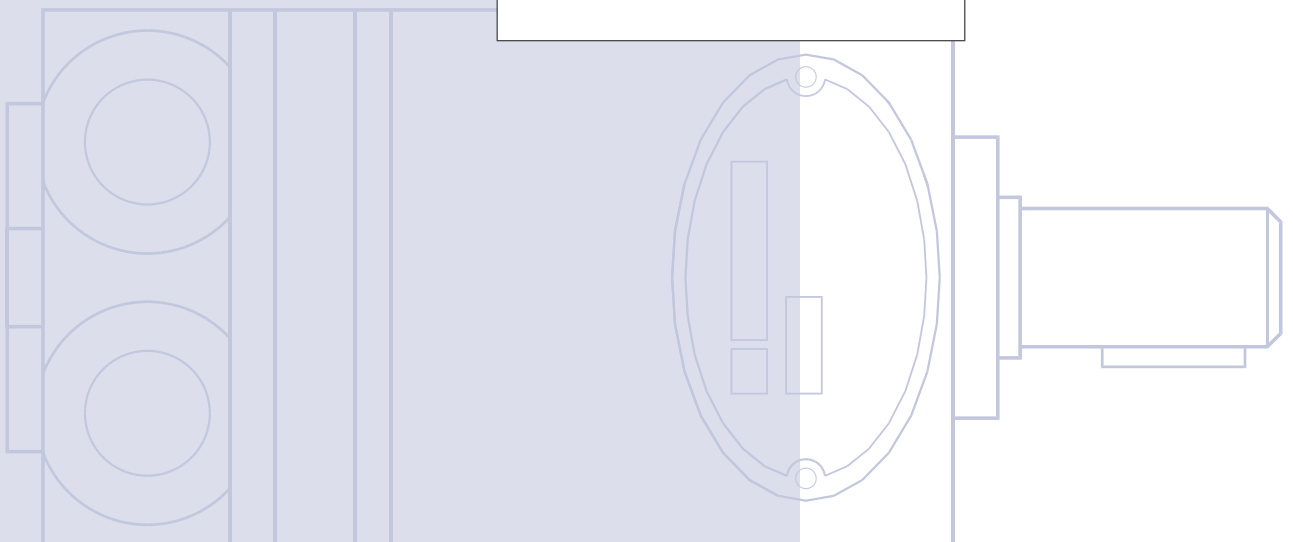
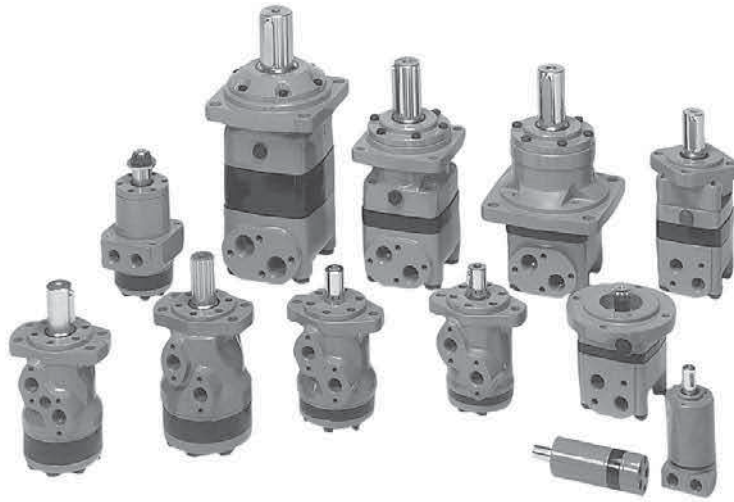




OML and OMM Orbital motors

Technical Information





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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 1600 different orbital motors, categorised in types, variants and sizes (incl. different shaft versions).

The motors vary in size (rated displacement) from 8 cm³ (0.50 in³) to 800 cm³ (48.9 in³) per revolution.

Speeds range up to approx. 2500 min⁻¹ (rpm) for the smallest type and up to approx 600 min⁻¹ (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
- For applications in both open and closed loop hydraulic systems
- Suitable for a wide variety of hydraulics fluids

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Frontpage: F300029.TIF, F300044.TIF, F300028.TIF, F300045.TIF, Drawing 151-1864

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

Planetary gears

Sauer - Danfoss complements the motor range with a complete programme of planetary gears adapted to suit. The combination of motors and gears makes it possible to obtain smooth running at fractional speeds and with torques up to 650.000 Nm (5.800.000 lbf-in].

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 5 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.

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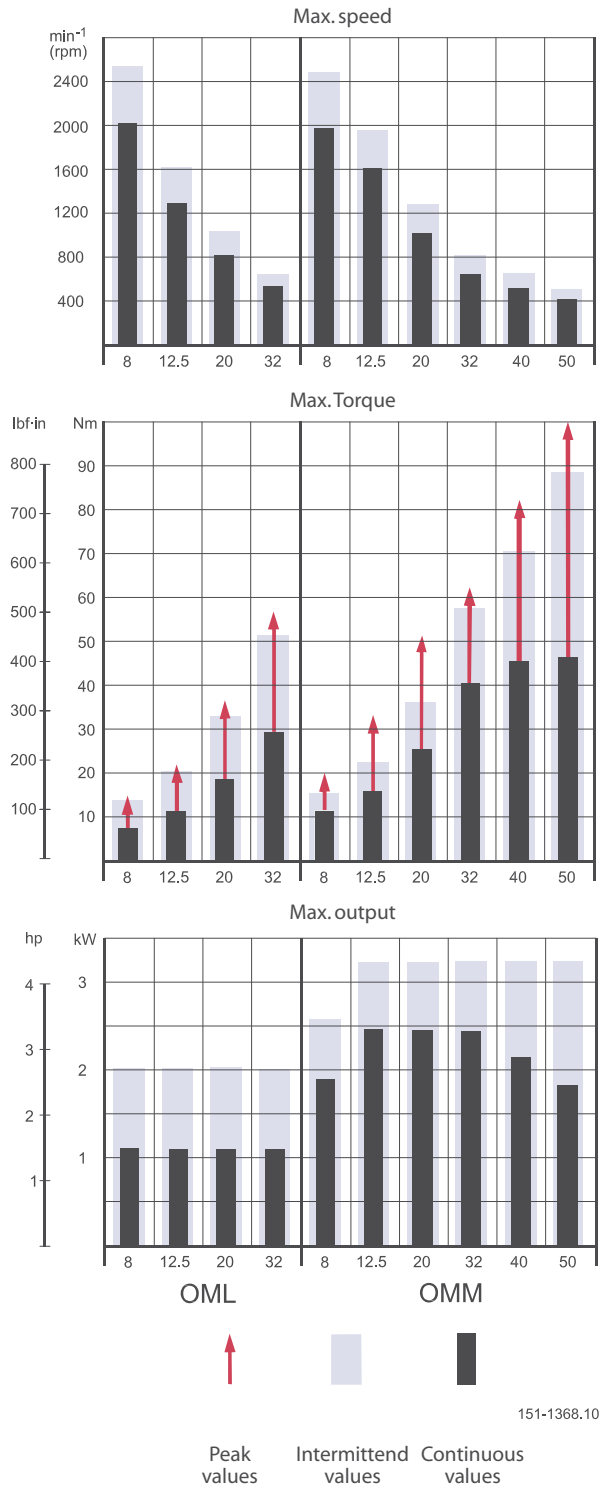
SPEED, TORQUE AND OUTPUT

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 mm²/s [165 SUS] and a temperature of 50°C [120°F]. For further explanation concerning how to read and use the function diagrams, please consult the paragraph "Selection of motor size" in the technical information "General" DKMH.PK.100.G2.02 520L0232.

SPEED, TORQUE AND OUTPUT



VERSIONS

Mounting	Shaft	Port size	European version	US version	Side port version	End port version	Flange port version	Standard shaft seal	High pressure shaft seal	Drain connection	Check valve	Specials	Main type designation
Front; 3 × M6	Cyl. 16 mm	G 3/8	X			X		X		Yes	Yes		OMM
		G 3/8	X		X			X		Yes	Yes		OMM
Front; 3 × 1/4 - 28 UNF	Cyl. 5/8 in	9/16-18 UNF		X		X		X		Yes	Yes		OMM
		9/16-18 UNF		X	X			X		Yes	Yes		OMM
Front; 3 × M6	Splined B17×14	G 3/8	X			X		X		Yes	Yes		OMM
		G 3/8	X		X			X		Yes	Yes		OMM

Function diagram - see page : →

Features available (options) :

- Speed sensor
- Reverse rotation
- Drain
- Corrosion protected
- Painted

CODE NUMBERS

CODE NUMBERS	DISPLACEMENT [cm ³]							Technical data – Page	Dimensions – Page
	8	12.5	20	32	40	50	Mounting flange ¹⁾		
151G	0040	0001	0002	0003	0277	0037	0211	20	28 (29) ²⁾
151G	0041	0004	0005	0006	0279	0013	0211	20	31 (32) ²⁾
151G	0048	0031	0032	0033	-	-	-	20	30
151G	0049	0034	0035	0036	-	0094	-	20	33
151G	0046	0024	0025	0026	-	-	0211	20	28 (29) ²⁾
151G	0047	0027	0028	0029	-	-	0211	20	31 (32) ²⁾
→	23	23	24	24	25	25			

1) To be ordered separately. Mounting screws included.

2) Dimension with extra mounting flange.

Ordering

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

Example:

151G0035 for an OMM 20 with front mounting (3 × 1/4 - 28 UNF), cyl. 5/8 in shaft and port size 9/16 - 18 UNF.

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

TECHNICAL DATA FOR OMM WITH 16 MM AND 5/8 IN CYLINDRICAL SHAFT

Type		OMM	OMM	OMM	OMM	OMM	OMM
Motor size		8	12.5	20	32	40	50
Geometric displacement	cm ³ [in ³]	8.2 [0.50]	12.9 [0.79]	19.9 [1.22]	31.6 [1.93]	39.8 [2.43]	50.3 [3.08]
Max. speed	min ⁻¹ [rpm]	cont.	1950	1550	1000	630	500
		int. ¹⁾	2450	1940	1250	800	630
Max. torque	Nm [lbf-in]	cont.	11 [95]	16 [140]	25 [220]	40 [350]	45 [400]
		int. ¹⁾	15 [135]	23 [200]	35 [310]	57 [500]	70 [620]
		peak ²⁾	21 [185]	33 [290]	51 [450]	64 [570]	82 [725]
Max. output	kW [hp]	cont.	1.8 [2.4]	2.4 [3.2]	2.4 [3.2]	2.4 [3.2]	2.2 [3.0]
		int. ¹⁾	2.6 [3.5]	3.2 [4.3]	3.2 [4.3]	3.2 [4.3]	3.2 [4.3]
Max. pressure drop	bar [psi]	cont.	100 [1450]	100 [1450]	100 [1450]	100 [1450]	90 [1310]
		int. ¹⁾	140 [2030]	140 [2030]	140 [2030]	140 [2030]	140 [2030]
		peak ²⁾	200 [2900]	200 [2900]	200 [2900]	160 [2320]	160 [2320]
Max. oil flow	l/min [gpm]	cont.	16 [4.2]	20 [5.3]	20 [5.3]	20 [5.3]	20 [5.3]
		int. ¹⁾	20 [5.3]	25 [6.6]	25 [6.6]	25 [6.6]	25 [6.6]
Max. starting pressure with unloaded shaft	bar [psi]	4 [60]	4 [60]	4 [60]	4 [60]	4 [60]	4 [60]
Min. starting torque	at max. press. drop cont.	7 [60]	12 [105]	21 [185]	34 [300]	38 [335]	41 [365]
	at max. press. drop int. ¹⁾	10 [90]	17 [150]	29 [255]	48 [425]	62 [550]	79 [700]
	Nm [lbf-in]						
Min. speed ³⁾	min ⁻¹ [rpm]	50	40	30	30	30	30

Type		Max. inlet pressure
OMM 8 - 50	bar [psi]	cont. 140 [2030]
	bar [psi]	int. ¹⁾ 175 [2538]
	bar [psi]	peak ²⁾ 225 [3260]

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

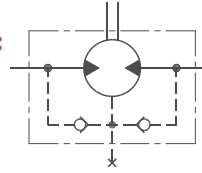
²⁾ Peak load: the permissible values may occur for max. 1% of every minute.

³⁾ Operation by lower speeds may be slightly less smooth.

**MAX. PERMISSIBLE
 SHAFT SEAL PRESSURE**

**OMM with check valves and
 without use of drain connection:**

The pressure on the shaft seal never exceeds the pressure in the return line.

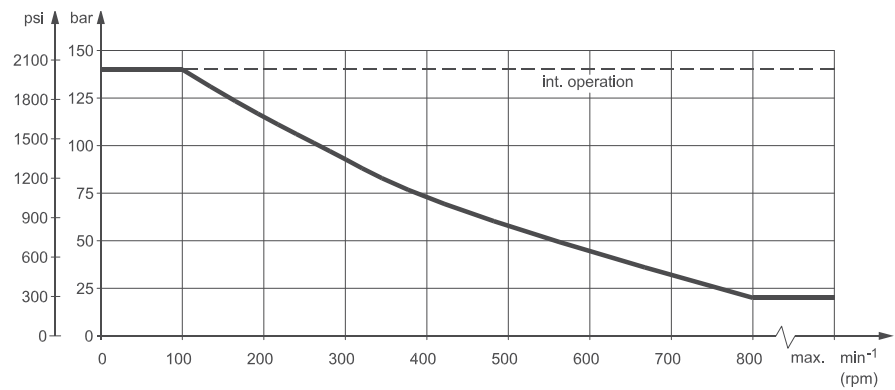


151-320.10

**OMM with check valves and
 drain connection:**

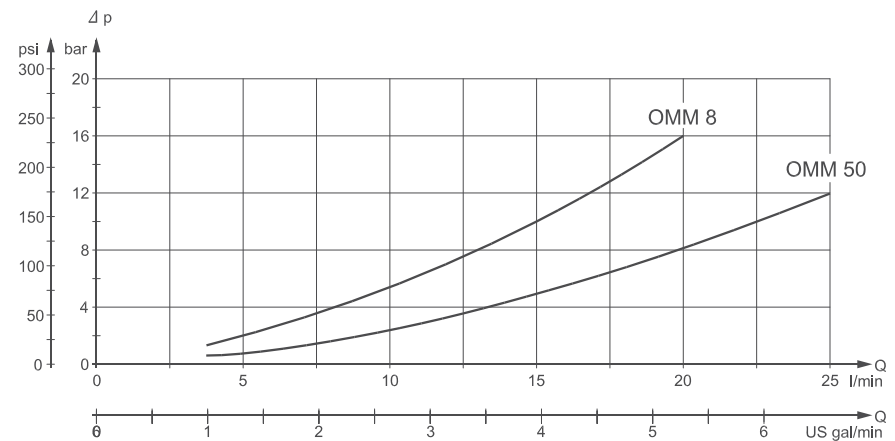
The shaft seal pressure equals the pressure on the drain line.

Max. return pressure without drain line or max. pressure in drain line



151-1671.10

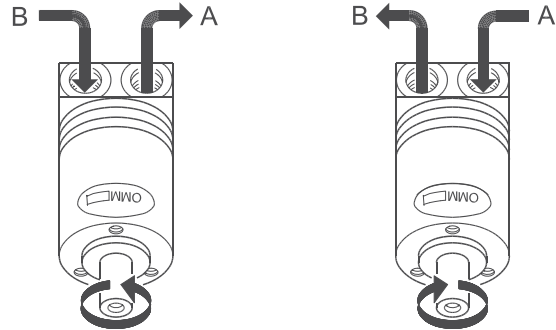
**PRESSURE DROP IN
 MOTOR**



151-1367.10

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

DIRECTION OF SHAFT ROTATION



151-1051.10

PERMISSIBLE SHAFT LOADS FOR OMM

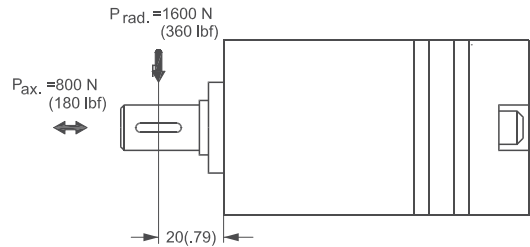
The permissible radial shaft load ($P_{rad.}$) is calculated from the distance (l) between the point of load and the mounting surface:

$$P_{rad.} = \frac{130400}{61.5 + l} \text{ N (l in mm; } l \leq 80 \text{ mm)}$$

$$P_{rad.} = \frac{748}{2.54 + l} \text{ lbf (l in inch; } l \leq 3.15 \text{ in)}$$

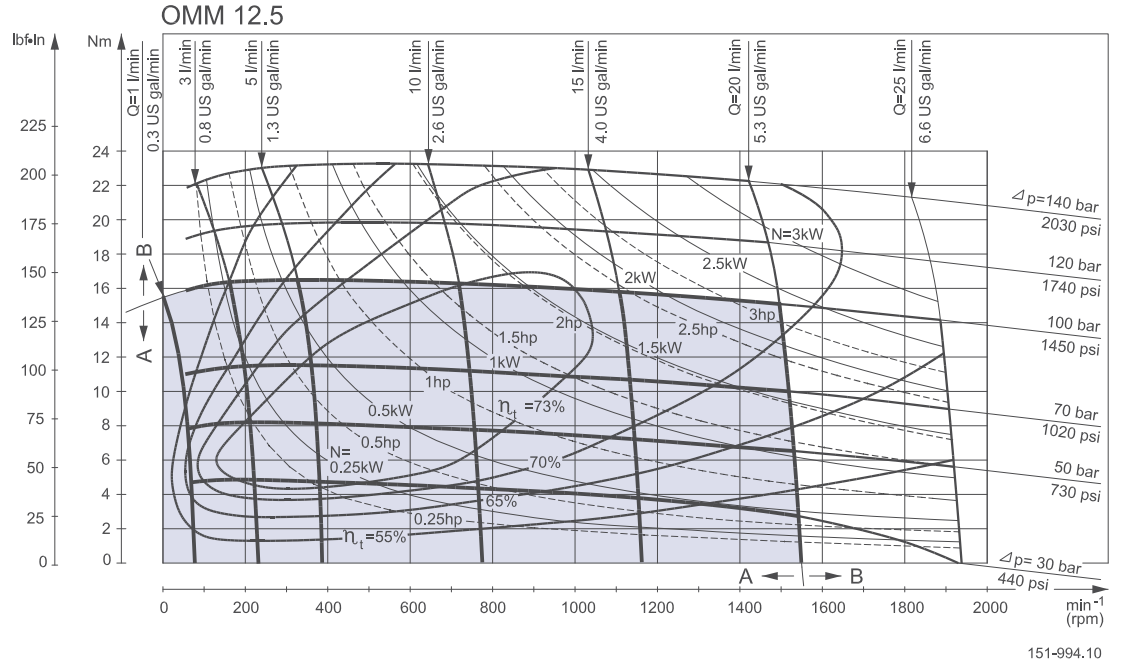
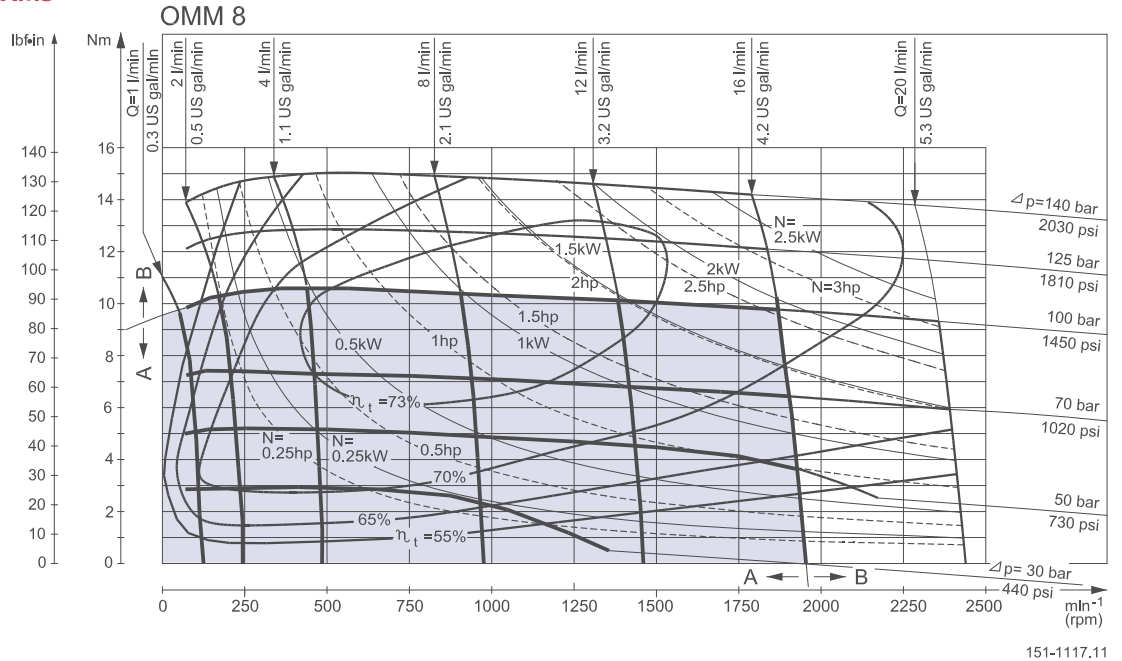
The drawing shows the permissible radial load when $l = 15 \text{ mm [0.59 in]}$.

The calculated shaft load should never exceed the permissible value.



151-980.11

FUNCTION DIAGRAMS



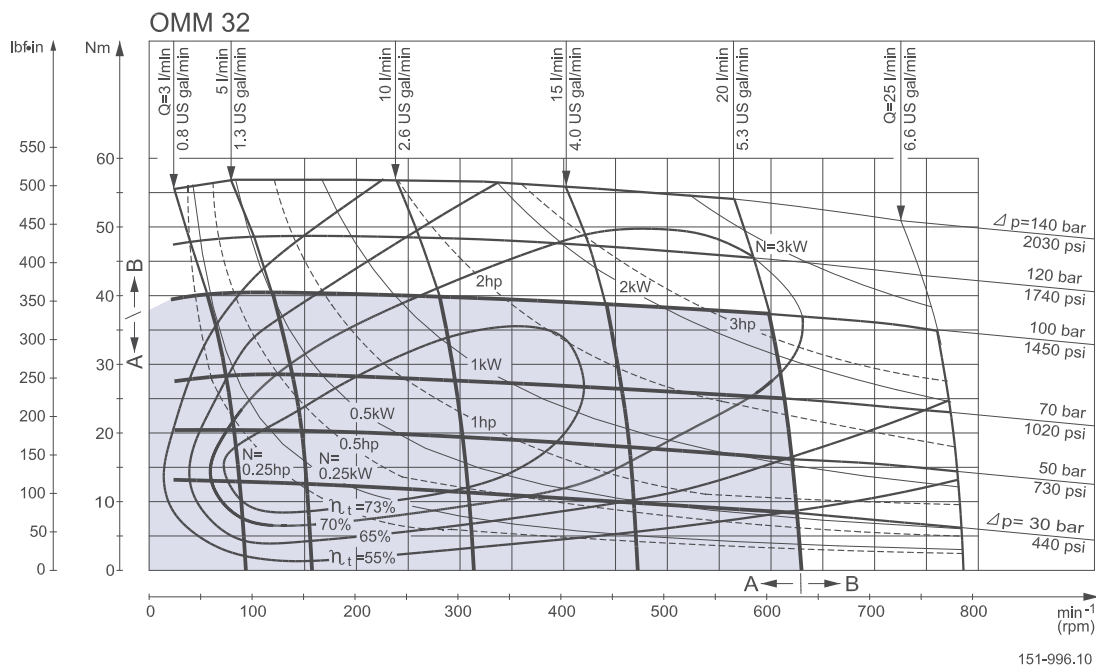
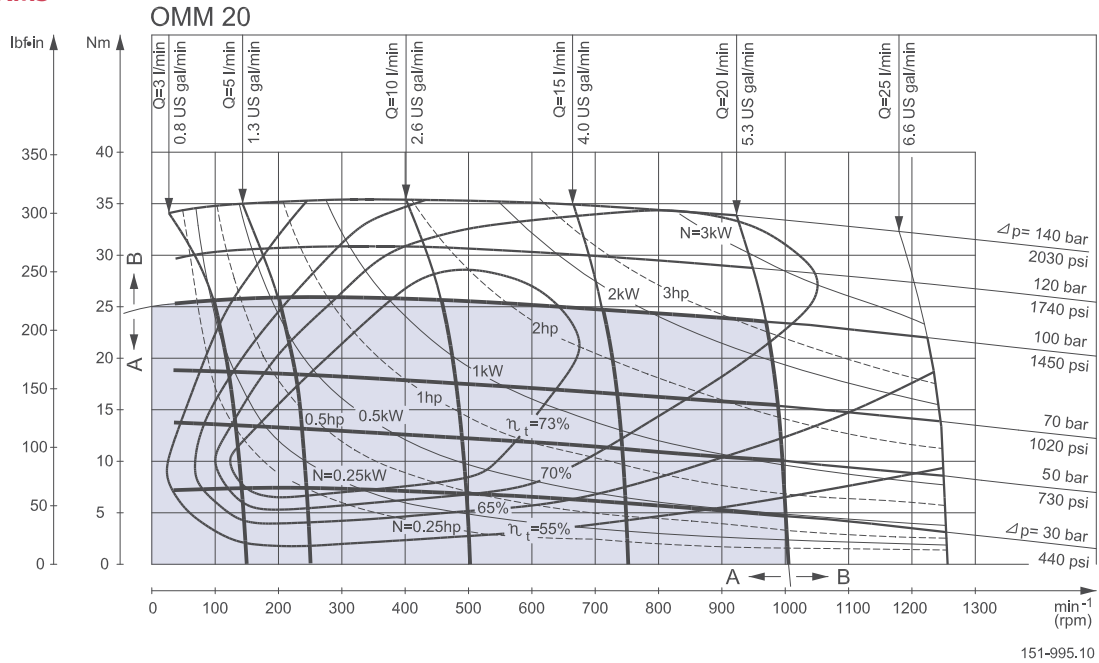
Explanation of function diagram use, basis and conditions can be found on page 4.

- 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 20.

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

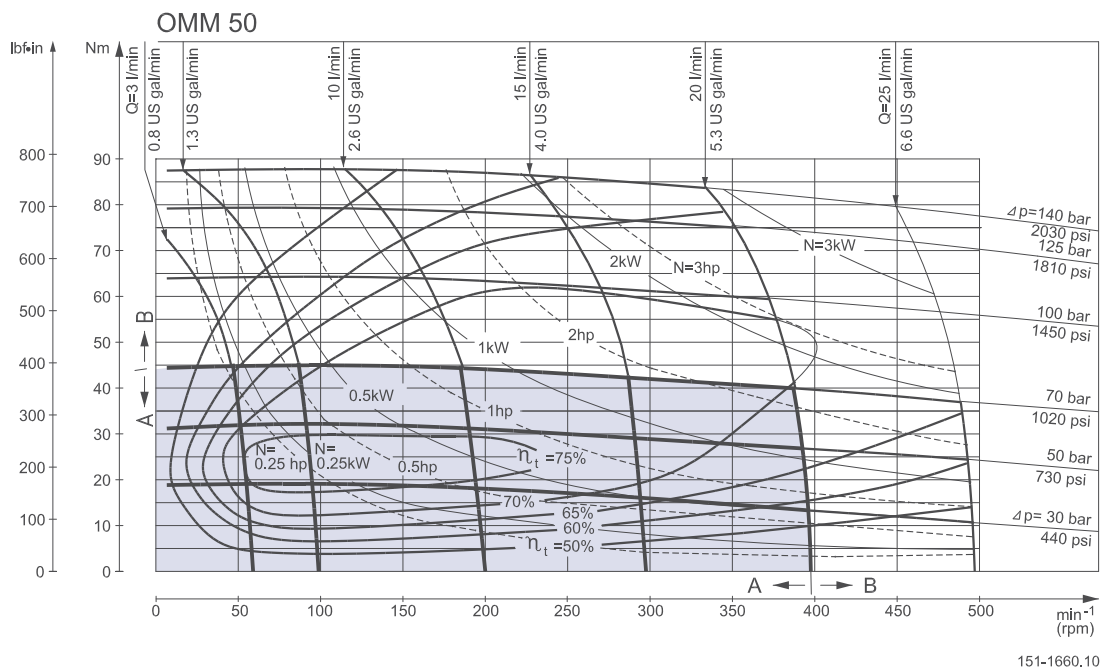
Max. permissible continuous/intermittent pressure drop for the actual shaft version can be found on page 20.

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

FUNCTION DIAGRAMS

OMM 40

No function diagram available for OMM 40.



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

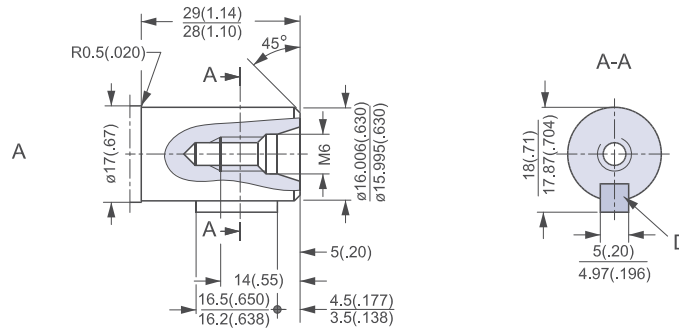
- A: Continuous range
- B: Intermittent range (max. 10% operation every minute)

Max. permissible continuous/intermittent pressure drop for the actual shaft version can be found on page 20.

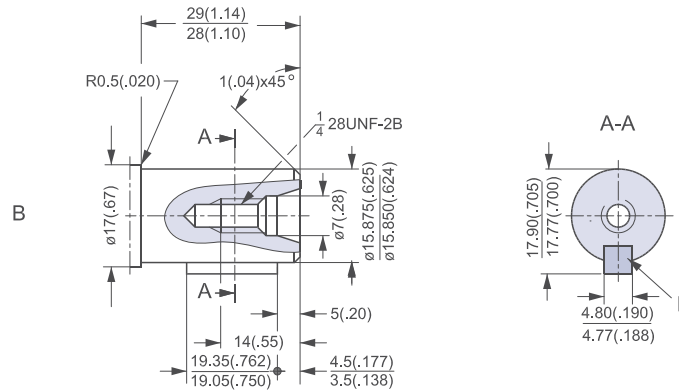
Note: Intermittent pressure drop and oil flow must not occur simultaneously.

SHAFT VERSION

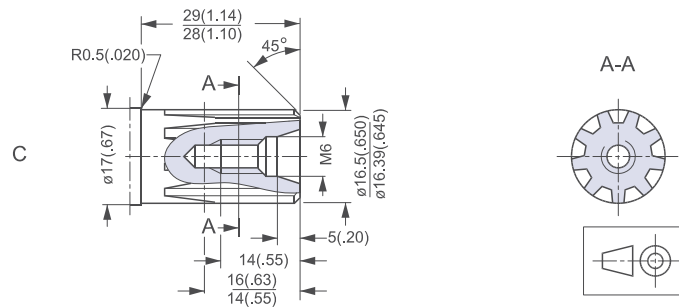
A: Cylindrical shaft
16 mm (xx in)
D: Parallel key
A5 • 5 • 16
DIN 6885



US version
B: Cylindrical shaft
 $\frac{5}{8}$ in
E: Parallel key
 $\frac{3}{16} \cdot \frac{3}{16} \cdot \frac{3}{4}$ in
B.S.46

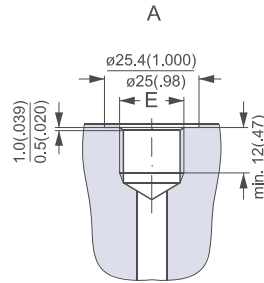


C: Involute splined shaft
B17 • 14, DIN 5482
Measurement 19,641 ± 0.04 mm
over 3 mm pins deviates from
DIN 5482

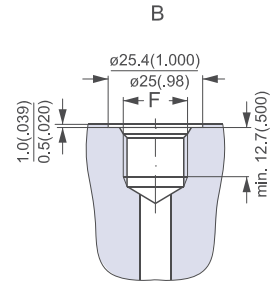


151-1866.10

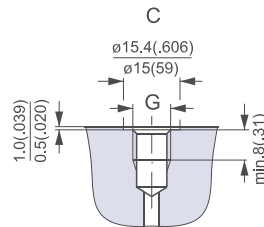
PORT THREAD VERSIONS



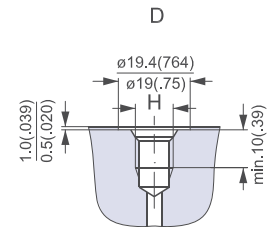
A: G main ports
E: ISO 228/1 - G^{3/8}



B: UNF main ports
F: ³/₁₆ - 18 UNF
O-ring boss port



C: G drain ports
G: ISO 228/1 - G^{1/8}



D: UNF drain ports
H: ³/₈ - 24 UNF
O-ring port

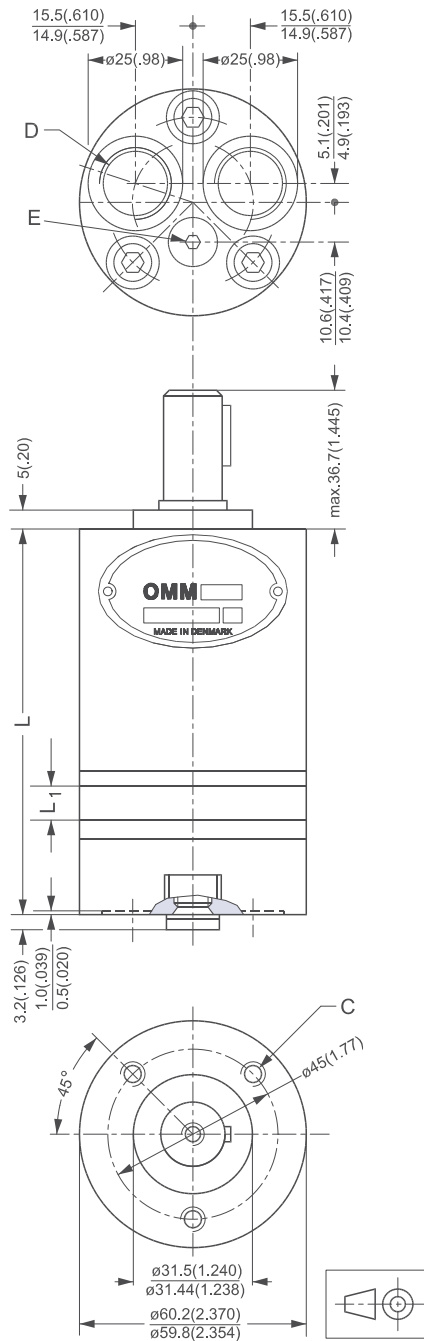
151-1869.10

DIMENSIONS

OMM.
 End port version.

Type	L _{max.}	L ₁ mm [in]
OMM 8	104.0 [4.09]	3.5 [0.14]
OMM 12.5	106.0 [4.17]	5.5 [0.22]
OMM 20	109.0 [4.29]	8.5 [0.33]
OMM 32	114.0 [4.49]	13.5 [0.53]
OMM 40	118.0 [4.65]	17.0 [0.67]
OMM 50	122.0 [4.80]	21.5 [0.85]

C: M6; 10 mm [0.39 in] deep
 D: G 3/8; 12 mm [0.47 in] deep
 E: Drain connection G 1/8;
 8 mm [0.39 in] deep



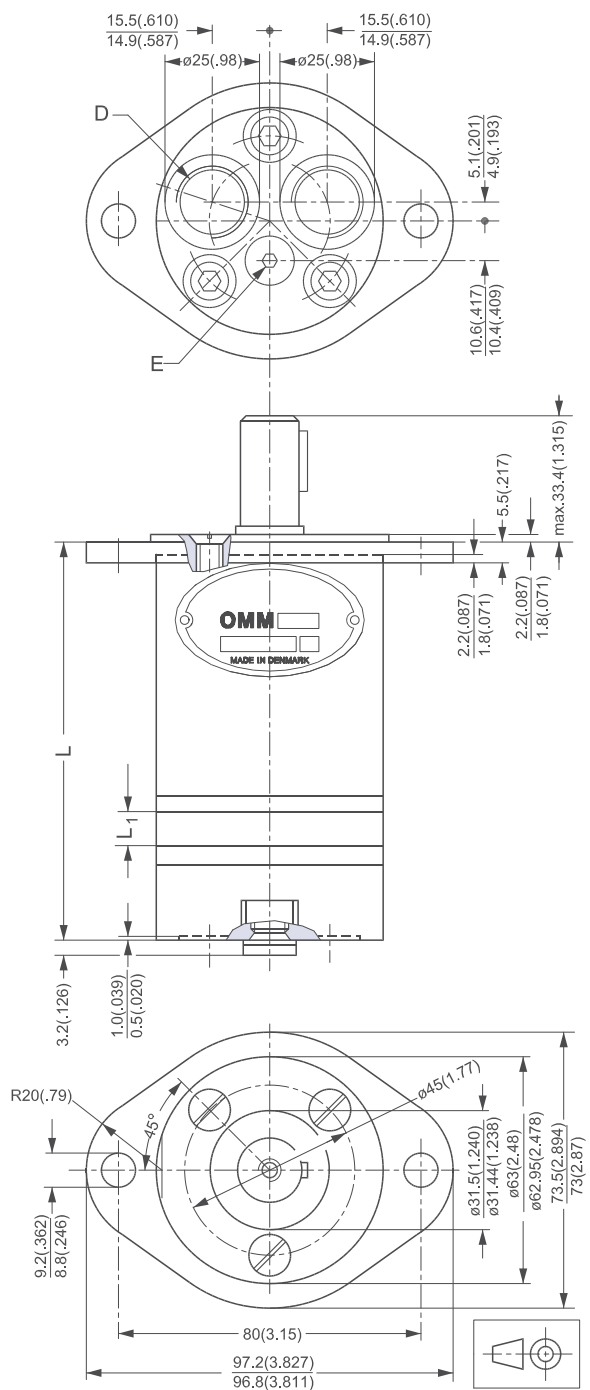
151-1149.10

DIMENSIONS

OMM.
 End port version with extra mounting flange.

Type	L _{max.}	L ₁ mm [in]
OMM 8	107.5 [4.23]	3.5 [0.14]
OMM 12.5	109.5 [4.31]	5.5 [0.22]
OMM 20	112.5 [4.43]	8.5 [0.33]
OMM 32	117.5 [4.63]	13.5 [0.53]
OMM 40	118.0 [4.65]	17.0 [0.67]
OMM 50	125.5 [4.94]	21.5 [0.85]

D: G 3/8; 12 mm [0.47 in] deep
 E: Drain connection G 1/8;
 8 mm [0.39 in] deep



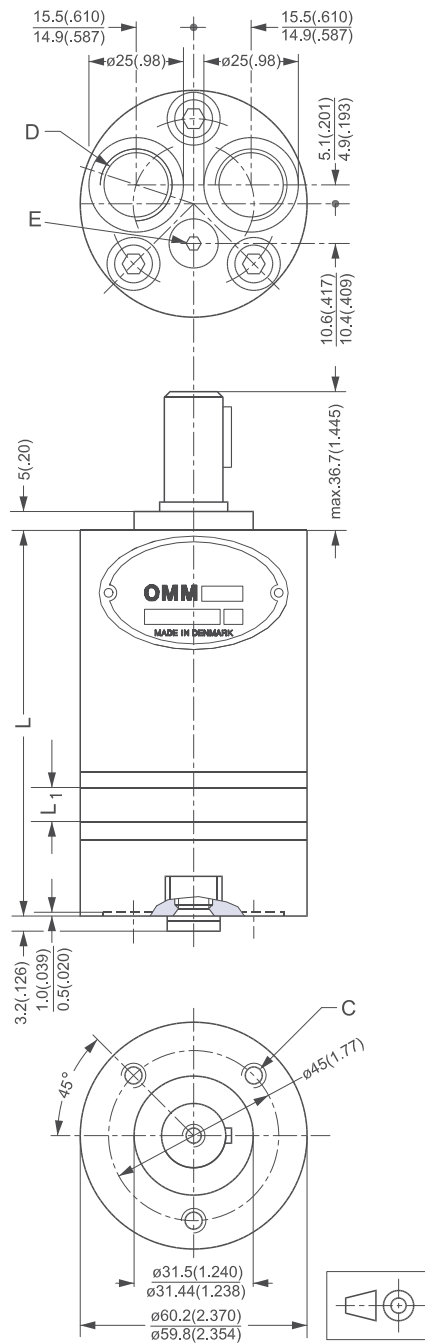
151-1148.10

DIMENSIONS

OMM.
 End port version.

Type	L _{max.}	L ₁ mm [in]
OMM 8	104.0 [4.09]	3.5 [0.14]
OMM 12.5	106.0 [4.17]	5.5 [0.22]
OMM 20	109.0 [4.29]	8.5 [0.33]
OMM 32	114.0 [4.49]	13.5 [0.53]
OMM 50	122.0 [4.80]	21.5 [0.85]

- C: 1/4 - 28 UNF - 2B;
 min. 10 mm [0.39 in] deep
- D: 9/16 - 18 UNF;
 12 mm [0.47 in] deep
 O-ring boss port
- E: 3/8 - 24 UNF;
 8 mm [0.39 in] deep
 O-ring port



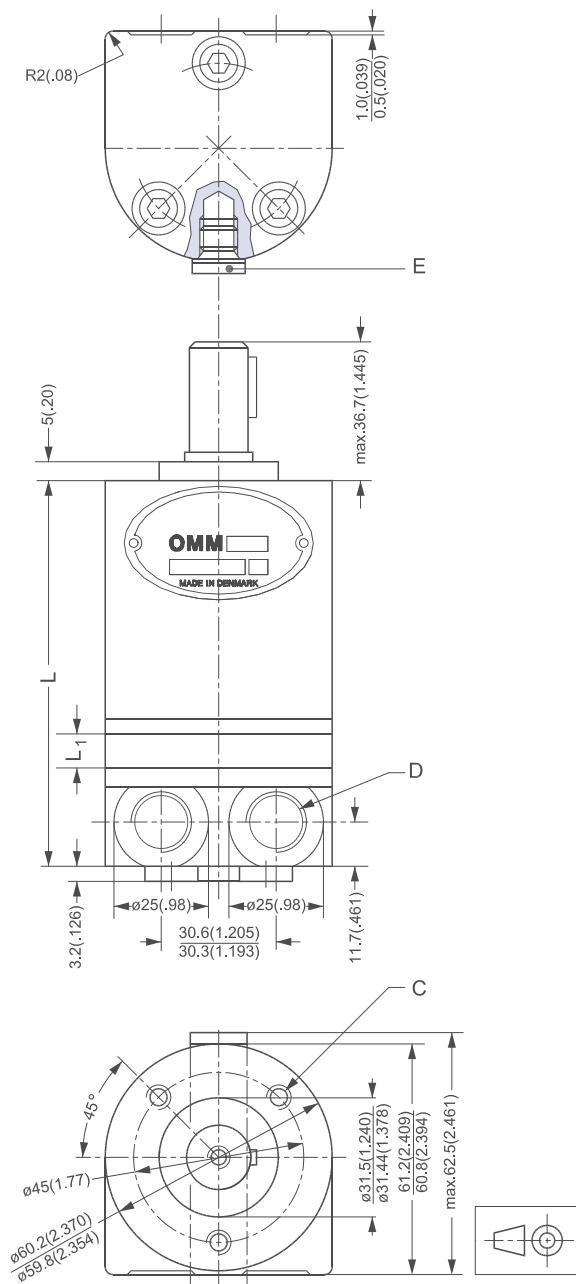
151-1149.10

DIMENSIONS

OMM.
 Side port version.

Type	L _{max.}	L ₁ mm [in]
OMM 8	105.8 [4.17]	3.5 [0.14]
OMM 12.5	107.8 [4.24]	5.5 [0.22]
OMM 20	110.8 [4.36]	8.5 [0.33]
OMM 32	115.8 [4.56]	13.5 [0.53]
OMM 40	118.0 [4.65]	17.0 [0.67]
OMM 50	123.8 [4.87]	21.5 [0.85]

C: M6; 10 mm [0.39 in] deep
 D: G^{3/8}; 12 mm [0.47 in] deep
 E: Drain connection G^{1/8};
 8 mm [0.39 in] deep



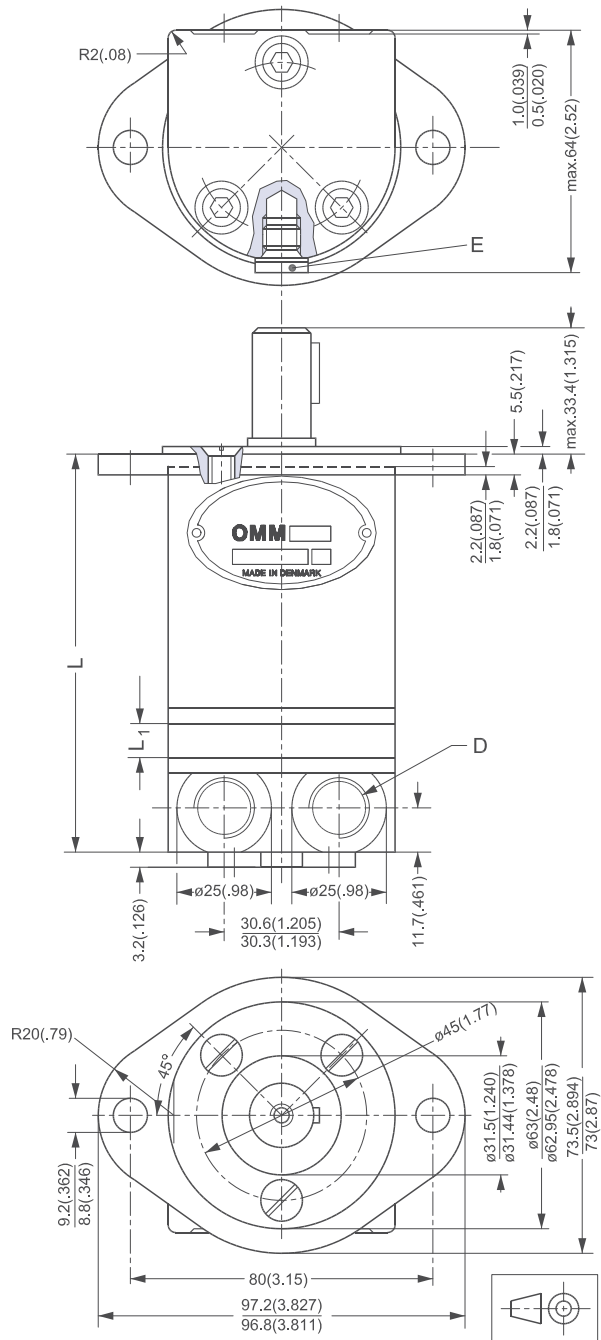
151-1146.10

DIMENSIONS

OMM.
 Side port version with extra mounting flange.

Type	L _{max.}	L ₁ mm [in]
OMM 8	109.3 [4.30]	3.5 [0.14]
OMM 12.5	111.3 [4.38]	5.5 [0.22]
OMM 20	114.3 [4.50]	8.5 [0.33]
OMM 32	119.3 [4.70]	13.5 [0.53]
OMM 40	118.0 [4.65]	17.0 [0.67]
OMM 50	127.3 [5.01]	21.5 [0.85]

D: G 3/8; 12 mm [0.47 in] deep
 E: Drain connection G 1/8;
 8 mm [0.39 in] deep



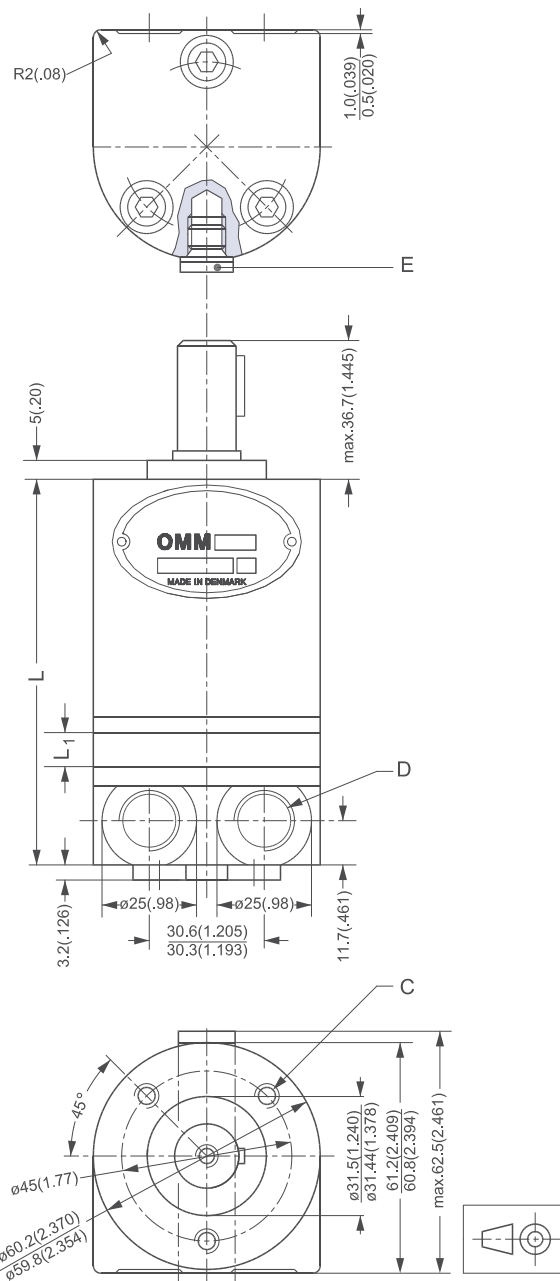
151-1147.10

DIMENSIONS

OMM.
 Side port version.

Type	L _{max.}	L ₁ mm [in]
OMM 8	105.8 [4.17]	3.5 [0.14]
OMM 12.5	107.8 [4.24]	5.5 [0.22]
OMM 20	110.8 [4.36]	8.5 [0.33]
OMM 32	115.8 [4.56]	13.5 [0.53]
OMM 50	121.8 [4.80]	21.5 [0.85]

- C: 1/4 - 28 UNF - 2B;
min. 10 mm [0.39 in] deep
- D: 9/16 - 18 UNF;
12 mm [0.47 in] deep
- E: 3/8 - 24 UNF;
8 mm [0.39 in] deep



151-1146.10

WEIGHT OF MOTORS

Code no.	Weight	
	kg	lb
151G0001	2.0	4.4
151G0002	2.1	4.6
151G0003	2.2	4.8
151G0004	2.0	4.4
151G0005	2.1	4.6
151G0006	2.2	4.8
151G0013	2.4	5.3
151G0024	2.0	4.4
151G0025	2.1	4.6
151G0026	2.2	4.8
151G0027	2.0	4.4
151G0028	2.1	4.6
151G0029	2.2	4.8

Code no.	Weight	
	kg	lb
151G0031	2.0	4.4
151G0032	2.2	4.8
151G0033	2.2	4.8
151G0034	2.0	4.4
151G0035	2.2	4.8
151G0036	2.2	4.8
151G0037	2.4	5.3
151G0040	1.9	4.2
151G0041	1.9	4.2
151G0046	1.9	4.2
151G0047	1.9	4.2
151G0048	1.9	4.2

Code no.	Weight	
	kg	lb
151G0049	1.9	4.2
151G0094	2.4	5.3
151G0277	2.3	5.1
151G0279	2.3	5.1
151G2001	1.0	2.2
151G2002	1.0	2.2
151G2003	1.1	2.4
151G2004	1.2	2.6
151G2021	1.0	2.2
151G2022	1.0	2.2
151G2023	1.1	2.4
151G2024	1.2	2.6