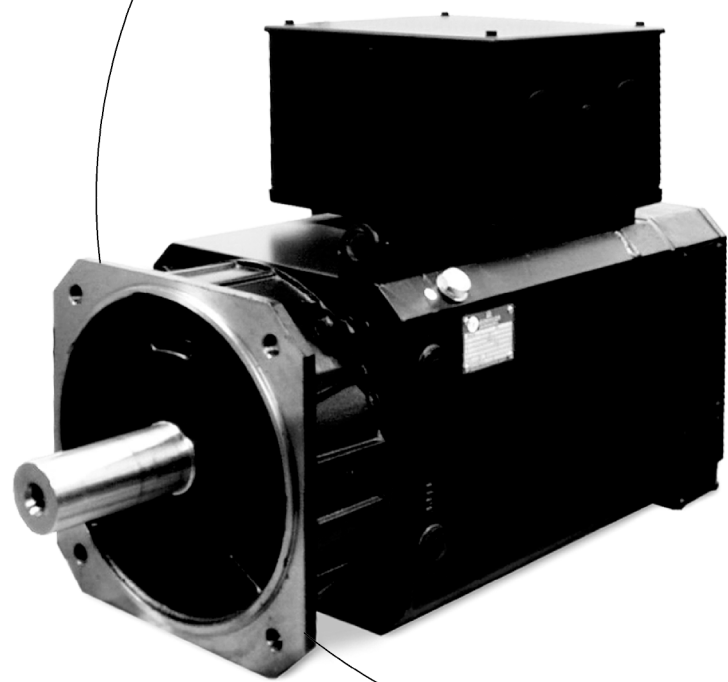




be in motion be in motion

**Liquid-Cooled
Drives**

**DA...W..
DS...W..**

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Liquid-cooled asynchronous and synchronous motors



Compact machinery and systems call for professional energy management. The heat must be dissipated where it is generated.

Baumüller developed drives with liquid cooling especially for applications in energy-sensitive sectors such as the plastics or printing industry. These Baumüller drives cover the power range from 20 kW to 205 kW.

With liquid cooling the heat can be easily dissipated at source. That makes the new series of motors highly compact so that they have a higher level of power density than similarly designed air-cooled motors of protection type IP 54.

Due to the very high power density and high dynamic response the new series of motors is ideal for sophisticated applications in mechanical engineering. With liquid cooling there is no need for a fan unit so motor noise emission is reduced significantly. The motors have large speed ranges. In addition, they feature roller bearings to cope with high lateral force loads. These durable, compact motors are also largely maintenance-free, which is an extra benefit to ensure efficient operation.

General technical data

Version	IM B3, IM B5 IM B3, IM B35	Version 100 / 132 / 160 Frame size 180 / 225
Type of protection	IP54	liquid-cooled
Connection	Main connection Control connection Brake Thermal sensor	Terminal box 12-pin connector Terminal box of brake in the main connection
Cooling method		IC 3W7 liquid-cooled
Thermal sensor	Linear thermal sensor for evaluation in the controller	
Temperature rise		$\Delta\theta = 105K$ Insulation class F acc. to EN 60034-1
Temperature range	0...+ 40°C	
Coolant input temperature	10°C to 35°C maximal 5 K lower than ambient temperature	
Storage	-30°C...+85°C (for temperatures lower than 3 °C the cooling-water must be drained)	
Paint	black matt	RAL 9005
Bearing	D-end: standard = ball bearing; option = roller bearing, locating bearing on the N-end	
Terminal box	N-end; top	
Water connection	D-end; lateral	
Balance quality	N R, S	According to DIN ISO 2373 On request
Vibration-resistant up to	DA 100 - DA 225	radial 3g / axial 1g, 10 Hz - 55 Hz acc. to EN 60068-2-6
	DS 100 – DS 160	radial 3g / axial 1g, 10 Hz - 55 Hz acc. to EN 60068-2-6
	Higher vibration resistance on request	
Flange	acc. to IEC standard	
Shaft end	cylindrical	according to DIN 748 without key Centering with internal thread acc. to DIN 332 form D Also available with key DIN 6885 as an option
Brake	Disk brakes from Baumüller: N-end mounting as a module other brands on request	

Actual speed encoder	2-pin resolver Option: Sincos Encoder Other encoders on request
UL design	Option in preparation

Winding isolation and temperature rise

All machines of this series are designed in insulation class F according to EN 60034 for a permissible winding temperature of 105 K at a maximum permissible inlet temperature of 35 °C. The insulation is resistant against gases and vapours of combustible materials and it meets the requirements placed on a moisture-proof and tropical insulation.

A special insulation that can be obtained for an extra charge is necessary if concentrated acid vapours and metallic powders occur, with a permanent relative air humidity of more than 80% and as protection against termite and mould fungus attacks.

In the case of converters with a DC link voltage > 500 V, the cables between the converter and the motor must not be longer than 20 meters. For longer cables, additional measures (e. g. motor filters) must be provided. The maximum permissible terminal voltage is 1000 V.

Explanation of the motor data

P_N	Nominal power (kW) with nominal speed n_N in continuous operation (S1)
M_N	Nominal torque (Nm) with nominal speed n_N in continuous operation (S1) Nominal speed (min^{-1})
n_1	Limit speed for field weakening (constant power) (min^{-1})
n_{max}	Mechanically permissible operating speed (min^{-1})
U_N	Nominal voltage (V)
K_E / COLD	Motor e. m. f. referred to 1000 min^{-1} (voltage constant) (V)
I_N	Nominal r .m. s. current (A)
I_{dN}	Magnetizing current for field weakening (A), synchronous motor
I_μ	Magnetizing current (A), asynchronous motor
$\cos \varphi$	Power factor
η_N	Efficiency
f_N	Nominal frequency (Hz)
J	Rotor inertia incl. resolver without holding brake (kg m ²)
m	Weight (kg)
$M_{o,\text{max}}$	Maximum standstill torque (Nm)

Ratings of asynchronous motors DA / synchronous motors DS

The specified ratings are achieved in inverter operation (field-oriented control) with a clock frequency of 4 kHz in the power stage. A chopping frequency of > 6 kHz is recommended.

Overload capacity

According to technical data sheet

Type key

DA FF G 225 M 54 W 17 – 5 UL

UL	Motor with UL approval
cUL	Motor with cUL approval
Mains voltage / Motor voltage	
5	400V / 360V
X	Special voltage
Nominal speed	
e. g. 17	= 1750 min ⁻¹
Cooling method	
W	Water cooling
A	Axially mounted separately driven fan
T	Suitable for pipe mounting
Type of protection	
54	IP 54
Length: K, M, L, B	
Frame size	
100...225	
Brake	
without brake	
G	with brake
Version	
Foot mounting	
F	Flange mounting
FF	Foot – flange mounting
Motor type	
DA	Three-phase asynchronous motor
DS	Three-phase synchronous motor

Technical data asynchronous

Three-phase asynchronous DA 100..54 W.. (IP 54 water-cooled)

Mains voltage 3 AC 400 V for converters with uncontrolled supply

Nom. speed	Motor type	Nom. power		Nom. torque		Nom. current	Nom. voltage	Limit speed with field weakening	Max. operating speed	Power factor	Magne-tizing current	Effi-cien-cy	Nom. fre-quen-cy
n_N min^{-1}		P_N kW	P_N hp	M_N Nm	M_N lbf ft	I_N A	U_N V	n_1 min^{-1}	n_{max} min^{-1}	$\cos \varphi$	I_{μ} A	η_N	f_N Hz
1000	DA100K54W10-5	4.5	6.0	43	32	12.4	330	3000	8000	0.83	6.5	0.755	35.8
	DA100M54W10-5	6.5	8.7	62	46	17.2	335	3000	8000	0.84	8.9	0.776	35.8
	DA100L54W10-5	7.8	10.5	74	55	21.0	330	3000	8000	0.81	11.7	0.794	35.5
	DA100B54W10-5	9.0	12.1	86	63	23.5	340	2700	8000	0.80	13.5	0.805	35.4
1500	DA100K54W15-5	6.5	8.7	41	30	16.5	340	2800	8000	0.82	7.4	0.805	52.7
	DA100M54W15-5	9.0	12.1	57	42	23.5	335	3000	8000	0.79	11.9	0.826	52.4
	DA100L54W15-5	11.0	14.8	70	52	28.0	335	3000	8000	0.79	14.3	0.839	52.3
	DA100B54W15-5	13.0	17.4	83	61	32.5	345	2500	8000	0.79	16.8	0.847	52.3
2000	DA100K54W20-5	8.5	11.4	41	30	22.0	330	4000	8000	0.81	10.0	0.835	69.3
	DA100M54W20-5	12.0	16.1	57	42	30.0	330	4000	8000	0.81	13.4	0.853	69.2
	DA100L54W20-5	15.0	20.1	72	53	37.0	340	3800	8000	0.80	17.5	0.863	69.1
	DA100B54W20-5	17.5	23.5	84	62	41.0	350	3000	8000	0.81	18.5	0.870	69.1
2500	DA100K54W25-5	10.0	13.4	38	28	24.5	340	4700	8000	0.81	10.3	0.854	86.0
	DA100M54W25-5	15.0	20.1	57	42	37.0	335	5000	8000	0.80	16.7	0.867	85.9
	DA100L54W25-5	18.5	24.8	71	52	44.0	340	4700	8000	0.81	18.7	0.877	85.9
	DA100B54W25-5	22.0	29.5	84	62	55.0	330	5000	8000	0.80	25.5	0.883	85.7
3000	DA100K54W30-5	11.5	15.4	37	27	28.0	340	5700	8000	0.80	12.0	0.865	102.6
	DA100M54W30-5	17.0	22.8	54	40	40.0	340	5700	8000	0.81	16.2	0.879	102.6
	DA100L54W30-5	21.0	28.2	67	49	49.0	345	5100	8000	0.80	21.5	0.887	102.4
	DA100B54W30-5	25.0	33.5	80	59	57.0	350	4500	8000	0.80	25.5	0.893	102.3

Nom. speed	Motor type	Inertia		Weight	
n_N min ⁻¹		J kgm ²	J lb ft ²	m kg	m lb
1000	DA100K54W10-5	0.017	0.40	41	90
	DA100M54W10-5	0.023	0.55	51	112
	DA100L54W10-5	0.029	0.69	60	132
	DA100B54W10-5	0.034	0.81	68	150
1500	DA100K54W15-5	0.017	0.40	41	90
	DA100M54W15-5	0.023	0.55	51	112
	DA100L54W15-5	0.029	0.69	60	132
	DA100B54W15-5	0.034	0.81	68	150
2000	DA100K54W20-5	0.017	0.40	41	90
	DA100M54W20-5	0.023	0.55	51	112
	DA100L54W20-5	0.029	0.69	60	132
	DA100B54W20-5	0.034	0.81	68	150
2500	DA100K54W25-5	0.017	0.40	41	90
	DA100M54W25-5	0.023	0.55	51	112
	DA100L54W25-5	0.029	0.69	60	132
	DA100B54W25-5	0.034	0.81	68	150
3000	DA100K54W30-5	0.017	0.40	41	90
	DA100M54W30-5	0.023	0.55	51	112
	DA100L54W30-5	0.029	0.69	60	132
	DA100B54W30-5	0.034	0.81	68	150

Maximum standstill torque

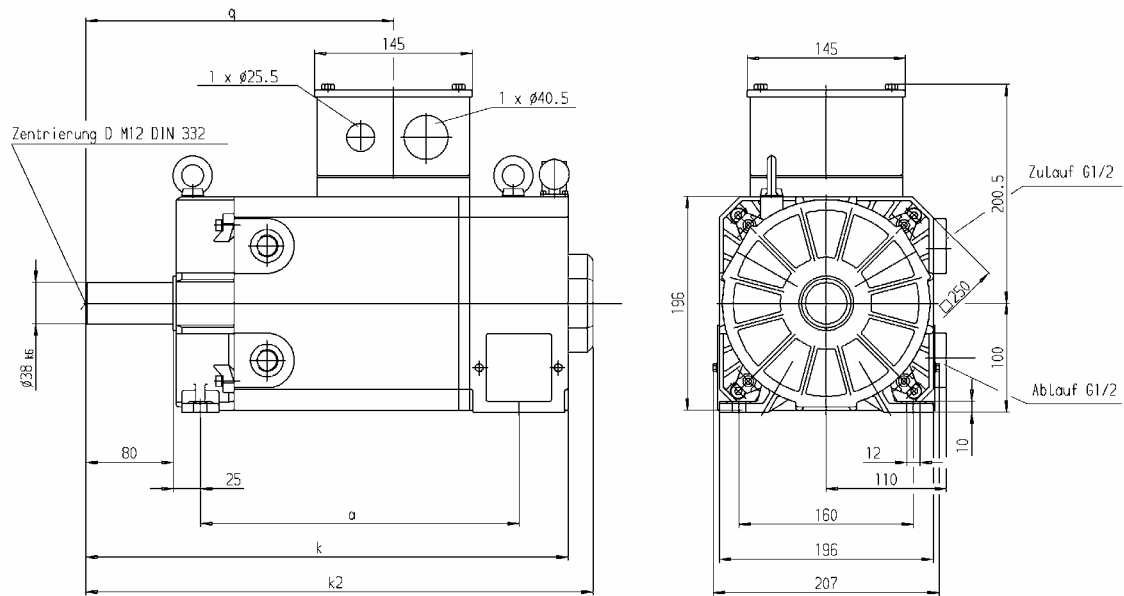
Motor type	$M_{0\ max}$ [Nm]	$M_{0\ max}$ [Nm]
DA100K54W	69	51
DA100M54W	99	73
DA100L54W	118	87
DA100B54W	138	102

Legend

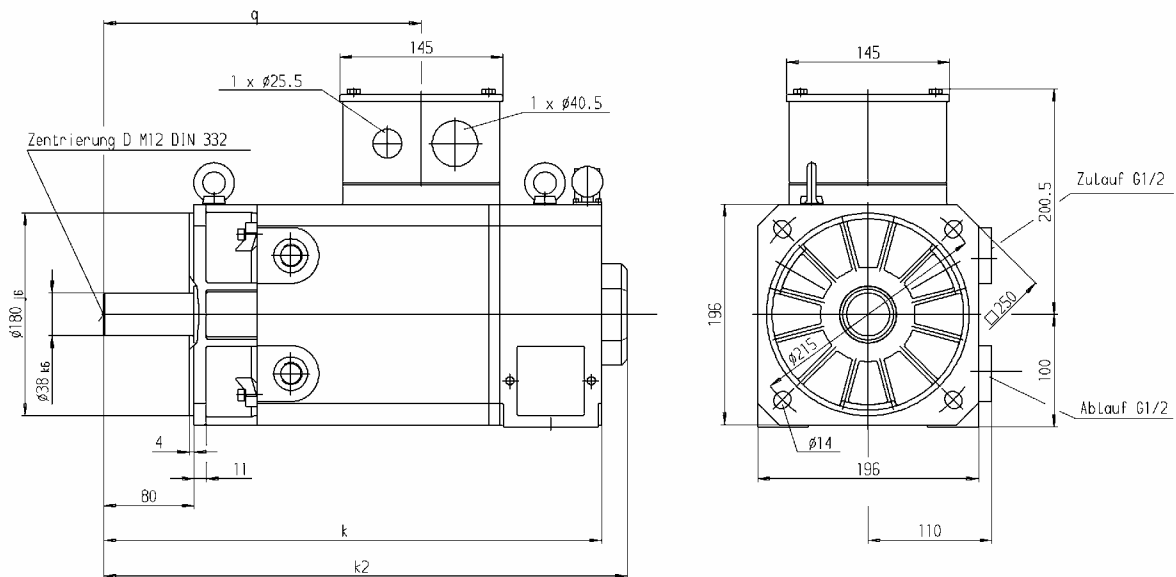
American units

Dimension drawing DA 100 .. W

Version IMB3 standard
DA..100..54W..



Version IMB5 standard
DAF.100..54W..



Type DA	a	k	k2	q
DA 100 K...W..	242	392	415	232
DA 100 M...W..	292	442	465	282
DA 100 L...W..	337	487	510	327
DA 100 B...W..	377	527	550	367

Brake k2 + 155 mm

Zentrierung / Centering	Zulauf / Inflow	Abfluss / Drain
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Three-phase asynchronous DA 132..54 W.. (IP 54 water-cooled)

Mains voltage 3 AC 400 V for converters with uncontrolled supply

Nom. speed	Motor type	Nom. power		Nom. torque		Nom. current	Nom. voltage	Limit speed with field weakening	Max. operating speed	Power factor	Magnetizing current	Efficiency	Nom. frequency
n_N min^{-1}		P_N kW	P_N hp	M_N Nm	M_N lbf ft	I_N A	U_N V	n_1 min^{-1}	$n_{\max}$ min^{-1}	$\cos \varphi$	I_μ A	η_N	f_N Hz
1000	DA132K54W10-5	11.5	15.4	110	81	30.1	335	2600	5000	0.78	17.0	0.832	34.8
	DA132M54W10-5	13.7	18.4	131	97	36.0	330	3000	5000	0.78	20.7	0.846	34.7
	DA132L54W10-5	16.2	21.7	155	114	43.5	335	2600	5000	0.76	26.5	0.852	34.6
	DA132B54W10-5	18.3	24.5	175	129	45.5	340	2400	5000	0.79	25.5	0.864	34.6
1500	DA132K54W15-5	16.5	22.1	105	77	42.0	320	3000	5000	0.81	18.5	0.869	51.6
	DA132M54W15-5	20.0	26.8	127	94	48.5	340	2800	5000	0.79	22.5	0.879	51.5
	DA132L54W15-5	24.0	32.2	153	113	58.0	340	2800	5000	0.79	28.0	0.885	51.4
	DA132B54W15-5	27.5	36.9	175	129	66.0	345	2500	5000	0.78	33.0	0.890	51.4
2000	DA132K54W20-5	21.5	28.8	103	76	51.0	340	3800	5000	0.80	21.5	0.889	68.3
	DA132M54W20-5	26.5	35.5	127	94	66.0	335	4000	5000	0.77	32.5	0.894	68.1
	DA132L54W20-5	31.0	41.6	148	109	76.0	335	4000	5000	0.78	36.5	0.900	68.1
	DA132B54W20-5	36.0	48.3	172	127	83.0	345	3400	5000	0.80	36.5	0.904	68.1
2500	DA132K54W25-5	25.5	34.2	97	72	59.0	345	4200	5000	0.80	24.5	0.900	84.9
	DA132M54W25-5	31.0	41.6	118	87	73.0	335	5000	5000	0.80	31.5	0.905	84.8
	DA132L54W25-5	37.0	49.6	141	104	89.0	335	5000	5000	0.78	40.5	0.909	84.7
	DA132B54W25-5	43.0	57.7	164	121	99.0	345	4200	5000	0.79	44.0	0.913	84.7
3000	DA132K54W30-5	29.0	38.9	92	68	66.0	350	4500	5000	0.80	26.0	0.906	101.5
	DA132M54W30-5	36.0	48.3	115	85	86.0	335	5000	5000	0.79	36.0	0.911	101.4
	DA132L54W30-5	43.0	57.7	137	101	97.0	345	5000	5000	0.81	38.0	0.915	101.4
	DA132B54W30-5	50.0	67.1	159	117	109.0	355	4000	5000	0.81	44.0	0.919	101.4

Nom. speed	Motor type	Inertia	Weight			
n_N min^{-1}		J kgm^2	J lb ft^2	m kg	m lb	
1000	DA132K54W10-5	0.074	1.76	115	254	
	DA132M54W10-5	0.090	2.14	130	287	
	DA132L54W10-5	0.105	2.49	145	320	
	DA132B54W10-5	0.120	2.85	160	353	
1500	DA132K54W15-5	0.074	1.76	115	254	
	DA132M54W15-5	0.090	2.14	130	287	
	DA132L54W15-5	0.105	2.49	145	320	
	DA132B54W15-5	0.120	2.85	160	353	
2000	DA132K54W20-5	0.074	1.76	115	254	
	DA132M54W20-5	0.090	2.14	130	287	
	DA132L54W20-5	0.105	2.49	145	320	
	DA132B54W20-5	0.120	2.85	160	353	
2500	DA132K54W25-5	0.074	1.76	115	254	
	DA132M54W25-5	0.090	2.14	130	287	
	DA132L54W25-5	0.105	2.49	145	320	
	DA132B54W25-5	0.120	2.85	160	353	
3000	DA132K54W30-5	0.074	1.76	115	254	
	DA132M54W30-5	0.090	2.14	130	287	
	DA132L54W30-5	0.105	2.49	145	320	
	DA132B54W30-5	0.120	2.85	160	353	

Maximum standstill torque

Motor type	$M_{0 \max}$ [Nm]	$M_{0 \max}$ [Nm]
DA132K54W	220	162
DA132M54W	262	193
DA132L54W	310	229
DA132B54W	350	258

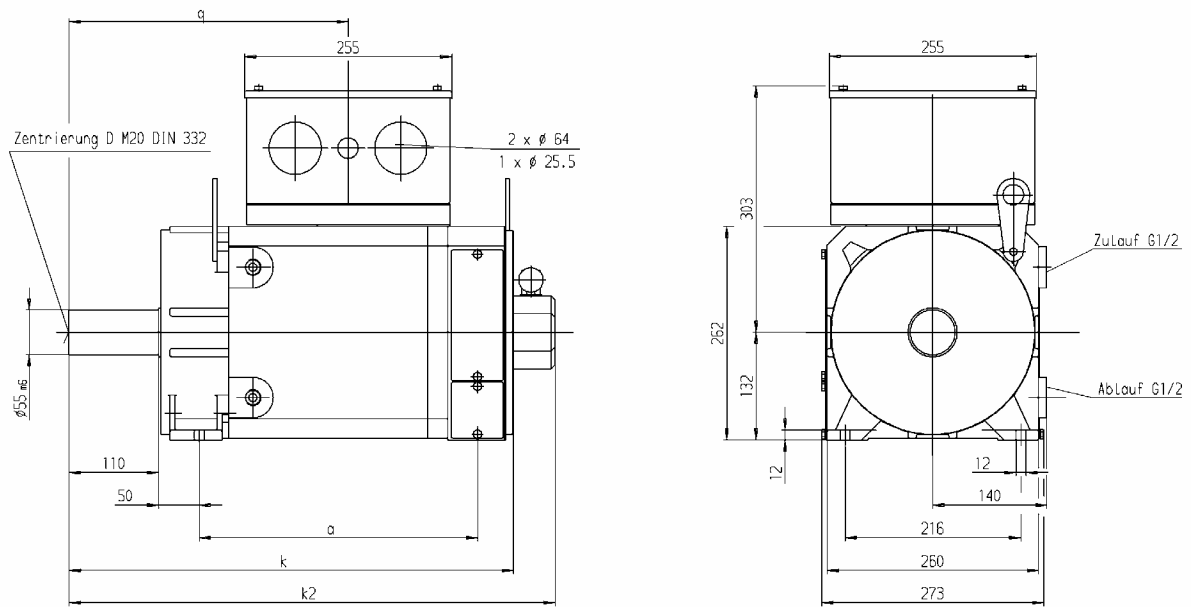
Legend

American units

Dimension drawing DA 132 .. W

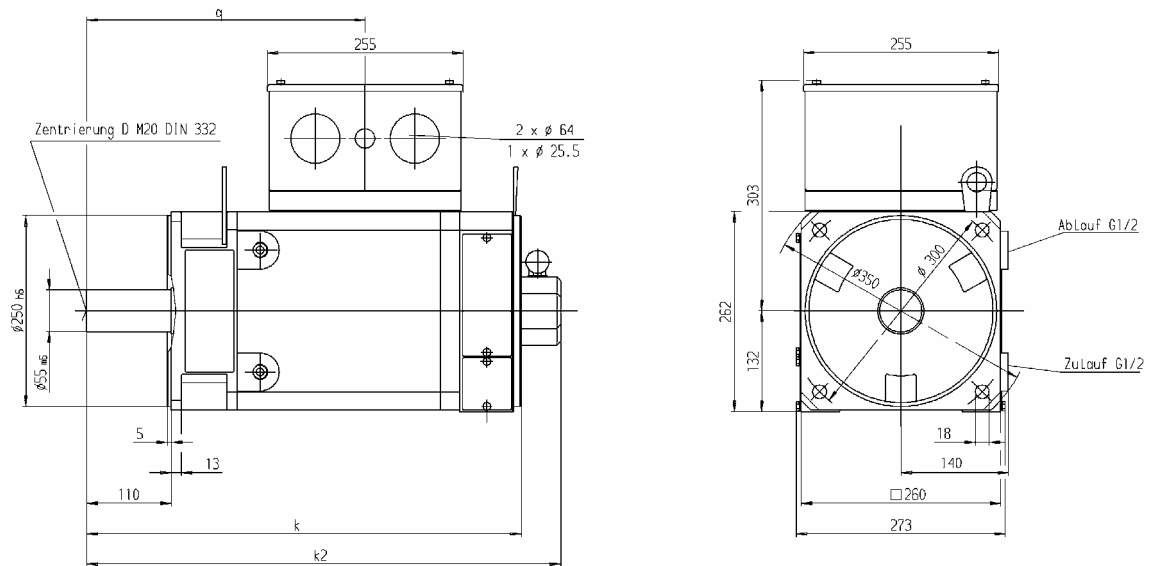
Version IMB3 standard

DA..132..54W..



Version IMB5 standard

DAF..132..54W..



Type DA	a	k	k2	q
DA 132 K..W..	322	527	578	323
DA 132 M..W..	362	567	618	363
DA 132 L..W..	402	607	658	403
DA 132 B..W..	442	647	698	443

Brake k2 + 130 mm

Zentrierung / Centering	Zulauf / Inflow	Ablauf / Drain
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Three-phase asynchronous DA 160..54 W.. (IP 54 water-cooled)

Mains voltage 3 AC 400 V for converters with uncontrolled supply

Nom. speed	Motor type	Nom. power	Nom. torque		Nom. current	Nom. voltage	Limit speed with field weakening	Max. operating speed	Power factor	Magne- tizing current	Effi- cien- cy	Nom. fre- quency	
n_N min^{-1}		P_N kW	P_N hp	M_N Nm	M_N lbf ft	I_N A	U_N V	n_1 min^{-1}	n_{max} min^{-1}	$\cos \varphi$	I_{μ} A	η_N	f_N Hz
1000	DA160K54W10-5	26	34.9	248	183	59	345	2500	4500	0.82	28.5	0.882	34.5
	DA160M54W10-5	32	42.9	306	226	72	345	2500	4500	0.83	35.0	0.892	34.4
	DA160L54W10-5	37	49.6	353	260	85	340	3000	4500	0.83	42.0	0.896	34.4
1500	DA160K54W15-5	38	51.0	242	178	86	345	2400	4500	0.81	36.5	0.905	51.3
	DA160M54W15-5	47	63.0	299	221	105	345	2400	4500	0.83	43.5	0.912	51.2
	DA160L54W15-5	55	73.8	350	258	118	355	2200	4500	0.82	49.5	0.915	51.2
2000	DA160K54W20-5	48	64.4	229	169	100	350	3000	4500	0.85	36.0	0.920	68.0
	DA160M54W20-5	60	80.5	287	212	131	345	3500	4500	0.83	54.0	0.925	67.9
	DA160L54W20-5	70	93.9	334	246	153	350	3000	4500	0.82	66.0	0.928	67.8
2500	DA160K54W25-5	58	77.8	222	164	127	345	4500	4500	0.81	53.0	0.928	84.5
	DA160M54W25-5	72	96.6	275	203	149	355	3500	4500	0.84	56.0	0.932	84.5
	DA160L54W25-5	82	110.0	313	231	176	350	4000	4500	0.82	74.0	0.935	84.4
3000	DA160K54W30-5	65	87.2	207	153	141	345	4500	4500	0.82	58.0	0.933	101.2
	DA160M54W30-5	80	107.3	255	188	169	350	4500	4500	0.83	66.0	0.936	101.1
	DA160L54W30-5	92	123.4	293	216	210	325	4500	4500	0.83	85.0	0.938	101.1

Nom. speed	Motor type	Inertia		Weight	
n_N min ⁻¹		J kgm ²	J lb ft ²	m kg	m lb
1000	DA160K54W10-5	0.245	5.81	235	518
	DA160M54W10-5	0.303	7.19	275	606
	DA160L54W10-5	0.346	8.21	310	683
1500	DA160K54W15-5	0.245	5.81	235	518
	DA160M54W15-5	0.303	7.19	275	606
	DA160L54W15-5	0.346	8.21	310	683
2000	DA160K54W20-5	0.245	5.81	235	518
	DA160M54W20-5	0.303	7.19	275	606
	DA160L54W20-5	0.346	8.21	310	683
2500	DA160K54W25-5	0.245	5.81	235	518
	DA160M54W25-5	0.303	7.19	275	606
	DA160L54W25-5	0.346	8.21	310	683
3000	DA160K54W30-5	0.245	5.81	235	518
	DA160M54W30-5	0.303	7.19	275	606
	DA160L54W30-5	0.346	8.21	310	683

Maximum standstill torque

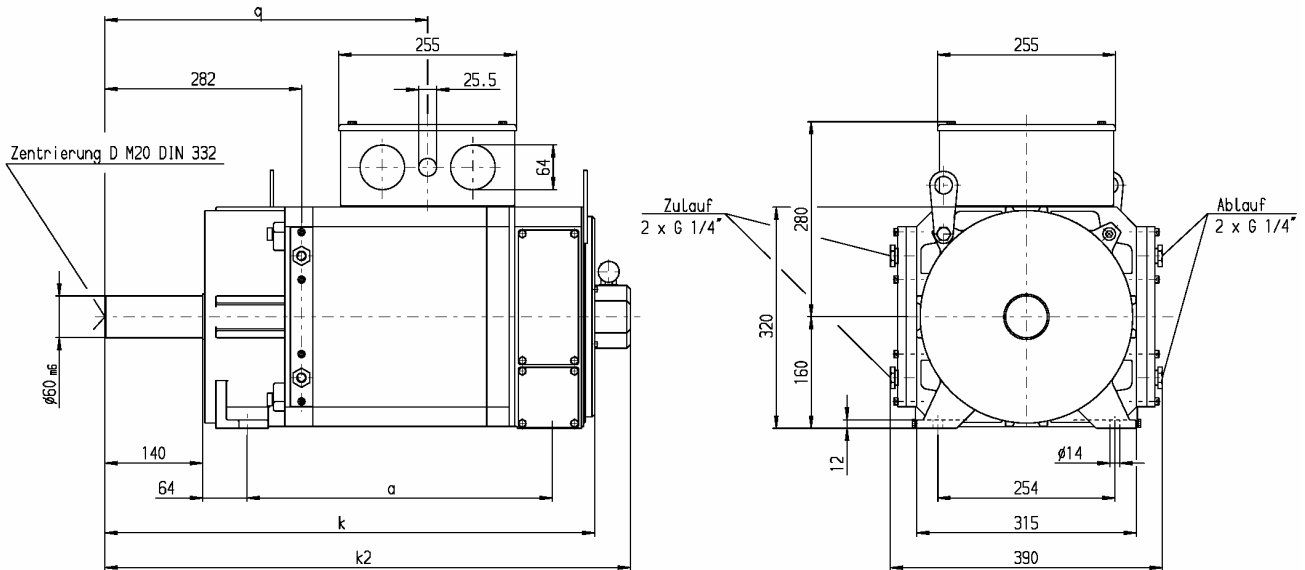
Motor type	$M_{0\ max}$ [Nm]	$M_{0\ max}$ [Nm]
DA160K54W	496	366
DA160M54W	612	451
DA160L54W	706	521

Legend

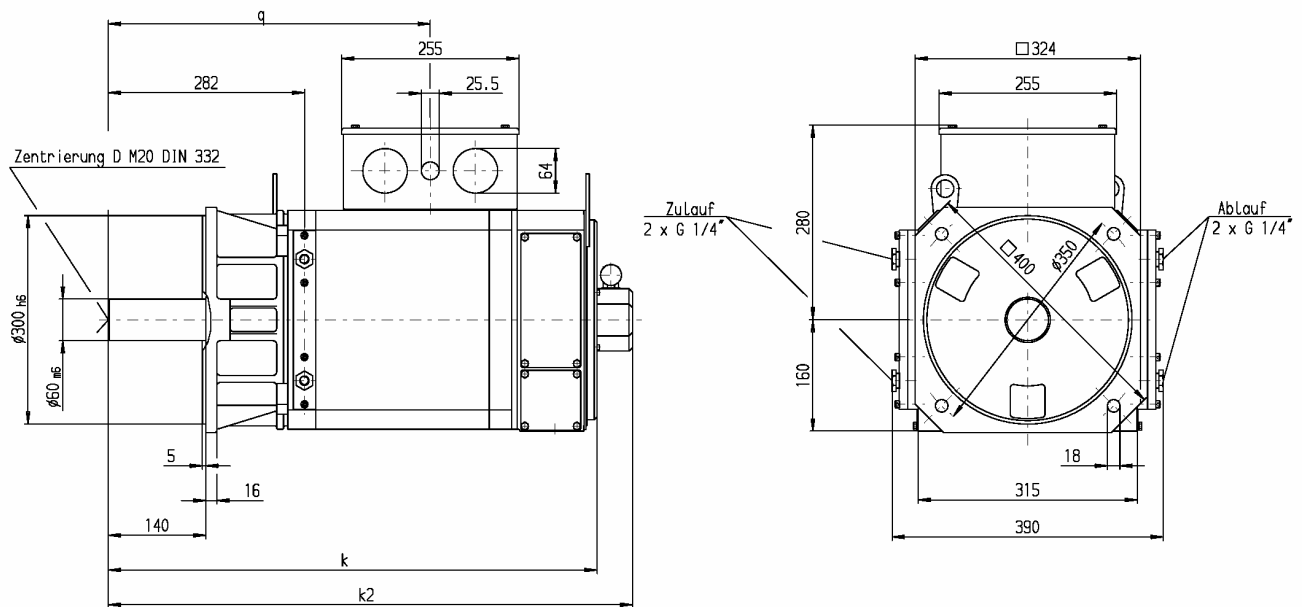
American units

Dimension drawing DA 160 .. W

Version IMB3 standard
DA..100..54W..



Version IMB5 standard
DAF..160..54W..



Type DA	a	k	k2	q
DA 160 K...W..	438	703	754	463
DA 160 M...W..	498	763	814	523
DA 160 L...W..	548	813	864	573

Brake k2 + 150 mm

Zentrierung / Centering

Zulauf / Inflow

Abfluss / Drain

Three-phase asynchronous DA 180..54 W.. (IP 54 water-cooled)

Mains voltage 3 AC 400 V for converters with uncontrolled supply

Nom. speed	Motor type	Nom. power	Nom. torque		Nom. current	Nom. voltage	Limit speed with field weakening	Max. operating speed	Power factor	Magne- tizing current	Effi- cien- cy	Nom. fre- quen- cy	
n_N min^{-1}		P_N kW	P_N hp	M_N Nm	M_N lbf ft	I_N A	U_N V	n_1 min^{-1}	n_{max} min^{-1}	$\cos \varphi$	I_{μ} A	η_N	f_N Hz
1000	DA180M54W10-5	40	53.6	382	282	92	335	2000	4300	0.82	44	0.909	34.1
	DA180L54W10-5	57	76.4	544	401	132	335	2000	4300	0.82	66	0.913	34.1
1500	DA180M54W15-5	60	80.5	382	282	130	350	2300	4300	0.83	49	0.924	51.0
	DA180L54W15-5	84	112.6	535	395	180	350	2300	4300	0.84	66	0.928	50.9
2000	DA180M54W20-5	76	101.9	363	268	166	350	3000	4300	0.81	71	0.932	67.5
	DA180L54W20-5	105	140.8	501	370	255	315	4000	4300	0.80	113	0.935	67.5
2500	DA180M54W25-5	92	123.4	351	259	197	355	3500	4300	0.81	81	0.937	84.2
	DA180L54W25-5	122	163.6	466	344	248	360	3000	4300	0.83	89	0.940	84.2
3000	DA180MW30-5	102	136.8	325	240	235	340	4300	4300	0.79	103	0.937	100.8
	DA180L54W30-5	135	181.0	430	317	312	340	4300	4300	0.79	141	0.940	100.7

Nom. speed	Motor type	Inertia		Weight	
n_N min ⁻¹		J kgm ²	J lb ft ²	m kg	m lb
1000	DA180M54W10-5	0.515	12.22	330	728
	DA180L54W10-5	0.676	16.04	435	959
1500	DA180M54W15-5	0.515	12.22	330	728
	DA180L54W15-5	0.676	16.04	435	959
2000	DA180M54W20-5	0.515	12.22	330	728
	DA180L54W20-5	0.676	16.04	435	959
2500	DA180M54W25-5	0.515	12.22	330	728
	DA180L54W25-5	0.676	16.04	435	959
3000	DA180MW30-5	0.515	12.22	330	728
	DA180L54W30-5	0.676	16.04	435	959

Maximum standstill torque

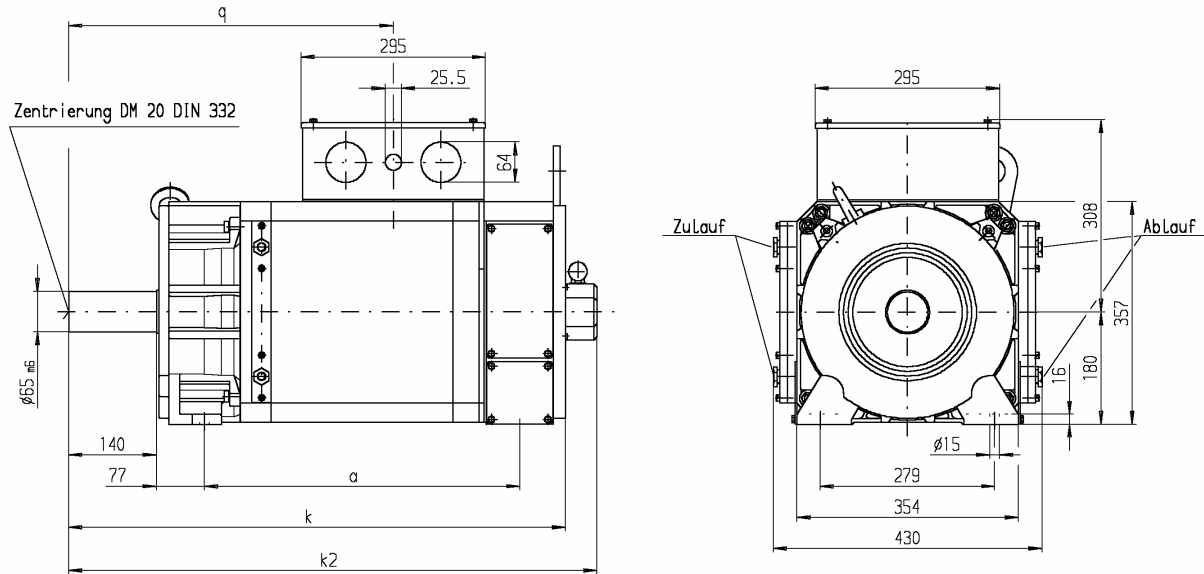
Motor type	$M_{0\ max}$ [Nm]	$M_{0\ max}$ [Nm]
DA180M54W	764	563
DA180L54W	1088	802

Legend

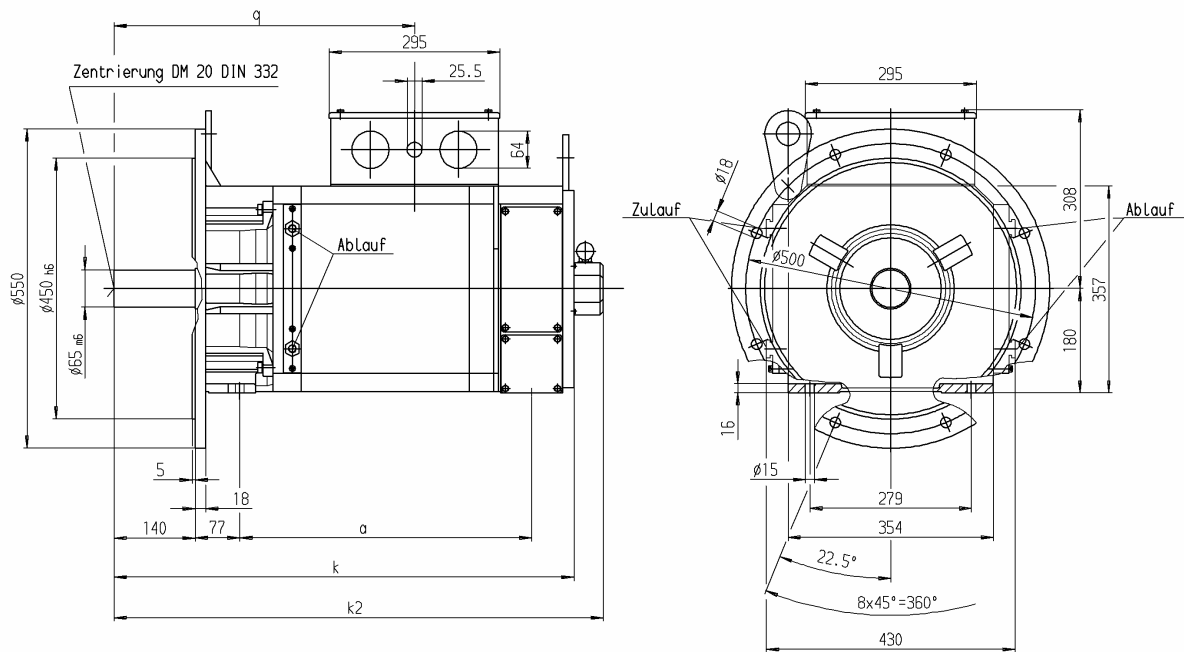
American units

Dimension drawing DA 180 .. W

Version IMB3 standard
DA..180..54W..



Version IMB35 standard
DAFF..180..54W..



Type DA	a	k	k2	q
DA 180 M..W..	504	794	845	519
DA 180 L..W..	604	894	945	619

Zentrierung / Centering	ZuLauf / Inflow	AbLauf / Drain
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Three-phase asynchronous DA 225..54 W.. (IP 54 water-cooled)

Mains voltage 3 AC 400 V for converters with uncontrolled supply

Nom. speed	Motor type	Nom. power	Nom. torque		Nom. current	Nom. voltage	Limit speed with field weakening	Max. operating speed	Power factor	Magne- tizing current	Effi- cien- cy	Nom. fre- quen- cy	
n_N min^{-1}		P_N kW	P_N hp	M_N Nm	M_N lbf ft	I_N A	U_N V	n_1 min^{-1}	$n_{\max}$ min^{-1}	$\cos \varphi$	I_{μ} A	η_N	f_N Hz
1000	DA225K54W10-5	68	91.2	649	479	161	325	2000	3800	0.81	71	0.926	33.9
	DA225M54W10-5	95	127.4	907	669	223	330	2000	3800	0.80	100	0.932	33.8
	DA225L54W10-5	120	160.9	1146	845	278	330	2000	3800	0.80	123	0.935	33.8
1500	DA225K54W15-5	97	130.1	618	456	208	350	2300	3800	0.81	85	0.940	50.6
	DA225M54W15-5	135	181.0	860	634	326	320	3000	3800	0.80	146	0.944	50.5
1750	DA225K54W17-5	108	144.8	589	434	244	340	3200	3800	0.80	107	0.943	58.9
	DA225M54W17-5	148	198.5	808	596	313	360	2300	3800	0.80	133	0.948	58.8
	DA225L54W17-5	185	248.1	1010	745	430	330	3500	3800	0.79	194	0.948	58.8
2000	DA225K54W20-5	120	160.9	573	423	300	310	3800	3800	0.79	137	0.943	67.2
	DA225M54W20-5	162	217.2	774	571	410	310	3800	3800	0.78	196	0.947	67.1
	DA225L54W20-5	205	274.9	979	722	423	355	3000	3800	0.82	162	0.952	67.2
2500	DA225K54W25-5	135	181.0	516	381	280	360	3200	3800	0.82	108	0.948	83.8
	DA225M54W25-5	185	248.1	707	521	388	355	3500	3800	0.81	153	0.951	83.8
3000	DA225K54W30-5	150	201.2	478	353	360	330	3800	3800	0.78	164	0.946	100.4

Nom. speed	Motor type	Inertia		Weight	
n_N min ⁻¹		J kgm ²	J lb ft ²	m kg	m lb
1000	DA225K54W10-5	1.313	31.16	600	1323
	DA225M54W10-5	1.710	40.58	710	1565
	DA225L54W10-5	2.063	48.95	810	1786
1500	DA225K54W15-5	1.313	31.16	600	1323
	DA225M54W15-5	1.710	40.58	710	1565
1750	DA225K54W17-5	1.313	31.16	600	1323
	DA225M54W17-5	1.710	40.58	710	1565
	DA225L54W17-5	2.063	48.95	810	1786
2000	DA225K54W20-5	1.313	31.16	600	1323
	DA225M54W20-5	1.710	40.58	710	1565
	DA225L54W20-5	2.063	48.95	810	1786
2500	DA225K54W25-5	1.313	31.16	600	1323
	DA225M54W25-5	1.710	40.58	710	1565
3000	DA225K54W30-5	1.313	31.16	600	1323

Maximum standstill torque

Motor type	$M_{0\ max}$ [Nm]	$M_{0\ max}$ [Nm]
DA225K54W	1298	957
DA225M54W	1796	1325
DA225L54W	2292	1690

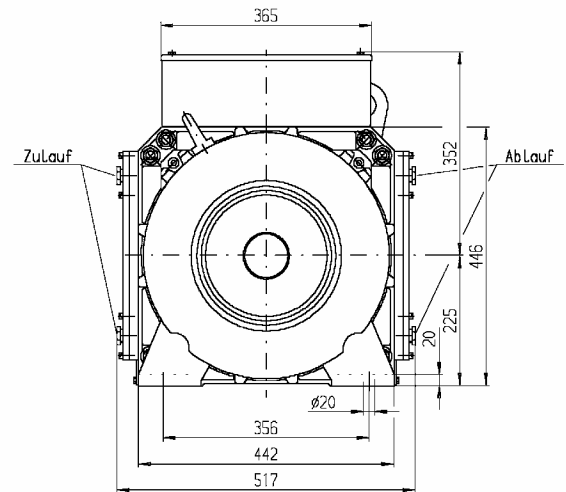
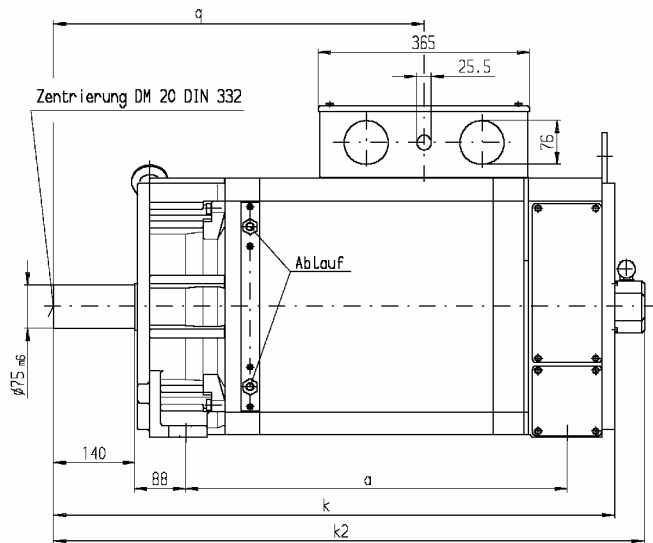
Legend

American units

Dimension drawing DA 225 .. W

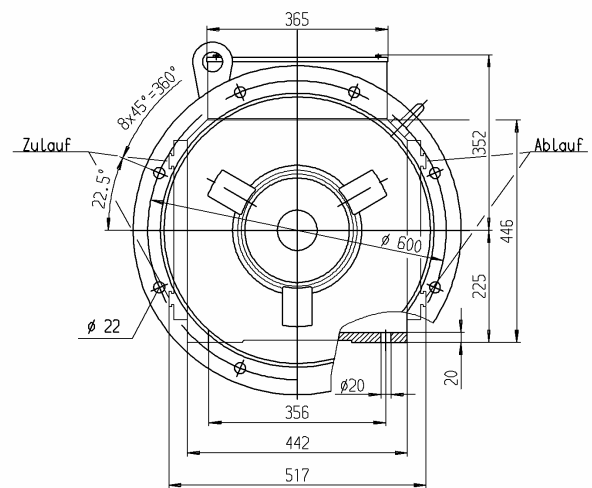
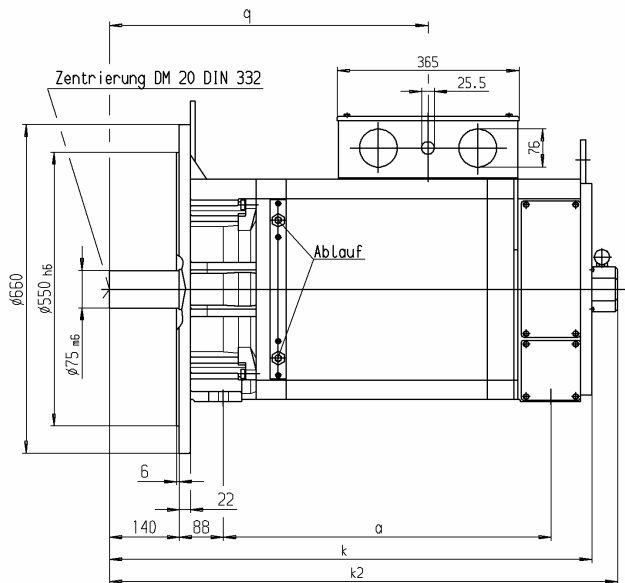
Version IMB3 standard

DA..225..54W..



Version IMB35 standard

DAFF..225..54W..



Type DA	a	k	k2	q
DA 225 K..W..	559	870	921	540
DA 225 M..W..	659	970	1021	640
DA 225 L..W..	749	1060	1111	730

Zentrierung / Centering	Zulauf / Inflow	Ablauf / Drain
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Technical data synchronous

Three-phase synchronous DS 100..54 W.. (IP 54 water-cooled)

Mains voltage 3 AC 400 V for converters with uncontrolled supply

Nom. speed	Motor type	Nom. power		Nom. torque		Nom. current	Nom. voltage	Voltage constant	Power factor	Magnetizing current (field weakening)	Efficiency	Nom. frequency
n_N Min ⁻¹		P_N kW	P_N hp	M_N Nm	M_N lbf ft	I_N A	U_N V	$K_{E, / KALT}$ V/1000min ⁻¹	cos φ	I_d A	η_N	f_N Hz
1000	DS100K54W10-5	5.9	8	56	41	13.0	345	276	0.90	0.0	0.843	50.0
	DS100M54W10-5	9.1	12	87	64	20.5	335	272	0.89	0.0	0.861	50.0
	DS100L54W10-5	12.3	16	118	87	27.5	340	277	0.88	0.0	0.871	50.0
	DS100B54W10-5	15.2	20	145	107	32.0	345	293	0.90	2.5	0.879	50.0
1500	DS100K54W15-5	8.7	12	55	41	18.0	340	198	0.92	2.0	0.884	75.0
	DS100M54W15-5	13.5	18	86	63	27.5	345	198	0.90	2.0	0.899	75.0
	DS100L54W15-5	18.2	24	116	86	36.0	350	208	0.91	4.5	0.906	75.0
	DS100B54W15-5	22.5	30	144	106	45.0	345	207	0.92	6.0	0.911	75.0
2000	DS100K54W20-5	11.4	15	54	40	22.0	350	162	0.94	4.5	0.905	100.0
	DS100M54W20-5	17.4	23	83	61	32.5	355	167	0.95	7.5	0.917	100.0
	DS100L54W20-5	23.5	32	112	83	45.0	345	166	0.95	11.0	0.923	100.0
	DS100B54W20-5	29.5	40	141	104	56.0	350	166	0.94	12.5	0.928	100.0
2500	DS100K54W25-5	13.7	18	52	38	26.0	345	134	0.96	7.5	0.917	125.0
	DS100M54W25-5	21.0	28	80	59	39.0	350	135	0.96	10.0	0.929	125.0
	DS100L54W25-5	28.5	38	109	80	53.0	345	138	0.96	16.0	0.933	125.0
	DS100B54W25-5	36.0	48	139	103	67.0	355	138	0.94	15.5	0.938	125.0
3000	DS100K54W30-5	16.2	22	52	38	30.5	345	113	0.96	8.0	0.927	150.0
	DS100M54W30-5	24.5	33	78	58	45.0	350	115	0.96	12.0	0.937	150.0
	DS100L54W30-5	34.0	46	108	80	63.0	350	115	0.95	17.0	0.941	150.0
	DS100B54W30-5	42.0	56	134	99	75.0	355	120	0.96	24.0	0.943	150.0

Nom. speed	Motor type	Inertia	Weight
n_N Min ⁻¹		J kgm ²	M Kg
1000	DS100K54W10-5	0.010	38
	DS100M54W10-5	0.014	48
	DS100L54W10-5	0.018	58
	DS100B54W10-5	0.022	68
1500	DS100K54W15-5	0.010	38
	DS100M54W15-5	0.014	48
	DS100L54W15-5	0.018	58
	DS100B54W15-5	0.022	68
2000	DS100K54W20-5	0.010	38
	DS100M54W20-5	0.014	48
	DS100L54W20-5	0.018	58
	DS100B54W20-5	0.022	68
2500	DS100K54W25-5	0.010	38
	DS100M54W25-5	0.014	48
	DS100L54W25-5	0.018	58
	DS100B54W25-5	0.022	68
3000	DS100K54W30-5	0.010	38
	DS100M54W30-5	0.014	48
	DS100L54W30-5	0.018	58
	DS100B54W30-5	0.022	68

Maximum standstill torque

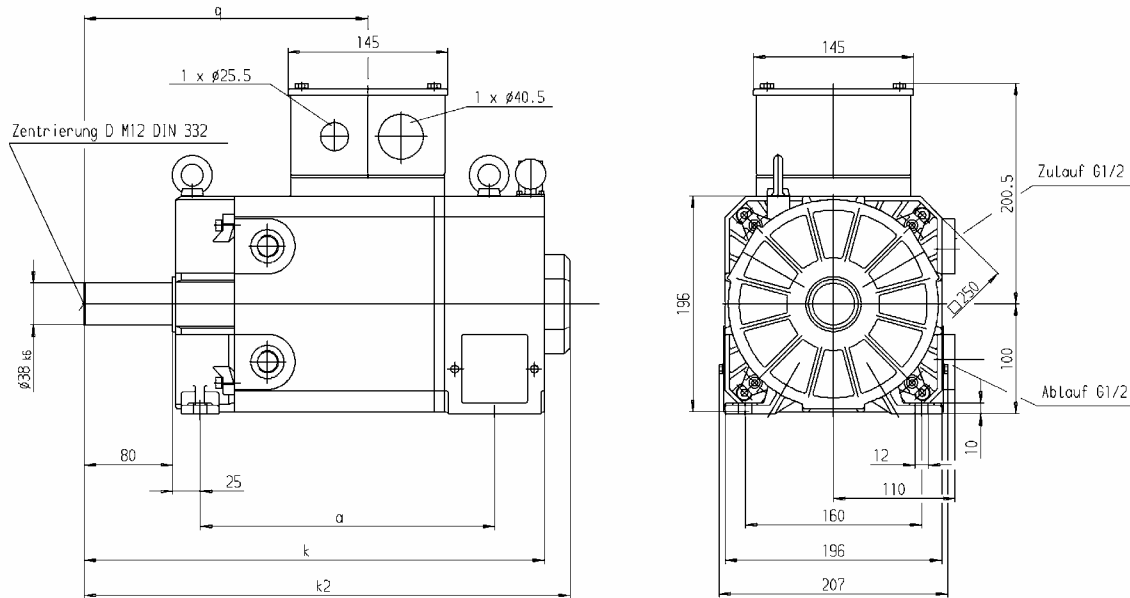
Motor type	$M_{0, max}$ [Nm]	$M_{0, max}$ [Nm]
DS100K54W	128	94
DS100M54W	190	140
DS100L54W	250	184
DS100B54W	310	229

Legend

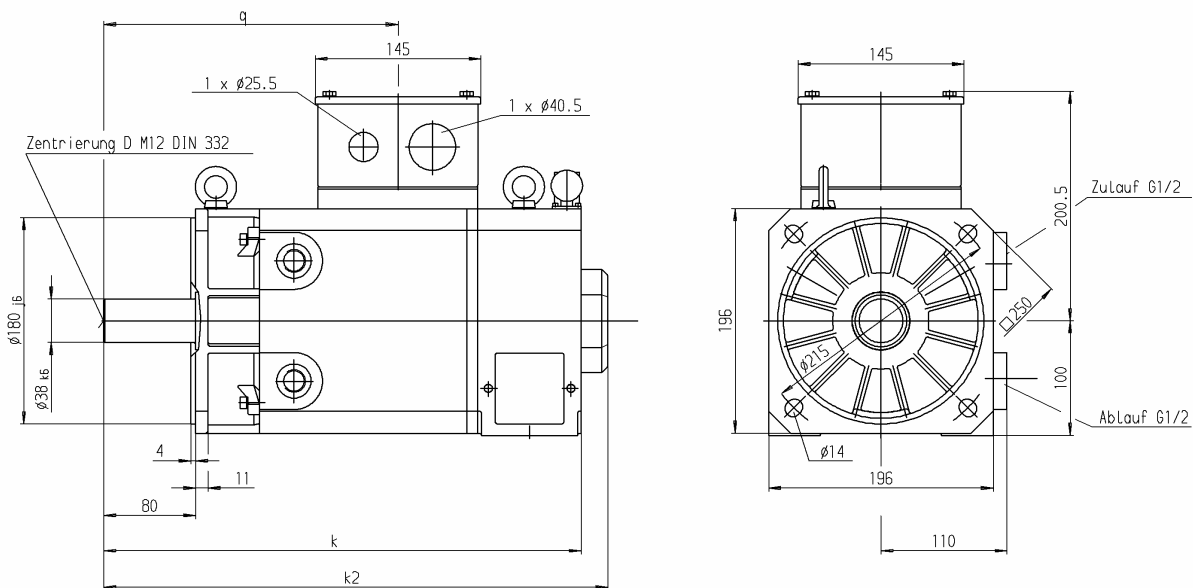
American units

Dimension drawing DS 100 .. W

Version IMB3 standard
DS. 100..54W..



Version IMB5 standard
DSF.100..54W..



Type DS	a	k	k2	q
DS 100 K...W..	217	367	390	207
DS 100 M...W..	237	417	440	257
DS 100 L...W..	317	467	490	307
DS 100 B...W..	367	517	540	357

Brake k2 + 155 mm

Zentrierung / Centering	Zulauf / Inflow	Ablauf / Drain
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Three-phase synchronous DS 132...54 W.. (IP 54 water-cooled)

Mains voltage 3 AC 400 V for converters with uncontrolled supply

Nom. speed	Motor type	Nom. power		Nom. torque		Nom. current	Nom. voltage	Voltage constant	Power factor	Magnetizing current (field weakening)	Efficiency	Nom. frequency
n_N Min ⁻¹		P_N KW	P_N hp	M_N Nm	M_N lbf ft	I_N A	U_N V	K_E / K_{ALT} V/1000min ⁻¹	cos φ	I_d A	η_N	f_N Hz
1000	DS132K54W10-5	15.3	21	146	108	31.5	350	297	0.89	0.0	0.909	50.0
	DS132M54W10-5	21.0	28	200	148	43.0	345	295	0.88	0.0	0.916	50.0
	DS132L54W10-5	26.0	35	249	184	51.0	345	319	0.93	8.5	0.920	50.0
1500	DS132B54W10-5	32.0	43	306	226	67.0	340	294	0.88	0.0	0.925	50.0
	DS132K54W15-5	22.5	30	143	105	43.5	350	208	0.91	3.0	0.933	75.0
	DS132M54W15-5	31.0	42	195	144	58.0	350	216	0.92	8.0	0.938	75.0
2000	DS132L54W15-5	39.0	52	247	182	73.0	350	221	0.93	12.5	0.941	75.0
	DS132B54W15-5	47.0	63	299	221	93.0	350	205	0.88	0.0	0.945	75.0
	DS132K54W20-5	29.0	39	138	102	54.0	350	162	0.93	7.5	0.945	100.0
2500	DS132M54W20-5	39.0	52	188	139	72.0	350	170	0.95	15.0	0.949	100.0
	DS132L54W20-5	50.0	67	239	176	92.0	350	172	0.94	20.5	0.951	100.0
	DS132B54W20-5	60.0	80	288	212	113.0	345	166	0.94	22.0	0.954	100.0
3000	DS132K54W25-5	35.0	47	134	99	64.0	350	133	0.94	10.5	0.951	125.0
	DS132M54W25-5	47.0	63	180	133	86.0	345	137	0.96	21.5	0.954	125.0
	DS132L54W25-5	61.0	82	233	172	113.0	345	139	0.96	29.5	0.956	125.0
3000	DS132B54W25-5	74.0	99	283	209	135.0	350	137	0.94	27.0	0.959	125.0
	DS132K54W30-5	40.0	54	127	94	71.0	350	119	0.97	20.5	0.954	150.0
	DS132M54W30-5	54.0	72	173	128	97.0	350	118	0.96	25.0	0.958	150.0
	DS132L54W30-5	72.0	97	229	169	132.0	350	115	0.95	28.0	0.960	150.0
	DS132B54W30-5	86.0	115	274	202	156.0	350	117	0.96	39.0	0.962	150.0

Nom. speed	Motor type	Inertia		Weight	
n_N Min ⁻¹		J kgm ²	J lb ft ²	m kg	m lb
1000	DS132K54W10-5	0.045	1.07	100	220
	DS132M54W10-5	0.058	1.38	115	254
	DS132L54W10-5	0.071	1.68	130	287
	DS132B54W10-5	0.084	1.99	145	320
1500	DS132K54W15-5	0.045	1.07	100	220
	DS132M54W15-5	0.058	1.38	115	254
	DS132L54W15-5	0.071	1.68	130	287
	DS132B54W15-5	0.084	1.99	145	320
2000	DS132K54W20-5	0.045	1.07	100	220
	DS132M54W20-5	0.058	1.38	115	254
	DS132L54W20-5	0.071	1.68	130	287
	DS132B54W20-5	0.084	1.99	145	320
2500	DS132K54W25-5	0.045	1.07	100	220
	DS132M54W25-5	0.058	1.38	115	254
	DS132L54W25-5	0.071	1.68	130	287
	DS132B54W25-5	0.084	1.99	145	320
3000	DS132K54W30-5	0.045	1.07	100	220
	DS132M54W30-5	0.058	1.38	115	254
	DS132L54W30-5	0.071	1.68	130	287
	DS132B54W30-5	0.084	1.99	145	320

Maximum standstill torque

Motor type	$M_{0\max}$ [Nm]	$M_{0\max}$ [Nm]
DS132K54W	340	251
DS132M54W	450	332
DS132L54W	550	406
DS132B54W	660	487

Legend

American units

Three-phase synchronous DS 160..54 W.. (IP 54 water-cooled)

Mains voltage 3 AC 400 V for converters with uncontrolled supply

Nom. speed	Motor type	Nom. power		Nom. torque		Nom. current	Nom. voltage	Voltage constant	Power factor	Magnetizing current (field weakening)	Efficiency	Nom. frequency
n_N Min ⁻¹		P_N kW	P_N hp	M_N Nm	M_N lbf ft	I_N A	U_N V	K_E / K_{ALT} V/1000min ⁻¹	$\cos \varphi$	I_d A	η_N	f_N Hz
1000	DS160K54W10-5	30	40	287	212	56	345	334	0.96	9.5	0.937	50.0
	DS160M54W10-5	38	51	366	270	72	345	328	0.94	8.5	0.941	50.0
	DS160L54W10-5	46	62	441	325	87	345	330	0.94	9.0	0.944	50.0
	DS160B54W10-5	55	74	525	387	105	350	324	0.91	4.0	0.945	50.0
1500	DS160K54W15-5	44	59	280	207	81	345	221	0.95	10.0	0.952	75.0
	DS160M54W15-5	57	76	361	266	105	350	221	0.93	8.5	0.954	75.0
	DS160L54W15-5	68	91	435	321	131	345	214	0.91	0.0	0.957	75.0
	DS160B54W15-5	80	107	509	375	142	355	235	0.95	23.5	0.958	75.0
2000	DS160K54W20-5	56	75	269	198	102	345	170	0.96	15.0	0.958	100.0
	DS160M54W20-5	73	98	350	258	134	345	168	0.95	17.0	0.960	100.0
	DS160L54W20-5	87	117	415	306	155	350	176	0.96	28.0	0.962	100.0
	DS160B54W20-5	104	139	497	367	187	350	175	0.95	29.5	0.963	100.0
2500	DS160K54W25-5	68	91	260	192	124	345	135	0.95	13.5	0.961	125.0
	DS160M54W25-5	88	118	336	248	160	345	136	0.95	19.0	0.963	125.0
	DS160L54W25-5	107	143	409	302	195	345	137	0.95	28.5	0.964	125.0
	DS160B54W25-5	125	168	477	352	221	350	145	0.97	48.0	0.965	125.0
3000	DS160K54W30-5	78	105	248	183	137	350	118	0.97	22.5	0.962	150.0
	DS160M54W30-5	104	139	330	243	185	360	115	0.93	7.0	0.964	150.0
	DS160L54W30-5	122	164	390	288	213	350	125	0.98	63.0	0.965	150.0
	DS160B54W30-5	140	188	446	329	240	360	130	0.99	77.0	0.966	150.0

Nom. speed	Motor type	Inertia		Weight	
n_N Min ⁻¹		J kgm ²	J lb ft ²	m kg	m lb
1000	DS160K54W10-5	0.150	3.6	175	386
	DS160M54W10-5	0.184	4.4	200	441
	DS160L54W10-5	0.217	5.1	225	496
	DS160B54W10-5	0.250	5.9	250	551
1500	DS160K54W15-5	0.150	3.6	175	386
	DS160M54W15-5	0.184	4.4	200	441
	DS160L54W15-5	0.217	5.1	225	496
	DS160B54W15-5	0.250	5.9	250	551
2000	DS160K54W20-5	0.150	3.6	175	386
	DS160M54W20-5	0.184	4.4	200	441
	DS160L54W20-5	0.217	5.1	225	496
	DS160B54W20-5	0.250	5.9	250	551
2500	DS160K54W25-5	0.150	3.6	175	386
	DS160M54W25-5	0.184	4.4	200	441
	DS160L54W25-5	0.217	5.1	225	496
	DS160B54W25-5	0.250	5.9	250	551
3000	DS160K54W30-5	0.150	3.6	175	386
	DS160M54W30-5	0.184	4.4	200	441
	DS160L54W30-5	0.217	5.1	225	496
	DS160B54W30-5	0.250	5.9	250	551

Maximum standstill torque

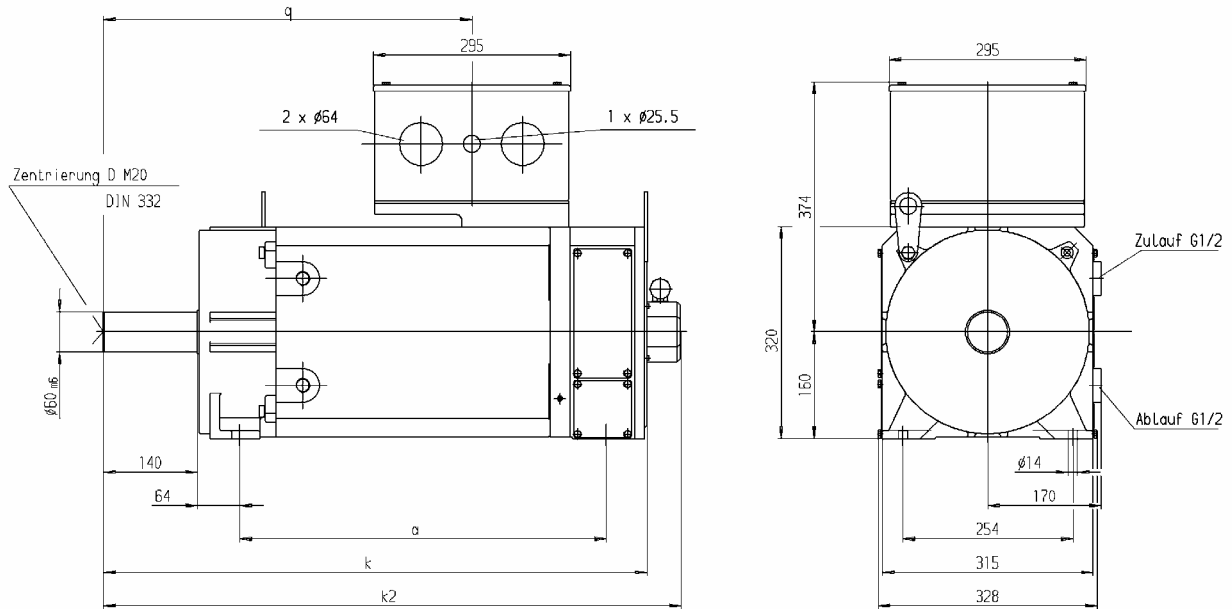
Motor type	$M_{0\ max}$ [Nm]	$M_{0\ max}$ [Nm]
DS160K54W	685	505
DS160M54W	845	623
DS160L54W	1005	741
DS160B54W	1160	856

Legend

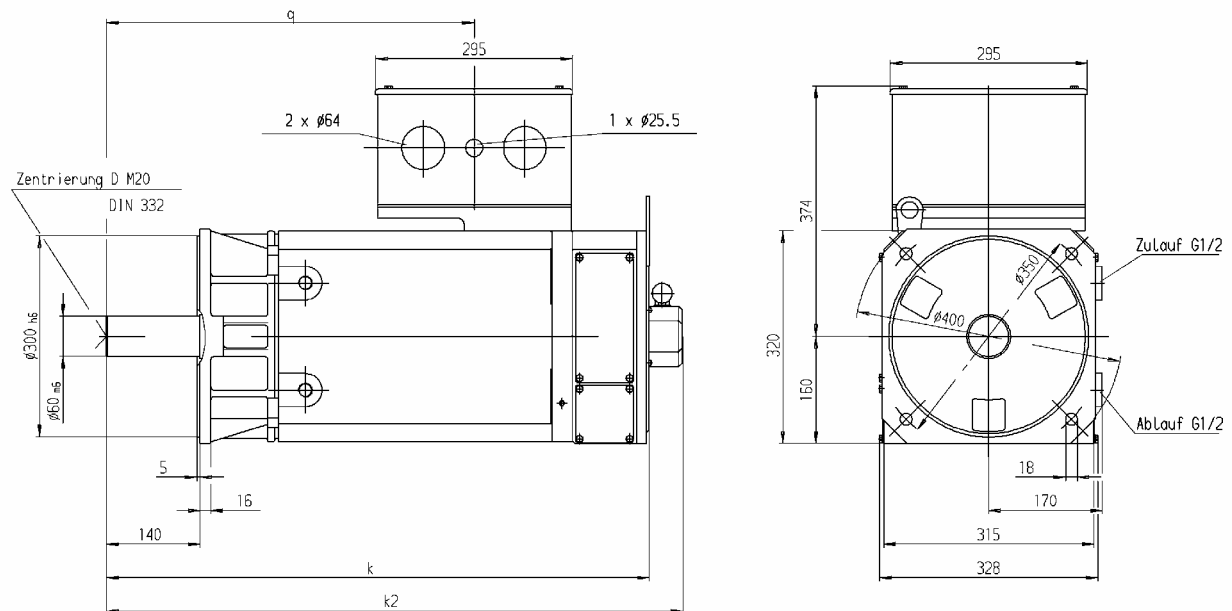
American units

Dimension drawing DS 160 .. W

Version IMB3 standard
DS. 160..54W..



Version IMB5 standard
DSF. 160..54W..



Type DS	a	k	k2	q
DS 160 K...W..	388	653	704	391
DS 160 M...W..	438	703	754	441
DS 160 L...W..	498	763	814	501
DS 160 B...W..	548	813	864	551

Brake k2 + 150 mm

Zentrierung / Centering	Zulauf / Inflow	Ablauf / Drain
-------------------------	-----------------	----------------

Bearings and shaft load

All machines are equipped with rolling-contact bearings. Normally, the non-locating bearing (ball bearing) is intended for the drive end and the locating bearing (ball bearing) for the non-drive end. Machines with roller bearings at the drive end are available for applications where increased radial forces can occur, for instance when using pulleys. Please specify radial forces in your order.

Ball bearing assignment for D-end

Frame size	D-end	N-end
100	6209 2ZRC3	6306 2ZRC3
132	6312 2ZRC3	6310 2ZRC3
160	6313 2ZRC3	6311 2ZRC3
180	6314 2ZRC3	6312 2ZRC3
225	6316 2ZRC3	6314 2ZRC3

Ball bearing assignment for D-end

Frame size	D-end	N-end
100	NU 209 E	6306 2ZRC3
132	NU 312 E	6310 2ZRC3
160	NU 313 E	6311 2ZRC3
180	NU 314 E	6312 2ZRC3
225	NU 316 E	6314 2ZRC3

Determination of radial forces F_R

When using pulleys, the radial load is calculated according to the following formula:

P = Nominal power in kW

$$F_R = k \frac{2 \cdot 10^7 \cdot P}{n \cdot D} \text{ [N]} \quad n = \text{Nominal speed in min}^{-1}$$

D = Disk diameter in mm

The belt tightening factor k is approximately:

$k = 1.8 \dots 2.5$ for V-belt

$k = 2.2 \dots 3.5$ for flat belt

(Observe specifications of the belt manufacturer)

For a safe transmission of the torque it is necessary to utilise the entire bearing length of the key. Otherwise, an excessive compressive load per unit area may occur at the key which may result in a motor defect.

The pulley must be mounted up to the shaft shoulder and is tightened with the following tightening torques as a maximum.

Gland	M5	M6	M8	M10	M12	M16	M20
Tightening torque	2.2 Nm	4.0 Nm	10.0 Nm	19.0 Nm	33.0 Nm	80 Nm	160 Nm

Permissible radial forces F_R at the shaft end

The ball bearings are dimensioned for a calculated service life of approx. 20,000 operating hours¹⁾. The load values specified in the following must not be exceeded. The specified permissible radial forces F_R are valid only for horizontal mounting of the motor without additional axial forces. If additional forces occur, please consult the manufacturer.

Axial load of the motor shaft

When mounting clutches, pulleys, etc. onto the motor shaft, axial forces must not occur! Therefore use the internal thread of the shaft end as assembly aid.

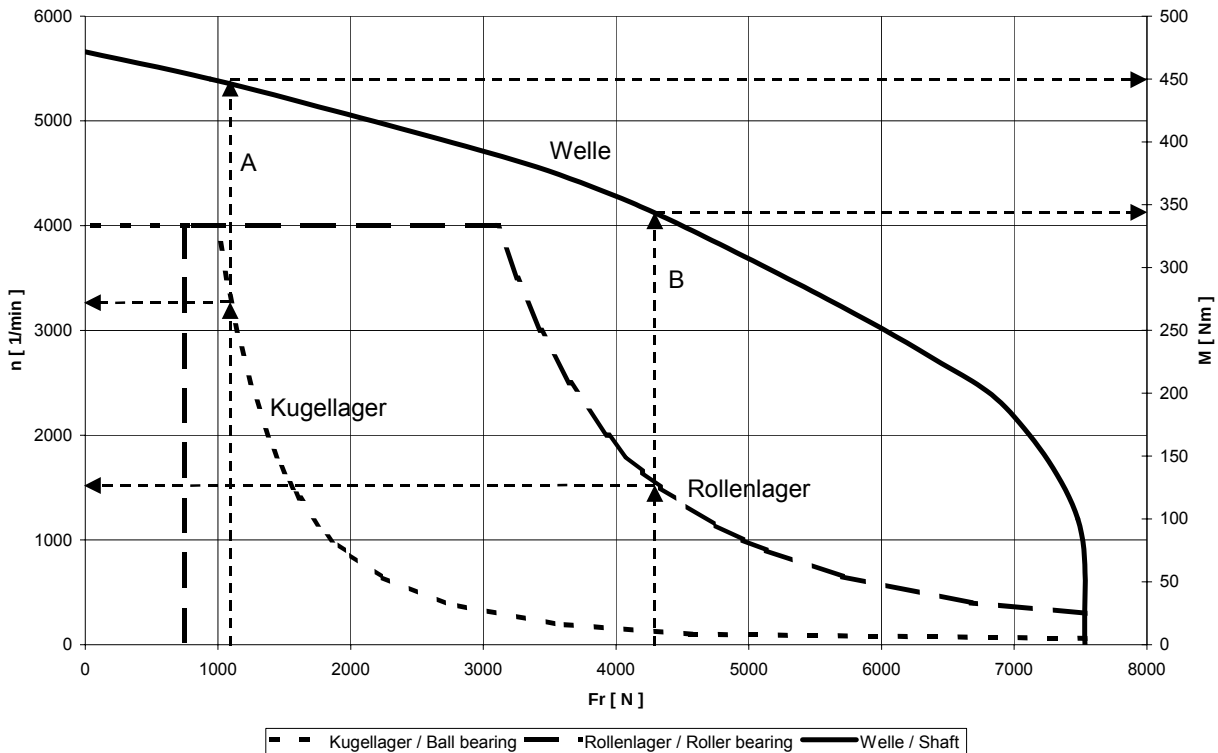
1) medium operating temperature < 90 °C

medium operating speed < 2000 U/min (DA 100 – DA 160), medium operating speed < 1500 U/min (DA 180 – DA 225)

medium operating speed < 2000 U/min (DS 100 – DS 160)

Radial force diagrams

Example



Explanation of the example

Force acting on the end of the shaft end (for force acting on the middle of the shaft end $Fr \times 1.1$)
 Shaft end with keyway

Case A – Ball bearing:

The radial force Fr of the application is used to determine the possible maximum speed of the bearing in the “Ball bearing” characteristic.

Radial force 1100 N $\Rightarrow$ maximum speed 3250 min^{-1}

The maximum transmittable torque results from the “Shaft” characteristic.

Radial force 1100 N $\Rightarrow$ maximum transmittable torque 450 Nm

Case B – Roller bearing:

The radial force Fr of the application is used to determine the possible maximum speed of the bearing in the “Roller bearing” characteristic.

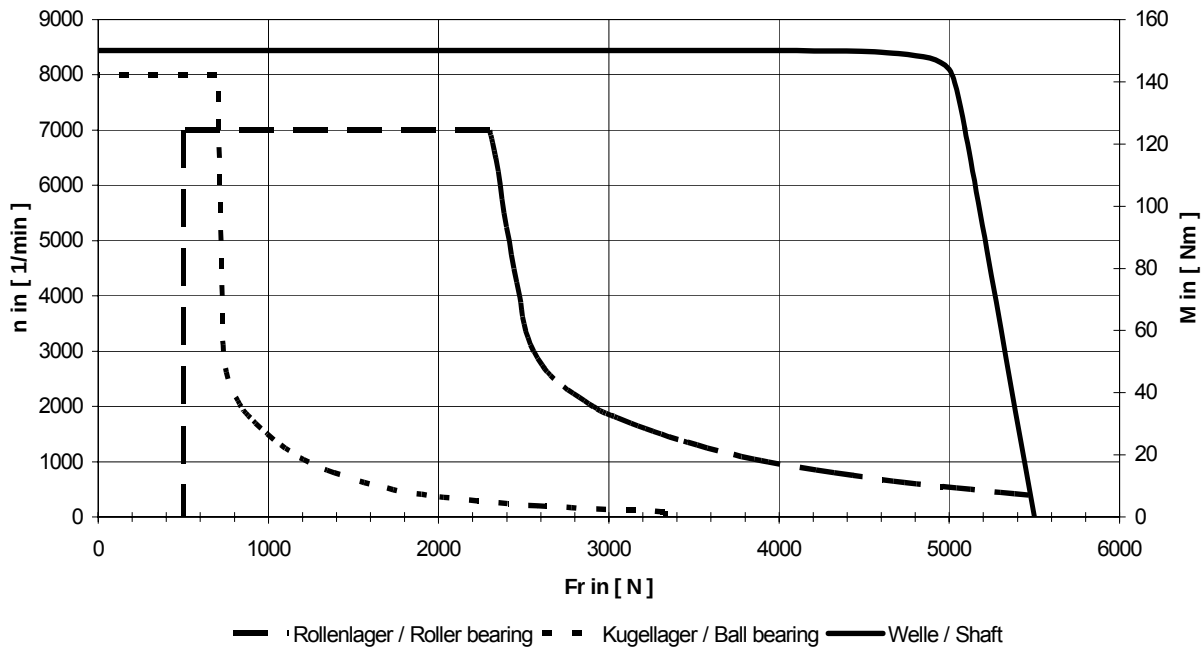
Radial force 4,300 N $\Rightarrow$ maximum speed 1,500 min^{-1}

The maximum transmittable torque results from the “Shaft” characteristic.

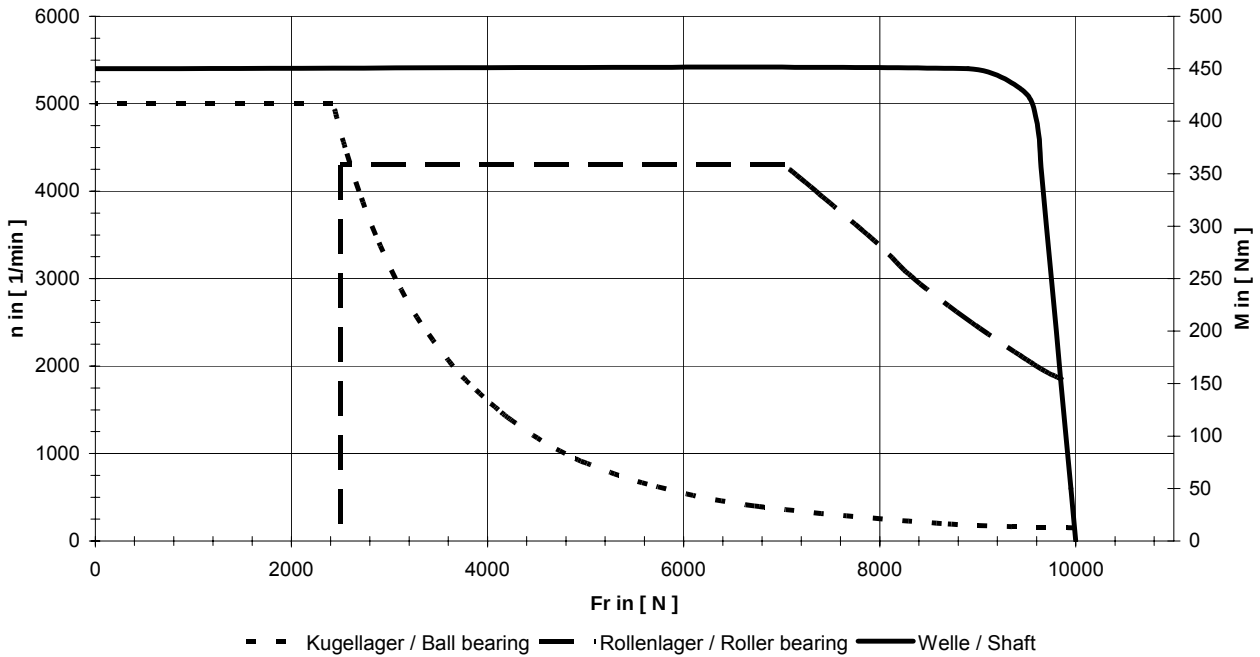
Radial force 4,300 N $\Rightarrow$ maximum transmittable torque 345 Nm

The roller bearing requires a minimum radial force of 800 N to avoid bearing damage.

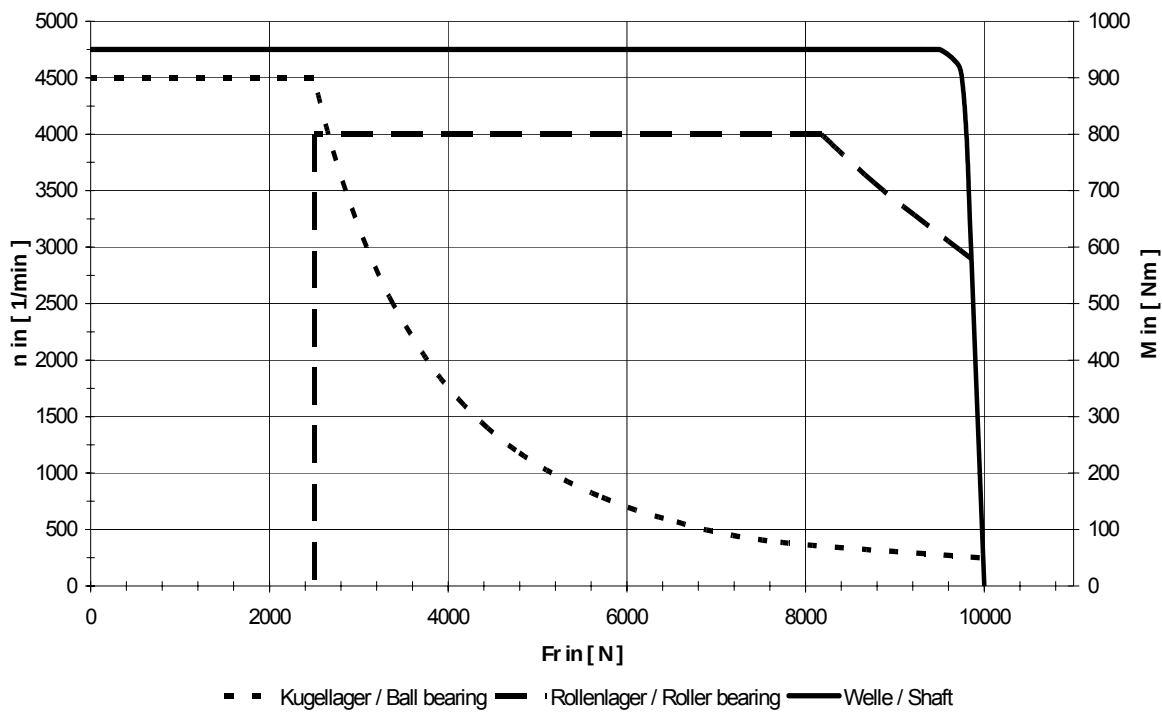
DA 100 / DS 100



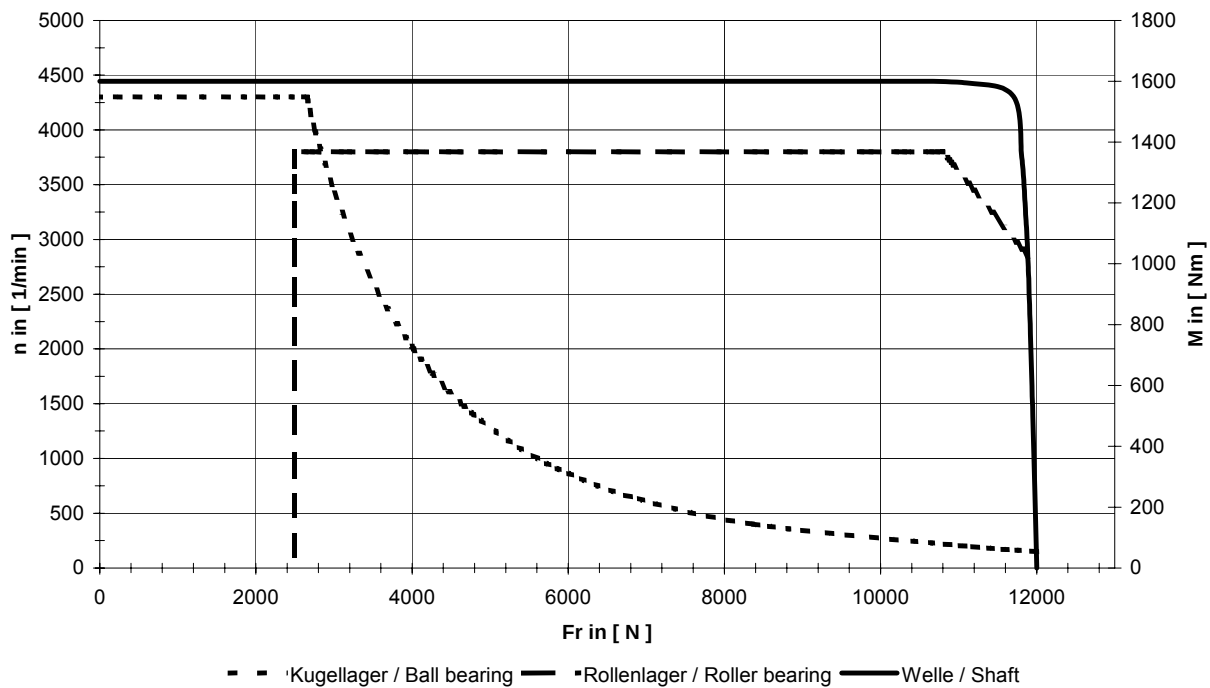
DA 132 / DS 132



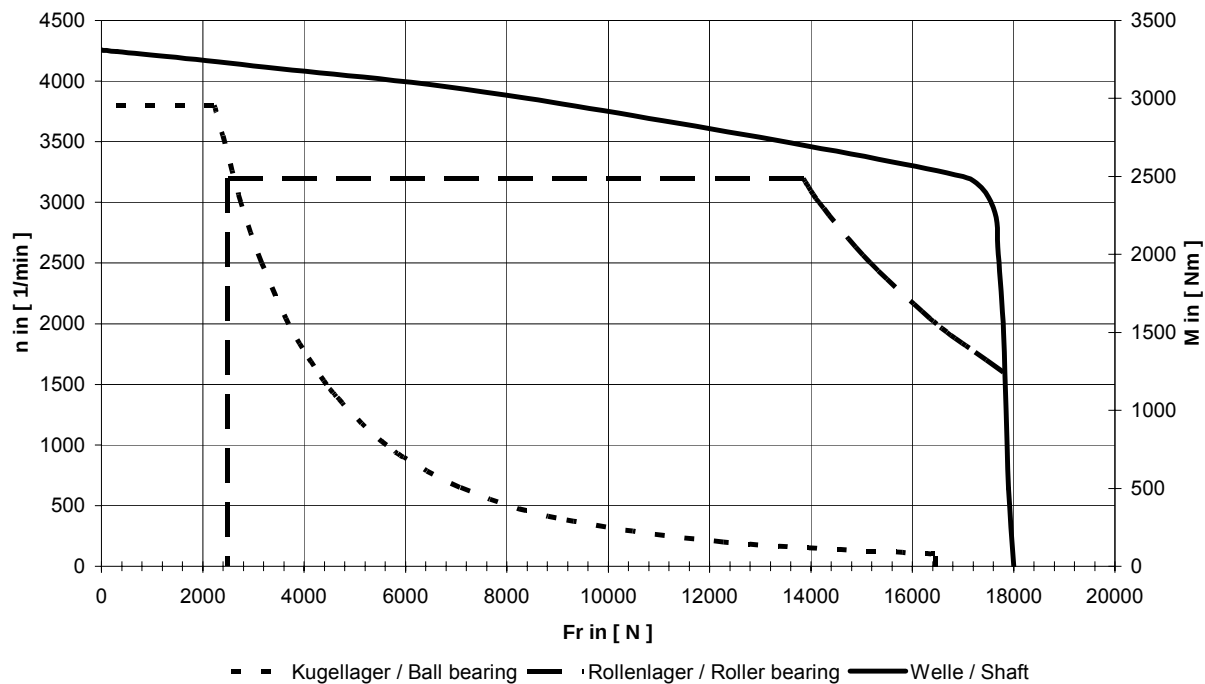
DA 160 / DS 160



DA 180

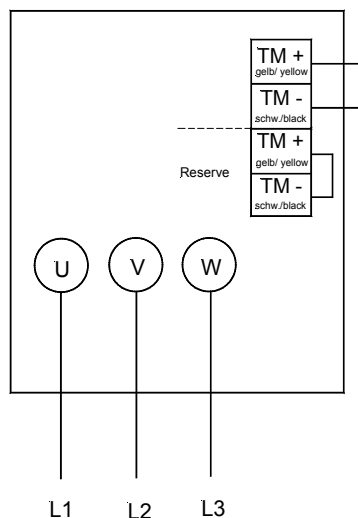


DA 225



Main connection – Terminal marking

Connection diagram



U V W Power connection
TM Thermal sensor

Electrical main connection

The terminal box sizes can vary depending on the nominal motor current. In the following section an assignment of current – terminal box size – bore diameter for glands and connecting bolt size is listed. EMC glands should be used.

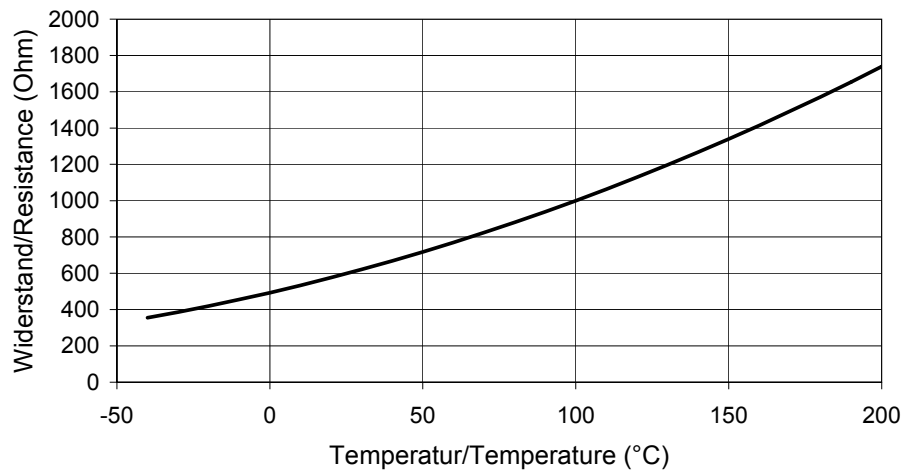
Motor frame size	Nom. current up to [A]	Terminal box	Cable gland	Max. possible cable dia. [mm]	Number of main connect. terminals	Maximum cross-section per terminal [mm ²]
DA100 DS 100	70 / 76	Gr. 140	1 x M 40 + 1 x M 25	32	3x pluggable	1 x 25
DA 132	115	Gr. 210	2 x M 50 + 1 x M 25	38	3 x M 6	2 x 35
DS 132 DA 160 DS 160	260	Gr. 250	2 x M 63 + 1 x M 25	48	3 x M 10	2 x 120
DA 180	300	Gr. 290	2 x M 63 + 1 x M 25	48	3 x M 12	2 x 185
	430	Gr. 290-II	2 x M 75 + 1 x M 25	63 *	3 x M 16	2 x 240
DA 225	300	Gr. 290	2 x M 63 + 1 x M 25	48	3 x M 12	2 x 185
	500	Gr. 360	2 x M 75 + 1 x M 25	63 *	3 x M 16	2 x 240
	570	Gr. 360-II	2 x M 75 + 1 x M 25	63 *	3 x M 16	2 x 240

* Terminal box screen laid on terminal in the terminal box.

Thermal sensor

As a standard, the motors are equipped with a thermal sensor in the stator winding; the data of which are evaluated in the motor controller. Additional PTCs or thermal sensors can be fitted on request.

KTY84 - 130



The motor temperature is continuously monitored using the thermal sensor type KTY 84-130. The above shown resistance results when the sensor is supplied with a measuring current of 2 mA.

Noise intensity

The motors do not exceed the limit values specified in EN 60034.

Vibration severity

Vibration severity	Speed [min ⁻¹]	Frame size	
		100-132 V _{eff} [mm/s]	160-225
N (normal)	600 - 1800 > 1800	1,8 1,8	2,8 2,8
R* (reduced)	600 - 1800 > 1800	0,71 1,12	1,12 1,8
S* (special)	600 - 1800 > 1800	0,45 0,71	0,71 1,12

- The motors can be supplied in three vibration classes according to DIN ISO 2373.
- R and S are available with ball bearings only

Requirements of the cooling circuit for liquid-cooled motors

The cooling circuit for water-cooled motors must meet the following requirements:

- Closed cooling circuit
- Water input temperature 10°C to 35°C maximal 5 K lower than ambient temperature
- Clear water without suspended matter or dirt
- Anti-corrosion agent added
- Water hardness 8 to 14 dH°
- pH range 6.5 to 7.5
- desalted and demineralized water: sodium chloride content (salt content) < 100 ppm (=0.01%)

The following amounts of coolants are necessary to cool the motors:

DS frame size	100	132	160
Flow rate [l/min] (min.)	7 (4.5)	9 (6.5)	10 (7)
Pressure drop [bar]	0.29 ±10%	0.33 ±10%	0.15 ±10%
Temperature rise [K] (max.)	6 (10)	7 (10)	8 (11)

DA frame size	100	132	160	180	225
Flow rate [l/min] (min.)	7 (5)	9 (6.5)	11 (9)	12 (10)	13 (11)
Pressure drop [bar]	0.29 ±10%	0.33 ±10%	1.05 ±10%	1.35 ±10%	2.55 ±10%
Temperature rise [K] (max.)	6 (9)	7 (10)	8 (10)	10 (12)	11 (13)

Maximum pressure: 5 bar

Brake assignment

For frame size	Brake type	Brake torque M4 for holding brake [Nm]	Input power [W]	max. perm. switching energy Wperm. per switching operation [kJ]	Disengaging time [s]	Engaging time [s]	Inertia [kgm ²]	max. perm. speed [min ⁻¹]	Weight [kg]
100	SB 100	100	106	18	0.180	0.250	0.0015	3500	9.5
132	SB 200	200	170	20	0.225	0.300	0.0040	3000	13
160	SB 360	360	190	30	0.350	0.300	0.0090	3000	29
180		On request							
225		On request							

For use as a **holding brake** the following must be observed:

The brake has a considerably increased brake torque.

3 emergency stops (individual braking operations) per hour are possible if evenly distributed

Switching times values are valid for switching on the AC side, in a cold state, with basic air gap and holding brake
Disengaging time – Time until the brake has completely disengaged (brake without torque)

Engaging time – Time until the brake torque is reached

M4 ... static torque

All information are valid for the installation on a horizontal shaft

The supplier must be contacted before vertical installation.

Requirements other than those indicated on request.

Brake time / Switching energy

It is necessary to check that the brake is suited for its application. For this, the switching energy must be determined.

Determination of the braking time [t_B]

$$t_B \quad t_B = \frac{\sum J \cdot \Delta n}{9,55 \cdot (M_B \pm M_L)} + t_0 \quad \text{in } s$$

$\sum J$ Total moment of inertia in kgm² = J_{mot} + J_{add} (referred to motor shaft)

J_{mot} Motor moment of inertia in kgm²

J_{zus} Additional moment of inertia in kgm² (referred to motor shaft)

Δn Motor speed in min⁻¹

M_B Brake torque in Nm

M_L Load torque in Nm (positively calculated if it decelerates, negatively calculated if it accelerates)

t₀ Time in s from the switching instant to the full extent of the braking torque (response time)

l Number of cycles per hour

Determining the switching energy [W_R]

$$W_R = \frac{\sum J \cdot \Delta n^2}{182.4} \cdot \frac{M_B}{(M_B \pm M_L)} \quad \text{in } \frac{\text{Joule}}{\text{switching operation}}$$

W_{Rperm} ≤ Value from table

In most cases, t₀ is negligible. If this is not the case and the time t₀ must be reduced, you can achieve this by interrupting the magnet circuit on the DC side.

However, this measure must be known before dimensioning the brake motor.

Brake supply

Normal voltage: 104 V DC (other voltages on request) . Supply voltage: 230 V 50 Hz AC

The voltage is supplied via the loosely attached brake supply device.

The brakes have a microswitch. Switching capacity of microswitches:

Ohmic load up to 30 V DC - 5 A or 250 V AC - 5 A, inductive load up to 30 V DC -3 A or 250 V AC -2 A

The contact ratings apply to silver contacts.

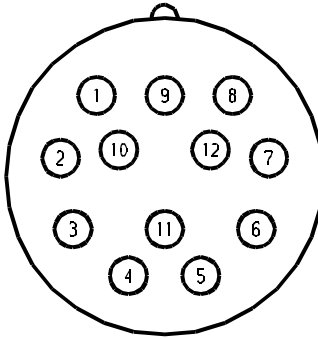
If you want to release the brake manually, please contact Baumüller.

Encoder

Resolver

Pole pair number	1
Ratio	0.5
Frequency	5 kHz
Nominal input voltage	4V
Active input power for no-load operation	112 mW
Current consumption for no-load operation	40mA
Max. output voltage for no-load operation	2 V eff
Voltage constant	
Rotor resistance	$44 \, \Omega \pm 10\%$
Stator resistance	$28 \, \Omega \pm 10\%$
Rotor impedance for no-load operation	$70 + j \, 74 \, \Omega \pm 15\%$
Rotor impedance at short-circuit	$62 + j \, 66 \, \Omega \pm 15\%$
Stator impedance for no-load operation with min. coupling	$108 + j \, 206 \, \Omega \pm 15\%$
Stator impedance at short-circuit and maximum coupling	$97 + j \, 183 \, \Omega \pm 15\%$
Phase shift	8°
Zero voltage	$15 \, \text{mV} / ^\circ$
Phase error referred to zero position	$10'$

Resolver connection

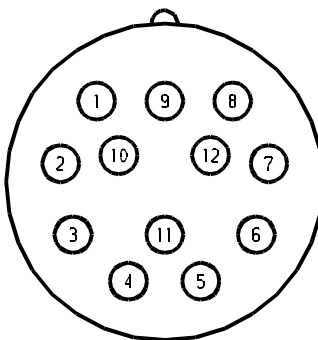
	Pin	Signal
	1	cos -
	2	
	3	
	4	
	5	sin -
	6	sin +
	7	
	8	cos +
	9	
	10	Ref +
	11	
	12	Ref -

View to contact side of female connector

SINCOS SRS/SRM 50 (Stegmann)

	SRS 50 / SRM 50
Number of sine, cosine periods per revolution	1024
Number of increments per revolution	32768
Number of absolute resolved revolutions	1 4096
Code type for the absolute value	Binary
Output frequency of sine, cosine signals (kHz)	0 ... 200
Error limits when evaluating 1024 signals, integral non-linearity (arc seconds)	+/- 45
Non-linearity within a sine, cosine period; differential non-linearity (arc seconds)	+/- 7
Working speed up to which the absolute position can be formed (1/min)	6000
Maximum operating speed (1/min)	12000
Output signals; 2 x 90° shifted sinusoidal signals (V_{pp})	1
Output signal	serial RS 485, asynchronous, halfduplex
Operating voltage range (V)	7 ... 12
Operating current without load (mA)	80

SRS/SRM 50 connection

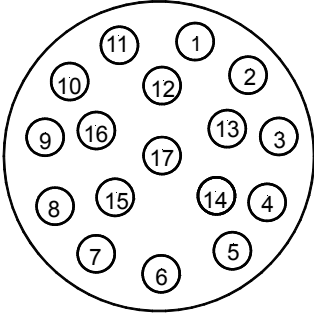
	Pin	Signal
	1	ref cos
	2	+ 485
	3	
	4	
	5	sin
	6	ref sin
	7	- 485
	8	cos
	9	Screening
	10	Gnd
	11	
	12	+ U

View to contact side of female connector

ECN 1313 EQN 1325 (Heidenhain)

	ECN 1313 / EQN 1325	
Number of sine, cosine periods per revolution	2048	
System accuracy in arc seconds	± 20	
Number of absolute resolved revolutions	1	4096 (12 bit)
Code type for the absolute value	EnDat	
Sampling limit frequency or limit frequency (kHz)	0 ... 200	
Position values / revolution	8192 (13 bit)	
Working speed up to which the absolute position can be formed (1/min)	12.000	
Maximum operating speed (1/min)	12000	
Voltage supply (V)	5 V $\pm$ 5%	
Current consumption without load (mA)	≤ 150	≤ 250

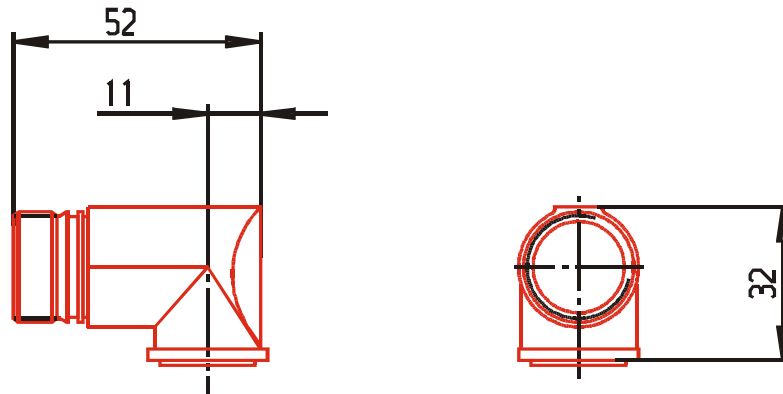
ECN 1313 EQN 1325 connection

	Pin	Signal
	1	U_p
	2	
	3	
	4	0V
	5	
	6	
	7	U_p
	8	Clock
	9	Clock inv.
	10	0V
	11	
	12	B+
	13	B-
	14	Data
	15	A+
	16	A-
	17	Data inv.

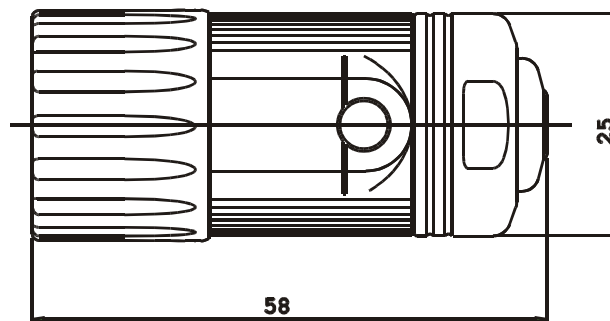
We recommend not to use optical encoders for motors with a vibration resistance of more than 3g.

Dimension drawing of encoder boxes and connectors

Female connector



Male connector



Commissioning and maintenance instructions

Please contact us for our commissioning and maintenance instructions for motor commissioning.

Headquarters

Baumüller Nürnberg GmbH
Ostendstraße 80-90, D-90482 Nürnberg
T: +49(0)911 5432-0, F: +49(0)911 5432-130
www.baumueller.com

Baumüller Anlagen-Systemtechnik GmbH & Co. KG
Ostendstraße 84, D-90482 Nürnberg
T: +49(0)911 54408-0, F: +49(0)911 54408-769
www.baumueller.com

Baumüller Reparaturwerk GmbH & Co. KG
Andernacher Straße 19, D-90411 Nürnberg
T: +49(0)911 9552-0, F: +49(0)911 9552-999
www.baumueller.com

Nürmont Installations GmbH & Co. KG
Am Keuper 14, D-90475 Nürnberg
T: +49(0)9128 9255-0, F: +49(0)9128 9255-333
www.nuermont.com

Subsidiaries

Australia
Baumüller Australia Pty. Ltd.
19 Baker Street, Botany NSW 2019, Sydney
T: +61 2 83350-100, F: +61 2 83350-169

Austria
Baumüller Austria Ges.mbH
Im Bäckerfeld 17, A-4060 Leonding
T: +43(0)732 674414-0, F: +43(0)732 674414-32

Brazil
NC Service Indústria e Comércio Ltda.
Av. Tamboré, 1217 Barueri-SP, BR-06460-000
T: +55(0)11 4195-0502, F: +55(0)11 4195-2479

China
Baumüller Automation Equipment Trading (Shanghai) Co. Ltd.
Cailun Rd. 88, Pudong Zhangjiang, 201203 Shanghai
T: +86(0)21 5855 1533, F: +86(0)21 5855 9487

China
Beijing Yanghai Automation Technology Co., Ltd.
Room 1008, No.7, Huaqing Business Building, Iluaqing Garden,
Wudaokou, Haidian District, 100083 Beijing
T: +86(0)10 8286 7980, F: +86(0)10 8286 7987

China
Sunary Automatic Technology Limited Company
3rd Floor No.476, Chunxiao Rd., Zhangjiang High-Tech Park
Pudong, Shanghai 201203
T: +86(0)21 5080 9898, F: +86(0)21 5308 7675

Czech Republic, Slovakia
VAE Prosys s.r.o.
Varsavska 9a, CZ-70900 Ostrava
T: +420-596 616 555, F: +420-596 616 777

Denmark
Robotek EL & Teknik A/S
Blokken 31, Postbox 30, DK-3460 Birkerød
T: +45 4484 7360, F: +45 4484 4177

England
Baumüller (UK) Ltd.
14 Redlands Centre, GB-Coulsdon, Surrey CR5 2HT
T: +44(0)208-763 2990, F: +44(0)208-763 2959

Finland
Kontram Oy
Olarinluoma 12, P.O.Box 88, FI-02201 Espoo
T: +358 9 8866 4500, F: +358 9 8866 4799

France
Baumüller France S.à.r.l.
Zone de la Malnoue 39, Avenue de l'Europe, F-77184
Emerainville
T: +33 1 6461-6622, F: +33 1 6461-6006

France
Baumüller France S.à.r.l. (Strasbourg)
9 rue de la Durance, F-67100 Strasbourg
T: +33(0)3 88 40 12 51, F: +33(0)3 88 40 07 24

Germany - Darmstadt
Baumüller Nürnberg GmbH
Waldstraße 1, D-64347 Griesheim
T: +49(0)6155 8430-00, F: +49(0)6155 8430-20

Germany - Düsseldorf
Baumüller Nürnberg GmbH
Jacob-Kaiser-Straße 7, D-47877 Willich-Münchheide
T: +49(0)2154 487-0, F: +49(0)2154 487-59

Germany - Dresden
Baumüller Nürnberg GmbH
Nordstraße 57, D-01917 Kamenz
T: +49(0)3578 3406-0, F: +49(0)3578 3406-50

Germany - Freiberg
Nürmont Installations GmbH & Co. KG
Am Junger Löwe Schacht 11, D-09599 Freiberg
T: +49(0)3731 3084-0, F: +49(0)3731 3084-33

Germany - Hannover
Baumüller Nürnberg GmbH
Bohlenweg 10, D-30853 Langenhagen
T: +49(0)511 771 968-0, F: +49(0)511 771 968-77

Germany - München
Baumüller München GmbH
Meglingerstraße 58, D-81477 München
T: +49(0)89 748 898-10, F: +49(0)89 748 898-75

Germany - Nürnberg
Baumüller Nürnberg GmbH
Ostendstraße 80-90, D-90482 Nürnberg
T: +49(0)911 5432-501, F: +49(0)911 5432-510

Germany - Stuttgart
Baumüller Nürnberg GmbH
Hahnweidstraße 21, D-73230 Kirchheim/Teck
T: +49(0)7021 48557-10, F: +49(0)7021 48557-77

Germany - Stuttgart
Nürmont Installations GmbH & Co. KG
Im Ghai 12, D-73776 Altbach
T: +49(0)7153 92798-0, F: +49(0)7153 92798-99

India
Baumüller KAT India Pvt. Ltd.
4th Floor, Commerce Avenue, Mahaganesh Colony, Paud Road,
IND-411038 Pune
T: +91 20 254596 82, F: +91 20 254596 84

Italy
Baumüller Italia s.r.l.,
Viale Italia 12, I-20094 Corsico (Mi),
T: +39 02 45100-181, F: +39 02 45100-426

Korea
Bomac Systems
712 Yucheon Factophia, 196 Anyang-7 dong, Mananku,
Anyangsi, Kyungkido 430-017
T: +82 31 467-2030, F: +82 31 467-2033

Netherlands
Baumüller Benelux B.V.
Platinastraat 141, NL-2718 SR Zoetermeer
T: +31(0)79 3614-290, F: +31(0)79 3614-339

Poland
Mekelburger Polska
Ul. Kóscielna 39 F/3, PL-60537 Poznań,
T: +48(0)61 8481 520, F: +48(0)61 8481 520

Russia, Kazakhstan
Permanent K&M
Wolokolamskoye Chaussee 73, Office 517, Moscow, 125424
T: +7(095)9563867, F: +7(095)7803429

Slovenia
Baumüller Dravinja d.o.o.
Delavska cesta 10, SI-3210 Slovenske-Konjice
T: +386 3 75723-00, F: +386 3 75723-32/33

Spain
Baumüller Ibérica S.A.
C/Ausias Marc 13 1º 2a, E-08010 Barcelona
T: +34(0)93 342 69 26, F: +34(0)93 270 13 21

Sweden
Robotek El & Teknik
Skårs Led 3, 40313 Göteborg
T: +46(0)31 703 71 90, F: +46(0)31 703 71 01

Switzerland
Baumüller Suisse S.A.
Rue des Usines 22, CH-2000 Neuchâtel
T: +41(0)71 929 46-66, F: +41(0)71 929 46-67

Switzerland
Baumüller Schweiz AG (Büro Ost)
Glärnischstrasse 46, CH-9500 Wil
T: +41(0)71 929 46-66, F: +41(0)71 929 46-67

Turkey
Baumüller Motor Kontrol Sistem SAN. VE TIC. LTD. STI
Colak Ismail Sok. No: 31/1, TR-81070 Istanbul-Suadiye
T: +90(0)216 372-2485, F: +90(0)216 372-7570

USA
Baumueller Inc.
117 West Dudley Town Road, USA-Bloomfield, CT 06002
T: +1 860-243-0232, F: +1 860-286-3080

USA
Baumueller-Nuermont Corp.
1512 East Algonquin Road, USA-Arlington Heights, IL 60005
T: +1 847-956-7392, F: +1 847-956-7925

USA
Baumueller-Nuermont Corp.
2650 Pleasantdale Road, Suite 15, USA-Doraville, GA 30340
T: +1 678-291-0535, F: +1 678-291-0537

Venezuela, Colombia, Ecuador
Nimbus International C.A.
C.C. Parque Tuy, Local P-18, YV-Ocumare del Tuy, 1209
T: +58 239 25 1347, F: +58 23

be in motion

Responsible for content: Baumüller Nürnberg GmbH Ostendstraße 80-90 90482 Nürnberg T: +49(0)911 54 32-0 F: +49(0)911 54 32-130 www.baumueller.com
Baumüller Anlagen-Systemtechnik GmbH & Co. KG Ostendstraße 84 90482 Nürnberg T: +49(0)911 544 08-0 F: +49(0)911 544 08-769
Baumüller Reparaturwerk GmbH & Co. KG Andernacher Str. 19 90411 Nürnberg T: +49(0)911 95 52-0 F: +49(0)911 95 52-999

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