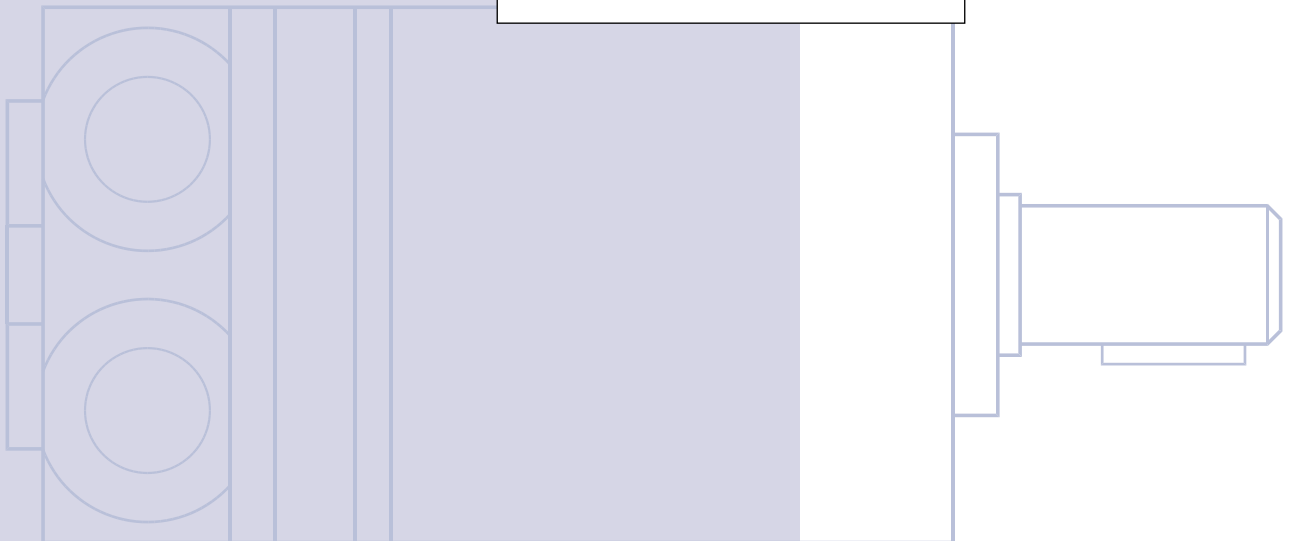


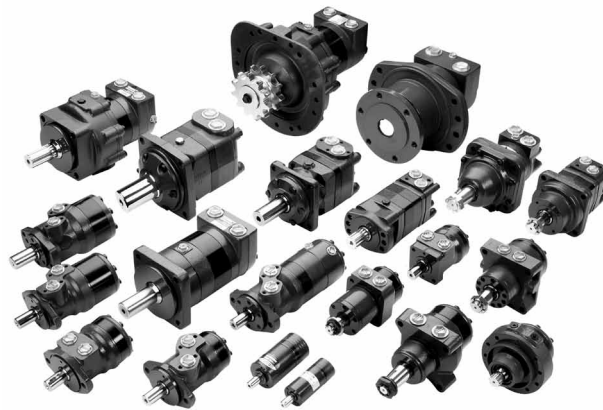
OML  
Orbital Motors

Technical  
Information



**Revision View**

Date	Page	Changed	Revision
Apr 2008	Many	Pictures, drawings and text	AB
Jul 2008	Various	Text	AC
Mar 2010	36	Japan location	AE
Sep 2010	36	New back page	AF
May 2011	20	Typos	AG
Oct 2011	30-31	Dimensions added to drawing	AH
Nov 2012	3	Planetary Gears deleted	AI



F301 245

**A Wide Range of Orbital Motors**

Sauer-Danfoss is a world leader within production of low speed orbital motors with high torque. We can offer more than 3000 different orbital motors, categorised in types, variants and sizes (incl. different shaft versions).

The motors vary in size (rated displacement) from 8 cm<sup>3</sup> (0.50 in<sup>3</sup>) to 800 cm<sup>3</sup> (48.9 in<sup>3</sup>) per revolution.

Speeds range up to approx. 2500 min<sup>-1</sup> (rpm) for the smallest type and up to approx 600 min<sup>-1</sup> (rpm) for the largest type.

Maximum operating torques vary from 13 Nm (115 lbf-in] to 2700 Nm (24.000 lbf-in] (peak) and maximum outputs are from 2.0 kW (2.7 hp] to 70 kW (95 hp].

Characteristic 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
- Long life under extreme operating conditions
- Robust and compact design
- High radial and axial bearing capacity

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Frontpage: F300 029, F300 044, F300 028, F300 045, Drawing P301 017

- For applications in both open and closed loop hydraulic systems
- Suitable for a wide variety of hydraulics fluids

The programme is characterised by technical features appealing to a large number of applications and a part of the programme is characterised by motors that can be adapted to a given application. Adaptions comprise the following variants among others:

- Motors with corrosion resistant parts
- Wheel motors with recessed mounting flange
- OMP, OMR- motors with needle bearing
- OMR motor in low leakage version
- OMR motors in a super low leakage version
- Short motors without bearings
- Ultra short motors
- Motors with integrated positive holding brake
- Motors with integrated negative holding brake
- Motors with integrated flushing valve
- Motors with speed sensor
- Motors with tacho connection
- All motors are available with black finish paint

The Sauer–Danfoss LSHT motors are used in the following application areas:

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

### **Survey of Literature with Technical Data on Sauer-Danfoss Orbital Motors**

Detailed data on all Sauer-Danfoss orbital motors can be found in our motor catalogue, which is divided into more individual subcatalogues:

- General information on Sauer-Danfoss orbital motors: function, use, selection of orbital motor, hydraulic systems, etc.
- Technical data on small motors: OML and OMM
- Technical data on medium sized motors: OMP, OMR, OMH and OMEW
- Technical data on medium sized motors: DH and DS
- Technical data on large motors: OMS, OMT and OMV
- Technical data on large motors: TMT

A general survey brochure on Sauer-Danfoss orbital motors gives a quick motor reference based on power, torque, speed and capabilities.

**Contents**

OML and OMM ..... 4  
 Speed, Torque and Output ..... 4

OML ..... 6  
 Versions ..... 6  
 Code Numbers ..... 7  
 Technical Data for OML with 16 mm and 5/8 in Cylindrical Shaft ..... 8  
 Technical Data ..... 8  
 Max. Permissible Shaft Seal Pressure ..... 9  
 Pressure Drop in Motor ..... 9  
 Direction of Shaft Rotation ..... 10  
 Permissible Shaft Loads for OML ..... 10  
 Function Diagrams ..... 11  
 Shaft Version ..... 13  
 Port Thread Versions ..... 14  
 Dimensions ..... 15

OMM ..... 18  
 Versions ..... 18  
 Code Numbers ..... 19  
 Technical Data for OMM with 16 mm and 5/8 in Cylindrical Shaft ..... 20  
 Technical Data ..... 20  
 Max. Permissible Shaft Seal Pressure ..... 21  
 Pressure Drop in Motor ..... 21  
 Direction of Shaft Rotation ..... 22  
 Permissible Shaft Loads for OMM ..... 22  
 Function Diagrams ..... 23  
 Shaft Version ..... 26  
 Port Thread Versions ..... 27  
 Dimensions ..... 28  
 Accessories ..... 32

Hydraulic Systems ..... 35  
 Installation of the Sauer-Danfoss Orbital Motors ..... 35  
 Starting Up and Running in the Hydraulic System ..... 35  
 Operation ..... 35  
 Maintenance ..... 35  
 Hydraulic Systems ..... 35

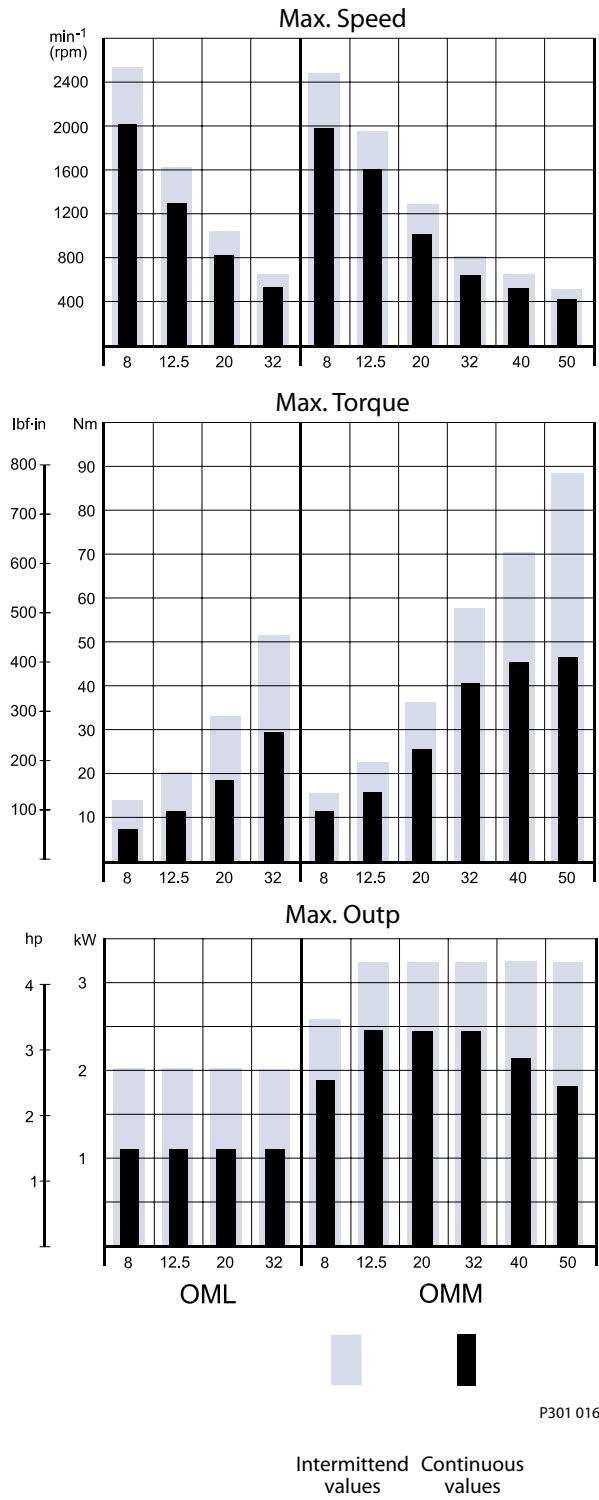
**Speed, Torque and Output**

The bar diagrams, see page 5, 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.

- OML can be found on pages 11 - 12
- OMM can be found on pages 23 - 25

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<sup>2</sup>/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" DKMH.PK.100.G2.02 520L0232.

**Speed, Torque and Output**



P301 016

**Versions**

Mounting	Shaft	Port size	European version	US version	Side port version	End port version	Standard shaft seal	Drain connection	Check valve	Specials	Main type designation
Front, 4 × M5	Cyl. 16 mm	G 1/4	X			X	X	No	Yes		OML
Front, 4 × 10-32 UNF	Cyl. 5/8 in	7/16 - 20 UNF		X		X	X	No	Yes		OML

Function diagram - see page : →

*Features available (options) :*  
 Painted

### Code Numbers

Code Numbers	DISPLACEMENT (cm <sup>3</sup> )				Technical data – Page	Dimensions – Page
	8	12.5	20	32		
<b>151G</b>	2001	2002	2003	2004	8	15
<b>151G</b>	2021	2022	2023	2024	8	16
→	11	11	12	12		

### Ordering

Add the four digit prefix “151G” to the four digit numbers from the chart for complete code number.

Example:

151G2001 for an OML 8 with front mounting (4 × M5), cyl. 16 mm shaft and port size G 1/4.

---

Note: Orders will not be accepted without the four digit prefix.

---

**Technical Data for OML with 16 mm and 5/8 in Cylindrical Shaft**

Type		OML	OML	OML	OML
Motor Size		8	12.5	20	32
Geometric displacement	cm <sup>3</sup> [in <sup>3</sup> ]	8.0 [0.49]	12.5 [0.77]	20.0 [1.22]	32.0 [1.96]
Max. speed	min <sup>-1</sup>	2000	1280	800	500
	[rpm]	2500	1600	1000	625
Max. torque	Nm [lbf·in]	cont.	7 [60]	11 [100]	18 [160]
		int. <sup>1)</sup>	13 [120]	20 [180]	32 [280]
Max. output	kW [hp]	cont.	1.1 [1.5]	1.1 [1.5]	1.1 [1.5]
		int. <sup>1)</sup>	2.0 [2.7]	2.0 [2.7]	2.0 [2.7]
Max. pressure drop	bar [psi]	cont.	70 [1020]	70 [1020]	70 [1020]
		int. <sup>1)</sup>	125 [1810]	125 [1810]	125 (85) <sup>3</sup> [1810] [800] <sup>3</sup>
		peak <sup>2)</sup>	140 [2030]	140 [2030]	125 (85) <sup>3</sup> [2030] [1230] <sup>3</sup>
Max. oil flow	l/min [USgal/min]	cont.	16 [4.2]	16 [4.2]	16 [4.2]
		int. <sup>1)</sup>	20 [5.3]	20 [5.3]	20 [5.3]
Max. starting pressure with unloaded shaft	bar [psi]	4 [60]	4 [60]	4 [60]	6 [90]
Min. starting torque	at max. press. drop cont.	5 [45]	9 [80]	15 [135]	24 [210]
	at max. press. drop int. <sup>1)</sup>	10 [90]	16 [140]	27 [240]	42 [370]
Min. speed <sup>4)</sup>	min <sup>-1</sup> [rpm]	50	50	50	50

Type		Max. Inlet Pressure
OML 8 - 32	bar [psi]	cont. 125 [1810]
	bar [psi]	int. <sup>1)</sup> 140 [2030]
	bar [psi]	peak <sup>2)</sup> 140 [2030]

<sup>1)</sup> Intermittent operation: the permissible values may occur for max. 10% of every minute.

<sup>2)</sup> Peak load: the permissible values may occur for max. 1% of every minute.

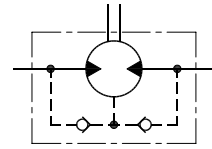
<sup>3)</sup> Max. pressure drop in applications with a large moment of inertia and frequent stops or reversings.

<sup>4)</sup> Operation at lower speed may be slightly less smooth.



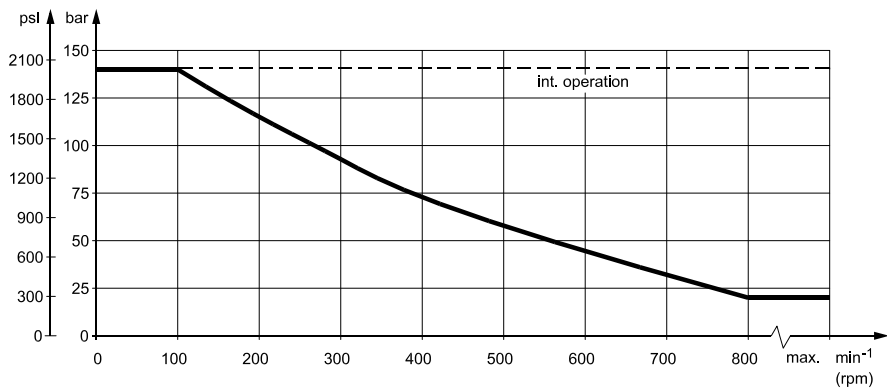
**Max. Permissible Shaft Seal Pressure**

**OML has incorporated check valves** which ensure that the pressure on the shaft seal never exceeds the pressure in the returnline



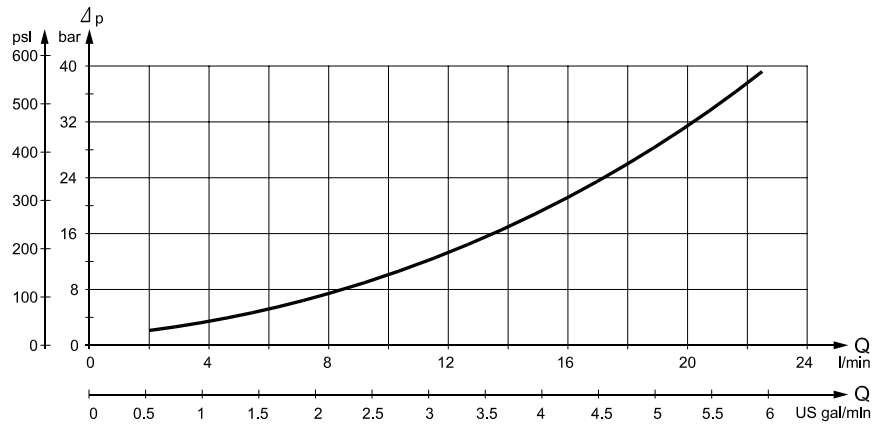
151-1316.10

**Max. return pressure (max. pressure on shaft seal)**



151-1671.10

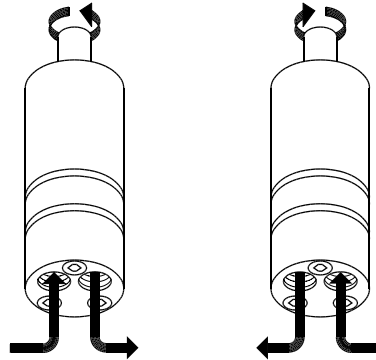
**Pressure Drop in Motor**



151-1415.10

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

**Direction of Shaft Rotation**



151-1309.10

**Permissible Shaft Loads for OML**

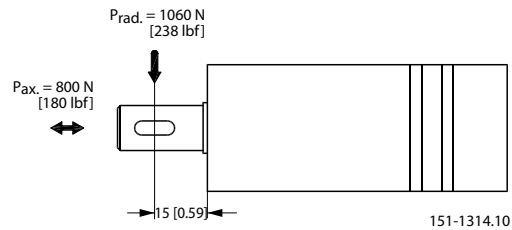
The permissible radial shaft load ( $P_{rad.}$ ) is calculated from the distance ( $l$ ) between the point of load and the mounting surface:

$$P_{rad.} = \frac{84500}{64.5 + l} \text{ N (l in mm; } l \leq 80)$$

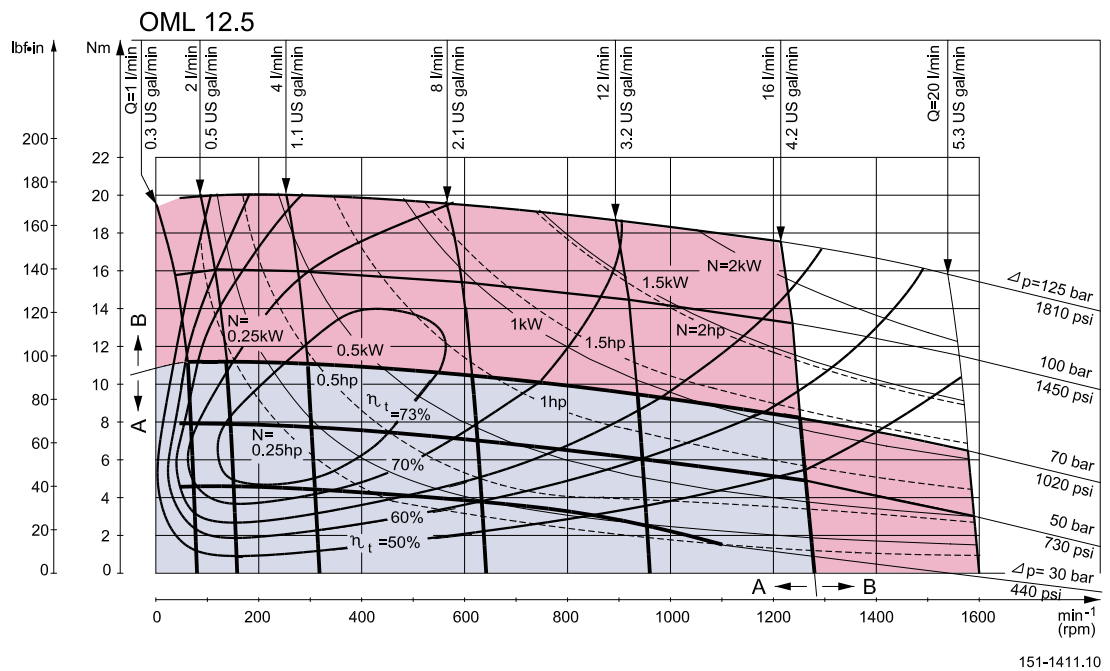
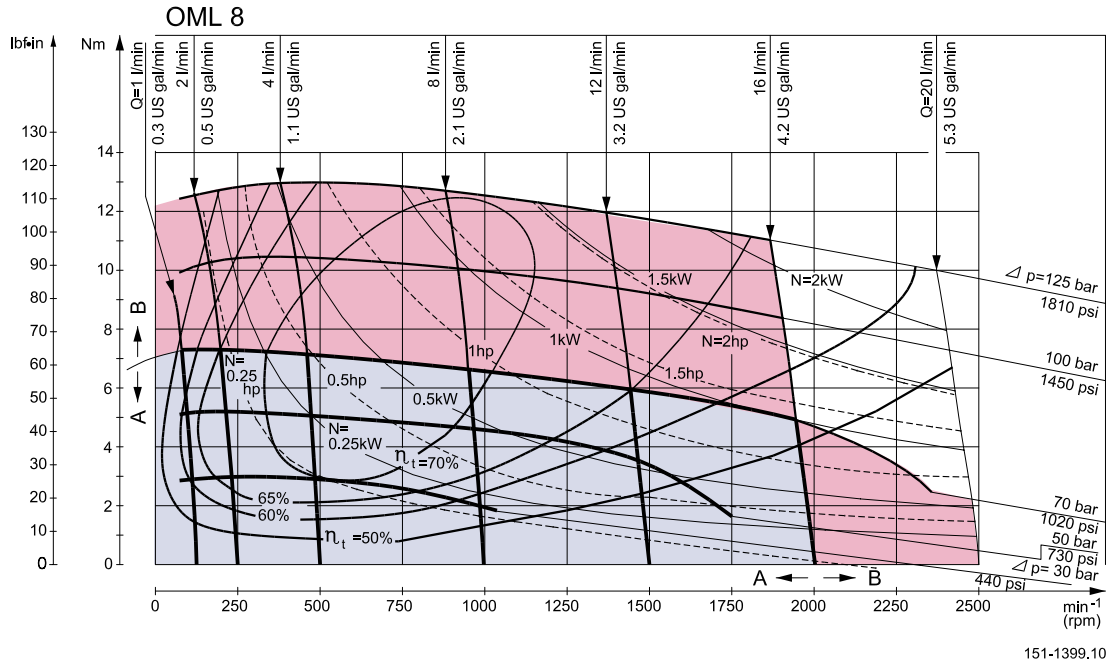
$$P_{rad.} = \frac{748}{254 + l} \text{ lbf (l in inch; } l \leq 3.15)$$

The drawing shows the permissible radial load when  $l = 15 \text{ mm [0.59 in]}$ .

The calculated shaft load should never exceed the permissible value.



Function Diagrams



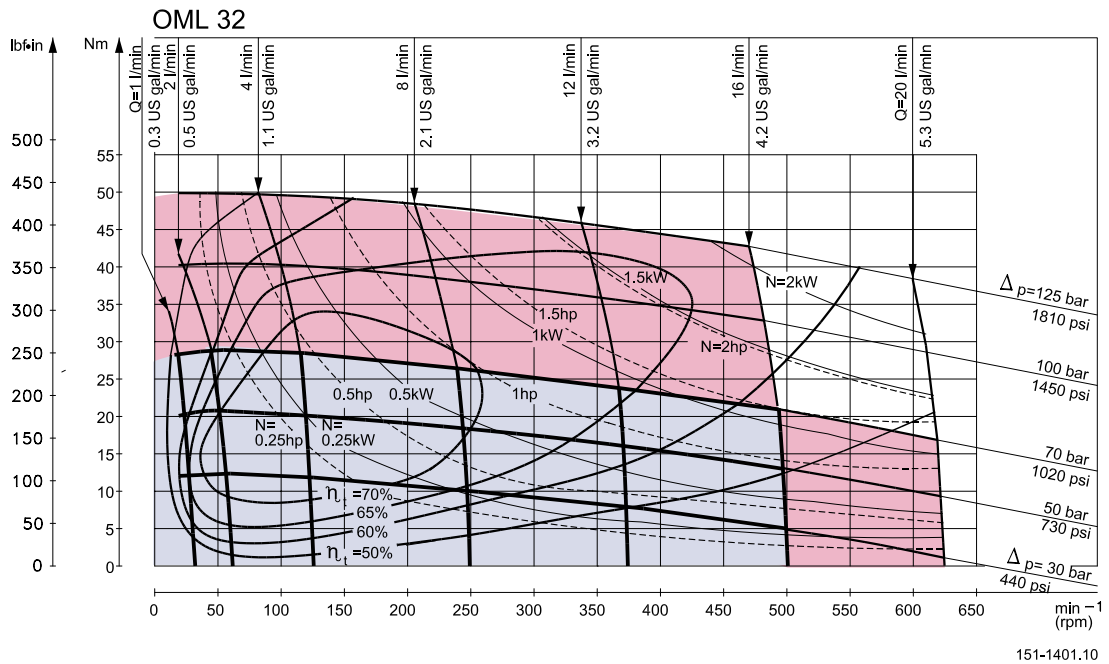
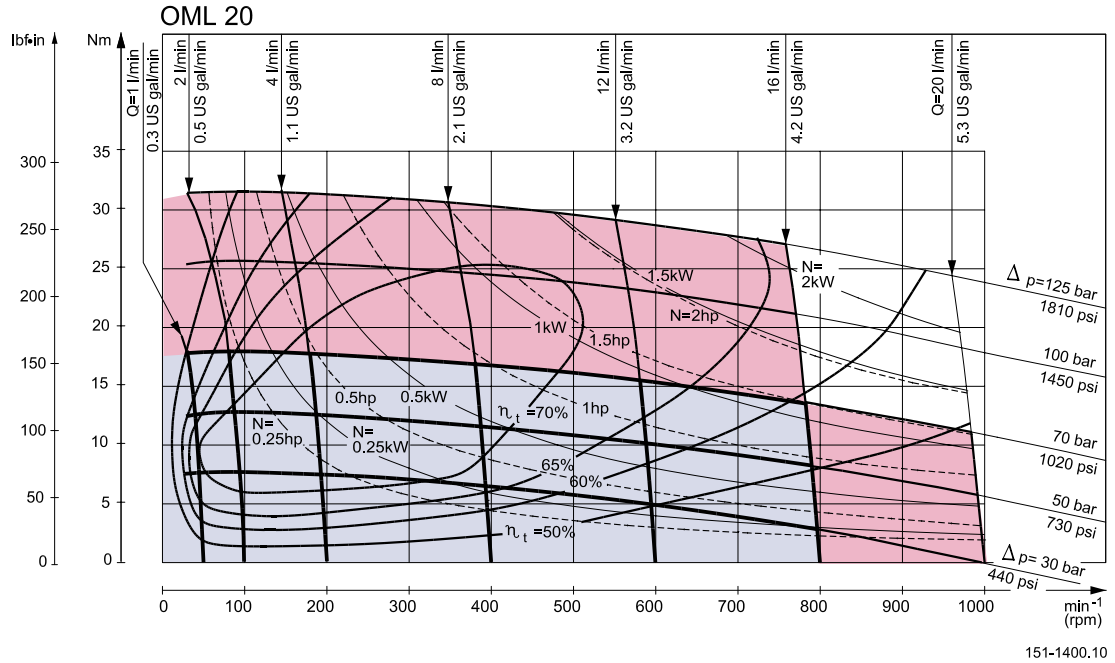
Explanation of function diagram use, basis and conditions can be found on page 4.

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

Max. permissible continuous/intermittent pressure drop for the actual shaft version can be found on page 8.

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

Function Diagrams



Explanation of function diagram use, basis and conditions can be found on page 4.

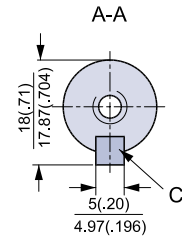
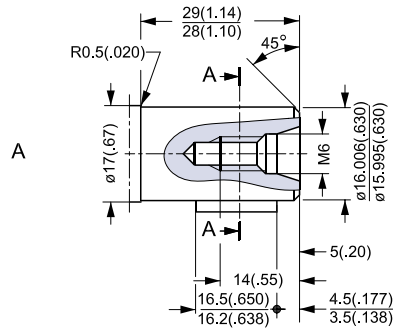
- A: Continuous range
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Max. permissible continuous/intermittent pressure drop for the actual shaft version can be found on page 8.

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

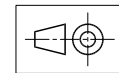
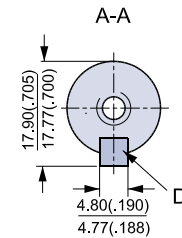
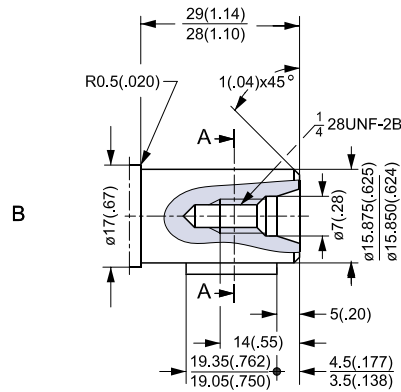
**Shaft Version**

- A: Cylindrical shaft  
 16 mm
- C: Parallel key  
 A5 × 5 × 16  
 DIN 6885



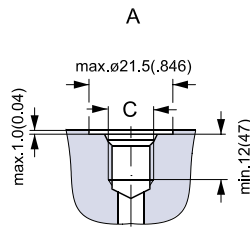
**US version**

- B: Cylindrical shaft  
 $\frac{5}{8}$ "
- D: Parallel key  
 $\frac{3}{16} \times \frac{3}{16} \times \frac{3}{4}$  in  
 B.S. 46

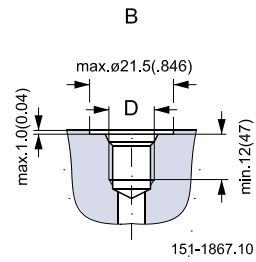


151-1865.10

**Port Thread Versions**



A: G main ports  
C: ISO 228/1 - G<sup>1</sup>/<sub>4</sub>



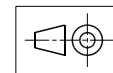
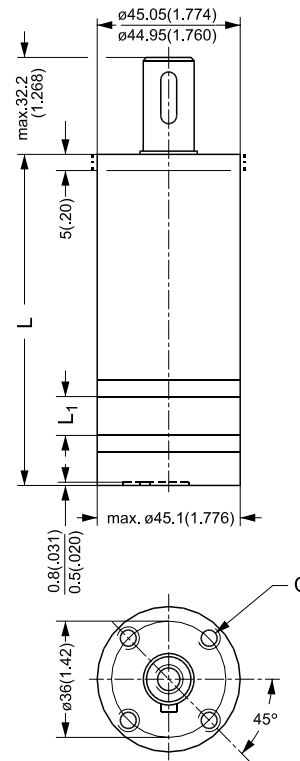
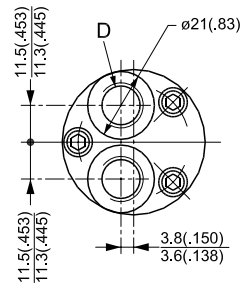
B: UNF main ports  
D: <sup>7</sup>/<sub>16</sub> - 20 UNF  
O-ring boss port

**Dimensions**

OML  
End port version.

Type	Length		Weight kg [lb]
	L <sub>max.</sub>	L <sub>1</sub> mm [in]	
OML 8	102.5 [4.04]	4.1 [0.16]	1.0 [2.2]
OML 12.5	104.8 [4.13]	6.4 [0.25]	1.0 [2.2]
OML 20	108.6 [4.28]	10.2 [0.40]	1.1 [2.4]
OML 32	114.7 [4.53]	16.3 [0.64]	1.2 [2.6]

C: M5; 15 mm [0.59 in] deep  
D: G ¼; 12 mm [0.47 in] deep



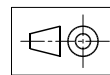
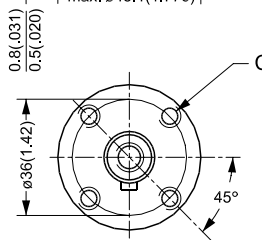
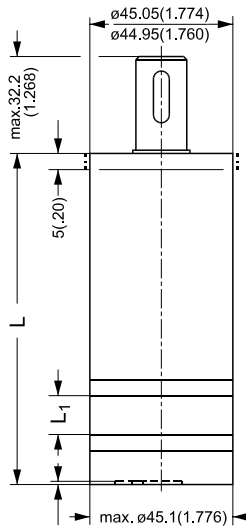
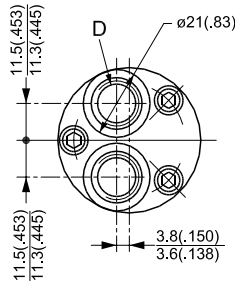
151-1315.10

**Dimensions**

OML  
 End port version.

Type	Length		Weight kg [lb]
	L <sub>max.</sub>	L <sub>1</sub> mm [in]	
OML 8	102.5 [4.04]	4.1 [0.16]	1.0 [2.2]
OML 12.5	104.8 [4.13]	6.4 [0.25]	1.0 [2.2]
OML 20	108.6 [4.28]	10.2 [0.40]	1.1 [2.4]
OML 32	114.7 [4.53]	16.3 [0.64]	1.2 [2.6]

C: 10 - 32 UNF;  
 15 mm [0.59 in] deep  
 D: 7/16 - UNF;  
 12 mm [0.47 in] deep  
 O-ring boss port



151-1315.10.22



Factory 19 / 5 Lyn Parade PRESTONS NSW 2170  
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