



Technical Information

Orbital Motor

TMK, TMKW and TMK FL



Revision History*Table of Revisions*

Date	Changed	Rev
Feb 2014	Converted to Danoss layout - DITA CMS	FA
Apr 2006		EA

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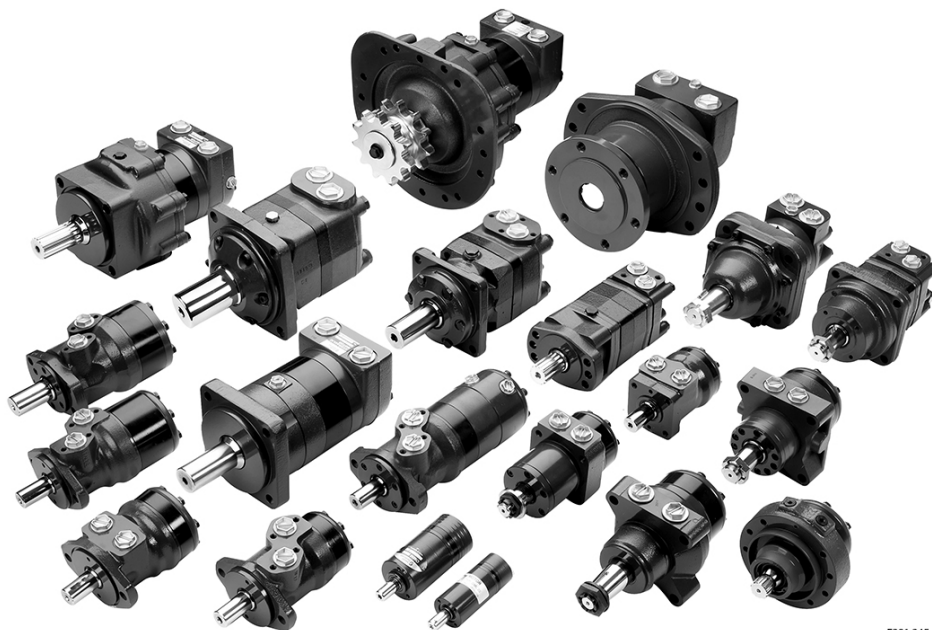
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A wide range of Orbital Motors

Characteristic, features and application areas of Orbital Motors



F301 245

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 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 N•m [115 lbf•in] to 2700 N•m [24.000 lbf•in] (peak) and maximum outputs are from 2.0 kW [2.7 hp] to 70 kW [95 hp].

Characteristic features of Danfoss Orbital Motors

- Smooth running over the entire speed range
- Constant operating torque over a wide speed range
- High starting torque
- High return pressure without the use of drain line (High pressure shaft seal)
- High efficiency
- Long life under extreme operating conditions
- Robust and compact design
- High radial and axial bearing capacity
- For applications in both open and closed loop hydraulic systems
- Suitable for a wide variety of hydraulics fluids

Technical features of Danfoss Orbital Motor

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

A wide range of Orbital Motors

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

The Danfoss Orbital 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 Danfoss Orbital Motors

Detailed data on all Danfoss Orbital Motors can be found in our motor catalogue, which is divided into more individual subcatalogues:

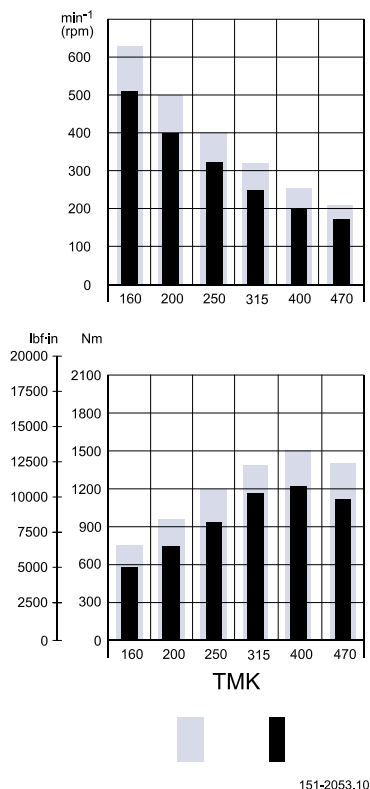
- General information on Danfoss Orbital Motors: function, use, selection of orbital motor, hydraulic systems, etc.
- Technical data on small motors: OML and OMM
- Technical data on medium sized motors: OMP, OMR, OMH
- Technical data on medium sized motors: DH and DS
- Technical data on medium sized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

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

Data survey

Speed and torque

Max. speed / Max. torque



[light] Intermittent values

[dark] Continuous values

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

- TMK can be found under [Function diagrams](#).

The function diagrams are based on actual tests on a representative number of motors from our production. The diagrams apply to a return pressure between 5 and 10 bar [75 and 150 psi] when using mineral based hydraulic oil with a viscosity of 35 mm²/s [165 SUS] and a temperature of 50°C [120°F]. For further explanation concerning how to read and use the function diagrams, please consult the paragraph "Selection of motor size" in the technical information "General" DHMH.PK.100.G2.02 520L0232.

Technical Information TMK, TMKW and TMK FL Orbital Motors

Versions

Version

Orbit motors US-versions, standard shaft seals, drain connections and painted black

Mount. flange	Spigot diameter front / rear end	Bolt circle diameter (BC)	Shaft	Port size	Side port version	End port version	Check valve	Main type design	Config.- code
Magneto	Ø 3.25 in	Ø 4.187 in	Cyl. 1.25 in	1 1/16-12 UN	x		x	TMK	1
			Spl. 1.25 in	1 1/16-12 UN	x		x	TMK	2
			Tap. 1.25 in	1 1/16-12 UN	x		x	TMK	3
SAE-C	Ø 5 in	Ø 6.375 in	Cyl. 1.25 in	1 1/16-12 UN	x		x	TMK	4
			Spl. 1.25 in	1 1/16-12 UN	x		x	TMK	5
			Tap. 1.25 in	1 1/16-12 UN	x		x	TMK	6
			Tap. 1.5 in	1 1/16-12 UN	x		x	TMK	7
			Tap. 1.625 in	1 1/16-12 UN	x		x	TMK	8
Wheel	Ø 4.25 in Ø 5 in (rear)	Ø 5.8 in	Tap. 1.5 in	1 1/16-12 UN				TMKW	9
				7/8-14 UNF		x		TMKW	10
Brake std.	Ø 5.5 in (only rear)	Ø 6.375 in	Tap. 1.5 in	1 1/16-12 UN	x			TMK-FL	11
				7/8-14 UNF		x		TMK-FL	12

Configuration code and code numbers

Config.- code	Code number - displacement (cm ³)					
	160	200	250	315	400	470
1	151F6060	151F6061	151F6062	151F6063	151F6064	151F6065
2	151F6050	151F6051	151F6052	151F6053	151F6054	151F6055
3	151F6070	151F6071	151F6072	151F6073	151F6074	151F6075
4	151F6130	151F6131	151F6132	151F6133	151F6134	151F6135
5	151F6120	151F6121	151F6122	151F6123	151F6124	151F6125
6	151F6140	151F6141	151F6142	151F6143	151F6144	151F6145
7	151F6090	151F6091	151F6092	151F6093	151F6094	151F6095
8	151F6080	151F6081	151F6082	151F6083	151F6084	151F6085
9	151F6010	151F6011	151F6012	151F6013	151F6014	151F6015
10	151F6030	151F6031	151F6032	151F6033	151F6034	151F6035
11	11008903	11008904	11008905	11008906	11008907	11008908
12	11008909	11008910	11008911	11008912	11008913	11008914

Features available (options)

Shaft options:

- Splined 1.5 in shaft
- Cyl. 40 mm shaft (not brake version)

Port option:

- Side port G 3/4
- End port G 1/2

Check valves

Flushing valves with different flushing flow

Motors are painted black

Technical Information TMK, TMKW and TMK FL Orbital Motors
Technical data

Type			TMK TMKW TMK FL	TMK TMKW TMK FL	TMK TMKW TMK FL	TMK TMKW TMK FL	TMK TMKW TMK FL	TMK TMKW TMK FL
Motor size			160	200	250	315	400	470
Geometric displacement	cm ³ [in ³]		158.0 [9.64]	201.5 [12.30]	252.2 [15.39]	315.3 [19.23]	397.2 [24.24]	471.1 [28.75]
Max. speed	min ⁻¹ [rpm]	cont.	505	400	320	255	200	170
		int. ¹⁾	630	500	400	315	250	210
Max. torque*		cont.	570 [5045]	720 [6370]	910 [8055]	1050 [9295]	1070 [9470]	1080 [9560]
		int. ¹⁾	725 [6415]	920 [8140]	1070 [9470]	1310 [11595]	1400 [12390]	1350 [11950]
Max. output	kW [hp]	cont.	22.0 [29.5]	22.0 [29.5]	21.0 [28]	20.0 [27]	17.5 [23.5]	13.0 [17.4]
		int. ¹⁾	27.0 [36]	27.0 [36]	25.0 [33.5]	23.5 [31.5]	22.0 [29.5]	17.0 [22.8]
Max. pressure drop*	bar [psi]	cont.	250 [3625]	250 [3625]	250 [3625]	250 [3625]	200 [2900]	160 [2320]
		int. ¹⁾	325 [4715]	325 [4715]	300 [4350]	300 [4350]	250 [3625]	200 [2900]
Max. oil flow	l/min [US gal/min]	cont.	80 [21.1]	80 [21.1]	80 [21.1]	80 [21.1]	80 [21.1]	80 [21.1]
		int. ¹⁾	100 [26.4]	100 [26.4]	100 [26.4]	100 [26.4]	100 [26.4]	100 [26.4]
Max. starting pressure with unloaded shaft	bar [psi]		8 [100]	8 [100]	7 [100]	7 [100]	7 [100]	7 [100]
Min. starting torque	Nm [lbf·in]	at max. press. drop cont.:	430 [3805]	540 [4780]	680 [6020]	790 [6990]	800 [7080]	830 [7350]
		at max. press. drop int. ¹⁾ :	545 [4825]	690 [6105]	800 [7080]	985 [8720]	1050 [9290]	1050 [9290]

Type		Max. inlet pressure		Max. return pressure with drain line	
TMK 160 - 470	bar [psi]	cont.	250 [3625]	cont.	140 [2030]
		max.	350 [5075]	int. ¹⁾	175 [2540]
		--		peak ²⁾	210 [3045]

*Max. torque for shaft type	Tap. 1.25 in	Splined 1.25 in	Cyl. 1.25 in
Nm [lbf·in]	900 [8000]	900 [8000]	900 [8000]

Max. values apply for applications where there is no external radial load. If radial load is present, please contact Danfoss for evaluation.

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.

For max. permissible combination of flow and pressure, see function diagram for actual motor.

Technical data
Technical data for parking brake motor TMK FL

Technical data for brake motor TMK FL		
Holding torque ¹⁾	Nm [lbf·in]	1050 [9295]
Min. release pressure ²⁾	bar [psi]	15 [215]
Max. pressure in drain/brake line	bar [psi]	30 [435]

¹⁾ This brake is to be used only as a passive parking brake. It may not be used for dynamic braking.

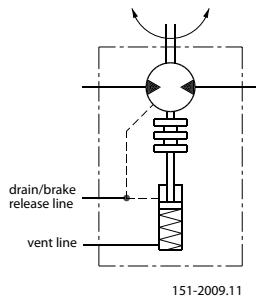
When release pressure²⁾ is greater than zero, the holding torque depends inversely proportional on the actual release pressure.

At 0 bar - holding torque = 1050 Nm [9295 lbf·in]

At 15 bar [215 psi] or more - holding torque = 0 Nm

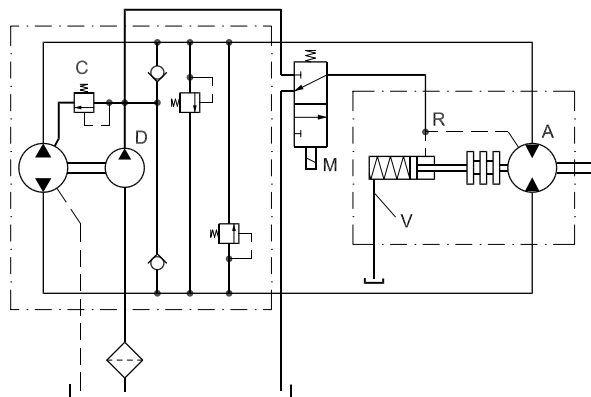
²⁾ The release pressure is the difference between the pressure in the drain/brake release line and the pressure in the vent line. The vent port must always be connected to tank.

The brake will be fully released at 15 bar [215 psi].



Schematic diagram

Schematic diagram



- A: Motor
- C: Charge pressure relief valve
(setting min 15 bar [215 psi])
- D: Charge pump
- M: Brake release valve
- R: Drain and brake release port
- V: Vent line

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The drain/release port on the TMK FL motor must never remain plugged or be connected to the system A or B pressures, since the brake is a low pressure device. A common solution for controlling the brake is to use a two position valve to connect the drain port to hydrostatic charge pressure (brake released), or to reservoir pressure (brake holding).

The vent port must always be connected to tank.

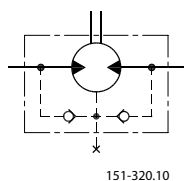
See the above schematic for details.

Shaft seal

Max. permissible shaft seal pressure

TMK, TMKW and TMK FL with use of drain connection

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



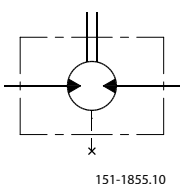
TMK with check valves and without use of drain connection

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

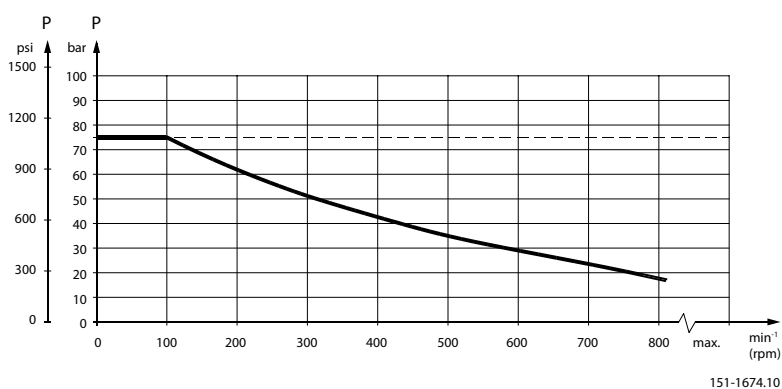
TMKW / TMK FL without check valves and without use of drain connection

The shaft seal pressure equals the average of input pressure and return pressure.

TMK FL must always have a drainline.

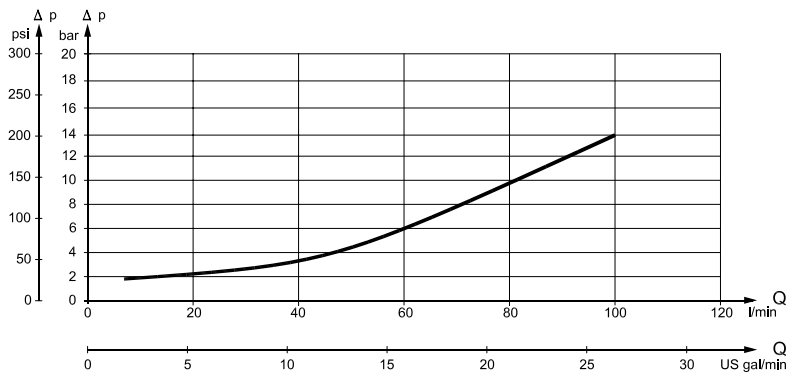


Max. pressure on shaft seal



Pressure drop

Pressure drop in motor



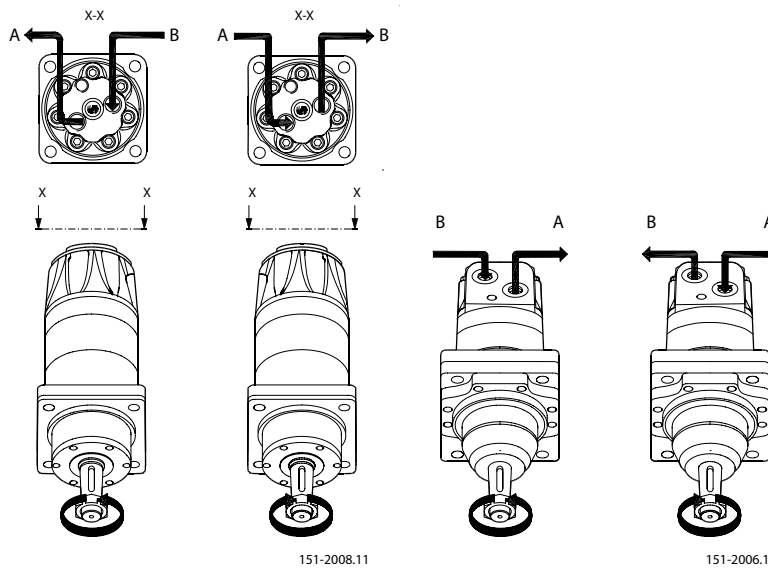
151-1957.11

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

Oil flow
Oil flow in drain line

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

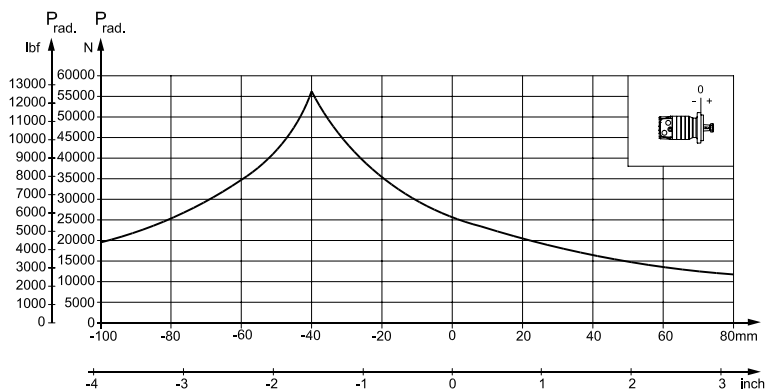
Pressure drop bar [psi]	Viscosity mm ² /s [SUS]	Oil flow in drain line l/min [US gal/min]
160 [2320]	20 [100]	1.7 [0.45]
	35 [165]	1.2 [0.32]
325 [4713]	20 [100]	3.5 [0.92]
	35 [165]	2.5 [0.66]

Direction of shaft rotation


Shaft load

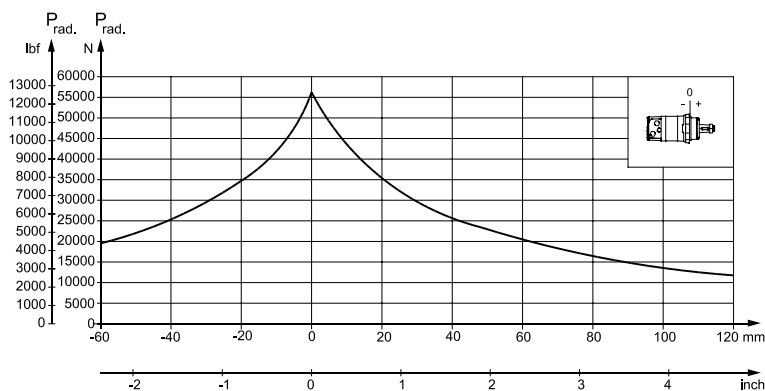
Permissible shaft load for TMKW

Mounting flange: Magneto, SAE-C



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Mounting flange: Wheel



151-1955.10

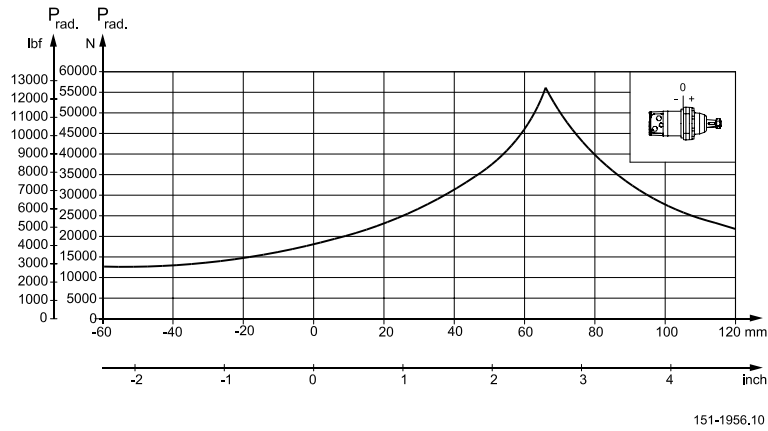
Permissible radial shaft load

The output shaft runs in tapered roller bearings that permit high axial and radial forces.

The permissible radial load on the shaft is shown for an axial load of 0 N as a function of the distance from the mounting flange to the point of load application.

The curve is based on B_{10} Bearing life (2000 hours or 12 000 000 shaft revolutions at 100 min^{-1}) at rated output torque, when mineral-based hydraulic oil with a sufficient content of anti-wear additives, is used.

Shaft load



Permissible radial shaft load

The output shaft runs in tapered roller bearings that permit high axial and radial forces.

The permissible radial load on the shaft is shown for an axial load of 0 N as a function of the distance from the mounting flange to the point of load application.

The curve is based on B₁₀ Bearing life (2000 hours or 12 000 000 shaft revolutions at 100 min⁻¹) at rated output torque, when mineral-based hydraulic oil with a sufficient content of anti-wear additives, is used.

Function diagrams

Function diagrams

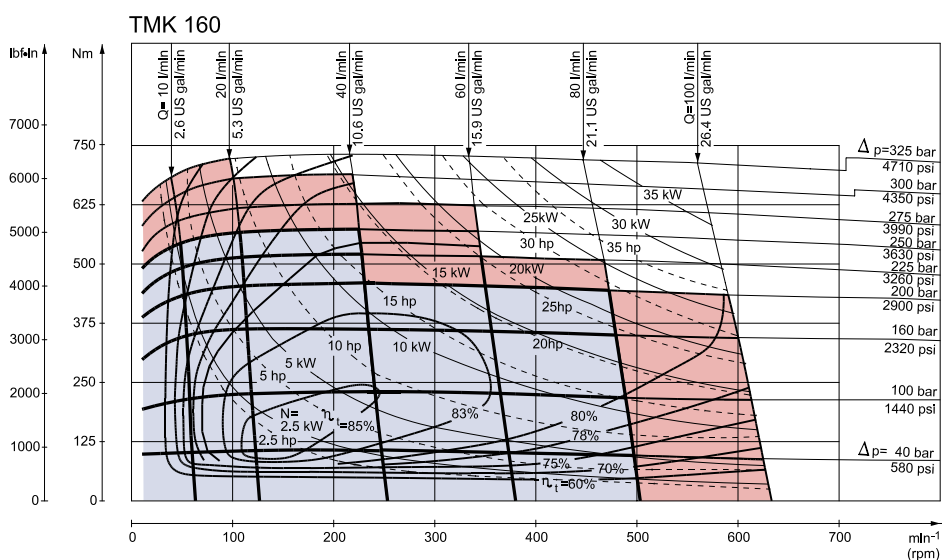
Explanation of function diagram use, basis and conditions can be found under [Speed and torque](#) on page 7 Speed and torque

[blue] Continuous range

[pink] Intermittent range (max. 10% operation every minute)

Intermittent pressure drop and oil flow must not occur simultaneously.

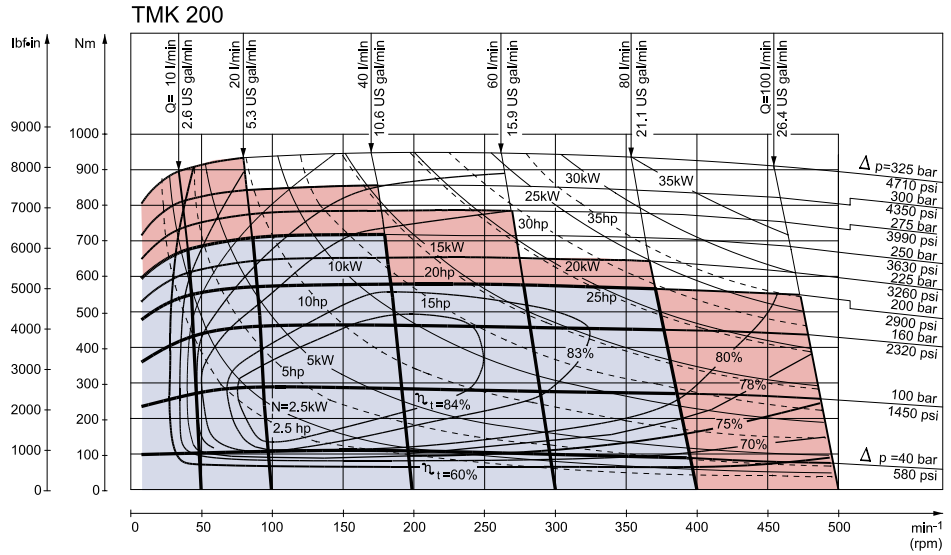
TMK 160 function diagram



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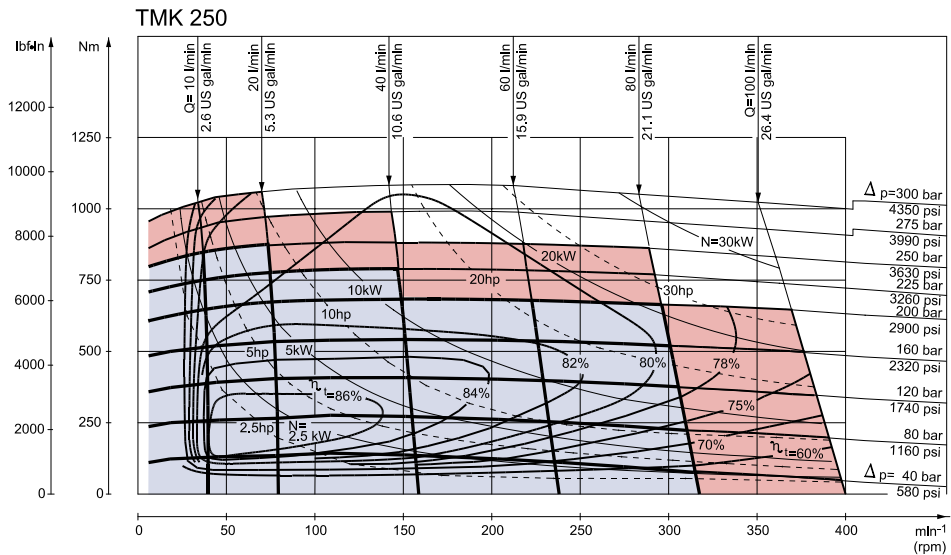
Function diagrams

TMK 200 function diagram



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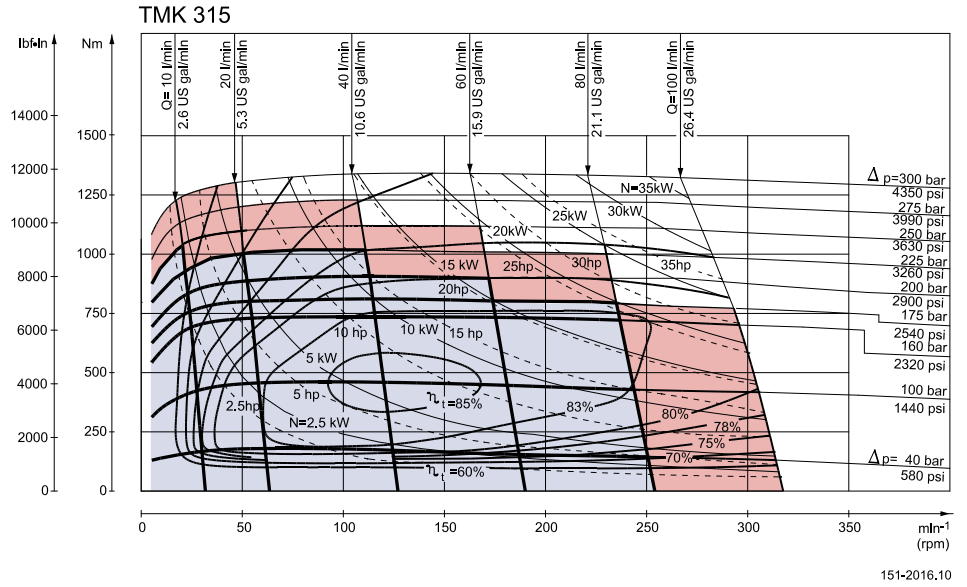
TMK 250 function diagram



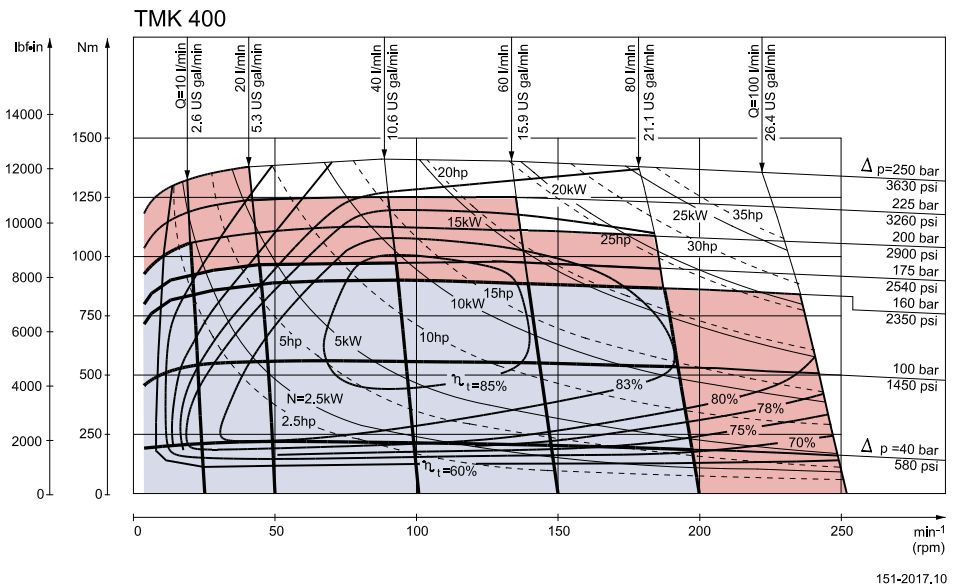
151-2015,10

Function diagrams

TMK 315 function diagram

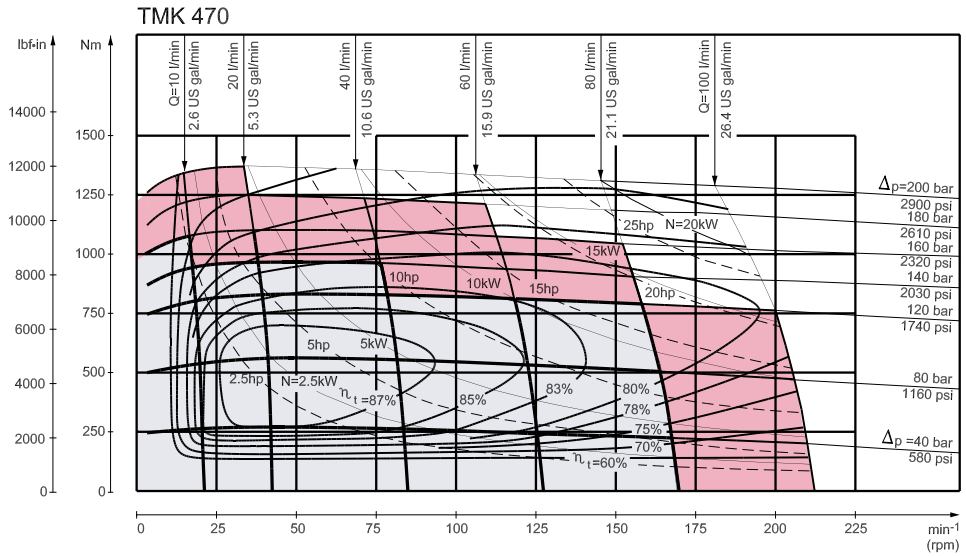


TMK 400 function diagram



Function diagrams

TMK 470 function diagram



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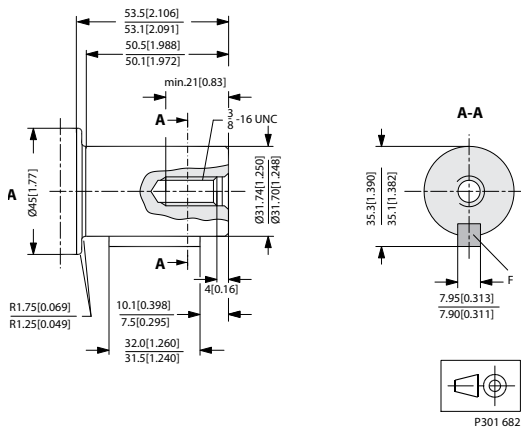
Shaft
Shaft Versions

A: Cylindrical shaft 1.25 in

F: Parallel key

5/16 x 5/16 x 1 1/4 in

SAE J744



B: Involute splined shaft

ANS B92.1 - 1970 standard

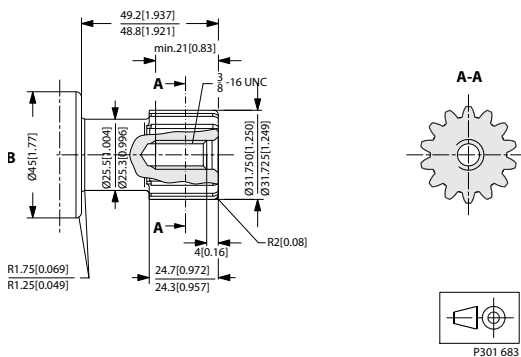
Flat root side fit

Pitch 12/24

Teeth 14

Major diameter: 1.25 in

Pressure angle 30°



C: Tapered shaft 1.25 in

G: Cone 1 : 8

SAE J501

H: 1 - 20 UNEF

Across flats: 1 7/16 in

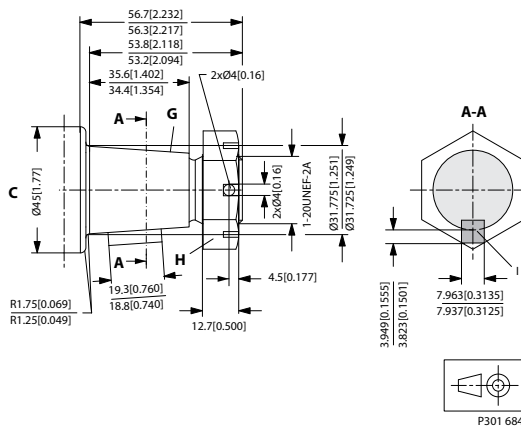
Tightening torque:

450 ± 10 Nm [3980 ± 85 lbf·in]

I: Parallel key

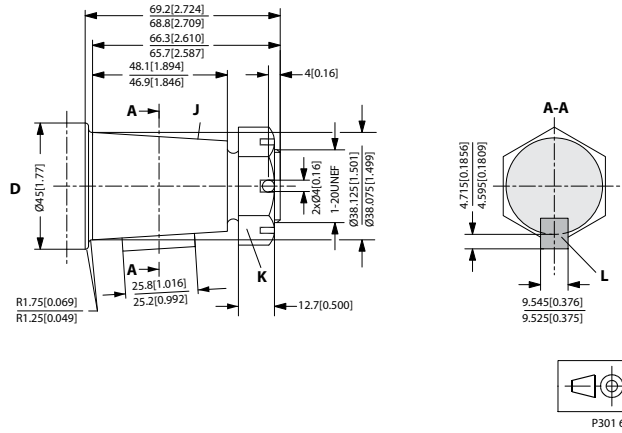
5/16 x 5/16 x 3/4 in

SAE J501

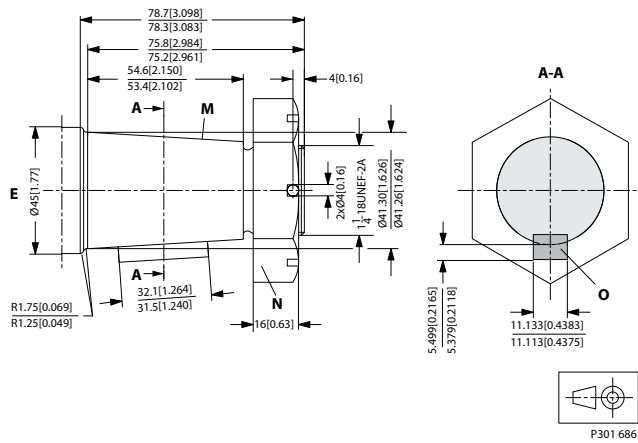


Shaft

- D:** Tapered shaft 1.5 in
- J:** Cone 1 : 8
- SAE J501
- K:** 1 - 20 UNEF
- Across flats: 1 7/16 in
- Tightening torque:
450 ± 10 Nm [3980 ± 85 lbf·in]
- L:** Parallel key 3/8 x 3/8 x 1 in
- B.S. 46

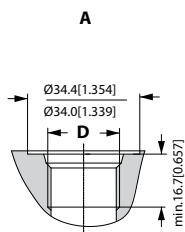


- E:** Tapered shaft 1.625 in
- M:** Cone 1 : 8
- SAE J501
- N:** 1 1/4- 18 UNEF
- Across flats: 2 3/16 in
- Tightening torque:
500 ± 10 Nm [4425 ± 85 lbf·in]
- O:** Parallel key
7/16 x 7/16 x 1 1/4 in
- B.S. 46



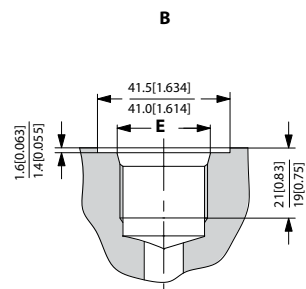
Port

Port thread versions



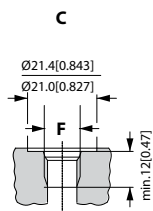
P301 687

A: UNF Main port
D: 7/8 - 14 UNF o-ring boss port



P301 688

B: UN Main port
E: 1 1/16 - 12 UN o-ring boss port

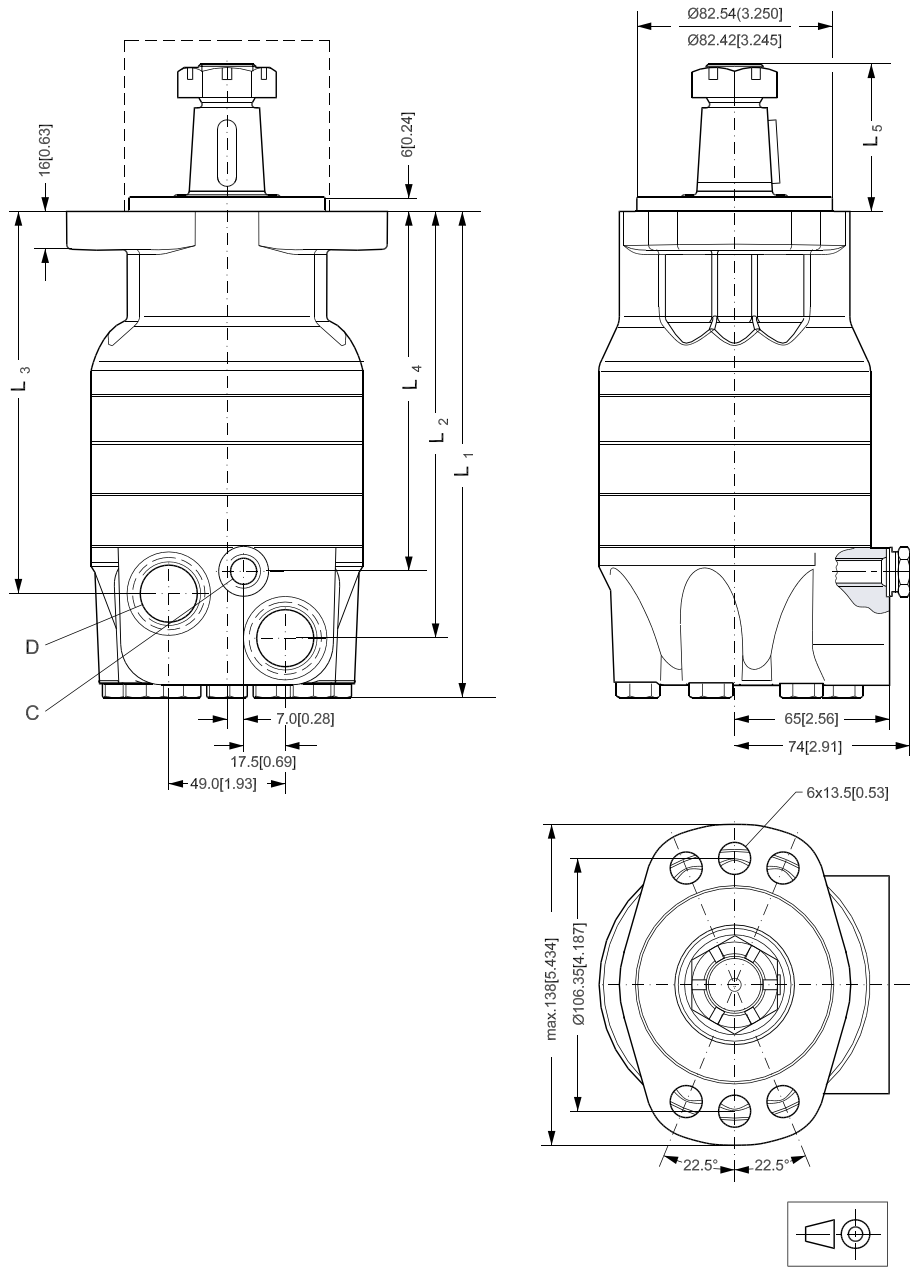


P301 689

C: UNF Drain/release port
F: 7/16 - 20 UNF o-ring boss port

Dimensions, US version, TMK with Magneto flange

TMK with Magneto flange



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C: Drain connection 7/16 - 20 UNF

D: 2 x 1 1/16 - 12 UN

-----Not Painted

Dimensions, US version, TMK with Magneto flange
Dimensions

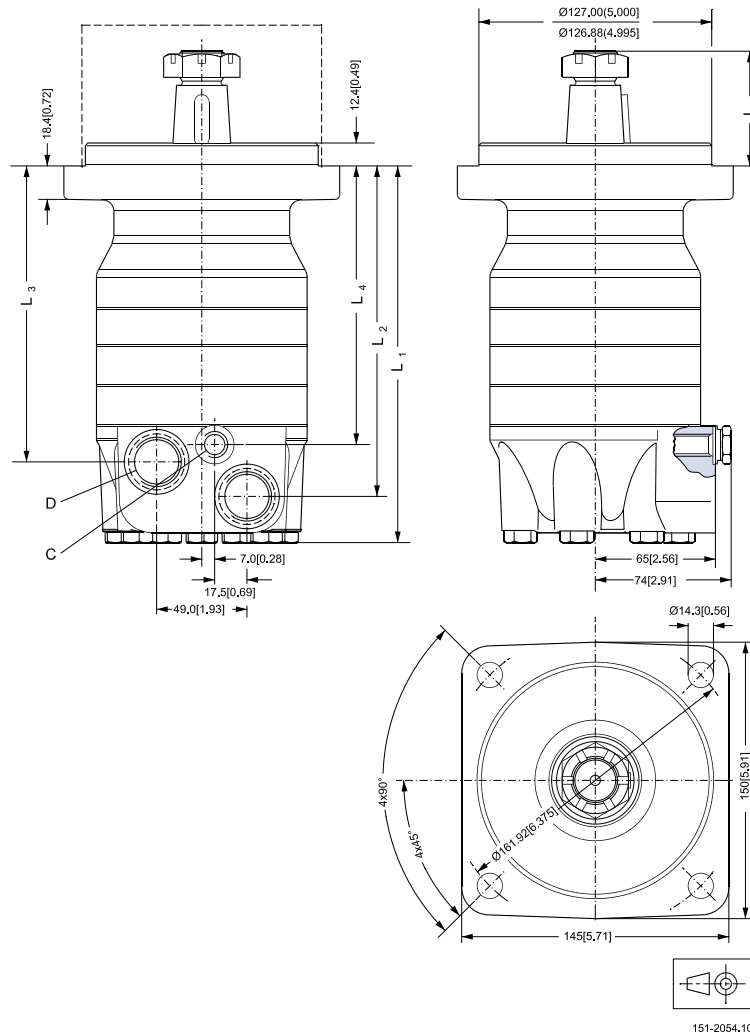
Type	L₁ mm [in]	L₂ mm [in]	L₃ mm [in]	L₄ mm [in]
TMK 160	204.6 [8.06]	179.6 [7.07]	160.8 [6.33]	151.4 [5.96]
TMK 200	210.6 [8.29]	185.6 [7.31]	166.8 [6.57]	157.4 [6.20]
TMK 250	217.6 [8.57]	192.6 [7.58]	176.8 [6.84]	164.4 [6.47]
TMK 315	226.3 [8.91]	201.3 [7.93]	182.5 [7.19]	173.1 [6.81]
TMK 400	237.6 [9.35]	212.6 [8.37]	193.8 [7.63]	184.4 [7.26]
TMK 470	247.8 [9.76]	222.8 [8.77]	204.0 [8.03]	194.6 [7.66]

Output shaft	L₅ mm [in]
Cyl. 1.25 in	58.8 [2.31]
Spl. 1.25 in	56.0 [2.20]
Tap. 1.25 in	62.0 [2.44]

The stated dimensions are without paint.

Dimensions, US version, TMK with SAE-C flange

TMK with SAE-C flange



C: Drain connection 7/16 - 20 UNF

D: 2 x 1 1/16 - 12 UN

-----Not Painted

Dimensions

Type	L ₁ mm [in]	L ₂ mm [in]	L ₃ mm [in]	L ₄ mm [in]
TMK 160	204.6 [8.06]	179.6 [7.07]	160.8 [6.33]	151.4 [5.96]
TMK 200	210.6 [8.29]	185.6 [7.31]	166.8 [6.57]	157.4 [6.20]
TMK 250	217.6 [8.57]	192.6 [7.58]	176.8 [6.84]	164.4 [6.47]
TMK 315	226.3 [8.91]	201.3 [7.93]	182.5 [7.19]	173.1 [6.81]

Dimensions, US version, TMK with SAE-C flange

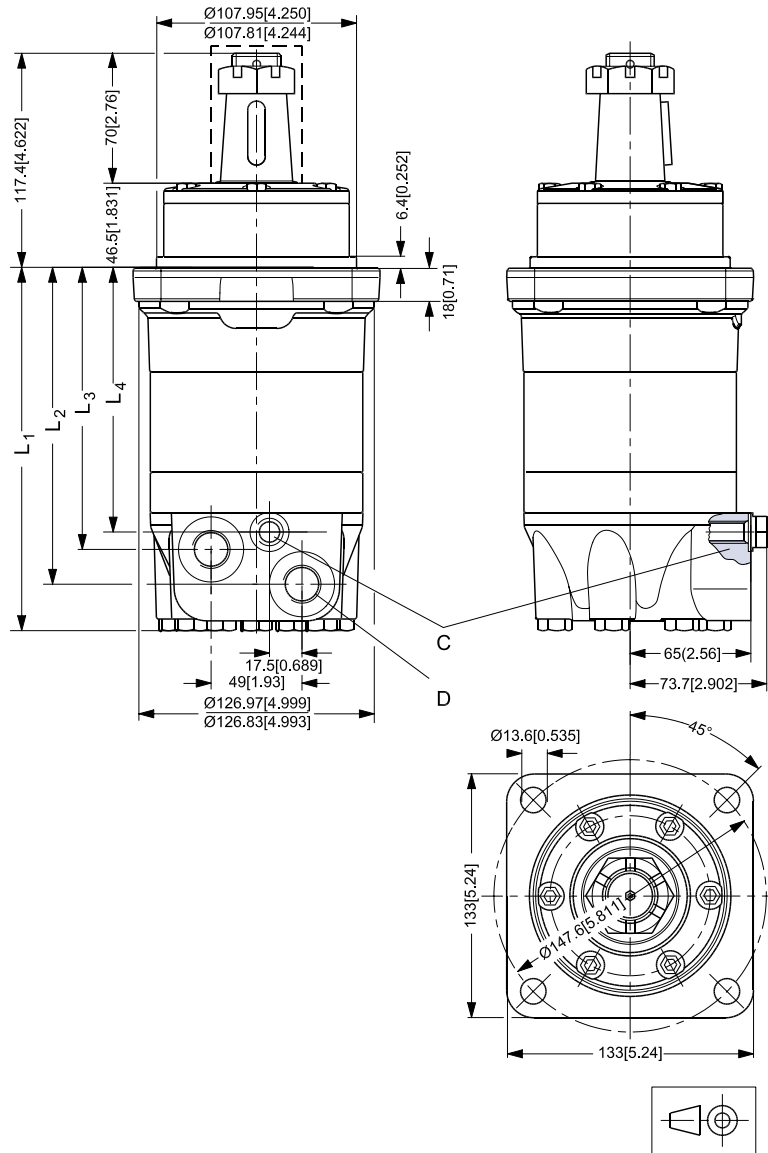
Type	L ₁ mm [in]	L ₂ mm [in]	L ₃ mm [in]	L ₄ mm [in]
TMK 400	237.6 [9.35]	212.6 [8.37]	193.8 [7.63]	184.4 [7.26]
TMK 470	247.8 [9.76]	222.8 [8.77]	204.0 [8.03]	194.6 [7.66]

Output shaft	L ₅ mm [in]
Cyl. 1.25 in	59.0 [2.32]
Spl. 1.25 in	56.3 [2.22]
Tap. 1.25 in	62.2 [2.45]
Tap.1.5 in	74.8 [2.94]
Tap. 1.625 in	84.3 [3.32]

The stated dimensions are without paint

Dimension, US version TMKW with side port

TMKW with side port and drain connection



151-1993.11

C: Drain connection 7/16 - 20 UNF

D: 2 x 1 1/16 - 12 UN

-----Not Painted

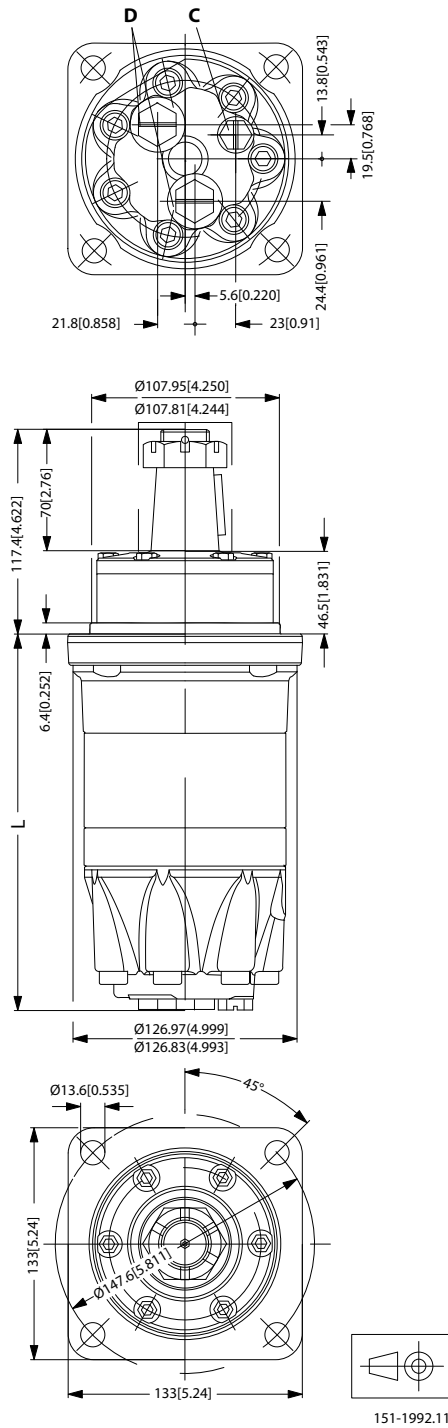
Dimension, US version TMKW with side port***Dimensions***

Type	L₁ mm [in]	L₂ mm [in]	L₃ mm [in]	L₄ mm [in]
TMKW 160	164.7 [6.48]	139.3 [5.48]	120.3 [4.74]	110.8 [4.36]
TMKW 200	170.7 [6.72]	145.3 [5.72]	126.3 [4.97]	116.8 [4.60]
TMKW 250	177.7 [7.00]	152.3 [6.00]	133.3 [5.25]	123.8 [4.87]
TMKW 315	186.4 [7.34]	161.0 [6.34]	142.0 [5.59]	132.5 [5.22]
TMKW 400	197.7 [7.78]	172.3 [6.78]	153.3 [6.00]	143.8 [5.66]
TMKW 470	207.9 [8.19]	182.5 [7.19]	163.5 [6.44]	154.0 [6.06]

The stated dimensions are without paint

Dimension, US version, TMKW with end port

TMKW with end port and drain connection



C: Drain connection

7/16 - 20 UNF

D: 2 x 7/8 - 14 UNF

-----Not Painted

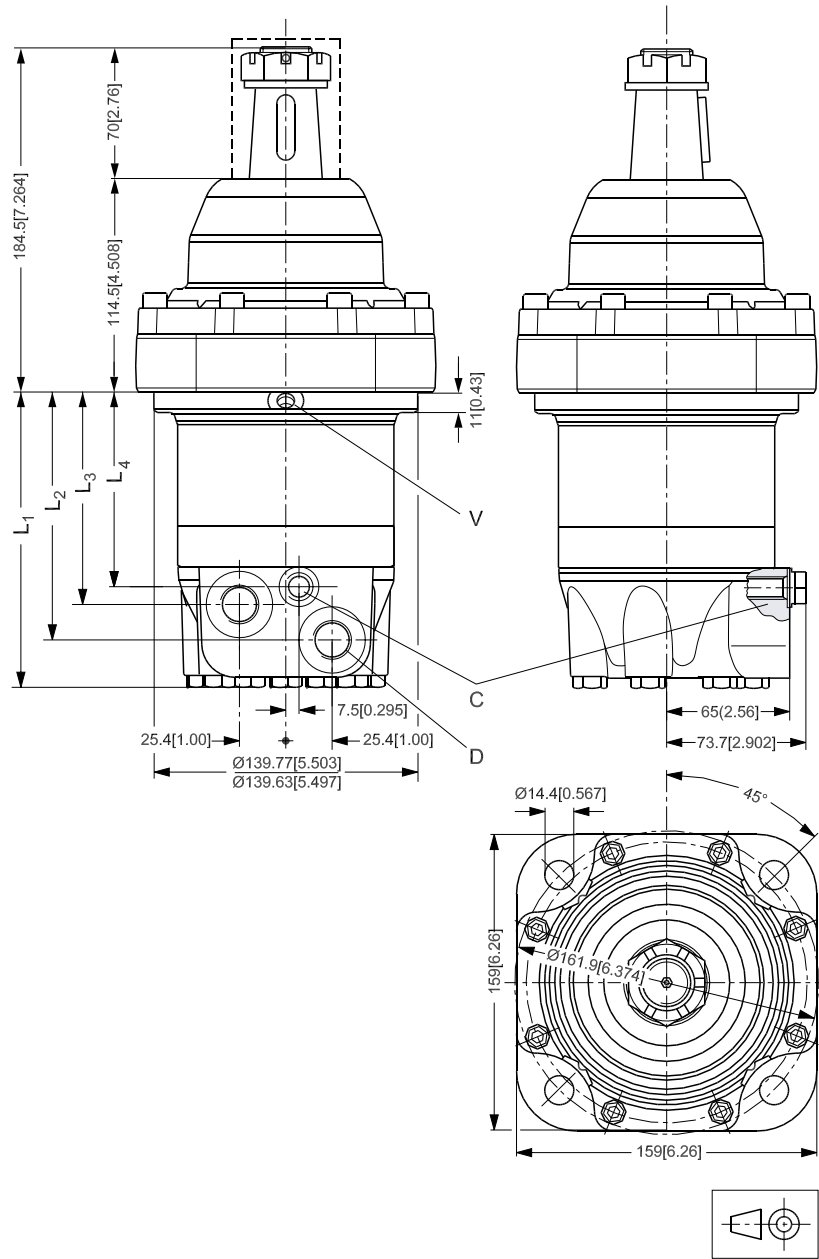
Dimension, US version, TMKW with end port***Dimensions***

Type	L mm [in]
TMKW 160	183.5 [7.2]
TMKW 200	189.5 [7.46]
TMKW 250	196.5 [7.74]
TMKW 315	205.2 [8.08]
TMKW 400	216.5 [8.52]
TMKW 470	226.7 [8.93]

The stated dimensions are without paint

Dimension, US version, TMK FL with side port

TMK FL with side port and drain connection



151-1994.12

C: Drain connection and brake release port 7/16 - 20 UNF

D: 2 x 1 1/16 - 12 UN

V: Vent port 7/16 - 20 UNF

-----Not Painted

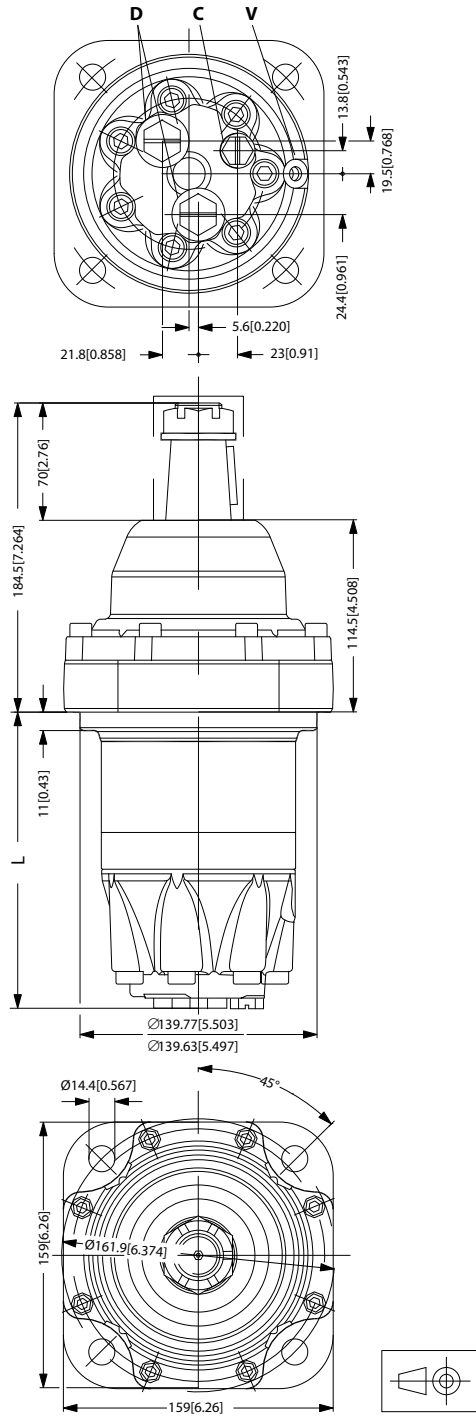
Dimension, US version, TMK FL with side port***Dimensions***

Type	L₁ mm [in]	L₂ mm [in]	L₃ mm [in]	L₄ mm [in]
TMK FL 160	125.2 [4.18]	100.2 [3.43]	81.2 [3.06]	71.2 [4.93]
TMK FL 200	131.2 [5.17]	106.2 [4.18]	87.2 [3.43]	77.7 [3.06]
TMK FL 250	138.2 [5.44]	113.2 [4.46]	94.2 [3.70]	84.7 [33.3]
TMK FL 315	146.9 [5.78]	121.9 [4.80]	102.9 [4.05]	93.4 [3.68]
TMK FL 400	158.2 [6.23]	133.2 [5.24]	114.2 [4.50]	104.7 [4.12]
TMK FL 470	168.4 [6.63]	143.4 [5.65]	124.4 [4.90]	114.9 [4.52]

The stated dimensions are without paint.

Dimension, US version, TMK FL with end port

TMK FL with end port and drain connection



151-1991.12

C: Drain connection and brake release port 7/16 - 20 UNF

D: 2 x 7/8 - 14 UNF

V: Vent port 7/16 - 20 UNF

-----Not Painted

Dimension, US version, TMK FL with end port***Dimensions***

Type	L mm [in]
TMK FL 160	144.0 [5.67]
TMK FL 200	150.0 [5.91]
TMK FL 250	157.0 [6.18]
TMK FL 315	165.7 [6.52]
TMK FL 400	177.0 [6.97]
TMK FL 470	187.2 [7.37]

The stated dimensions are without paint.

Weight
Weight of Orbital Motors

Code no	Weight kg [lb]	Code no	Weight kg [lb]
151F6010	16.0 [35.3]	151F6090	16.9 [37.2]
151F6011	16.5 [36.4]	151F6091	17.4 [38.3]
151F6012	17.0 [37.5]	151F6092	17.9 [39.4]
151F6013	17.5 [38.6]	151F6093	18.4 [40.5]
151F6014	18.0 [39.7]	151F6094	18.9 [41.6]
151F6015	18.5 [40.8]	151F6095	19.4 [42.7]
151F6030	16.0 [35.3]	151F6120	16.5 [36.5]
151F6031	16.5 [36.4]	151F6121	17.0 [37.6]
151F6032	17.0 [37.5]	151F6122	17.5 [38.7]
151F6033	17.5 [38.6]	151F6123	18.0 [39.8]
151F6034	18.0 [39.7]	151F6124	18.5 [40.9]
151F6035	18.5 [40.8]	151F6125	19.0 [42.0]
151F6050	14.0 [30.9]	151F6130	16.7 [36.7]
151F6051	14.5 [32.0]	151F6131	17.2 [37.8]
151F6052	15.0 [33.1]	151F6132	17.7 [38.9]
151F6053	15.5 [34.2]	151F6133	18.2 [40.0]
151F6054	16.0 [35.3]	151F6134	18.7 [41.1]
151F6055	16.5 [36.4]	151F6135	19.2 [42.2]
151F6060	14.1 [31.2]	151F6140	16.7 [36.8]
151F6061	14.6 [32.3]	151F6141	17.2 [37.9]
151F6062	15.1 [33.4]	151F6142	17.7 [39.0]
151F6063	15.6 [34.5]	151F6143	18.2 [40.1]
151F6064	16.1 [35.6]	151F6144	18.7 [41.2]
151F6065	16.6 [36.7]	151F6145	19.2 [42.3]
151F6070	14.2 [31.2]	11008903	19.5 [43.0]
151F6071	14.7 [32.3]	11008904	20.0 [44.1]
151F6072	15.2 [33.3]	11008905	20.5 [45.2]
151F6073	15.7 [34.5]	11008906	21.0 [46.3]
151F6074	16.2 [35.6]	11008907	21.5 [47.4]
151F6075	16.7 [36.7]	11008908	22.0 [48.5]
151F6080	17.2 [37.9]	11008909	19.5 [43.0]
151F6081	17.7 [39.0]	11008910	20.0 [44.1]
151F6082	18.2 [40.1]	11008911	20.5 [45.2]
151F6083	18.7 [41.2]	11008912	21.0 [46.3]
151F6084	19.2 [42.3]	11008913	21.5 [47.4]
151F6085	19.7 [43.4]	11008914	22.0 [48.5]



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