

ENGINEERING
TOMORROW



Technical Information

Orbital Motors with Speed Sensor



Revision history

Table of revisions

Date	Changed	Rev
June 2021	Changed document number from '520L0830' to 'BC152886483462' and removed obsolete motors	0401
June 2015	Removed some code numbers	0201
November 2014	Converted to Danfoss layout - DITA CMS	CA
November 2012	First edition	BF

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A wide range of Orbital Motors

A Wide Range of Hydraulic Motors

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

The motors vary in size (rated displacement) from 25 cm³ [1.5 in³] to 800 cm³ [48.9 in³] per revolution.

Speeds range up to approx. 1700 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 12 kW [16.1 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

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
- 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

Survey of Literature with Technical Data on Danfoss Hydraulic Motors

Detailed data on all Danfoss motors can be found in our motor catalogue, which is divided into 5 individual subcatalogues:

- General information on Danfoss hydraulic motors: function, use, selection of hydraulic motor, hydraulic systems, etc.
- Technical data on large motors: OMT and OMV
- Technical data on large motors: TMK
- Technical data on large motors: TMT
- Technical data on large motors: TMVW

Data survey

Introduction

Danfoss has developed a speed sensor specially designed for LSHT motors.

The electric output signal is a standard voltage signal that can be used for regulating the speed motor.

Principle

The speed is measured by a sensor in accordance with the Hall principle. Signal processing and amplification are performed in the sensor housing. A connection is provided in the housing for a Binder Series 713 plug or a plug with 5 metres of cable (available from Danfoss). The sensor can also be supplied with 2 metres molded in cable.

Advantages

- Robust design
- CE-marked
- Fulfils EMC requirements of EN50081 and EN50082
- Large frequency range, precise regulation
- No limit on motor performance when compared to corresponding motors without speed sensor
- IEC 529 degree of protection: IP 67
- Replacable transducer
- Standard speed signal
- Easy installation
- Electronic signal processing and amplification integrated in the sensor's housing and requiring no maintenance.

Typical Applications

- Speed indication
- Setting tightening speed in machine tools
- Extend/retract positioning of work platforms
- Granulate metering on injection moulding machines
- Conveyor speed regulation
- Metering on salt spreaders

Versions OMT EM and OMV EM

Versions

Mounting flange	Spigot diameter	Bolt circle diameter (BC)	Shaft	Port size	European version - delivered with sensor for plug connector (PNP version)	US version - delivered with sensor with 2 m moduled in cable (PNP version)	Side port version	Standard shaft seal	Drain connection	Check valve	Main type designation
OMT EM Motors											
Standard flange	Ø125 mm	Ø160 mm	Cyl. 40 mm	G 3/4	X		X	X	Yes	Yes	OMT EM
	Ø5 in	Ø6.38	Cyl. 1.5 in	11/16 - 12 UN		☒	X	X	Yes	Yes	OMT EM
OMV EM Motors											
Standard flange	Ø160 mm	Ø200 mm	Cyl. 50 mm	G 1	X		X	X	Yes	Yes	OMV EM

Features available:

Motors in european version: Speed sensor with 2 metres of molded in cable.

Motors in US versions: Speed sensor for plug connection.

Speed sensor for plug connector in NPN version.

[The standard speed sensor is a PNP version](#)

Code Numbers OMT EM and OMV EM

Code number

Code numbers	Displacements										
	80	100	125	160	200	250	315	400	500	630	800
OMT EM Motors											
151B	-	-	-	3260	3261	3262	3263	3264	3265	-	-
151B	-	-	-	3700	3701	3702	3703	3704	3705	-	-
OMV EM Motors											
151B	-	-	-	-	-	-	3266	3267	3268	3269	3270

Ordering

Add the four digit prefix "151-" to the four digit numbers from the chart for complete code number.

Orders will not be accepted without the four digit prefix.

Technical Data OMT EM

Technical data for OMT EM

Type Motor size			OMT EM 160	OMT EM 200	OMT EM 250	OMT EM 315	OMT EM 400	OMT EM 500
Geometric displacements	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]
Max. speed	min ⁻¹ rpm	cont.	625	625	500	380	305	240
		int.	780	750	600	460	365	285
Max torque	Nm [lbf·in]	cont.	470 [4160]	590 [5220]	730 [6460]	950 [8410]	1080 [9560]	1220 [10800]
		int.	560 [4960]	710 [6280]	880 [7790]	1140 [10090]	1260 [11150]	1370 [12130]
Max. 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]
Max. 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]
Max. oil flow	l/min [US gal/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]
Max. starting pressure with unloaded shaft	bar [psi]		10 [145]	10 [145]	10 [145]	10 [145]	10 [145]	10 [145]
Min starting torque	Nm [lbf·in]	at max. press. drop cont.	340 [3010]	430 [3810]	530 [4690]	740 [6550]	840 [7430]	950 [8410]
		at max. press. drop int. ¹⁾	410 [3630]	520 [4600]	630 [5580]	890 [7880]	970 [8590]	1060 [9380]
Frequency	[Hz]	max.	1014	975	780	598	475	371

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.

Type		Max. inlet pressure	Max. return pressure with drain line
OMT EM	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 max. 10% of every minute.

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

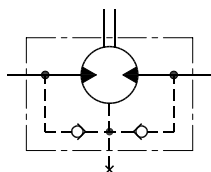
[For further technical specifications please see technical information for OMT and OMV \(BC152886483862\)](#)

Technical Data OMT EM

Max. Permissible Shaft Seal Pressure

OMT EM with check valves and without use of drain connection:

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

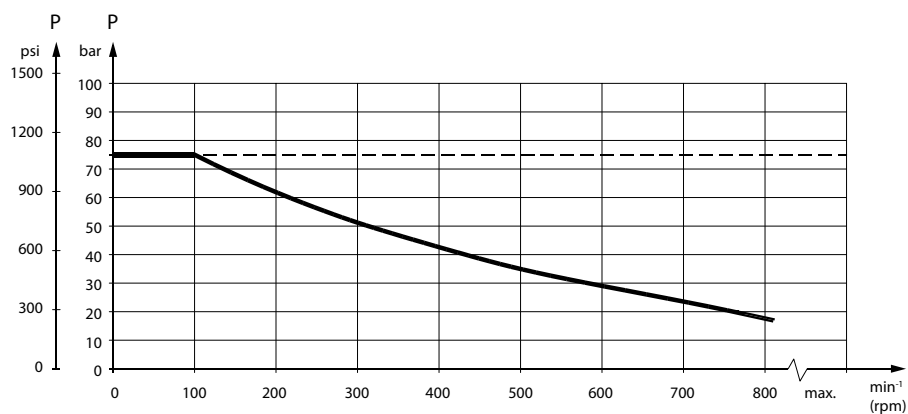


151-320.10

OMT EM with check valves and with 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

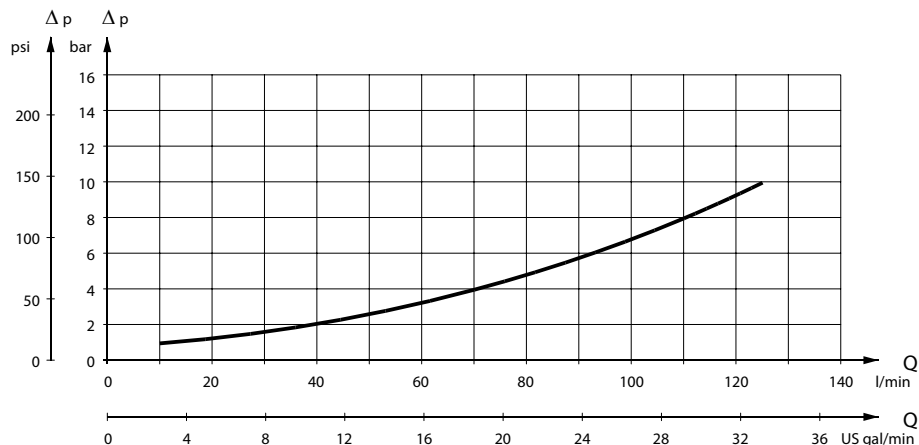


151-1674.10

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

___ Continuous operation

Pressure drop in motor



151-1409.10

Technical Data OMT EM

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

Technical Data OMV EM

Technical data for OMV EM

Type Motorsize			OMV EM 315	OMV EM 400	OMV EM 500	OMV EM 630	OMV EM 800
Geometric displacements	cm ³ [in ³]		314.5 [19.19]	400.9 [24.46]	499.6 [30.49]	629.1 [38.39]	801.8 [48.93]
Max. speed	min ⁻¹ rpm	cont.	510	500	400	315	250
		int.	630	600	480	380	300
Max torque	Nm [lbf·in]	cont.	920 [8140]	1180 [10440]	1460 [12920]	1660 [14690]	1880 [16640]
		int.	1110 [9820]	1410 [12480]	1760 [15580]	1940 [17170]	2110 [18680]
Max. output	kW [hp]	cont.	42.5 [57.0]	53.5 [71.7]	53.5 [71.7]	48.0 [64.4]	42.5 [57.0]
		int. ¹⁾	51.0 [68.4]	64.0 [85.8]	64.0 [85.8]	56.0 [75.1]	48.0 [64.4]
Max. pressure drop	bar [psi]	cont.	200 [2900]	200 [2900]	200 [2900]	180 [2610]	160 [2320]
		int. ¹⁾	240 [3480]	240 [3480]	240 [3480]	210 [3050]	180 [2610]
		peak ²⁾	280 [4060]	280 [4060]	280 [4060]	240 [3480]	210 [3050]
Max. oil flow	l/min [US gal/min]	cont.	160 [42.3]	200 [52.8]	200 [52.8]	200 [52.8]	200 [52.8]
		int. ¹⁾	200 [52.8]	240 [63.4]	240 [63.4]	240 [63.4]	240 [63.4]
Max. starting pressure with unloaded shaft	bar [psi]		8 [116]	8 [116]	8 [116]	8 [116]	8 [116]
Min starting torque	Nm [lbf·in]	at max. press drop cont.	710 [6280]	910 [8050]	1130 [10000]	1330 [11770]	1510 [13360]
		at max. press.drop int. ¹⁾	850 [7520]	1090 [9650]	1360 [12040]	1550 [13720]	1700 [15050]
Frequency	[Hz]	max.	1071	1020	816	646	510

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.

Type		Max. inlet pressure	Max. return pressure with drain line
OMV EM	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 max. 10% of every minute.

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

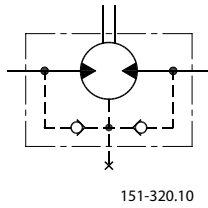
[For further technical specifications please see technical information for OMT and OMV \(BC152886483862\)](#)

Max. Permissible Shaft Seal Pressure

OMV EM with check valves and without use of drain connection:

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

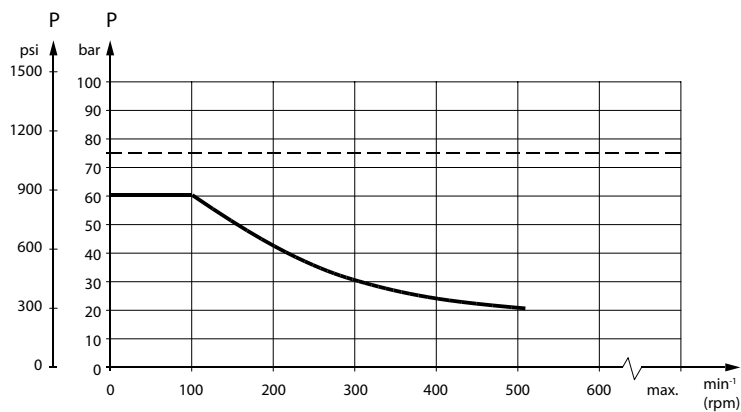
Technical Data OMV EM



OMV EM with check valves and with 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

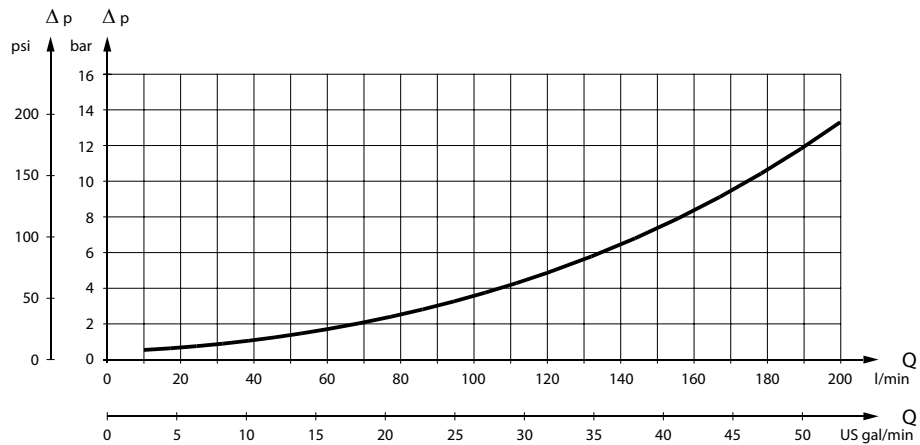


151-1673.10

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

___ Continuous operation

Pressure drop in motor



151-1410.10

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

Technical Data Speed Sensor

Technical Data Speed Sensor

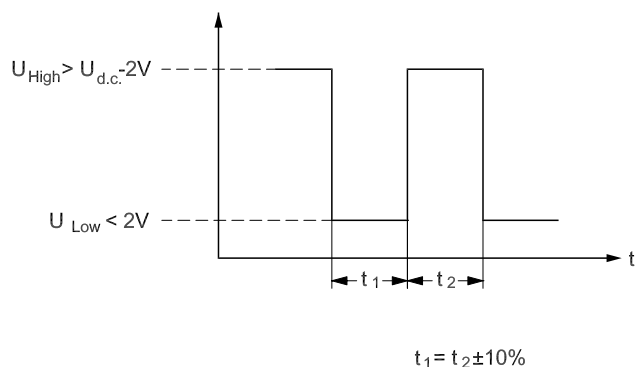
Mechanical data:

Temperatur range: -30°C to +90°C
 Enclosure acc. to IEC 529: IP 67

Electrical data

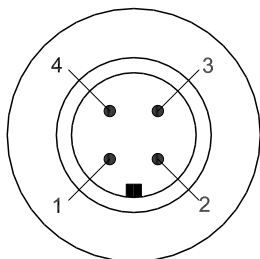
Principle: Hall
 Supply voltage: 11 - 30V
 Load max.: $L_{high} = L_{low} \pm 50$ mA
 No load current, max.: 20 mA

Output signal:



159G33.11

Connection type			
	Binder Series 713	Molded in cable	Connection
Terminal no.:	1	brown	UDC (+supply)
	2	White	No connection
	3	Blue	UDC (-supply)
	4	Black	Output signal
Protection: Protected against short circuit and incorrect polarization.			



159G82.10

Revolution:

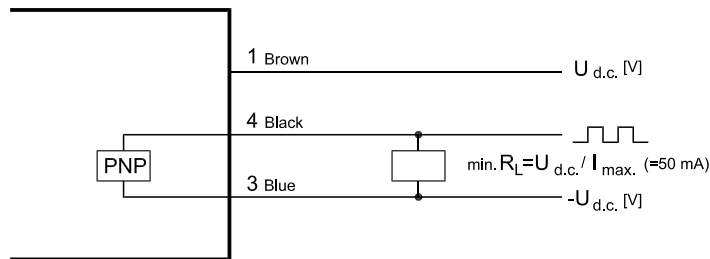
Pulses per revolution (PPR)	OMT EM	OMV EM
		84

Technical Data Speed Sensor

Calculation of frequency:

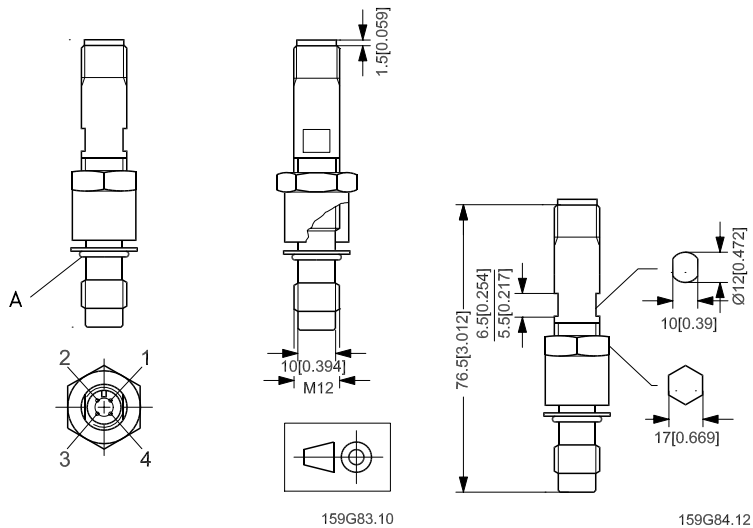
$$f_r = \frac{\text{RPM} \cdot \text{PPR}}{60} \text{ [Hz]}$$

Wiring Diagram



159G34.10

Speed Sensor with Plug Connection Dimensions

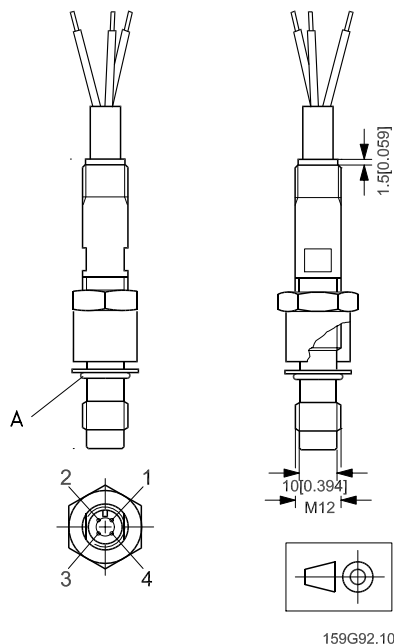


159G83.10

159G84.12

Technical Data Speed Sensor

Speed Sensor with Molded in Cable Dimensions



Spare Parts

Speed sensor

Code numbers

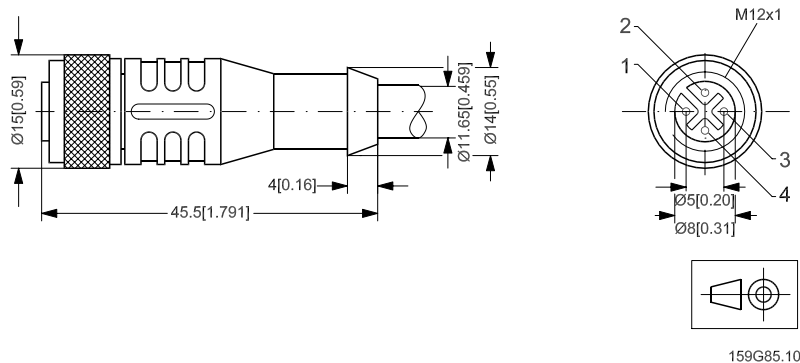
Type	Code no.
Sensor with plug (PNP output)	151-5662
Sensor with 2 m [6.56 ft] molded in cable (PNP output)	151-5663
Sensor with 5.5 m [18.04 ft] moulded in cable (PNP output)	151-5667
Sensor with plug (NPN output)	151-5833

Accessories

Cable with plug

Code numbers

Cable length 5 m [16.4 ft]	984F0101
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Technical Data Speed Sensor**Wire (shield)**Core: Cu, 4 • 0.34 mm²

Sheath: PUR/PVC, colour: grey

Plug

Type: Binder, Series 713

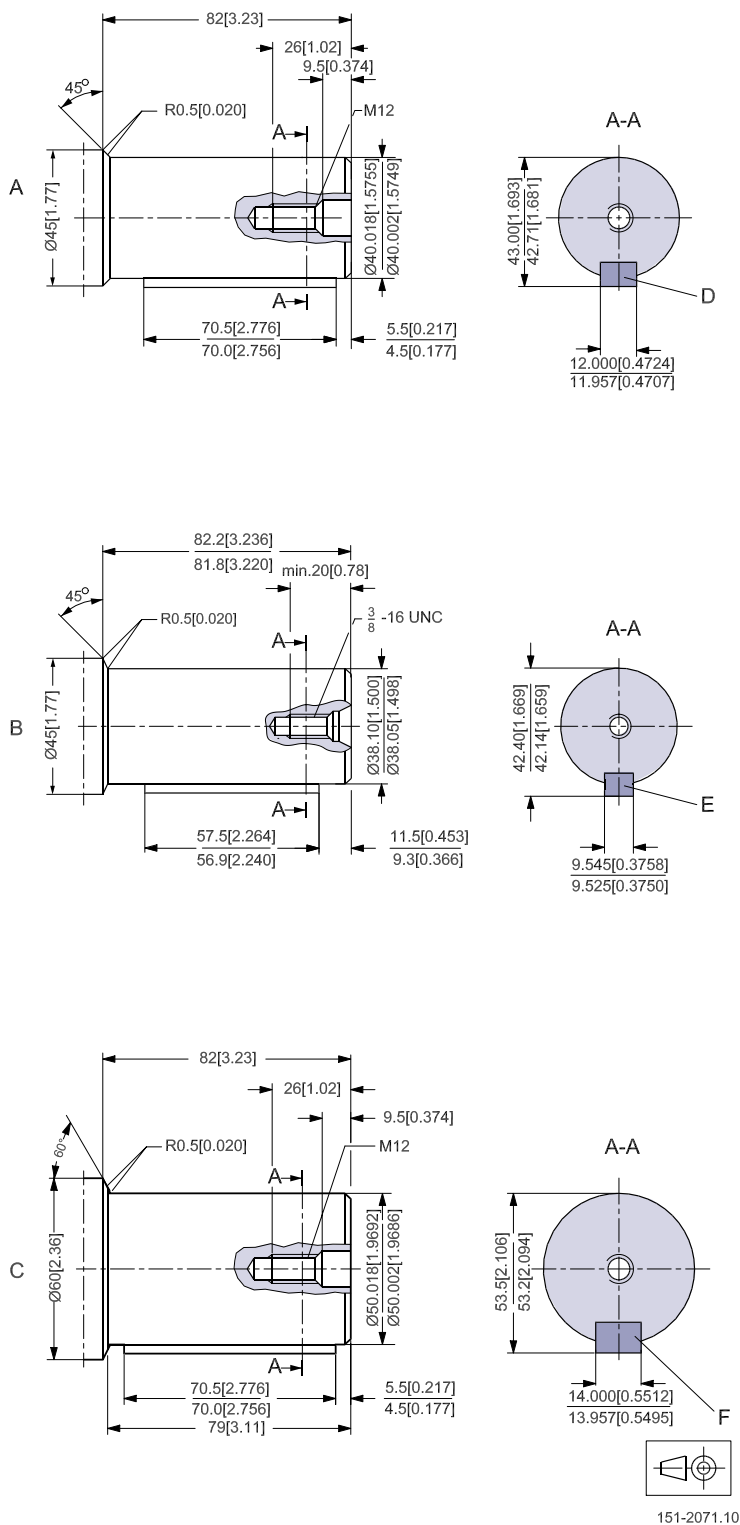
Cable no:	1	brown
	2	white
	3	blue
	4	black

Temperature range: -30 °C to +80 °C

Enclosure acc. to IEC 529: IP 67

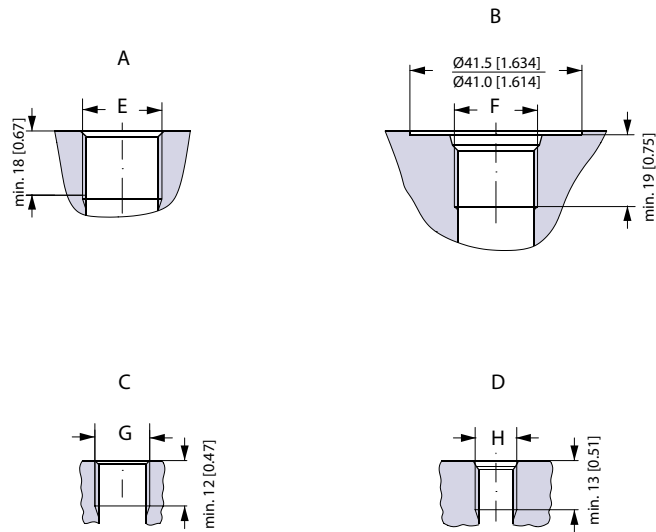
Shaft Versions

Shaft Versions



Port Thread Versions

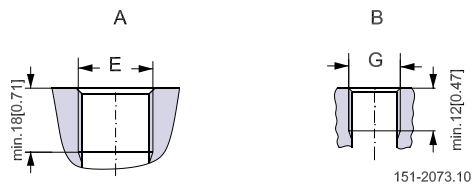
Port Thread Versions



151-1977.11

OMT

- A: G main ports B: UN main ports
- E: ISO 228/1 - G3/4 F: 1 1/16 - 12 UN, O-ring boss port
- C: G drain port D: UNF drain port
- G: ISO 228/1 - G1/4 H: 9/16 - 20 UNF, O-ring boss port



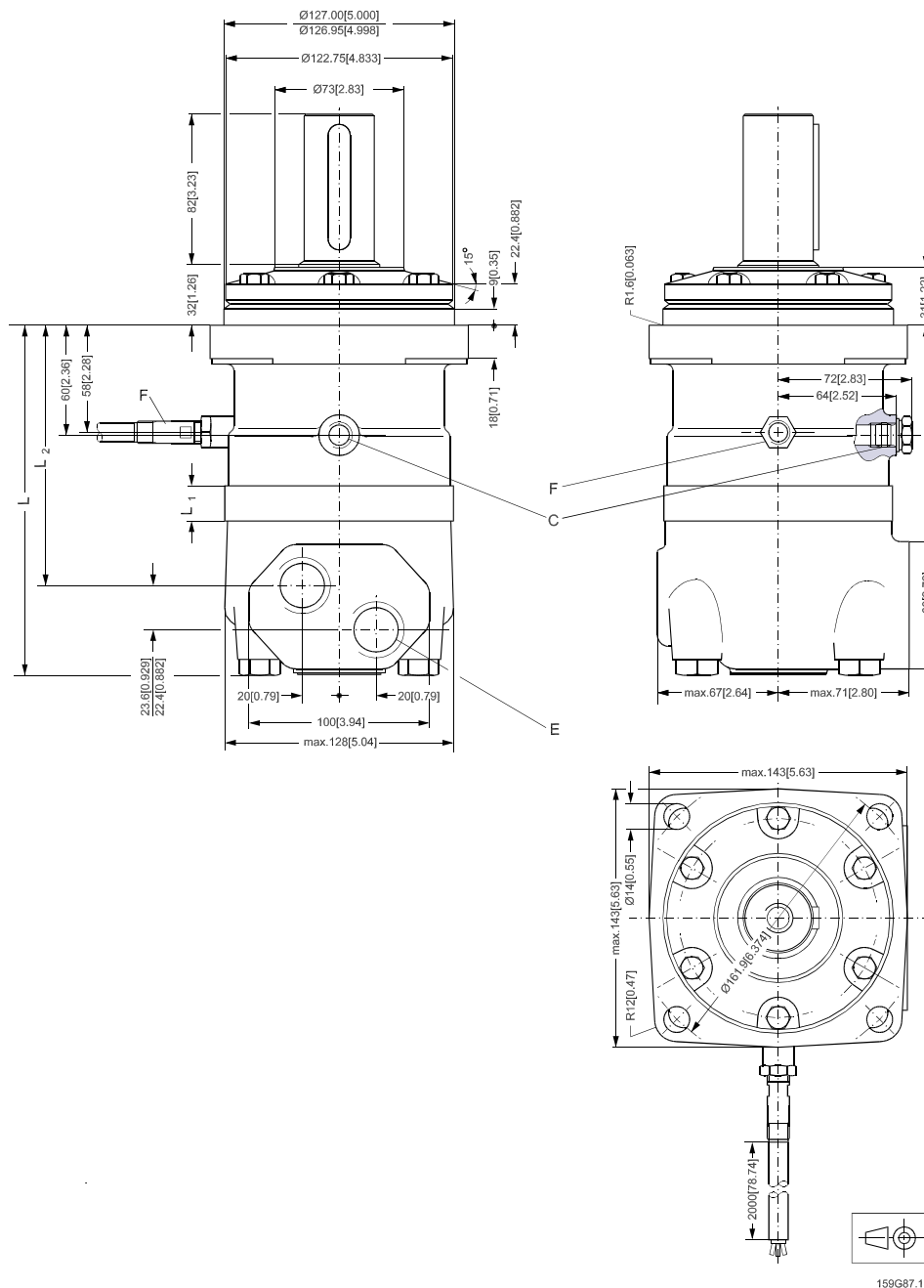
151-2073.10

OMV

- A: G Main port B : G drain port
- E: ISO 228/1 - G1 G: ISO 228/1 - G1/4

Dimensions - US Version

OMT EM



159G87.10

C: Drain connection 9/16 - 18 UNF; 13 mm [0.51 in] deep O-ring boss port

D: 1 1/16 - 12 UN; 19 mm [0.75 in] deep O-ring boss port

F : Plug connection: 2 m [6.56 ft] molded in cable

Type	Lmax mm [in]	L1 mm [in]	L2 mm [in]
OMT 160 EM	190 [7.48]	16.5 [0.650]	140 [5.51]
OMT 200 EM	195 [7.68]	21.5 [0.846]	145 [5.71]

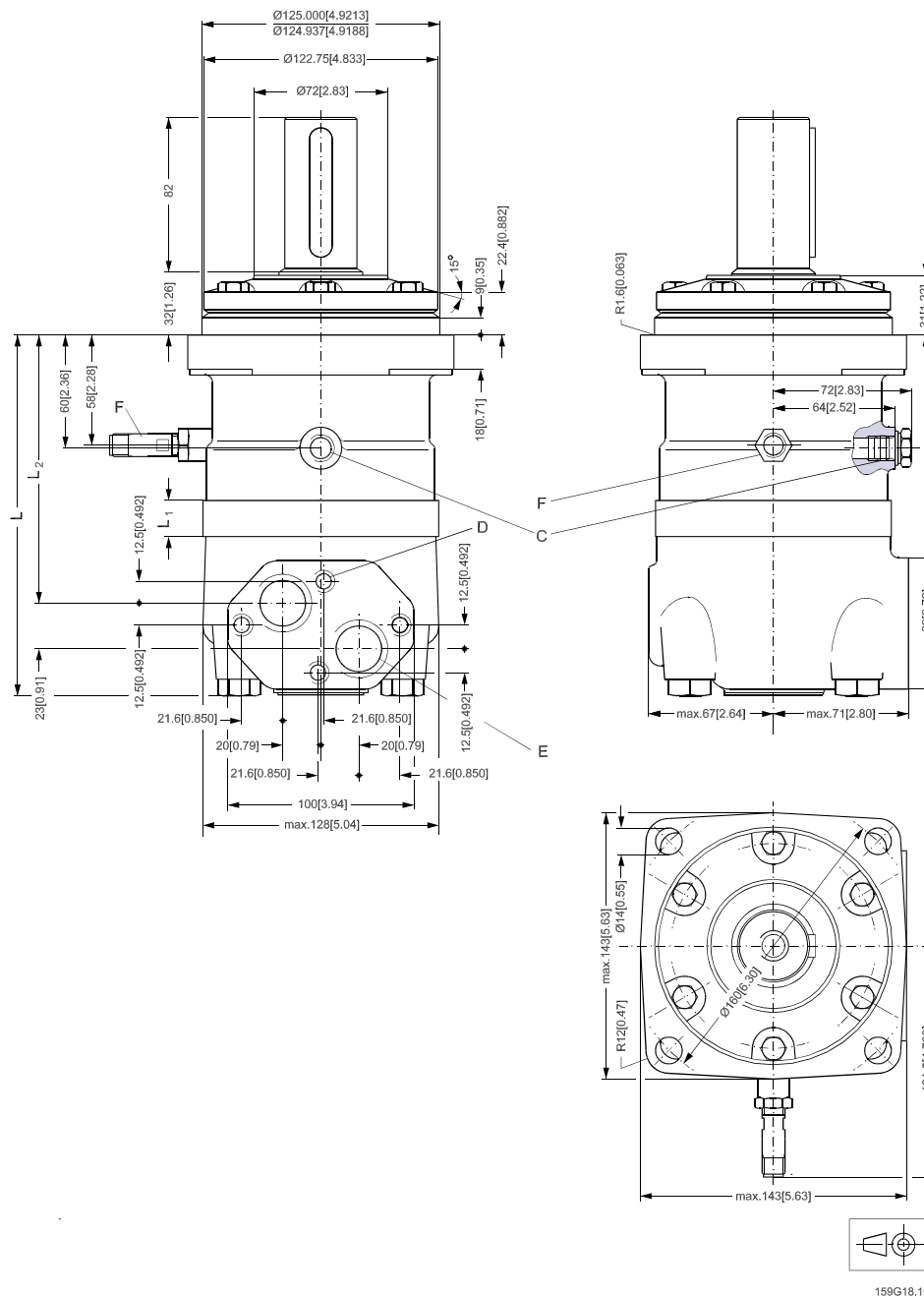
Dimensions - US Version

Type	Lmax mm [in]	L1 mm [in]	L2 mm [in]
OMT 250 EM	201 [7.91]	27.8 [1.094]	151 [5.94]
OMT 315 EM	211 [8.31]	37.0 [1.457]	161 [6.34]
OMT 400 EM	221 [8.70]	47.5 [1.870]	171 [6.73]
OMT 500 EM	235 [9.25]	61.5 [2.421]	185 [7.28]

*) The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L1 dimensions

Dimensions - European Version

OMT EM



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

F : Plug connection: Binder Series 713

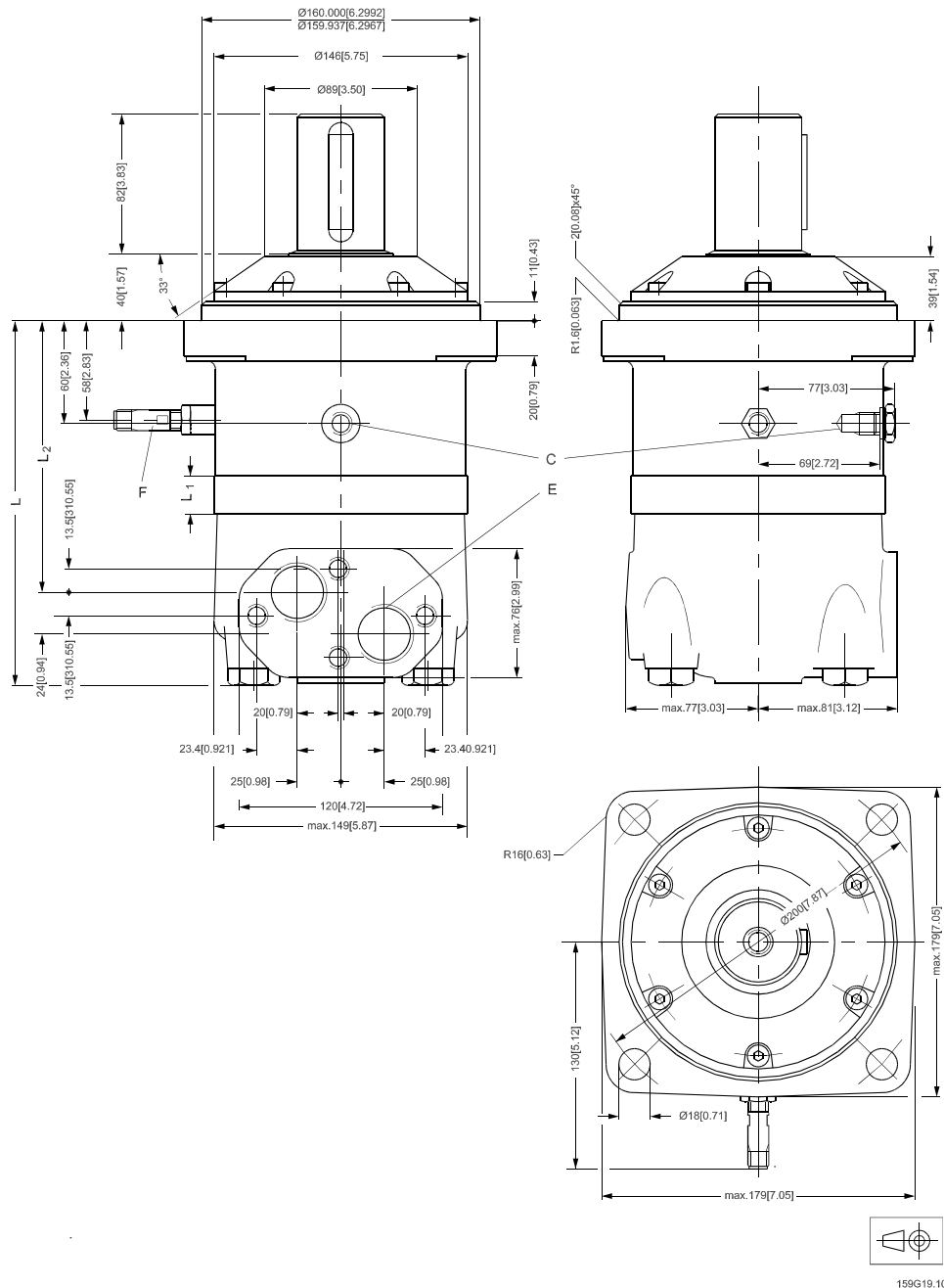
Type	Lmax mm [in]	L1 mm [in]	L2 mm [in]
OMT 160 EM	190 [7.48]	16.5 [0.650]	140 [5.51]
OMT 200 EM	195 [7.68]	21.5 [0.846]	145 [5.71]

Dimensions - European Version

Type	Lmax mm [in]	L1 mm [in]	L2 mm [in]
OMT 250 EM	201 [7.91]	27.8 [1.094]	151 [5.94]
OMT 315 EM	211 [8.31]	37.0 [1.457]	161 [6.34]
OMT 400 EM	221 [8.70]	47.5 [1.870]	171 [6.73]
OMT 500 EM	235 [9.25]	61.5 [2.421]	185 [7.28]

*) The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L1 dimensions

OMV EM



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

Dimensions - European Version

D: M12; 12 mm [0.47 in] deep

E: G 1; 18 mm [0.71 in] deep

F : Plug connection: Binder Series 713

Type	Lmax mm [in]	L1 mm [in]	L2 mm [in]
OMV 315 EM	215 [8.46]	22.0 [0.87]	160 [6.30]
OMV 400 EM	222 [8.74]	29.0 [1.14]	167 [6.57]
OMV 500 EM	230 [9.05]	37.0 [1.46]	175 [6.89]
OMV 630 EM	240 [9.45]	47.5 [1.87]	186 [7.32]
OMV 800 EM	254 [10.00]	61.5 [2.42]	200 [7.87]

*) The gearwheel set is 3.5 mm [0.138 in] wider across the rollers than the L1 dimensions

Weight of Motors

Weight of Motors OMT and OMV

Code no.	Weight	
	kg	[lb]
151B3260	20.1	[44.31]
151B3262	21.1	[44.31]
151B3263	22.1	[40.72]
151B3264	23.1	[50.93]
151B3265	24.1	[53.13]
151B3266	31.9	[70.33]
151B3260	32.7	[72.09]
151B3261	20.6	[45.42]
151B3268	33.6	[74.07]
151B3269	35.0	[77.16]
151B3270	36.6	[80.69]
151B3700	20.2	[44.53]
151B3701	20.7	[45.64]
151B3702	21.2	[46.74]
151B3703	22.2	[48.94]
151B3704	23.2	[51.15]
151B3705	24.2	[53.35]

Products we offer:

- Cartridge valves
- DCV directional control valves
- Electric converters
- Electric machines
- Electric motors
- Gear motors
- Gear pumps
- Hydraulic integrated circuits (HICs)
- Hydrostatic motors
- Hydrostatic pumps
- Orbital motors
- PLUS+1® controllers
- PLUS+1® displays
- PLUS+1® joysticks and pedals
- PLUS+1® operator interfaces
- PLUS+1® sensors
- PLUS+1® software
- PLUS+1® software services, support and training
- Position controls and sensors
- PVG proportional valves
- Steering components and systems
- Telematics

Danfoss Power Solutions is a global manufacturer and supplier of high-quality hydraulic and electric components. We specialize in providing state-of-the-art technology and solutions that excel in the harsh operating conditions of the mobile off-highway market as well as the marine sector. Building on our extensive applications expertise, we work closely with you to ensure exceptional performance for a broad range of applications. We help you and other customers around the world speed up system development, reduce costs and bring vehicles and vessels to market faster.

Danfoss Power Solutions – your strongest partner in mobile hydraulics and mobile electrification.

Go to www.danfoss.com for further product information.

We offer you expert worldwide support for ensuring the best possible solutions for outstanding performance. And with an extensive network of Global Service Partners, we also provide you with comprehensive global service for all of our components.

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