3	20,5	**11193624**	7,8	17,3
11185627	7,3	16,1	**11185869**	6,5	14,2	**11186162**	6,9	15,2	**11193633**	8,2	18,1
11185628	7,8	17,3	**11185870**	6,7	14,8	**11186163**	7,2	15,8	**11193635**	6,3	13,9
11185629	7,1	15,7	**11185871**	7,0	15,5	**11186164**	7,2	15,9	**11193640**	5,9	13,1
11185630	7,1	15,7	**11185872**	7,5	16,4	**11186171**	6,9	15,2	**11194011**	7,1	15,7
11185631	7,5	16,6	**11185873**	5,6	12,4	**11186172**	7,2	15,8	**11194028**	6,4	14,0