Danfoss OMT EMD 160 11106121 orbital hydraulic motor

Manufacturer: Danfoss

Manufacturer part number / published order designation: 11106121

Published model: 11106121

About this compilation

Prepared by Hydmaster from selected manufacturer documentation. Original technical pages follow without cropped drawings, rewritten data or altered units. This cover and index are Hydmaster editorial material, not a manufacturer-issued exact-execution datasheet.

Coverage: selected pages relevant to the identified size and configuration. Other options or neighbouring models retained on an original page apply only where explicitly identified.

Execution notes and conditions

Factory article identity is verified on the current manufacturer page; the original technical-document editions are retained.

Representative series photograph; sensor and rear-interface arrangement may differ.

Separate catalogue limits; verify shaft loading, drain pressure and the size-specific operating point.

The motor is sensor-ready. The EMD speed sensor is ordered separately; no sensor output mode is included by this motor article.

Factory model code: OMT-0160-A-NN-G21-AD-1D-A31-A-A-1B-1-N-AA-NNNNN-NN-NN-NN-SP-NNN

Source-page index

Source page numbers below are physical pages of each complete original PDF. The original printed page labels and technical content remain unchanged. Compiled page numbers count this cover/index.

Source A: Danfoss OMT and OMV - October 2024

Original pages	Compiled pages	Relevant content
7-8	2-3	OMT EMD 160 applicable original technical data, execution, conditions or interface
10-13	4-7	OMT EMD 160 applicable original technical data, execution, conditions or interface
15	8	OMT EMD 160 applicable original technical data, execution, conditions or interface
18	9	OMT EMD 160 applicable original technical data, execution, conditions or interface
21	10	OMT EMD 160 applicable original technical data, execution, conditions or interface

Source B: Danfoss Orbital Motor EMD Speed Sensor - June 2021

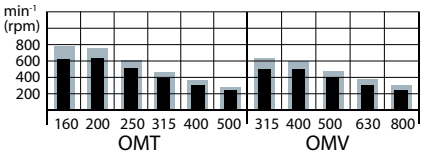
Supplemental stage/component reference; not a complete assembly drawing.

Original pages	Compiled pages	Relevant content
4	11	OMT EMD 160 applicable original technical data, execution, conditions or interface
6	12	OMT EMD 160 applicable original technical data, execution, conditions or interface
12-14	13-15	OMT EMD 160 applicable original technical data, execution, conditions or interface

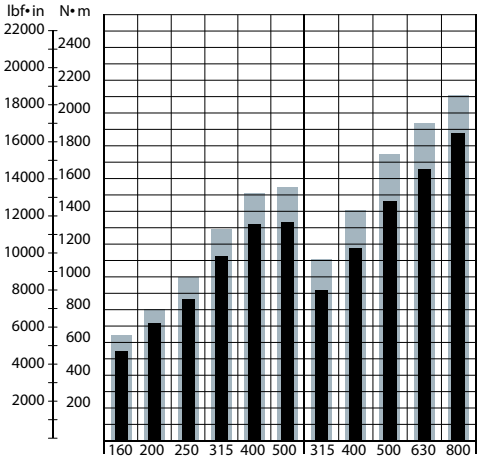
Orbital motors

Speed, torque, and output

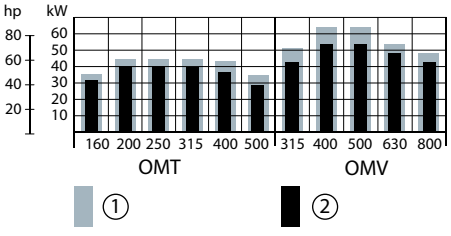
Maximum speed



Maximum torque



Maximum output



1. Intermittend values
2. Continuous values

The bar diagrams above are useful for a quick selection of relevant motor size for the application. The final motor size can be determined by using the function diagram for each motor size: see *OMT Function diagrams* on page 15, or *OMV function diagrams* on page 44.

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].

OMT

Versions

OMT versions

Mounting flange	Shaft	Port size	European version	US version	Drain connection	Check valve	Low pressure release	High pressure release	Main type designation
Standard flange	Cyl. 40 mm	G 3/4	X		Yes	Yes			OMT
	Cyl. 1.5 in	1 1/16-12 UN		X	Yes	Yes			OMT
	Splined 1.5 in	G 3/4	X		Yes	Yes			OMT
		1 1/16-12 UN		X	Yes	Yes			OMT
	Tapered 45 mm	G 3/4	X		Yes	Yes			OMT
	Tapered 1.75 in	1 1/16-12 UN		X	Yes	Yes			OMT
	P.t.o.	G 3/4	X		Yes	Yes			OMT
Wheel	Cyl. 40 mm	G 3/4	X		Yes	Yes			OMTW
	Tapered 45 mm	G 3/4	X		Yes	Yes			OMTW
	Tapered 1.75 in	1 1/16-12 UN		X	Yes	Yes			OMTW
Brake-wheel	Wheel bolt flange	G 3/4	X		Yes	No	X		OMT FX
	Thread hole flange	G 3/4	X		Yes	No	X		OMT FX
Brake-standard	Cyl. 40 mm	G 3/4	X		Yes	No	X		OMT FL
	Splined 1.5 in	G 3/4	X		Yes	No	X		OMT FL
	Cyl. 40 mm	G 3/4	X		Yes	No		X	OMT FH
	Splined 1.5 in	G 3/4	X		Yes	No		X	OMT FH
Short	No output shaft	G 3/4	X		Yes	Yes			OMTS

Features

Features available (options):

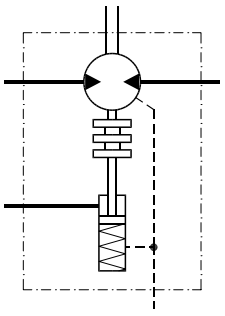
- Speed sensor
- Motor with tacho connection
- Viton shaft seal
- Painted
- Ultra short

Code numbers

OMT code numbers

Code Numbers	Displacement [cm^3]					
	160	**200**	**250**	**315**	**400**	**500**
151B	3000	3001	3002	3003	3004	3005
151B	2050	2051	2052	2053	2054	2055
151B	3006	3007	3008	3009	3010	3011
151B	2056	2057	2058	2059	2060	2061
151B	3012	3013	3014	3015	3016	3017
151B	2062	2063	2064	2065	2066	2067

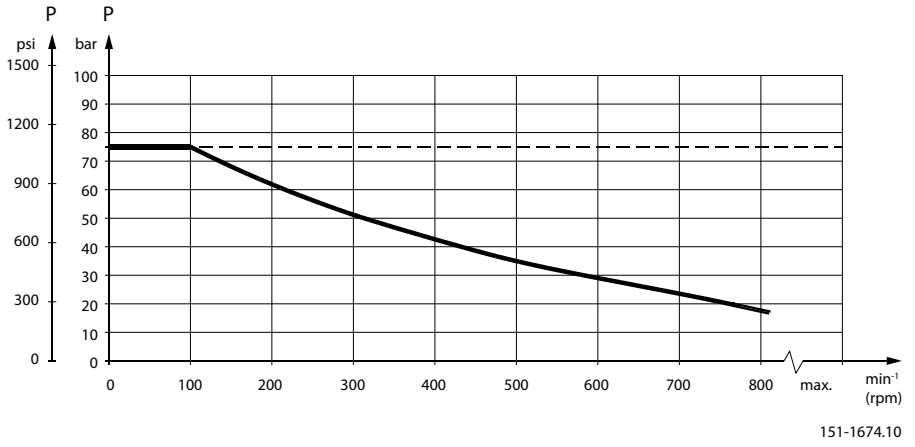
OMT



Motor with check valves and with drain connection

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

Maximum return pressure without drain line or maximum pressure in the drain line



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

——— Continuous operation

OMT, OMTW, OMTS, OMT FX OMT FL and OMT FH

Technical data for OMT, OMTW, OMTS, OMT FX OMT FL and OMT FH

Type			**OMT OMTW OMTS OMT FX OMT FL OMT FH**	**OMT OMTW OMTS OMT FX OMT FL OMT FH**	**OMT OMTW OMTS OMT FX OMT FL OMT FH**	**OMT OMTW OMTS OMT FX OMT FL OMT FH**	**OMT OMTW OMTS OMT FX OMT FL OMT FH**	**OMT OMTW OMTS OMT FX OMT FL OMT FH**
Motor size			**160**	**200**	**250**	**315**	**400**	**500**
Geometric displacement	cm^3 [in^3]		161.1 [9.83]	201.4 [12.29]	251.8 [15.37]	326.3 [19.91]	410.9 [25.07]	523.6 [31.95]
Maximum speed	min^{-1} [rpm]	cont.	625	625	500	380	305	240
		int[1)]	780	750	600	460	365	285
Maximum torque	Nm [lbf·in]	cont.	470 [4160]	590 [5220]	730 [6460]	950 [8410]	1080 [9560]	1220 [10800]
		int.[1)]	560 [4960]	710 [6280]	880 [7790]	1140 [10090]	1260 [11150]	1370 [12130]

OMT

Technical data for OMT, OMTW, OMTS, OMT FX OMT FL and OMT FH (continued)

Type			**OMT OMTW OMTS OMT FX OMT FL OMT FH**	**OMT OMTW OMTS OMT FX OMT FL OMT FH**	**OMT OMTW OMTS OMT FX OMT FL OMT FH**	**OMT OMTW OMTS OMT FX OMT FL OMT FH**	**OMT OMTW OMTS OMT FX OMT FL OMT FH**	**OMT OMTW OMTS OMT FX OMT FL OMT FH**
Motor size			**160**	**200**	**250**	**315**	**400**	**500**
Maximum output	kW [hp]	cont.	26.5 [35.5]	33.5 [44.9]	33.5 [44.9]	33.5 [44.9]	30.0 [40.2]	26.5 [35.5]
		int.[1)]	32.0 [42.9]	40.0 [53.6]	40.0 [53.6]	40.0 [53.6]	35.0 [46.9]	30.0 [40.2]
Maximum pressure drop	bar [psi]	cont.	200 [2900]	200 [2900]	200 [2900]	200 [2900]	180 [2610]	160 [2320]
		int.[1)]	240 [3480]	240 [3480]	240 [3480]	240 [3480]	210 [3050]	180 [2610]
		peak[2)]	280 [4060]	280 [4060]	280 [4060]	280 [4060]	240 [3480]	210 [3050]
Maximum oil flow	l/min [USgal/min]	cont.	100 [26.4]	125 [33.0]	125 [33.0]	125 [33.0]	125 [33.0]	125 [33.0]
		int.[1)]	125 [33.0]	150 [39.6]	150 [39.6]	150 [39.6]	150 [39.6]	150 [39.6]
Maximum starting pressure with unloaded shaft	bar [psi]		10 [145]	10 [145]	10 [145]	10 [145]	10 [145]	10 [145]
Minimum starting torque	at maximum pressure drop cont. Nm [lbf·in]		200 [2900]	200 [2900]	200 [2900]	200 [2900]	180 [2610]	160 [2320]
	at maximum pressure drop int.[1)] Nm [lbf·in]		240 [3480]	240 [3480]	240 [3480]	240 [3480]	210 [3050]	180 [2610]

[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 maximum permissible combination of flow and pressure, see function diagram for actual motor.

Type			**Maximum inlet pressure**	**Maximum return pressure with drain line**
OMT, OMTW, OMTS, OMT FX, OMT FL, OMT FH	bar [psi]	cont.	210 [3050]	140 [2030]
	bar [psi]	int.[1)]	250 [3630]	175 [2540]
	bar [psi]	peak[2)]	300 [4350]	210 [3050]

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

[2)] Peak load: The permissible values may occur for maximum 1% of every minute.

Brake motors

Type	**Maximum pressure in drain line[3)]**	**Holding torque[4)]**	**Brake-release pressure[3)]**	**Maximum pressure in brake line**
OMT FX, OMT FL	5 bar [70 psi]	1200 Nm [10620 lbf·in]	12 bar [170 psi]	30 bar [440 psi]
OMT FH	5 bar [70 psi]	1200 Nm [10620 lbf·in]	30 bar [440 psi]	280 bar [4060 psi]

[3)] Brake motors must always have a drain line. The brake-release pressure is the difference between the pressure in the brake line and the pressure in the drain line.

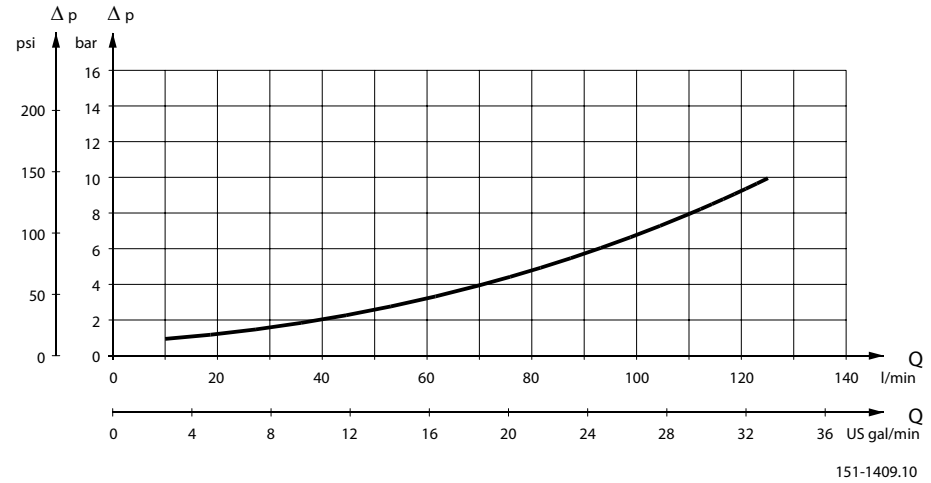
[4)] For the supply of motors with holding torques higher than those stated, please contact the Danfoss sales organization.

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

OMT

Pressure drop in motor

OMT 160, 200, 250, 315, 400, 500 pressure drop



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

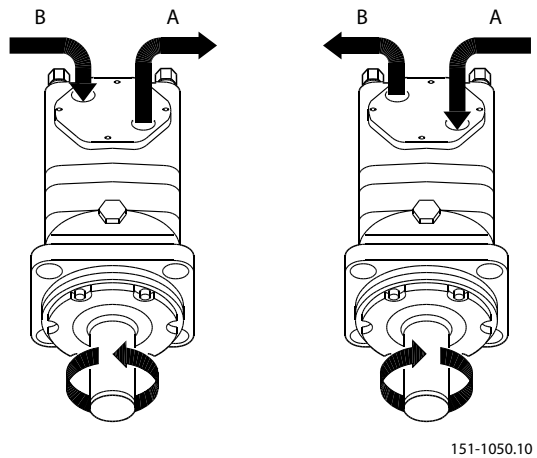
Oil flow in drain line

Maximum oil flow in the drain line at a return pressure less than 5-10 bar [75-150 psi]

Pressure drop		Viscosity		Oil flow in drain line	
bar	**[psi]**	**mm^2/s**	**[SUS]**	**l/min**	**[US gal/min]**
140	[2030]	20	[100]	2.5	[0.66]
		35	[165]	1.5	[0.40]
210	[3050]	20	[100]	5.0	[1.32]
		35	[165]	3.0	[0.79]

OMT direction of shaft rotation

Standard rotation



OMT

Permissible shaft loads for OMT

Shaft load and bearing life time

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.

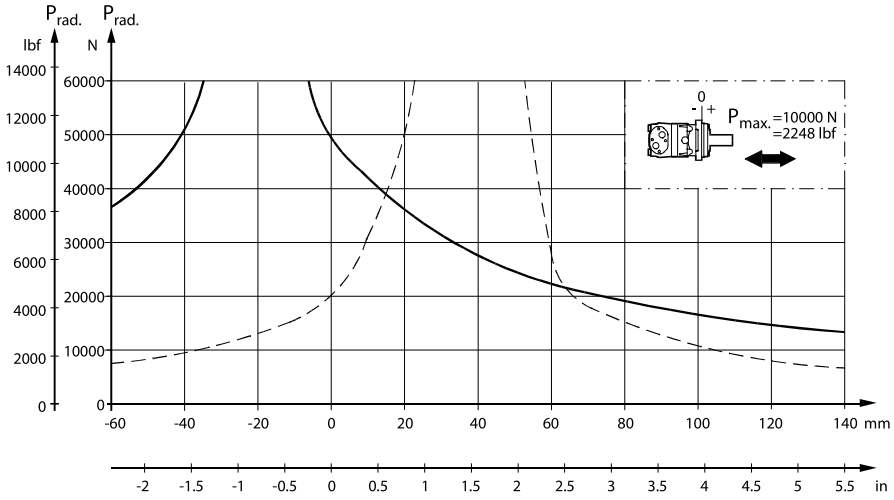
The curves are based on B10 bearing life (2000 hours or 12,000,000 shaft revolutions at 100 min^{-1}) at rated output torque, when mineral-based hydraulic oil with a sufficient content of anti-wear additives, is used.

For 3,000,000 shaft revolutions or 500 hours – increase these shaft loads with 52%.

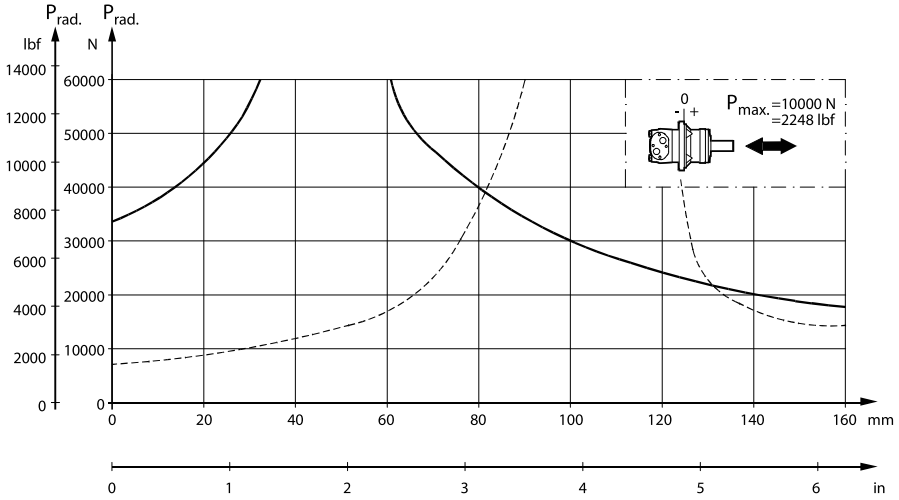
The dash curve shows max. radial shaft load. Any shaft load exceeding the values shown in the curve will involve a risk of breakage.

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**.

Standard mounting flange with all shaft types



Wheel mounting flange with all shaft types

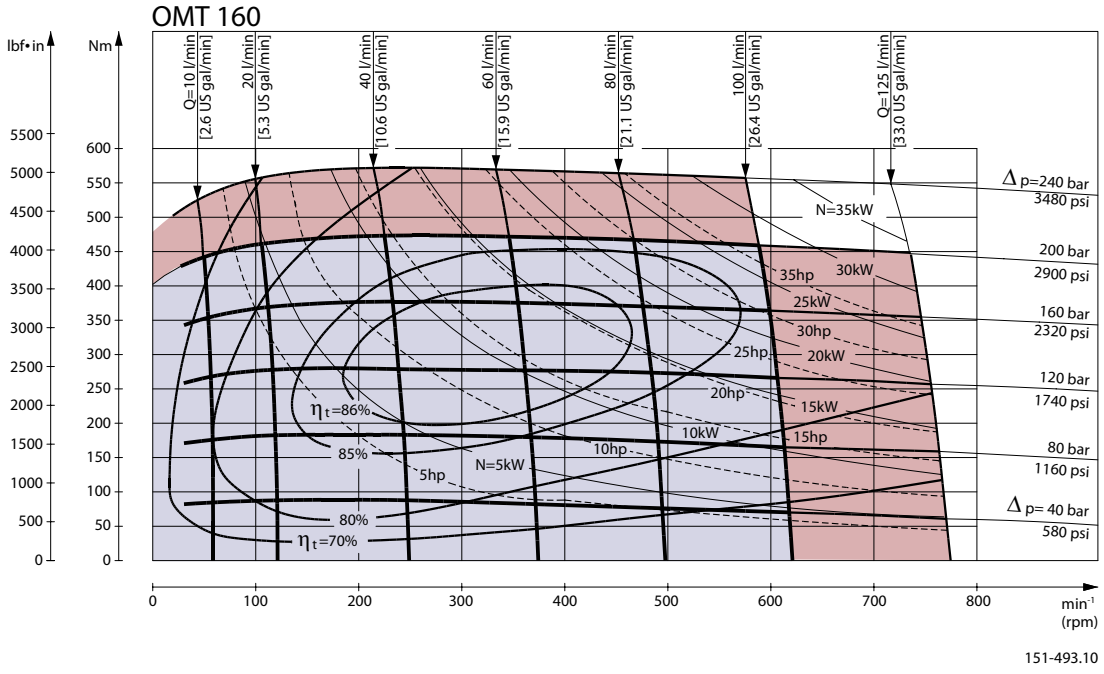


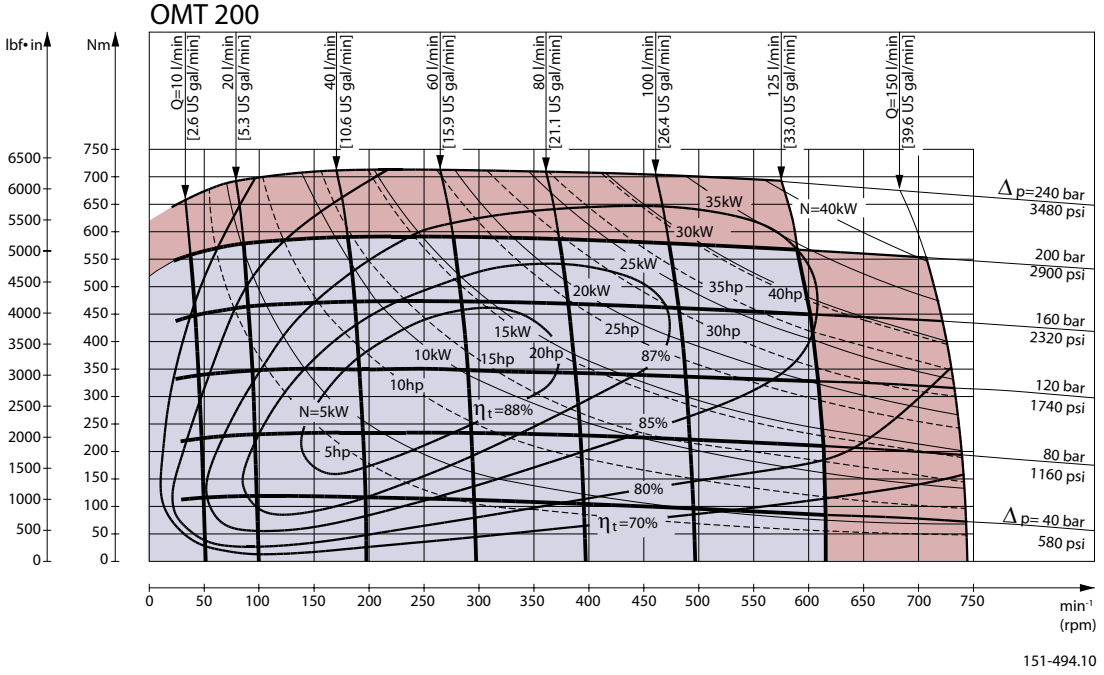
OMT

OMT Function diagrams

Continuous range

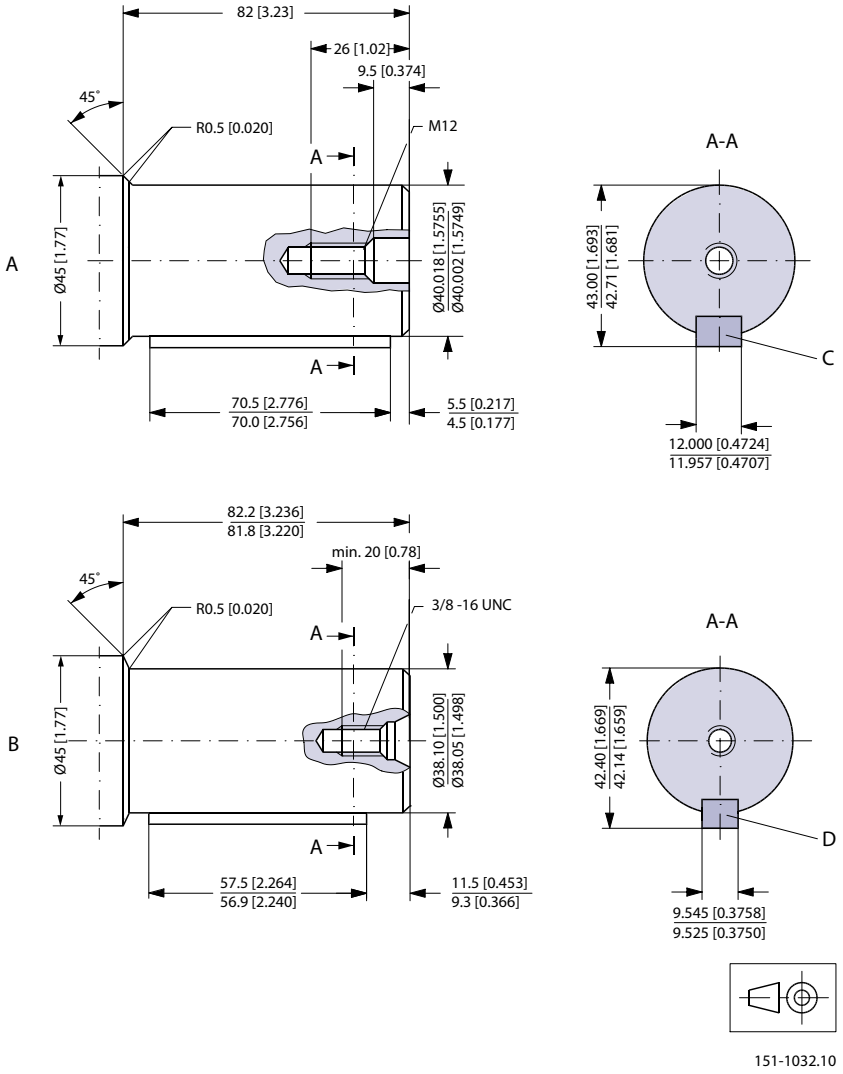
Intermittent range (maximum 10% operation every minute)





OMT

Shaft version



A Cylindrical 40 mm shaft

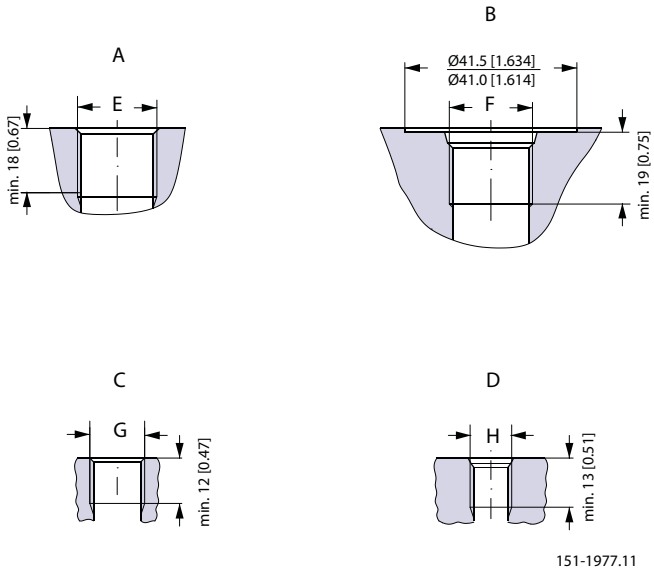
C Parallel key
A12 × 8 × 70
DIN 6885
Keyway deviates from standard

B Cylindrical 1.5 in shaft

D Parallel key
3/8 × 3/8 × 21/4 in
B.S. 46
Keyway deviates from standard

OMT

Port thread versions



A	G main ports	**B**	UN main ports
E	ISO 228/1 - G3/4 O-ring boss port	**F**	1 1/16 - 12 UN
C	G drain port	**D**	UNF drain port
G	G: ISO 228/1 - G1/4 O-ring boss port	**H**	9/16 - 18 UNF

Product overview

Description

Warning

Please note that the EMD speed sensor may fail. Output signals may not represent correct rotation speed or direction.

Any application of the EMD speed sensor should be subjected to appropriate hazard and risk assessment, according to relevant safety standards for the application.

Reliability data MTBF for the EMD speed sensor are available on request from your Danfoss representative.

Function of the speed sensor is to detect the shaft speed and the direction of rotation. The sensor is mounted to the endcover of a Danfoss orbital motor and senses the speed from a magnet that is rotating inside the motor. Because of the digital output signals for speed and direction and a non speed dependent output voltage level, the sensor is ideal for high and low speed measurements.

The speed sensor is designed for rugged outdoor, mobile or heavy industrial speed sensing applications. The detection of the speed is contactless. It is a “plug and perform” device that does not need any calibration or adjustments.

Mounting with a snap/click lock and can be adjusted in 36 different positions.

- Available for following LSHT-motors: OMT, OMV, TMK, TMT and TMV.
- Speed and Direction output.
- Highest resolution in the market.
- Sensor is not in contact with oil making it robust and exchangeable in the field.
- PLUS+1® Compliant

General data

EMD Speed Sensor specifications

Specifications:

Output signal *			**D1**	**D2**
	Pulse mode	Push-pull output. Direction = CCW: high, CW: low Configurable up to 180 pulse/revolutions	Square Wave	Direction
	Quadrature mode	2 channels with 90° phaseshift each with 90 pulses/revolution Push-pull output	Square Wave Phase A	Square Wave Phase B
	CAN mode	Supports CAN 2.0B with SAE J1939 Message Protocol with Proprietary Messages		
		Baudrate: 250 kbaud (fixed)		
		Shaft velocity: ± 2500 rpm		
Speed range		0 - 2500 rpm		
Supply voltage		9 - 36 Vdc		
Maximum power		0.8 W		
Temperature range (ambient)		-30 °C to 60 °C		
EMC-Immunity (EMI):		100 V/m ISO 13766		
Grade of enclosure †		IP 69 K		
Vibration		30 G (294 m/s^2)		
Shock		50 G (490 m/s^2)		

* Configurable with PLUS+1® Service Tool - Please contact Danfoss for further information.

† According to IEC 529.

EMD speed sensor ordering information

Standard sensor

Part number	**Output**	**Parameter**	**Default setting**
11094003	Pulse mode	Pulse/rev (PPR)	180
11101202	Quadrature mode	2 channels 90° phaseshift	90 *
11101205	CAN mode	Node address	0x51 †
		Message transmission rate	50 ms
11114575	OEM configurable sensor	Pulse/rev (PPR)	180

* Fixed setting. Can not be changed

† Hexadecimal

Special sensor

Part number	**Output**	**Parameter**	**Default setting**
11101189	Compatibility mode OMT	Pulse/rev (PPR)	84
11101191	Compatibility mode OMV	Pulse/rev (PPR)	102
11101204	Compatibility mode TMK	Pulse/rev (PPR)	70

If product is not seen in this table refer to Technical Information of the specific product.

Order information

Orbital Motor prepared for EMD speed sensor is to be order separately. See *OMT EMD and OMV EMD versions* on page 12.

If you need TMK, TMT or TMV motors with EMD Speed Sensor, please contact Danfoss

Version and code numbers

OMT EMD and OMV EMD versions

Versions

Mounting flange	Spigot diameter	Bolt circle diam. (BC)	Shaft	Port size	Version		Side port version	Standard shaft seal	Drain connection	Check valve	Main type designation	Conf. code
					EU	US						
OMT EMD Motors												
Standard flange	∅125 mm	∅160 mm	Cyl. 40 mm	G 3/4	X		X	X	X	X	OMT EMD	1
	∅5 in	∅6.38	Cyl. 1.5 in	11/16 - 12 UN		X	X	X	X	X	OMT EMD	2
OMV EMD Motors												
Standard flange	∅160 mm	∅200 mm	Cyl. 50 mm	G 1	X		X	X	X	X	OMV EMD	3

Please contact Danfoss if a TMK, TMT, or TMV motor with EMD Speed Sensor is needed.

Code numbers

Displacements	Config. code		
	OMT EMD Motors		OMV EMD Motors
	1	2	3
160	11106121	11113705	
200	11106122	11113706	
250	11106123	11113707	
315	11095277	11113708	11106132
400	11106124	11113709	11106133
500	11106125	11113710	11095278
630			11106134
800			11106135

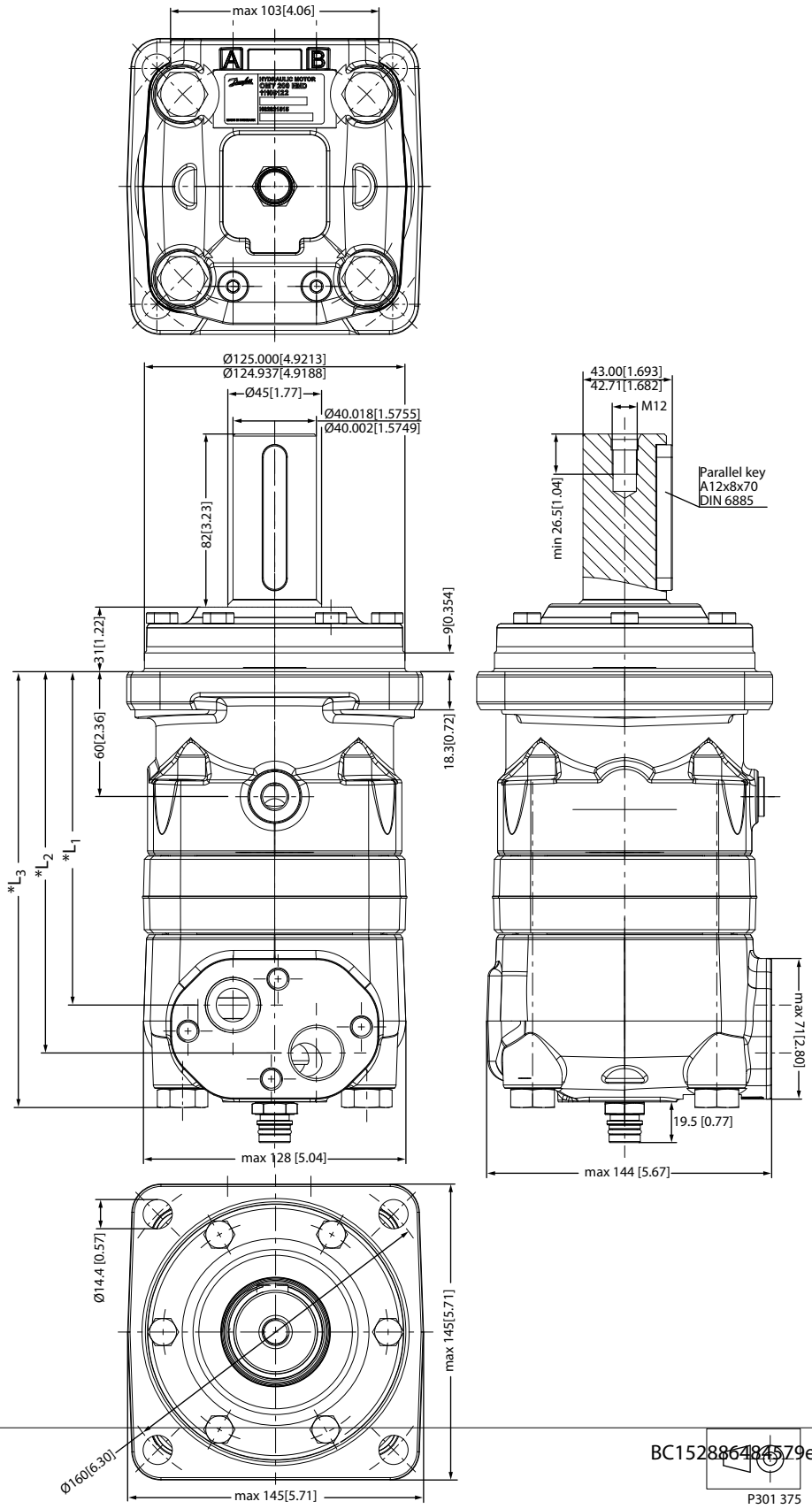
Order information

Orbital Motor prepared for EMD Speed Sensor is to be order separately. See *EMD speed sensor ordering information* on page 6.

Dimensions, European version, OMT EMD

OMT - European version

OMT EMD



Dimensions, European version, OMT EMD

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

D: M10; 10 mm [0.39 in] deep

E: G 3/4; 17 mm [0.67 in] deep

Type		OMT 160 EMD	OMT 200 EMD	OMT 250 EMD	OMT 315 EMD	OMT 400 EMD	OMT 500 EMD
$*L_1$	mm [in]	140.0 [5.51]	145.0 [5.70]	151.3 [5.96]	160.5 [6.32]	171.0 [6.73]	185.0 [7.28]
$*L_2$	mm [in]	163.0 [6.42]	168.0 [6.61]	174.3 [6.86]	183.5 [7.22]	194.0 [7.64]	208.0 [8.19]
$*L_3$	mm [in]	192.2 [7.57]	197.2 [7.76]	203.5 [8.01]	212.7 [8.37]	223.2 [8.79]	237.2 [9.34]