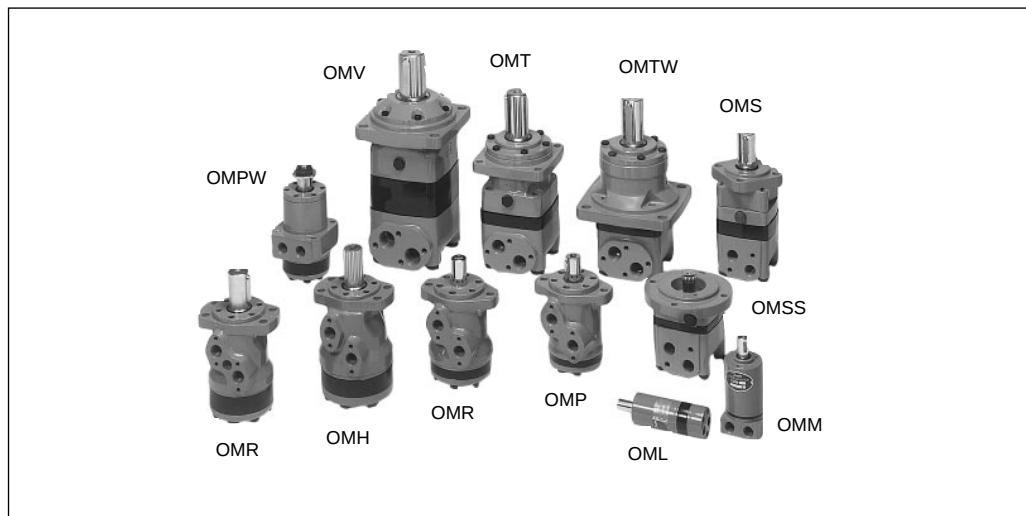


Hydraulic motors OMS, OMT and OMV

Low speed high torque motors



A wide range of hydraulic motors



Danfoss is Europe's largest producer of low speed high torque hydraulic motors. We can offer more than 1600 different hydraulic motors, categorised in types, variants and sizes (incl. different shaft versions).

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

Speeds range up to approx. 2500 rpm for the smallest type and up to approx 600 rpm for the largest type.

Maximum operating torques vary across the ranges from 1.3 daNm to 250 daNm (peak) and maximum power-outputs from 2.0 kW to 64 kW.

Characteristic features:

- Smooth running over the entire speed range
- Constant operating torque over a wide speed range
- High starting torque
- High return pressure without use of drain line
- 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

Variants

Standard/Extended Programme

The Danfoss metric motor programme has been divided into standard ranges and extended ranges.

The standard ranges are characterised by technical features appealing to a large number of applications.

The extended ranges are characterised by motors adapted to specific applications and comprising the following variants among others:

- Motors with corrosion resistant parts
- Wheel motors with recessed mounting flange
- OMP, OMR motors with needle bearing
- Short motors without bearings
- Ultra short motors
- Motors with integrated drum brake
- Motors with integrated negative holding brake
- Motors with integrated flushing valve
- Actuator motors
- Compact motors; type OMN
- Motors with speed sensor
- Motors with tachometer connection

Planetary gears

Danfoss represents a complete range of planetary gears with flanges and couplings designed for Danfoss hydraulic motors. The combination of motors and gears makes it possible to obtain completely smooth running at fractional speeds and torques up to 65.000 daNm.

Examples of Danfoss hydraulic motor applications

- Machines for agriculture and forestry
- Mining machinery
- Construction plant equipment and access platforms
- Grass cutting machinery
- Special vehicles
- Ship's equipment and winches on fishing vessels
- Machine tools
- Woodworking and sawmill machinery
- Plastic and rubber machinery etc.

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 4 individual subcatalogues:

- General information on Danfoss hydraulic motors: function, use, selection of hydraulic motor, hydraulic systems, etc.
- OML and OMM technical data on small motors.

- Technical data on medium sized motors: OMP, OMR and OMH
- Technical data on large motors: OMS, OMT and OMV

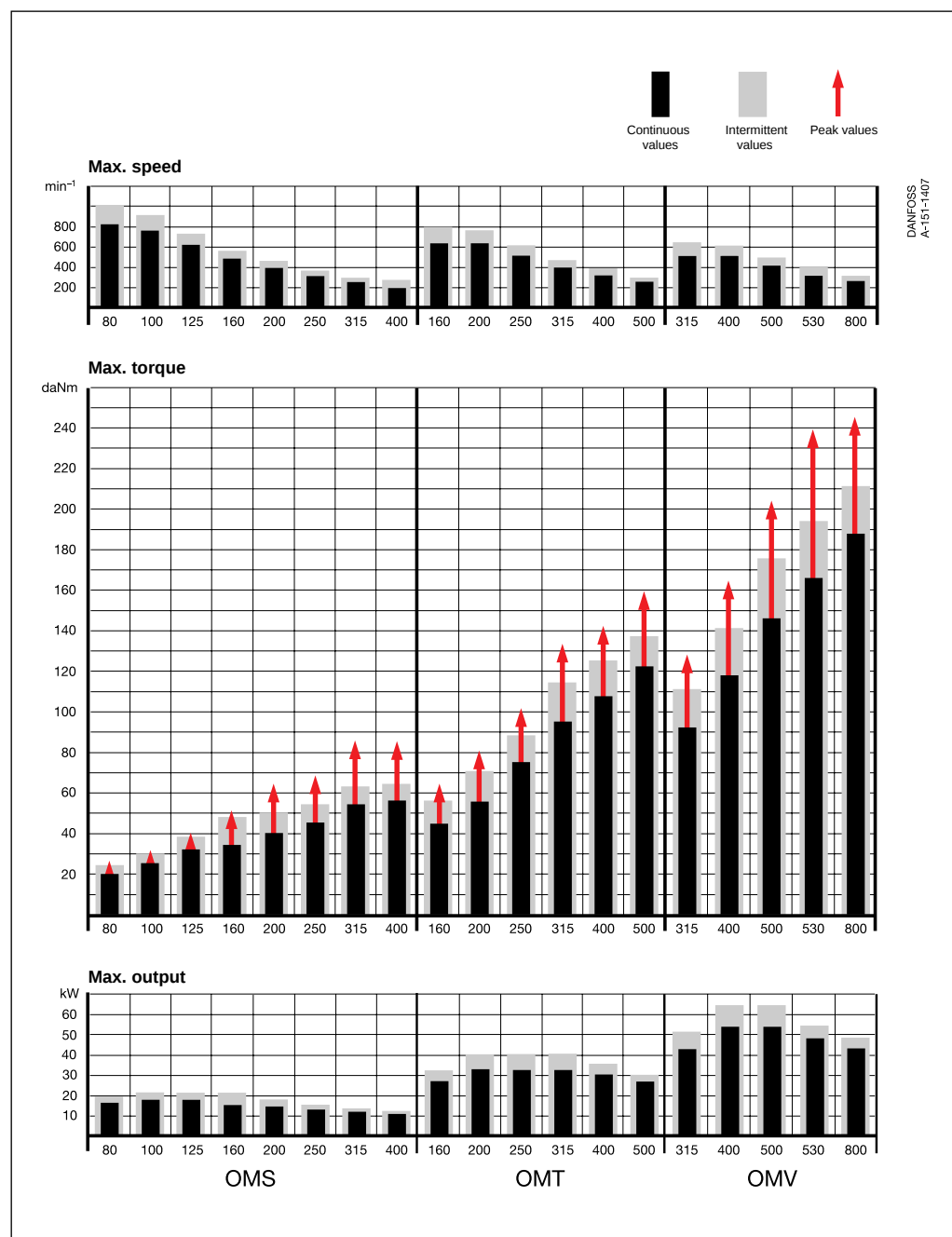
A general survey brochure on Danfoss hydraulic motors giving a quick motor reference based on power, torque, speed and capabilities.

Contents and data survey

Contents

Type OMS, OMSW, OMSS, OMS B	max.	1000 min ⁻¹ ,	63 daNm,	21 kW	Page 4
Type OMT, OMTW, OMTS	max	780 min ⁻¹ ,	137 daNm,	40 kW	20
Type OMV, OMVW, OMVS	max.	630 min ⁻¹ ,	211 daNm,	64 kW	36
Conversion factors					48

Speed, torque and output



The bar diagram above is used for a quick selection of relevant motor sizes for the application. The final motor size can be determined by using the function diagram for each motor size.

The function diagrams are drawn on the basis of actual tests on a representative number of motors from our production. The diagrams apply to a return pressure between 5 and 10 bar when using mineral based hydraulic oil with a viscosity of 35 mm²/s and a temperature of 50°C. For further explanation concerning how to read and use the function diagrams, please consult the paragraph "Selection of motor size" in our catalogue "General Information".

Thread designation

The designation G for pipe thread replaces the previous designation BSP.F, cf BS/ISO 228/1.

The function diagrams for

- OMS can be found on pages 7 - 10
- OMT can be found on pages 25 - 27
- OMV can be found on pages 40 - 42.

Hydraulic motor OMS

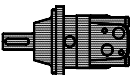
Code numbers and weight

	Motor type	OMS 80	OMS 100	OMS 125	OMS 160	OMS 200	OMS 250	OMS 315	OMS 400
	Cylindrical shaft	151F0200	151F0201	151F0202	151F0203	151F0204	151F0205	151F0206	151F0305
	Splined shaft	151F0207	151F0208	151F0209	151F0210	151F0211	151F0212	151F0213	
	Tapered shaft	151F0214	151F0215	151F0216	151F0217	151F0218	151F0219	151F0220	
	P.t.o. shaft	151F0260	151F0261	151F0262	151F0263*)	151F0264*)	151F0265	151F0266	
	Weight (kg)	9.8	10.0	10.3	10.7	11.1	11.6	12.3	13.1

Motor with special flange

	Motor type	OMS 80	OMS 100	OMS 125	OMS 160	OMS 200	OMS 250	OMS 315	
	Splined shaft	151F0242	151F0243	151F0244	151F0245	151F0246	151F0247	151F0248	
	Weight (kg)	10.2	10.4	10.7	11.1	11.5	12.0	12.7	

Wheel motor

	Motor type	OMSW 80	OMSW 100	OMSW 125	OMSW 160	OMSW 200	OMSW 250	OMSW 315	OMSW 400
	Cylindrical shaft	151F0221	151F0222	151F0223	151F0224	151F0225	151F0226	151F0227	151F0310
	Tapered shaft	151F0228	151F0229	151F0230	151F0231	151F0232	151F0233	151F0234	151F0309
	Weight (kg)	10.3	10.5	10.8	11.2	11.6	12.1	12.8	13.6

Short motor

	Motor type	OMSS 80	OMSS 100	OMSS 125	OMSS 160	OMSS 200	OMSS 250	OMSS 315	OMSS 400
	Without output shaft	151F0235	151F0236	151F0237	151F0238	151F0239	151F0240	151F0241	151F0308
	Weight (kg)	7.8	8.0	8.3	8.7	9.1	9.6	10.3	11.1

Motor with drum brake

	Motor type	OMS B 80	OMS B 100	OMS B 125	OMS B 160	OMS B 200	OMS B 250	OMS B 315	
	Brake lever Left	151F0065*)	151F0066*)	151F0067*)	151F0068	151F0069*)	151F0070	151F0071	
	Brake lever Right	151F0072*)	151F0073*)	151F0074*)	151F0075	151F0076*)	151F0077	151F0078	
	Weight (kg)	16.8	17.0	17.3	17.7	18.1	18.6	19.3	

*) Code number not active. Please contact Danfoss Sales Organization for Hydraulics.

Motors with tachometer connection
For code numbers of motors with tachometer connection,
please contact Danfoss Sales Organization for
Hydraulics.

Technical data

Motor type		OMS OMSW OMSS OMS B	OMS OMSW OMSS OMS B	OMS OMSW OMSS OMS B	OMS OMSW OMSS OMS B	OMS OMSW OMSS OMS B	OMS OMSW OMSS OMS B	OMS OMSW OMSS OMS B	OMS OMSW OMSS OMS B
Motor size		80	100	125	160	200	250	315	400
Geometric displacement	(cm ³ /rev)	80.5	100	125.7	159.7	200	250	314.9	393
Max. speed	(min ⁻¹)	cont.	810	750	600	4570	375	300	240
		int. ¹⁾	1000	900	720	560	450	360	285
Max. torque	(daNm)	cont.	20	25	32	34	40	45	54
		int. ¹⁾	24	30	38	48	50	54	63
		peak ²⁾	26	32	40	51	65	69	84
Max. output	(kW)	cont.	16	17.5	17.5	15.5	14	12.5	11.5
		int. ¹⁾	19	21	21	21	17.5	15	13.5
Max. pressure drop	(bar)	cont.	175	175	175	150	140	125	120
		int. ¹⁾	210	210	210	210	175	155	140
		peak ²⁾	225	225	225	225	225	200	185
Max. oil flow	(l/min)	cont.	65	75	75	75	75	75	75
		int. ¹⁾	80	90	90	90	90	90	90
Max. starting pressure with unloaded shaft	(bar)		12	10	10	8	8	8	8
Min. starting torque	(daNm)	at max. press. drop cont.	16.5	20.5	26	28	33	36	44
		at max. press. drop int. ¹⁾	19.5	25	31	39	41	44	52
Min. speed ³⁾	(min ⁻¹)		10	10	8	8	6	6	5
Holding torque (OMS B) ⁴⁾	(daNm)		75	75	75	75	75	75	75

Type		Max. inlet pressure	Max. return pressure with drain line
OMS	cont.	210	140
OMSW	int. ¹⁾	250	175
OMSS	peak ²⁾	300	210
OMS B			

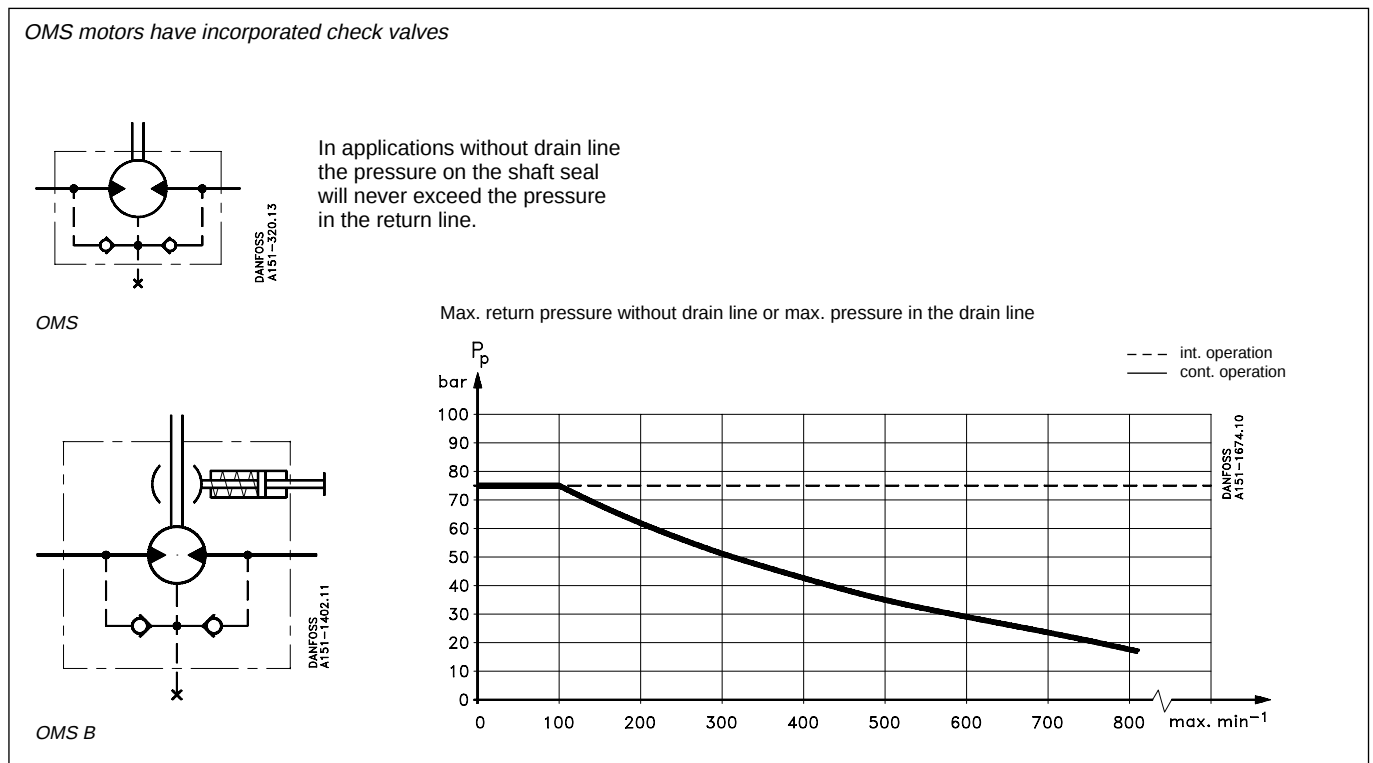
¹⁾ Intermittent operation: the permissible values may occur for max. 10% of every minute.

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

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

⁴⁾ Applies to an actuating force of 145 daN vertically on the actuating arm. Max. actuating force: 270 daN.

Max. permissible shaft seal pressure

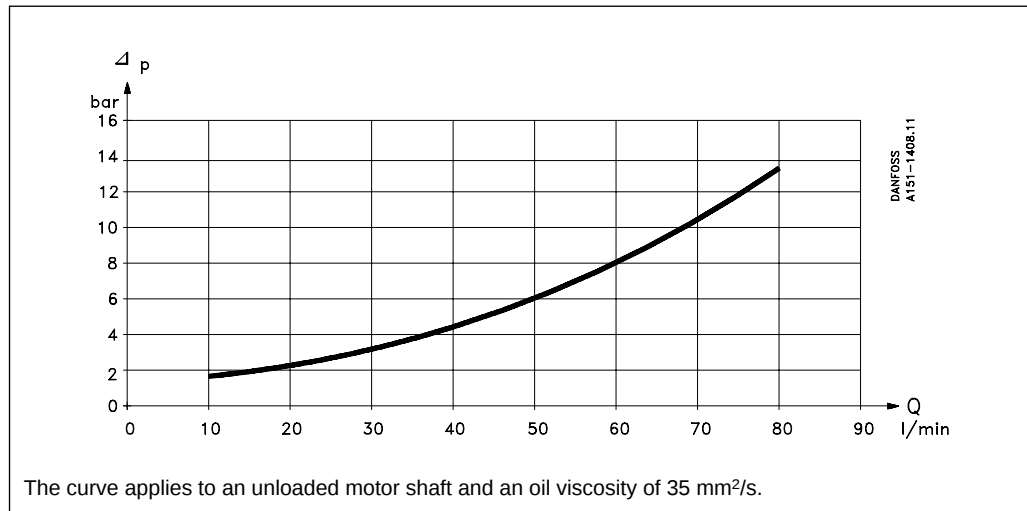


Oil flow in drain line

The table shows the max. oil flow in the drain line for all OMS motors. The values are measured at a return pressure less than 5-10 bar.

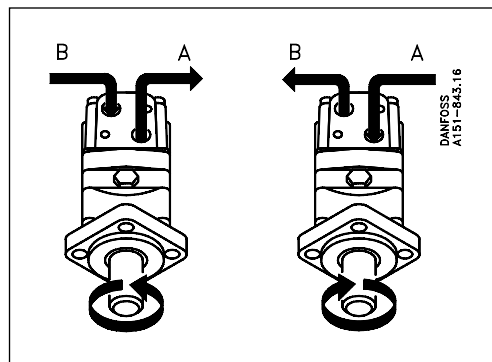
Pressure drop (bar)	Viscosity (mm ² /s)	Oil flow in drain line (l/min)
140	20	1.5
	35	1
210	20	3
	35	2

Pressure loss in the motor



Direction of shaft rotation and shaft load for OMS, OMSW and OMS B

Direction of shaft rotation



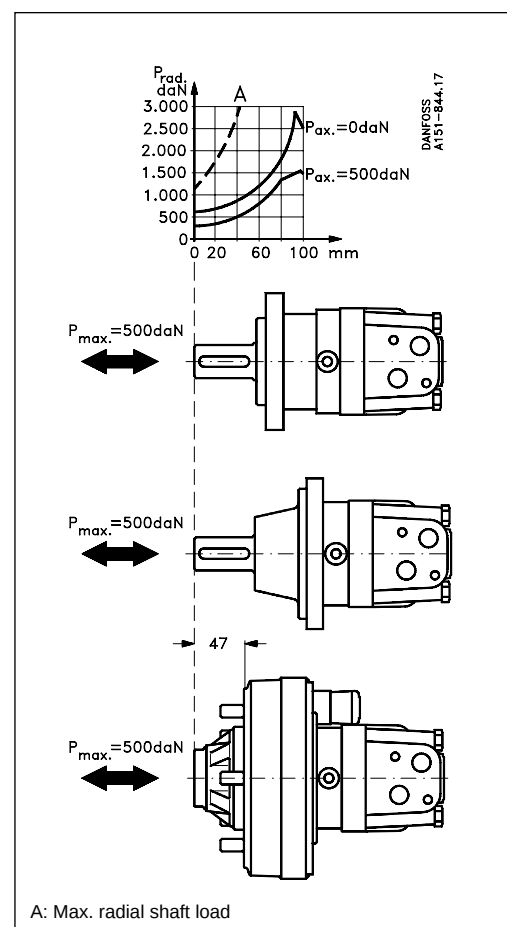
Permissible shaft loads

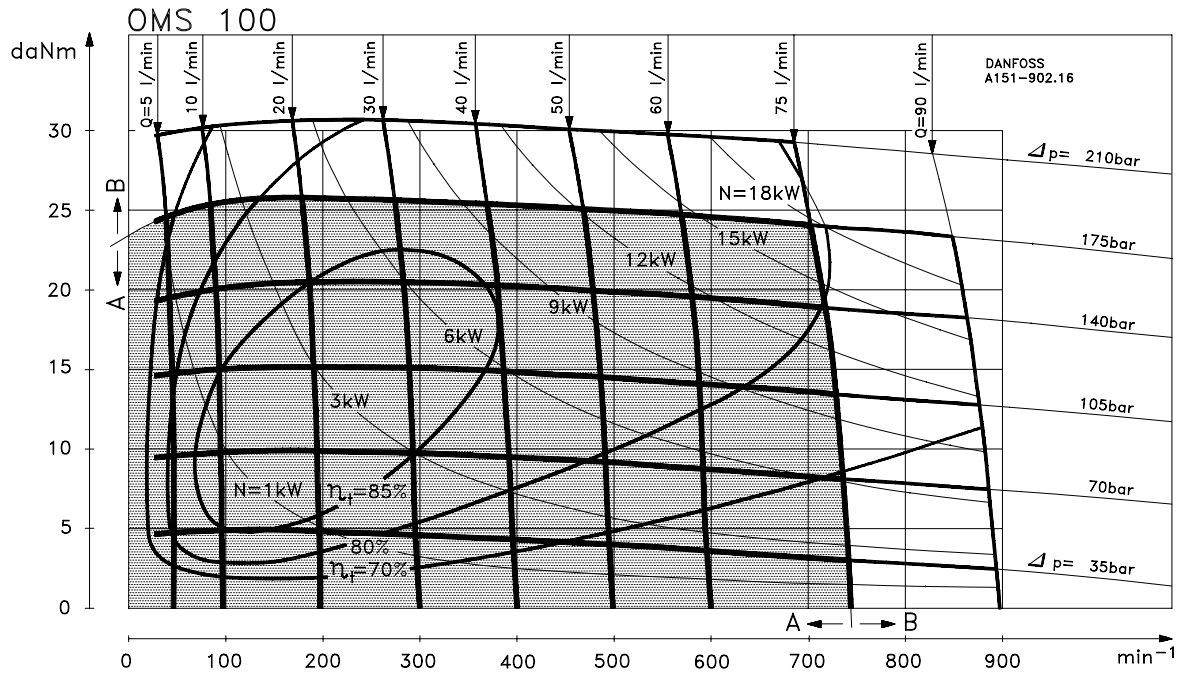
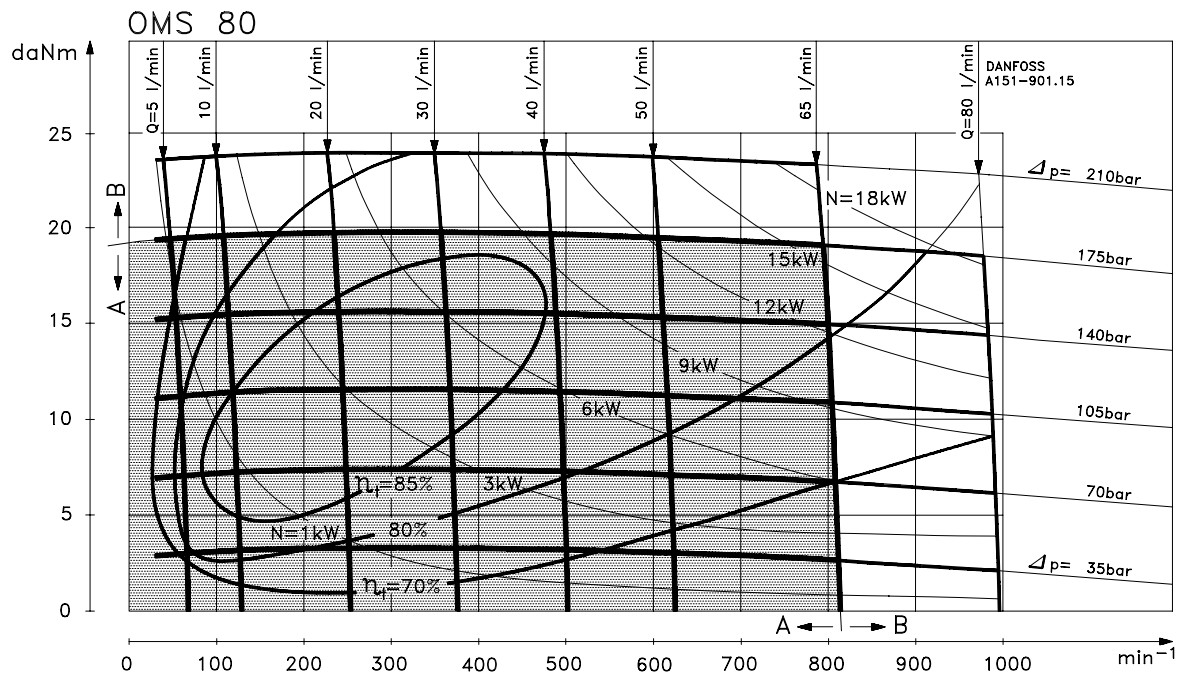
The output shaft runs in tapered roller bearings that permit high axial and radial forces.

The permissible radial load on the shaft is shown for an axial load of 0 and 500 daN as a function of the distance from the mounting flange to the point of load application.

Curve A shows max. radial shaft load. Any shaft load exceeding the values quoted in the curve will involve a risk of breakage. The other curves apply to a B10 bearing life of 3000 hours at 200 min⁻¹ when mineral based hydraulic oil with a sufficient content of anti-wear additives is used.

Bearing life calculations can be made using the explanation and formula provided in the chapter "Bearing dimensioning" in the subcatalogue "General information".



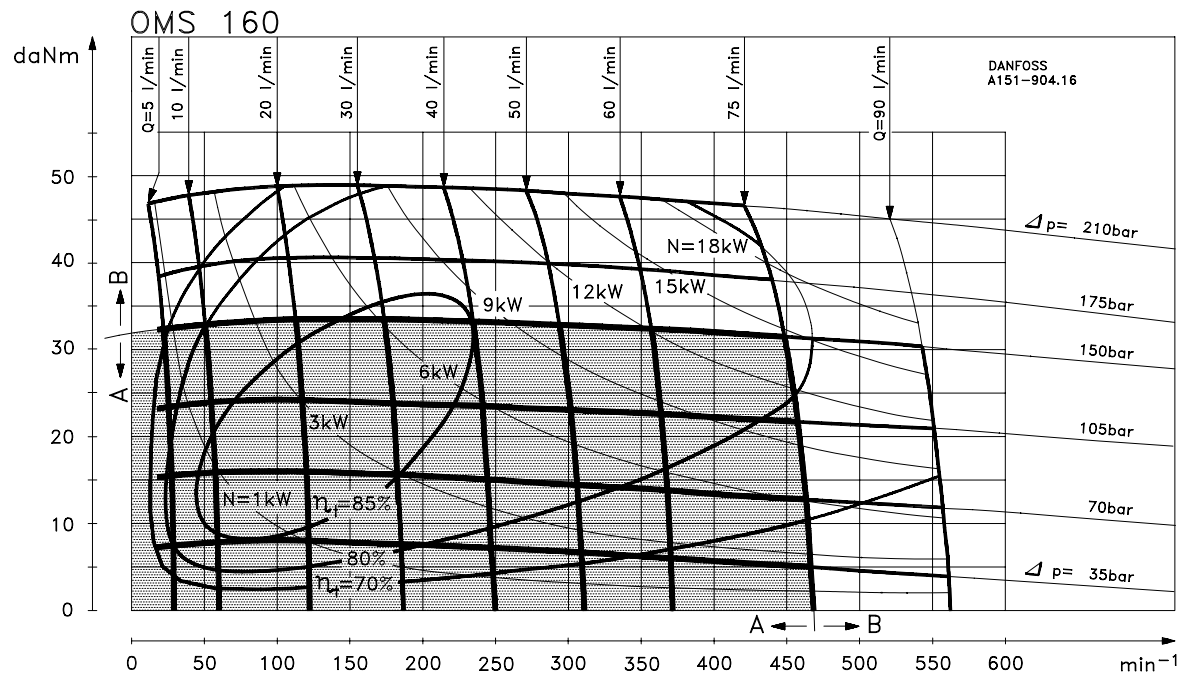
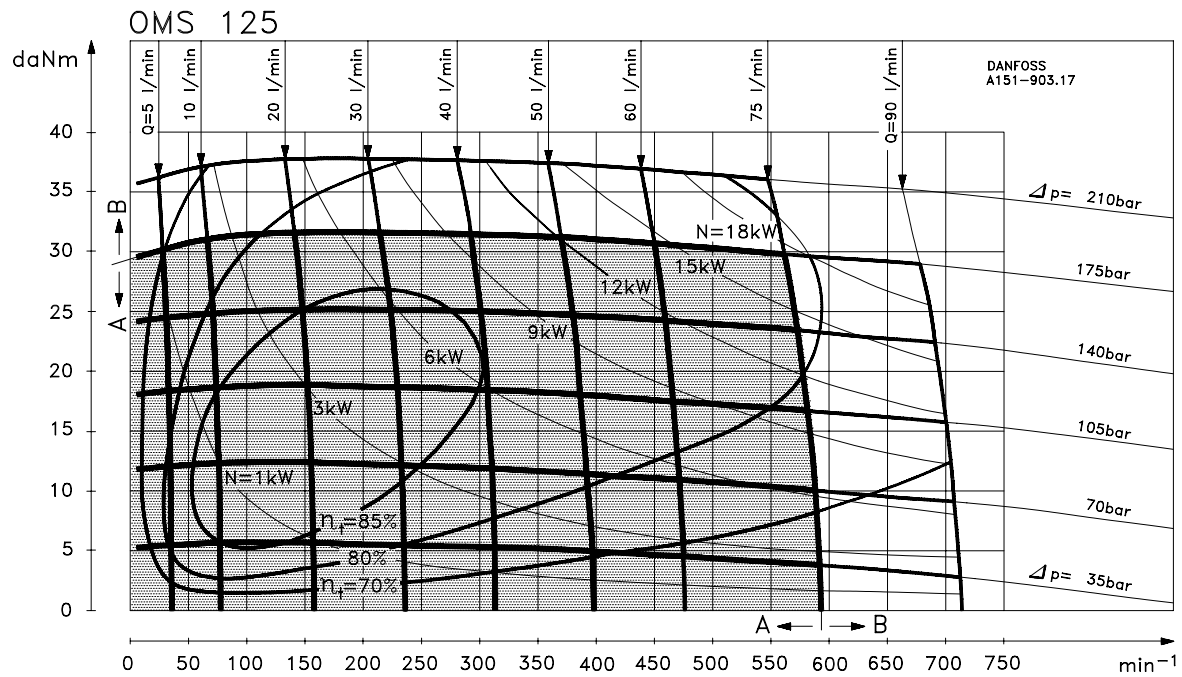


Explanation of function diagram use, basis and conditions can be found on page 3.

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

Note:

Intermittent pressure drop and oil flow must not occur simultaneously.

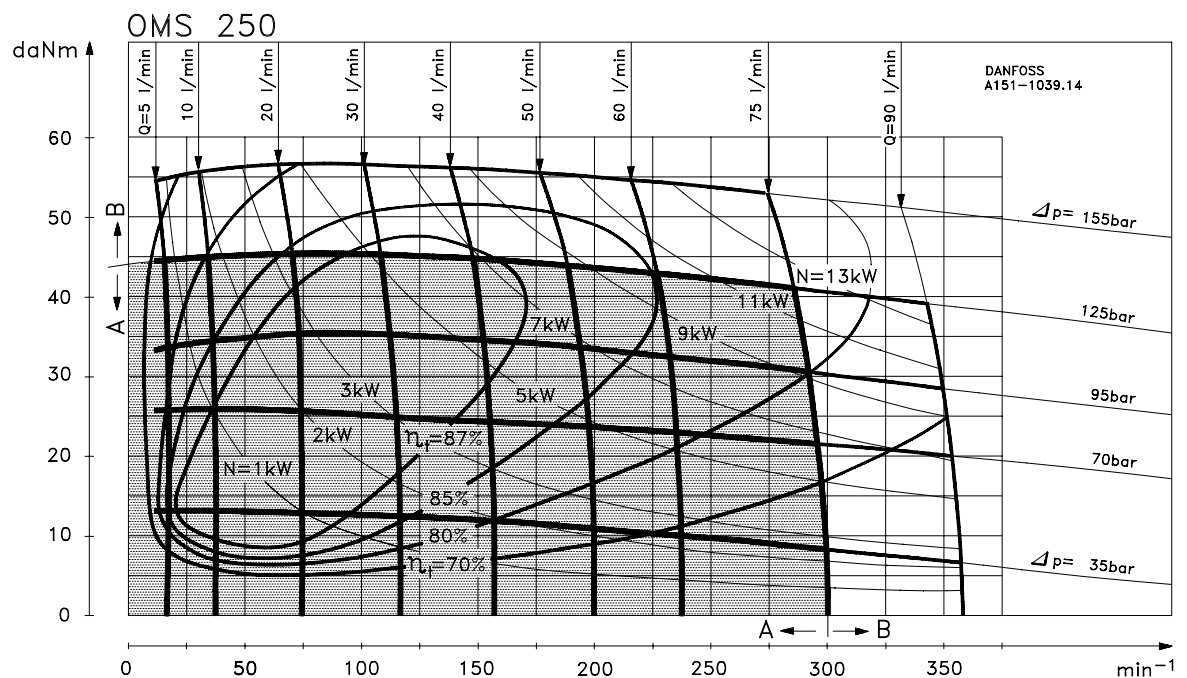
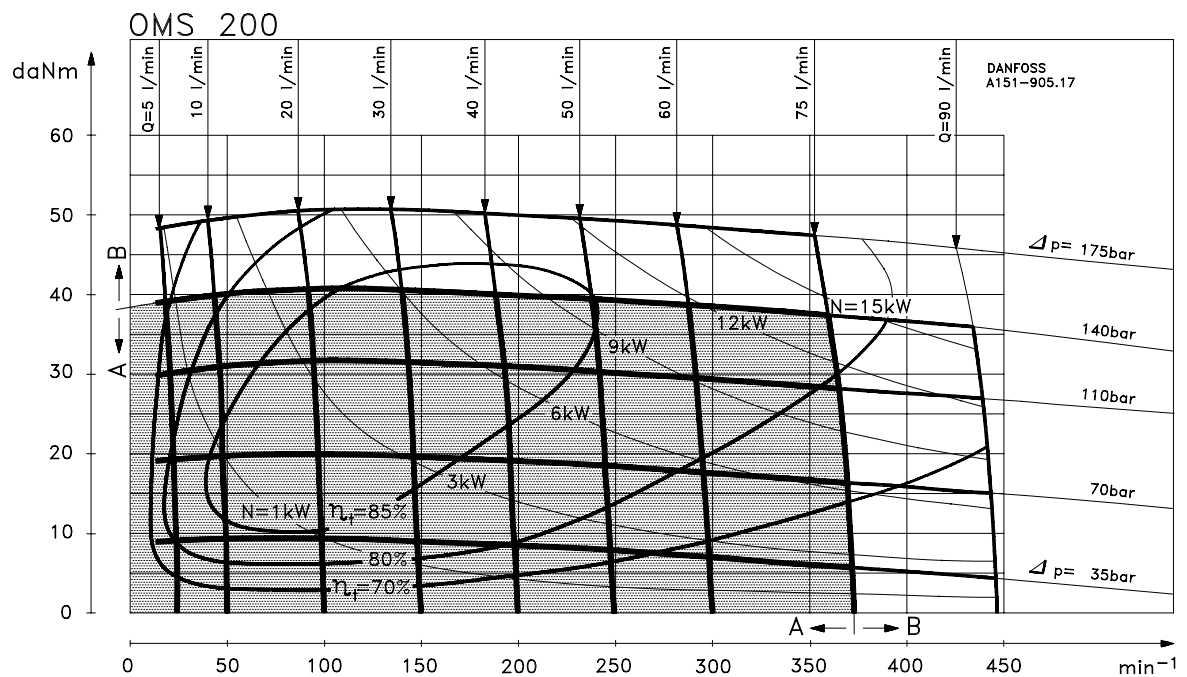


Explanation of function diagram use, basis and conditions can be found on page 3.

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

Note:

Intermittent pressure drop and oil flow must not occur simultaneously.

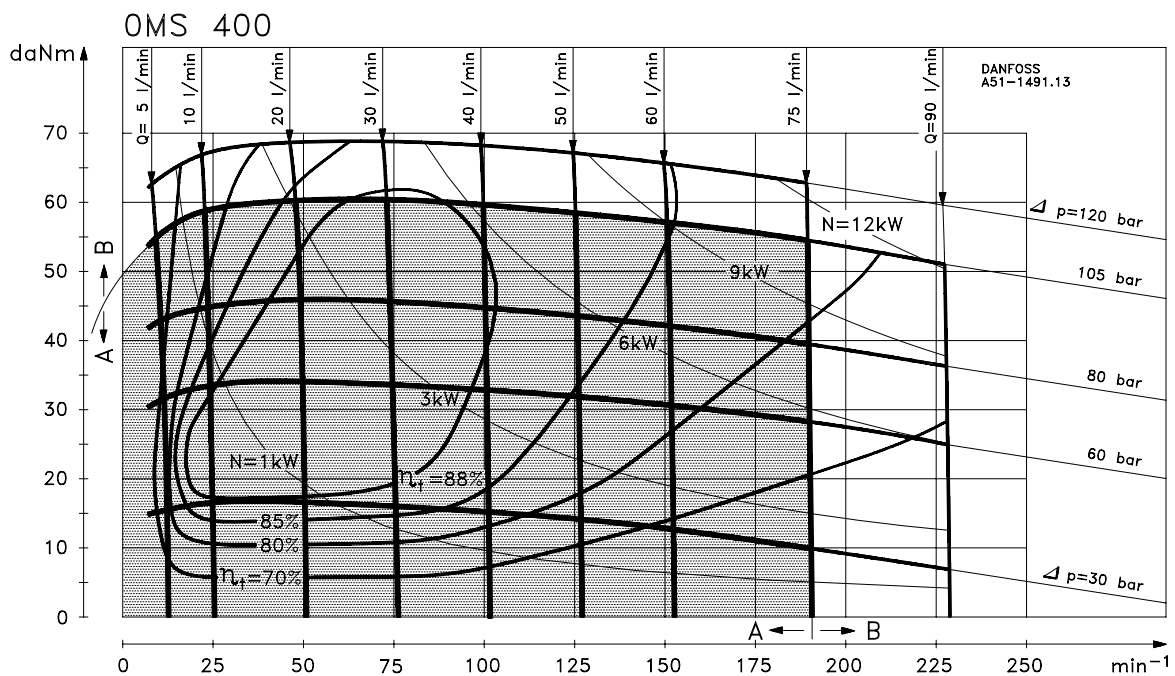
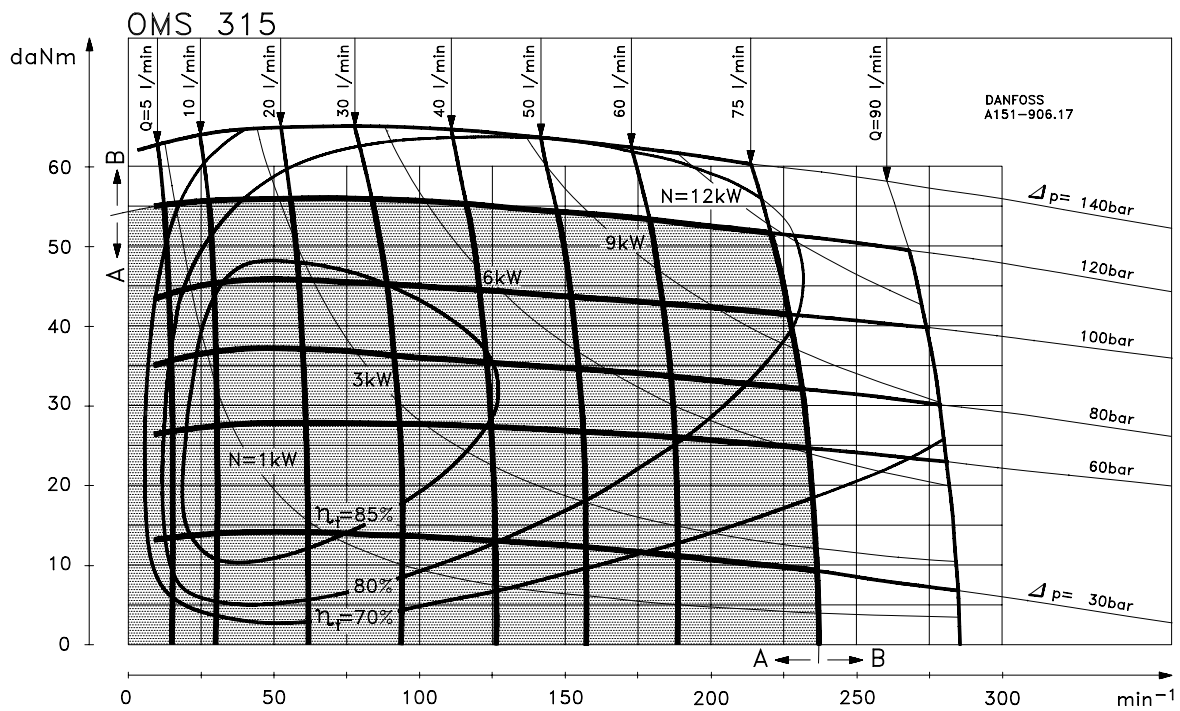


Explanation of function diagram use, basis and conditions can be found on page 3.

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

Note:

Intermittent pressure drop and oil flow must not occur simultaneously.



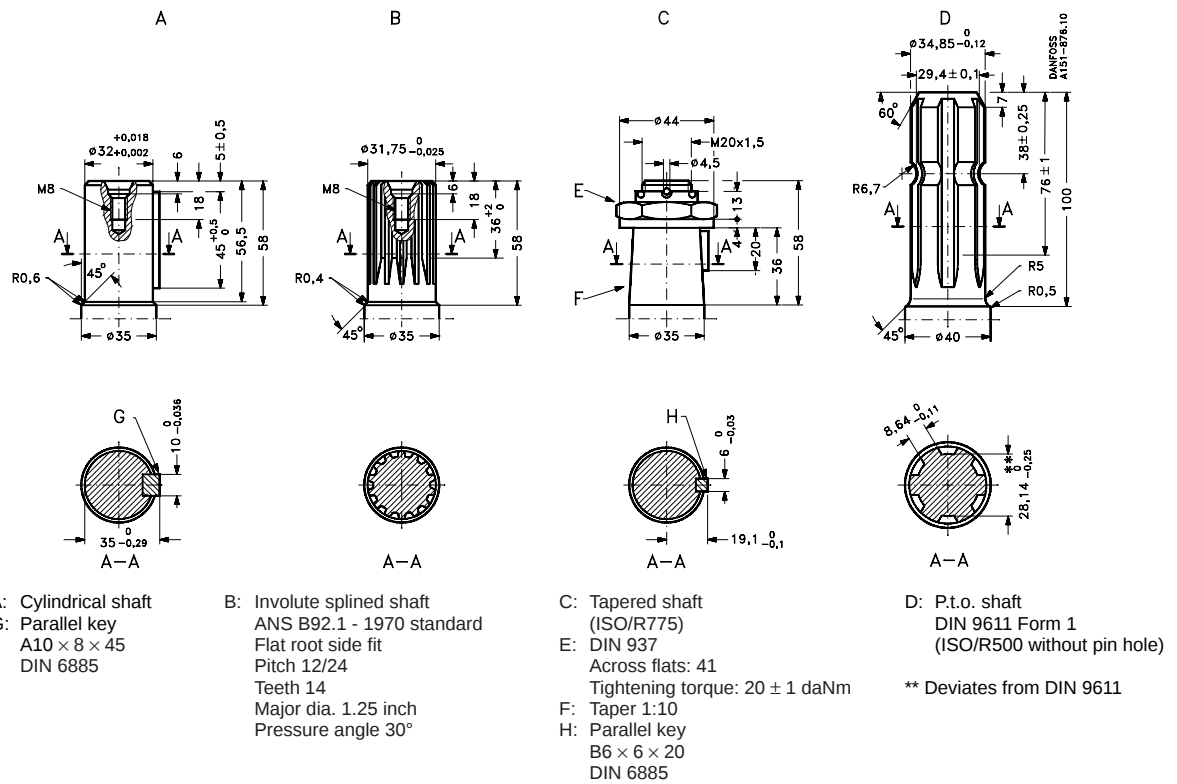
Explanation of function diagram use, basis and conditions can be found on page 3.

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

Note:

Intermittent pressure drop and oil flow must not occur simultaneously.

Shaft versions



Technical drawing of the DANFOSS A151-1023.18 valve, showing front and side views with dimensions.

Front View Dimensions:

- Overall height: 66 ± 1
- Height of top flange: 58
- Top flange diameter: $\phi 82,5^{+0,05}_0$
- Height of main body: 65 ± 1
- Height of bottom flange: 18
- Overall width: L_2
- Height of mounting flange: L_1
- Mounting flange diameter: $\phi 20$
- Distance from top of main body to center of mounting flange: $5 \pm 0,6$
- Distance from center of mounting flange to center of bottom flange: $27 \pm 0,6$
- Distance from center of mounting flange to center of side flange: $22 \pm 0,6$
- Distance from center of mounting flange to center of bottom flange (horizontal): $16 \pm 0,3$
- Distance from center of mounting flange to center of side flange (horizontal): $16 \pm 0,3$
- Distance from center of mounting flange to center of bottom flange (horizontal): $21 \pm 0,3$
- Distance from center of mounting flange to center of side flange (horizontal): $21 \pm 0,3$
- Overall width of bottom flange: 72
- Maximum overall width: max. 103
- Radius of bottom flange: R18

Side View Dimensions:

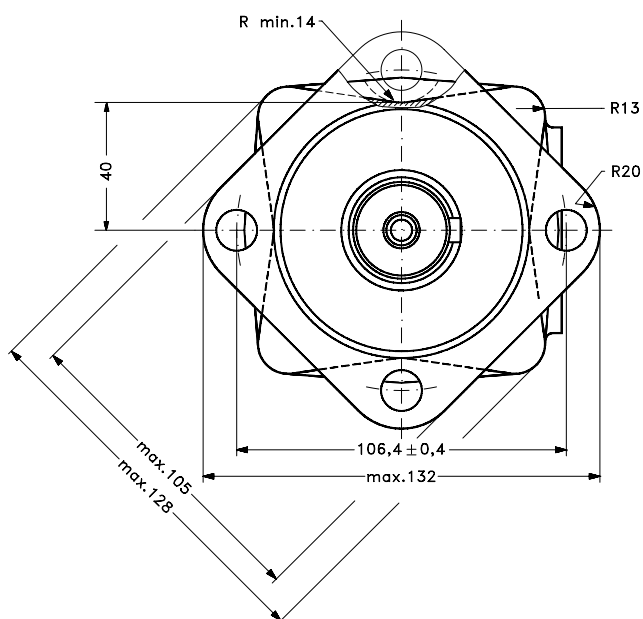
- Radius of top flange: R1
- Angle of top flange: $1 \times 45^\circ$
- Distance from center of mounting flange to center of side flange: 48
- Distance from center of mounting flange to center of bottom flange: max. 52
- Distance from center of mounting flange to center of side flange (horizontal): max. 53
- Distance from center of mounting flange to center of bottom flange (horizontal): 56
- Distance from center of mounting flange to center of side flange (horizontal): $\phi 13,5$

Labels:

- C: Center of mounting flange
- D: Center of bottom flange
- E: Center of side flange

Product Information:

DANFOSS
A151-1023.18

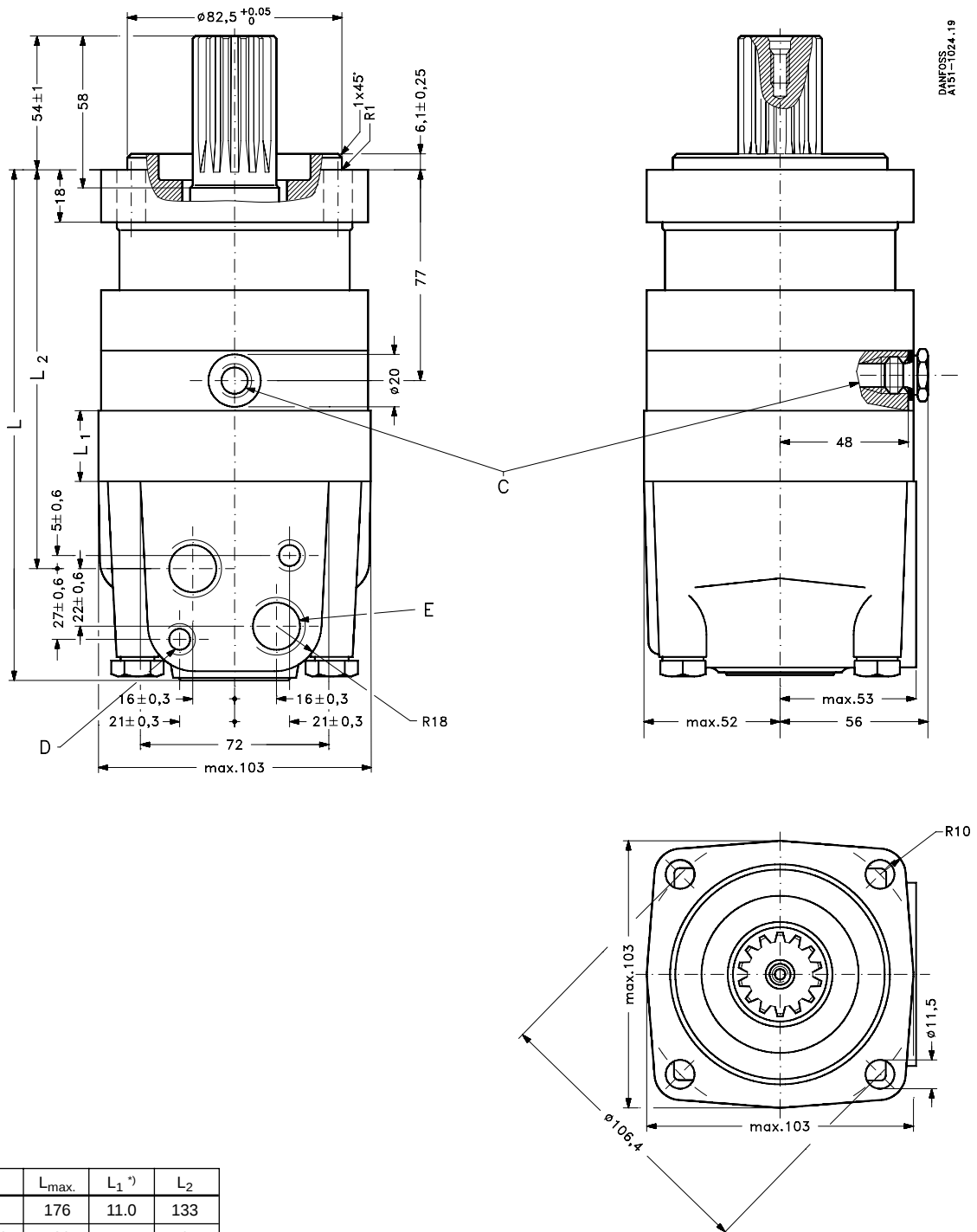


Type	L _{max}	L ₁ ')	L ₂
OMS 80	165	11.0	121
OMS 100	168	14.4	124
OMS 125	173	18.8	129
OMS 160	179	24.8	135
OMS 200	186	31.8	142
OMS 250	194	40.5	150
OMS 315	206	51.8	162
OMS 400	221	65.4	175

C: Drain connection
G 1/4; 12 mm deep
D: M10; 13 mm deep
E: G 1/2; 15 mm deep

HK.13.B-

OMS with special flange

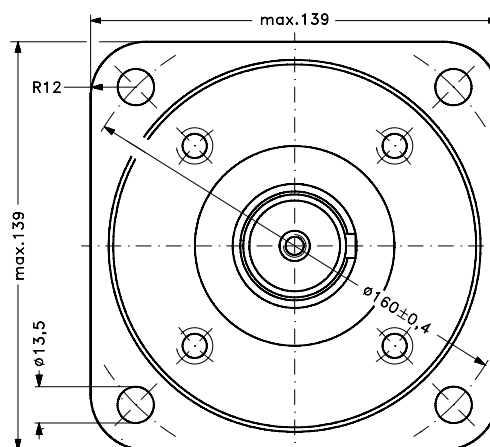
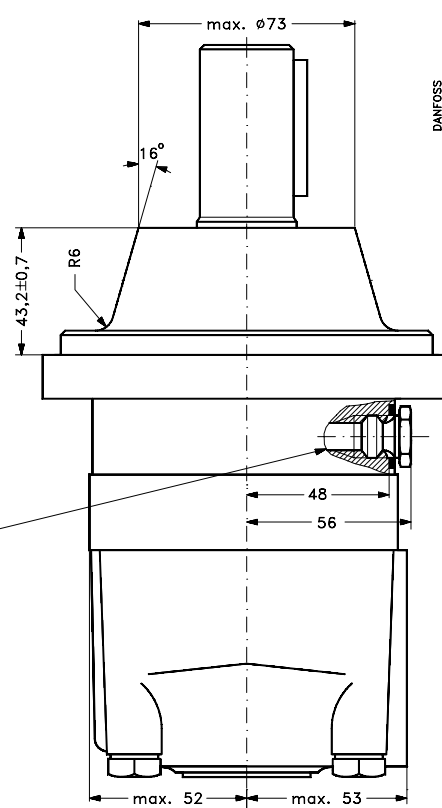


DANFOSS
A151-1024.19

Type	L _{max.}	L ₁ *)	L ₂
OMS 80	176	11.0	133
OMS 100	180	14.4	137
OMS 125	184	18.8	141
OMS 160	190	24.8	147
OMS 200	197	31.8	154
OMS 250	206	40.5	163
OMS 315	217	51.8	174
OMS 400	230	64.8	187

C: Drain connection
G 1/4 ; 12 mm deep
D: M10; 13 mm deep
E: G 1/2; 15 mm deep

*) The gearwheel set is 3.0 mm wider across the rollers than the L₁ dimensions

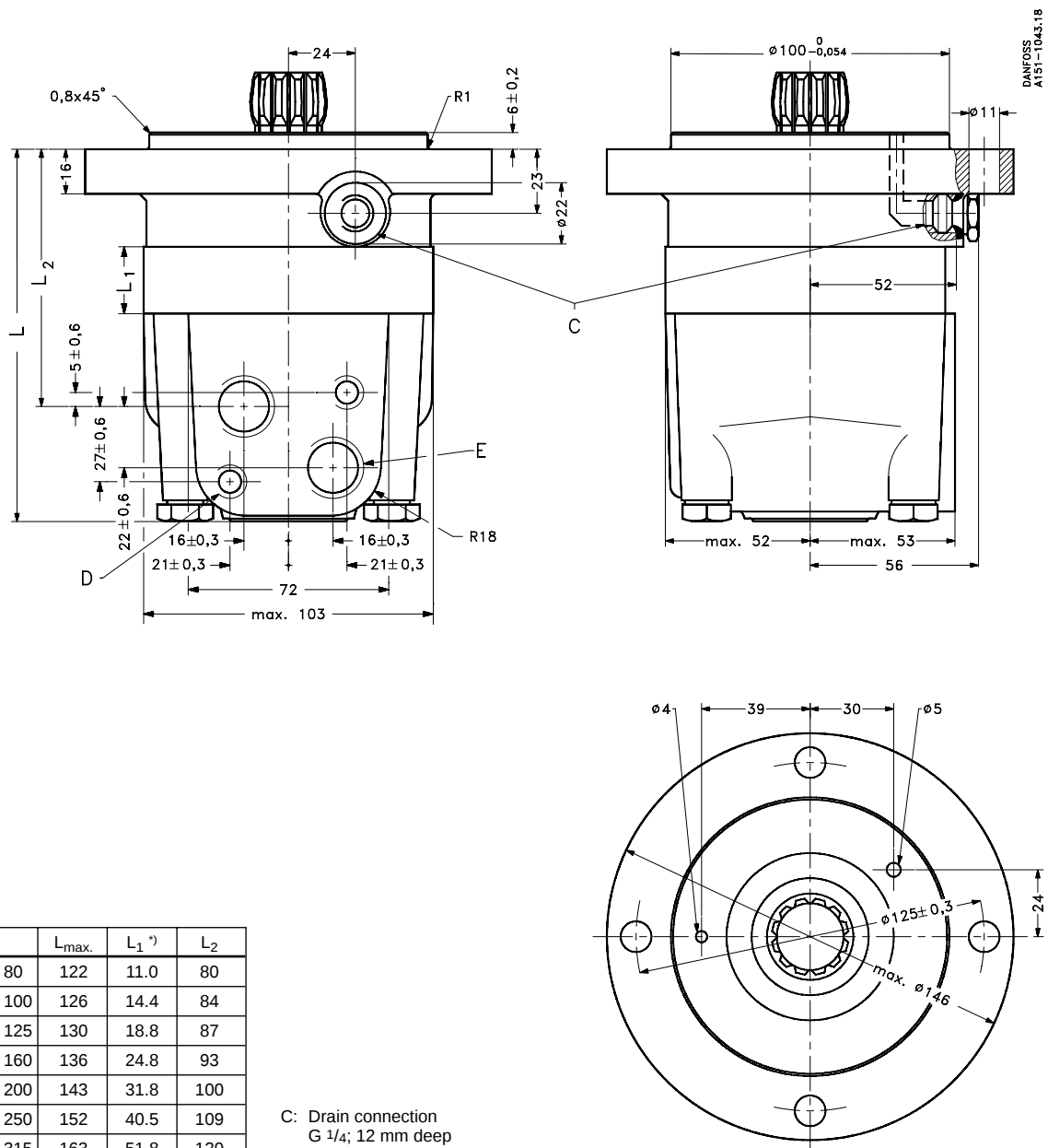
[illegible]

Type	L_{max}	L_1 ')	L_2
OMSW 80	128	11.0	84
OMSW 100	131	14.4	88
OMSW 125	136	18.8	92
OMSW 160	142	24.8	98
OMSW 200	154	31.8	105
OMSW 250	157	40.5	114
OMSW 315	168	51.8	125
OMSW 400	181	64.8	138

C: Drain connection
G 1/4 ; 12 mm deep
D: M10; 13 mm deep
E: G 1/2; 15 mm deep

*) The gearwheel set is 3.0 mm wider across the rollers than the L_1 dimensions

OMSS short motor



Type	L _{max.}	L ₁ *)	L ₂
OMSS 80	122	11.0	80
OMSS 100	126	14.4	84
OMSS 125	130	18.8	87
OMSS 160	136	24.8	93
OMSS 200	143	31.8	100
OMSS 250	152	40.5	109
OMSS 315	163	51.8	120
OMSS 400	176	64.8	133

C: Drain connection
G 1/4; 12 mm deep
D: M10; 13 mm deep
E: G 1/2; 15 mm deep

*) The gearwheel set is 3.0 mm wider across the rollers than the L₁ dimensions

Installing the OMSS

The cardan shaft of the OMSS motor acts as an "output shaft". Because of the movement of the shaft, no seal can be fitted at the shaft output. Internal oil leakage from the motor will therefore flow into the attached component.

During start and operation it is important that the spline connection and the bearings in the attached component receive oil and are adequately lubricated. To ensure that the spline connection receives sufficient oil, a conical sealing ring between the shaft of the attached component and the motor intermediate plate is recommended. This method is used in the OMS.

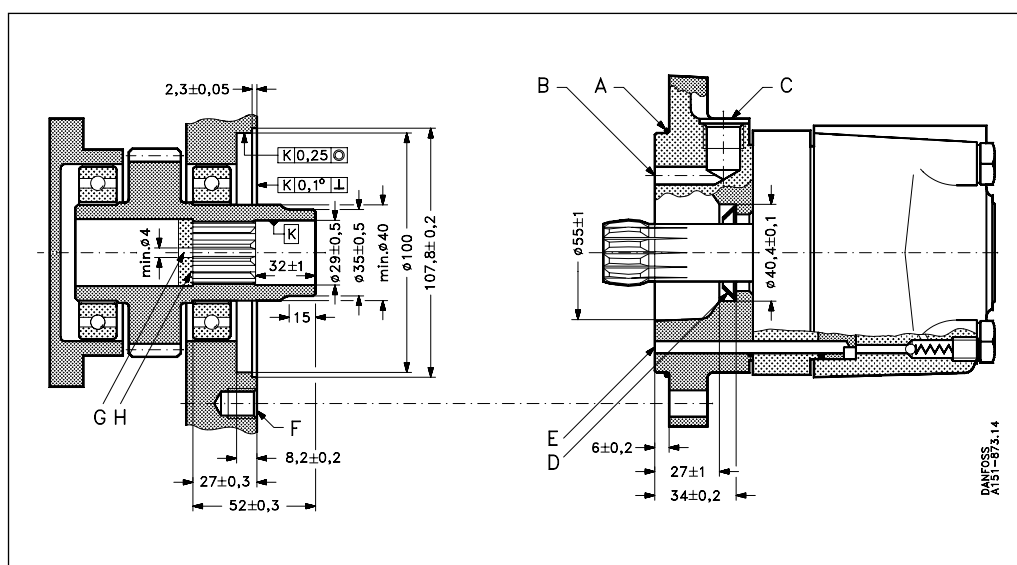
The conical sealing ring (code. no. 633B9023) is supplied with the motor.

To ensure that oil runs to the bearings and other parts of the attached component, the stop plate must have a hole in it (see fig. overleaf).

We recommend an O-ring between motor and attached component. The O-ring (code no. 151F1033) is supplied with the motor. If motor and attached component have been separated, remember to refill before starting up. Fill the oil through the drain connection.

Dimensions of the attached component

- A: O-ring: 100 × 3 mm
- B: External drain channel
- C: Drain connection
G ¾; 12 mm deep
- D: Conical seal ring
- E: Internal drain channel
- F: M10; min. 15 mm deep
- G: Oil circulation hole
- H: Hardened stop plate



Internal spline data for the component to be attached

The attached component must have internal splines corresponding to the external splines on the motor cardan shaft (see drawing below).

Material:
Case hardening steel with a tensile strength corresponding at least to 20 MoCr4 (90 daN/mm²).

See also SAE 8620 for further information on steel material.

- Hardening specification:**
- On the surface: HV = 750 ± 50
 - 0,7 ± 0,2 mm under the surface: HV = 560

Internal involute spline data Standard <i>ANS B92.1-1970, class 5</i> (corrected $m \cdot \times = 0.8$; $m = 2.1166$)			
Fillet root side fit		mm	inch
Number of teeth	z	12	12
Pitch	DP	12/24	12/24
Pressure angle		30°	30°
Pitch dia.	D	25,4	1.0
Major dia.	D_{ri}	$28,0^{+0}_{-0,1}$	$1.10^{+0}_{-0,004}$
Form dia. (min.)	D_{fi}	27,6	1.09
Minor dia.	D_i	$23,0^{+0,033}_{-0}$	$.9055^{+0,0013}_{-0}$
Space width (circular)	L_o	$4,308 \pm 0,020$	$.1696 \pm .0008$
Tooth thickness (circular)	S_o	2,341	.09217
Fillet radius	$R_{min.}$	0,2	.008
Max. measurement between pins*	I	$17,62^{+0,15}_{-0}$	$.700^{+0}_{-0,06}$
Pin dia.	d	$4,835 \pm 0,001$	$.1903 \pm .00004$

* Finished dimensions (when hardened)

Drain connection on OMSS or attached component

A drain line ought to be used when pressure in the return line can exceed the permissible pressure on the shaft seal of the attached component.

The drain line can be connected at two different points:

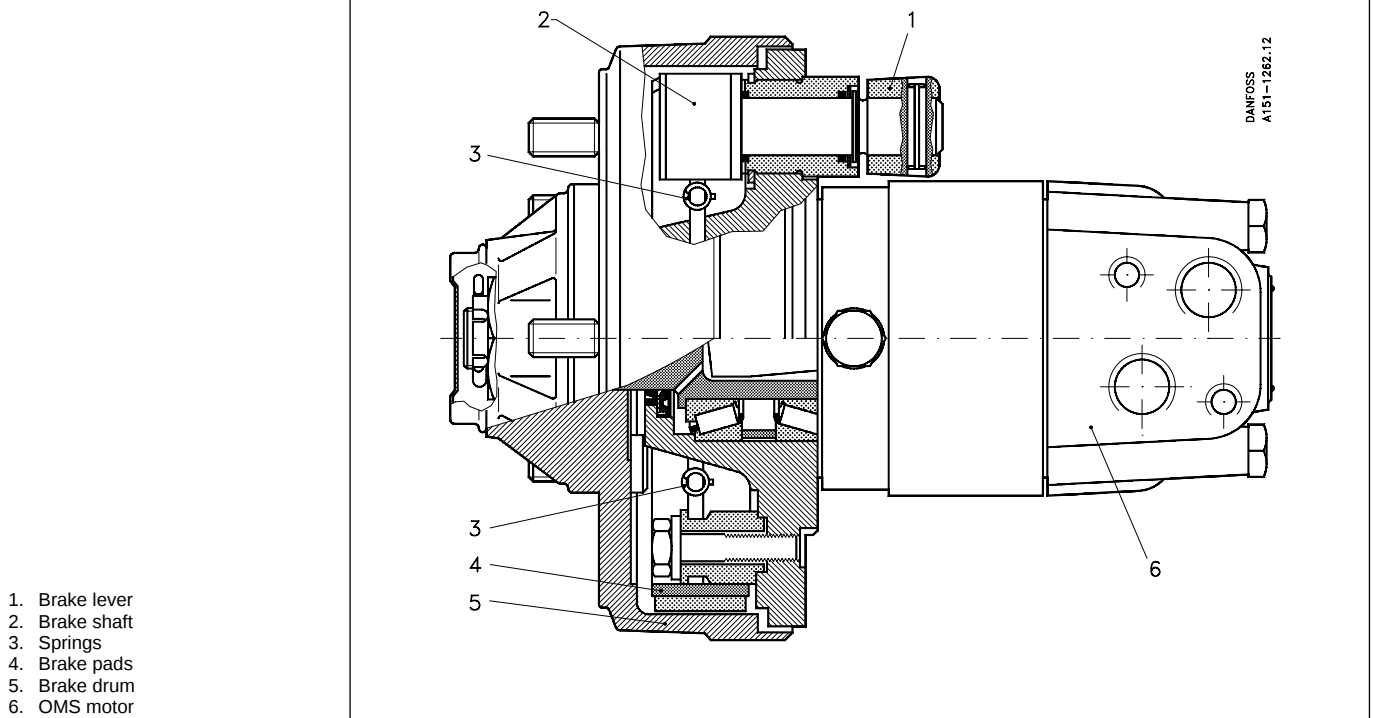
- 1) at the motor drain connection
- 2) at the drain connection of the attached component.

If a drain line is fitted to the attached component, it must be possible for oil to flow freely between motor and attached component.

The drain line must be led to the tank in such a way that there is no risk of the motor and attached component being drained of oil when at rest.

The maximum pressure in the drain line is limited by the attached component and its shaft seal.

**Motor with drum brake,
OMS B**



When the brake lever is actuated, the brake shaft is turned. The rectangular shape of the inner part of this shaft forces the brake pads to be pressed against the brake drum. This brakes the wheel or the winch drum.

When the lever is released, the springs pull it and the brake pads back to their initial positions and the motor output shaft is released.

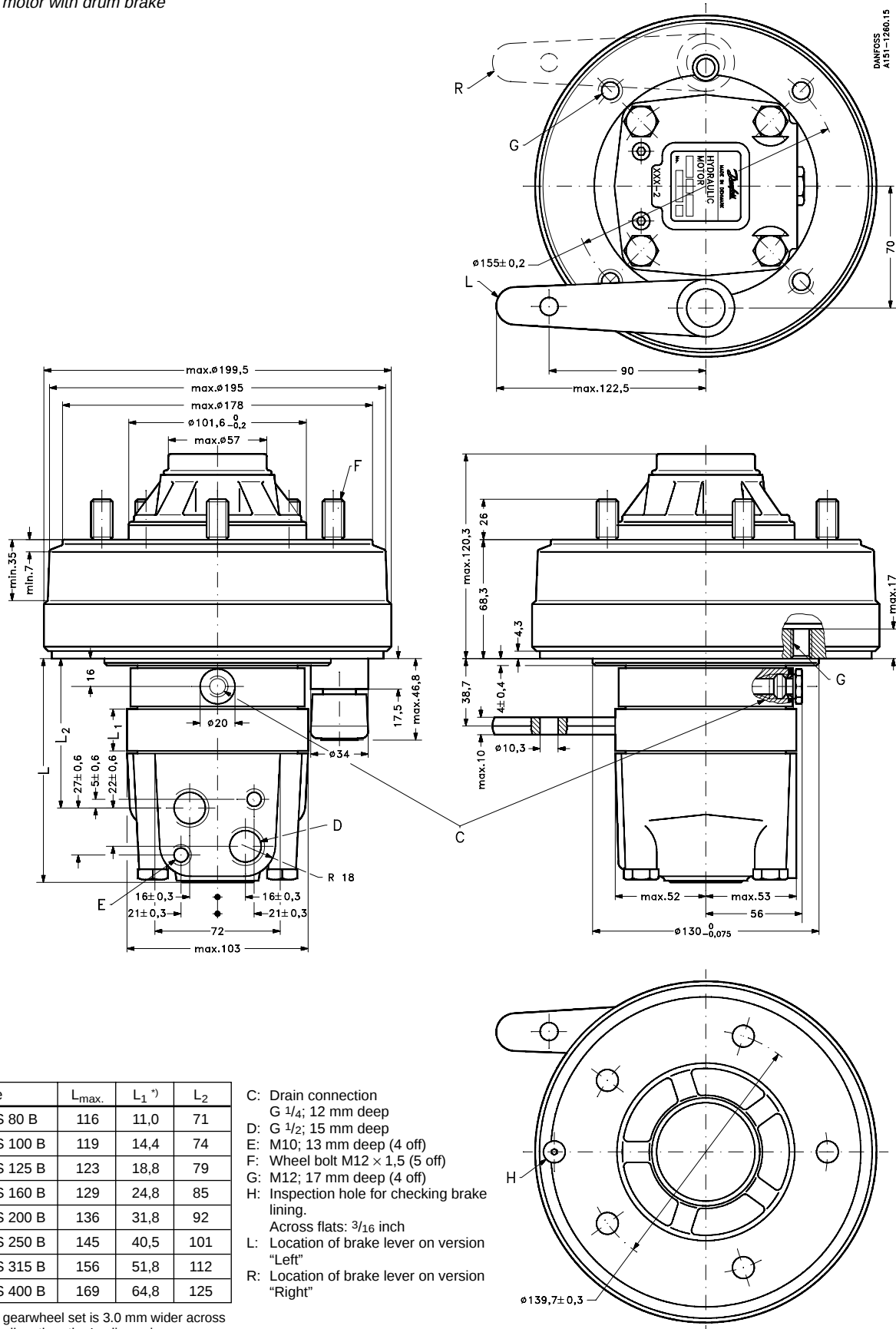
**Adjustment of actuating
angle**

The actuating angle can be adjusted by dismantling the brake lever and placing it in the requested angle on the splines profile of the brake shaft. Minimum angle adjustment is 11°.

**Actuating direction and min.
actuating movement**

Due to the construction of the brake shaft, the brake is actuated irrespective of the actuating direction of the brake lever. You can choose the actuating direction best suited for the individual application. The cable or rod connection actuating the brake should be capable of moving at least 25 mm from neutral position to extreme position.

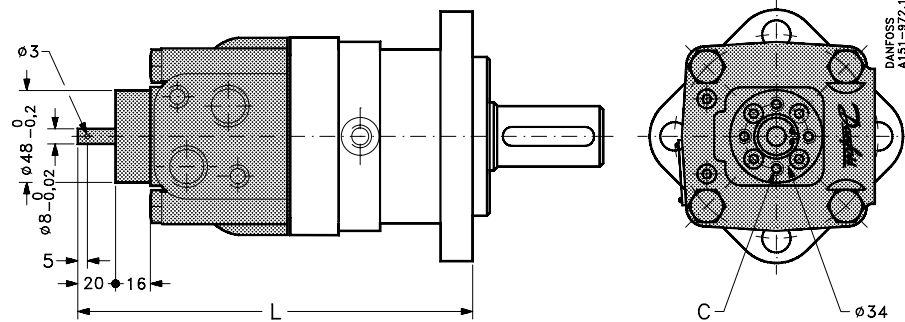
OMS B, motor with drum brake



*) The gearwheel set is 3.0 mm wider across the rollers than the L_1 dimensions

Motors with tacho connection
OMS T, OMSW T, OMSS T, OMS BT

Dimensions



Dimensions (mm)

Motor size	80	100	125	160	200	250	315	400
Type OMS T	199	203	207	213	220	229	240	253
Type OMSW T	162	165	170	176	183	191	202	215
Type OMSS T	156	160	164	170	177	186	197	210
Type OMS BT	150	153	157	163	170	179	190	203

C: M5 (4); 8 mm deep

Weight of tacho connection unit: 0.2 kg

Angular backlash

Tolerances in the connection between the motor output shaft and tacho connection give a certain angular backlash. Backlash can be defined as the angle the output shaft will turn on reversing before the tacho shaft is engaged. On the OMS motors the backlash is min. 9.1° and max. 14.1°.

Permissible load on the tacho drive of motor

- *Torque:*
0.01 Nm cont. and 0.04 Nm int.
- *Radial force in the middle of drive shaft:*
5 daN at 0-800 min⁻¹
- *Axial load:*
5 daN

Hydraulic motor OMT

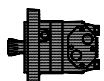
Code numbers and weight

	Motor type	OMT 160	OMT 200	OMT 250	OMT 315	OMT 400	OMT 500
	Cylindrical shaft	151B3000	151B3001	151B3002	151B3003	151B3004	151B3005
	Splined shaft	151B3006	151B3007	151B3008	151B3009	151B3010	151B3011
	Tapered shaft	151B3012	151B3013	151B3014	151B3015	151B3016	151B3017
	P.t.o. shaft	151B3018	151B3019	151B3020	151B3021	151B3022	151B3023
	Weight (kg)	20	20.5	21	22	23	24

Wheel motor

	Motor type	OMTW 160	OMTW 200	OMTW 250	OMTW 315	OMTW 400	OMTW 500
	Cylindrical shaft	151B3024	151B3025	151B3026	151B3027	151B3028	151B3029
	Tapered shaft	151B3030	151B3031	151B3032	151B3033	151B3034	151B3035
	Weight (kg)	22	22.5	23	24	25	26

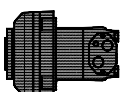
Short motor

	Motor type	OMTS 160	OMTS 200	OMTS 250	OMTS 315	OMTS 400	OMTS 500
	Without output shaft	151B3036	151B3037	151B3038	151B3039	151B3040	151B3041
	Weight (kg)	20	20.5	21	22	23	24

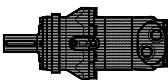
Motors with tacho connection

For code numbers of motors with tacho connection, please contact Danfoss Sales Organization for Hydraulics.

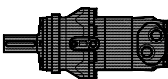
Brake motor OMT FX

	Motor type	OMT FX	OMT FX	OMT FX	OMT FX	OMT FX	OMT FX
	Motor size	160	200	250	315	400	500
	Wheel bolt flange	151B3207	151B3208	151B3209	151B3210	151B3211	151B3212
	Thread hole flange	151B3200	151B3201	151B3202	151B3203	151B3204	151B3205
	Weight (kg)	31.0	31.5	32.0	33.0	34.0	35.0

Brake motor OMT FL

	Motor type	OMT FL	OMT FL	OMT FL	OMT FL	OMT FL	OMT FL
	Motor size	160	200	250	315	400	500
	Cylindrical shaft	151B4000	151B4001	151B4002	151B4003	151B4004	151B4005
	Splined shaft	151B4007	151B4008	151B4009	151B4010	151B4011	151B4012
	Weight (kg)	24.5	25.0	25.5	26.5	27.5	28.5

Brake motor OMT FH

	Motor type	OMT FH	OMT FH	OMT FH	OMT FH	OMT FH	OMT FH
	Motor size	160	200	250	315	400	500
	Cylindrical shaft	151B4021	151B4022	151B4023	151B4024	151B4025	151B4026
	Splined shaft	151B4028	151B4029	151B4030	151B4031	151B4032	151B4033
	Weight (kg)	24.5	25.0	25.5	26.5	27.5	28.5

Technical data

Motor 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 /rev)	161.1	201.4	251.8	326.3	410.9	523.6
Max. speed	(min ⁻¹)	cont.	625	625	500	380	240
		int. ¹⁾	780	750	600	460	285
Max. torque	(daNm)	cont.	47	59	73	95	122
		int. ¹⁾	56	71	88	114	137
		peak ²⁾	66	82	102	133	160
Max. output	(kW)	cont.	26.5	33.5	33.5	33.5	30
		int. ¹⁾	32	40	40	40	35
Max. pressure drop	(bar)	cont.	200	200	200	200	180
		int. ¹⁾	240	240	240	240	210
		peak ²⁾	280	280	280	280	240
Max. oil flow	(l/min)	cont.	100	125	125	125	125
		int. ¹⁾	125	150	150	150	150
Max. starting pressure with unloaded shaft	(bar)	10	10	10	10	10	10
Min. starting torque	(daNm)	at max. press. drop cont.	34	43	53	74	84
		at max. press. drop int. ¹⁾	41	52	63	89	97
Min. speed ³⁾	(min ⁻¹)	10	9	8	7	6	5

Type		Max. inlet pressure	Max. return pressure with drain line ⁴⁾
OMT, OMTW, OMTS OMT FX, OMT FL, OMT FH	cont.	210	140
	int. ¹⁾	250	175
	peak ²⁾	300	210

Brake motors

Type	Max. pressure in drain line ⁴⁾ (bar)	Holding torque ⁵⁾ (daNm)	Brake-release pressure ⁴⁾ (bar)	Max. pressure in brake line (bar)
OMT FX, OMT FL	5	120	12	30
OMT FH	5	120	30	280

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

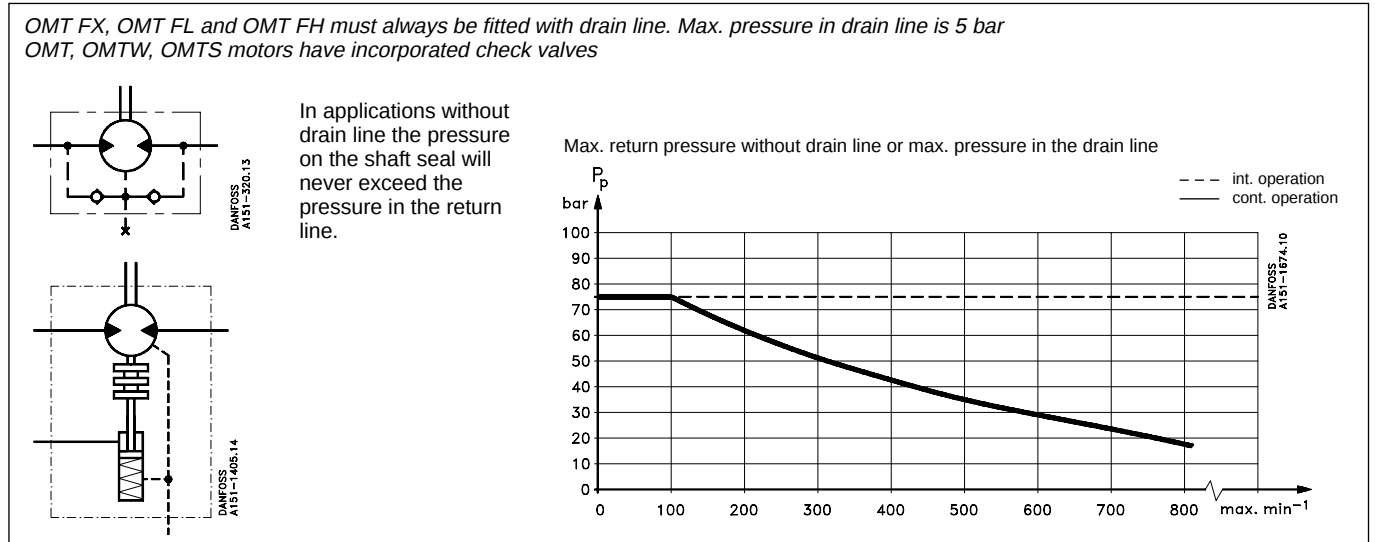
²⁾ Peak load: The permissible values may occur for max. 1% of every minute.

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

⁴⁾ 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.

⁵⁾ For the supply of motors with holding torques higher than those stated, please contact the Sales Organization for Danfoss Hydraulics.

Max. permissible shaft seal pressure

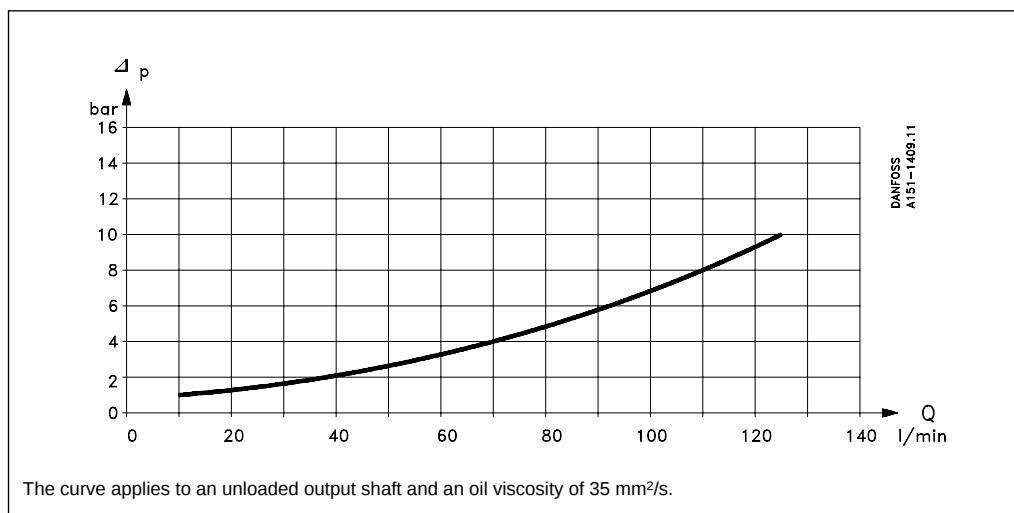


Oil flow in drain line

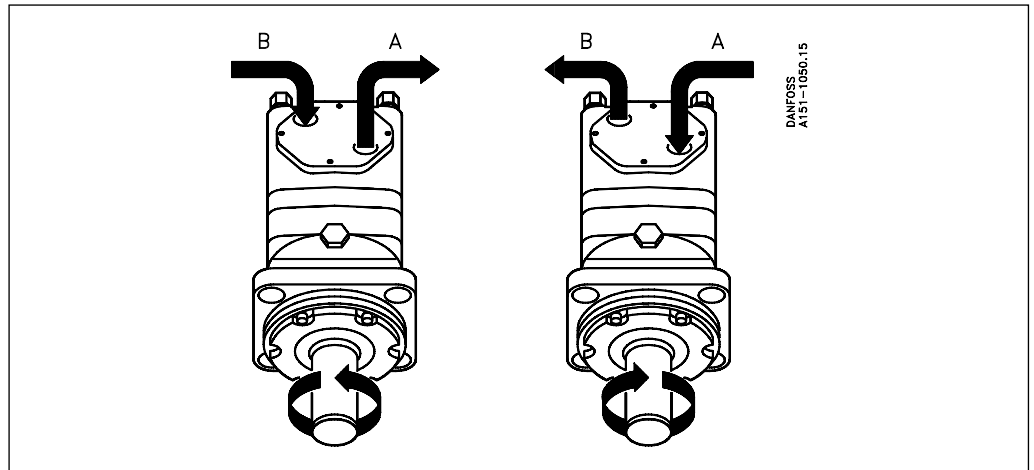
The table shows the max. oil flow in the drain line for all OMT motors. The values are measured at a return pressure less than 5-10 bar.

Pressure drop (bar)	Viscosity (mm ² /s)	Oil flow in drain line (l/min)
140	20	2.5
	35	1.5
210	20	5
	35	3

Pressure loss in the motor



Direction of shaft rotation



Permissible shaft load for OMT and OMTW

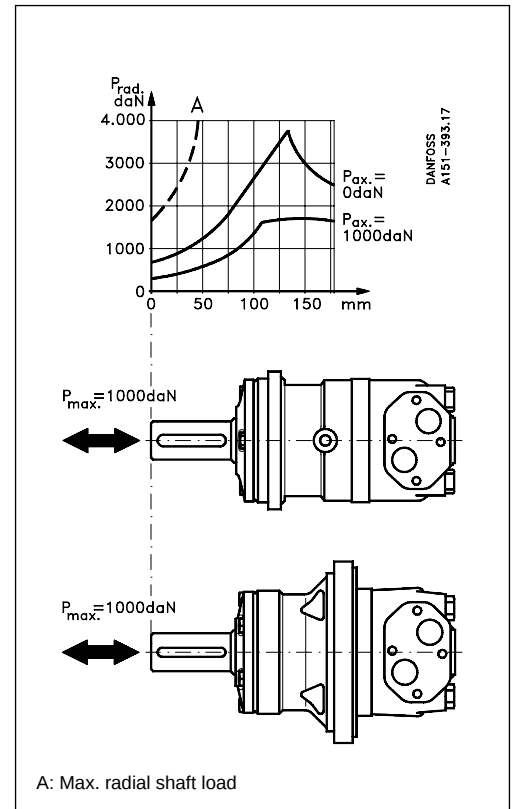
The output shaft runs in tapered roller bearings that permit high axial and radial forces.

The permissible radial load on the shaft is shown for an axial load of 0 and 1000 daN as a function of the distance from the mounting flange to the point of load application.

Curve A shows max. radial shaft load. Any shaft load exceeding the values quoted in the curve will involve a risk of breakage.

The other curves apply to a B10 bearing life of 3000 hours at 200 min⁻¹ when mineral based hydraulic oil with a sufficient content of anti-wear additives is used.

Bearing life calculations can be made using the explanation and formula provided in the chapter "Bearing dimensioning" in the subcatalogue "General information".

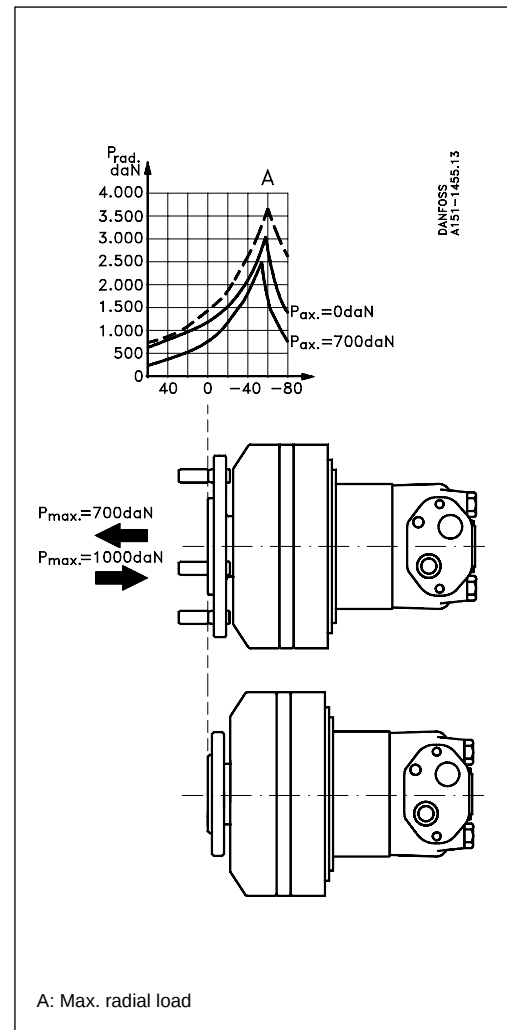


Permissible radial and axial loads for OMT FX

OMT FX shafts run in ball race bearings. This means that OMT FX can be used for heavy vehicles and for winches with relatively high tractive effort without the necessity for further bearings on wheel or winch drum.

The drawing shows the permissible axial and radial forces. Curve A shows the maximum radial load. Any radial load exceeding the values quoted in the curve will involve a risk of breakage.

The other curves apply to a B 10 bearing life of 3000 hours at 50 min⁻¹ when mineral-based hydraulic oil with a sufficient content of antiwear additives is used.



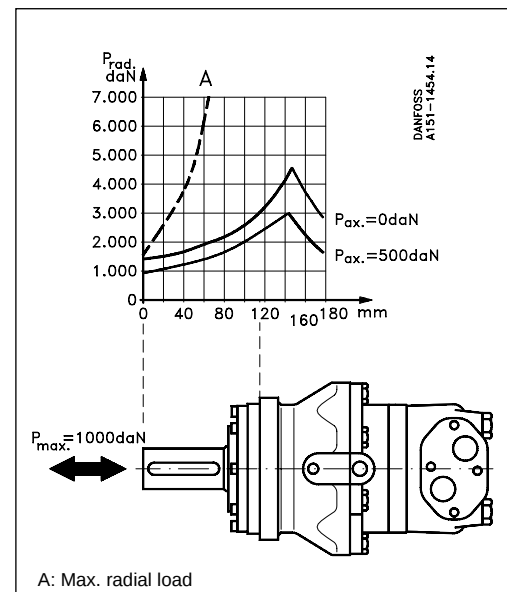
Permissible radial and axial loads for OMT FL and OMT FH

OMT FL shafts run in taper roller bearings. This means that OMT FL and OMT FH can be used for very heavy vehicles and for winches with great tractive efforts without the necessity for further bearings on wheel or winch drum.

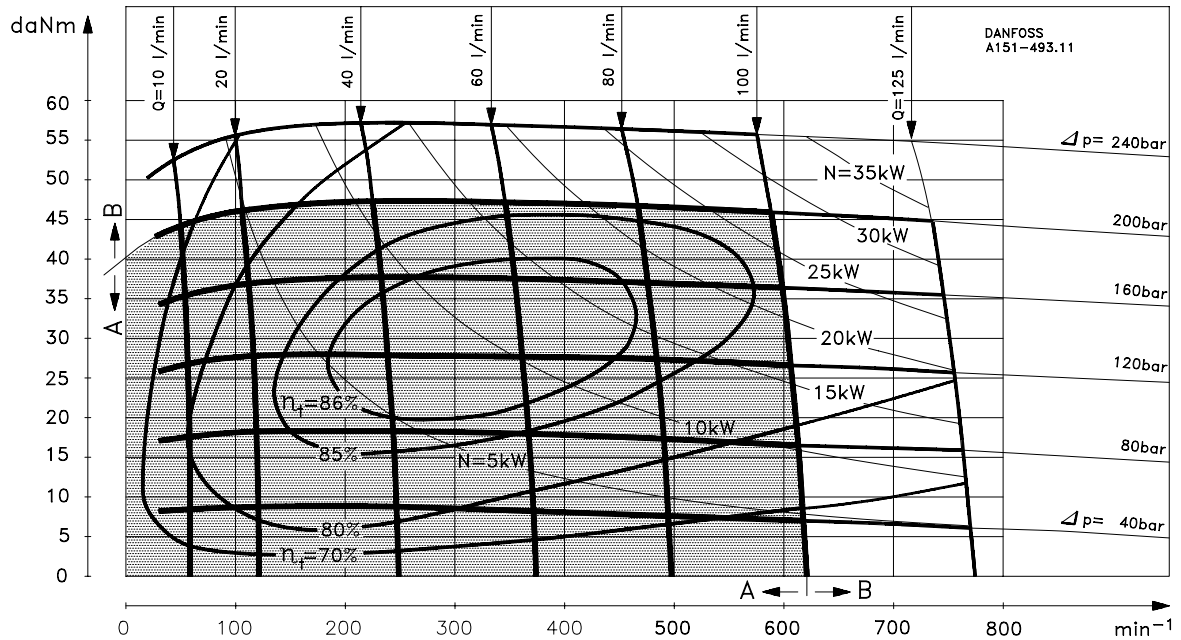
The drawing shows the permissible axial and radial forces.

Curve A shows the maximum radial load. Any radial load exceeding the values quoted in the curve will involve a risk of breakage.

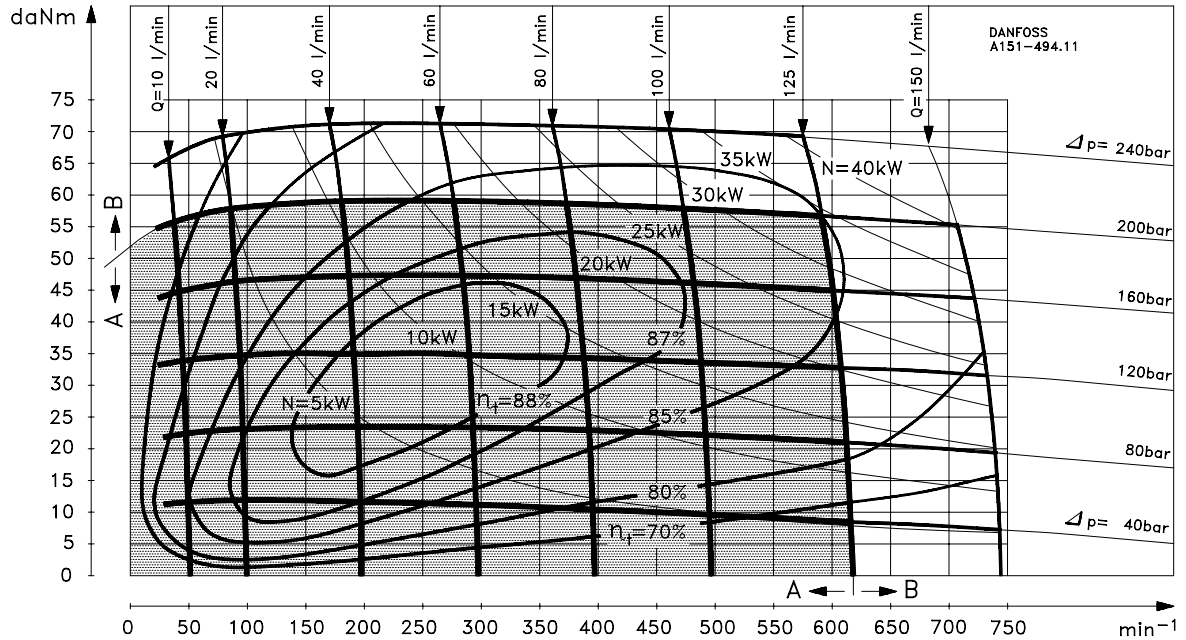
The other curves apply to a B10 bearing life of 3000 hours at 200 min⁻¹ when mineral-based hydraulic oil with a sufficient content of anti-wear additives is used.



OMT 160



OMT 200

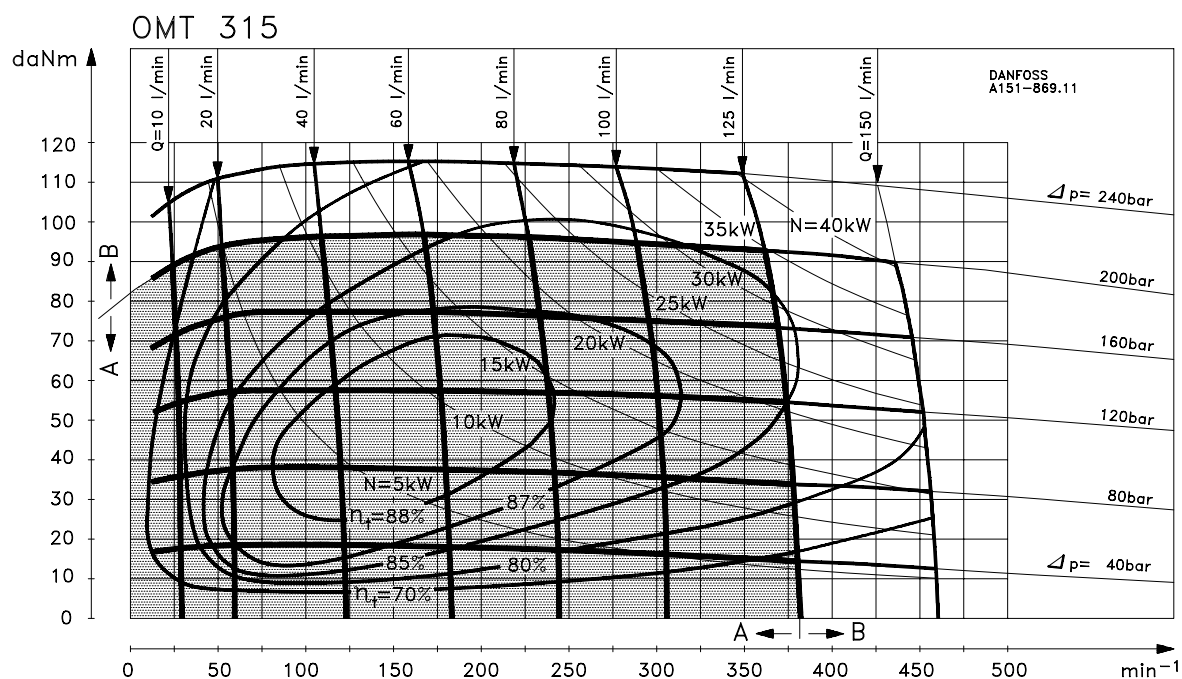
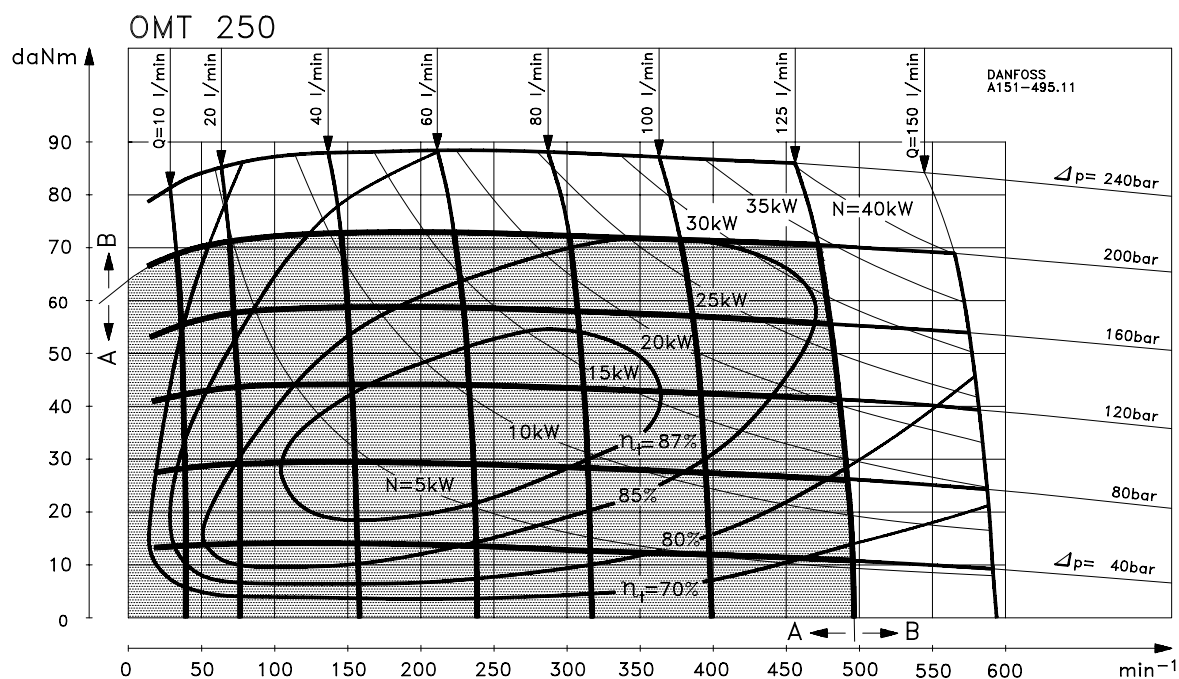


Explanation of function diagram use, basis and conditions can be found on page 3.

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

Note:

Intermittent pressure drop and oil flow must not occur simultaneously.

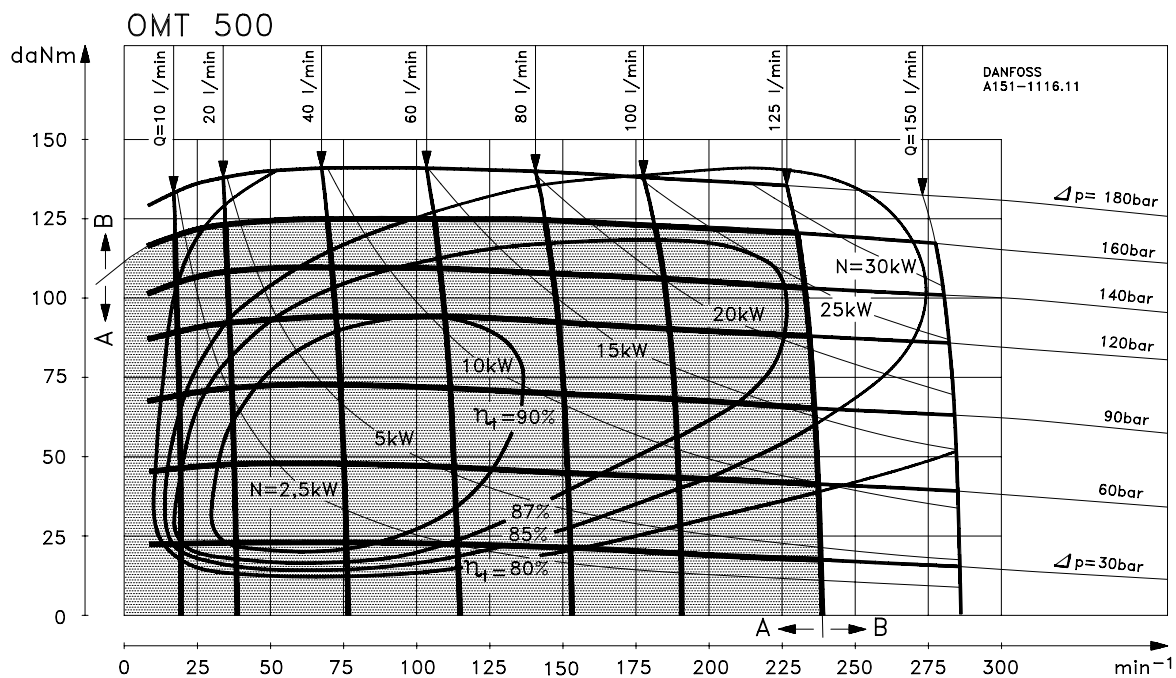
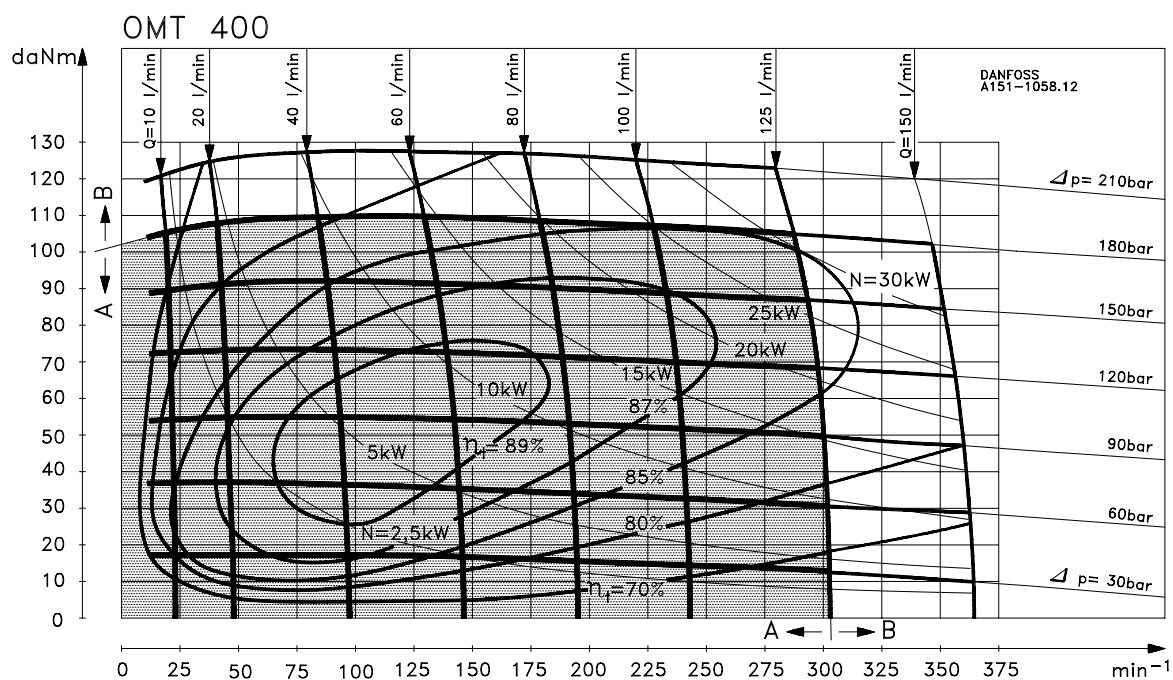


Explanation of function diagram use, basis and conditions can be found on page 3.

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

Note:

Intermittent pressure drop and oil flow must not occur simultaneously.



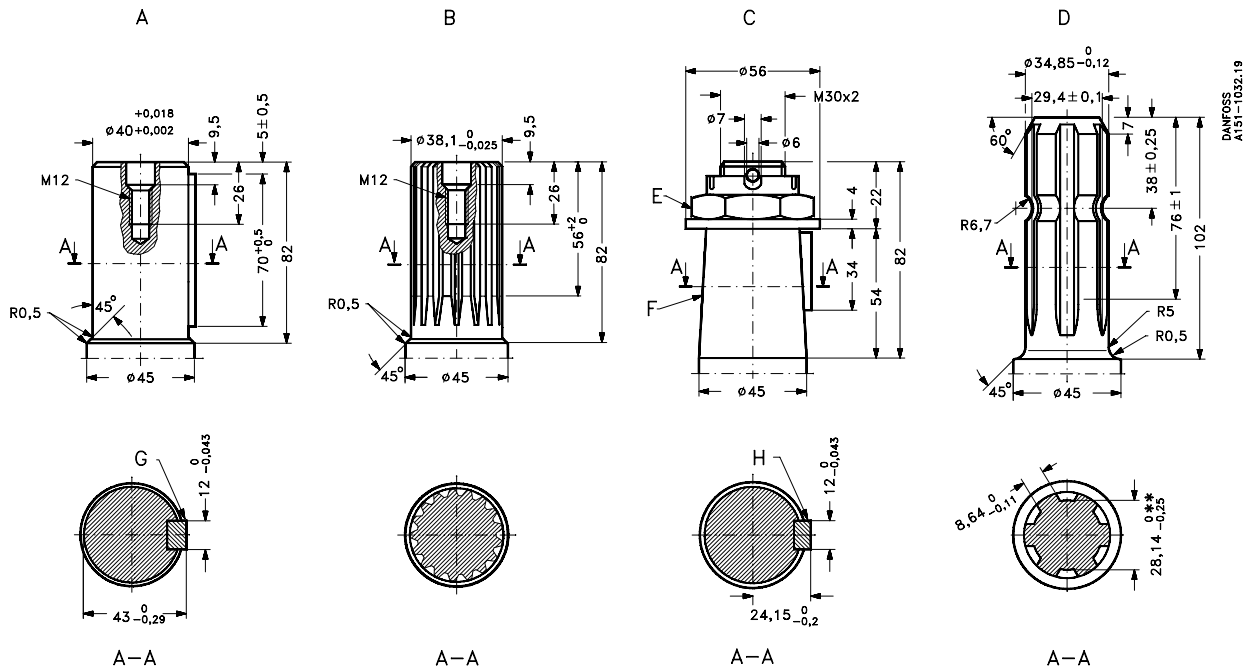
Explanation of function diagram use, basis and conditions can be found on page 3.

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

Note:

Intermittent pressure drop and oil flow must not occur simultaneously.

Shaft versions



A: Cylindrical shaft
G: Parallel key
A12 × 8 × 70
DIN 6885

B: Involute splined shaft
ANS B92.1 - 1970 standard
Flat root side fit
Pitch 12/24
Teeth 17
Major dia. 1.50 inch
Pressure angle 30°

C: Tapered shaft
(ISO/R775)
E: DIN 937
Across flats: 46
Tightening torque:
50 ± 3 daNm
F: Taper 1:10
H: Parallel key
B12 × 8 × 28
DIN 6885

D: P.t.o. shaft
DIN 9611 Form 1
(ISO/R500 without pin hole)
** Deviates from DIN 9611

Technical drawing of a Danfoss A151-889.14 valve, showing three views: front, side, and top. The drawing includes detailed dimensions in millimeters and degrees.

Front View Dimensions:

- Overall height: 82
- Top flange diameter: $\varnothing 125^{+0}_{-0.063}$
- Top flange thickness: 32
- Main body diameter: $\varnothing 72 \pm 1$
- Base dimensions: 100, 128, and 143
- Mounting points: D, E, and F
- Angles: 15°

Side View Dimensions:

- Overall height: 82
- Top flange diameter: $\varnothing 125^{+0}_{-0.063}$
- Top flange thickness: 32
- Main body diameter: $\varnothing 72 \pm 1$
- Base dimensions: 100, 128, and 143
- Mounting points: D, E, and F

Top View Dimensions:

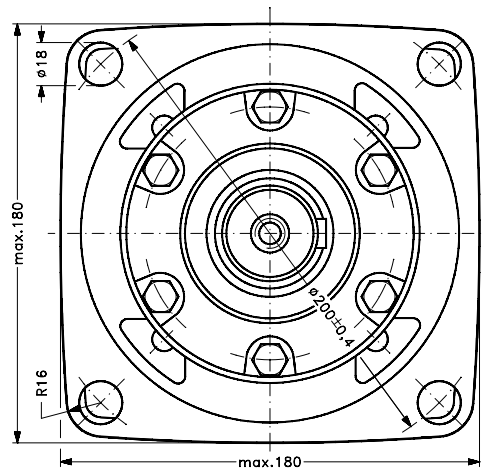
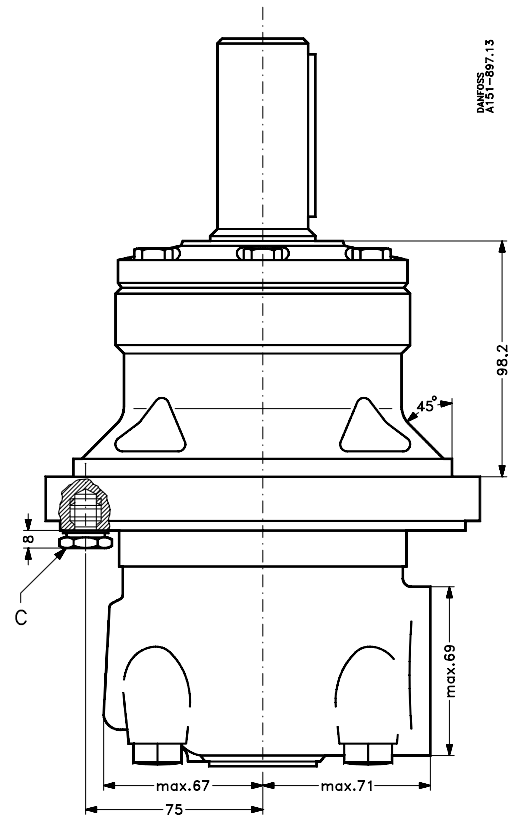
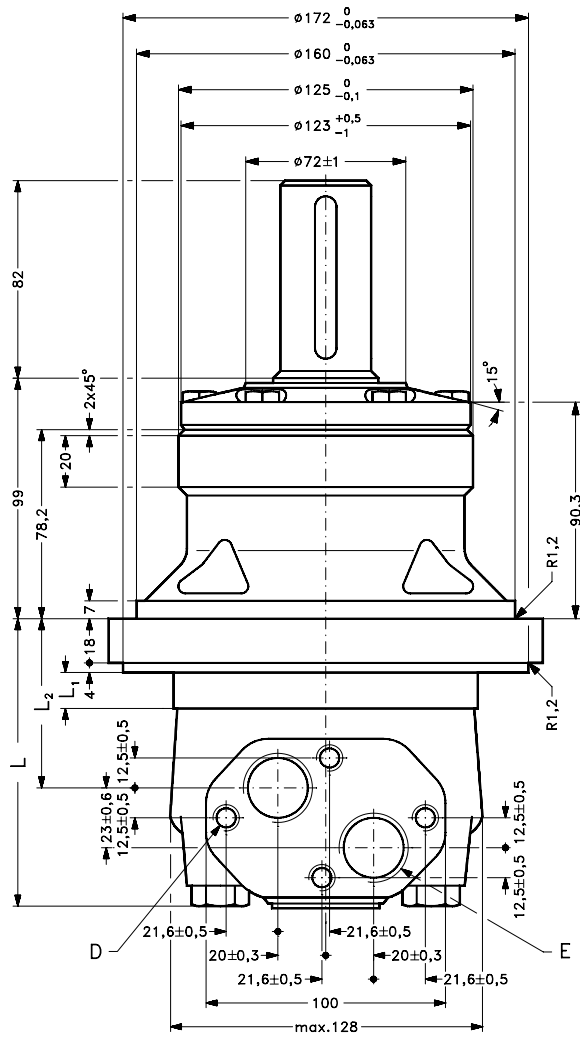
- Overall width: 143
- Top flange diameter: $\varnothing 125^{+0}_{-0.063}$
- Top flange thickness: 32
- Main body diameter: $\varnothing 72 \pm 1$
- Base dimensions: 100, 128, and 143
- Mounting points: D, E, and F

Type	L _{max}	L ₁ ')	L ₂
OMT 160	190	16.5	140
OMT 200	195	21.5	145
OMT 250	201	27.8	151
OMT 315	211	37.0	161
OMT 400	221	47.5	171
OMT 500	235	61.5	185

C: Drain connection
G 1/4 ; 12 mm deep
D: M10; 10 mm deep
E: G 3/4; 17 mm deep

*) The gearwheel set is 3.5 mm wider across the rollers than the L_1 dimensions

OMTW wheel motor



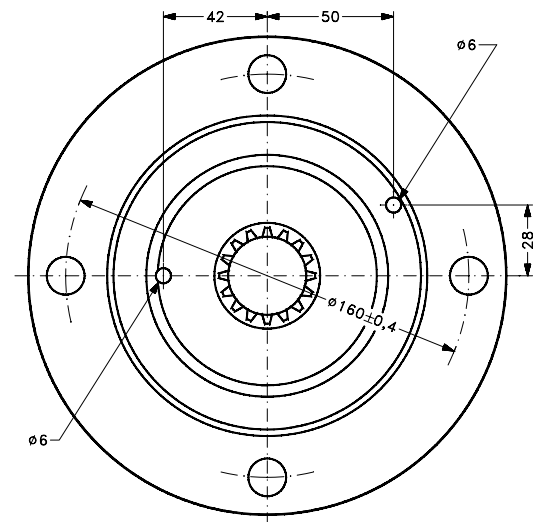
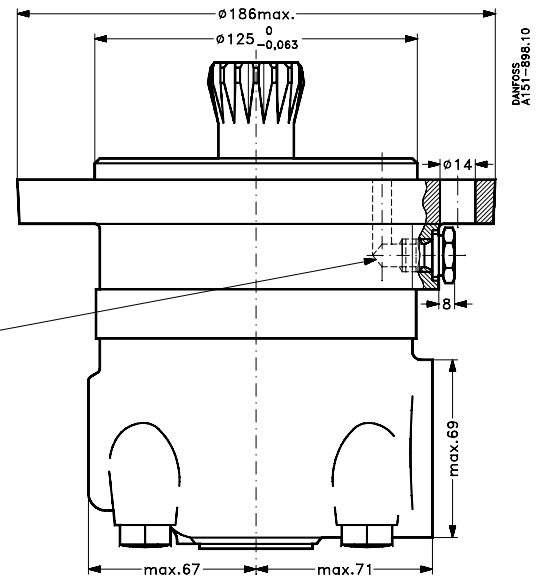
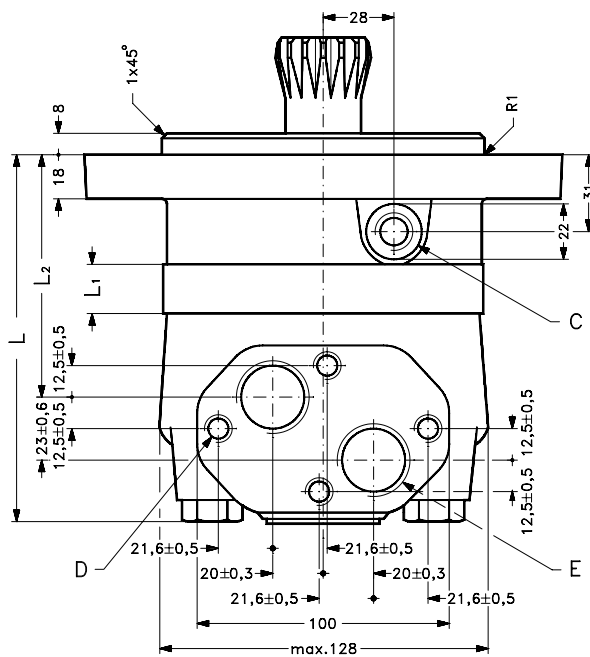
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Type	L _{max}	L ₁ *)	L ₂
OMTW 160	123	16.5	73
OMTW 200	128	21.5	78
OMTW 250	134	27.8	84
OMTW 315	144	37.0	94
OMTW 400	154	47.5	104
OMTW 500	168	61.5	118

C: Drain connection
G 1/4; 12 mm deep
D: M10; 10 mm deep
E: G 3/4; 17 mm deep

*) The gearwheel set is 3.5 mm wider across the rollers than the L₁ dimensions

OMTS short motor



Type	L _{max.}	L ₁ *)	L ₂
OMTS 160	146	16.5	96
OMTS 200	151	21.5	101
OMTS 250	157	27.8	107
OMTS 315	166	37.0	116
OMTS 400	177	47.5	127
OMTS 500	191	61.5	142

C: Drain connection
G 1/4 ; 12 mm deep
D: M10; 10 mm deep
E: G 3/4; 17 mm deep

*) The gearwheel set is 3.5 mm wider across the rollers than the L₁ dimensions

Installing the OMTS

The cardan shaft of the OMTS motor acts as an "output shaft". Because of the movement of the shaft, no seal can be fitted at the shaft output. Internal oil leakage from the motor will therefore flow into the attached component.

During start and operation it is important that the spline connection and the bearings in the attached component receive oil and are adequately lubricated. To ensure that the spline connection receives sufficient oil, a conical sealing ring between the shaft of the attached component and the motor intermediate plate is recommended. This method is used in the OMT.

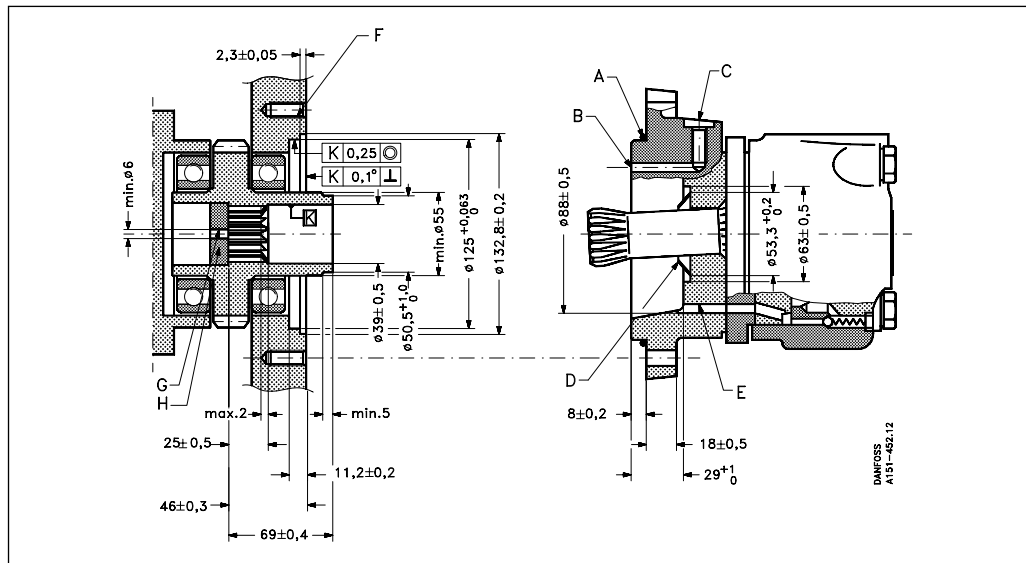
The conical sealing ring (code. no. 633B9022) is supplied with the motor.

To ensure that oil runs to the bearings and other parts of the attached component, the stop plate must have a hole in it (see fig. overleaf).

We recommend an O-ring between motor and attached component. The O-ring (code no. 151B1040) is supplied with the motor. If motor and attached component have been separated, remember to refill before starting up. Fill the oil through the drain connection.

Dimensions of the attached component

- A: O-ring: 125 × 3 mm
- B: External drain channel
- C: Drain connection
G 1/4; 12 mm deep
- D: Conical seal ring
- E: Internal drain channel
- F: M12; min. 18 mm deep
- G: Oil circulation hole
- H: Hardened stop plate



Internal spline data for the component to be attached

The attached component must have internal splines corresponding to the external splines on the motor cardan shaft (see drawing below).

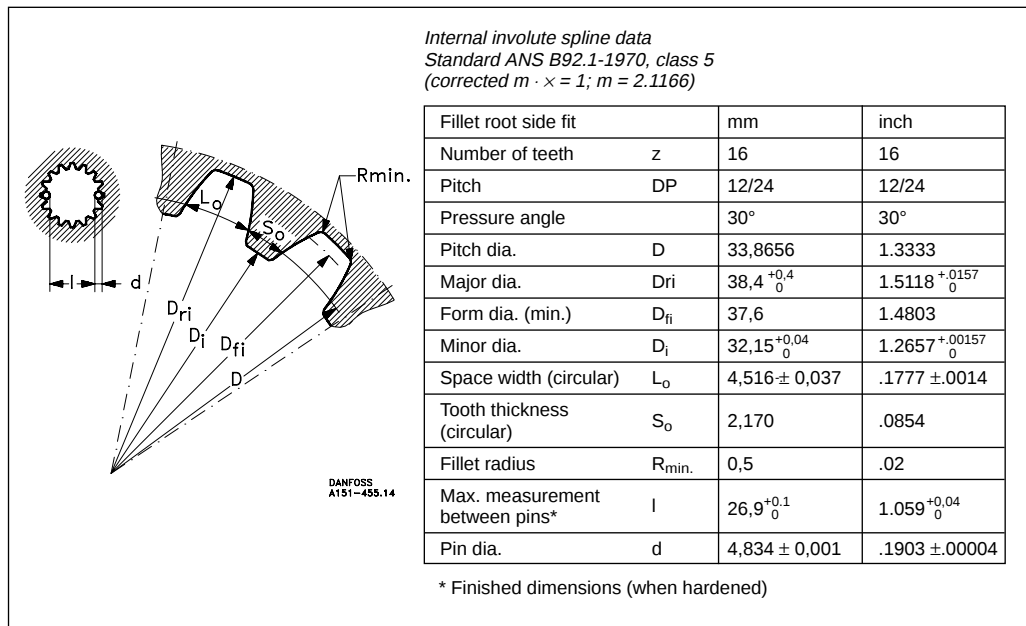
Material:

Case hardening steel with a tensile strength corresponding at least to 20 MoCr4 (90 daN/mm²).

See also SAE 8620 for further information on steel material.

Hardening specification:

- On the surface: HV = 750 ± 50
- 0,7 ± 0,2 mm under the surface: HV = 560



Drain connection on OMTS or attached component

A drain line ought to be used when pressure in the return line can exceed the permissible pressure on the shaft seal of the attached component.

The drain line can be connected at two different points:

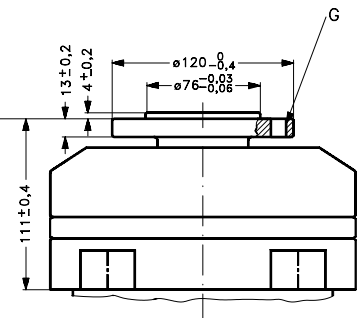
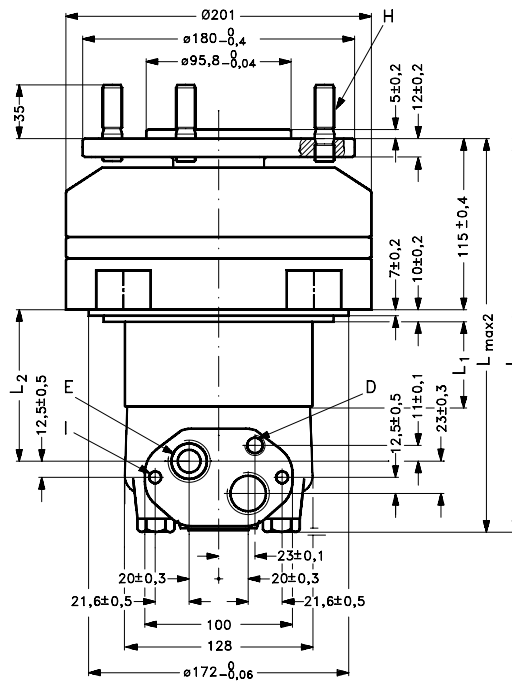
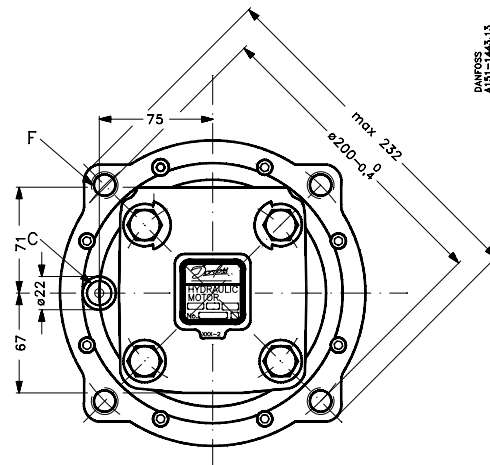
- 1) at the motor drain connection
- 2) at the drain connection of the attached component.

If a drain line is fitted to the attached component, it must be possible for oil to flow freely between motor and attached component.

The drain line must be led to the tank in such a way that there is no risk of the motor and attached component being drained of oil when at rest.

The maximum pressure in the drain line is limited by the attached component and its shaft seal.

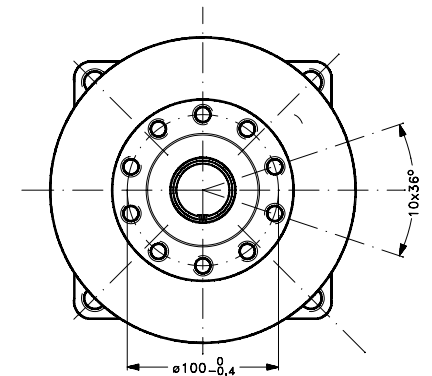
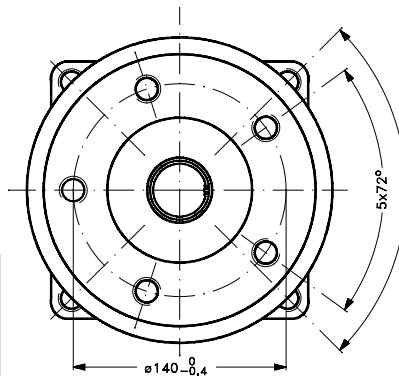
OMT FX



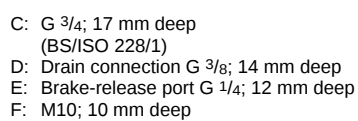
- C: Brake-release port G 1/4; 12 mm deep (BS/ISO 228/1)
 D: Drain connection G 1/4; 12 mm deep
 E: G 3/4; 17 mm deep
 F: 4 × M12; 27 mm deep
 G: 10 × M12
 H: Wheel bolts 5 × M14 × 1.5
 I: M10; 10 mm deep

Type	L _{max. 1}	L _{max. 2}	L ₁ *)	L ₂
OMT 160 FX	223	227	16.5	62.3
OMT 200 FX	228	232	21.5	67.3
OMT 250 FX	234	238	27.8	73.5
OMT 315 FX	243	247	37.0	82.8
OMT 400 FX	254	258	47.5	93.3
OMT 500 FX	268	272	61.5	107.1

*) The gearwheel set is 3.5 mm wider across the rollers than the L₁ dimensions



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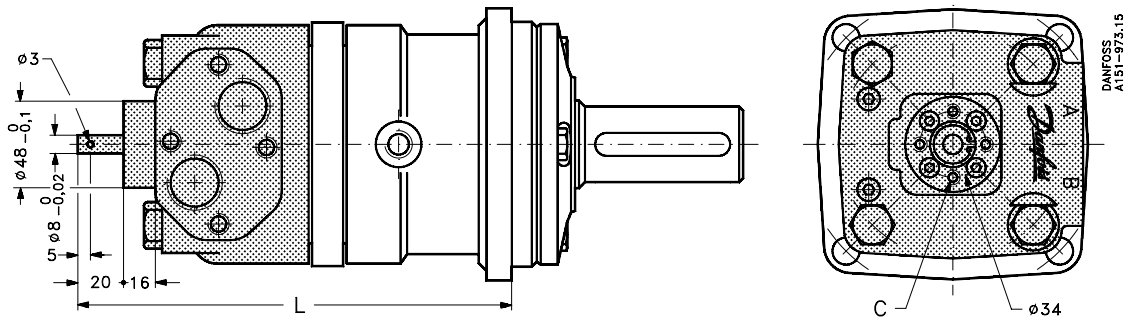


Type	$L_{\max}$	L_1 ')	L_2
OMT 160 FL/FH	228	16.5	178
OMT 200 FL/FH	233	21.5	183
OMT 250 FL/FH	239	27.8	189
OMT 315 FL/FH	248	37.0	199
OMT 400 FL/FH	259	47.5	209
OMT 500 FL/FH	273	61.5	223

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Motors with tacho connection
OMT T, OMTW T, OMTS T

Dimensions



Dimensions (mm)

Motor size	160	200	250	315	400	500
Type OMT T	223	228	234	244	254	268
Type OMTW T	156	161	167	177	187	201
Type OMTS T	179	184	190	199	210	224

C: M5 (4); 8 mm deep

Weight of tacho connection unit: 0.2 kg

Angular backlash

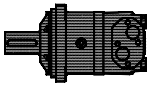
Tolerances in the connection between the motor output shaft and tacho connection give a certain angular backlash. Backlash can be defined as the angle the output shaft will turn on reversing before the tacho shaft is engaged. On the OMT motors the backlash is min. 7.9° and max. 12.4°.

Permissible load on the tacho drive of motor

- *Torque:*
0.01 Nm cont. and 0.04 Nm int.
- *Radial force in the middle of drive shaft:*
5 daN at 0-800 min⁻¹
- *Axial load:*
5 daN

Hydraulic motor OMV

Code numbers and weight

	Motor type	OMV 315	OMV 400	OMV 500	OMV 630	OMV 800
	Cylindrical shaft	151B3100	151B3101	151B3102	151B3103	151B3104
	Splined shaft	151B3105	151B3106	151B3107	151B3108	151B3109
	Tapered shaft	151B3110	151B3111	151B3112	151B3113	151B3114
	Weight (kg)	31.8	32.6	33.5	34.9	36.5

Wheel motor

	Motor type	OMVW 315	OMVW 400	OMVW 500	OMVW 630	OMVW 800
	Cylindrical shaft	151B3115	151B3116	151B3117	151B3118	151B3119
	Tapered shaft	151B3120	151B3121	151B3122	151B3123	151B3124
	Weight (kg)	32.4	33.2	34.1	35.5	37.1

Short motor

	Motor type	OMVS 315	OMVS 400	OMVS 500	OMVS 630	OMVS 800
	Without output shaft	151B3125	151B3126	151B3127	151B3128	151B3129
	Weight (kg)	22.7	23.5	24.4	25.6	27.7

Motors with tacho connection

For code numbers of motors with tacho connection, please contact Danfoss Sales Organization for Hydraulics.

Technical data

Motor type		OMV OMVW OMVS	OMV OMVW OMVS	OMV OMVW OMVS	OMV OMVW OMVS	OMV OMVW OMVS
Motor size		315	400	500	630	800
Geometric displacement	(cm ³ /rev)	314.5	400.9	499.6	629.1	801.8
Max. speed	(min ⁻¹)	cont.	510	500	400	315
		int. ¹⁾	630	600	480	380
Max. torque	(daNm)	cont.	92	118	146	166
		int. ¹⁾	111	141	176	194
		peak ²⁾	129	164	205	221
Max. output	(kW)	cont.	42.5	53.5	53.5	48
		int. ¹⁾	51	64	64	56
Max. pressure drop	(bar)	cont.	200	200	200	180
		int. ¹⁾	240	240	240	210
		peak ²⁾	280	280	280	240
Max. oil flow	(l/min)	cont.	160	200	200	200
		int. ¹⁾	200	240	240	240
Max. starting pressure with unloaded shaft	(bar)	8	8	8	8	8
Min. starting torque	(daNm)	at max. press. drop cont.	71	91	113	133
		at max. press. drop int. ¹⁾	85	109	136	155
Min. speed ³⁾	(min ⁻¹)	10	9	8	6	5

Type		Max. inlet pressure	Max. return pressure with drain line
OMV OMVW OMVS	cont.	210	140
	int. ¹⁾	250	175
	peak ²⁾	300	210

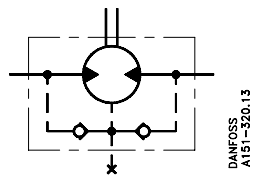
¹⁾ Intermittent operation: the permissible values may occur for max. 10% of every minute.

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

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

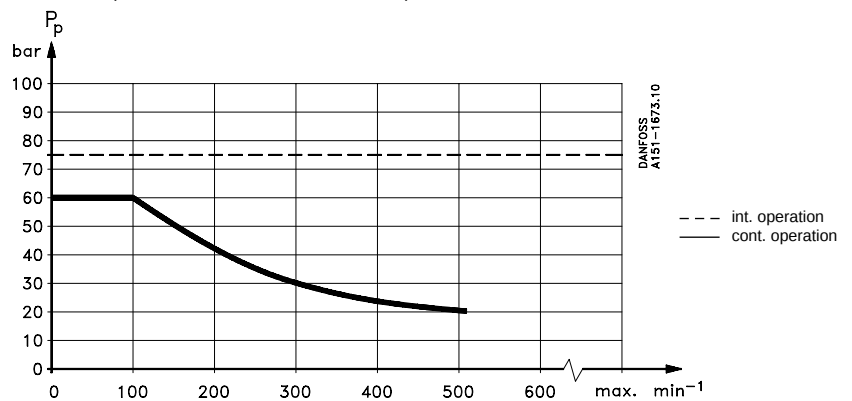
Max. permissible shaft seal pressure

OMV motors have incorporated check valves



In applications without drain line the pressure on the shaft seal will never exceed the pressure in the return line.

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

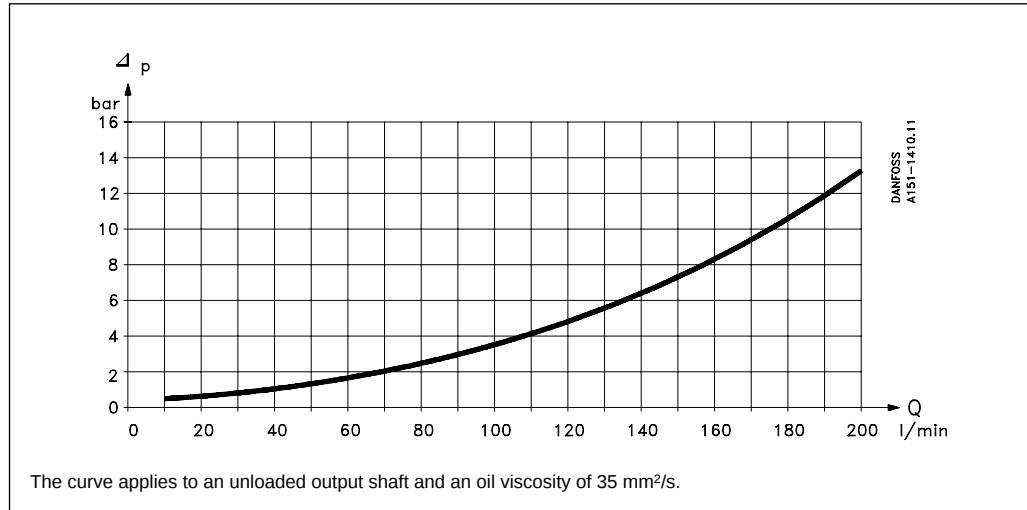


Oil flow in drain line

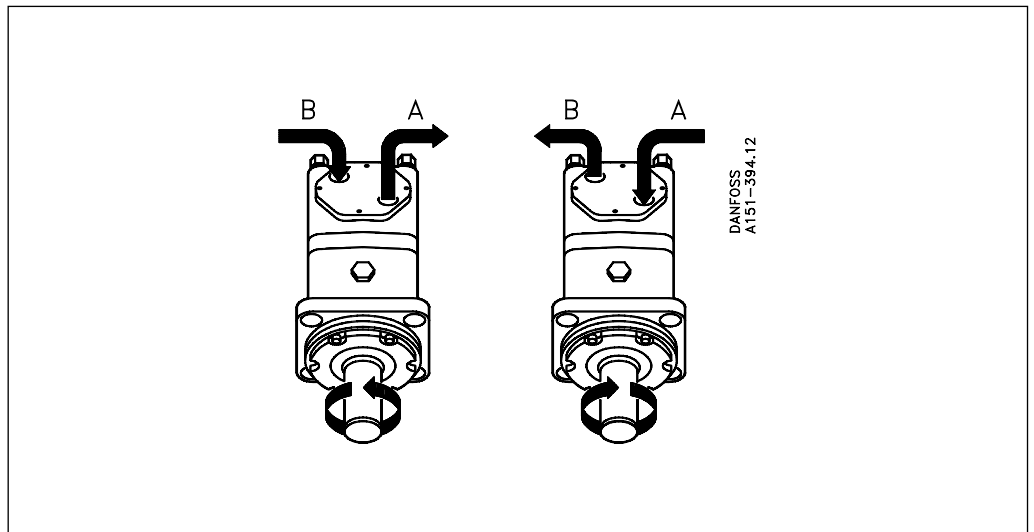
The table shows the max. oil flow in the drain line for all OMV motors. The values are measured at a return pressure less than 5-10 bar.

Pressure drop (bar)	Viscosity (mm ² /s)	Oil flow in drain line (l/min)
140	20	3
	35	2
210	20	6
	35	4

Pressure loss in the motor



Direction of shaft rotation



Permissible shaft load for OMV and OMVW

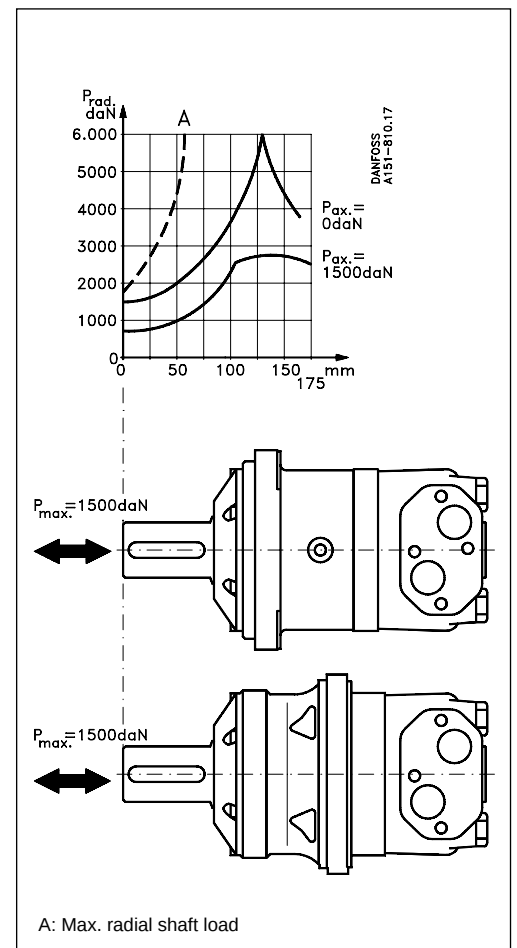
The output shaft runs in tapered roller bearings that permit high axial and radial forces.

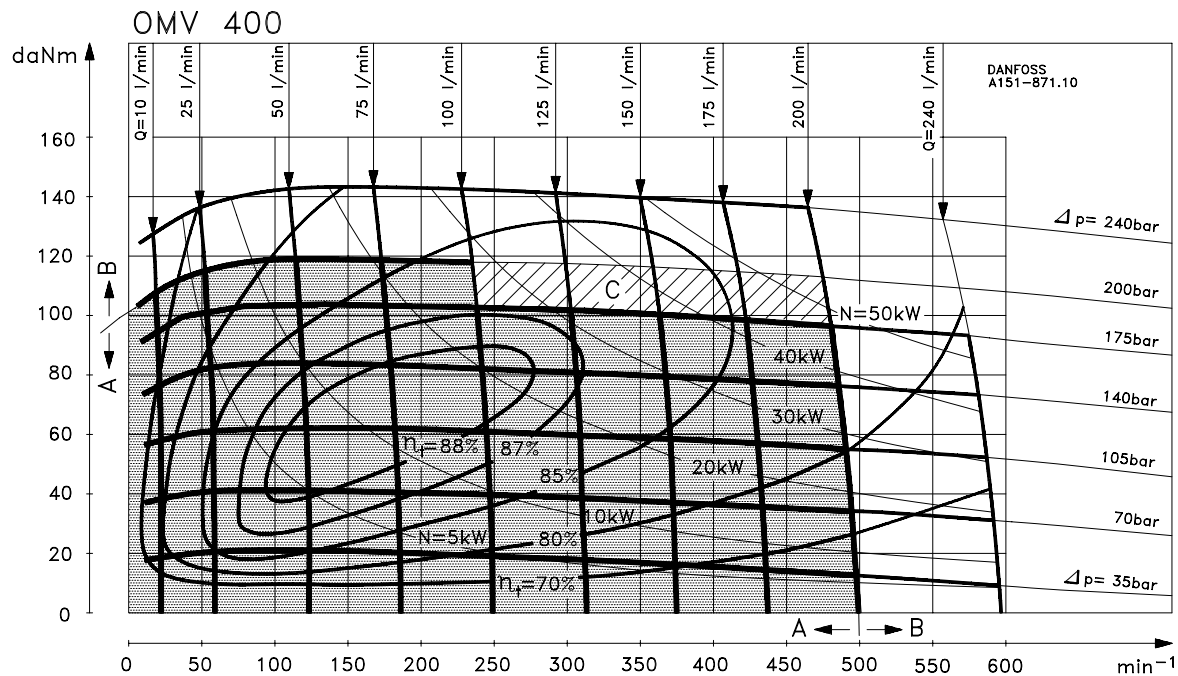
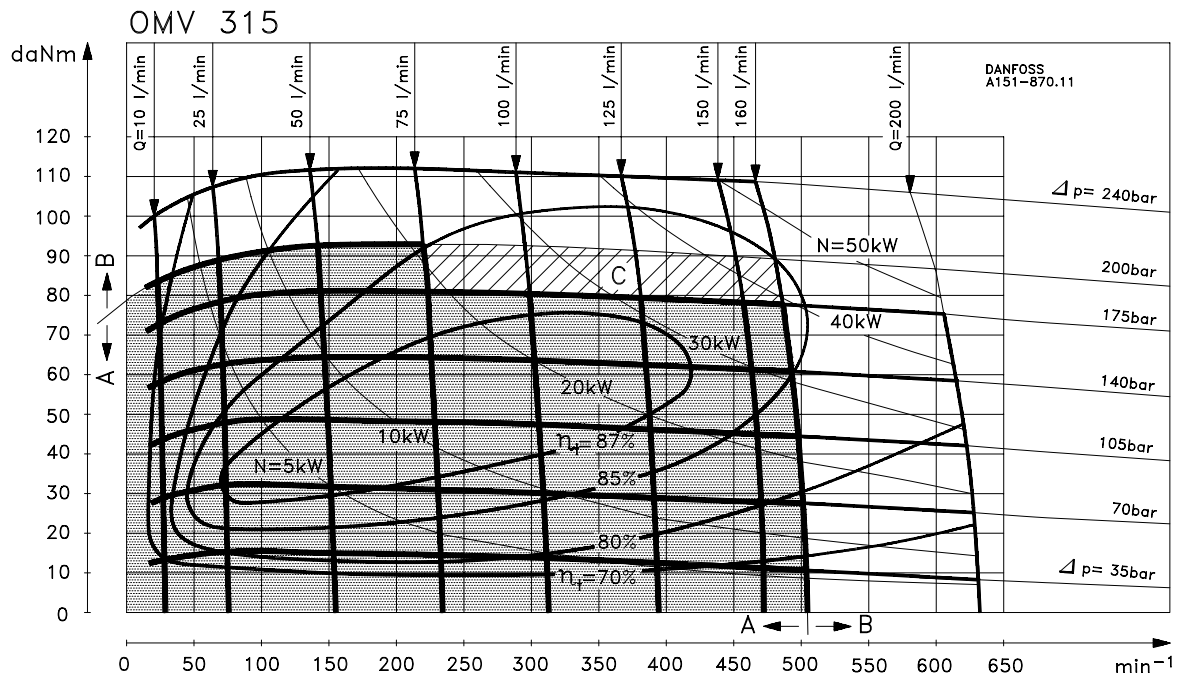
The permissible radial load on the shaft is shown for an axial load of 0 and 1500 daN as a function of the distance from the mounting flange to the point of load application.

Curve A shows max. radial shaft load. Any shaft load exceeding the values quoted in the curve will involve a risk of breakage.

The other curves apply to a B10 bearing life of 3000 hours at 200 min⁻¹ when mineral based hydraulic oil with a sufficient content of anti-wear additives is used.

Bearing life calculations can be made using the explanation and formula provided in the chapter "Bearing dimensioning" in the subcatalogue "General information".



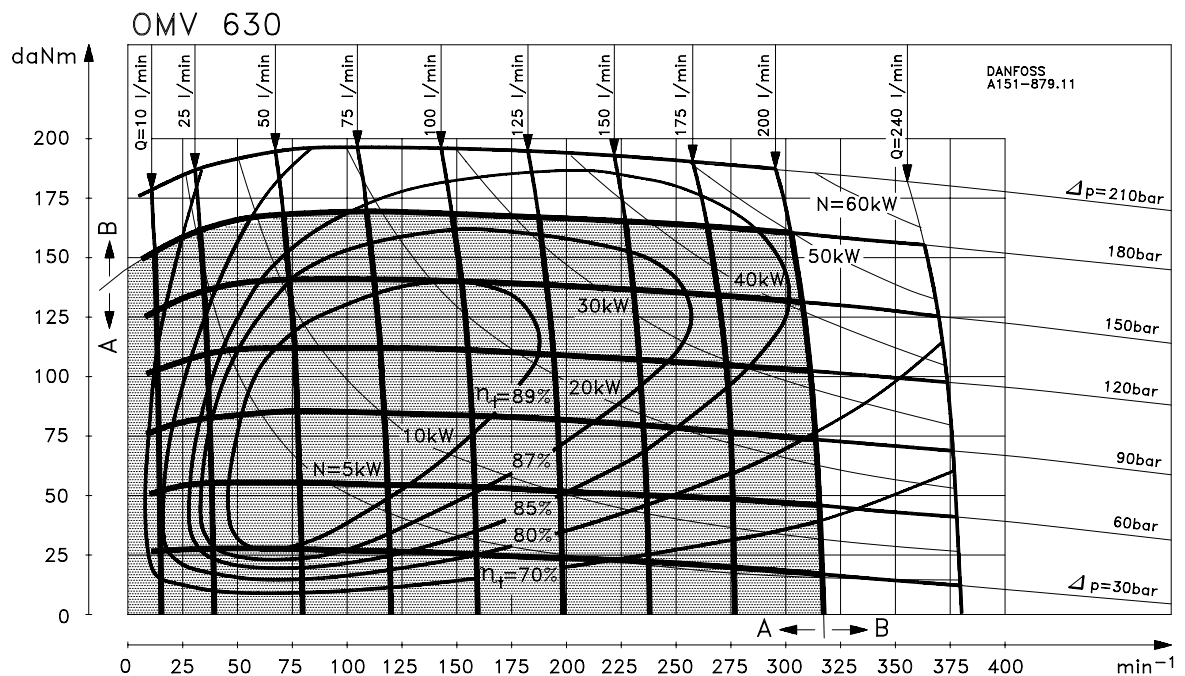
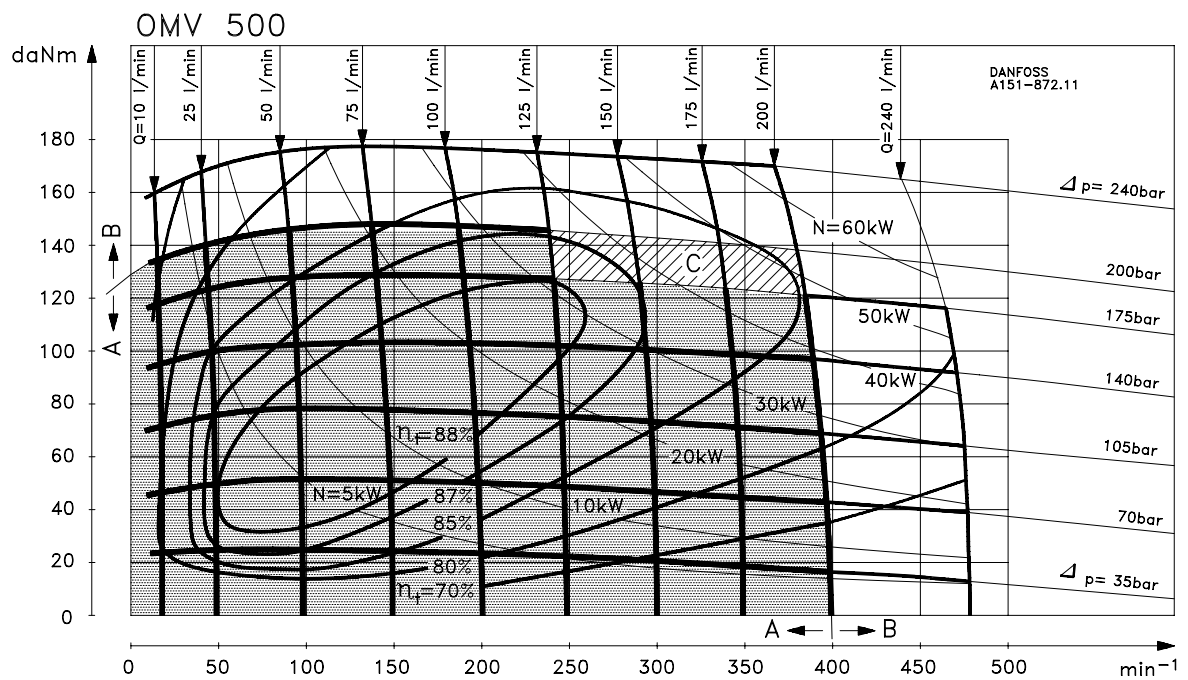


Explanation of function diagram use, basis and conditions can be found on page 3.

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

Note:

Intermittent pressure drop and oil flow must not occur simultaneously.



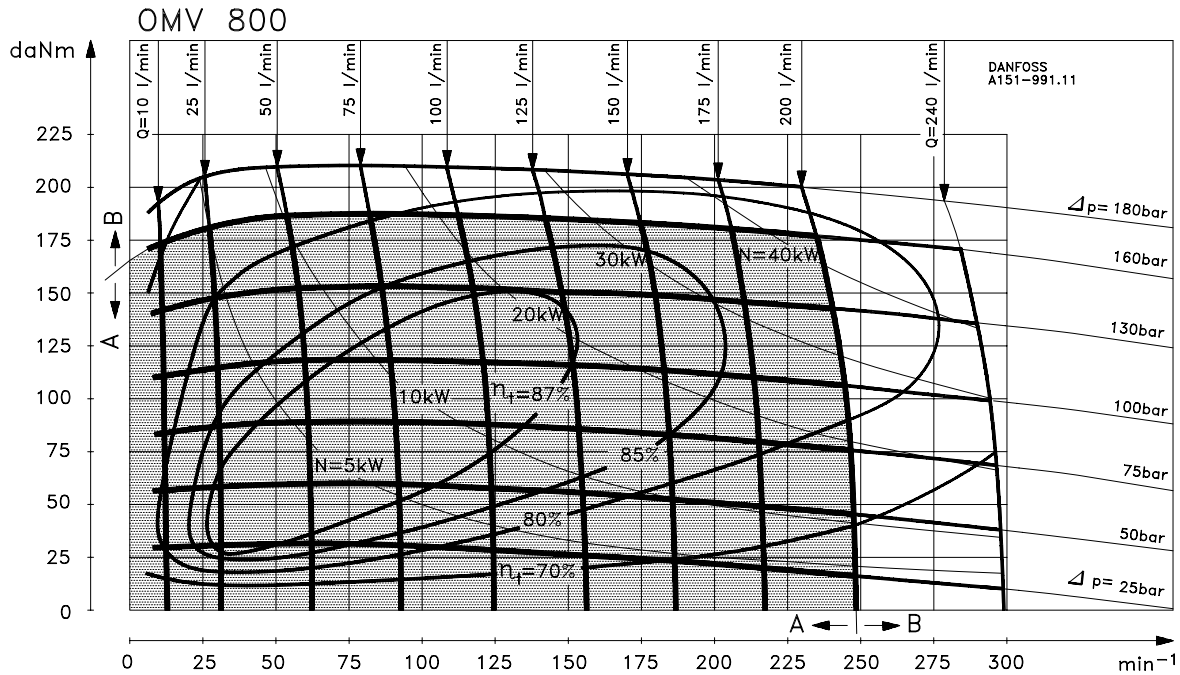
Explanation of function diagram use, basis and conditions can be found on page 3.

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

Note:

Intermittent pressure drop and oil flow must not occur simultaneously.

Function diagrams



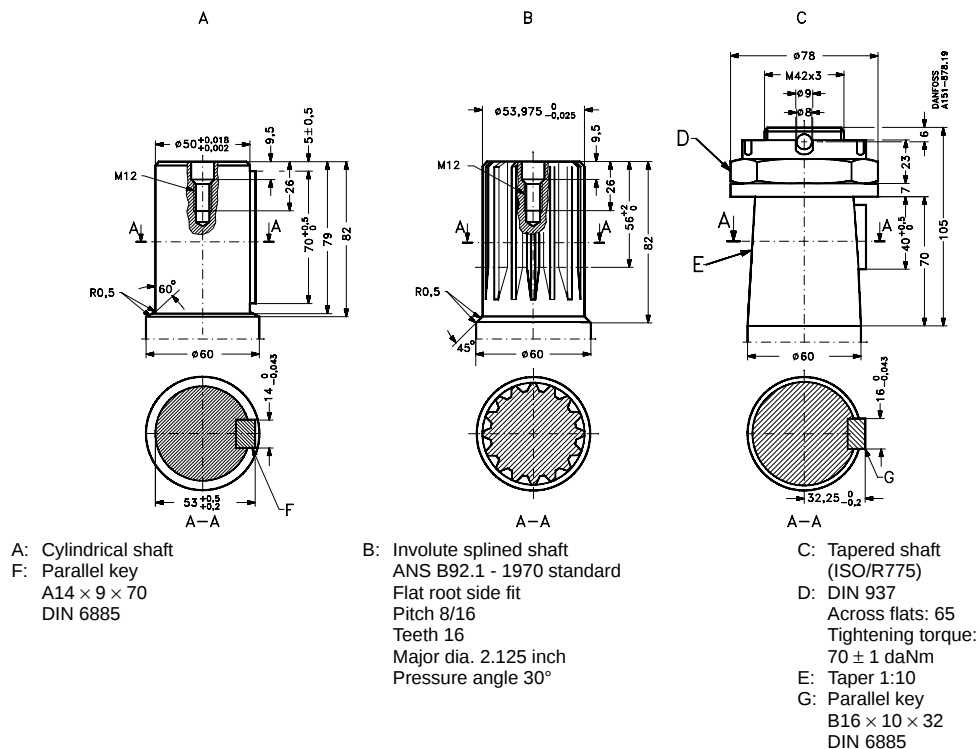
Explanation of function diagram use, basis and conditions can be found on page 3.

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

Note:

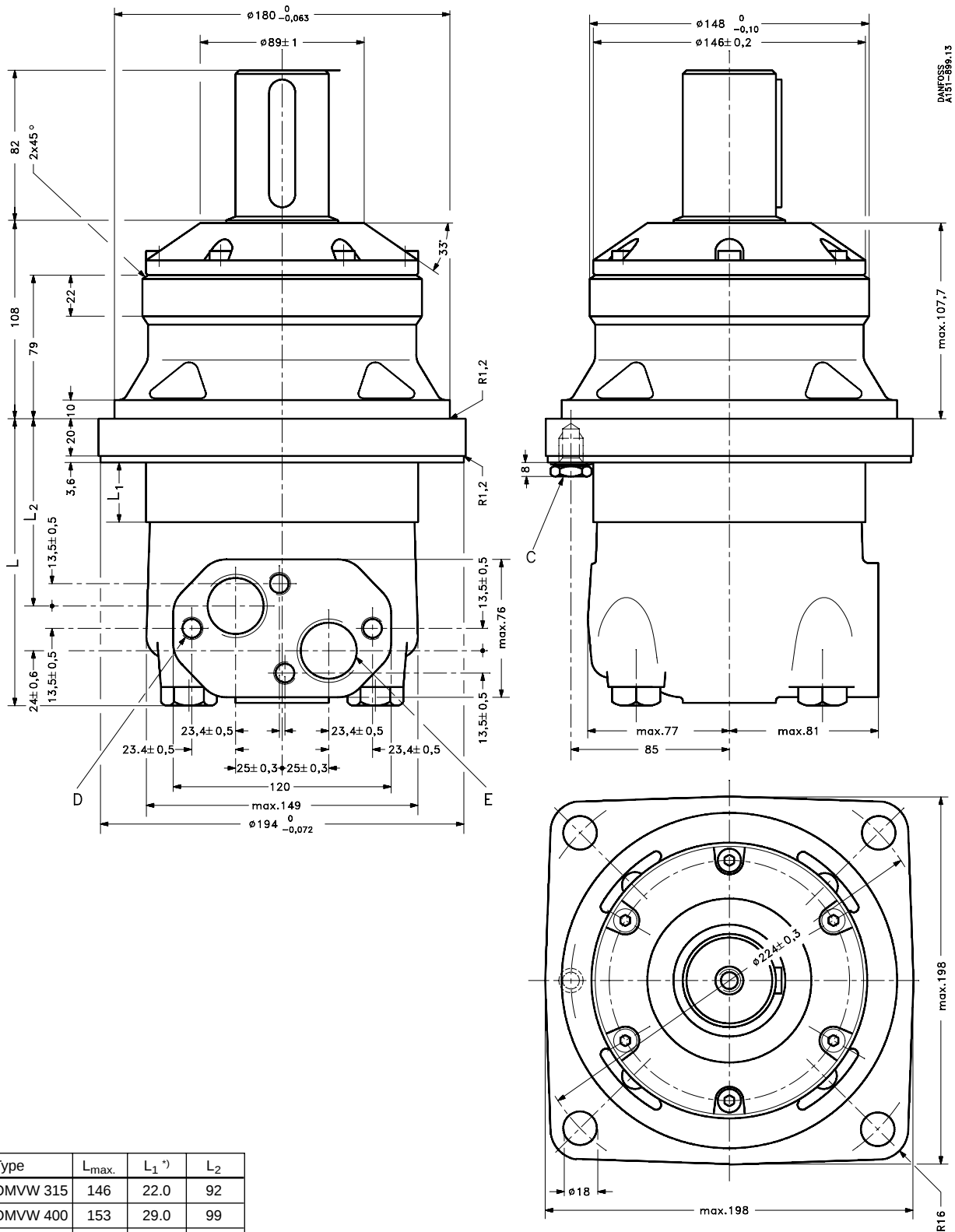
Intermittent pressure drop and oil flow must not occur simultaneously.

Shaft versions



C: Drain connection
G 1/4; 12 mm deep
D: M12; 12 mm deep
E: G 1; 18 mm deep

OMVW wheel motor



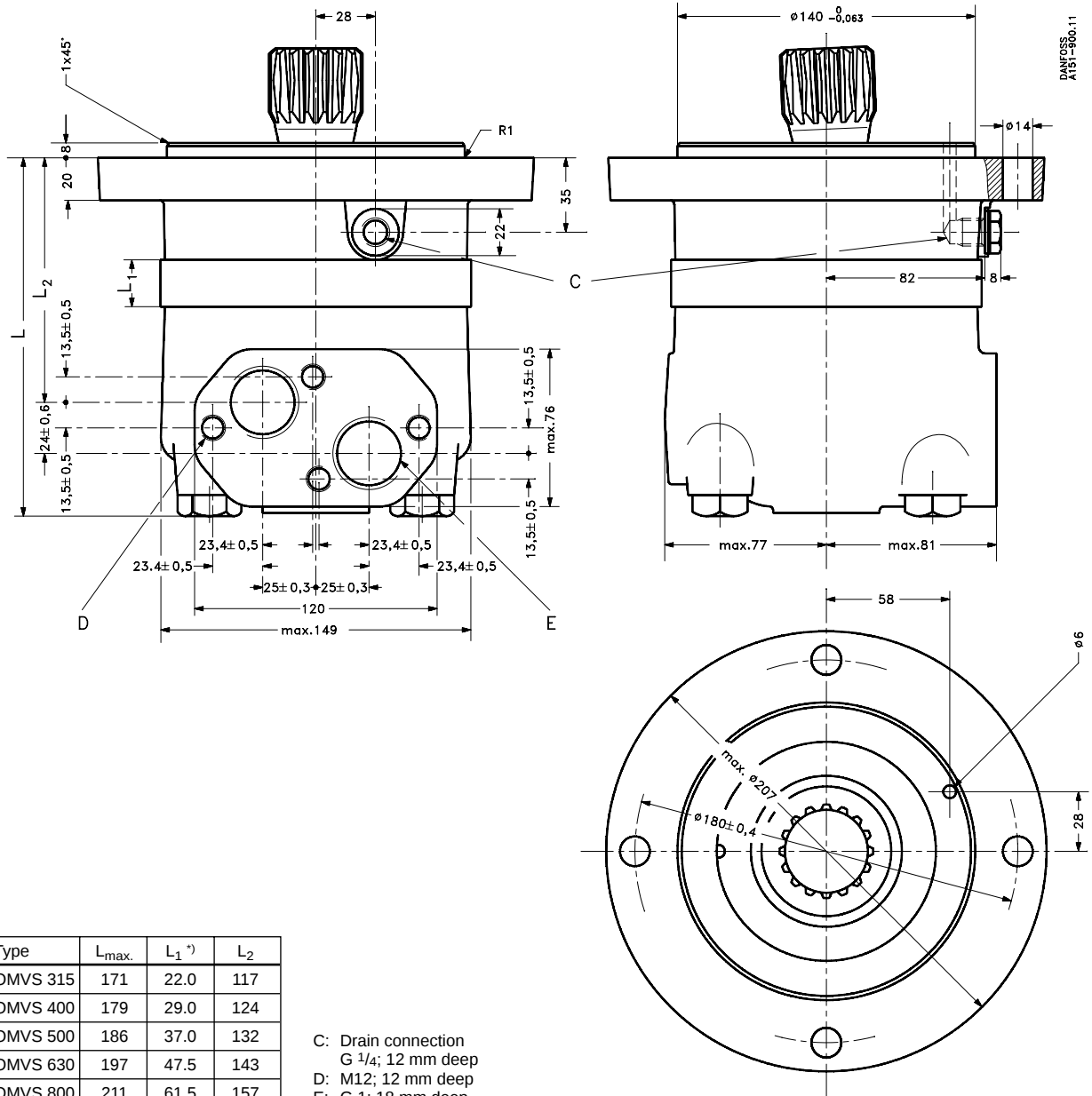
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Type	L _{max.}	L ₁ *)	L ₂
OMVW 315	146	22.0	92
OMVW 400	153	29.0	99
OMVW 500	161	37.0	107
OMVW 630	172	47.5	118
OMVW 800	185	61.5	132

C: Drain connection
G 1/4; 12 mm deep
D: M12; 12 mm deep
E: G 1; 18 mm deep

*) The gearwheel set is 3.5 mm wider across the rollers than the L₁ dimensions

OMVS short motor



Type	L _{max.}	L ₁ *)	L ₂
OMVS 315	171	22.0	117
OMVS 400	179	29.0	124
OMVS 500	186	37.0	132
OMVS 630	197	47.5	143
OMVS 800	211	61.5	157

*) The gearwheel set is 3.5 mm wider across the rollers than the L₁ dimensions

Installing the OMVS

The cardan shaft of the OMVS motor acts as an "output shaft". Because of the movement of the shaft, no seal can be fitted at the shaft output. Internal oil leakage from the motor will therefore flow into the attached component.

During start and operation it is important that the spline connection and the bearings in the attached component receive oil and are adequately lubricated. To ensure that the spline connection receives sufficient oil, a conical sealing ring between the shaft of the attached component and the motor intermediate plate is recommended. This method is used in the OMV.

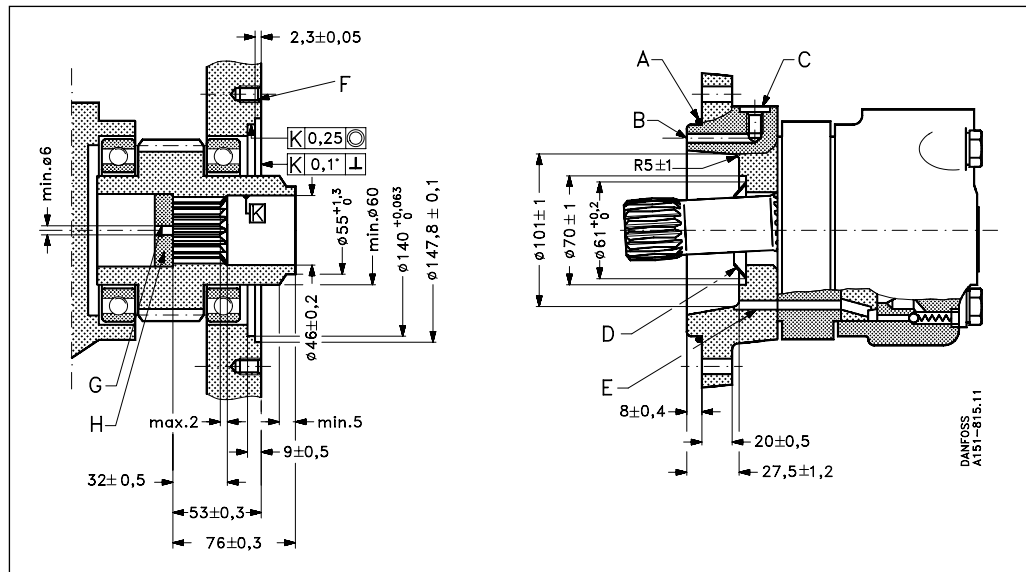
The conical sealing ring (code. no. 633B9021) is supplied with the motor.

To ensure that oil runs to the bearings and other parts of the attached component, the stop plate must have a hole in it (see fig. overleaf).

We recommend an O-ring between motor and attached component. The O-ring (code no. 151B1041) is supplied with the motor. If motor and attached component have been separated, remember to refill before starting up. Fill the oil through the drain connection.

Dimensions of the attached component

- A: O-ring: 140 × 3 mm
 B: External drain channel
 C: Drain connection
 G 1/4; 12 mm deep
 D: Conical seal ring
 E: Internal drain channel
 F: M12; min. 18 mm deep
 G: Oil circulation hole
 H: Hardened stop plate



Internal spline data for the component to be attached

The attached component must have internal splines corresponding to the external splines on the motor cardan shaft (see drawing below).

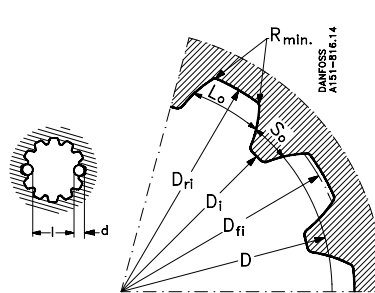
Material:

Case hardening steel with a tensile strength corresponding to at least 20 MoCr4 (90 daN/mm²).

See also SAE 8620 for further information on steel material.

Hardening specification:

- On the surface: HV = 750 ± 50
- 0,7 ± 0,2 mm under the surface: HV = 560



		mm	inch
Fillet root side fit			
Number of teeth	z	16	16
Pitch	DP	10/20	10/20
Pressure angle		30°	30°
Pitch dia.	D	40,640	1.6
Major dia.	D _{ri}	45,2 ^{+0.4} ₀	1.780 ^{+0.016} ₀
Form dia. (min.)	D _{fi}	44,6	1.756
Minor dia.	D _i	38,5 ^{+0.039} ₀	1.516 ^{+0.0015} ₀
Space width (circular)	L _o	5,180 ± 0,037	.204 ± .0015
Tooth thickness (circular)	S _o	2,835	.1116
Fillet radius	R _{min.}	0,4	.015
Max. measurement between pins*	l	32,47 ^{+0.15} ₀	1.278 ^{+0.006} ₀
Pin dia.	d	5,6 ± 0,001	.22 ± .00004

* Finished dimensions (when hardened)

Drain connection on OMVS or attached component

A drain line ought to be used when the return line can exceed the permissible pressure on the shaft seal of the attached component.

The drain line can be connected at two different points:

- 1) at the motor drain connection
- 2) at the drain connection of the attached component.

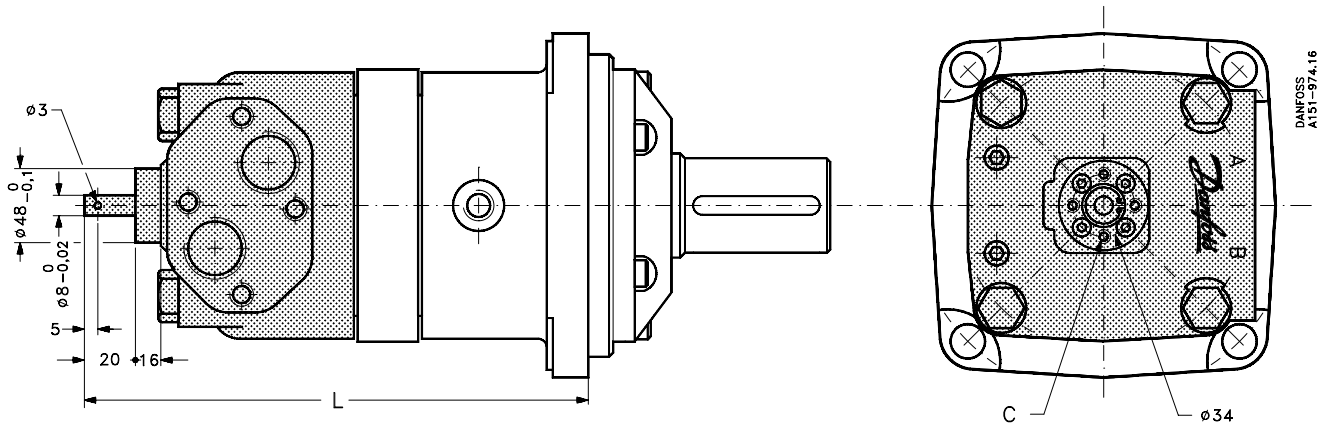
If a drain line is fitted to the attached component, it must be possible for oil to flow freely between motor and attached component.

The drain line must be led to the tank in such a way that there is no risk of the motor and attached component being drained of oil when at rest.

The maximum pressure in the drain line is limited by the attached component and its shaft seal.

Motors with tacho connection
OMV T, OMVW T, OMVS T

Dimensions



Dimensions (mm)

Motor size	315	400	500	630	800
Type OMV T	246.5	253.5	261.5	272	286
Type OMVW T	178.5	185.5	193.5	204	218.5
Type OMVS T	203.5	210.5	218.5	229	243

C: M5 (4); 8 mm deep

Weight of tacho connection unit: 0,2 kg

Angular backlash

Tolerances in the connection between the motor output shaft and tacho connection give a certain angular backlash. Backlash can be defined as the angle the output shaft will turn on reversing before the tacho shaft is engaged. On the OMV motors the backlash is min. 8.0° and max. 12.1°.

Permissible load on the tacho drive of motor

- *Torque:*
0.01 Nm cont. and 0.04 Nm int.
- *Radial force in the middle of drive shaft:*
5 daN at 0-800 min⁻¹
- *Axial load:*
5 daN

Danfoss quality and hydraulic range

ISO 9001

INTERNATIONAL STANDARD



INTERNATIONAL ORGANIZATION FOR STANDARDIZATION
ORGANISATION INTERNATIONALE DE NORMALISATION
МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Quality management and quality assurance standards



Danfoss Mobile Hydraulics have been manufactured to meet the quality demands specified by ISO 9001.

Conversion factors

1 daNm = 88.51 lbf in
1 daN = 2.248 lbf
1 bar = 14.50 lbf/in²
1 mm = 0.0394 in

1 cm³ = 0.061 in³
1 litre = 0.22 gallon, UK
1 litre = 0.264 gallon, US
°F = 1.8 × °C + 32

Catalogues and leaflets are available for detailed information on the following hydraulic components:

- Low-speed high-torque hydraulic motors
- Planetary gears
- Hydrostatic steering units
- Steering columns
- Valve blocks
- Flow-amplifiers
- Priority valves
- Torque amplifiers
- Variable displacement hydraulic pumps
- Pump controls
- Proportional valves
- Remote control units
- Electronics for hydr. components
- Rotary actuators
- Gear wheel motors
- Gear wheel pumps
- Cartridge valves
- Directional control valves

Please contact the Danfoss Sales Organization for Hydraulics for further information.



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