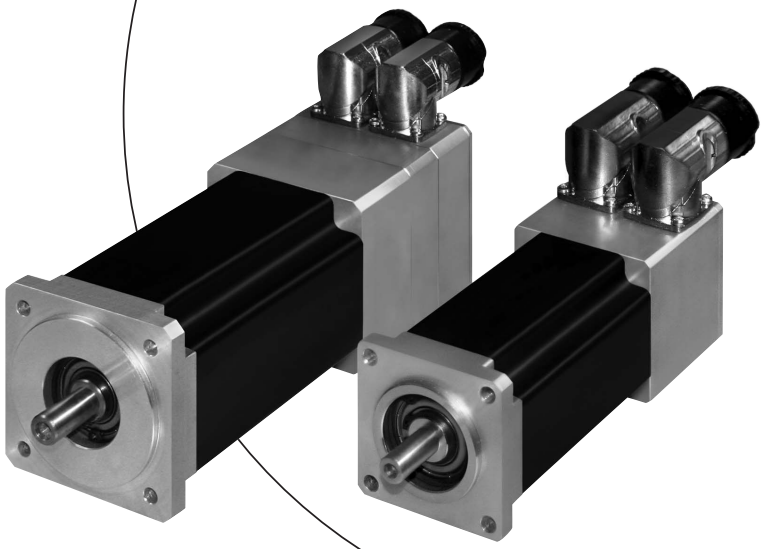
BAUMÜLLER



be in motion be in motion

Three-phase synchronous motors

DSD 28-36

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For this reason, we cannot accept any liability for the accuracy of the information!

1. Three-phase synchronous motors DSD 28 - 36

The motors of the DSD servo series are self-cooled three-phase synchronous motors. A low rotor inertia and a power that is optimized in accordance with that inertia provide the 8-pole motors with excellent acceleration capability. This motor series covers a speed range of up to 6,000 rpm.
The motors are highly dynamic and their speed and position can be accurately controlled, making them ideally suited for applications in machine tools, production machines (e.g., printing, packaging, textiles), handling equipment, and those in the field of medical engineering.

1.1. General technical data

Version:	IM B5	Horizontal mounting, acc. to EN 60034-7
	IM V1	Vertical mounting, shaft end to the bottom, acc. to EN 60034-7
	IM V3	Vertical mounting, shaft end to the top, acc. to EN 60034-7
		(Note: Must be protected against the ingress of water and dust)
Type of protection:	IP44	Standard: surface-cooled, without fan
	IP65	Optional: surface-cooled, without fan, with shaft sealing ring
Shaft gland:	IP44	With optional shaft sealing ring, IP65
Connection:		
Main connection:	U V W	8-pin connector
Brake:		In the main connection
Thermal sensor:		In the control connection (for resolver)
		In the main connection (for sincos encoder)
Encoder connection:		12-pin
Cooling method:	IC 410	Completely enclosed machine, surface-cooled, no fan
Thermal sensor:	KTY84-130	Linear thermal sensor for evaluation in the controller
Temperature rise:	$\Delta\vartheta$ = 105 K	Insulation class F acc. to EN 60034
Temperature range:	0 to +40°C	
Storage:	-30°C to +60°C	
	+60°C to +85°C	Permissible, although there is a risk of gaskets ageing
Paint:	Black matt	RAL 9005
Bearing service life:	L_{h10} 20,000 h	Approximate value, rolling-contact bearings with long-term grease lubrication
Balance quality:	A	Acc. to DIN EN 60034-14 (VDE 0530 Part 14): 2004-09
	B	On request
True run:	N	Standard: Normal acc. to DIN 42955
	R	Optional: Reduced acc. to DIN 42955
Vibration-resistant up to:	Radial 3 g	10 Hz to 100 Hz acc. to EN 60068-2-6
	Axial 1 g	10 Hz to 100 Hz acc. to EN 60068-2-6, with brake 0.5 g
		Higher vibration resistance on request
Flange:	Acc. to IEC standard	Dimension b1: tolerance j6
Shaft end:	Cylindrical	Smooth acc. to DIN 748 (also available with key DIN 6885)
		Dimension d: tolerance h6 (tolerance k6 also possible)
		Centering with internal thread acc. to DIN 332 form D
Holding brake:	Option	
Actual speed encoder:	2-pin resolver	
	Sincos encoder (option)	Other encoders on request

1.2. Definition of ratings

The ratings (torques) listed in the table apply to continuous operation (S1) with nominal speed at a maximum ambient temperature of 40°C and with the machine being installed below 1000 m a.m.s.l.
If motors are to be operated at an ambient temperature of over 40°C or at altitudes above 1000 m a.m.s.l., the required list power P_L (list torque M_n) results from the product of the factors k_1, k_2 specified in the table below and the required power P (torque M).

Ambient temperature	40°C	45°C	50°C	55°C	60°C
Correction factor k_1	1	1.06	1.13	1.22	1.34
Altitude a.m.s.l. up to	1,000 m	2,000 m	3,000 m	4,000 m	5,000 m
Correction factor k_2	1	1.07	1.16	1.27	1.55

For ambient temperatures above 40°C and if motors are to be installed in an enclosed manner, it is imperative that you contact the manufacturer, as changes to the design may be necessary.

If, with increasing site altitude above 1000 m, the ambient temperature decreases by approx. 10°C per 1000 m increase, no power correction is necessary (note the minimum operating temperature).

1.3. Winding insulation and temperature rise

All machines in this series are designed for insulation class F according to EN 60034 for a permissible winding temperature rise of 105 K at a room temperature of up to 40°C. The insulation is resistant to gases and vapors of combustible materials and it meets the requirements expected of moisture-proof and tropical insulation.

1.4. Explanation of the motor data

$M_{0,}\ I_0$	Nominal torque (Nm) with nominal current (A) at speed ≥ 1 rpm without time limit, I_0 is the r.m.s. value
$M_{0,\ max,}\ I_{0,\ max}$	Maximum torque (Nm) with maximum current (A) at speed = 0, $I_{0\ max}$ is the r.m.s. value
P_n	Nominal power (kW) at nominal speed n_n in continuous operation (S1) T_A = 40°C, installation up to 1000 m a.m.s.l.
$M_{n,}\ I_n$	Nominal torque (Nm) with nominal current (A) at nominal speed n_r in continuous operation (S1); T_A = 40°C*
n_n	Nominal speed (rpm)
k_{Tn}	Torque constant: M_n/I_n
f_n	Nominal frequency (Hz)
J	Rotor inertia incl. resolver without holding brake (kgcm²)
m	Weight in kg

The specified ratings and torques at nominal speed are achieved in converter operation with a clock frequency of 8 kHz in the power unit.

1.5. Type key

DSD	036	L	44	U	60	54	0244/0900	K	P	B04	S15	X			
													Other:	Plain text	Gearbox, for example
													Encoder:	S15	Resolver
														CKS36	Encoder, single-turn 36
														SKS36	Sincos, single-turn 36
														SKM36	Sincos, multi-turn 36
														SRS50	Sincos, single-turn 50
														SRM50	Sincos, multi-turn 50
													Brake:	B02	With 2 Nm brake
														B04	With 4.5 Nm brake
													Connection:	C	Cable
														P	Male connector
														T	Terminal box
													Shaft:	K	Key
													Winding:		See tables
													DC link voltage:	54	540 V
														31	310 V
														05	048 V special
													Nominal speed:	40	4,000 rpm
														45	4,500 rpm
														60	6,000 rpm
													Cooling:	U	Without fan
													Housing type of protection:	44	IP44
														65	IP65
													Length:	S	
														M	
														L	
													Size:	028	
														036	
													Motor type:	DSD	Three-phase Synchronous Dynamic

2. Technical data

2.1. DSD028

Line voltage 1 AC 230 V for converters with unregulated supply 8 kHz switched-mode and sinusoidal commutation

Nominal speed	Motor type	Stand-still torque[1]		Stand-still current[1]	Max. stand-still torque		Max. stand-still current	Nom. power[1]		Nom. torque[1]		Nom. current[1]
n_N min^{-1}		M_O Nm	M_O lbf ft	I_O A	$M_{O,max}$ Nm	$M_{O,max}$ lbf ft	$I_{O,max}$ A	P_N kW	P_N hp	M_N Nm	M_N lbf ft	I_N A
4500	DSD028 S…U4531 580/0450	0.7	0.52	1.55	2	1	6.1	0.28	0.4	0.6	0.4	1.4
	DSD028 M…U4531 296/0630	1.2	0.89	2.6	3.9	3	11.9	0.47	0.6	1	0.7	2.3
6000	DSD028 S…U6031 468/0500	0.7	0.52	1.9	2	1	7.5	0.35	0.5	0.55	0.4	1.65
	DSD028 M…U6031 256/0670	1.2	0.89	3	3.9	3	13.7	0.57	0.8	0.9	0.7	2.4

Nominal speed	Motor type	Torque con-stant		Nom. fre-quen-cy	Rotor inertia (motor)		W e-igh t	
n_N min^{-1}		k_{TN} Nm/A	k_{TN} lbf ft / A	f_N Hz	J Kgcm^2	J lb in²	m kg	m lb
4500	DSD028 S…U4531 580/0450	0.43	0.32	300	0.13	0.04	1.3	2.9
	DSD028 M…U4531 296/0630	0.43	0.32	300	0.2	0.07	1.8	4.0
6000	DSD028 S…U6031 468/0500	0.34	0.25	400	0.13	0.04	1.3	2.9
	DSD028 M…U6031 256/0670	0.38	0.28	400	0.2	0.07	1.8	4.0

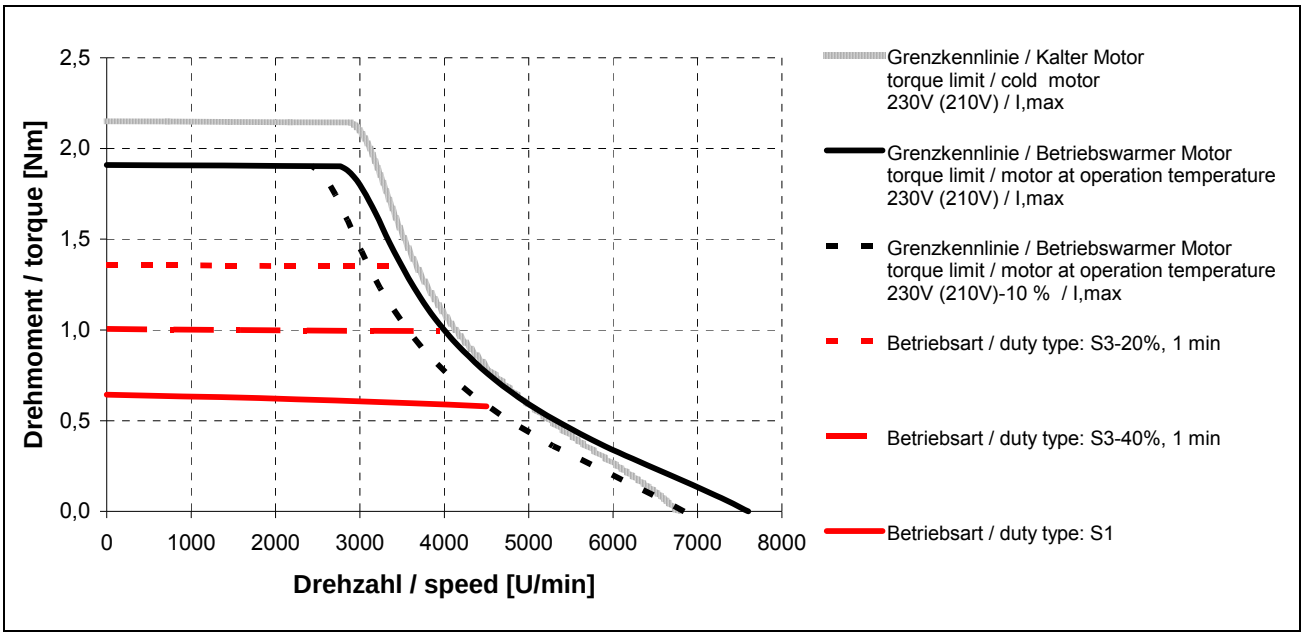
Line voltage 3 AC 400 V for converters with unregulated supply 8 kHz switched-mode and sinusoidal commutation

Nominal speed	Motor type	Stand-still torque[1]		Stand-still current[1]	Max. stand-still torque		Max. stand-still current	Nom. power[1]		Nom. torque[1]		Nom. current[1]
n_N min^{-1}		M_O Nm	M_O lbf ft	I_O A	$M_{O,max}$ Nm	$M_{O,max}$ lbf ft	$I_{O,max}$ A	P_N kW	P_N hp	M_N Nm	M_N lbf ft	I_N A
6000	DSD028 S…U6054 880/0355	0.7	0.52	1	2	1	4	0.35	0.5	0.55	0.4	0.85
	DSD028 M…U6054 452/0500	1.2	0.89	1.7	3.9	3	7.8	0.57	0.8	0.9	0.7	1.35

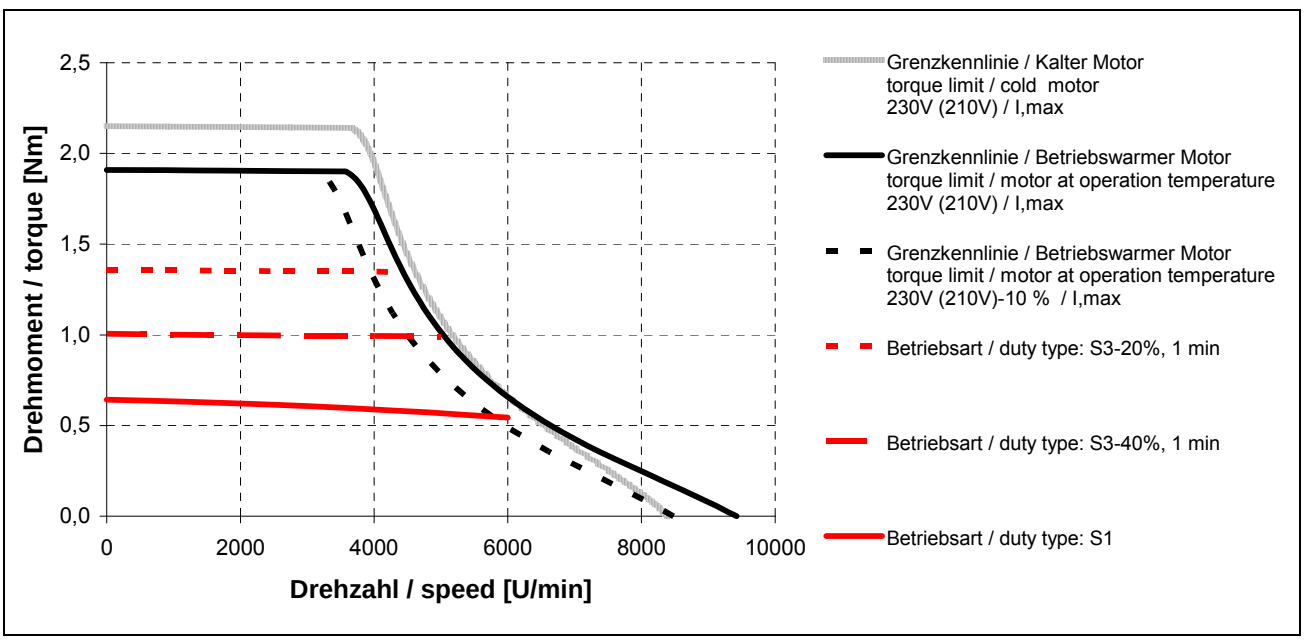
Nominal speed	Motor type	Torque con-stant		Nom. fre-quen-cy	Rotor inertia (motor)		We-ight	
n_N min^{-1}		k_{TN} Nm/A	k_{TN} lbf ft / A	f_N Hz	J Kgcm^2	J lb in^2	m kg	m lb
6000	DSD028 S…U6054 880/0355	0.65	0.48	400	0.13	0.04	1.3	2.9
	DSD028 M…U6054 452/0500	0.67	0.49	400	0.2	0.07	1.8	4.0

[1] Winding temperature $\Delta T < 105$ K; direct flange connection (mounting plate 250 mm x 250 mm)

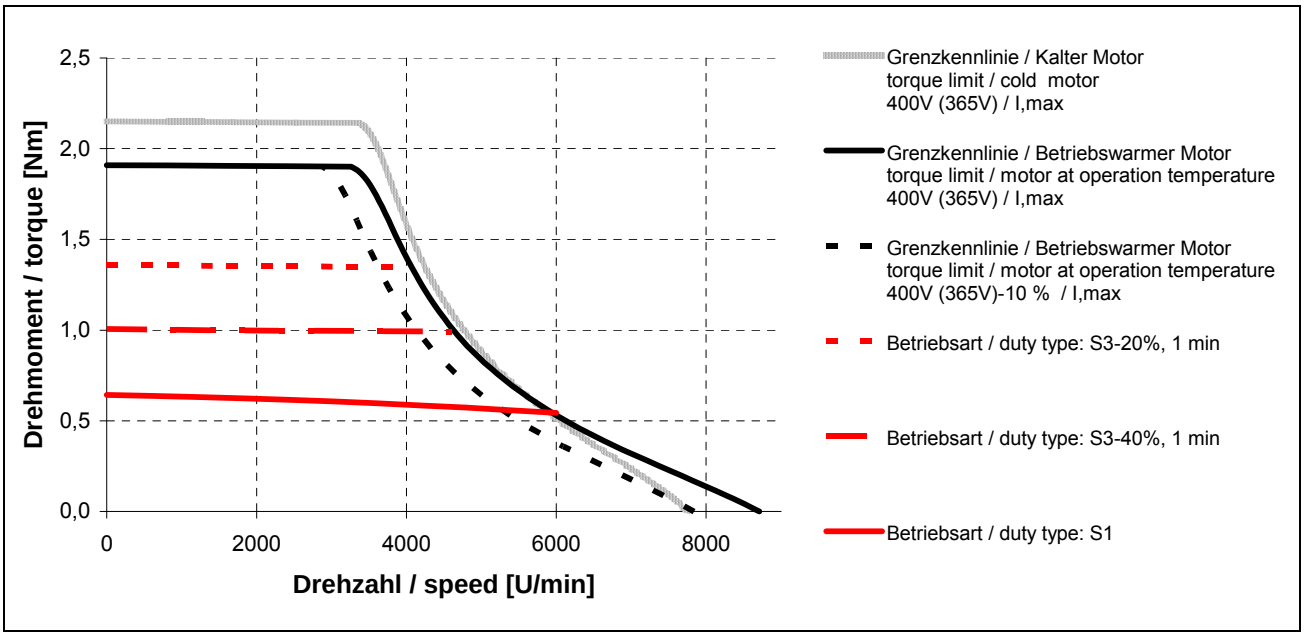
DSD028 S
580/0450
DC link voltage U_{DC} = 310 V



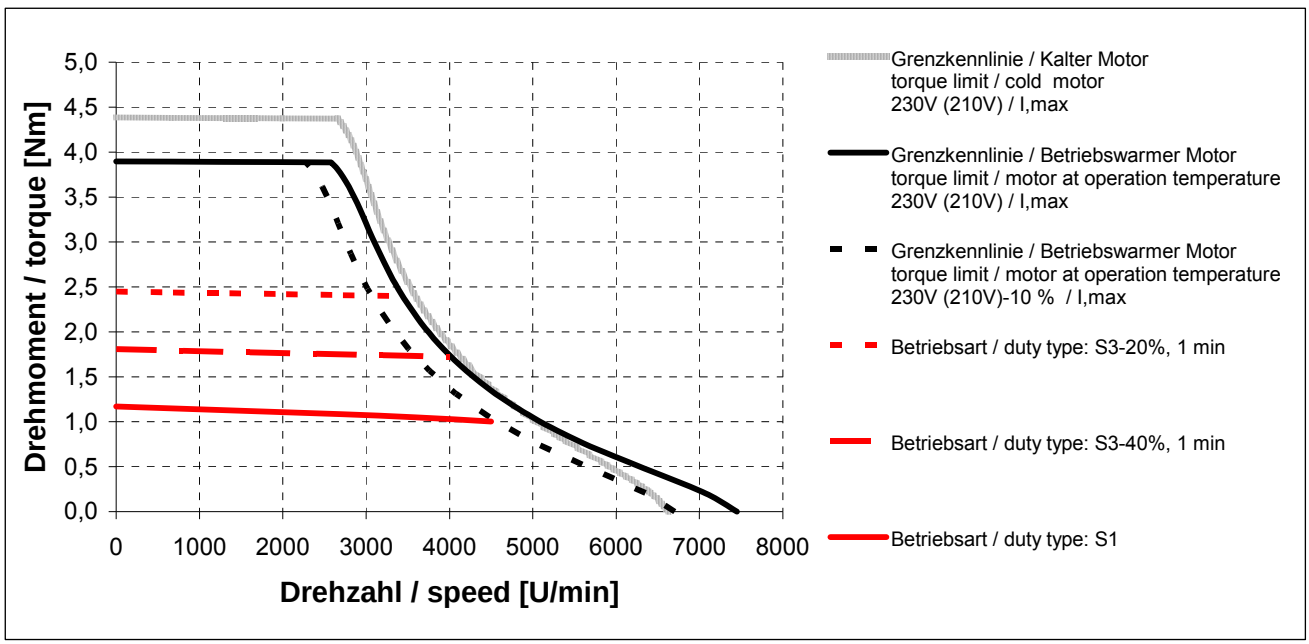
DSD028 S
468/0500
DC link voltage U_{DC} = 310 V



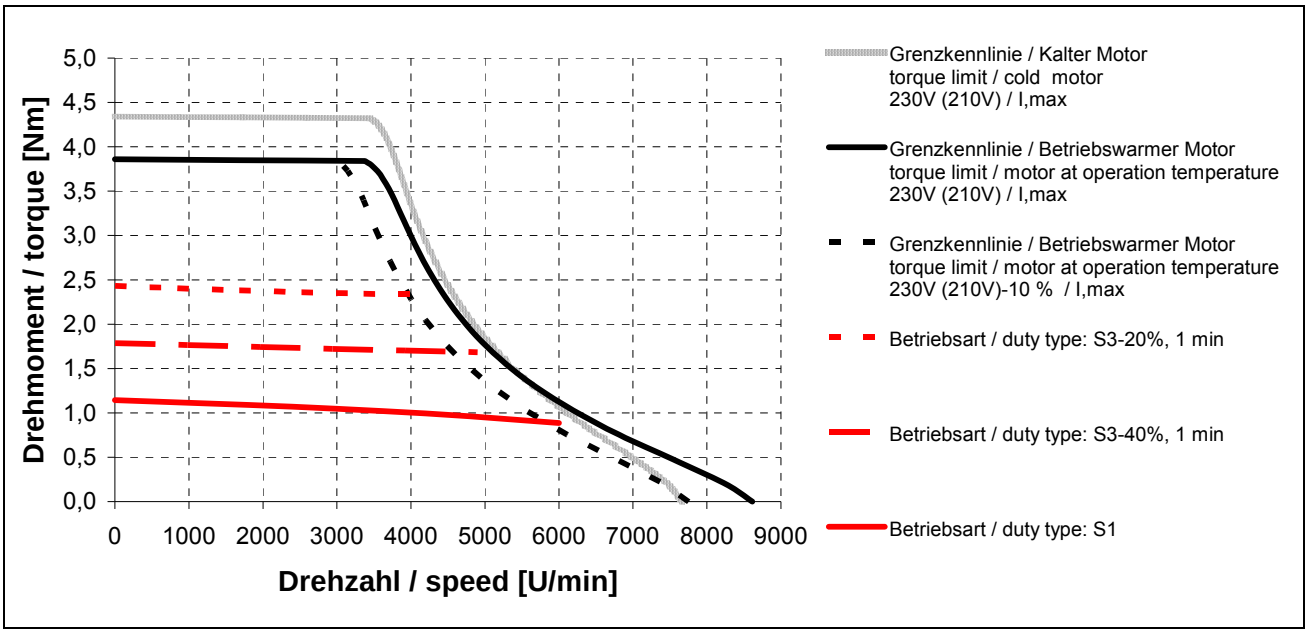
DSD028 S
880/0355
DC link voltage U_{DC} = 540 V



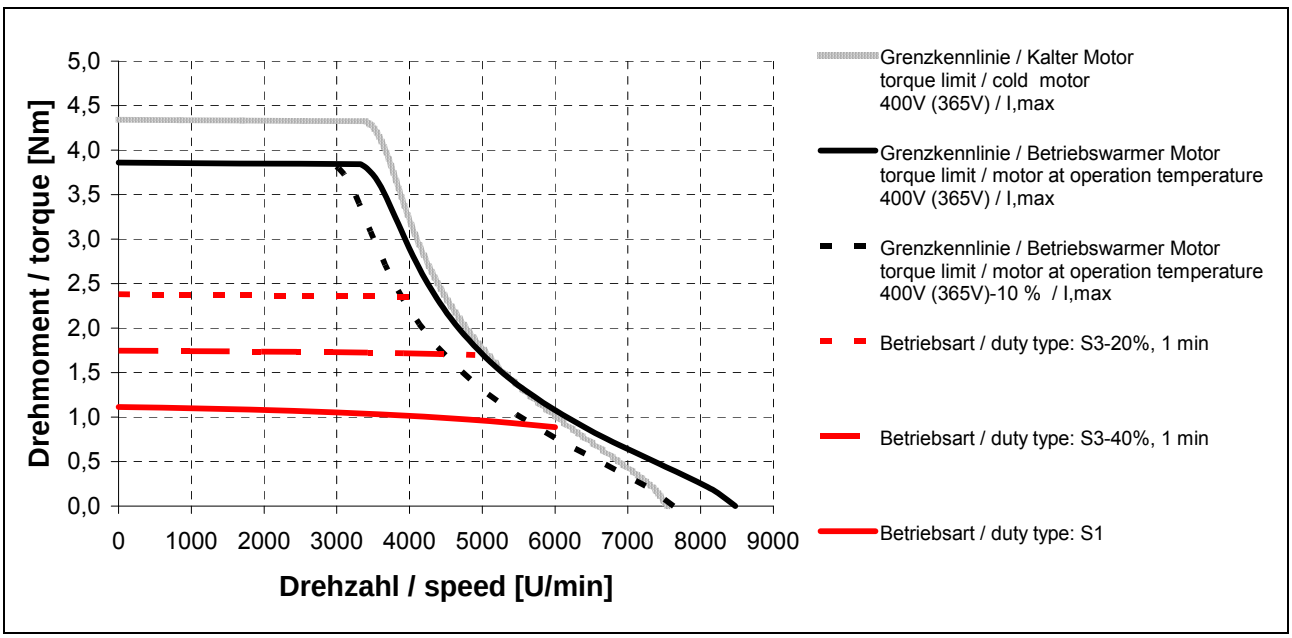
DSD028 M
296/0630
DC link voltage U_{DC} = 310 V



DSD028 M
256/0670
DC link voltage U_{DC} = 310 V



DSD028 M
452/0500
DC link voltage U_{DC} = 540 V



2.2. DSD036

Line voltage 1 AC 230 V for converters with unregulated supply 8 kHz switched-mode and sinusoidal commutation

Nominal speed	Motor type	Stand-still torque[1]		Stand-still current[1]	Max. stand-still torque		Max. stand-still current	Nom. power[1]		Nom. torque[1]		Nom. current[1]
n_N min^{-1}		M_O Nm	M_O lbf ft	I_O A	$M_{O,max}$ Nm	$M_{O,max}$ lbf ft	$I_{O,max}$ A	P_N kW	P_N hp	M_N Nm	M_N lbf ft	I_N A
4000	DSD036 S...U4031 524/0630	1.2	0.89	2.4	2.8	2	7.9	0.44	0.6	1.05	0.8	2.2
	DSD036 M…U4031 288/0800	2	1.48	3.6	5.7	4	15.1	0.67	0.9	1.6	1.2	2.9
4500	DSD036 L…U4531 188/1000	2.8	2.07	5	8.4	6	22	0.85	1.1	1.8	1.3	3.45
6000	DSD036 S…U6031 356/0750	1.2	0.89	3.55	2.8	2	12	0.57	0.8	0.9	0.7	2.7
	DSD036 M…U6031 208/0950	2	1.48	5	5.7	4	21	0.82	1.1	1.3	1.0	3.35
	DSD036 L...U6031 152/1120	2.8	2.07	6.15	8.4	6	27.2	0.9	1.2	1.45	1.1	3.45

Nominal speed	Motor type	Torque con-stant		Nom. fre-quen-cy	Rotor inertia (motor)		We-igh t	
n_N min^{-1}		k_{TN} Nm/A	k_{TN} lbf ft / A	f_N Hz	J Kgcm^2	J lb in²	m kg	m lb
4000	DSD036 S...U4031 524/0630	0.48	0.35	267	0.18	0.06	2.1	4.6
	DSD036 M…U4031 288/0800	0.55	0.41	267	0.3	0.10	2.9	6.4
4500	DSD036 L…U4531 188/1000	0.53	0.39	300	0.42	0.14	3.7	8.2
6000	DSD036 S…U6031 356/0750	0.33	0.24	400	0.18	0.06	2.1	4.6
	DSD036 M…U6031 208/0950	0.39	0.29	400	0.3	0.10	2.9	6.4
	DSD036 L...U6031 152/1120	0.42	0.31	400	0.42	0.14	3.7	8.2

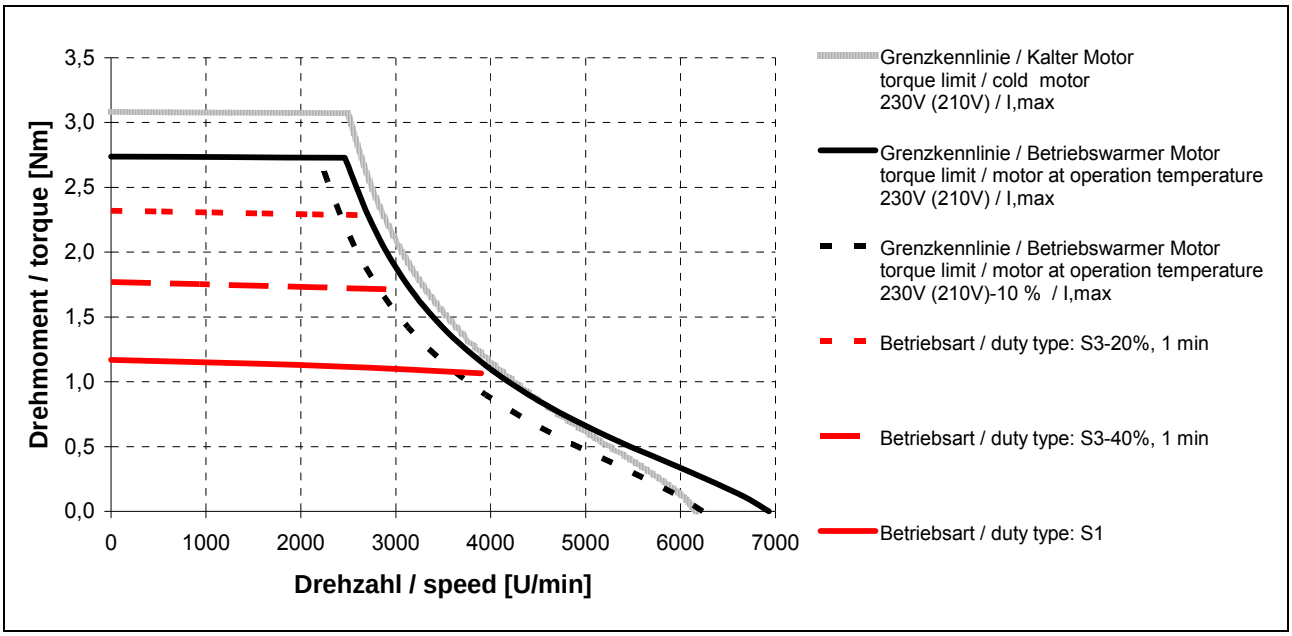
Line voltage 3 AC 400 V for converters with unregulated supply 8 kHz switched-mode and sinusoidal commutation

Nominal speed	Motor type	Stand-still torque[1]		Stand-still current[1]	Max. stand-still torque		Max. stand-still current	Nom. power[1]		Nom. torque[1]		Nom. current[1]
n_N min^{-1}		M_O Nm	M_O lbf ft	I_O A	$M_{O,max}$ Nm	$M_{O,max}$ lbf ft	$I_{O,max}$ A	P_N kW	P_N hp	M_N Nm	M_N lbf ft	I_N A
4000	DSD036 S…U4054 872/0475	1.2	0.89	1.45	2.8	2	4.7	0.44	0.6	1.05	0.8	1.35
4500	DSD036 M…U4554 408/0710	2	1.48	2.55	5.7	4	10.7	0.71	1.0	1.5	1.1	1.95
	DSD036 L…U4554 276/0850	2.8	2.07	3.45	8.4	6	15.3	0.85	1.1	1.8	1.3	2.3
6000	DSD036 S…U6054 620/0560	1.2	0.89	2.05	2.8	2	7	0.57	0.8	0.9	0.7	1.5
	DSD036 M...U6054 352/0750	2	1.48	2.95	5.7	4	12	0.82	1.1	1.3	1.0	2
	DSD036 L...U6054 244/0900	2.8	2.07	3.85	8.4	6	17	0.9	1.2	1.45	1.1	2.15

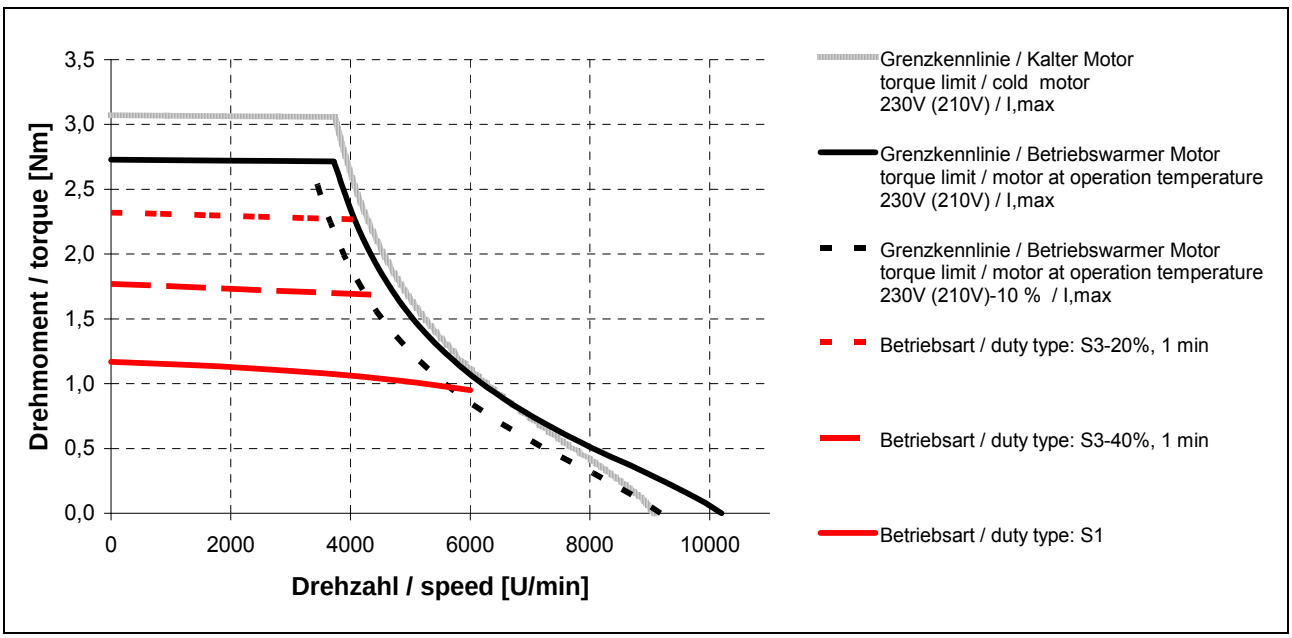
Nominal speed	Motor type	Torque con-stant		Nom. fre-quen-cy	Rotor inertia (motor)		We-igh t	
n_N min^{-1}		k_{TN} Nm/A	k_{TN} lbf ft / A	f_N Hz	J Kgcm^2	J lb in^2	m kg	m lb
4000	DSD036 S…U4054 872/0475	0.78	0.58	267	0.18	0.06	2.1	4.6
4500	DSD036 M…U4554 408/0710	0.77	0.57	300	0.3	0.10	2.9	6.4
	DSD036 L…U4554 276/0850	0.78	0.58	300	0.42	0.14	3.7	8.2
6000	DSD036 S…U6054 620/0560	0.6	0.44	400	0.18	0.06	2.1	4.6
	DSD036 M...U6054 352/0750	0.65	0.48	400	0.3	0.10	2.9	6.4
	DSD036 L...U6054 244/0900	0.67	0.49	400	0.42	0.14	3.7	8.2

[1] Winding temperature $\Delta T < 105$ K; direct flange connection (mounting plate 250 mm x 250 mm)

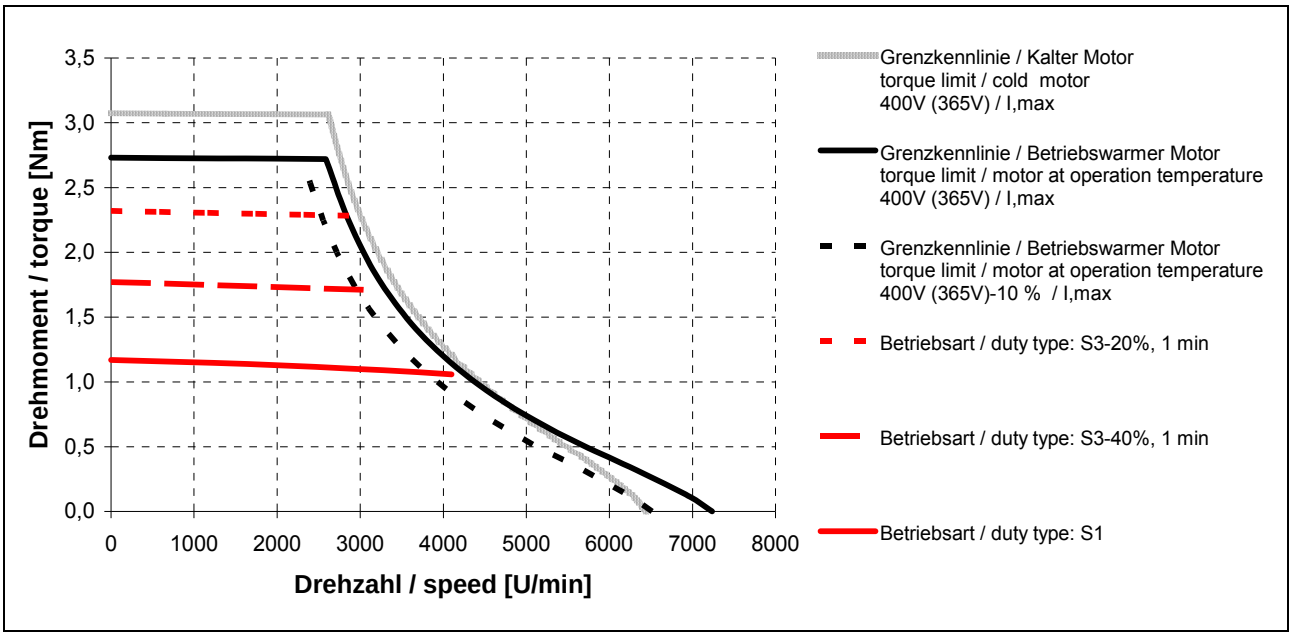
DSD036 S
524/0630
DC link voltage U_{DC} = 310 V



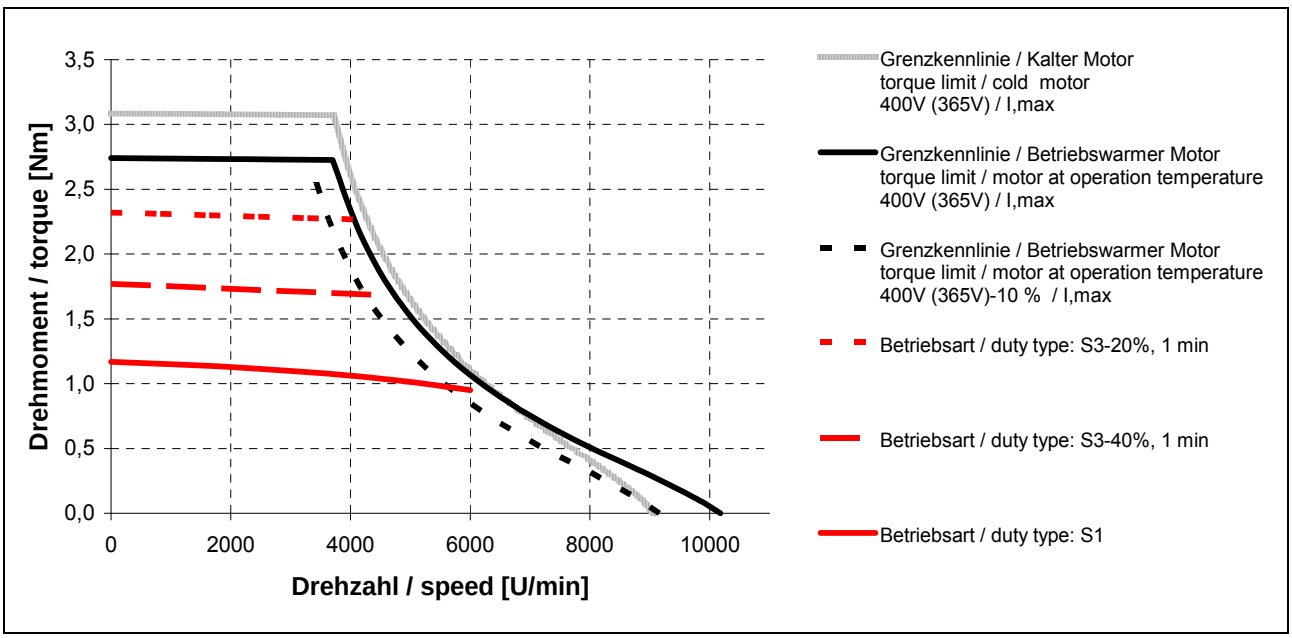
DSD036 S
356/0750
DC link voltage U_{DC} = 310 V



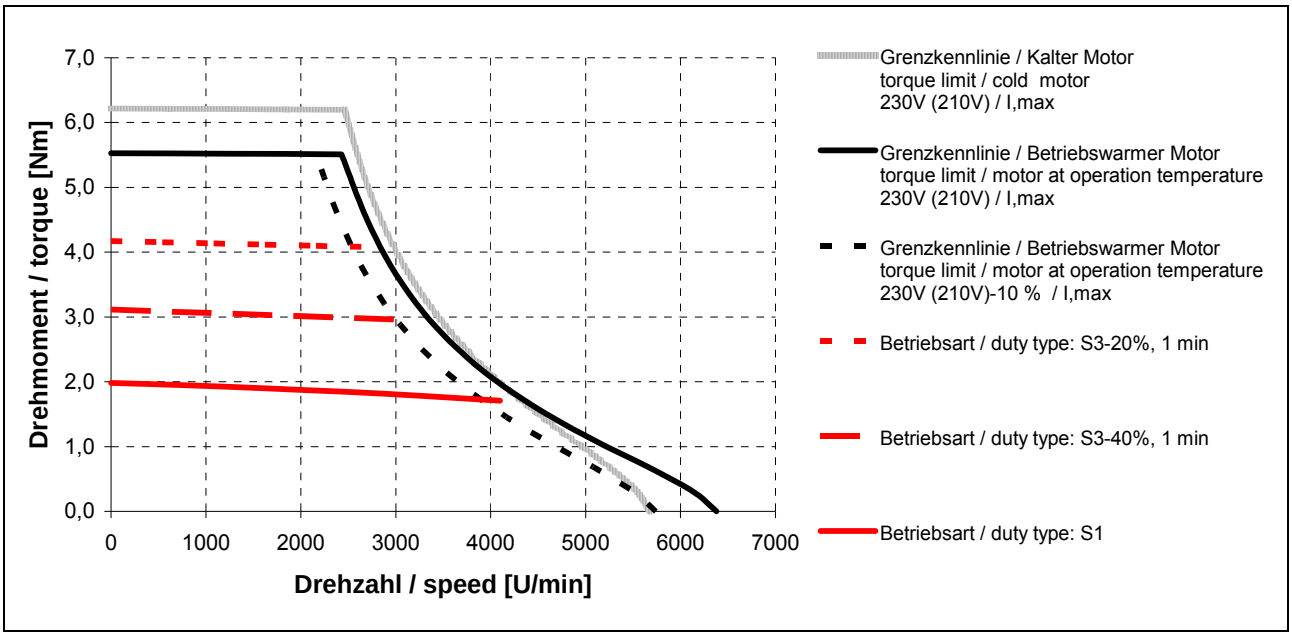
DSD036 S
872/0475
DC link voltage U_{DC} = 540 V



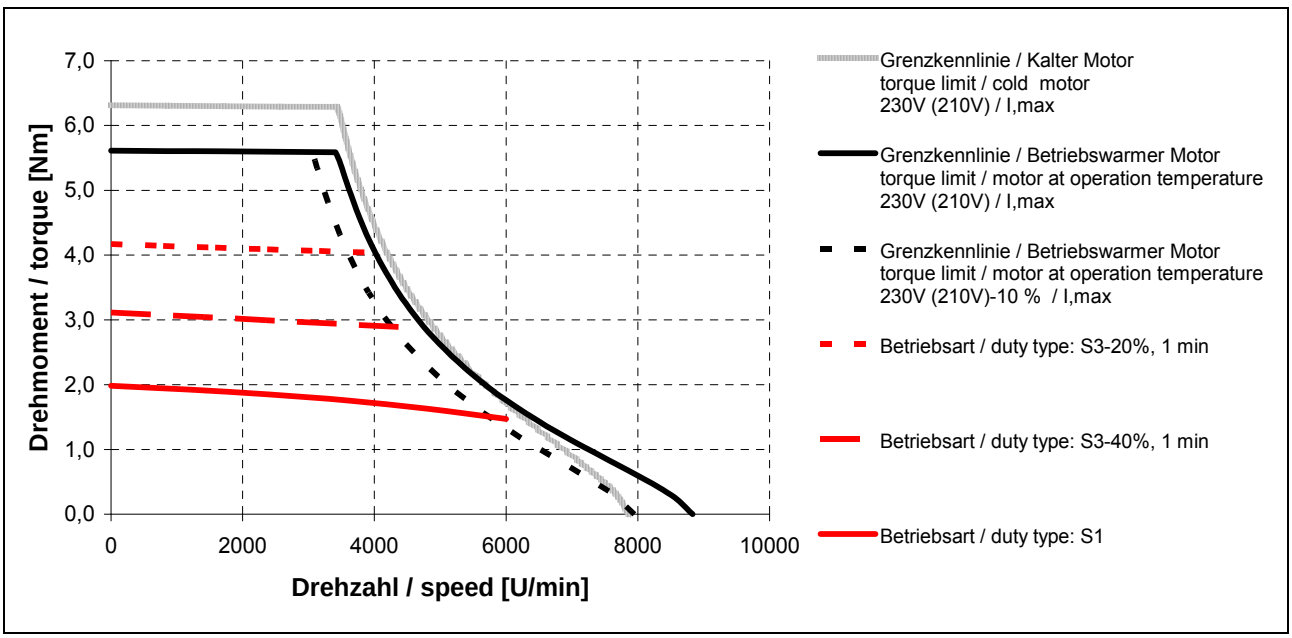
DSD036 S
620/0560
DC link voltage U_{DC} = 540 V



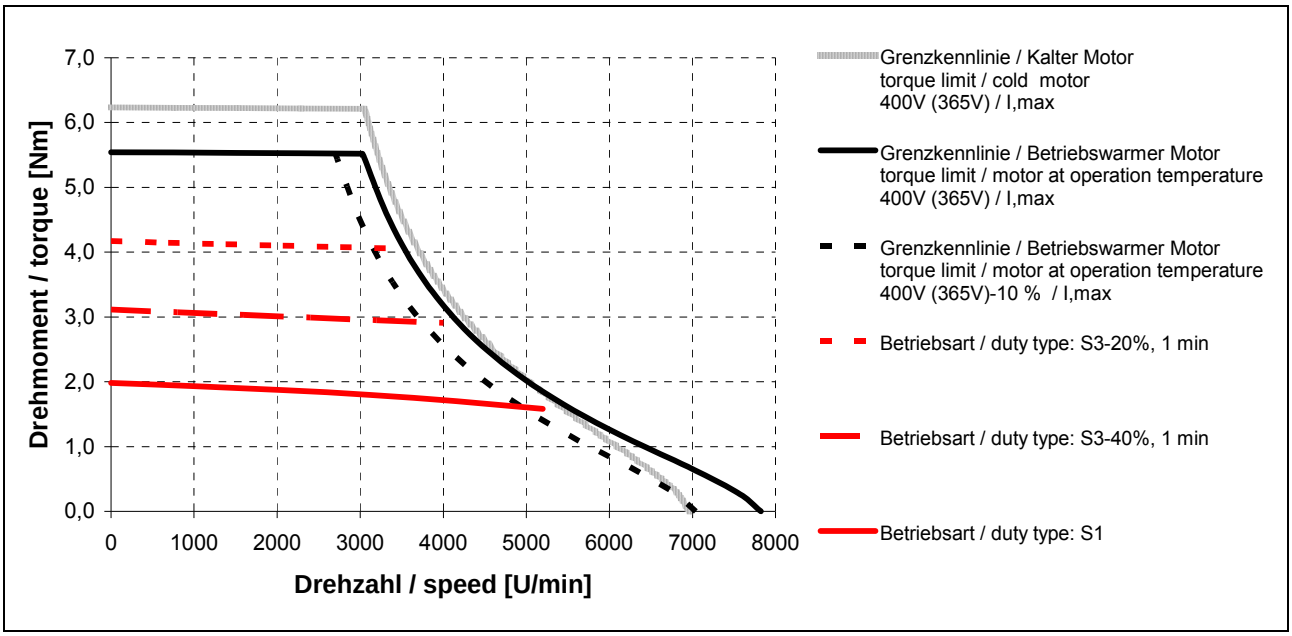
DSD036 M
288/0800
DC link voltage U_{DC} = 310 V



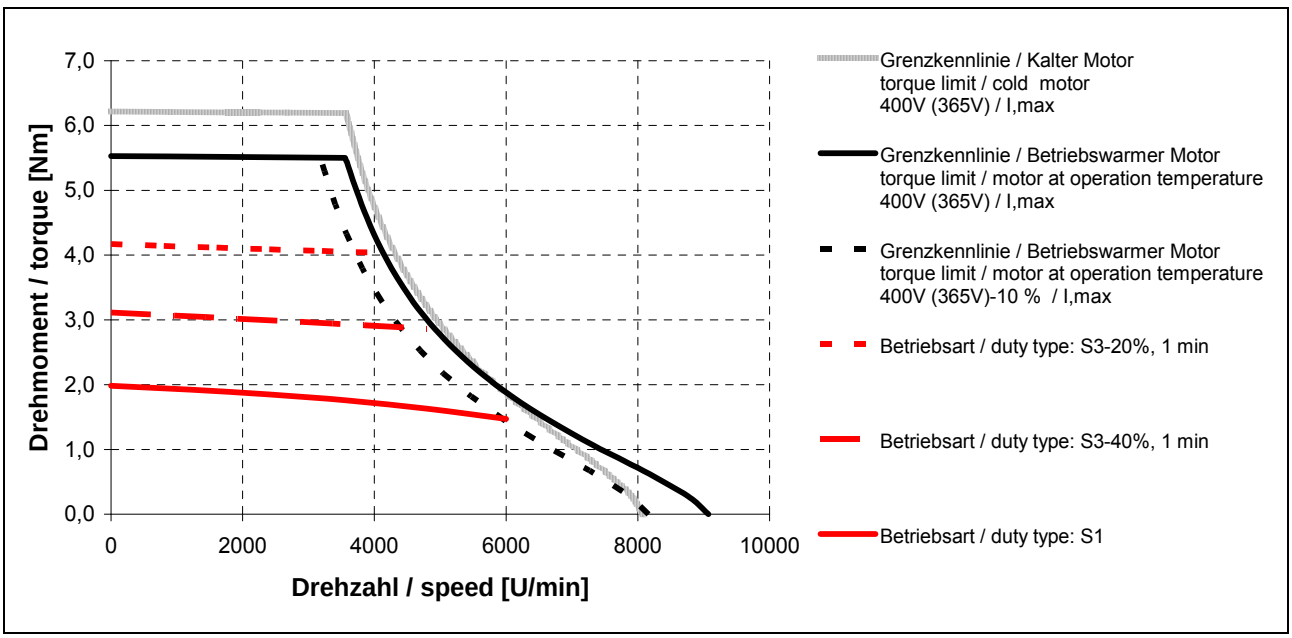
DSD036 M
208/0950
DC link voltage U_{DC} = 310 V



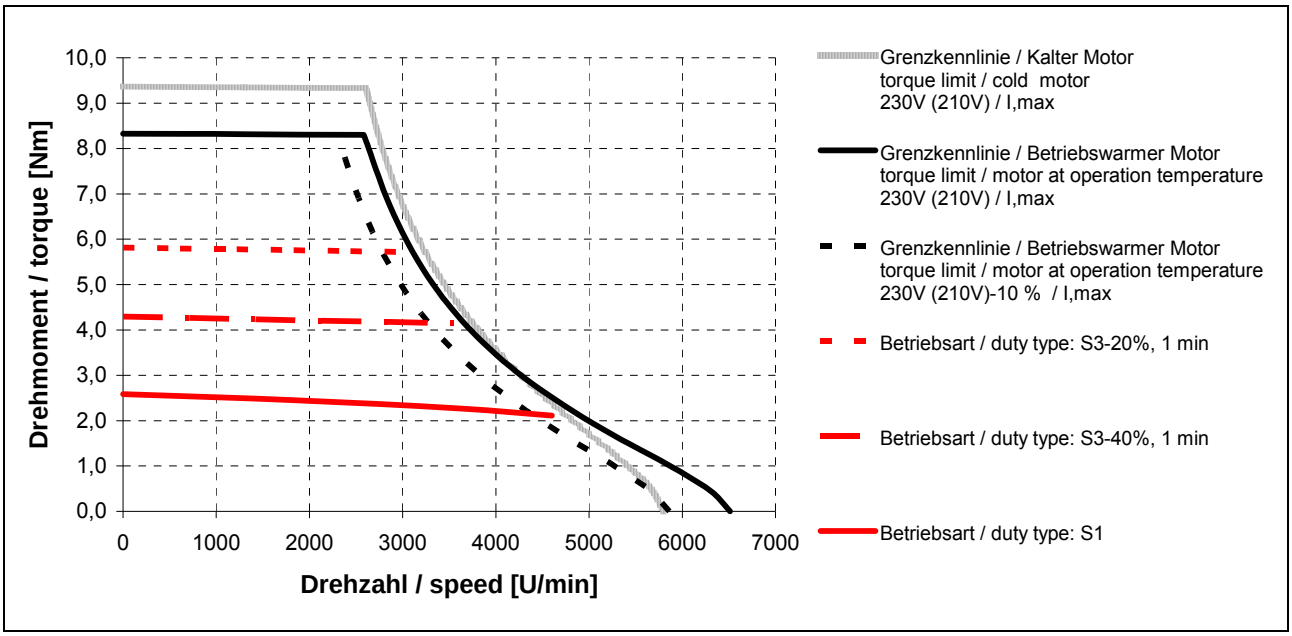
DSD036 M
408/0710
DC link voltage U_{DC} = 540 V



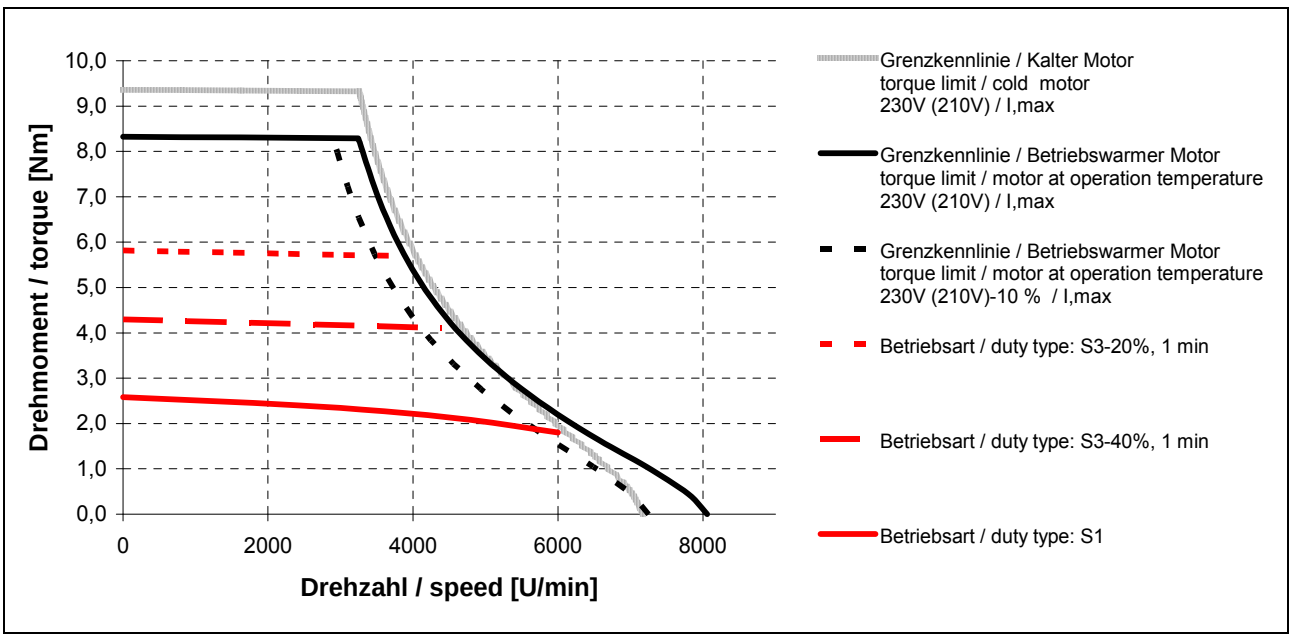
DSD036 M
352/0750
DC link voltage U_{DC} = 540 V



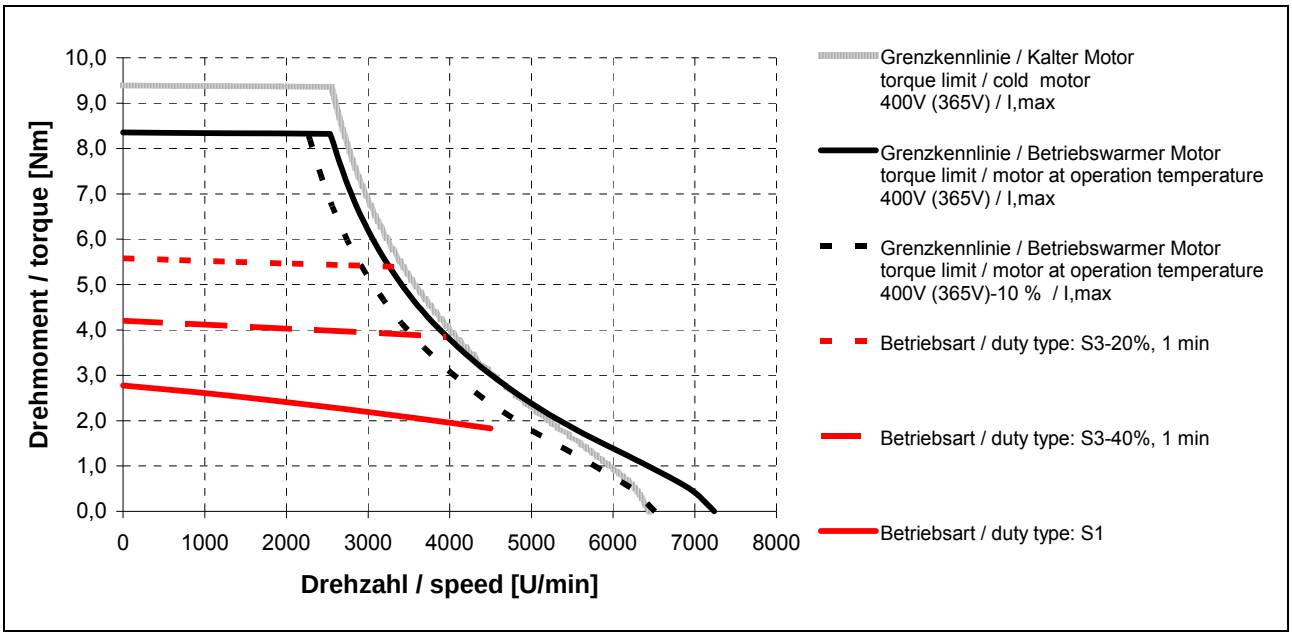
DSD036 L
188/1000
DC link voltage U_{DC} = 310 V



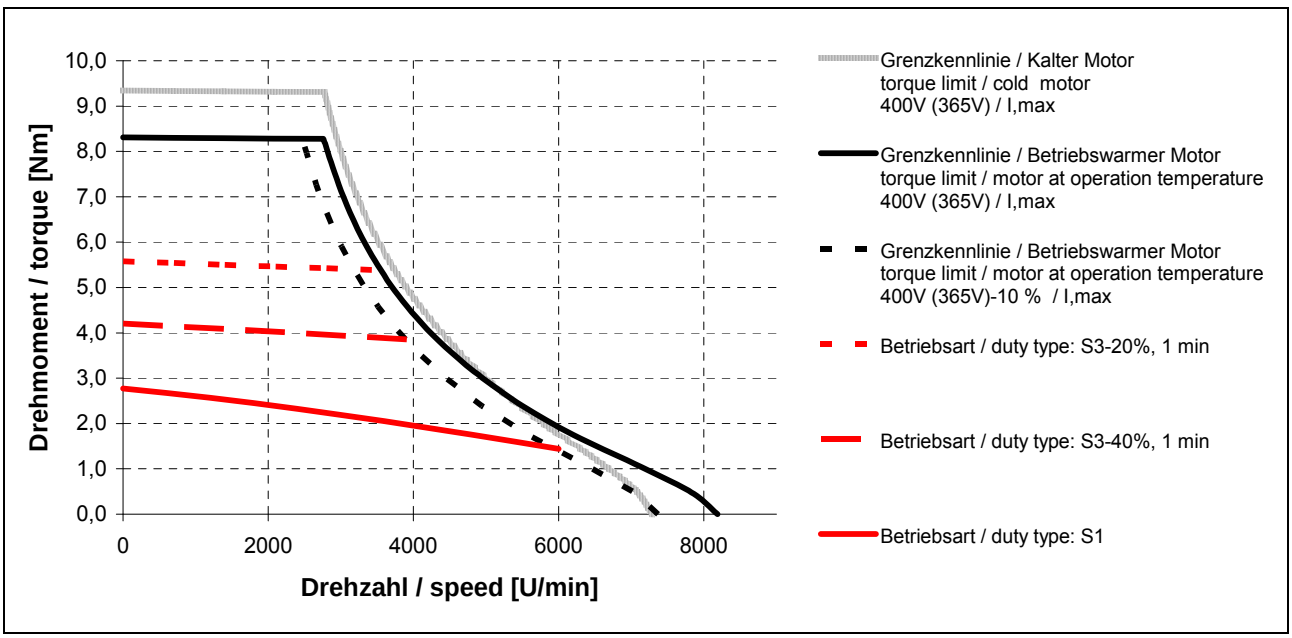
DSD036 L
152/1120
DC link voltage U_{DC} = 310 V



DSD036 L
276/0850
DC link voltage U_{DC} = 540 V



DSD036 L
244/0900
DC link voltage U_{DC} = 540 V



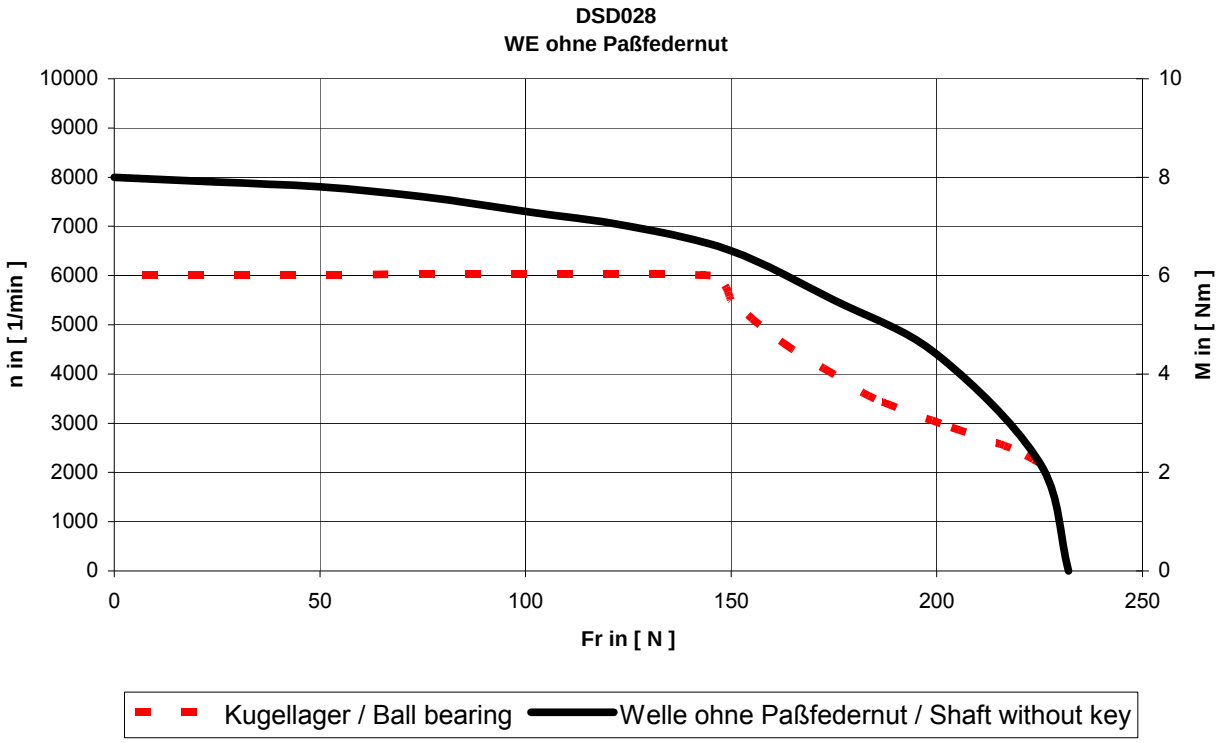
2.3. Radial force diagrams

All bearings are dimensioned for a service life of 20,000 h L_{h10}, The load values specified below must not be exceeded, The specified permissible radial forces F_R are only valid for horizontal mounting of the motor without additional axial forces,

Axial load on the motor shaft:
When mounting clutches, pulleys, etc,, onto the motor shaft, axial forces must not occur!
To avoid this, use the internal thread of the shaft end as an assembly aid,

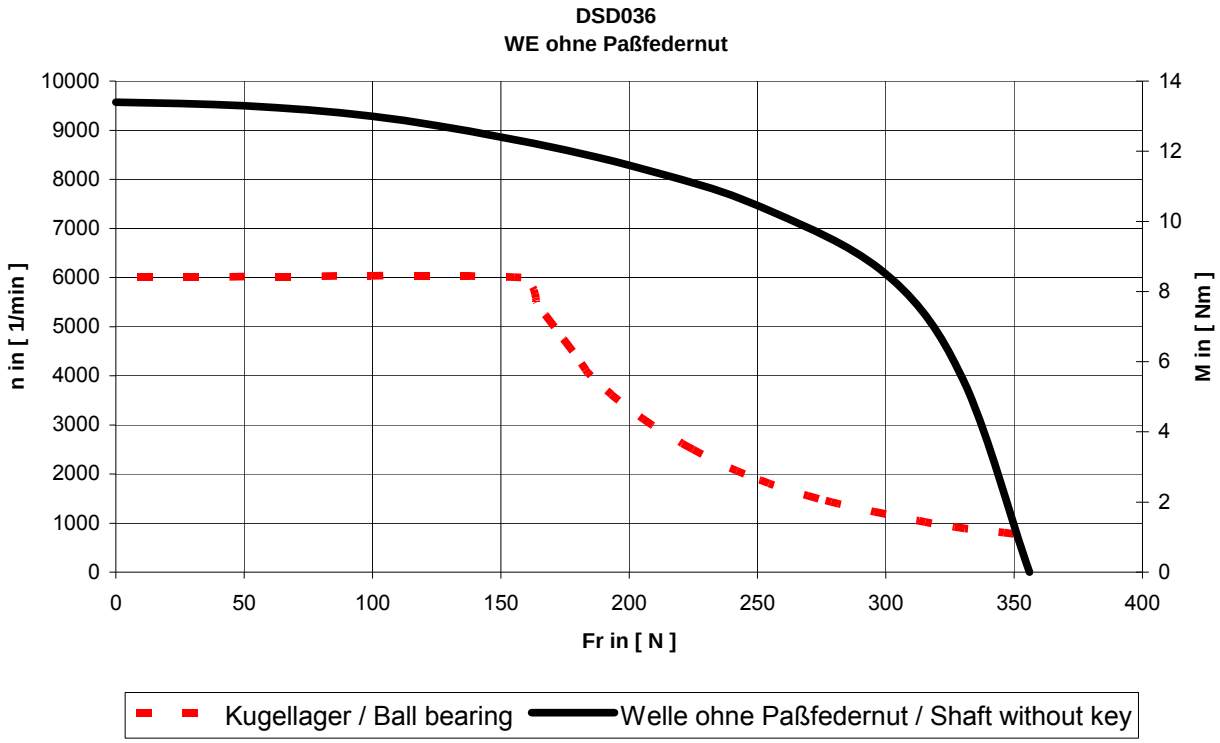
Example:
Force acting on the end of the shaft end (for force acting on the middle of the shaft end Fr x 1,1)
Bearing life 20,000 h L_{h10}; shaft end without keyway

Diagrams:



Explanation of the diagram:

The radial force Fr of the application is used to determine the bearing's maximum possible speed in the "Ball bearing" characteristic,
Radial force 200 N => maximum speed 3,000 rpm
The maximum transmittable torque is based on the "Shaft" characteristic,
Radial force 200 N => maximum transmittable torque 4,2 Nm



Explanation of the diagram:

The radial force Fr of the application is used to determine the bearing's maximum possible speed in the "Ball bearing" characteristic,

Radial force 300 N => maximum speed 1,150 rpm

The maximum transmittable torque is based on the "Shaft" characteristic,

Radial force 300 N => maximum transmittable torque 8,5 Nm

3. Motor components (options)

3.1. Holding brake

The motors can be equipped with a holding brake as an option, The holding brakes in question are permanent-magnet brakes which are free from backlash, The brakes use the normally-on principle, i,e,, the brake engages when the operating voltage is switched off or fails, The brakes are dimensioned for a switching voltage of 24 V DC +/- 10%,

The motors are available with the following holding brakes:

Motor type	DSD028 S	DSD028 M	DSD036 S	DSD036 M	DSD036 L
Minimum holding torque at 100°C (Nm)	2,0	2,0	2,0	4,5	4,5
Max, perm, friction work per braking operation (J)	250	250	250	580	580
Connection values (+7% -7% smoothed)	24 V = 8 W	24 V = 8 W	24 V = 8 W	24 V = 9 W	24 V = 9 W
Inertia ($kgcm^2$)	0,068	0,068	0,068	0,18	0,18
Maximum speed (rpm)	10,000	10,000	10,000	10,000	10,000
Switching time ON (ms), release; with basic air gap	11	11	11	18,5	18,5
Switching time OFF (ms), apply; with basic air gap	37	37	37	50	50
Weight (kg)	0,17	0,17	0,17	0,35	0,35

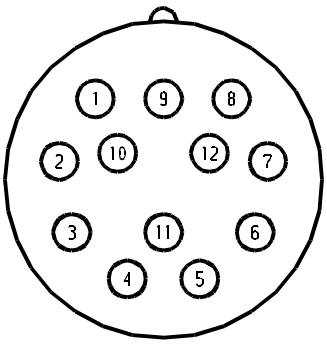
None of the brakes are fail-safe brakes, so the torque may be reduced by interference factors that cannot be controlled, Observe the relevant accident prevention guidelines, as well as the basic safety and health requirements of Appendix I of the Machinery Directive, and harmonized European standards, in accordance with the application in question,
In the event of emergency stop or voltage failure, approx, 2,500 braking operations can be performed before the holding brake will wear out (condition: maximum external inertia = motor inertia and $n_{max,}$ depending on type),

3.2. Encoder

3.2.1. Resolver

Pole pair number	1
Transmission ratio	0,5
Frequency	5 kHz
Nominal input voltage	4 V
Active input power for no-load operation	112 mW
Current consumption for no-load operation	40 mA
Max, output voltage for no-load operation	2 V r,m,s,
Voltage constant	-
Rotor resistance	44 Ω ± 10%
Stator resistance	28 Ω ± 10%
Rotor impedance for no-load operation	70 + j 74 Ω ± 15%
Rotor impedance at short-circuit	62 + j 66 Ω ± 15%
Stator impedance for no-load operation with min, coupling	108 + j 206 Ω ± 15%
Stator impedance at short-circuit with max, coupling	97 + j 183 Ω ± 15%
Phase shift	8°
Zero voltage	15 mV
Phase error referred to zero position	10’

Resolver connection

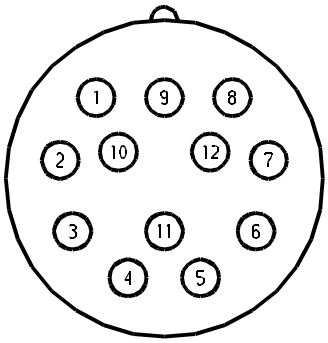


Pin	Signal
1	cos -
2	
3	
4	
5	sin –
6	sin +
7	TM -
8	cos +
9	TM +
10	Ref +
11	
12	Ref -

3.2.2. SINCOS SRS/SRM 50, SKS/SKM 36 (Sick-Stegmann)

	SRS 50	SRM 50	SKS 36	SKM 36
Number of sine, cosine periods per revolution	1,024	1,024	128	128
Number of increments per revolution	32,768	32,768	4,096	4,096
Number of absolute resolved revolutions	1	4,096	1	4,096
Code type for the absolute value	Binary	Binary	Binary	Binary
Output frequency of sine, cosine signals (kHz)	0 to 200	0 to 200	0 to 65	0 to 65
Error limits when evaluating 1,024/128 signals; integral non-linearity (arc seconds)	+/-45	+/-45	+/-1,3	+/-1,3
Non-linearity within a sine, cosine period; differential non-linearity (arc seconds)	+/-7	+/-7	+/-0,6	+/-0,6
Working speed up to which the absolute position can be formed (rpm)	6,000	6,000	6,000	6,000
Maximum operating speed (rpm)	12,000	12,000	12,000	12,000
Output signals; 2 x 90° shifted sinusoidal signals (V_{pp})	1	1	1	1
Output signal	Serial RS 485, asynchronous, half-duplex	Serial RS 485, asynchronous, half-duplex	Serial RS 485, asynchronous, half-duplex	Serial RS 485, asynchronous, half-duplex
Operating voltage range (V)	7 to 12	7 to 12	7 to 12	7 to 12
Operating current without load (mA)	80	80	60	60

SRS/SRM 50, SKS/SKM 36 connection



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

View of contact side of female connector

3.3. Encoder cables

General

A fully preassembled encoder cable is used for all encoder systems, The connection on the motor side takes the form of a 12-pin round signal connector in the case of a resolver, SKS/SKM36, and SRS/SRM50, The connection on the controller side takes the form of a 15-pin SUB-D connector,

The encoder cables are available in 'trailing' or 'non-trailing' versions, The trailing cable is suitable for mobile use in trailing chains, for example, In contrast to the 'non-trailing' cable, which has a PVC sheath, the cable sheath for the trailing version consists of tougher PU for use in environments containing acids and bases (coolants), Cables can be supplied cut to lengths of complete meters up to a maximum of 10 m, If lengths in excess of 10 m are required, cables can be supplied cut at 5 m intervals (10 m, 15 m, etc,),

3.3.1. Technical data

1, Technical description – Non-trailing

- LiYCY, 5x (2 x 0,14 mm²) + 2 x 0,5 mm² stranded copper, twisted pair
- PVC sheath, gray
- 1st end: 12-pin round signal connector with 12 female contacts
- 2nd end: 15-pin SUB-D connector with male contacts and locking screws 4-40UNC
- Baumüller labeling, black
- Outer diameter 9,0 mm (+/- 0,3 mm)
- Bending radius: r ≥ 60 mm (fixed installation), r ≥ 135 mm (flexible use)
- Nominal voltage: 250 V_{AC}

2, Technical description – Trailing

- Li12YC11Y, 5x (2 x 0,14 mm²) + 2 x 0,5 mm² stranded copper, twisted pair
- PU sheath, black
- 1st end: 12-pin round signal connector with 12 female contacts
- 2nd end: 15-pin SUB-D connector with male contacts and locking screws 4-40UNC
- Baumüller labeling, white
- Outer diameter 9,0 mm (+/- 0,3 mm)
- Bending radius: r ≥ 70 mm (fixed installation), r ≥ 100 mm (flexible use)
- Nominal voltage: 300 V_{AC}

3.3.2. Application notes

- Operating temperature

	Trailing	Non-trailing
Limit temperature	At the surface	At the surface
No/few movements	-40°C to +80°C	-30°C to +80°C
Continuous movements	-30°C to +80°C	-5°C to +70°C

- Cable laying at the motor

The cables must not touch the motor surface,

3.3.3. Ordering data for encoder cables

Encoder cables for resolver, SKS/SKM36, and SRS/SRM50 – Preassembled cables with plugs

Non-trailing, fully preassembled Cable 5x (2 x 0,14 mm^2) + 2 x 0,5 mm^2 with connector		**Trailing, fully preassembled** Cable 5x (2 x 0,14 mm^2) + 2 x 0,5 mm^2 with connector	
Length in m	Article number	Length in m	Article number
1	243601	3	246658
2	211338	4	243379
3	219333	5	239540
4	231166	6	242954
5	209879	8	239541
6	220197	10	239542
7	216455	15	239543
8	220429	20	239544
10	210052	25	239545
15	215716	30	239546
20	218568	35	239547
25	218569	40	240520
30	217094	45	240521
35	216444	50	240522
40	217095	55	244033
45	217567	60	245484
50	217568		
55	217569		
60	217570		Article number
70	232088	**Mating plug**	201833

3.4. Motor cables

The motor cables are highly flexible trailing cables with overall shielding, They comply with VDE, UL, and CSA regulations,
The control cables are integrated as star quads, The brake control and the temperature sensor are connected via the main connector,
The cables are particularly suited for the optimum use of cable racks thanks to their low cross-section, low weight, and non-impeding surface, As a result, they can be efficiently used in trailing chains,
The overall shielding with an optical coverage of more than 85% makes it an uncritical cable as far as EMC is concerned,
The connector size is designed in accordance with the motor's standstill current I_0,

3.4.1. Technical data

- Sheath resistance against media such as coolants, machine and gearbox oils
- Abrasion resistance because of a special surface in cable racks and trailing chains
- Highly flexible trailing cable, minimum bending radius for flexible use 12 x D
- Sheath surface not blocking, satin-finish
- Shield made of tinned copper braid with optical coverage of ≥ 85%
- Core insulation made of TPE or polyester, sheath material PUR halogen-free
- Cable CFC- and silicone-free
- Behavior in case of fire: fire-inhibiting, halogen-free
- Cable color RAL 1028, melon yellow
- Label features Baumüller logo, VDE, UL, and CSA signs

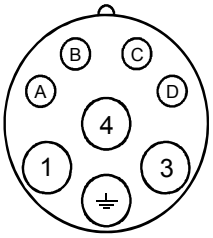
Nominal voltage
Uo/U 600/1000 V (power cores)
U 24 V DC (control cores)

Core lettering
Power cores U, VV, WWW
Colored control cable pairs as star quads in red, white, black, yellow
Assignment of pairs red – black (brake),
white – yellow (temperature)

3.4.2. Main connection via connector

The connector size is determined by the standstill current I_0 of the motor used,

Poles of the female main connectors:

		Pin	Signal	Color/marking
Size 1 I_0 < 20 A		1 ⏚ 3 4 A B C D	Phase U PE Phase V Phase W B+ B- Tm+ Tm-	U Green/yellow V V W W W Red Black White Yellow

Cable cross-section	Nominal current [A][1)]	Connector 540 V size	Cable diameter [mm]
4 ×1,5 mm² 4 × 0,75 mm²	15	1	11,7 – 12,3

1) Current carrying capacity acc, to Table 5 laying type C or E (VDE 0113/EN 60204 Part 1 issue 1997) Ambient temperature 40°C

For the laying of the cables, the current carrying capacity acc, to Table 5 laying type C or E (VDE 0113/EN 60204 Part 1 issue 1997) and an ambient temperature of 40°C must be considered,

3.4.3. Application notes

Operating temperature
The cables can be operated within a temperature range from -20°C to +80°C,

Cable laying at the motor
The cables must not touch the motor surface,

Smallest permissible bending radii
12 times outer cable diameter,
Smaller bending radii are possible with reduced service life,

Maximum cable lengths
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 put in place, The maximum permissible terminal voltage is 1,000 V,

3.4.4. Ordering data for main connection cables

Nominal current: 15 A

Cable 4 x 1,5 mm² + 4 x 0,75 mm²

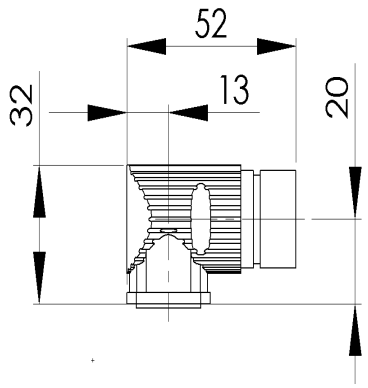
With connector size 1

Length in m	Article number
5	324781
7	324782
10	324783
15	324784
20	324785
25	324786
30	324787
35	324788
40	324789
50	324790
75	324791
100	324792

3.5. Connectors for main connection and encoder

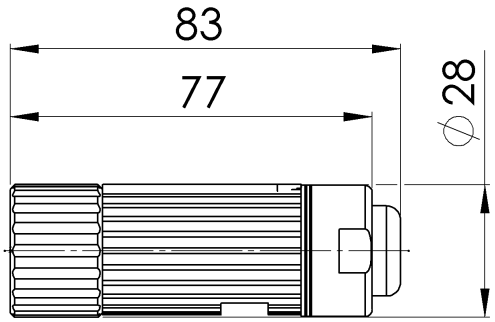
Connector for main connection

(size 1 for current intensity I_0 up to 20 A)

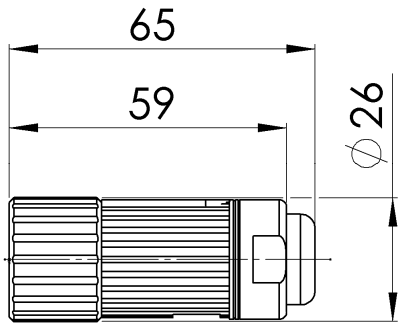


Mating plug for main connection

(size 1 for current intensity I_0 up to 20 A)

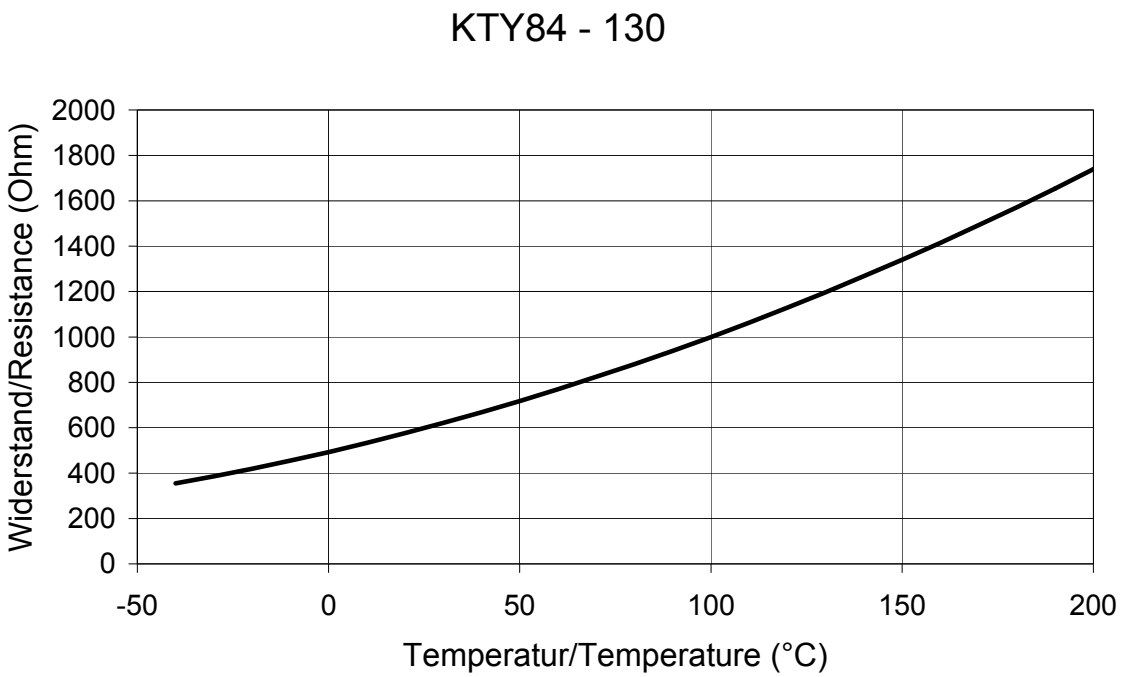


Mating plug for encoder



3.6. Thermal sensor

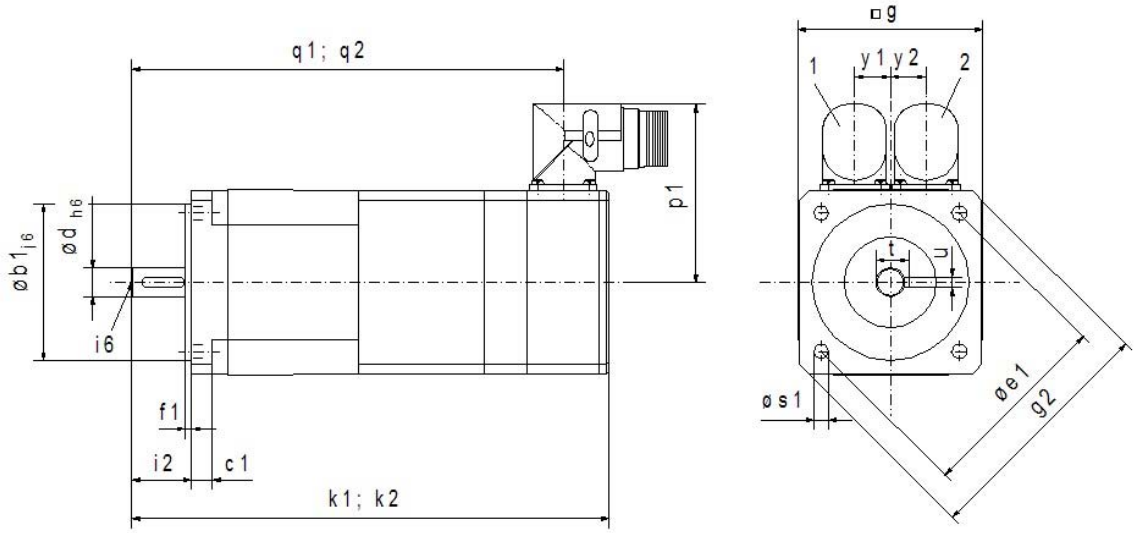
With a resolver, the thermal sensor is connected via the control connection; with a sincos encoder, it is connected via the main connection,



The motor temperature is continuously monitored using the thermal sensor type KTY84-130,
The resistance shown above results when the sensor is supplied with a measuring current of 2 mA,

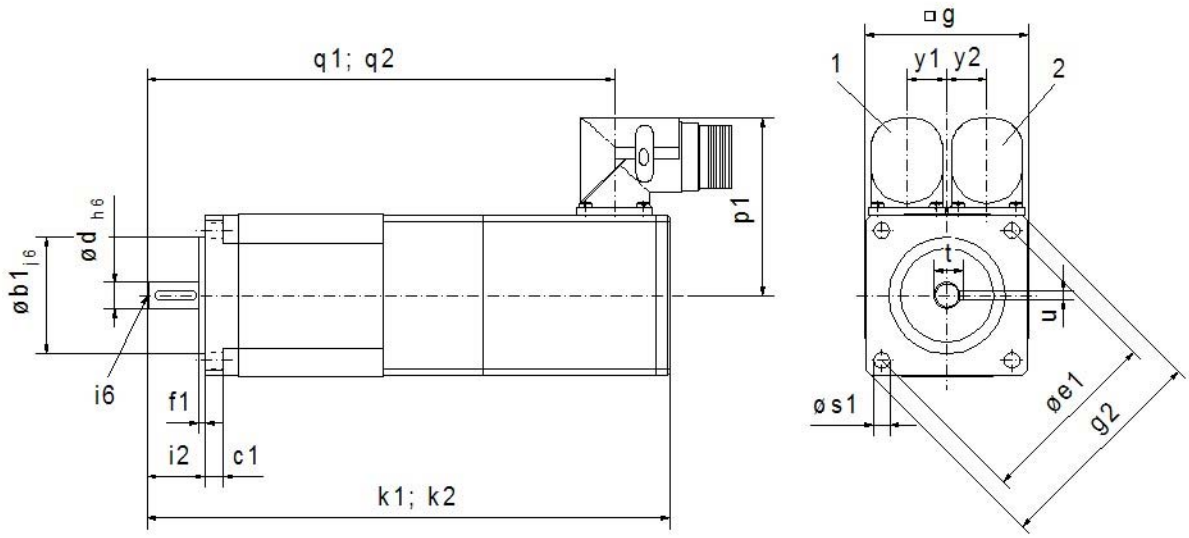
4. Dimension drawing

4.1. DSD028 dimension drawings



Type	Flange							Shaft			Motor													With brake	
	a1	b1	c1	e1	f1	i2	s1	d	t	u	g2	g	g1	k1	m1	p1	q	q1	y	y1	y2	s2	s3	k2	q2
28S incl, resolver	-	40	6	63	2,5	20	5,4	9	10	3	75	56	-	120	-	61	-	102	-	14	14	-	-	160	142
28M incl, resolver														150				132						190	172
28S incl, sincos encoder														136				118						176	157
28M incl, sincos encoder														166				148						206	187

4.2. DSD036 dimension drawings



Type	Flange							Shaft			Motor														With brake	
	a1	b1	c1	e1	f1	i2	s1	d	t	u	g2	g	g1	k1	m1	p1	q	q1	y	y1	y2	s2	s3	k2	q2
36S incl, resolver	-	60	8	75	2,5	23	5,5	11	12,5	4	94	71	-	141	-	69	-	123	-	13,7	13,7	-	-	183	165
36M incl, resolver														171				153						220	202
36L incl, resolver														201				183						250	232
36S incl, sincos encoder														148				130						195	177
36M incl, sincos encoder														178				160						227	209
36L incl, sincos encoder														208				190						257	239

5. Commissioning and maintenance instructions

When commissioning, please request the Commissioning and Maintenance Instructions version 01/2004).

6. Declaration of Conformity/Manufacturer's Declaration

In this section we give general information on EC directives, CE marking and on the Declaration of Conformity/Manufacturer's Declaration.

6.1. What is an EC directive

EC directives state requirements. The directives are compiled by the relevant authorities within the EU and are implemented in national law by all member states.
In this way, the EC directives safeguard free trade within the EU.

An EC directive contains only essential minimum requirements. You will find detailed requirements in standards that are referenced in the directive.

6.2. What does the CE mark signify?

a) CE marking certifies conformity with all the obligations that need to be met by the manufacturer in relation to a product, based on the community directives containing provisions relating to CE marking.

b) The CE mark applied to industrial products signifies that the natural or legal person who applies the mark or has the mark applied, has ensured that the product meets all Community directives on complete harmonization and has been subjected to all the conformity assessment procedures demanded by the regulations.

Decision 93/465/EEC of the Council, Annex I B. a) + c)

We apply the CE mark to the unit and to the documentation as soon as we have ascertained that we have met the requirements of the relevant directives.

As long as this Baumüller product is used correctly within your overall machine, you can assume that the product complies with the requirements of 2006/95/EC.

A key aspect for ensuring compliance with 89/336/EEC (EMC directive) is how this product is installed. Since you are performing the installation, you are also responsible for compliance with 89/336/EEC.

We provide you with support in the form of EMC instructions. This information can be found in the relevant technical instructions. If you have met all the requirements stated in this documentation and in the technical instructions, you can assume (standard: ”suppose”) that the product complies with the requirements of the EMC directive.
All national, local, and system-specific regulations must also be observed.
To operate your machine in the EU, the following must be available:

- Conformity mark (CE mark)
- Declaration(s) of Conformity in relation to the directive(s) relevant for the machine.

6.3. Declaration of Conformity, definition of term

Within the context of this documentation, a Declaration of Conformity is a declaration that the electrical equipment
placed on the market complies with all applicable essential health and safety requirements.

With the Declaration of Conformity provided in this section, Baumüller Nürnberg GmbH declares that the product complies with the applicable essential health and safety requirements from the directives and standards that are listed in the Declaration of Conformity.

6.4. Manufacturer's Declaration, definition of term

Within the context of this documentation, a Manufacturer's Declaration is a declaration that the machinery/safety components placed on the market complies with all applicable essential health and safety requirements.

With the Manufacturer's Declaration provided in this section, Baumüller Nürnberg GmbH declares that the product complies with the applicable essential health and safety requirements from the directives and standards that are listed in the Manufacturer's Declaration.

The product from Baumüller Nürnberg GmbH is installed in a machine. For the health and safety of the user (and others), it is important that the overall machine complies with all applicable essential health and safety requirements.
For this reason Baumüller Nürnberg GmbH highlights in the Manufacturer's Declaration that the commissioning of the overall machine must be prohibited until it has been clarified that the machine complies with the stipulations of the Machinery Directive.

6.5. EU – Declaration of Conformity

EG-Konformitätserklärung

Hersteller:	Baumüller Nürnberg GmbH Geschäftsbereich Kleinsysteme Flugplatzweg 2 D-37581 Bad Gandersheim Deutschland
Produktbezeichnung:	Drehstrom-Servomotor **Baureihe DSD**

Das bezeichnete Produkt stimmt mit den Vorschriften der EG-Niederspannungs-richtlinie 73/23 EWG überein:

Die Übereinstimmung des bezeichneten Produkts mit den Vorschriften dieser Richt-linie wird nachgewiesen durch die vollständige Einhaltung folgender harmonisierter Europäischer Normen:

Referenznummer	Ausgabedatum
EN 60034-1	September 2000 + A11 Mai 2002
EN 60034-5	Dezember 2001
EN 60034-9	Juni 1998

Nationale Normen / nach Maschinenrichtlinie Art.5 Abs.1 Satz2)

Referenznummer
VDE 0530

Das sichtbare Zeichen für die Konformität des bezeichneten Produktes mit dieser Richtlinie ist die Vergabe und Anbringung der

CE-Kennzeichnung

Ort, Datum: Bad Gandersheim, 14.6.2007

Rechtsverbindliche Unterschrift: .....

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, beinhaltet jedoch keine Zusicherung von Eigenschaften.
Die Sicherheitsrichtlinien der mitgelieferten Produktdokumentation ist zu beachten
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Three-phase Synchronous motors

DSD 45-100..540 V
DS 45-100..540 V

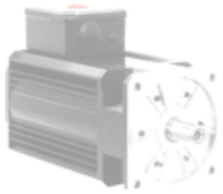
Table of contents

Note: Preliminary DSD list!
The technical data—electrical and mechanical—are subject to change!
Date: 05/03

All information in this list represents nonbinding information for customers. The information is subject to continuous development and is continually being updated through our permanent updating service. Please note that data/numbers/information represent current values at the time of printing. This information is not legally binding for measurement, analysis and calculation. Before using any of the information listed in this bochure as the basis of personal calculations and/or applications, please ensure that the information you are using is current.
No liability is assumed that the information presented here is correct

Three-phase synchronous motors DSD 45 - 100..540V

New design for frame size 56/71/100 available from October 2003.
Frame size 45 is already available.



General technical data

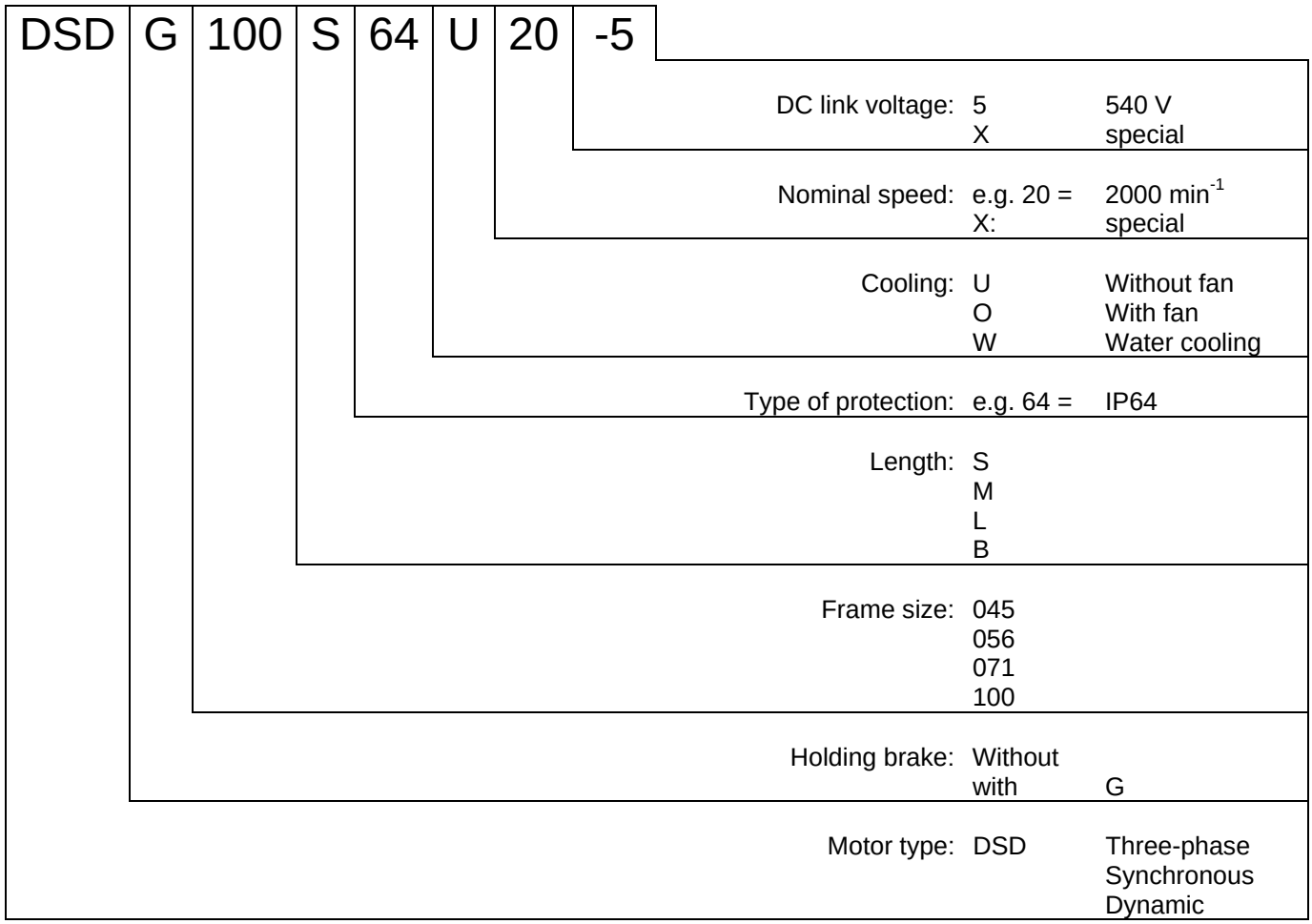
Version:	IM B5	Horizontal mounting
	IM V1	Vertical mounting, shaft end to the bottom
	IM V3	Vertical mounting, shaft end to the top
Protection type:	IP65	Surface-cooled, **without** fan, DIN 40050, DIN 40053
	IP54	Surface-cooled, **with** fan
Shaft gland:	IP64	Standard
	IP65	with shaft sealing ring (option)
Connection:		
Main connection	U V W	Terminal box
		Connector (option)
		Frame size 45 with connector as standard
Control connection		12-pin connector
Brake		in the main connection
Thermal sensor		in control connection (for resolver only)
Cooling type:	IC 0041	Completely enclosed machine surface-cooled no fan
	IC 0641	as above, but with fan (air flow direction from B to A end)
Thermal sensor:		Linear thermal sensor for evaluation in the controller
Temperature rise:	$\Delta\vartheta$ = 105K	Insulation class F acc. to EN 60034
Temperature range:	0....+ 40°C	
Storage:	-30°C...+85°C	
Paint:	black matt	RAL 9005
Bearing:	$\geq$ 20,000h	Service life
Balance quality:	N	According to DIN ISO 2373
	R, S	On request
Vibration resistant up to:	radial 3g	20 Hz to 2 kHz acc. to EN 60068-2-6
	axial 0.5g	20 Hz to 2 kHz acc. to EN 60068-2-6
		Higher vibration resistance on request
Flange:	acc. to IEC standard	Dimension b1: Tolerance j6
Shaft end:	cylindrical	Smooth acc. to DIN 748; (also available with key DIN 6885)
		Dimension d: Tolerance k6
		Centering with internal thread acc. to DIN 332 form D
Holding brake:	Option	
Actual speed encoder:	2-pin resolver	
	Sincos encoder (option)	Other encoders on request

Explanation of the motor data

$M_{0,}$ I_0	Nominal torque (Nm) with nominal current (A) with speed >= 1 min^{-1} no time limit, I_0 is the r.m.s. value
$M_{0, max,}$ $I_{0, max}$	Maximum torque (Nm) with Maximum current (A) with zero speed, $I_{0\ max}$ is the r.m.s. value
P_N	Nominal power (kW) with nominal speed n_N in continuous operation (S1) T_A=40°C installation up to 1000m a.m.s.l.
$M_{N,}$ I_N	Nominal torque (Nm) at nominal current (A) with nominal speed n_N in continuous operation (S1); TA= 40°C
n_N	Nominal speed (min^{-1})
k_{TN}	Torque constant: M_N / I_N
f_N	Nominal frequency (Hz)
J	Rotor inertia incl. resolver without holding brake (kg cm²)
m	Weight in kg

The specified ratings / torques at nominal speed are achieved with a chopping frequency of $\geq$ 4 kHz in the power unit of the converter. A chopping frequency of $>$ 6 kHz is recommended.

Type key



Technical data

DSD 045..64 U.. (IP 64 without fan)

Mains voltage 3 AC 400 V for converters with uncontrolled supply

Nom. speed	Motor type	Stand-still torque[1]		Stand-still current[1]	max. stand-still torque		max. stand-still current	Nom. power[1]		Nom. torque[1]		Nom. current[1]
n_N min^{-1}		M_O Nm	M_O lbf ft	I_O A	$M_{O,max}$ Nm	$M_{O,max}$ lbf ft	$I_{O,max}$ A	P_N kW	P_N hp	M_N Nm	M_N lbf ft	I_N A
3000	DSD045S64U30-5	2.5	1.84	1.60	11	8	7.6	0.63	0.8	2.0	1.5	1.40
	DSD045M64U30-5	4.0	2.95	2.40	18[2]	13	12.0	0.94	1.3	3.0	2.2	2.0
	DSD045L64U30-5	5.2	3.84	3.10	25[2]	18	16.2	1.22	1.6	3.9	2.9	2.50
4500	DSD045S64U45-5	2.5	1.84	2.25	11	8	11.0	0.89	1.2	1.9	1.4	1.95
	DSD045M64U45-5	4.0	2.95	3.45	18[2]	13	17.0	1.18	1.6	2.5	1.8	2.40
	DSD045L64U45-5	5.2	3.84	4.45	25[2]	18	23.0	1.37	1.8	2.9	2.1	2.74

Nom. speed	Motor type	Torque constant		Nom. frequency	Rotor inertia (motor)		Weight	
n_N min^{-1}		k_{TN} Nm/A	k_{TN} lbf ft / A	f_N Hz	J Kgcm^2	J lb in^2	m kg	m lb
3000	DSD045S64U30-5	1.43	1.05	200.0	1.39	0.47	4.2	9.3
	DSD045M64U30-5	1.50	1.11	200.0	1.64	0.56	5.3	11.7
	DSD045L64U30-5	1.56	1.15	200.0	1.90	0.65	6.3	13.9
4500	DSD045S64U45-5	0.97	0.72	300.0	1.39	0.47	4.2	9.3
	DSD045M64U45-5	1.04	0.77	300.0	1.64	0.56	5.3	11.7
	DSD045L64U45-5	1.06	0.78	300.0	1.90	0.65	6.3	13.9

1) Winding overheat ΔT < 105 K; direct flange connection (mounting plate 250mm×250mm)

2) max. shaft torque: **M_{max} ≤ 16 Nm for shaft end with key**
M_{max} ≤ 28 Nm for shaft end without key

Legend

	American units

DSD 056..64 U.. (IP 64 without fan)

Mains voltage 3 AC 400 V for converters with uncontrolled supply

Nom. speed	Motor type	Stand-still torque[1)]		Stand-still current[1)]	max. stand-still torque		max. stand-still current	Nom. power[1)]		Nom. torque[1)]		Nom. current[1)]
n_N min^{-1}		M_O Nm	M_O lbf ft	I_O A	$M_{O,max}$ Nm	$M_{O,max}$ lbf ft	$I_{O,max}$ A	P_N KW	P_N hp	M_N Nm	M_N lbf ft	I_N A
2000	DSD056S64U20-5	5.5	4.06	2.4	23	17	11.0	1.0	1.3	4.8	3.5	2.2
	DSD056M64U20-5	8.8	6.49	3.8	38	28	18.0	1.6	2.1	7.5	5.5	3.3
	DSD056L64U20-5	11.5	8.48	4.9	52	38	24.0	2.0	2.7	9.4	6.9	4.2
3000	DSD056S64U30-5	5.5	4.06	3.5	23	17	16.0	1.3	1.7	4.1	3.0	2.7
	DSD056M64U30-5	8.8	6.49	5.4	38	28	25.5	2.0	2.7	6.5	4.8	4.2
	DSD056L64U30-5	11.5	8.48	6.8	52	38	34.0	2.4	3.2	7.7	5.7	5.0
4500	DSD056S64U45-5	5.5	4.06	4.9	23	17	22.0	1.6	2.1	3.4	2.5	3.3
	DSD056M64U45-5	8.8	6.49	7.6	38	28	36.0	2.4	3.2	5.0	3.7	4.7
	DSD056L64U45-5	11.5	8.48	9.6	52	38	47.5	2.3	3.1	4.8	3.5	4.7

Nom. speed	Motor type	Torque con-stant		Nom. fre-quency	Rotor inertia (motor)		Weight	
n_N min^{-1}		k_{TN} Nm/A	k_{TN} lbf ft / A	f_N Hz	J $Kgcm^2$	J lb in^2	m Kg	m lb
2000	DSD056S64U20-5	2.18	1.61	133.3	3.0	1.03	8.2	18.1
	DSD056M64U20-5	2.27	1.67	133.3	4.3	1.47	10.0	22.0
	DSD056L64U20-5	2.24	1.65	133.3	5.7	1.95	11.8	26.0
3000	DSD056S64U30-5	1.52	1.12	200.0	3.0	1.03	8.2	18.1
	DSD056M64U30-5	1.55	1.14	200.0	4.3	1.47	10.0	22.0
	DSD056L64U30-5	1.54	1.14	200.0	5.7	1.95	11.8	26.0
4500	DSD056S64U45-5	1.03	0.76	300.0	3.0	1.03	8.2	18.1
	DSD056M64U45-5	1.06	0.78	300.0	4.3	1.47	10.0	22.0
	DSD056L64U45-5	1.02	0.75	300.0	5.7	1.95	11.8	26.0

1) Winding overheat ΔT < 105 K; direct flange connection (mounting plate 250mm×250mm)

Legend

	American units

DSD 056..54 O.. (IP 54 with fan)

Mains voltage 3 AC 400 V for converters with uncontrolled supply

Nom. speed	Motor type	Stand-still torque[1)]		Stand-still current[1)]	max. stand-still torque		Max. stand-still current	Nom. power[1)]		Nom. torque[1)]		Nom. current[1)]
n_N min^{-1}		M_O Nm	M_O lbf ft	I_O A	$M_{O,max}$ Nm	$M_{O,max}$ lbf ft	$I_{O,max}$ A	P_N KW	P_N hp	M_N Nm	M_N lbf ft	I_N A
2000	DSD056S54O20-5	7.2	5.31	3.2	23	17	11.0	1.4	1.9	6.6	4.9	3.0
	DSD056M54O20-5	11.8	8.7	5.1	38	28	18.0	2.3	3.1	11.0	8.1	4.9
	DSD056L54O20-5	15.5	11.4	6.7	52	38	24.0	3.0	4.0	14.2	10.5	6.3
3000	DSD056S54O30-5	7.2	5.31	4.6	23	17	16.0	2.0	2.7	6.3	4.6	4.1
	DSD056M54O30-5	11.8	8.7	7.3	38	28	25.5	3.3	4.4	10.4	7.7	6.6
	DSD056L54O30-5	15.5	11.4	9.4	52	38	34.0	4.1	5.5	13.0	9.6	8.2
4500	DSD056S54O45-5	7.2	5.31	6.4	23	17	22.0	2.6	3.5	5.5	4.1	5.2
	DSD056M54O45-5	11.8	8.7	10.3	38	28	36.0	4.2	5.6	9.0	6.6	8.2
	DSD056L54O45-5	15.5	11.4	13.0	52	38	47.5	5.4	7.2	11.4	8.4	10.5

Nom. speed	Motor type	Torque con-stant		Nom. fre-quency	Rotor inertia (motor)		Weight	
n_N min^{-1}		k_{TN} Nm/A	k_{TN} lbf ft / A	f_N Hz	J Kgcm^2	J lb in^2	m Kg	m lb
2000	DSD056S54O20-5	2.20	1.62	133.3	3.0	1.03	11.0	24.3
	DSD056M54O20-5	2.24	1.65	133.3	4.3	1.47	12.8	28.2
	DSD056L54O20-5	2.25	1.66	133.3	5.7	1.95	14.6	32.2
3000	DSD056S54O30-5	1.54	1.14	200.0	3.0	1.03	11.0	24.3
	DSD056M54O30-5	1.58	1.17	200.0	4.3	1.47	12.8	28.2
	DSD056L54O30-5	1.58	1.17	200.0	5.7	1.95	14.6	32.2
4500	DSD056S54O45-5	1.06	0.78	300.0	3.0	1.03	11.0	24.3
	DSD056M54O45-5	1.10	0.81	300.0	4.3	1.47	12.8	28.2
	DSD056L54O45-5	1.09	0.80	300.0	5.7	1.95	14.6	32.2

1) Winding overheat ΔT < 105 K; direct flange connection (mounting plate 250mm×250mm)

Legend

	American units

DSD 071..64 U.. (IP 64 without fan)

Mains voltage 3 AC 400 V for converters with uncontrolled supply

Nom. speed	Motor type	Stand-still torque[1)]		Stand-still current[1)]	Max. stand-still torque		max. stand-still current	Nom. power[1)]		Nom. torque[1)]		Nom. current[1)]
n_N min^{-1}		M_O Nm	M_O lbf ft	I_O A	$M_{O.max}$ Nm	$M_{O.max}$ lbf ft	$I_{O.max}$ A	P_N KW	P_N hp	M_N Nm	M_N lbf ft	I_N A
2000	DSD071S64U20-5	13.5	9.96	5.7	51	38	24.5	2.3	3.1	11.0	8.1	4.9
	DSD071M64U20-5	19.5	14.4	8.4	75	55	36.5	3.1	4.2	15.0	11.1	6.8
	DSD071L64U20-5	25.0	18.4	10.7	100	74	48.0	4.2	5.6	20.0	14.8	8.9
3000	DSD071S64U30-5	13.5	9.96	8.2	51	38	35.5	2.9	3.9	9.2	6.8	6.0
	DSD071M64U30-5	19.5	14.4	11.7	75	55	51.0	4.0	5.4	12.6	9.3	8.0
	DSD071L64U30-5	25.0	18.4	15.2	100	74	68.0	5.0	6.7	16.0	11.8	10.2
4500	DSD071S64U45-5	13.5	9.96	11.6	51	38	50.0	3.4	4.6	7.2	5.3	6.7
	DSD071M64U45-5	19.5	14.4	17.0	75	55	75.0	4.3	5.8	9.2	6.8	8.7
	DSD071L64U45-5	25.0	18.4	21.4	100	74	95.0	5.2	7.0	11.0	8.1	10.0

Nom. speed	Motor type	Torque con-stant		Nom. fre-quency	Rotor inertia (motor)		Weight	
n_N min^{-1}		k_{TN} Nm/A	k_{TN} lbf ft / A	f_N Hz	J kgcm^2	J lb in^2	m kg	m lb
2000	DSD071S64U20-5	2.24	1.65	133.3	9.2	3.14	16.2	35.7
	DSD071M64U20-5	2.21	1.63	133.3	12.8	4.37	18.7	41.2
	DSD071L64U20-5	2.25	1.66	133.3	16.5	5.64	21.0	46.3
3000	DSD071S64U30-5	1.53	1.13	200.0	9.2	3.14	16.2	35.7
	DSD071M64U30-5	1.58	1.17	200.0	12.8	4.37	18.7	41.2
	DSD071L64U30-5	1.57	1.16	200.0	16.5	5.64	21.0	46.3
4500	DSD071S64U45-5	1.07	0.79	300.0	9.2	3.14	16.2	35.7
	DSD071M64U45-5	1.06	0.78	300.0	12.8	4.37	18.7	41.2
	DSD071L64U45-5	1.10	0.81	300.0	16.5	5.64	21.0	46.3

1) Winding overheat ΔT < 105 K; direct flange connection (mounting plate 400mm×400mm)

Legend

	American units

DSD 071..54 O.. (IP 54 with fan)

Mains voltage 3 AC 400 V for converters with uncontrolled supply

Nom. speed	Motor type	Stand-still torque[1)]		Stand-still current[1)]	Max. stand-still torque		max. stand-still current	Nom. power[1)]		Nom. torque[1)]		Nom. current[1)]
n_N min^{-1}		M_O Nm	M_O lbf ft	I_O A	$M_{O,max}$ Nm	$M_{O,max}$ lbf ft	$I_{O,max}$ A	P_N kW	P_N hp	M_N Nm	M_N lbf ft	I_N A
2000	DSD071S54O20-5	18.0	13.3	7.7	51	38	24.5	3.1	4.2	15.0	11.1	6.7
	DSD071M54O20-5	26.5	19.5	11.3	75	55	36.5	4.6	6.2	22.0	16.2	9.9
	DSD071L54O20-5	34.5	25.4	14.8	100	74	48.0	6.1	8.2	29.0	21.4	12.8
3000	DSD071S54O30-5	18.0	13.3	11.2	51	38	35.5	4.2	5.6	13.5	10.0	8.8
	DSD071M54O30-5	26.5	19.5	15.9	75	55	51.0	6.3	8.4	20.0	14.8	12.6
	DSD071L54O30-5	34.5	25.4	21.0	100	74	68.0	8.0	10.7	24.5	18.1	15.4
4500	DSD071S54O45-5	18.0	13.3	15.7	51	38	50.0	5.7	7.6	12.0	8.9	11.0
	DSD071M54O45-5	26.5	19.5	23.0	75	55	75.0	8.0	10.7	17.0	12.5	15.8
	DSD071L54O45-5	34.5	25.4	29.6	100	74	95.0	10.1	13.5	21.5	15.9	19.2

Nom. speed	Motor type	Torque con-stant		Nom. fre-quency	Rotor inertia (motor)		Weight	
n_N min^{-1}		k_{TN} Nm/A	k_{TN} lbf ft / A	f_N Hz	J Kgcm^2	J lb in^2	m Kg	m lb
2000	DSD071S54O20-5	2.24	1.65	133.3	9.2	3.14	20.0	44.1
	DSD071M54O20-5	2.22	1.64	133.3	12.8	4.37	22.5	49.6
	DSD071L54O20-5	2.26	1.67	133.3	16.5	5.64	24.8	54.7
3000	DSD071S54O30-5	1.53	1.13	200.0	9.2	3.14	20.0	44.1
	DSD071M54O30-5	1.59	1.17	200.0	12.8	4.37	22.5	49.6
	DSD071L54O30-5	1.59	1.17	200.0	16.5	5.64	24.8	54.7
4500	DSD071S54O45-5	1.09	0.80	300.0	9.2	3.14	20.0	44.1
	DSD071M54O45-5	1.08	0.80	300.0	12.8	4.37	22.5	49.6
	DSD071L54O45-5	1.12	0.83	300.0	16.5	5.64	24.8	54.7

1) Winding overheat ΔT < 105 K; direct flange connection (mounting plate 400mm×400mm)

Legend

	American units

DSD 100..64 U.. (IP 64 without fan)

Mains voltage 3 AC 400 V for converters with uncontrolled supply

Nom. speed n_N min^{-1}	Motor type	Stand-still torque[1)] M_O Nm	M_O lbf ft	Stand-still current[1)] I_O A	max. stand-still torque $M_{O,max}$ Nm	$M_{O,max}$ lbf ft	max. stand-still current $I_{O,max}$ A	Nom. power[1)] P_N KW	P_N hp	Nom. torque[1)] M_N Nm	M_N lbf ft	Nom. current[1)] I_N A
1200	DSD100S64U12-5	34.0	25.1	9.1	105	77	33	3.8	5.1	30.0	22.1	8.3
	DSD100M64U12-5	51.0	37.6	13.7	158	117	49	5.6	7.5	44.5	32.8	12.3
	DSD100L64U12-5	66.5	49	18.0	210	155	66	7.0	9.4	56.0	41.3	15.5
2000	DSD100S64U20-5	34.0	25.1	14.5	105	77	52	5.4	7.2	26.0	19.2	11.5
	DSD100M64U20-5	51.0	37.6	21.0	158	117	75	7.7	10.3	37.0	27.3	16.0
	DSD100L64U20-5	66.5	49	27.5	210	155	102	9.4	12.6	45.0	33.2	19.5
3000	DSD100S64U30-5	34.0	25.1	21.5	105	77	76	6.6	8.9	21.0	15.5	13.5
	DSD100M64U30-5	51.0	37.6	30.5	158	117	110	9.0	12.1	28.5	21.0	18.5
	DSD100L64U30-5	66.5	49	40.0	210	155	147	10.7	14.3	34.0	25.1	21.5
4500	DSD100S64U45-5	34.0	25.1	30.5	105	77	110	5.9	7.9	12.5	9.2	11.7
	DSD100M64U45-5	51.0	37.6	44.0	158	117	157	7.5	10.1	16.0	11.8	15.0

Nom. speed n_N min^{-1}	Motor type	Torque constant k_{TN} Nm/A	k_{TN} lbf ft / A	Nom. frequency f_N Hz	Rotor inertia (motor) J Kgcm^2	J lb in²	Weight m kg	m lb
1200	DSD100S64U12-5	3.61	2.66	80.0	42.5	14.52	31.0	68.3
	DSD100M64U12-5	3.62	2.67	80.0	60.0	20.50	38.5	84.9
	DSD100L64U12-5	3.61	2.66	80.0	77.0	26.31	45.5	100.3
2000	DSD100S64U20-5	2.26	1.67	133.3	42.5	14.52	31.0	68.3
	DSD100M64U20-5	2.31	1.70	133.3	60.0	20.50	38.5	84.9
	DSD100L64U20-5	2.31	1.70	133.3	77.0	26.31	45.5	100.3
3000	DSD100S64U30-5	1.56	1.15	200.0	42.5	14.52	31.0	68.3
	DSD100M64U30-5	1.54	1.14	200.0	60.0	20.50	38.5	84.9
	DSD100L64U30-5	1.58	1.17	200.0	77.0	26.31	45.5	100.3
4500	DSD100S64U45-5	1.07	0.79	300.0	42.5	14.52	31.0	68.3
	DSD100M64U45-5	1.07	0.79	300.0	60.0	20.50	38.5	84.9

1) Winding overheat ΔT < 105 K; direct flange connection (mounting plate 400mm×400mm)

Legend

	American units

DSD 100..54 O.. (IP 54 with fan)

Mains voltage 3 AC 400 V for converters with uncontrolled supply

Nom. speed	Motor type	Stand-still torque[1)]		Stand-still current[1)]	Max. stand-still torque		max. stand-still current	Nom. power[1)]		Nom. torque[1)]		Nom. current[1)]
n_N min^{-1}		M_O Nm	M_O lbf ft	I_O A	$M_{O,max}$ Nm	$M_{O,max}$ lbf ft	$I_{O,max}$ A	P_N KW	P_N hp	M_N Nm	M_N lbf ft	I_N A
1200	DSD100S54O12-5	43.5	32.1	11.8	105	77	33	4.6	6.2	37.0	27.3	10.2
	DSD100M54O12-5	67.0	49.4	18.0	158	117	49	7.3	9.8	58.0	42.8	16.1
	DSD100L54O12-5	89.0	65.6	24.0	210	155	66	9.3	12.5	74.0	54.6	20.6
2000	DSD100S54O20-5	43.5	32.1	18.5	105	77	52	6.8	9.1	32.5	24.0	14.3
	DSD100M54O20-5	67.0	49.4	27.5	158	117	75	10.3	13.8	49.0	36.1	21.2
	DSD100L54O20-5	89.0	65.6	37.0	210	155	102	13.4	18.0	64.0	47.2	27.7
3000	DSD100S54O30-5	43.5	32.1	27.2	105	77	76	8.6	11.5	27.5	20.3	18.0
	DSD100M54O30-5	67.0	49.4	40.0	158	117	110	13.2	17.7	42.0	31.0	26.8
	DSD100L54O30-5	89.0	65.6	53.5	210	155	147	17.0	22.8	54.0	39.8	34.0
4500	DSD100S54O45-5	43.5	32.1	39.0	105	77	110	10.0	13.4	21.5	15.9	20.0
	DSD100M54O45-5	67.0	49.4	57.5	158	117	157	15.0	20.1	32.0	23.6	29.5

Nom. speed	Motor type	Torque con-stant		Nom. fre-quency	Rotor inertia (motor)		Weight	
n_N min^{-1}		k_{TN} Nm/A	k_{TN} lbf ft / A	f_N Hz	J Kgcm^2	J lb in^2	m kg	m lb
1200	DSD100S54O12-5	3.63	2.68	80.0	42.5	14.52	36.3	80.0
	DSD100M54O12-5	3.60	2.66	80.0	60.0	20.50	43.8	96.6
	DSD100L54O12-5	3.59	2.65	80.0	77.0	26.31	50.8	112.0
2000	DSD100S54O20-5	2.25	1.66	133.3	42.5	14.52	36.3	80.0
	DSD100M54O20-5	2.31	1.70	133.3	60.0	20.50	43.8	96.6
	DSD100L54O20-5	2.38	1.76	133.3	77.0	26.31	50.8	112.0
3000	DSD100S54O30-5	1.53	1.13	200.0	42.5	14.52	36.3	80.0
	DSD100M54O30-5	1.56	1.15	200.0	60.0	20.50	43.8	96.6
	DSD100L54O30-5	1.59	1.17	200.0	77.0	26.31	50.8	112.0
4500	DSD100S54O45-5	1.07	0.79	300.0	42.5	14.52	36.3	80.0
	DSD100M54O45-5	1.08	0,80	300.0	60.0	20,50	43.8	96,6

1) Winding overheat ΔT < 105 K; direct flange connection (mounting plate 400mm×400mm)

Legend

	American units

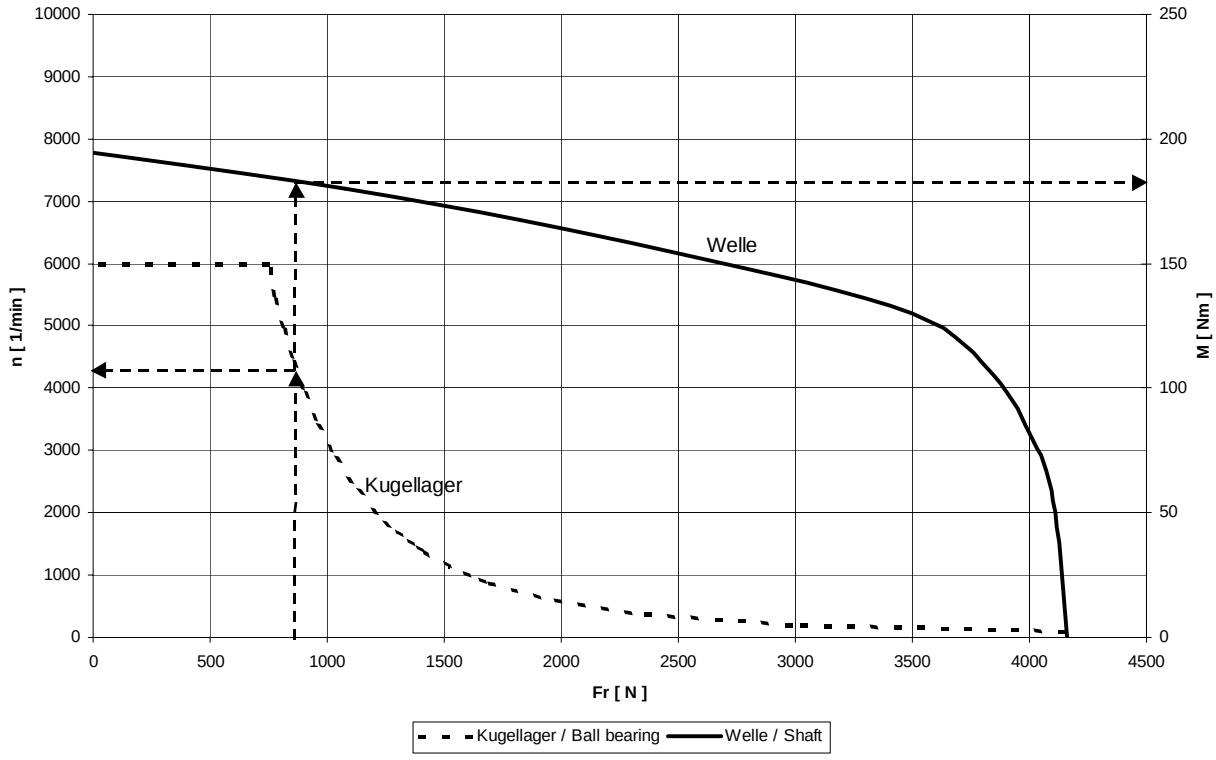
Radial force diagrams

Permissible radial forces F_R at the shaft end
All bearings are dimensioned for a service life of approx. 20,000 operating hours; the loads 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.

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.

Example

Force acting on the end of the shaft end (for force acting on the middle of the shaft end Fr x 1.1)
Bearing life 20,000 h; shaft end with keyway



Explanation of the example

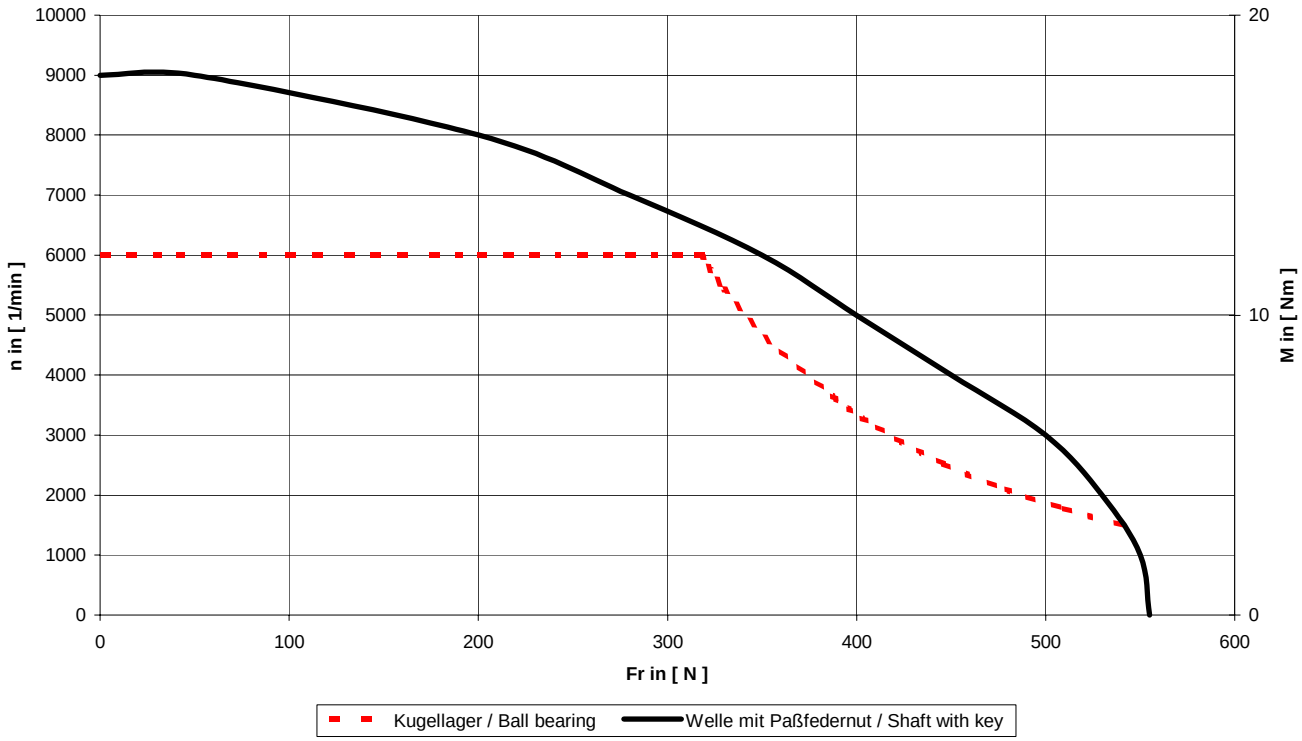
The radial force Fr of the application is used to determine the possible maximum speed of the bearing in the "Ball bearing" characteristic.

Radial force 850 N => maximum speed 4250 min^{-1}

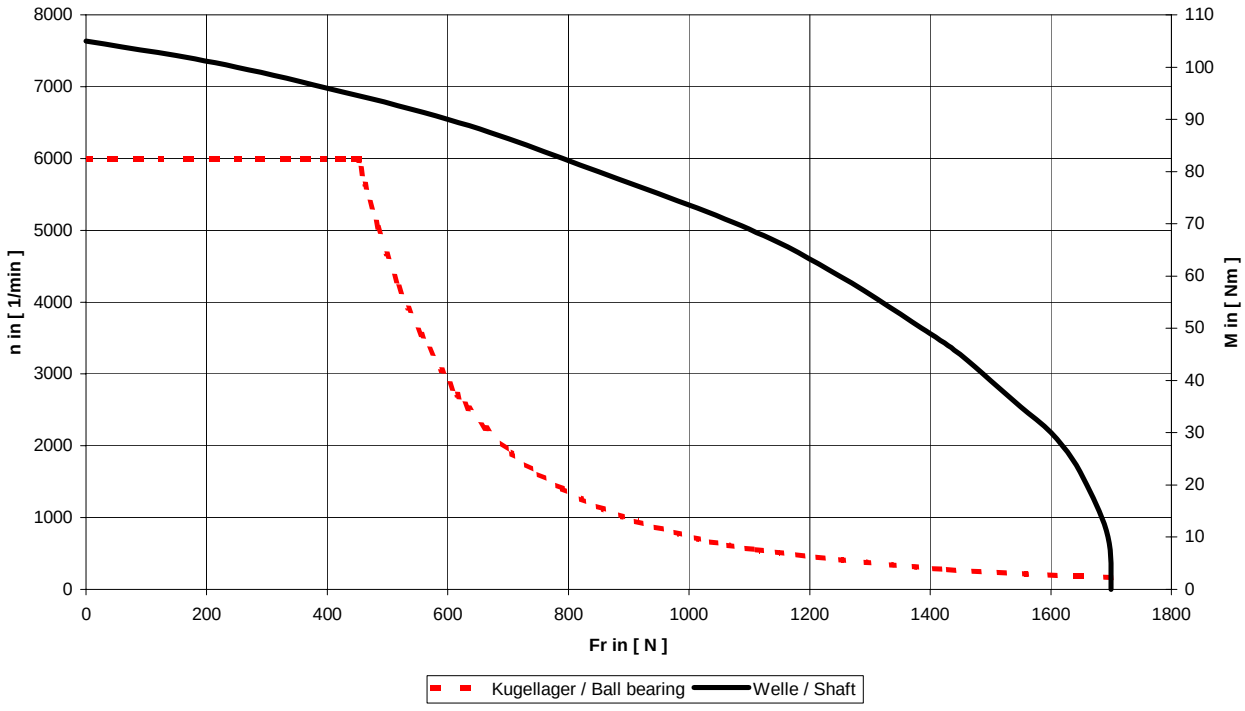
The maximum transmittable torque results from the "Shaft" characteristic.

Radial force 850 N => maximum transmittable torque 185 Nm

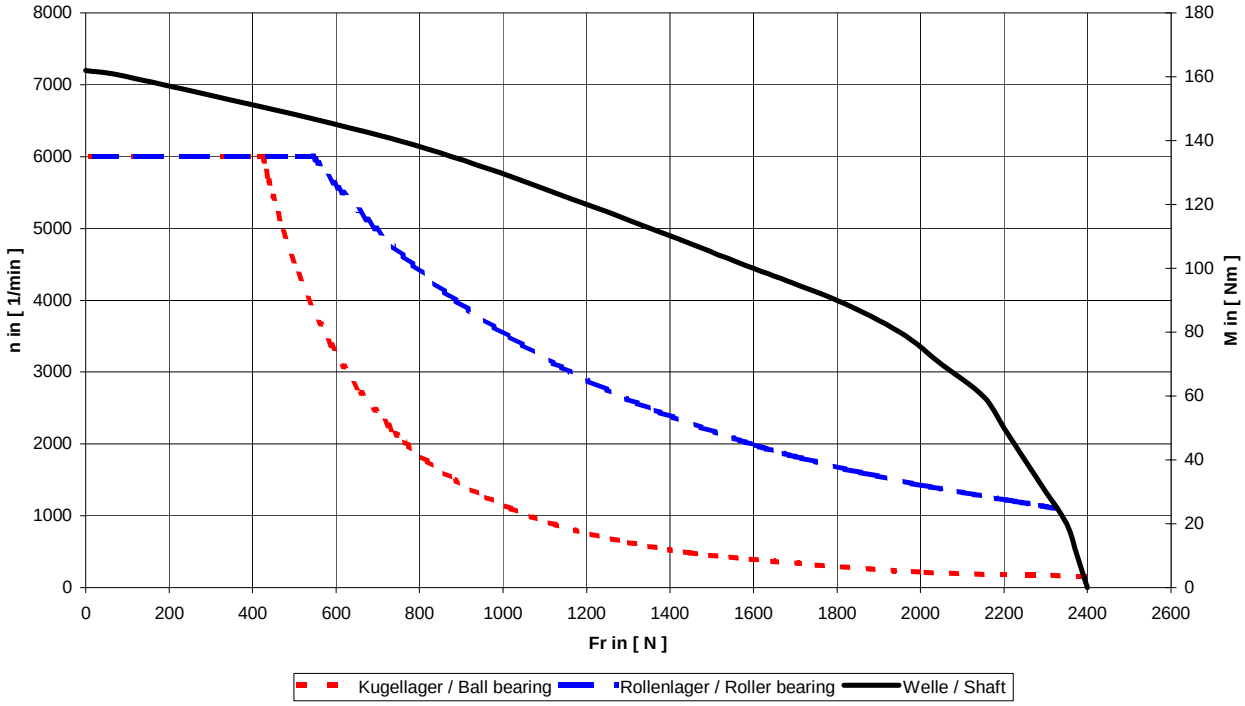
DSD 45


10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
n in [1/min]
20
10
0
M in [Nm]
0
100
200
300
400
500
600
Fr in [N]
Kugellager / Ball bearing
Welle mit Paßfedernut / Shaft with key

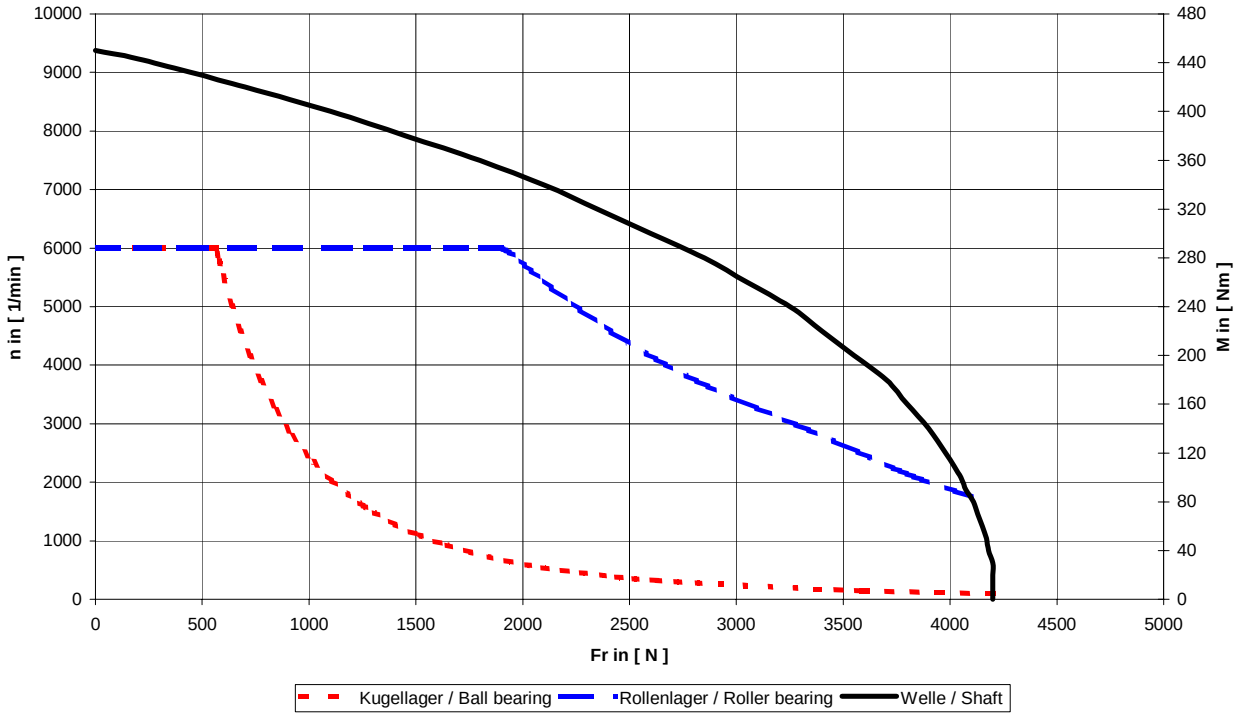
DSD 56


8000
7000
6000
5000
4000
3000
2000
1000
0
n in [1/min]
110
100
90
80
70
60
50
40
30
20
10
0
M in [Nm]
0
200
400
600
800
1000
1200
1400
1600
1800
Fr in [N]
Kugellager / Ball bearing
Welle / Shaft

DSD 71



DSD 100



Brake assignment

The motors are optionally equipped with a holding brake. The brake uses the normally-on principle, i.e. the brake engages with the operating voltage is switched off or fails. The brakes are supplied for a switching voltage of 24 VDC ± 10%.

The motors are available with the following holding brakes:

Motor type	DSD 45	DSD 56	DSD 71	DSD 100
minimum holding torque	6	15	35	80
max. perm. friction work per braking operation [J]	1000	2000	5000	15000
Connection values (±10% smoothed)	24 V = 19 W	24 V = 22 W	24 V = 35 W	24 V = 52 W
Inertia [$kgcm^2$]	0.3	0.8	3.5	8.6
Maximum speed [min^{-1}]	6000	6000	6000	4500
Switching time On Brake released [ms]	50	70	100	140
Off [ms]	50	70	100	140
Weight [kg]	1.0	2.0	3.5	8.2

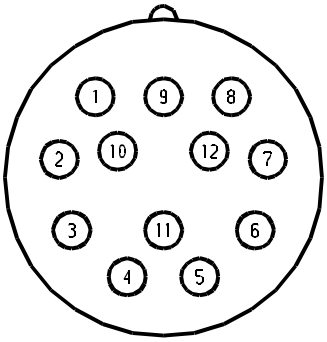
None of the brakes are **fail-safe brakes** so that the torque may be reduced by interference factors beyond control. In accordance with the case of application, observe the relevant accident prevention guidelines as well as the basic safety and health requirements of Appendix I of the Machinery Directive and the harmonized European Standards.
In the event of emergency stop or voltage failure, approx. 2,500 braking operations can be carried out without causing the holding brake to overheat (Condition: maximum external inertia = motor inertia and $n_{max.}$ type-related).

Encoders

Resolver

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

Resolver connection



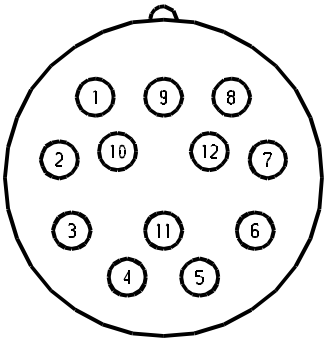
Pin	Signal
1	cos -
2	
3	
4	
5	sin –
6	sin +
7	TM -
8	cos +
9	TM +
10	Ref +
11	
12	Ref -

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, halbduplex	
Operating voltage range (V)	7 ... 12	
Operating current without load (mA)	80	

SRS/SRM 50 connection

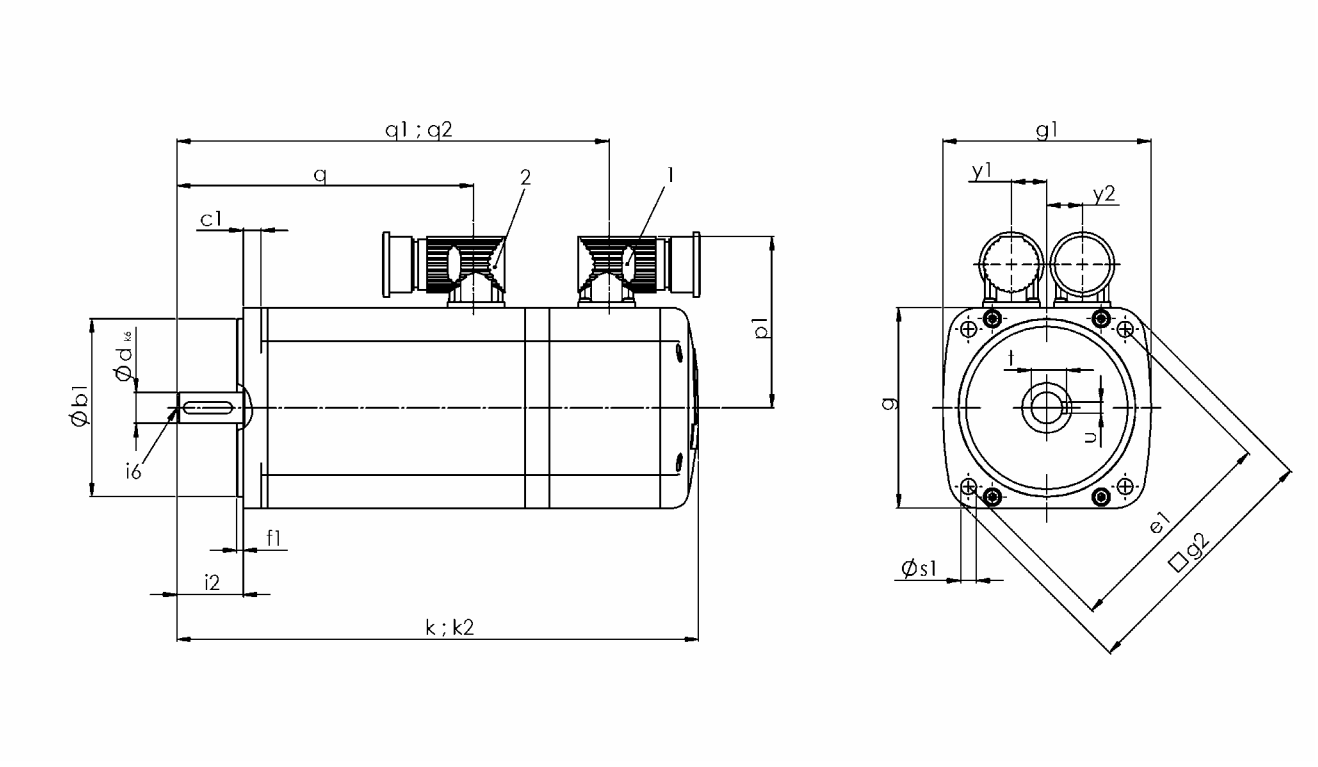


Pin	Signal
1	ref cos
2	+ 485
3	-
4	-
5	sin
6	ref sin
7	- 485
8	cos
9	-
10	Gnd
11	-
12	+ U

View to contact side of female connector

Drawings

DSD 45 standard version,
main connection with connector



k = motor with encoder
k2 = motor with brake and encoder
q1 = motor with encoder
q2 = motor with brake and encoder

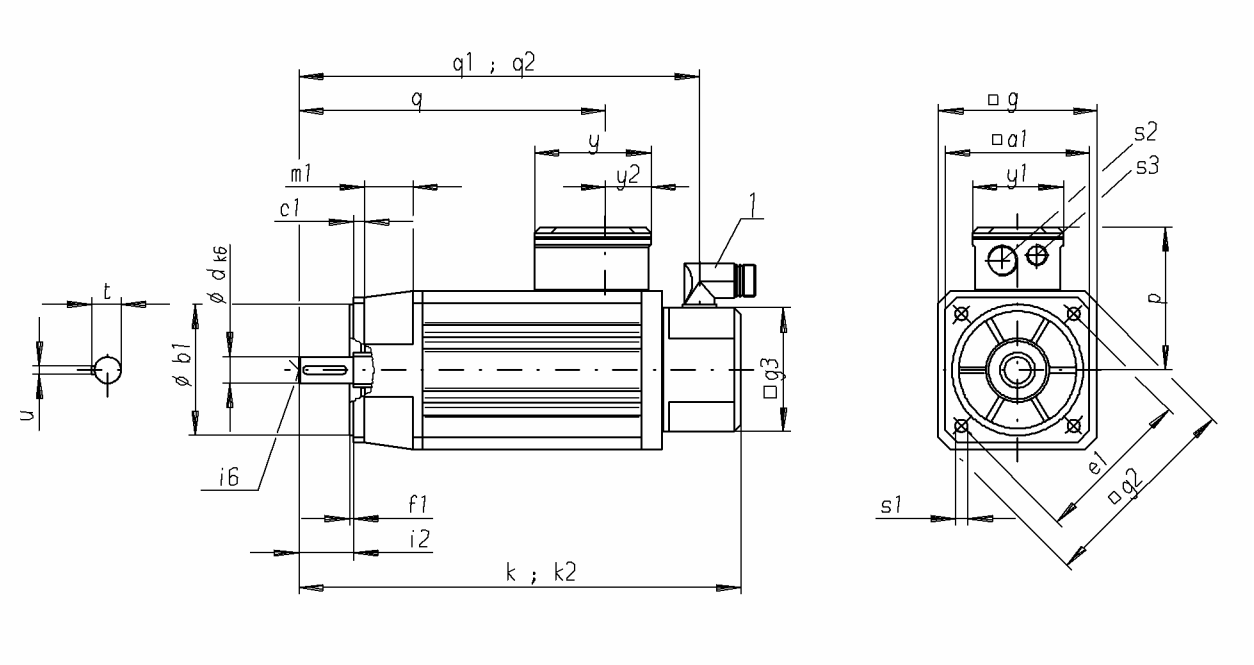
i6 = Centring with internal thread acc. to DIN 332 form D
1 = Encoder connector
2 = Connector for main connection/brake (use only up to 44 A)

- DC link voltage of 540 V motors
- Key: Motors are also available with key DIN 6885.
- IP 65 type of protection is ensured with mounted connectors only.
- Shaft gland protection type is IP64

Type	Flange							Shaft			Motor												Brake	
	a1	b1	c1	e1	f1	i2	s1	d	t	u	g2	g	g1	k	m1	p1	q	q1	y	y1	y2	s2	s3	k2	q2
45 S	-	80	8	100	3	30	7	14	16	5	115	90	94	240	-	75	134	195	-	16	16	-	-	300	260
45 M														270			164	225						330	290
45 L														300			194	255						360	320

Version IM B5	Type of protection IP 65	Cooling method IC 0041		

DSD 56 / 71 / 100 standard version,
main connection with terminal box



k = motor with encoder
k2 = motor with brake and encoder
q1 = motor with encoder
q2 = motor with brake and encoder

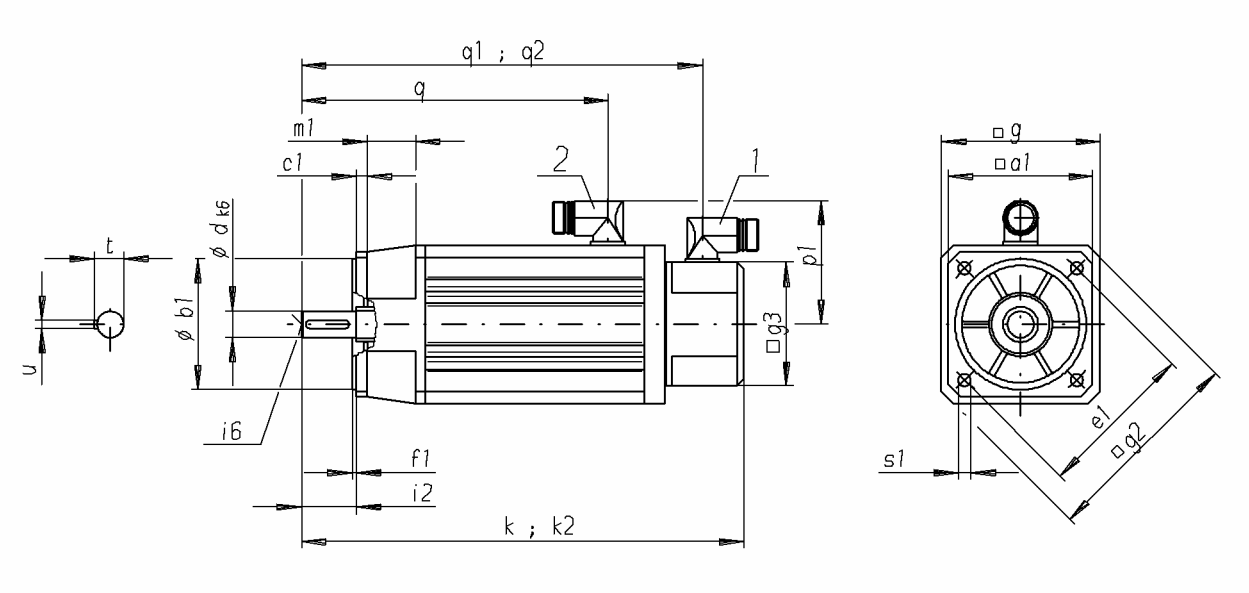
i6 = Centring with internal thread acc. to DIN 332 form D
1 = Encoder connector

- DC link voltage of 540 V motors
- Key: Motors are also available with key DIN 6885.
- Brake: When a brake is mounted the dimensions remain unchanged.
- IP 65 type of protection is ensured with mounted connectors only.
- Shaft gland protection type is IP64

Type	Flange							Shaft			Motor													Brake	
	a1	b1	c1	e1	f1	i2	s1	d	t	u	g2	g	g3	k	m1	p	q	q1	s2	s3	y	y1	y2	k2	q2
56 S	120	110	9	130	3.5	50	9	24	27	8	150	115	90	291	28	103	183	261	M20	M16	85	66	33	376	346
56 M														329			221	299						414	384
56 L														367			259	337						452	422
71 S	142	130	10	165	3.5	58	12	28	31	8	186	142	90	337	32	129	230	307	M25	M16	110	70	35	421	391
71 M														377			270	347						461	431
71 L														417			310	387						501	471
100 S	190	180	12	215	4	80	14	38	41	10	250	190	90	408	38	174	288	378	M16	M40	150	135	37	528	498
100 M														460			340	430						580	550
100 L														512			392	482						632	602

Version IM B5	Type of protection IP 65	Cooling method IC 0041		

DSD 56 / 71 / 100 standard version,
main connection with connector



k = motor with encoder
k2 = motor with brake and encoder
q1 = motor with encoder
q2 = motor with brake and encoder

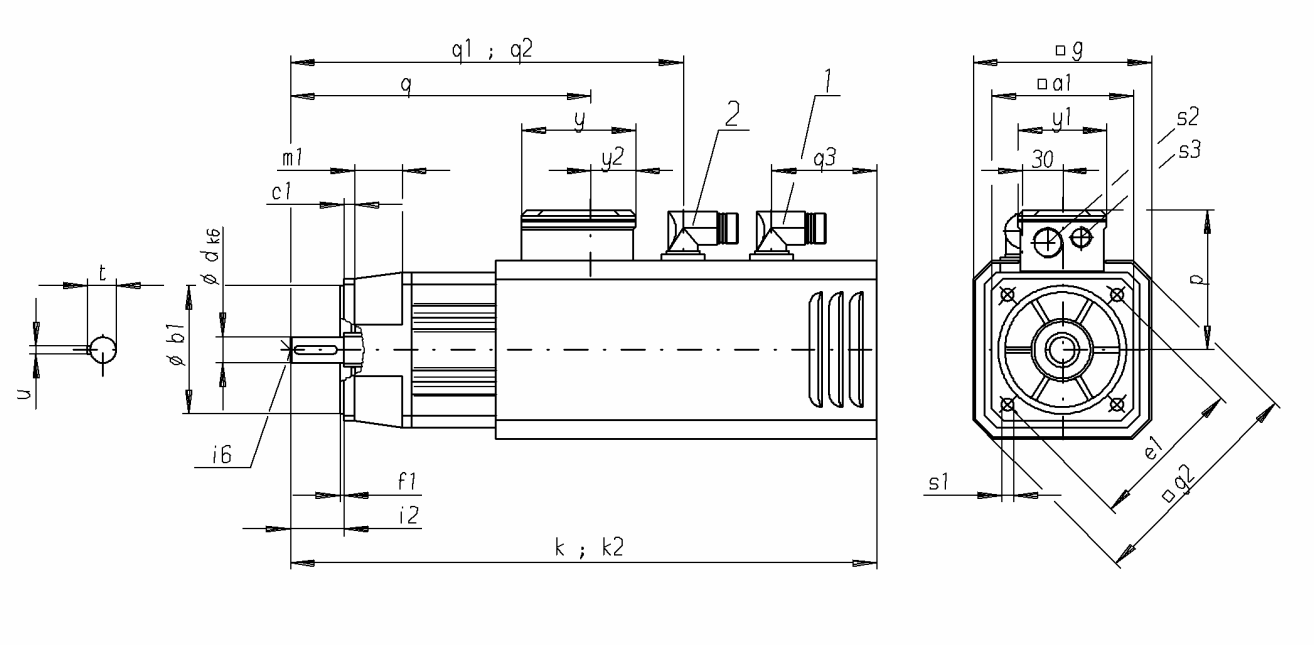
i6 = Centring with internal thread acc. to DIN 332 form D
1 = Encoder connector
2 = Connector for main connection/brake (use only up to 44 A)

- DC link voltage of 540 V motors
- Key: Motors are also available with key DIN 6885.
- IP 65 type of protection is ensured with mounted connectors only.
- Shaft gland protection type is IP64

Type	Flange							Shaft			Motor													Brake	
	a1	b1	c1	e1	f1	i2	s1	d	t	u	g2	g	g3	k	m1	p1	q	q1	y	y1	y2	s2	s3	k2	q2
56 S	120	110	9	130	3.5	50	9	24	27	8	150	115	90	291	28	123	183	261	-	-	-	-	-	376	346
56 M														329			221	299						414	384
56 L														367			259	337						452	422
71 S	142	130	10	165	3.5	58	12	28	31	8	186	142	90	337	32	136	230	307	-	-	-	-	-	421	391
71 M														377			270	347						461	431
71 L														417			310	387						501	471
100 S	190	180	12	215	4	80	14	38	41	10	250	190	90	408	38	160	288	378	-	-	-	-	-	528	498
100 M														460			340	430						580	550
100 L														512			392	482						632	602

Version IM B5	Type of protection IP 65	Cooling method IC 0041		

DSD 56 / 71 / 100 standard version with fan,
main connection with terminal box



k = motor with encoder
k2 = motor with brake and encoder
q1 = motor with encoder
q2 = motor with brake and encoder

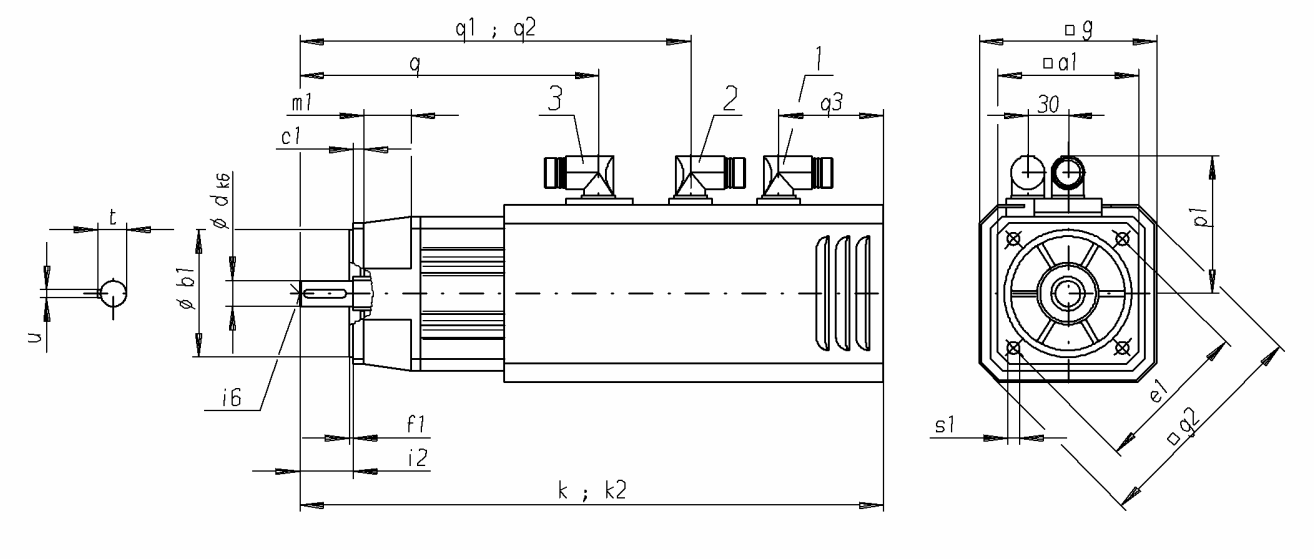
i6 = Centring with internal thread acc. to DIN 332 form D
1 = Fan connector
2 = Encoder connector

- DC link voltage of 540 V motors
- Key: Motors are also available with key DIN 6885.
- IP 65 type of protection is ensured with mounted connectors only.
- Shaft gland protection type is IP64

Type	Flange							Shaft			Motor														Brake	
	a1	b1	c1	e1	f1	i2	s1	d	t	u	g2	g	k	m1	p	q	q1	q3	y	y1	y2	s2	s3	k2	q2
56 S	120	110	9	130	3.5	50	9	24	27	8	185	140	426	28	103	183	261	124	85	66	33	M20	M16	511	346
56 M													464			221	299							549	384
56 L													502			259	337							587	422
71 S	142	130	10	165	3.5	58	12	28	31	8	230	180	466	32	129	230	307	124	110	70	35	M25	M16	550	391
71 M													506			270	347							590	431
71 L													546			310	387							630	471
100 S	190	180	12	215	4	80	14	38	41	10	275	215	537	38	174	288	378	124	150	135	37	M16	M40	657	498
100 M													589			340	430							709	550
100 L													641			392	482							761	602

Version IM B5	Type of protection IP 54	Cooling method IC 0641		

DSD 56 / 71 / 100 standard version with fan,
main connection with connector



k = motor with encoder
k2 = motor with brake and encoder
q1 = motor with encoder
q2 = motor with brake and encoder

i6 = Centring with internal thread acc. to DIN 332 form D
1 = Fan connector
2 = Encoder connector
3 = Connector for main connection/brake

- DC link voltage of 540 V motors
- Key: Motors are also available without key
- IP 65 type of protection is ensured with mounted connectors only.
- Shaft gland protection type is IP64

Type	Flange							Shaft			Motor														Brake	
	a1	b1	c1	e1	f1	i2	s1	d	t	u	g2	g	k	m1	p1	q	q1	q3	y	y1	y2	s2	s3	k2	q2
56 S	120	110	9	130	3.5	50	9	24	27	8	180	134	426	28	123	183	261	124	-	-	-	-	-	511	346
56 M													464			221	299							549	384
56 L													502			259	337							587	422
71 S	142	130	10	165	3.5	58	12	28	31	8	230	178	466	32	136	230	307	124	-	-	-	-	-	550	391
71 M													506			270	347							590	431
71 L													546			310	387							630	471
100 S	190	180	12	215	4	80	14	38	41	10	284	224	537	38	160	288	378	124	-	-	-	-	-	657	498
100 M													589			340	430							709	550
100 L													641			392	482							761	602

Version IM B5	Type of protection IP 54	Cooling method IC 0641		

Motor cables

General
The motor cables are highly flexible trailing cables with overall shielding. They comply with the regulations VDE, UL and CSA.
The control cables are integrated as star-quads integriert. When the sincos encoder is used the brake triggering and the connection of the thermal sensor are brought out via the main connector.
The cables are particularly suitable for the optimum use of cable racks thanks to their low cross-section, low weight and non-impeding surface. They can thus be efficiently used in trailing chains.
The overall shielding with an optical coverage of more than 85% makes it an EMC uncritical cable.
The connector size is designed in accordance with the motor's standstill current I_0.

Technical data
Technical description

- Sheath resistance against media such as coolants, machine and gearbox oils
- Abrasion resistance because of a special surface in cable racks and trailing chains
- High-flexible, trailing cable
- Sheath surface not blocking, satin-finish
- Shield made of tinned copper braid with optical coverage of ≥ 85 %
- Core insulation made of TPE or polyester, sheath material PUR holgene-free
- Cable FCF-free and silicone-free
- Behavior in case of fire: fire-inhibiting, halogene-free
- Cable color in RAL 1028, melon yellow
- Labelling with Baumüller sign, VDE, UL and CSA sign
- Minimum bending radius for flexible use 12 x D

Nominal voltage
Uo/U 600 / 1000 V (power cores)
U 24 V DC (control cores)

Core lettering
Power cores U, VV, WWW
Colored control cable pairs as star-quads in red, white, black, yellow
Assignment of pairs red – black (brake),
white – yellow (temperature)

Cable data

Cable cross-section	Nominal current [A][1)]	Cable diameter [mm]
4×1.5 mm² 4×0.75 mm²	15	11.7 – 12.3
4×2.5 mm² 4×0.75 mm²	21	12.7 – 14.6
4×4 mm² 4×0.75 mm²	28	14.2 – 15.4
4×6 mm² 4×0.75 mm²	36	16.6 – 17.9
4×10 mm² 4×0.75 mm²	50	20.5 – 21.5
4×16 mm² 4×0.75 mm²	66	23.0 – 25.8
4×25 mm² 2×(2×1.5 mm²)	84	26.3 – 29.7
4×35 mm² 2×(2×1.5 mm²)	104	30.8 – 32.5

1) Current carrying capacity acc. to table 5 laying type C or E
(VDE 0113 / EN 60 204 Part 1 issue 1997)
Ambient temperature 40°C

Cable – connector assignment

Cable cross-sections	nominal current [A]	Male connector 540 V Volume
4×1.5 mm^2 4×0.75 mm^2	15	1
4×2.5 mm^2 4×0.75 mm^2	21	1.5
4×4 mm^2 4×0.75 mm^2	28	1.5
4×6 mm^2 4×0.75 mm^2	36	1.5
4×10 mm^2 4×0.75 mm^2	50	1.5

The connectors must be designed with respect to the I_0 motor current. For the laying of the cables, the current carrying capacity acc. to table 5 laying type C or E (VDE 0113 / EN 60 204 Part 1 issue 1997) and an ambient temperature of 40°C must be considered.

Cables of 2.5 mm^2 can be laid up to 100 m without additional filters, when larger cross-sections used, up to 40 m are permissible. The terminal voltage at the motor must be < 1kV. When longer cables are used, filters must be installed between converter and motor.

Application notes

Operating temperature
The cables can be operated within a temperature range from –20°C to +80°C.

Cable laying at the motor
The cables must not touch the motor surface.

Smallest permissible bending radii
12 times outer cable diameter.
Smaller bending radii are possible with reduced service life.

Main connection cables / Assembled cable with connector

Nominal current: 15 A
Cable 4 x 1.5 mm² + 4x 0.75 mm²
with connector size 1

Length in m	Article no.
5	324781
7	324782
10	324783
15	324784
20	324785
25	324786
30	324787
35	324788
40	324789
50	324790
75	324791
100	324792

Nominal current: 21 A
Cable 4 x 2.5 mm² + 4x 0.75 mm²
with connector size 1.5

Length in m	Article no.
5	326577
7	326578
10	326579
15	326580
20	326581
25	326582
30	326583
35	326584
40	326585
50	326586
75	326587
100	326588

Nominal current: 28 A
Cable 4 x 4 mm² + 4x 0.75 mm²
with connector size 1.5

Length in m	Article no.
5	326589
7	326591
10	326592
15	326593
20	326594
25	326596
30	326597
35	326598
40	326599

Nominal current: 36 A
Cable 4 x 6 mm² + 4x 0.75 mm²
with connector size 1.5

Length in m	Article no.
5	326600
7	326601
10	326602
15	326603
20	326604
25	326605
30	326606
35	326607
40	326608

Nominal current: 50 A
Cable 4 x 10 mm² + 4x 0.75 mm²
with connector size 1.5

Length in m	Article no.
5	326609
7	326610
10	326611
15	326612
20	326613
25	326614
30	326615
35	326616
40	326617

Connector

Type	Article no.
Size 1 f. 4x1.5mm^2	261740
Size 1.5 f. 4x2.5mm^2 o. 4mm^2	326574
Size 1.5 f. 4x6mm^2 o.10mm^2	326569

Larger cable cross-sections on request.
Longer cables can also be used. The terminal voltage at the motor must be < 1kV. In this case, however, filters must be installed between converter and motor.

Encoder cables

General

A fully preassembled encoder cable is used for all encoder systems. Motor connection is via a 12-pin round signal connector and converter connection via a 15-pin sub-D plug. The encoder cables are available as 'trailing' and 'non-trailing' cables. The trailing cable is suitable for use in trailing chains, for example. As opposed to the 'non-trailing' cable, the cable sheath consists of tougher PUR for use in environments with acids and bases (coolants) instead of PVC. Up to a length of 10 m, the cables are available in 1 m sections (1 m, 2 m, 10 m). From a cable length of 10 m, the sections come in 5 m intervals (10 m, 15 m, …).

In the case of servo motors, the resolver encoder system links the temperature sensor with the converter via the encoder cable.

Technical data

1. Technical description – non-trailing

- LiYCY, 5x (2x0.14mm²) + 2 x 0.5mm² copper lead, twisted pair
- PVC sheath, grey
- 1st end: 12-pin signal circular connector with 12 female contacts
- 2nd end: 15-pin D-Sub connector with male contacts and locking screws 4-4OUNC
- Baumüller labelling, black
- Outer diameter 9.0 mm (+/-3mm)
- Bending radius: $r \geq 60$ mm (fixed installation), $r \geq 135$ mm (flexible use)
- Nominal voltage: $250V_{AC}$

2. Technical description – trailing

- Li12YC11Y, 5x (2x0.14mm²) + 2 x 0.5mm² copper lead, twisted pair
- PU sheath, black
- 1st end: 12-pin signal circular connector with 12 female contacts
- 2nd end: 15-pin D-Sub connector with male contacts and locking screws 4-4OUNC
- Baumüller labelling, white
- Outer diameter 9.0 mm (+/-3mm)
- Bending radius: $r \geq 70$ mm (fixed installation), $r \geq 100$ mm (flexible use)
- Nominal voltage: $300V_{AC}$

Application notes

- Operating temperature

	trailing	non-trailing
Limit temperature	at the surface	at the surface
no / few movements	-40 °C to +80 °C	- 30 °C to +80 °C
continuous movements	- 30 °C to +80 °C	-5 °C to + 70 °C

- Cable laying at the motor

The cables must not touch the motor surface.

Ordering data

Encoder cables / preassembled cables with connector

Encoder cable

Non-trailing,assembled
Cable 5 x (2x014mm^2) + 2 x 0.5 mm² with connector

Length in m	Article no.
1	243601
2	211338
3	219333
4	231166
5	209879
6	220197
7	216455
8	220429
10	210052
15	215716
20	218568
25	218569
30	217094
35	216444
40	217095
45	217567
50	217568
55	217569
60	217570
70	232088

Trailing, assembled
Cable 5 x (2x014mm^2) + 2 x 0.5 mm² with connector

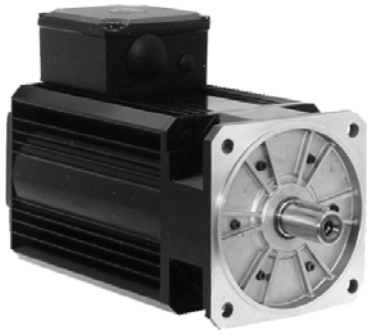
Length in m	Article no.
3	246658
4	243379
5	239540
6	242954
8	239541
10	239542
15	239543
20	239544
25	239545
30	239546
35	239547
40	240520
45	240521
50	240522
55	244033
60	245484

Encoder connector	Article no.
Encoder connector	201833

Commissioning and maintenance instructions

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

Three-phase synchronous motors DS 45 - 100..540V



General technical data

Version:	IM B5	Horizontal mounting
	IM V1	Vertical mounting, shaft end to the bottom
	IM V3	Vertical mounting, shaft end to the top
Type of protection:	IP65	Surface-cooled, **without** fan, DIN 40050, DIN 40053
	IP54	Surface-cooled, **with** fan
Shaft gland:	IP64	Standard
	IP65	with shaft sealing ring (option)
Connection:		
Main connection	U V W	Terminal box
		Connector (option)
		Frame size 45 with connector as standard
Control connection		12-pin connector
Brake		in the main connection
Thermal sensor		in control connection (for resolver only)
Cooling method:	IC 0041	completely enclosed machine surface-cooled no fan
	IC 0641	as above, but with fan (air flow direction from B to A end)
Thermal sensor:		Linear thermal sensor for evaluation in the controller
Temperature rise:	$\Delta\vartheta$ = 105K	Insulation class F acc. to EN 60034
Temperature range:	0....+ 40°C	
Storage:	-30°C...+85°C	
Paint:	black matt	RAL 9005
Lager:	$\geq$ 20,000h	Service life
Balance quality:	N	According to DIN ISO 2373
	R, S	On request
Vibration-resistant up to:	radial 3g	20 Hz to 2 kHz acc. to EN 60068-2-6
	axial 0.5g	20 Hz to kHz acc to EN 60068-2-6
		Higher vibration resistance on request
Flange:	acc. to IEC standard	Dimension b1: Tolerance j6
Shaft end:	cylindrical	According to DIN 748 with shaft key DIN 6885; also available without keyway)
		Dimension d: Tolerance k6
		Centering with internal thread acc. to DIN 332 form D
Holding brake:	Option	
Actual speed encoder:	2-pin resolver	
	Sincos encoder (option)	Other encoders on request

Ratings definition

The ratings (torques) listed in the table apply to continuous operation (S1) with nominal speed at a maximum ambient temperature of 40°C with the machine being installed below 1000m a.m.s.l.

If motors are to be operated in an ambient temperature of more than 40 °C or altitudes above 1000 m a.m.s.l., the required list nominal power P_L (list torque M_n) results from the product of the factors k_1, k_2 specified in the table and the required power P (torque M).

Ambient temperature	40 °C	45°C	50 °C	55°C	60°C	For ambient temperatures above 40 °C and enclosed installation of motors, it is absolutely necessary to contact the manufacturer, because design changes may be necessary. If, with increasing site altitude above 1000 m, the ambient temperature decreases by approx. 10 °C per 1000 m increase in altitude, no power correction is necessary.
Correction factor k_1	1	1.06	1.13	1.22	1.34	
Altitude a.m.s.l. up to	1.000 m	2.000 m	3.000 m	4.000 m	5.000 m	
Correction factor k_2	1	1.07	1.16	1.27	1.55	

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 room temperature of up to 40 °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

$M_{0,}$ I_0	Nominal torque (Nm) with nominal current (A) with speed >= 1 min^{-1} without time limit, I_0 is the r.m.s. value
M_N, I_N	Nominal torque (Nm) with Nominal current (A) with nominal speed n_N in continuous operation (S1);TA = 40 °C*
$M_{S3\text{-}40\%,}$ $I_{S3\text{-}40\%}$	Torque and speed for intermittent operation S3-40% duty time, cycle of 10 minutes
n_N	Nominal speed (min^{-1})
k_E	Motor e.m.f. referred to 1000 min^{-1} (voltage constant)
k_T	Torque constant: k_T x I_0 = M_0 + M_R (intrinsic moment)
k_D	Torque loss referred to 1000 min^{-1} (eddy-current loss)
M_R	Bearing friction including hysteresis torque
m	Weight in kg
J	Rotor inertia incl. resolver without holding brake (kg cm²)

The specified ratings / torques at nominal speed are achieved with a chopping frequency of $\geq$ 4 kHz in the power unit of the converter. A chopping frequency of $>$ 6 kHz is recommended.
* A part of the loss in the motor is dissipated via the flange. The temperature at the flange must not exceed 65°C!

Basic calculation

Valid under the prerequisite that torque and speed are within the speed-torque characteristic.

Motor current I for speed n and torque M

$$I = \frac{M + M_R + k_D * n/10^3}{k_T} [A]$$

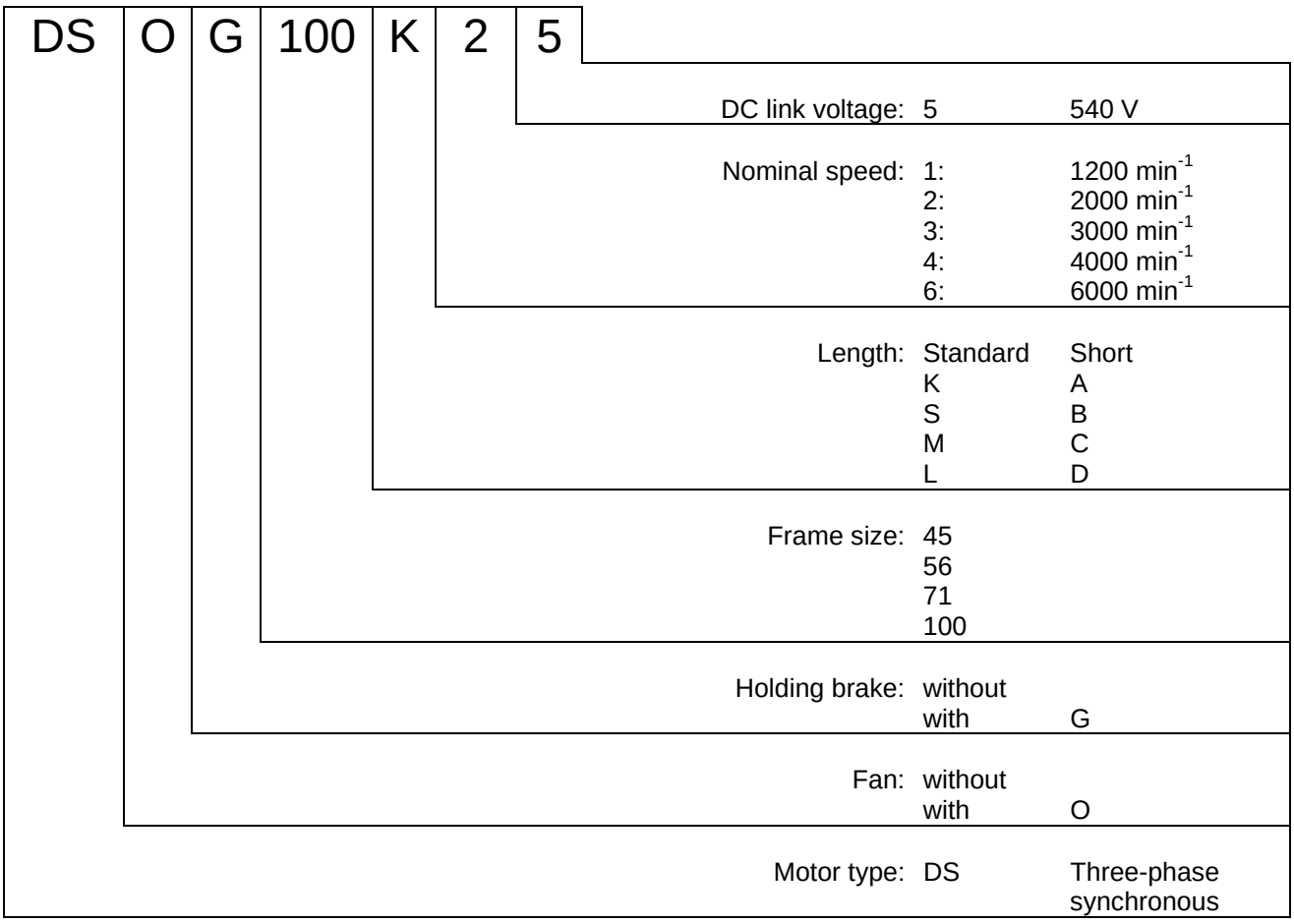
Torque M for any speed and current I

$$M = I * k_T - (M_R + k_D * \frac{n}{10^3}) [Nm]$$

Performance overview

DS (Three-phase current synchronous	Frame size	Standstill torque
Standard version without fan	DS 45...100	0.8 - 57 Nm
Standard version with fan	DSO 56...100	4.8 - 84 Nm
Short version without fan	DS 56...100	1.9 – 24 Nm
Standard version with holding brake	DSG 45...100	0.8 – 57 Nm
Standard version with holding brake and fan	DSOG 56...DSOG 100	4.8 – 84 Nm
Short version with brake	DSG 56...DSG 100	1.9 – 24 Nm

Type key



Technical data

DS standard version

Type	n_N ($^1/_{min}$)	M_0 (Nm)	M_0 (lbf ft)	M_N (Nm)	M_N (lbf ft)	$M_{S3-40\%}$ (Nm)	M_{S3-40} (lbf ft)	I_0 (A)	I_N (A)	$I_{S3-40\%}$ (A)
DS 45 S	3000	0.8	0.6	0.8	0.6	1.0	0.74	0.7	0.7	0.8
DS 45 S	4000			0.7	0.5	1.2	0.89	0.9	0.8	1.3
DS 45 S	6000			0.6	0.4	1.0	0.74	1.4	1.1	1.7
DS 45 M	3000	1.7	1.3	1.6	1.2	2.4	1.8	1.3	1.3	1.9
DS 45 M	4000			1.5	1.1	2.3	1.7	1.8	1.6	2.4
DS 45 M	6000			1.1	0.8	2.0	1.5	2.7	1.9	3.2
DS 45 L	3000	3.2	2.4	2.9	2.1	4.4	3.2	2.5	2.3	3.4
DS 45 L	4000			2.7	2.0	4.2	3.1	3.3	2.9	4.3
DS 45 L	6000			2.0	1.5	3.8	2.8	4.9	3.3	6.0
DS 56 S	2000	3.8	2.8	3.7	2.7	5.4	4.0	1.8	1.8	2.6
DS 56 S	3000			3.6	2.7	5.4	4.0	2.5	2.4	3.6
DS 56 S	4000			3.4	2.5	5.3	3.9	3.2	3.0	4.5
DS 56 S	6000			2.6	1.9	4.7	3.5	5.1	3.8	6.6
DS 56 M	2000	7.0	5.2	6.9	5.1	10.1	7.4	3.0	3.0	4.3
DS 56 M	3000			6.4	4.7	9.8	7.2	4.2	4.0	6.0
DS 56 M	4000			5.6	4.1	9.4	6.9	5.5	4.6	7.6
DS 56 M	6000			2.9	2.1	7.9	5.8	8.0	3.8	9.4
DS 56 L	2000	10.0	7.4	9.5	7.0	14.1	10.4	4.1	4.0	5.8
DS 56 L	3000			8.4	6.2	13.6	10.0	5.9	5.1	8.1
DS 56 L	4000			6.9	5.1	12.7	9.4	7.7	5.6	10.0
DS 56 L	6000			0.6	0.4	9.8	7.2	11.1	1.5	11.5
DS 71 K	2000	10.5	7.7	10.3	7.6	15.2	11.2	4.4	4.4	6.4
DS 71 K	3000			9.5	7.0	14.8	10.9	6.3	5.9	9.0
DS 71 K	4000			8.2	6.0	14.2	10.5	8.3	6.7	11.4
DS 71 K	6000			3.8	2.8	11.8	8.7	11.9	5.0	13.9
DS 71 S	2000	16.5	12.2	15.4	11.4	23.4	17.3	6.6	6.3	9.5
DS 71 S	3000			13.4	9.9	22.4	16.5	9.6	8.1	13.3
DS 71 S	4000			10.3	7.6	20.7	15.3	12.4	8.2	16.0
DS 71 S	6000			0.0	0.0	16.4	12.1	18.6	0.0	20.1
DS 71 M	2000	22.0	16.2	20.0	14.8	27.6	20.4	8.4	7.8	10.7
DS 71 M	3000			16.3	12.0	28.3	20.9	12.3	9.5	16.2
DS 71 M	4000			10.4	7.7	16.3	12.0	15.8	8.2	12.4
DS 71 M	6000			0.0	0.0	18	13.3	24.8	0.0	13.8
DS 100 K	1200	25.0	18.4	24.8	18.3	36.3	26.8	6.3	6.3	9.2
DS 100 K	2000			23.3	17.2	35.9	26.5	10.0	9.5	14.4
DS 100 K	3000			19.9	14.7	34.4	25.4	14.5	11.9	20.2
DS 100 K	4000			14.7	10.8	31.7	23.4	19.1	11.9	24.7
DS 100 K	6000			0.0	0.0	24.8	18.3	28.2	0.0	19.8
DS 100 S	1200	36.0	26.6	34.7	25.6	51.6	38.1	8.8	8.6	12.6
DS 100 S	2000			31.4	23.2	50.4	37.2	14.0	12.4	19.7
DS 100 S	3000			24.6	18.1	47.0	34.7	20.3	14.4	26.9
DS 100 S	4000			13.8	10.2	41.7	30.8	27.0	11.5	32.1
DS 100 M	1200	46.0	33.9	43.7	32.2	66.0	48.7	11.0	10.5	15.8
DS 100 M	2000			38.2	28.2	63.6	46.9	17.6	15.0	24.6
DS 100 M	3000			27.1	20.0	58.0	42.8	25.9	16.0	33.2
DS 100 L	1200	57.0	42.0	52.1	38.4	79.7	58.8	13.5	12.5	19.0
DS 100 L	2000			44.2	32.6	76.0	56.1	21.4	17.1	28.9
DS 100 L	3000			28.1	20.7	67.7	49.9	32.2	16.9	39.0

Legend

	American units

Type	n_N ($^1/_{min}$)	k_E ($^V/_{1000\ 1/min}$)	k_T ($^{Nm}/_A$)	k_T (lbf ft / A)	k_D ($^{Nm}/_{1000\ 1/min}$)	M_R (Nm)	M_R (lbf ft)	m (kg)	m (lb)	J ($kgcm^2$)	J ($lb\ in^2$)
DS 45 S	3000	82.3	1.36	1.00	0.005	0.127	0.094	4.9	10.8	1.5	0.51
DS 45 S	4000	61.8	1.02	0.75							
DS 45 S	6000	41.2	0.68	0.50							
DS 45 M	3000	82.3	1.36	1.00	0.010	0.131	0.097	5.9	13.0	2.1	0.72
DS 45 M	4000	61.8	1.02	0.75							
DS 45 M	6000	41.2	0.68	0.50							
DS 45 L	3000	82.3	1.36	1.00	0.021	0.140	0.103	6.9	15.2	3.4	1.16
DS 45 L	4000	61.8	1.02	0.75							
DS 45 L	6000	41.2	0.68	0.50							
DS 56 S	2000	133	2.2	1.62	0.030	0.154	0.114	6.6	14.6	5.7	1.95
DS 56 S	3000	95.2	1.57	1.16							
DS 56 S	4000	74.6	1.23	0.91							
DS 56 S	6000	46.0	0.76	0.56							
DS 56 M	2000	145.4	2.41	1.78	0.062	0.180	0.133	8.5	18.7	10.2	3.49
DS 56 M	3000	102	1.69	1.25							
DS 56 M	4000	78.8	1.3	0.96							
DS 56 M	6000	54.5	0.9	0.66							
DS 56 L	2000	150	2.48	1.83	0.094	0.208	0.153	10.8	23.8	15.7	5.36
DS 56 L	3000	104.7	1.73	1.28							
DS 56 L	4000	80	1.33	0.98							
DS 56 L	6000	55.6	0.92	0.68							
DS 71 K	2000	147.5	2.44	1.80	0.082	0.230	0.170	12.2	26.9	22.4	7.65
DS 71 K	3000	102.4	1.69	1.25							
DS 71 K	4000	79	1.3	0.96							
DS 71 K	6000	54.3	0.9	0.66							
DS 71 S	2000	152.8	2.53	1.87	0.139	0.280	0.207	16.3	35.9	36.3	12.40
DS 71 S	3000	105.2	1.74	1.28							
DS 71 S	4000	81.5	1.35	1.00							
DS 71 S	6000	56	0.9	0.66							
DS 71 M	2000	161	2.66	1.96	0.202	0.334	0.246	20.5	45.2	50.2	17.15
DS 71 M	3000	109.7	1.81	1.33							
DS 71 M	4000	85.3	1.41	1.04							
DS 71 M	6000	54.5	0.9	0.66							
DS 100 K	1200	243	4.02	2.96	0.195	0.400	0.295	26.1	57.5	74	25.29
DS 100 K	2000	153.5	2.54	1.87							
DS 100 K	3000	106	1.75	1.29							
DS 100 K	4000	80.4	1.33	0.98							
DS 100 K	6000	54.8	0.9	0.66							
DS 100 S	1200	250	4.15	3.06	0.297	0.489	0.361	32.7	72.1	108	36.91
DS 100 S	2000	158	2.61	1.93							
DS 100 S	3000	109	1.8	1.33							
DS 100 S	4000	81.7	1.35	1.00							
DS 100 M	1200	257	4.25	3.13	0.398	0.579	0.427	39.6	87.3	141	48.18
DS 100 M	2000	159.3	2.64	1.95							
DS 100 M	3000	108.6	1.8	1.33							
DS 100 L	1200	257.5	4.26	3.14	0.500	0.668	0.493	48.8	107.6	175	59.80
DS 100 L	2000	162.6	2.69	1.98							
DS 100 L	3000	108.4	1.79	1.32							

DS standard version with fan

Type	n_N ($^1/_{min}$)	M_0 (Nm)	M_0 (lbf ft)	M_N (Nm)	M_N (lbf ft)	$M_{S3-40\%}$ (Nm)	$M_{S3-40\%}$ (lbf ft)	I_0 (A)	I_N (A)	$I_{S3-40\%}$ (A)
DSO 56 S	2000	4.8	3.5	4.8	3.5	5.5	4.1	2.2	2.3	2.6
DSO 56 S	3000			4.8	3.5	5.3	3.9	3.1	3.2	3.5
DSO 56 S	4000			4.7	3.5	5.2	3.8	4.0	4.1	4.5
DSO 56 S	6000			4.2	3.1	4.7	3.5	5.9	5.4	6.0
DSO 56 M	2000	9.2	6.8	9.1	6.7	10.3	7.6	3.9	3.9	4.4
DSO 56 M	3000			9.0	6.6	10.1	7.4	5.5	5.5	6.2
DSO 56 M	4000			8.6	6.3	9.6	7.1	7.2	7.0	7.7
DSO 56 M	6000			7.3	5.4	8.5	6.3	10.5	8.8	10.2
DSO 56 L	2000	13.2	9.7	13.1	9.7	14.5	10.7	5.4	5.4	6.0
DSO 56 L	3000			12.5	9.2	14.2	10.5	7.7	7.5	8.5
DSO 56 L	4000			11.7	8.6	13.1	9.7	10.1	9.2	10.3
DSO 56 L	6000			9.2	6.8	11.5	8.5	14.7	10.9	13.4
DSO 71 K	2000	14.0	10.3	13.9	10.3	16.3	12.0	5.8	5.8	6.8
DSO 71 K	3000			13.7	10.1	15.9	11.7	8.4	8.4	9.7
DSO 71 K	4000			13.4	9.9	15.0	11.1	11.0	10.8	12.0
DSO 71 K	6000			11.8	8.7	13.5	10.0	16.0	14.1	16.0
DSO 71 S	2000	23.0	17.0	22.8	16.8	25.6	18.9	9.2	9.2	10.3
DSO 71 S	3000			21.9	16.2	24.5	18.1	13.4	13.0	14.5
DSO 71 S	4000			20.5	15.1	23.4	17.3	17.3	15.8	18.0
DSO 71 S	6000			16.3	12.0	18.1	13.3	25.2	18.9	20.8
DSO 71 M	2000	31.0	22.9	30.2	22.3	33.4	24.6	12.1	11.9	13.2
DSO 71 M	3000			28.6	21.1	33.5	24.7	17.8	16.8	19.6
DSO 71 M	4000			26.2	19.3	29.4	21.7	22.9	20.0	22.3
DSO 71 M	6000			18.8	13.9	25.0	18.4	35.0	22.7	29.6
DSO 100 K	1200	36.0	26.6	35.9	26.5	41.5	30.6	9.0	9.1	10.5
DSO 100 K	2000			35.6	26.3	41.3	30.5	14.3	14.3	16.6
DSO 100 K	3000			35.1	25.9	40.4	29.8	20.9	20.7	23.7
DSO 100 K	4000			33.5	24.7	37.7	27.8	27.5	26.2	29.4
DSO 100 K	6000			27.6	20.4	32.2	23.7	40.5	32.5	37.6
DSO 100 S	1200	53.0	39.1	52.8	38.9	59.0	43.5	12.9	12.9	14.4
DSO 100 S	2000			52.4	38.6	60.1	44.3	20.5	20.5	23.4
DSO 100 S	3000			50.1	37.0	57.2	42.2	29.8	28.7	32.6
DSO 100 S	4000			46.1	34.0	51.2	37.8	39.8	35.5	39.3
DSO 100 M	1200	69.0	50.9	68.8	50.7	77.9	57.5	16.3	16.4	18.6
DSO 100 M	2000			67.5	49.8	75.4	55.6	26.4	26.1	29.1
DSO 100 M	3000			63.1	46.5	69.9	51.6	38.7	36.1	39.9
DSO 100 L	1200	84.0	62.0	83.8	61.8	96.8	71.4	19.9	19.9	23.0
DSO 100 L	2000			81.4	60.0	91.8	67.7	31.5	30.9	34.7
DSO 100 L	3000			75.0	55.3	82.9	61.1	47.4	43.2	47.6

Legend

	American units

Typ	n_N ($^1/_{min}$)	k_E ($^V/_{1000\ 1/min}$)	k_T ($^{Nm}/_A$)	k_T (lbf ft / A)	k_D ($^{Nm}/_{1000\ 1/min}$)	M_R (Nm)	M_R (lbf ft)	m (kg)	m (lb)	J ($kgcm^2$)	J ($lb\ in^2$)
DSO 56 S	2000	132.9	2.2	1.62	0.030	0.154	0.114	8.3	18.3	5.7	1.95
DSO 56 S	3000	95.2	1.57	1.16							
DSO 56 S	4000	74.6	1.23	0.91							
DSO 56 S	6000	52.2	0.86	0.63							
DSO 56 M	2000	145.4	2.41	1.78	0.062	0.180	0.133	10.2	22.5	10.2	3.49
DSO 56 M	3000	102.1	1.69	1.25							
DSO 56 M	4000	78.8	1.3	0.96							
DSO 56 M	6000	54.5	0.9	0.66							
DSO 56 L	2000	149.9	2.48	1.83	0.094	0.208	0.153	12.5	27.6	15.7	5.36
DSO 56 L	3000	104.7	1.73	1.28							
DSO 56 L	4000	80.1	1.33	0.98							
DSO 56 L	6000	55.6	0.92	0.68							
DSO 71 K	2000	147.5	2.44	1.80	0.082	0.230	0.170	14.7	32.4	22.4	7.65
DSO 71 K	3000	102.4	1.69	1.25							
DSO 71 K	4000	78.9	1.3	0.96							
DSO 71 K	6000	54.3	0.9	0.66							
DSO 71 S	2000	152.8	2.53	1.87	0.139	0.280	0.207	18.8	41.4	36.3	12.40
DSO 71 S	3000	105.2	1.74	1.28							
DSO 71 S	4000	81.5	1.35	1.00							
DSO 71 S	6000	56	0.9	0.66							
DSO 71 M	2000	160.9	2.66	1.96	0.202	0.334	0.246	23.0	50.7	50.2	17.15
DSO 71 M	3000	109.7	1.81	1.33							
DSO 71 M	4000	85.3	1.41	1.04							
DSO 71 M	6000	54.5	0.9	0.66							
DSO 100 K	1200	243.1	4.02	2.96	0.195	0.400	0.295	29.6	65.3	74	25.29
DSO 100 K	2000	153.5	2.54	1.87							
DSO 100 K	3000	106	1.75	1.29							
DSO 100 K	4000	80.4	1.33	0.98							
DSO 100 K	6000	54.8	0.9	0.66							
DSO 100 S	1200	250.7	4.15	3.06	0.297	0.489	0.361	36.2	79.8	108	36.91
DSO 100 S	2000	158	2.61	1.93							
DSO 100 S	3000	109	1.8	1.33							
DSO 100 S	4000	81.7	1.35	1.00							
DSO 100 M	1200	257.1	4.25	3.13	0.398	0.579	0.427	43.1	95.0	141	48.18
DSO 100 M	2000	159.3	2.64	1.95							
DSO 100 M	3000	108.6	1.8	1.33							
DSO 100 L	1200	257.5	4.26	3.14	0.500	0.668	0.493	52.3	115.3	175	59.80
DSO 100 L	2000	162.6	2.69	1.98							
DSO 100 L	3000	108.4	1.79	1.32							

DS short version

Type	n_N ($^1/_{min}$)	M_0 (Nm)	M_0 (lbf ft)	M_N (Nm)	M_N (lbf ft)	$M_{S3-40\%}$ (Nm)	$M_{S3-40\%}$ (lbf ft)	I_0 (A)	I_N (A)	$I_{S3-40\%}$ (A)
DS 56 A	2000	1.9	1.4	1.8	1.3	2.7	2.0	1.0	0.9	1.4
DS 56 A	3000			1.8	1.3	2.8	2.1	1.5	1.4	2.2
DS 56 A	4000			1.8	1.3	2.7	2.0	2.0	2.0	2.9
DS 56 A	6000			1.4	1.0	2.5	1.8	3.1	2.5	4.1
DS 56 B	2000	3.7	2.7	3.6	2.7	5.4	4.0	1.7	1.7	2.5
DS 56 B	3000			3.6	2.7	5.3	3.9	2.4	2.4	3.5
DS 56 B	4000			3.3	2.4	5.1	3.8	3.1	2.9	4.4
DS 56 B	6000			2.4	1.8	4.6	3.4	4.6	3.3	5.8
DS 71 B	2000	7.0	5.2	6.9	5.1	10.2	7.5	3.5	3.5	5.1
DS 71 B	3000			6.5	4.8	10.0	7.4	5.3	5.1	7.6
DS 71 B	4000			5.7	4.2	9.6	7.1	7.1	6.1	9.9
DS 71 B	6000			3.3	2.4	8.2	6.0	10.8	5.9	13.1
DS 71 C	2000	10.0	7.4	9.8	7.2	14.6	10.8	4.2	4.2	6.1
DS 71 C	3000			8.9	6.6	14.2	10.5	6.1	5.5	8.7
DS 71 C	4000			7.4	5.5	13.4	9.9	7.9	6.2	10.8
DS 71 C	6000			2.2	1.6	10.8	8.0	11.6	3.4	13.0
DS 100 B	1200	12.5	9.2	12.4	9.1	18.8	13.9	3.7	3.7	5.6
DS 100 B	2000			12.3	9.1	18.8	13.9	6.3	6.3	9.5
DS 100 B	3000			11.5	8.5	18.4	13.6	9.5	9.0	14.0
DS 100 B	4000			9.8	7.2	17.5	12.9	12.8	10.5	18.0
DS 100 B	6000			3.7	2.7	14.3	10.5	19.5	7.4	22.9
DS 100 C	1200	18.5	13.6	18.4	13.6	27.2	20.1	5.5	5.5	8.1
DS 100 C	2000			17.8	13.1	27.1	20.0	9.2	9.0	13.6
DS 100 C	3000			15.5	11.4	26.1	19.3	13.9	12.1	19.8
DS 100 C	4000			12.1	8.9	24.3	17.9	18.7	13.0	24.9
DS 100 C	6000			0.0	0.0	20.1	14.8	28.0	0.0	31.0
DS 100 D	1200	24.0	17.7	23.8	17.6	35.2	26.0	6.0	6.1	8.9
DS 100 D	2000			22.3	16.4	34.7	25.6	9.6	9.1	14.0
DS 100 D	3000			18.6	13.7	33.0	24.3	14.0	11.2	19.5
DS 100 D	4000			13.0	9.6	30.1	22.2	18.5	10.8	23.7
DS 100 D	6000			0.0	0.0	22.8	16.8	18.5	0.0	18.5

Legend

	American units

Typ	n_N ($^1/_{min}$)	k_E ($^V/_{1000\ 1/min}$)	k_T ($^{Nm}/_A$)	k_T (lbf ft / A)	k_D (lbf ft / A)	M_R (Nm)	M_R (lbf ft)	m (kg)	m (lb)	J ($kgcm^2$)	J ($lb\ in^2$)
DS 56 A	2000	123.5	2.04	1.50	0.014	0.14	0.103	5.5	12.1	3.0	1.03
DS 56 A	3000	82.3	1.36	1.00							
DS 56 A	4000	61.8	1.02	0.75							
DS 56 A	6000	41.2	0.68	0.50							
DS 56 B	2000	132.9	2.2	1.62	0.030	0.154	0.114	6.7	14.8	5.5	1.88
DS 56 B	3000	95.2	1.57	1.16							
DS 56 B	4000	74.6	1.23	0.91							
DS 56 B	6000	52.2	0.86	0.63							
DS 71 B	2000	123.5	2.04	1.50	0.054	0.206	0.152	10.3	22.7	14.6	4.99
DS 71 B	3000	82.3	1.36	1.00							
DS 71 B	4000	61.8	1.02	0.75							
DS 71 B	6000	41.2	0.68	0.50							
DS 71 C	2000	147.5	2.44	1.80	0.082	0.230	0.170	12.4	27.3	21.5	7.35
DS 71 C	3000	102.4	1.69	1.25							
DS 71 C	4000	78.9	1.3	0.96							
DS 71 C	6000	54.3	0.9	0.66							
DS 100 B	1200	205.8	3.4	2.51	0.094	0.31	0.229	18.9	41.7	36.5	12.47
DS 100 B	2000	123.5	2.04	1.50							
DS 100 B	3000	82.3	1.36	1.00							
DS 100 B	4000	61.7	1.02	0.75							
DS 100 B	6000	41.2	0.68	0.50							
DS 100 C	1200	205.8	3.4	2.51	0.144	0.355	0.262	22.5	49.6	53.3	18.21
DS 100 C	2000	123.5	2.04	1.50							
DS 100 C	3000	82.3	1.36	1.00							
DS 100 C	4000	61.8	1.02	0.75							
DS 100 C	6000	41.0	0.68	0.50							
DS 100 D	1200	243.1	4.02	2.96	0.195	0.400	0.295	26.3	58.0	70.0	23.92
DS 100 D	2000	153.5	2.54	1.87							
DS 100 D	3000	106	1.75	1.29							
DS 100 D	4000	80.4	1.33	0.98							
DS 100 D	6000	54.8	0.9	0.66							

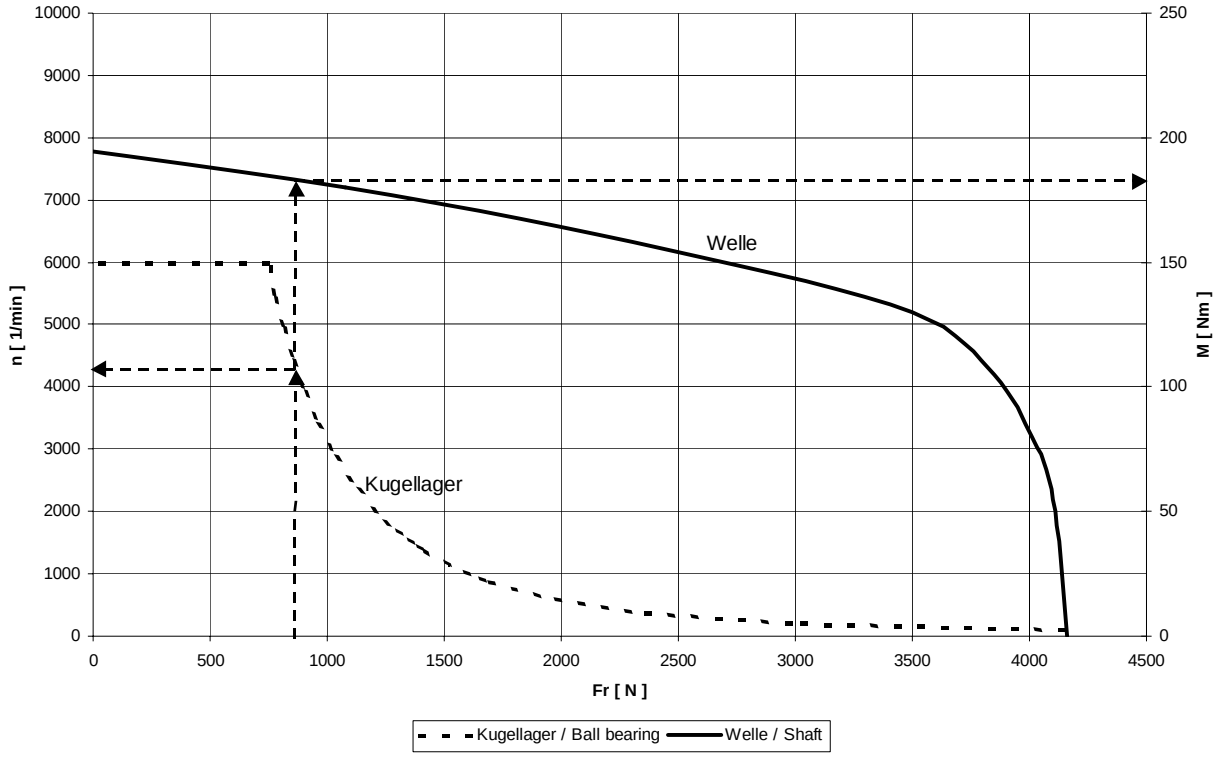
Radial force diagrams

Permissible radial forces F_R at the shaft end
All bearings are dimensioned for a service life of approx. 20.000 operating hours; the loads 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.

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.

Example

Force acting on the end of the shaft end (for force acting on the middle of the shaft end Fr x 1.1)
Bearing life 20.000 h; shaft end with keyway



Explanation of the example

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

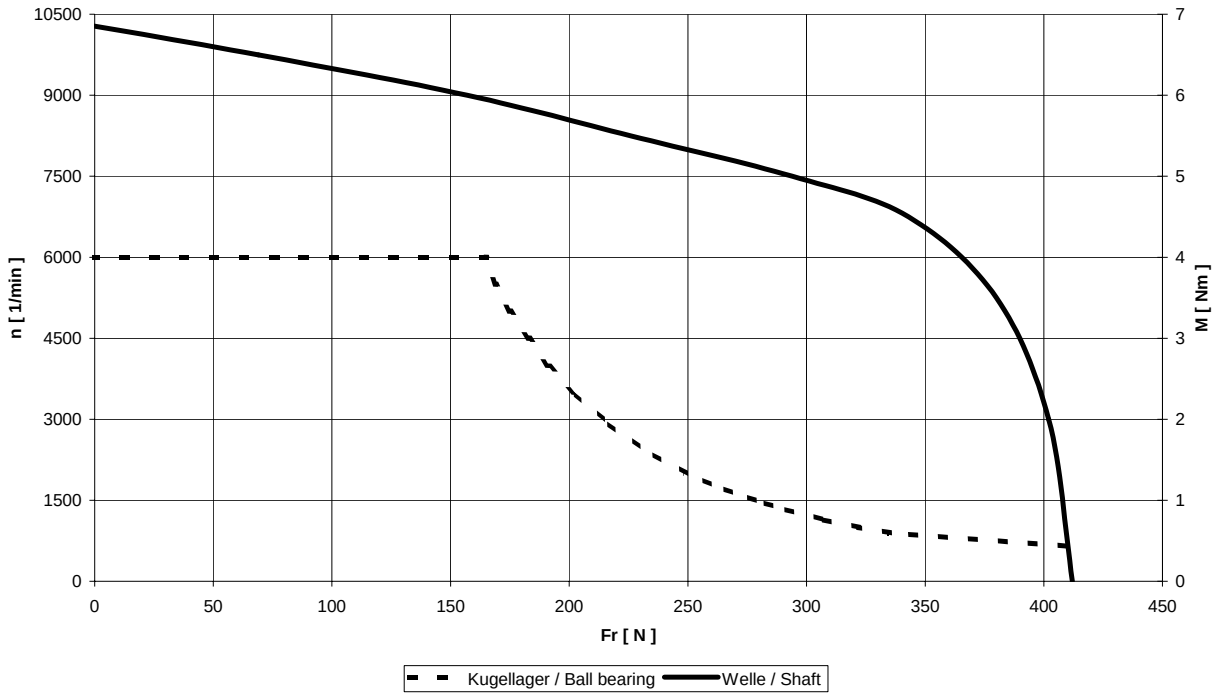
Radial force 850 N => maximum speed 4250 min^{-1}

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

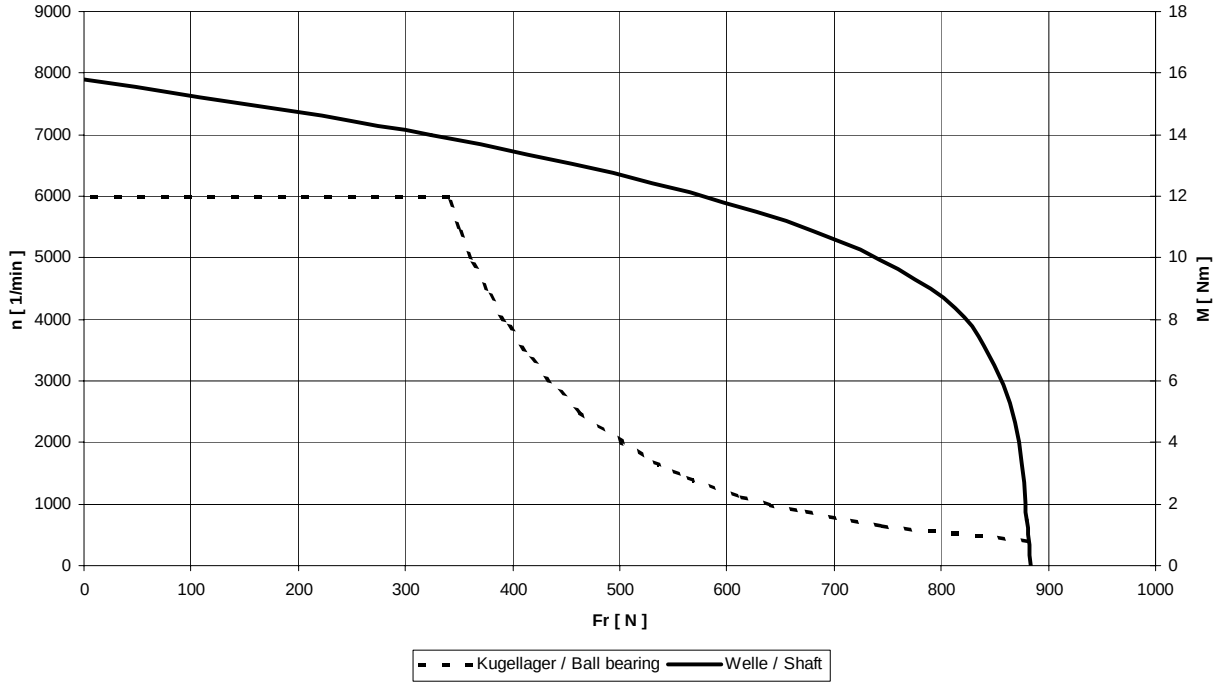
Radial force 850 N => maximum transmittable torque 185 Nm

DS in standard version or with fan

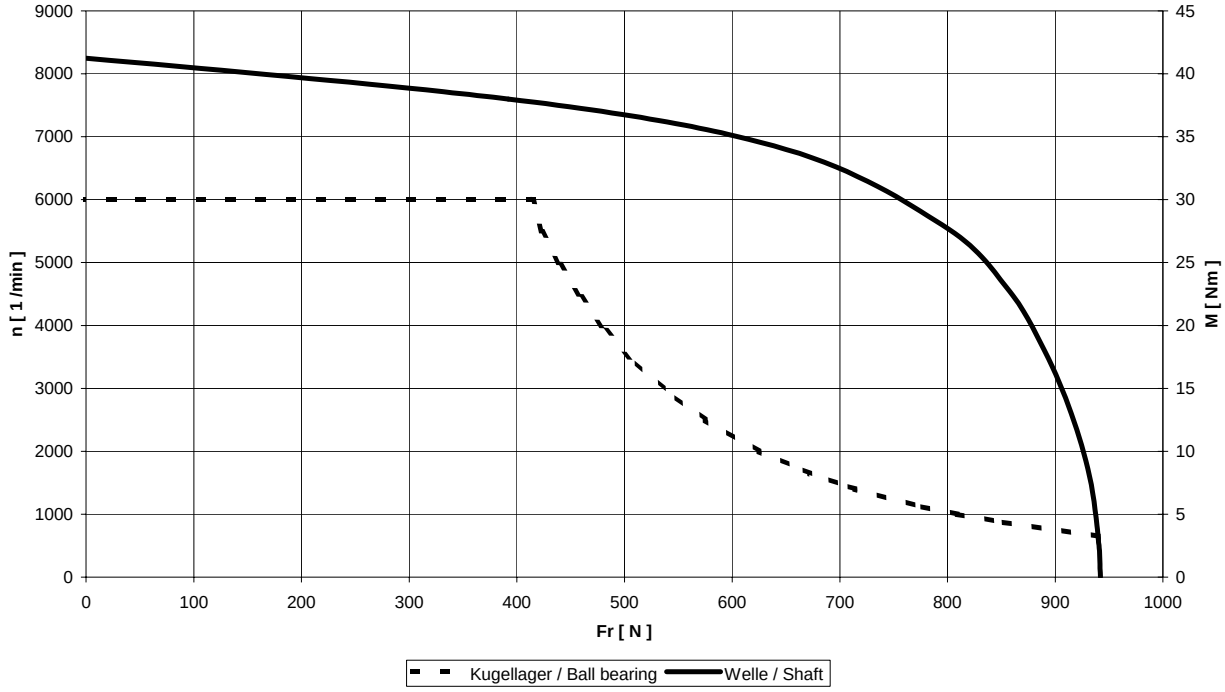
DS 36



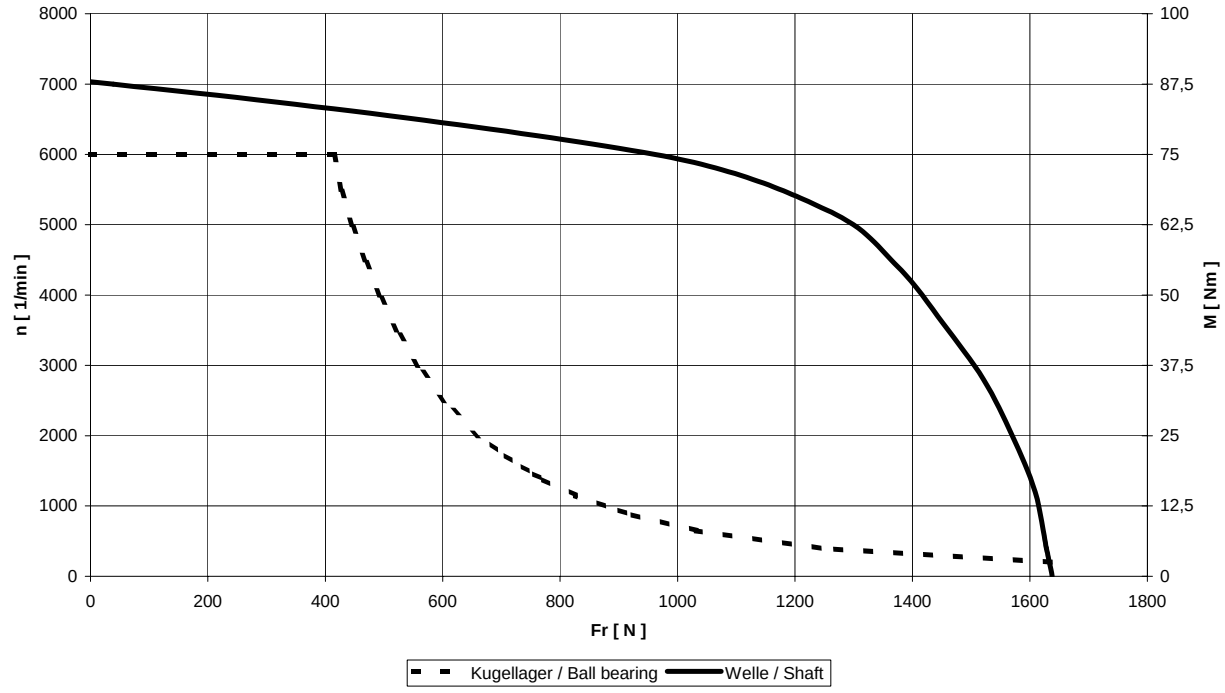
DS 45



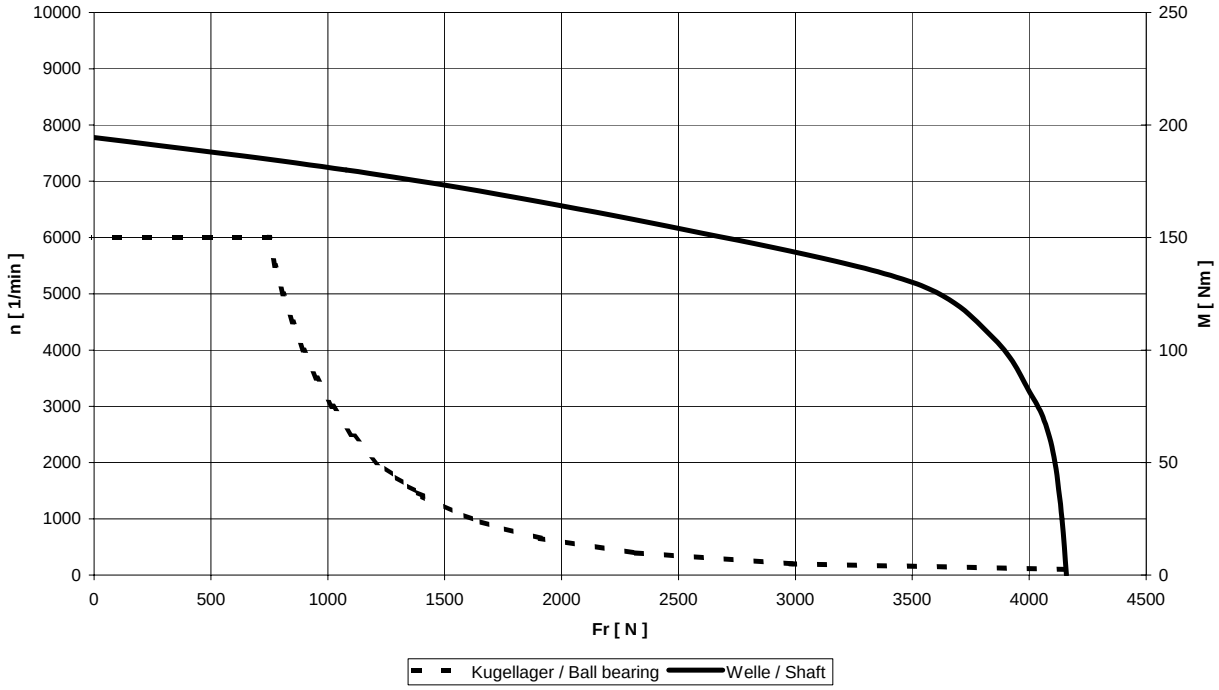
DS 56


9000
8000
7000
6000
5000
4000
3000
2000
1000
0
n [1 /min]
45
40
35
30
25
20
15
10
5
0
M [Nm]
0
100
200
300
400
500
600
700
800
900
1000
Fr [N]
Kugellager / Ball bearing
Welle / Shaft

DS 71

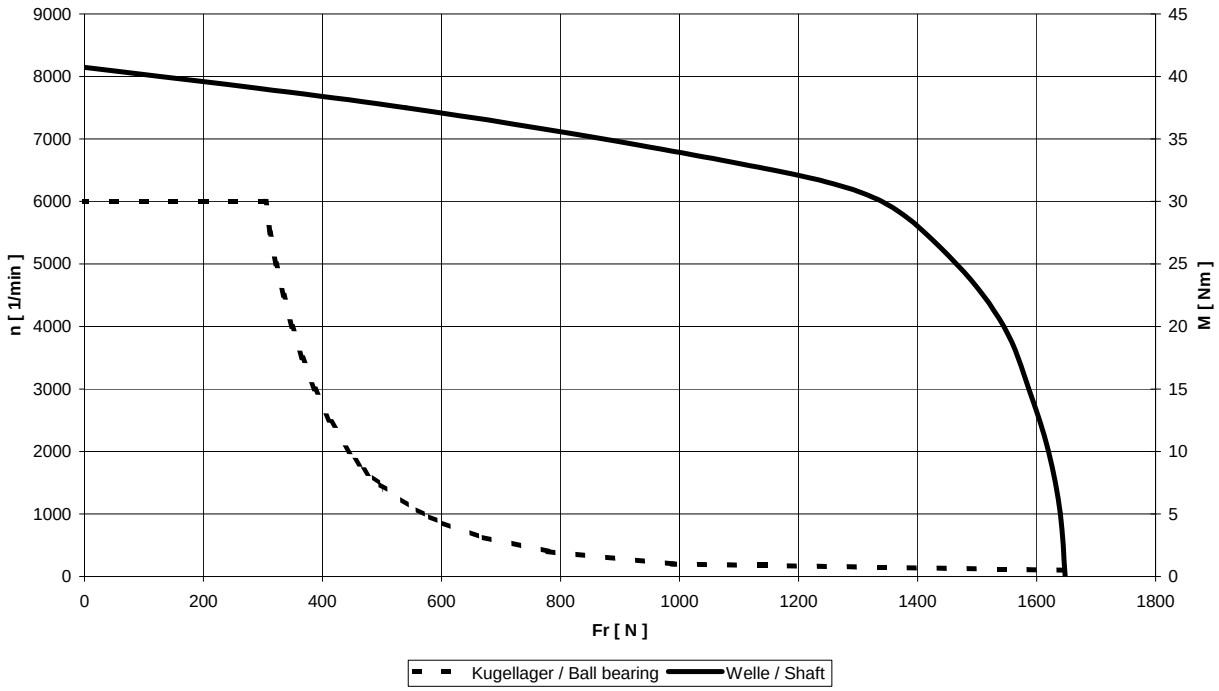

8000
7000
6000
5000
4000
3000
2000
1000
0
n [1/min]
100
87,5
75
62,5
50
37,5
25
12,5
0
M [Nm]
0
200
400
600
800
1000
1200
1400
1600
1800
Fr [N]
Kugellager / Ball bearing
Welle / Shaft

DS 100

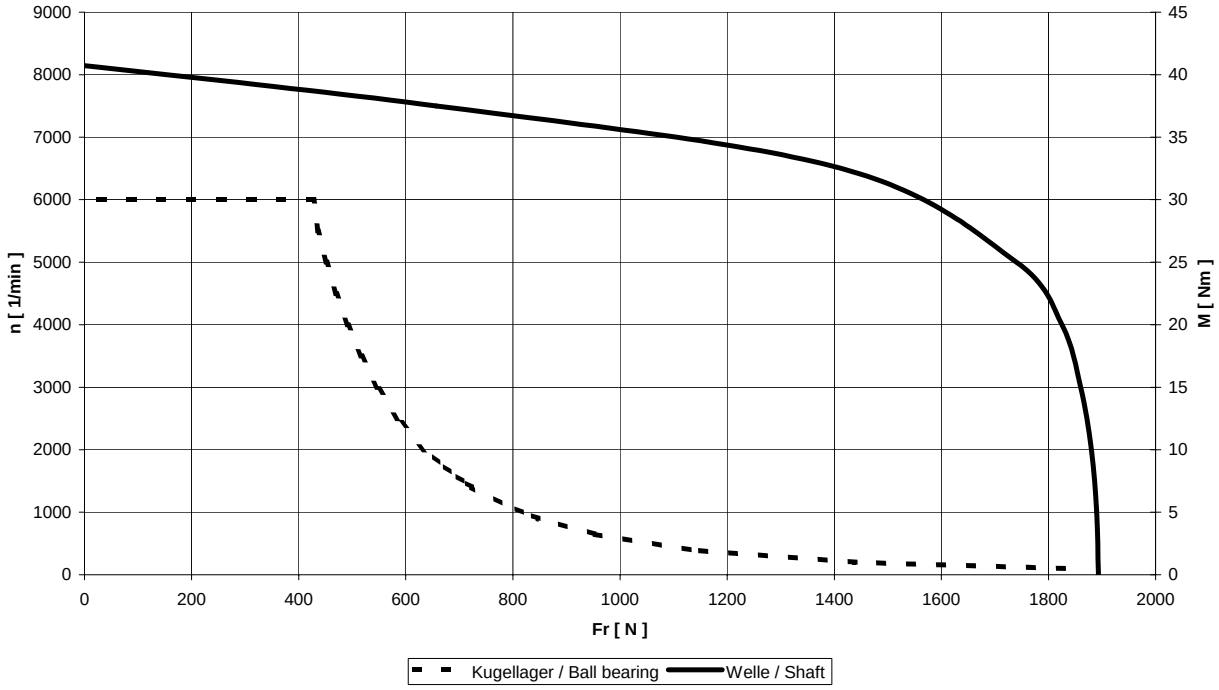

10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
n [1/min]
250
200
150
100
50
0
M [Nm]
0
500
1000
1500
2000
2500
3000
3500
4000
4500
Fr [N]
Kugellager / Ball bearing
Welle / Shaft

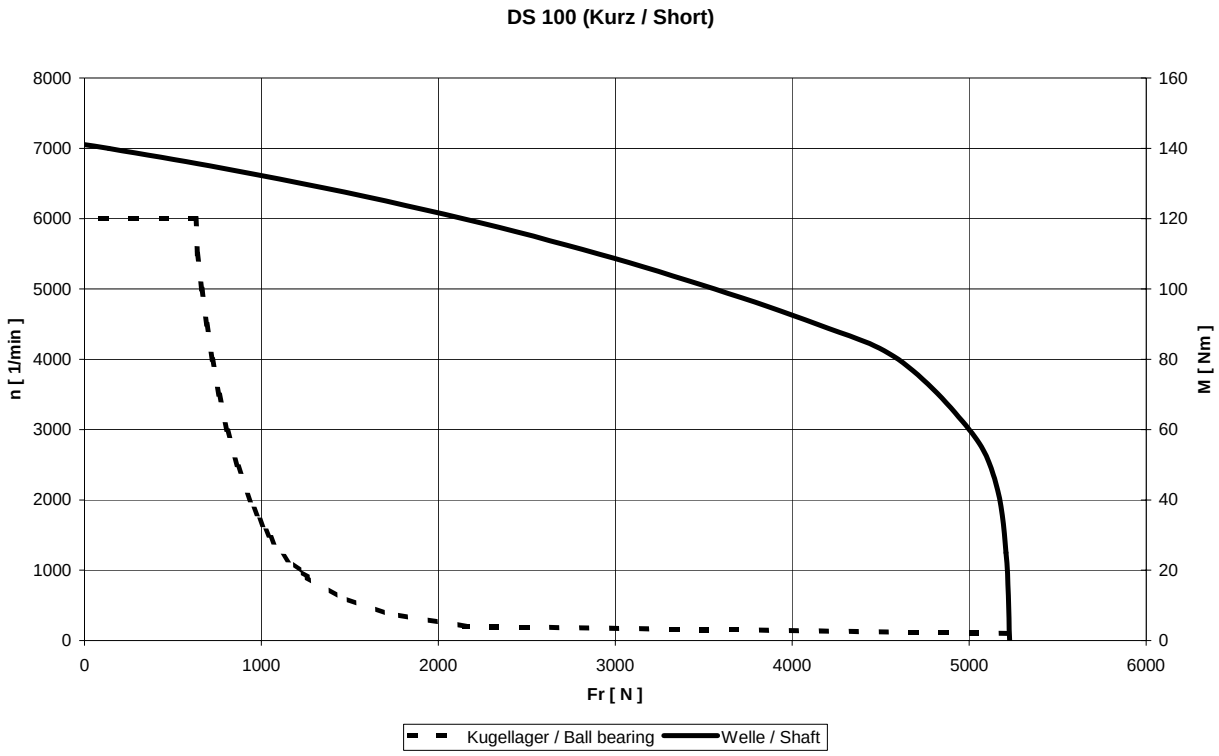
DS in short version

DS 56 (Kurz / Short)



DS 71 (Kurz / Short)

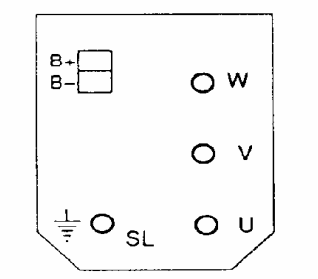



DS 100 (Kurz / Short)
n [1/min]
M [Nm]
Fr [N]
0
1000
2000
3000
4000
5000
6000
7000
8000
20
40
60
80
100
120
140
160
Kugellager / Ball bearing
Welle / Shaft

Main connection – terminal marking and connector assignment

Main connection via terminal box
The thermal sensor for the resolver is connected via the encoder cable.

Connection diagram

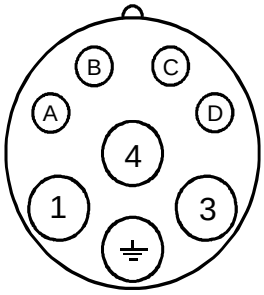
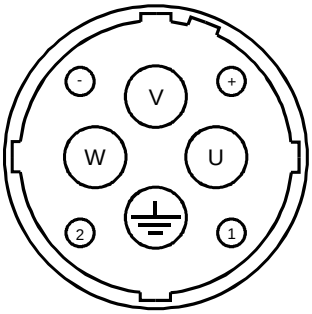


U V W ----------Power connection
SL ----------Protective earth
B+ B- ----------Brake (option)

Frame size	56	71	100
Stud	M4	M6	M8
metric gland	M20 and M16	M25 and M16	M16 and M40

Main connection via connector
The connector size is determined by the standstill current I_0 of the motor used. The thermal sensor for the resolver is connected via the encoder cable.

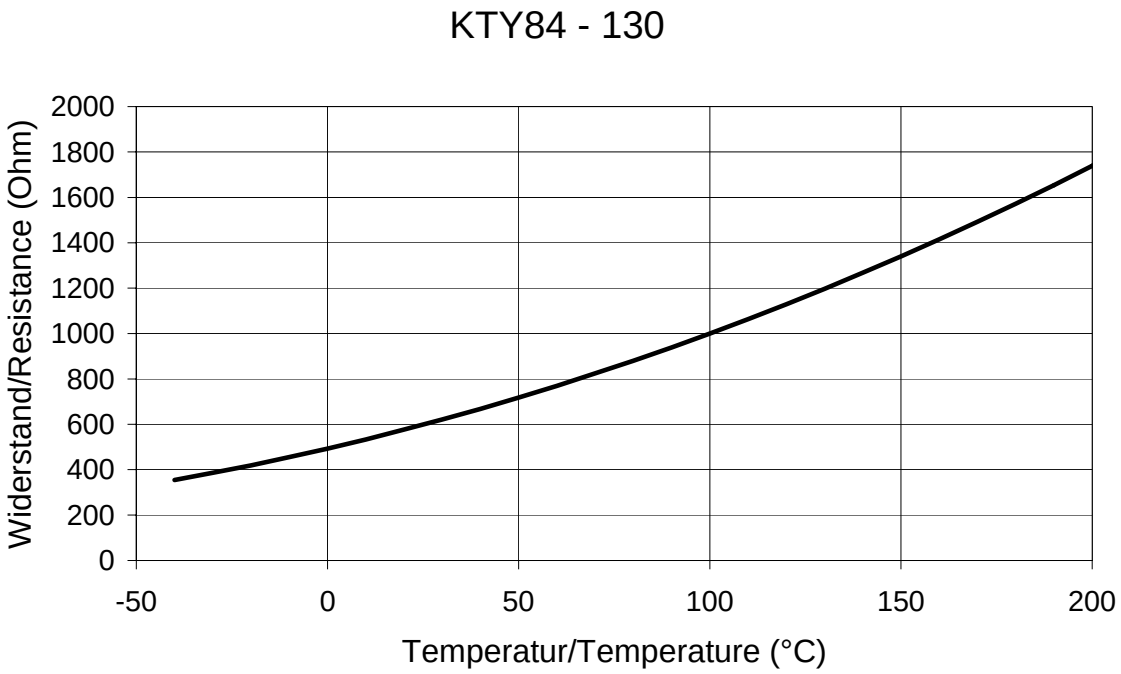
Poles of the female main connectors

		Pin	Signal	Color / marking
Size 1 I < 15 A		1 ⏚ 3 4 A B C D	Phase U PE Phase V Phase W B+ B-	U green / yellow V V W W W red black white yellow
Size 1.5 I < 50 A		U V W ⏚ + - 1 2	Phase U Phase V Phase W PE B+ B-	U V V W W W green / yellow red black white yellow

View to contact side of female connector

Thermal sensor

On resolver use. the temperature sensor is connected via the encoder plug. For SinCos encoder use. connection is effected via the main connection.

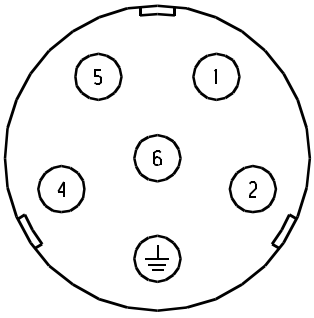


The motor temperature is continuously monitored using the thermal sensor type KTY 84-130.
The above shown resistance results when the sensor is supplied with a measuring current of 2 mA.

Fan data

Fan for type	DSO 56	4656 ZW - 956	230V. 50/60Hz; 0.12A
		4606 ZW - 958	115V. 60 Hz
Fan for type	DSO/ 71 and DSO/LIO 100	148VK028172	230V. 50/60Hz; 0.2A
		148VK028272	115V. 50/60Hz; 0.3A
Type of protection	IP54		
Connection	6-pin connector		

Fan connection

		Pin	Signal
		1	Phase U
		2	Neutral N
		⏚	PE

View to contact side of female connector

Brake assignment

The motors are optionally equipped with a holding brake. The brake uses the normally-on principle. i.e. the brake engages with the operating voltage is switched off or fails. The brakes are supplied for a switching voltage of 24 VDC +5%-10%.

The motors are available with the following holding brakes:

Motor type	Standard version				Short version		
	DS 45	DS 56	DS 71	DS 100	DS 56	DS 71	DS 100
Holding brake	Pm07	PM09	Pm11	Pm16	Pm06	Pm07	Pm11
Minimum static holding torque [Nm] at 120°C	6.5	12	20	80	2.5	6.5	20
Minimum dynamic torque [Nm] at 120°C	4.5	7.5	13	45	1.3	4.5	13
Max. switching work [Joule] per braking operation from n = 3000 min^{-1}	260	200	1000	2800	40	260	460
Connection values (+5% -10%)	24 V = 16 W	24 V = 18 W	24 V = 22 W	24 V = 31 W	24 V = 12 W	24 V = 16 W	24 V = 22 W
Inertia [$kgcm^2$]	1.06	3.6	7.6	30	0.8	1.06	9.5
Weight [kg]	0.7	1.1	1.9	3.0	0.3	0.7	1.9
Switching time On Brake released [ms]	40	60	100	130	30	40	70
Off [ms]	20	30	25	50	25	20	30

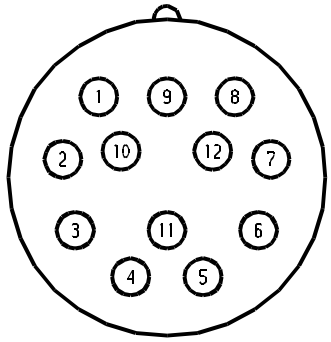
None of the brakes are **fail-safe brakes** so that the torque may be reduced by interference factors beyond control. In accordance with the case of application. observe the relevant accident prevention guidelines as well as the basic safety and health requirements of Appendix I of the Machinery Directive and the harmonized European Standards.
In the event of emergency stop or voltage failure. approx. 2000 braking operations can be carried out without causing the holding brake to overheat (Condition: maximum external inertia = motor inertia and $n_{max.}$ type-related).

Encoder

Resolver

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

Resolver connection



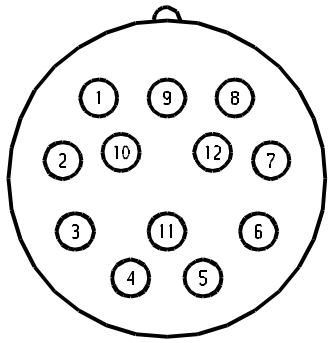
Pin	Signal
1	cos -
2	
3	
4	
5	sin –
6	sin +
7	TM -
8	cos +
9	TM +
10	Ref +
11	
12	Ref -

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

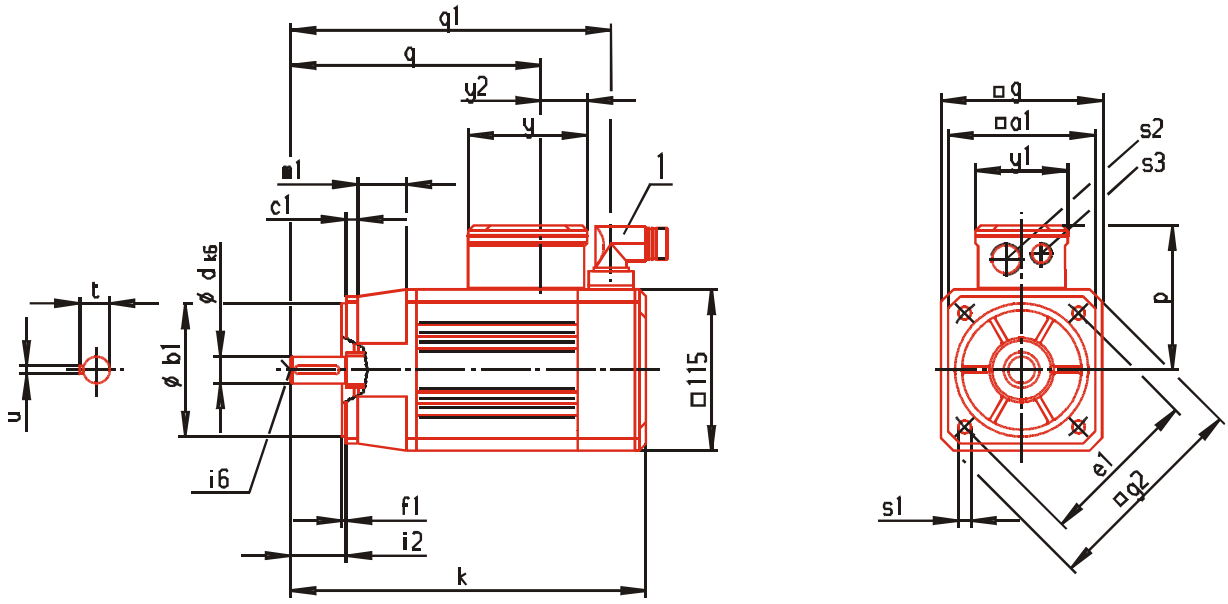


Pin	Signal
1	ref cos
2	+ 485
3	-
4	-
5	sin
6	ref sin
7	- 485
8	cos
9	-
10	Gnd
11	-
12	+ U

View to contact side of female connector

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

DS 56 / 71 / 100 standard version.
main connection with terminal box



i6 = Centring with internal thread acc. to DIN 332 form D
1 = Encoder connector

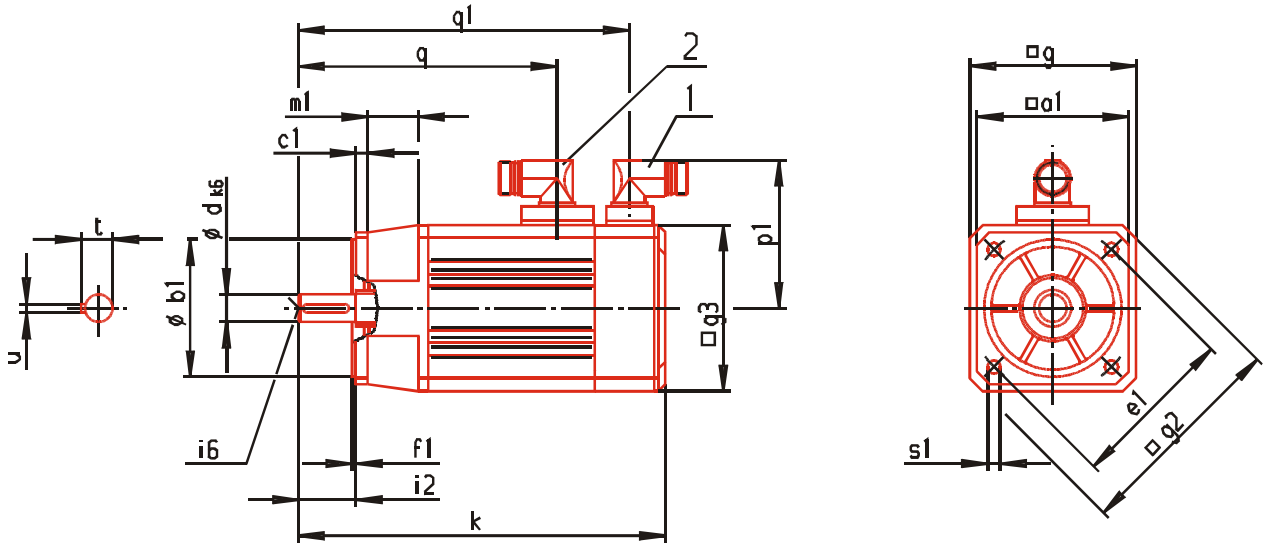
- DC link voltage of 540 V motors
- Key: Motors are also available without keyway.
- Brake: When a brake is mounted the dimensions remain unchanged.
- IP 65 type of protection is ensured with mounted connectors only.
- Shaft gland protection type is IP64

Type	Flange							Shaft			Motor												
	a1	b1	c1	e1	f1	i2	s1	d	t	u	g2	g	k	m1	p	q	q1	s2	s3	y	y1	y2
56 S	105	95	8	115	3	40	9	19	21.5	6	150	115	255**	29	103	179	229	M20	M16	85	66	33
56 M													295**			219	269					
56 L													335**			259	309					
56 *	120	110	9	130	3.5	40	9							28								
71 K	142	130	12	165	3.5	50	12	24	27	8	186	142	316**	32	129	238	290	M25	M16	110	70	35
71 S													366**			288	340					
71 M													416**			338	390					
100 K	190	180	13	215	4	58	14	32	35	10	250	190	367**	45	174	287	341	M16	M40	150	135	37
100 S													415**			335	389					
100 M													463**			383	437					
100 L													511**			431	485					

* The flange of frame size 56 is also available with dimension a1 = 120 mm as a standard. Order in plain text.
** for sincos encoder SCS/SCM k + 20 mm; SRS/SRM k + 30 mm

Version IM B5	Type of protection IP 65	Cooling method IC 0041		

DS 45 / 56 / 71 / 100 standard version.
main connection with connector



i6 = Centring with internal thread acc. to DIN 332 form D
1 = Encoder connector
2 = Connector for main connection/brake (use only up to 44 A)

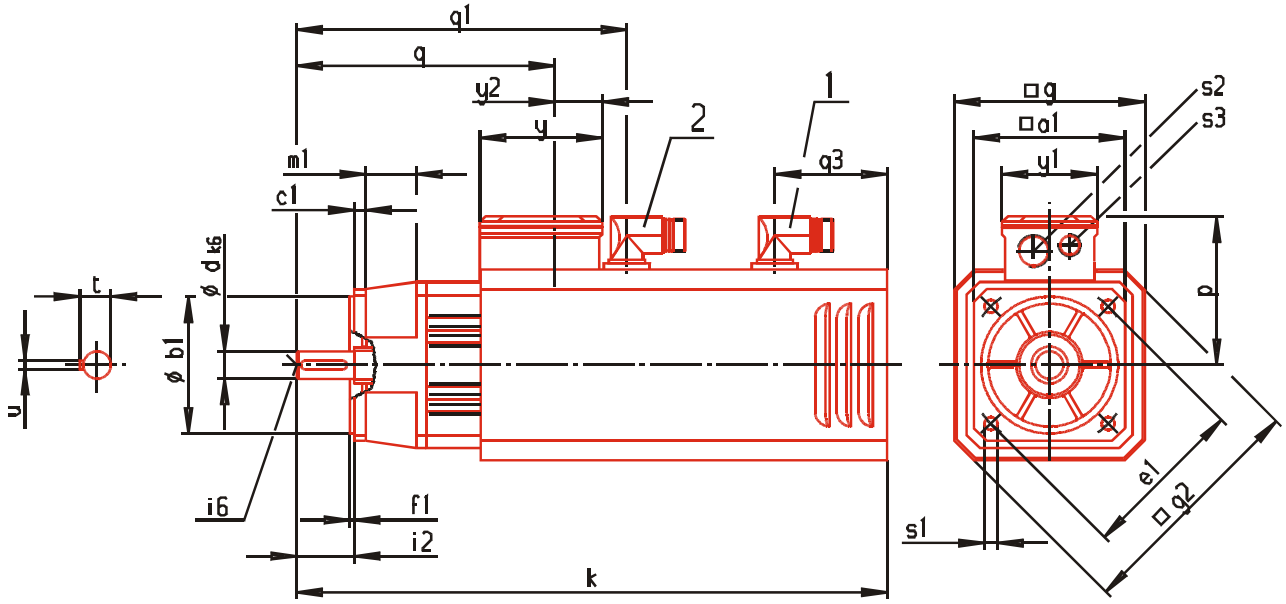
- DC link voltage of 540 V motors
- Key: Motors are also available without key.
- Brake: When a brake is mounted the dimensions remain unchanged.
- IP 65 type of protection is ensured with mounted connectors only.
- Shaft gland protection type is IP64

Type	Flange							Shaft			Motor											
	a1	b1	c1	e1	f1	i2	s1	d	t	u	g2	g	g3	k	m1	p1	q	q1	q2	y	y1	y2
45 S	90	80	8	100	3	30	7	14	16	5	121	90	90*	192*	27	82	142	175	-	-	-	-
45 M														217*			167	200				
45 L														267*			217	250				
56 S	105	95	8	115	3	40	9	19	21.5	6	150	115	115	255**	29	100	179	229	-	-	-	-
56 M														295**			219	269				
56 L														335**			259	309				
56 ***	120	110	9	130	3.5	40	9								28							
71 K	142	130	12	165	3.5	50	12	24	27	8	186	142	115	316**	32	100	238	290	-	-	-	-
71 S														366**			288	340				
71 M														416**			338	390				
100 K	190	180	13	215	4	58	14	32	35	10	250	190	115	367**	45	100	287	341	-	-	-	-
100 S														415**			335	389				
100 M														463**			383	437				
100 L														511**			431	485				

* for sincos encoder SCS/SCM g3 + 9 mm and k + 33 mm; SRS/SRM g3 + 9 mm and k + 35 mm
** for sincos encoder SCS/SCM k + 20 mm; SRS/SRM k + 30 mm
*** The flange of frame size 56 is also available with dimension a1 = 120 mm as a standard. Order in plain text.

Version IM B5	Type of protection IP 65	Cooling method IC 0041		70599207

DS 56 / 71 / 100 standard version with fan.
main connection with terminal box



i6 = Centring with internal thread acc. to DIN 332 form D
1 = Fan connector
2 = Encoder connector

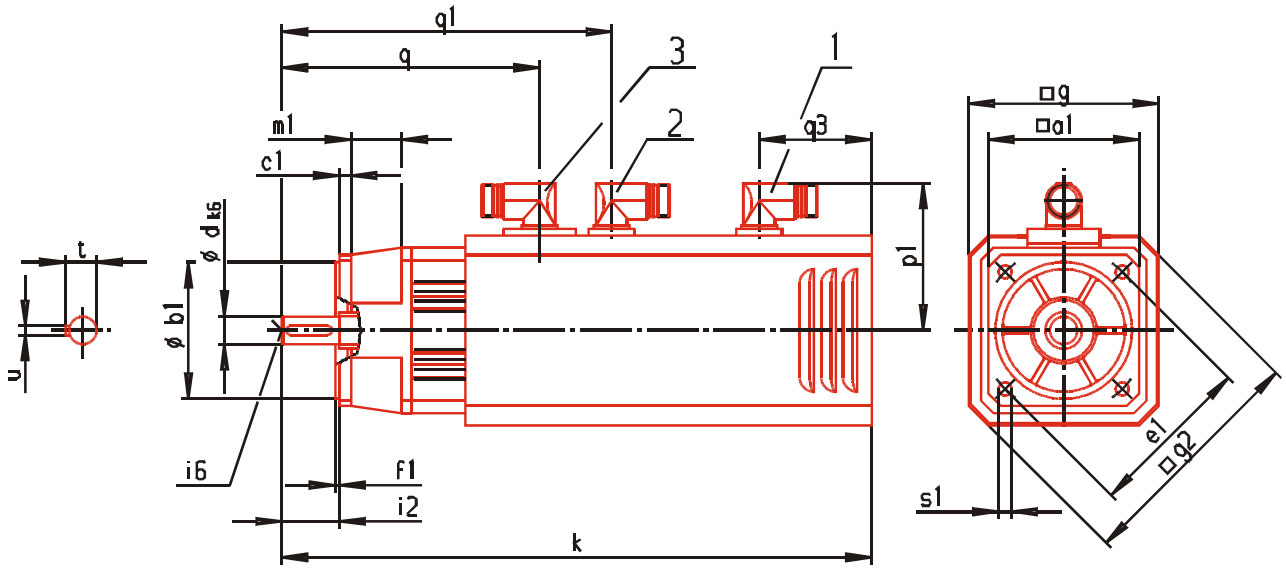
- DC link voltage of 540 V motors
- Key: Motors are also available without key
- Brake: When a brake is mounted the dimensions remain unchanged.
- IP 54 type of protection is ensured with mounted connectors only.
- Shaft gland protection type is IP64

Type	Flange							Shaft			Motor													
	a1	b1	c1	e1	f1	i2	s1	d	t	u	g2	g	k	m1	p	q	q1	q3	y	y1	y2	s2	s3
56 S	105	95	8	115	3	40	9	19	21.5	6	167	132	411	29	103	179	229	78	85	66	33	M20	M16
56 M													451			219	269						
56 L													491			259	309						
56 *	120	110	9	130	3.5	40	9							28									
71 K	142	130	12	165	3.5	50	12	24	27	8	218	180	503	32	129	238	290	90	110	70	35	M25	M16
71 S													553			288	340						
71 M													603			338	390						
100 K	190	180	13	215	4	58	14	32	35	10	270	210	576	45	174	287	341	115	150	135	37	M16	M40
100 S													624			335	389						
100 M													672			383	437						
100 L													720			431	485						

* The flange of frame size 56 is also available with dimension a1 = 120 mm as a standard. Order in plain text.

Version IM B5	Type of protection IP 54	Cooling method IC 0641		70599208

DS 56 / 71 / 100 standard version with fan.
main connection with connector



i6 = Centring with internal thread acc. to DIN 332 form D
1 = Fan connector
2 = Encoder connector
3 = Connector for main connection/brake

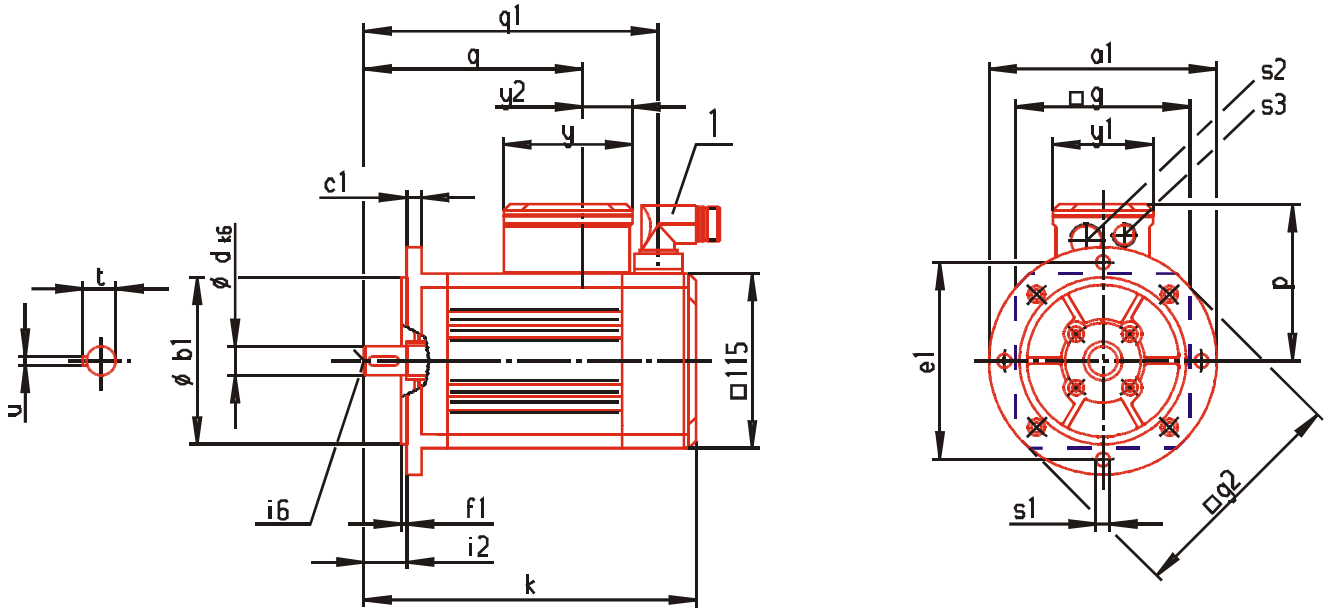
- DC link voltage of 540 V motors
- Key: Motors are also available without key
- Brake: When a brake is mounted the dimensions remain unchanged.
- IP 54 type of protection is ensured with mounted connectors only.
- Shaft gland protection type is IP64

Type	Flange							Shaft			Motor													
	a1	b1	c1	e1	f1	i2	s1	d	t	u	g2	g	k	m1	p1	q	q1	q3	y	y1	y2	s2	s3
56 S	105	95	8	115	3	40	9	19	21.5	6	167	132	411	29	97	179	229	78					
56 M													451			219	269						
56 L													491			259	309						
56 *	120	110	9	130	3.5	40	9							28									
71 K	142	130	12	165	3.5	50	12	24	27	8	218	180	503	32	110	238	290	90					
71 S													553			288	340						
71 M													603			338	390						
100 K	190	180	13	215	4	58	14	32	35	10	270	210	576	45	134	287	341	115					
100 S													624			335	389						
100 M													672			383	437						
100 L													720			431	485						

* The flange of frame size 56 is also available with dimension a1 = 120 mm as a standard. Order in plain text.

Bauform IM B5	Schutzart IP 54	Kühlart IC 0641		70599209

DS 56 / 71 / 100 short version.
main connection with terminal box



i6 = Centring with internal thread acc. to DIN 332 form D
1 = Encoder connector

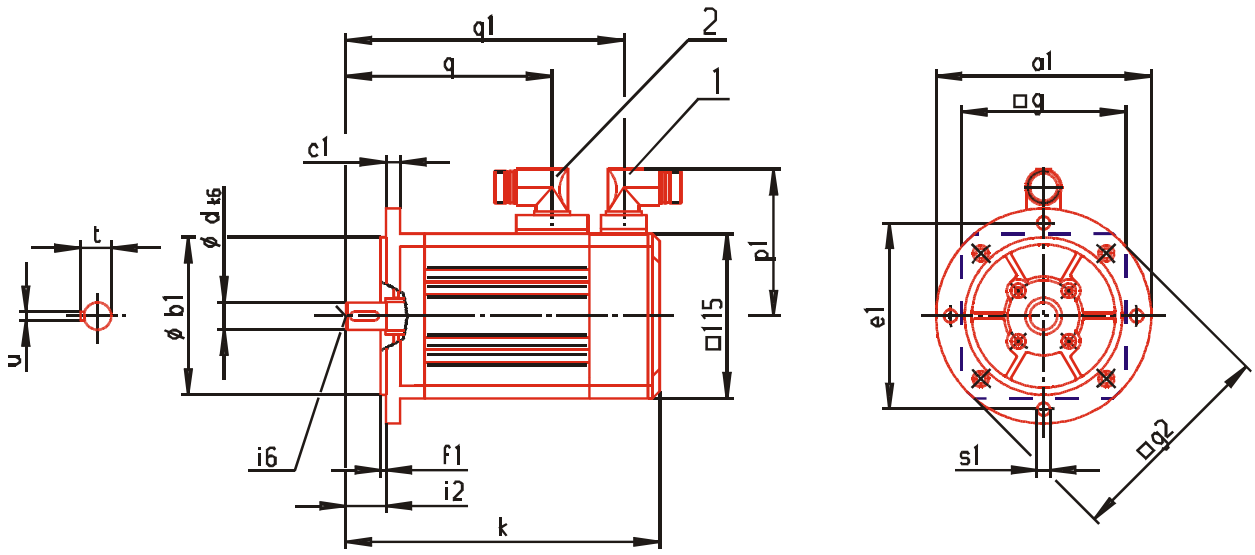
- DC link voltage of 540 V motors
- Key: Motors are also available without key
- Brake: When a brake is mounted the dimensions remain unchanged.
- IP 65 type of protection is ensured with mounted connectors only.
- Shaft gland protection type is IP64

Type	Flange							Shaft			Motor												
	a1	b1	c1	e1	f1	i2	s1	d	t	u	g2	g	k	m1	p	q	q1	s2	s3	y	y1	y2
56 A	150	110	10	130	3.5	28	9	19	21.5	6	150	115	199*	-	103	124	174	M20	M16	85	66	33
56 B													219*			144	194					
71 B	186	130	10	165	3.5	28	11	19	21.5	6	186	142	234*	-	129	157	209	M25	M16	110	70	35
71 C													259*			182	234					
100 B	250	180	13	215	4	42	14	28	31	8	250	190	266*	-	174	186	240	M16	M40	150	135	37
100 C													290*			210	264					
100 D													314*			234	288					

* for sincos encoder SCS/SCM k + 20 mm; SRS/SRM k + 30 mm

Version IM B5	Type of protection IP 65	Cooling method IC 0041		

DS 56 / 71 / 100 short version.
main connection with connector



i6 = Centring with internal thread acc. to DIN 332 form D
1 = Encoder connector
2 = Main connection/brake

- DC link voltage of 540 V motors
- Key: Motors are also available without key
- Brake: When a brake is mounted the dimensions remain unchanged.
- IP 65 type of protection is ensured with mounted connectors only.
- Shaft gland protection type is IP64

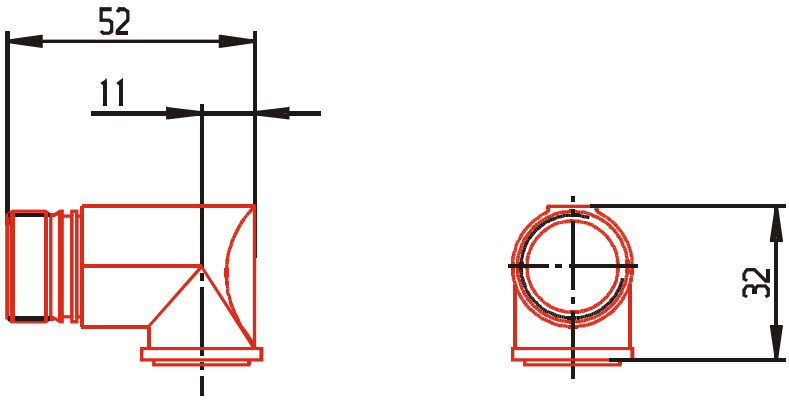
Type	Flange							Shaft			Motor												
	a1	b1	c1	e1	f1	i2	s1	d	t	u	g2	g	k	m1	p1	q	q1	q2	q3	y	y1	y2
56 A	150	110	10	130	3.5	28	9	19	21.5	6	150	115	199*	-	100	124	174	-	-	-	-	-
56 B													219*			144	194					
71 B	186	130	10	165	3.5	28	11	19	21.5	6	186	142	234*	-	100	157	209	-	-	-	-	-
71 C													259*			182	234					
100 B	250	180	13	215	4	42	14	28	31	8	250	190	266*	-	100	186	240	-	-	-	-	-
100 C													290*			210	264					
100 D													314*			234	288					

* for Sincos encoder SCS/SCM k + 20 mm; SRS/SRM k + 30 mm

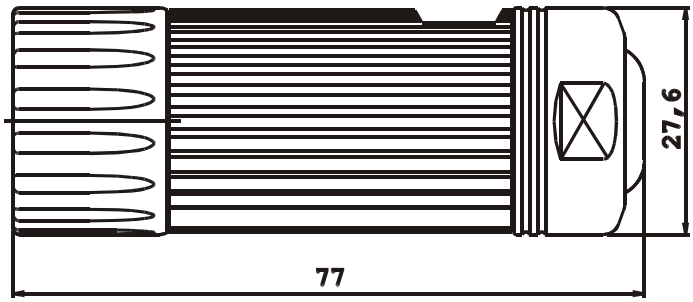
Version IM B5	Type of protection IP 65	Cooling method IC 0041		70599211

Main connection. fan and male and female encoder connectors

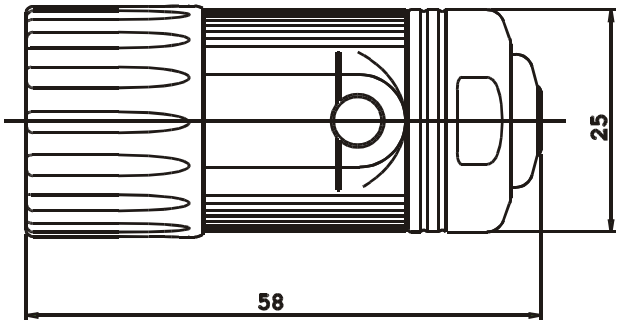
Female flange connector main connection (size 1 for current I_0 to 15 A). fan and encoder



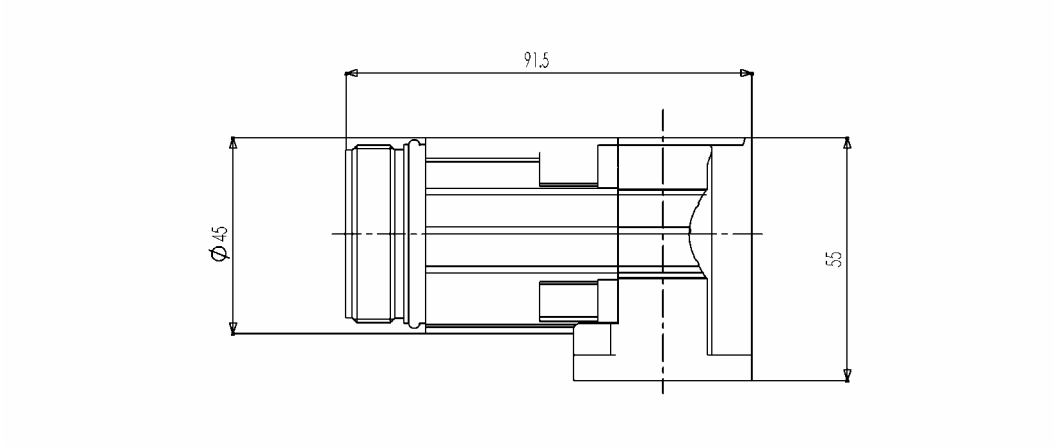
Main connector (size 1 for current I_0 to 15 A) and fan



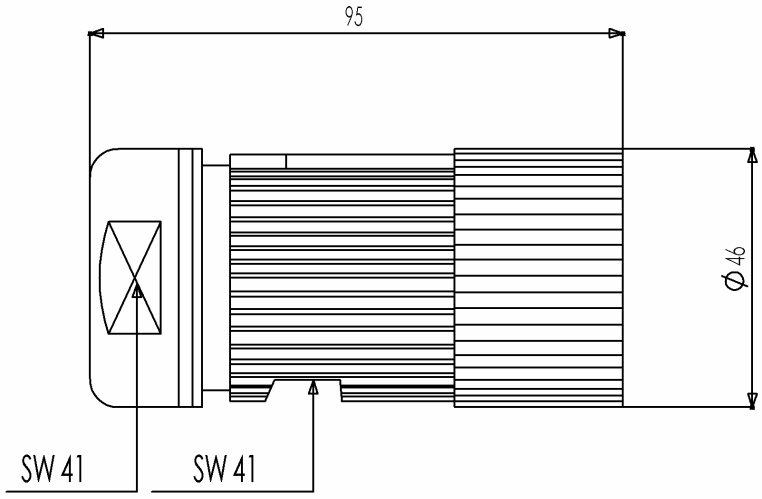
Encoder connector



Female flange connector main connection (size 1.5 for current I_0 to 50 A)



Main connector (size 1.5 for current I_0 to 50 A)



Motor cables

General
The motor cables are highly flexible trailing cables with overall shielding. They comply with the regulations VDE. UL and CSA.
The control cables are integrated as star-quads. When the sincos encoder is used the brake triggering and the connection of the thermal sensor are brought out via the main connector.
The cables are particularly suitable for the optimum use of cable racks thanks to their low cross-section. low weight and non-impeding surface. They can thus be efficiently used in trailing chains.
The overall shielding with an optical coverage of more than 85% makes it an EMC uncritical cable.
The connector size is designed in accordance with the motor's standstill current I_0.

Technical data
Technical description

- Sheath resistance against media such as coolants. machine and gearbox oils
- Abrasion resistance because of a special surface in cable racks and trailing chains
- High-flexible. trailing cable
- Sheath surface not blocking. satin-finish
- Shield made of tinned copper braid with optical coverage of ≥ 85 %
- Core insulation made of TPE or polyester. sheath material PUR holgene-free
- Cable FCF-free and silicone-free
- Behavior in case of fire: fire-inhibiting. halogene-free
- Cable color in RAL 1028. melon yellow
- Labelling with Baumüller sign. VDE. UL and CSA sign
- Minimum bending radius for flexible use 12 x D

Nominal voltage
Uo/U 600 / 1000 V (power cores)
U 24 V DC (control cores)

Core lettering
Power cores U. VV. WWW
Colored control cable pairs as star-quads in red. white. black. yellow
Assignment of pairs red – black (brake).
white – yellow (temperature)

Cable data

Cable cross-section	Nominal current [A][1)]	Cable diameter [mm]
4×1.5 mm² 4×0.75 mm²	15	11.7 – 12.3
4×2.5 mm² 4×0.75 mm²	21	12.7 – 14.6
4×4 mm² 4×0.75 mm²	28	14.2 – 15.4
4×6 mm² 4×0.75 mm²	36	16.6 – 17.9
4×10 mm² 4×0.75 mm²	50	20.5 – 21.5
4×16 mm² 4×0.75 mm²	66	23.0 – 25.8
4×25 mm² 2×(2×1.5 mm²)	84	26.3 – 29.7
4×35 mm² 2×(2×1.5 mm²)	104	30.8 – 32.5

1) Current carrying capacity acc. to table 5 laying type C or E
(VDE 0113 / EN 60 204 Part 1 issue 1997)
Ambient temperature 40°C

Cable – connector assignment

Cable cross-sections	Nominal current [A]	Male connector 540 V Size
4×1.5 mm^2 4×0.75 mm^2	15	1
4×2.5 mm^2 4×0.75 mm^2	21	1.5
4×4 mm^2 4×0.75 mm^2	28	1.5
4×6 mm^2 4×0.75 mm^2	36	1.5
4×10 mm^2 4×0.75 mm^2	50	1.5

The connectors must be designed with respect to the I_0 motor current. For the laying of the cables. the current carrying capacity acc. to table 5 laying type C or E (VDE 0113 / EN 60 204 Part 1 issue 1997) and an ambient temperature of 40°C must be considered.

Cables of 2.5 mm^2 can be laid up to 100 m without additional filters. when larger cross-sections used. up to 40 m are permissible. The terminal voltage at the motor must be < 1kV. When longer cables are used. filters must be installed between converter and motor.

Application notes

Operating temperature
The cables can be operated within a temperature range from –20°C to +80°C.

Cable laying at the motor
The cables must not touch the motor surface.

Smallest permissible bending radii
12 times outer cable diameter.
Smaller bending radii are possible with reduced service life.

Main connection cables / Assembled cable with connector

Nominal current: 15 A
Cable 4 x 1.5 mm² + 4x 0.75 mm²
with connector Size1

Length in m	Article no.
5	324781
7	324782
10	324783
15	324784
20	324785
25	324786
30	324787
35	324788
40	324789
50	324790
75	324791
100	324792

Nominal current: 21 A
Cable 4 x 2.5 mm² + 4x 0.75 mm²
with connector Size1.5

Length in m	Article no.
5	326577
7	326578
10	326579
15	326580
20	326581
25	326582
30	326583
35	326584
40	326585
50	326586
75	326587
100	326588

Nominal current: 28 A
Cable 4 x 4 mm² + 4x 0.75 mm²
with connector Size1.5

Length in m	Article no.
5	326589
7	326591
10	326592
15	326593
20	326594
25	326596
30	326597
35	326598
40	326599

Nominal current: 36 A
Cable 4 x 6 mm² + 4x 0.75 mm²
with connector Size1.5

Length in m	Article no.
5	326600
7	326601
10	326602
15	326603
20	326604
25	326605
30	326606
35	326607
40	326608

Nominal current: 50 A
Cable 4 x 10 mm² + 4x 0.75 mm²
with connector Size1.5

Length in m	Article no.
5	326609
7	326610
10	326611
15	326612
20	326613
25	326614
30	326615
35	326616
40	326617

Connector

Type	Article no.
Size 1 f. 4x1.5mm^2	261740
Size 1.5 f. 4x2.5mm^2 o. 4mm^2	326574
Size 1.5 f. 4x6mm^2 o.10mm^2	326569

Larger cable cross-sections on request.
Longer cables can also be used. The terminal voltage at the motor must be < 1kV. In this case. however. filters must be installed between converter and motor.

Encoder cables

General

A fully preassembled encoder cable is used for all encoder systems. Motor connection is via a 12-pin round signal connector and converter connection via a 15-pin sub-D plug. The encoder cables are available as 'trailing' and 'non-trailing' cables. The trailing cable is suitable for use in trailing chains. for example. As opposed to the 'non-trailing' cable. the cable sheath consists of tougher PUR for use in environments with acids and bases (coolants) instead of PVC. Up to a length of 10 m. the cables are available in 1 m sections (1 m. 2 m. 10 m). From a cable length of 10 m. the sections come in 5 m intervals (10 m. 15 m. …).

In the case of servo motors. the resolver encoder system links the temperature sensor with the converter via the encoder cable.

Technical data

1. Technical description – non-trailing

- LiYCY. 5x (2x0.14mm²) + 2 x 0.5mm² copper lead. twisted pair
- PVC sheath. grey
- 1st end: 12-pin signal circular connector with 12 female contacts
- 2nd end: 15-pin D-Sub connector with male contacts and locking screws 4-4OUNC
- Baumüller labelling. black
- Outer diameter 9.0 mm (+/-3mm)
- Bending radius: $r \geq 60$ mm (fixed installation). $r \geq 135$ mm (flexible use)
- Nominal voltage: $250V_{AC}$

2. Technical description – trailing

- Li12YC11Y. 5x (2x0.14mm²) + 2 x 0.5mm² copper lead. twisted pair
- PU sheath. black
- 1st end: 12-pin signal circular connector with 12 female contacts
- 2nd end: 15-pin D-Sub connector with male contacts and locking screws 4-4OUNC
- Baumüller labelling. white
- Outer diameter 9.0 mm (+/-3mm)
- Bending radius: $r \geq 70$ mm (fixed installation). $r \geq 100$ mm (flexible use)
- Nominal voltage: $300V_{AC}$

Application notes

- Operating temperature

	trailing	non-trailing
Limit temperature	at the surface	at the surface
no / few movements	-40 °C to +80 °C	- 30 °C to +80 °C
continuous movements	- 30 °C to +80 °C	-5 °C to + 70 °C

- Cable laying at the motor

The cables must not touch the motor surface.

Ordering data

Encoder cables / preassembled cables with connector

Encoder cable
non-trailing.
assembled
Cable 5 x (2x014mm^2) + 2 x 0.5 mm² with connector

Length in m	Article no.
1	243601
2	211338
3	219333
4	231166
5	209879
6	220197
7	216455
8	220429
10	210052
15	215716
20	218568
25	218569
30	217094
35	216444
40	217095
45	217567
50	217568
55	217569
60	217570
70	232088

trailing.
assembled
Cable 5 x (2x014mm^2) + 2 x 0.5 mm² with connector

Length in m	Article no.
3	246658
4	243379
5	239540
6	242954
8	239541
10	239542
15	239543
20	239544
25	239545
30	239546
35	239547
40	240520
45	240521
50	240522
55	244033
60	245484

Encoder connector	Article no.
Encoder connector	201833

Commissioning and maintenance instructions

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

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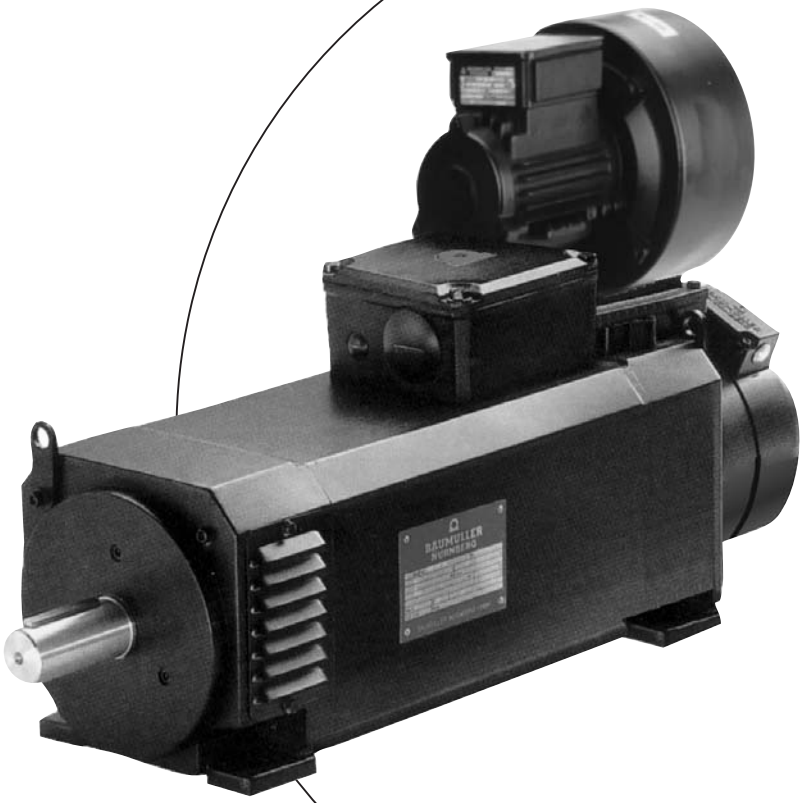


be in motion be in motion

Three-phase synchronous motors

DS 100-160

Table of contents

Three-phase synchronous motors DS

Three-phase synchronous motors of the **DS** series are permanently excited motors.
Boasting a very high power density, very high efficiency and high response the motors are perfectly suitable for most sophisticated applications in mechanical engineering.
This is additionally supported by a high overload capability.
These durable, compact motors are also largely maintenance-free, which is an extra benefit to ensure most efficient operation.

General technical data

Version		IM B3, IM B34, IM B35	
Type of protection		IP23	Internally cooled, with fan
		IP54	surface-cooled **with** fan or uncooled
Forced ventilation / standard		N-end, top, left or right hand side Air conduction non-drive end to drive end, lateral air outlet at drive end	
Forced ventilation / option		Drive end, top, left or right hand side Air conduction drive end to non-drive end, lateral air outlet at N-end	
Connection	Main connection	U V W	Terminal box
	Control connection		12-pin connector
	Brake		Terminal box of brake
	Thermal sensor		in the main connection
Cooling	IP 23	IC 06	Internally cooled machine (air conduction from N- to D-end)
	IP 54	IC 0641	Surface-cooled machine (air conduction from N- to D-end)
	IP 54	IC 0041	completely enclosed machine
Thermal sensor			Linear thermal sensor for evaluation in the controller
Temperature rise		$\Delta\vartheta \leq$ 105K	Insulation class F acc. to EN 60034-1
Temperature range		0....+ 40°C,	
Storage		-30°C...+85°C	
Paint		black matt	RAL 9005
Bearing		D-end: standard = ball bearing; option = roller bearing, locating bearing on the N-end	
Terminal box		D- and N-end; top , left or right hand side	
Balance quality		N	According to DIN ISO 2373
		R, S	On request
Vibrationproof / standard		radial 3 g / axial 1g , 10 .. 55 Hz acc. to EN 60068-2-6	
		Higher vibration resistance on request	
Flange		acc. to IEC standard	Dimension b1: up to flange size a1 300 mm tolerance j6 as from flange size a1 300 mm tolerance h6
shaft end		cylindrical	Acc. to DIN 748 with shaft key DIN 6885; also available without keyway) centering with internal thread acc. to DIN 332 form D Dimension d: ≤∅ 50 mm tolerance k6; d: >∅ 50 mm tolerance m6
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		Option in preparation	

Ratings definition

The ratings (torques) listed in the table apply to continuous operation (S1) with nominal speed at a maximum ambient temperature of 40°C with the machine being installed below 1000m a.m.s.l.

If motors are to be operated in an ambient temperature of more than 40 °C or altitudes above 1000 m a.m.s.l., the required list nominal power P_L (list torque M_h) results from the product of the factors k_1, k_2 specified in the table and the required power P (torque M).

Ambient temperature	40 °C	45°C	50 °C	55°C	60°C
Correction factor k_1	1	1.06	1.13	1.22	1.34
Altitude a.m.s.l. up to	1.000 m	2.000 m	3.000 m	4.000 m	5.000 m
Correction factor k_2	1	1.07	1.16	1.27	1.55

For ambient temperatures above 40 °C and enclosed installation of motors, it is absolutely necessary to contact the manufacturer, because design changes may be necessary.

If, with increasing site altitude above 1000 m, the ambient temperature decreases by approx. 10 °C per 1000 m increase in altitude, no power correction is necessary.

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 room temperature of up to 40 °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

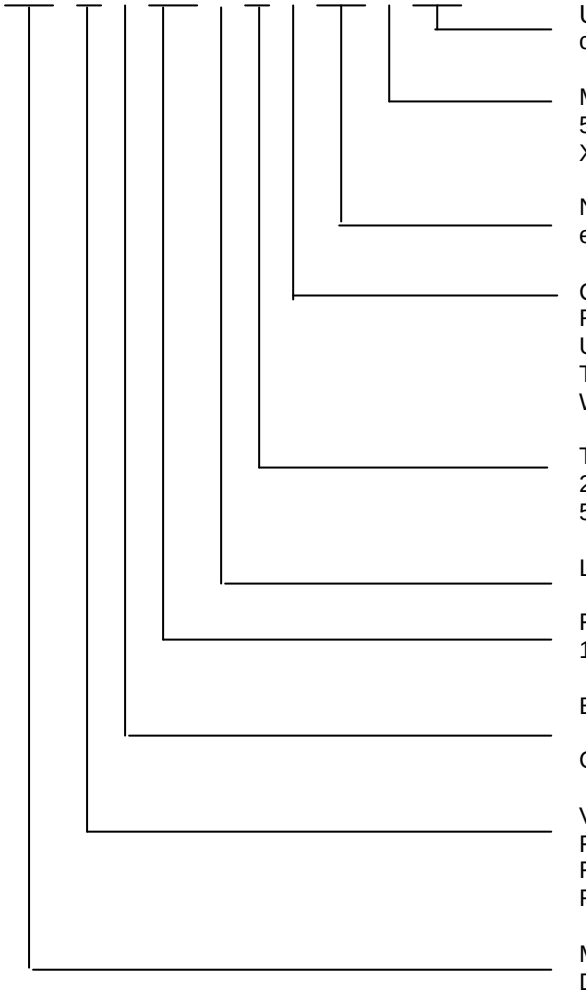
P_N	Nominal power (kW) with nominal speed n_N in continuous operation (S1)
M_N	Nominal torque (kW) with nominal speed n_N in continuous operation (S1) Nominal r.m.s. current (A)
I_{dN}	Magnetizing current for field weakening (A)
U_N	Nominal voltage (V)
$K_{E\,/\,COLD}$	referred to 1000 min^{-1} motor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

Ratings of synchronous motors DS
The specified ratings are achieved in converter operation (field-oriented control) with a clock frequency of 4 kHz in the power stage.

Overload capacity
According to technical data sheet

Type key

DS FF G 100 M 54 R 15 – 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. 15 = 1500 min^{-1}

Cooling method
R radially mounted external fan
U unventilated
T Suitable for pipe mounting
W Water cooling

Type of protection
23 IP 23
54 IP 54

Length: K, M, L, B

Frame size
100...200

Brake
without brake
G with brake

Version
Foot mounting
F Flange mounting
FF Foot – flange mounting

Motor type
DS Three-phase synchronous motor

Technical data

DS 100..23 R.. (IP 23 internally ventilated)

Mains voltage 3 AC 400 V for converter 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	Inertia	Weight
n_N Min^{-1}		P_N KW	M_N Nm	I_N A	U_N V	$K_{E\ /\ KALT}$ $V/1000min^{-1}$	cos φ	I_{dN} A	η_N	f_N Hz	J kgm^2	m kg
1000	DS100K23R10-5	6.9	66	15.0	350	276	0.90	1.5	0.825	50.0	0.010	45
	DS100M23R10-5	9.7	93	21.5	345	272	0.88	0.0	0.856	50.0	0.014	55
	DS100L23R10-5	12.3	117	27.0	340	277	0.89	0.0	0.875	50.0	0.018	65
	DS100B23R10-5	14.7	140	30.0	355	293	0.89	0.0	0.886	50.0	0.022	75
1500	DS100K23R15-5	10.0	64	21.0	350	198	0.91	3.0	0.872	75.0	0.010	45
	DS100M23R15-5	14.3	91	29.0	350	198	0.90	2.0	0.897	75.0	0.014	55
	DS100L23R15-5	18.0	115	35.0	350	208	0.92	5.0	0.909	75.0	0.018	65
	DS100B23R15-5	21.5	137	42.0	350	207	0.92	4.0	0.917	75.0	0.022	75
2000	DS100K23R20-5	13.0	62	25.0	355	162	0.94	6.5	0.896	100.0	0.010	45
	DS100M23R20-5	18.0	86	33.5	350	167	0.95	10.0	0.915	100.0	0.014	55
	DS100L23R20-5	23.0	110	43.0	350	166	0.95	10.0	0.926	100.0	0.018	65
	DS100B23R20-5	27.5	131	51.0	350	166	0.95	11.5	0.932	100.0	0.022	75
2500	DS100K23R25-5	15.5	59	30.0	345	134	0.96	10.0	0.910	125.0	0.010	45
	DS100M23R25-5	22.0	84	40.5	355	135	0.95	10.5	0.929	125.0	0.014	55
	DS100L23R25-5	27.5	105	50.0	350	138	0.97	15.0	0.936	125.0	0.018	65
	DS100B23R25-5	33.5	128	60.0	355	138	0.96	14.0	0.942	125.0	0.022	75
3000	DS100K23R30-5	18.0	57	34.0	345	113	0.96	11.0	0.921	150.0	0.010	45
	DS100M23R30-5	25.5	81	46.0	350	115	0.96	13.0	0.936	150.0	0.014	55
	DS100L23R30-5	32.0	102	58.0	350	115	0.96	15.0	0.944	150.0	0.018	65
	DS100B23R30-5	38.0	121	66.0	360	120	0.97	18.0	0.948	150.0	0.022	75

Maximum standstill torque

Motor type	$M_{0\ max}$ [Nm]
DS100K23R	130
DS100M23R	195
DS100L23R	260
DS100B23R	320

DS 132..23 R.. (IP 23 internally ventilated)

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	Inertia	Weight
N_N Min^{-1}		P_N KW	M_N Nm	I_N A	U_N V	$K_{E/KALT}$ $V/1000min^{-1}$	cos φ	I_{dN} A	η_N	f_N Hz	J kgm^2	M Kg
1000	DS132K23R10-5	20.5	196	43	350	297	0.89	7.5	0.883	50.0	0.045	110
	DS132M23R10-5	27.0	258	56	355	295	0.87	4.0	0.898	50.0	0.058	125
	DS132L23R10-5	31.5	301	62	350	319	0.92	13.5	0.906	50.0	0.071	140
	DS132B23R10-5	37.5	358	78	355	294	0.85	0.0	0.916	50.0	0.084	155
1500	DS132K23R15-5	30.5	194	61	355	208	0.89	11.0	0.916	75.0	0.045	110
	DS132M23R15-5	39.0	248	75	355	216	0.91	16.0	0.925	75.0	0.058	125
	DS132L23R15-5	46.0	293	88	355	221	0.92	20.0	0.933	75.0	0.071	140
	DS132B23R15-5	55.0	350	109	355	205	0.87	5.0	0.939	75.0	0.084	155
2000	DS132K23R20-5	39.0	186	76	350	163	0.91	20.0	0.931	100.0	0.045	110
	DS132M23R20-5	50.0	239	94	350	170	0.93	28.5	0.939	100.0	0.058	125
	DS132L23R20-5	60.0	286	110	360	172	0.92	26.5	0.946	100.0	0.071	140
	DS132B23R20-5	70.0	334	130	355	166	0.91	22.5	0.951	100.0	0.084	155
2500	DS132K23R25-5	48.0	184	90	355	133	0.91	22.5	0.942	125.0	0.045	110
	DS132M23R25-5	61.0	233	114	355	137	0.92	34.5	0.948	125.0	0.058	125
	DS132L23R25-5	71.0	271	130	350	139	0.94	35.5	0.954	125.0	0.071	140
	DS132B23R25-5	83.0	317	152	355	137	0.93	34.0	0.957	125.0	0.084	155
3000	DS132K23R30-5	54.0	172	99	350	119	0.95	36.0	0.948	150.0	0.045	110
	DS132M23R30-5	70.0	223	129	350	118	0.94	44.0	0.954	150.0	0.058	125
	DS132L23R30-5	81.0	258	147	355	115	0.93	32.0	0.960	150.0	0.071	140
	DS132B23R30-5	92.0	293	166	350	117	0.95	45.0	0.961	150.0	0.084	155

Maximum standstill torque

Motor type	$M_{0\ max}$ [Nm]
DS132K23R	350
DS132M23R	460
DS132L23R	575
DS132B23R	680

DS 160..23R.. (IP 23 internally ventilated)

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	Inertia	Weight
n_N Min^{-1}		P_N kW	M_N Nm	I_N A	U_N V	$K_{E\,/\,Kalt}$ $V/1000min^{-1}$	cos φ	I_{dN} A	η_N	f_N Hz	J kgm^2	m kg
1000	DS160K23R10-5	42.5	406	81	355	334	0.93	20.0	0.916	50.0	0.150	195
	DS160M23R10-5	51.0	487	99	345	328	0.94	24.0	0.925	50.0	0.184	220
	DS160L23R10-5	60.0	573	113	360	330	0.91	15.0	0.933	50.0	0.217	245
	DS160B23R10-5	69.0	659	131	360	324	0.90	9.0	0.937	50.0	0.250	270
1500	DS160K23R15-5	63.0	401	119	350	221	0.93	26.0	0.940	75.0	0.150	195
	DS160M23R15-5	76.0	484	143	350	221	0.93	28.0	0.946	75.0	0.184	220
	DS160L23R15-5	88.0	560	168	350	214	0.90	16.0	0.951	75.0	0.217	245
	DS160B23R15-5	98.0	624	176	360	235	0.94	36.0	0.953	75.0	0.250	270
2000	DS160K23R20-5	82.0	392	152	350	170	0.93	35.0	0.951	100.0	0.150	195
	DS160M23R20-5	99.0	473	183	355	168	0.93	33.0	0.956	100.0	0.184	220
	DS160L23R20-5	109.0	520	196	350	176	0.95	49.0	0.959	100.0	0.217	245
	DS160B23R20-5	125.0	597	224	355	175	0.94	43.0	0.962	100.0	0.250	270
2500	DS160K23R25-5	100.0	382	183	355	135	0.93	34.0	0.958	125.0	0.150	195
	DS160M23R25-5	118.0	450	215	350	136	0.93	40.0	0.961	125.0	0.184	220
	DS160L23R25-5	130.0	497	236	345	137	0.95	50.0	0.964	125.0	0.217	245
	DS160B23R25-5	145.0	554	252	360	145	0.96	56.0	0.966	125.0	0.250	270
3000	DS160K23R30-5	110.0	350	198	345	118	0.96	60.0	0.961	150.0	0.150	195
	DS160M23R30-5	130.0	414	236	345	115	0.96	54.0	0.964	150.0	0.184	220
	DS160L23R30-5	140.0	446	240	355	125	0.98	78.0	0.966	150.0	0.217	245
	DS160B23R30-5	150.0	477	254	355	130	0.99	96.0	0.966	150.0	0.250	270

Maximum standstill torque

Motor type	$M_{0\,max}$ [Nm]
DS160K23R	740
DS160M23R	910
DS160L23R	1080
DS160B23R	1180

DS 100..54R.. IP 54 surface-ventilated

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	Inertia	Weight
n_N Min^{-1}		P_N KW	M_N Nm	I_N A	U_N V	$K_{E\ /\ KALT}$ V/1000min^{-1}	cos φ	I_{dN} A	η_N	f_N Hz	J kgm^2	M Kg
1100	DS100K54R11-5	5.0	43.0	10.2	350	276	0.92	0.0	0.873	55.0	0.010	45
	DS100M54R11-5	7.5	65.0	15.5	335	271	0.91	0.0	0.890	55.0	0.014	55
	DS100L54R11-5	10.0	87.0	20.5	340	277	0.91	0.0	0.900	55.0	0.018	65
	DS100B54R11-5	12.0	104.0	23.5	355	293	0.91	0.0	0.907	55.0	0.022	75
1600	DS100K54R16-5	7.1	42.0	14.0	350	198	0.92	0.0	0.903	80.0	0.010	45
	DS100M54R16-5	10.7	64.0	21.0	350	198	0.91	0.0	0.916	80.0	0.014	55
	DS100L54R16-5	14.2	85.0	27.0	355	208	0.93	2.0	0.924	80.0	0.018	65
	DS100B54R16-5	17.2	103.0	33.0	355	207	0.91	0.0	0.929	80.0	0.022	75
2000	DS100K54R20-5	8.7	41.5	17.0	355	162	0.92	0.0	0.916	100.0	0.010	45
	DS100M54R20-5	13.1	62.5	25.0	360	167	0.91	0.0	0.928	100.0	0.014	55
	DS100L54R20-5	17.4	83.0	33.0	360	166	0.91	0.0	0.935	100.0	0.018	65
	DS100B54R20-5	21.0	100.0	38.5	350	172	0.95	4.0	0.938	100.0	0.022	75
2500	DS100K54R25-5	10.6	40.5	20.0	360	134	0.92	0.0	0.926	125.0	0.010	45
	DS100M54R25-5	15.8	60.5	29.5	350	135	0.94	3.0	0.936	125.0	0.014	55
	DS100L54R25-5	21.0	80.0	38.0	355	138	0.94	3.5	0.942	125.0	0.018	65
	DS100B54R25-5	25.0	95.0	46.0	340	138	0.96	7.0	0.945	125.0	0.022	75
3000	DS100K54R30-5	12.3	39.0	23.0	360	113	0.92	0.0	0.932	150.0	0.010	45
	DS100M54R30-5	18.0	57.0	33.0	350	115	0.95	3.0	0.941	150.0	0.014	55
	DS100L54R30-5	24.0	76.5	44.0	355	115	0.94	3.0	0.947	150.0	0.018	65
	DS100B54R30-5	28.0	89.0	50.0	350	120	0.98	10.0	0.949	150.0	0.022	75

Maximum standstill torque

Motor type	$M_{0\ max}$ [Nm]
DS100K54R	120
DS100M54R	175
DS100L54R	235
DS100B54R	290

DS 132..54R.. IP 54 surface-ventilated

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	Inertia	Weight
N_N Min^{-1}		P_N KW	M_N Nm	I_N A	U_N V	$K_{E\ /\ KALT}$ $V/1000min^{-1}$	cos φ	I_{dN} A	η_N	f_N Hz	J kgm^2	M Kg
1100	DS132K54R11-5	13.5	117	26.0	360	297	0.90	0.0	0.922	55.0	0.045	110
	DS132M54R11-5	18.0	156	35.0	350	295	0.90	0.0	0.930	55.0	0.058	125
	DS132L54R11-5	22.0	191	40.0	360	319	0.94	5.0	0.935	55.0	0.071	140
	DS132B54R11-5	26.0	225	51.0	345	293	0.91	0.0	0.939	55.0	0.084	155
1600	DS132K54R16-5	19.2	115	36.5	360	208	0.91	0.0	0.940	80.0	0.045	110
	DS132M54R16-5	25.0	149	46.0	355	216	0.94	5.0	0.946	80.0	0.058	125
	DS132L54R16-5	30.0	179	54.0	350	221	0.95	8.0	0.950	80.0	0.071	140
	DS132B54R16-5	35.5	212	69.0	345	205	0.91	0.0	0.952	80.0	0.084	155
2000	DS132K54R20-5	23.0	110	44.5	350	163	0.91	0.0	0.947	100.0	0.045	110
	DS132M54R20-5	30.0	143	56.0	360	170	0.91	0.0	0.952	100.0	0.058	125
	DS132L54R20-5	36.0	172	67.0	355	172	0.91	0.0	0.956	100.0	0.071	140
	DS132B54R20-5	42.5	203	82.0	345	166	0.92	0.0	0.957	100.0	0.084	155
2500	DS132K54R25-5	27.5	105	52.0	350	133	0.91	0.0	0.952	130.0	0.045	110
	DS132M54R25-5	35.5	136	66.0	360	137	0.91	0.0	0.956	130.0	0.058	125
	DS132L54R25-5	42.0	160	77.0	355	139	0.92	0.0	0.959	130.0	0.071	140
	DS132B54R25-5	50.0	190	93.0	350	137	0.92	0.0	0.960	130.0	0.084	155
3000	DS132K54R30-5	31.0	99	55.0	360	119	0.95	5.0	0.954	150.0	0.045	110
	DS132M54R30-5	40.0	127	72.0	345	118	0.96	10.0	0.958	150.0	0.058	125
	DS132L54R30-5	47.0	150	88.0	350	114	0.93	0.0	0.959	150.0	0.071	140
	DS132B54R30-5	55.0	175	99.0	355	117	0.93	0.0	0.960	150.0	0.084	155

Maximum standstill torque

Motor type	$M_{0\ max}$ [Nm]
DS132K54R	305
DS132M54R	400
DS132L54R	500
DS132B54R	600

DS 100..54U.. (IP 54 unventilated)

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	Inertia	Weight
n_N Min^{-1}		P_N KW	M_N Nm	I_N A	U_N V	$K_{E\ /\ KALT}$ $V/1000min^{-1}$	cos φ	I_{dN} A	η_N	f_N Hz	J kgm^2	m kg
1200	DS100K54U12-5	3.5	27.5	6.7	345	276	0.96	0.0	0.902	60.0	0.010	40
	DS100M54U12-5	5.0	40.0	9.9	335	271	0.96	0.0	0.918	60.0	0.014	50
	DS100L54U12-5	6.5	52.0	12.5	340	277	0.96	0.0	0.926	60.0	0.018	60
	DS100B54U12-5	7.6	60.0	14.0	350	293	0.96	0.0	0.931	60.0	0.022	70
1700	DS100K54U17-5	4.7	26.5	9.0	345	198	0.96	0.0	0.919	85.0	0.010	40
	DS100M54U17-5	6.8	38.0	12.8	340	198	0.96	0.0	0.931	85.0	0.014	50
	DS100L54U17-5	8.6	48.0	15.5	350	208	0.96	0.0	0.938	85.0	0.018	60
	DS100B54U17-5	10.0	56.0	18.0	345	207	0.97	0.0	0.941	85.0	0.022	70
2100	DS100K54U21-5	5.5	25.0	10.4	345	162	0.96	0.0	0.926	105.0	0.010	40
	DS100M54U21-5	7.9	36.0	14.4	350	167	0.96	0.0	0.936	105.0	0.014	50
	DS100L54U21-5	9.8	44.5	18.0	345	166	0.97	0.0	0.940	105.0	0.018	60
	DS100B54U21-5	11.2	51.0	20.5	340	166	0.97	0.0	0.942	105.0	0.022	70
2600	DS100K54U26-5	6.3	23.0	11.6	350	134	0.97	0.0	0.927	130.0	0.010	40
	DS100M54U26-5	8.7	32.0	16.0	350	135	0.97	0.0	0.936	130.0	0.014	50
	DS100L54U26-5	10.6	39.0	19.0	350	138	0.97	0.0	0.939	130.0	0.018	60
	DS100B54U26-5	11.6	42.5	21.0	345	138	0.98	0.0	0.938	130.0	0.022	70
3000	DS100K54U30-5	6.6	21.0	12.7	355	113	0.97	0.0	0.935	150.0	0.010	40
	DS100M54U30-5	8.9	28.0	16.8	335	115	0.97	0.0	0.932	150.0	0.014	50
	DS100L54U30-5	10.4	33.0	19.5	335	115	0.98	0.0	0.932	150.0	0.018	60

Maximum standstill torque

Motor type	$M_{0\ max}$ [Nm]
DS100K54U	110
DS100M54U	160
DS100L54U	215
DS100B54U	265

DS 132..54U.. (IP 54 unventilated)

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	Inertia	Weight
N_N Min^{-1}		P_N KW	M_N Nm	I_N A	U_N V	$K_{E/KALT}$ $V/1000min^{-1}$	cos φ	I_{dN} A	η_N	f_N Hz	J kgm^2	m kg
1200	DS132K54U12-5	9.7	78.0	17.5	360	297	0.96	0.0	0.938	60.0	0.045	100
	DS132M54U12-5	12.4	98.0	22.5	355	295	0.95	0.0	0.944	60.0	0.058	115
	DS132L54U12-5	15.0	119.0	25.5	360	319	0.99	5.0	0.948	60.0	0.071	130
	DS132B54U12-5	17.0	135.0	31.0	345	293	0.96	0.0	0.951	60.0	0.084	145
1700	DS132K54U17-5	12.7	71.0	23.0	355	208	0.95	0.0	0.947	85.0	0.045	100
	DS132M54U17-5	15.5	87.0	27.0	355	216	0.98	2.0	0.951	85.0	0.058	115
	DS132L54U17-5	18.7	105.0	32.0	355	221	0.99	4.0	0.954	85.0	0.071	130
	DS132B54U17-5	20.0	112.0	37.0	340	205	0.97	0.0	0.954	85.0	0.084	145
2100	DS132K54U21-5	14.2	64.0	26.5	340	163	0.96	0.0	0.948	105.0	0.045	100
	DS132M54U21-5	16.7	76.0	30.0	345	170	0.97	0.0	0.951	105.0	0.058	115
	DS132L54U21-5	19.6	89.0	35.0	345	172	0.97	0.0	0.952	105.0	0.071	130
2600	DS132K54U26-5	14.5	53.0	27.0	340	133	0.97	0.0	0.944	130.0	0.045	100
	DS132M54U26-5	16.2	59.0	29.5	340	137	0.98	0.0	0.943	130.0	0.058	115
	DS132L54U26-5	17.0	63.0	31.0	340	139	0.98	0.0	0.938	130.0	0.071	130
3000	DS132K54U30-5	13.2	42.0	24.0	340	119	0.98	0.0	0.933	150.0	0.045	100
	DS132M54U30-5	13.7	43.5	25.5	335	118	0.99	0.0	0.925	150.0	0.058	115

Maximum standstill torque

Motor type	$M_{0\ max}$ [Nm]
DS132K54U	275
DS132M54U	360
DS132L54U	450
DS132B54U	535

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. For increased radial force, machines with roller bearings on the drive end are available. Please specify radial forces in your order.

Ball bearing assignment for D-end

Frame size	D-end	N-end
100	6209	6209
132	6212	6212
160	6214	6214

Ball bearing assignment for D-end

Frame size	D-end	N-end
100	NU 209 E	6209
132	NU 212 E	6212
160	NU 214 E	6214

Determination of radial forces F_R
When using pulleys, the radial load is calculated according to the following formula:

$$F_R = k\frac{2 \cdot 10^7 \cdot P}{n \cdot D}\ [N]$$

P = Nominal power in kW
n = Nominal speed in min^{-1}
D = Disk diameter in mm

The belt tightening factor k is approximately:
k = 1.8...2.5 for V-belt
k = 2.2..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

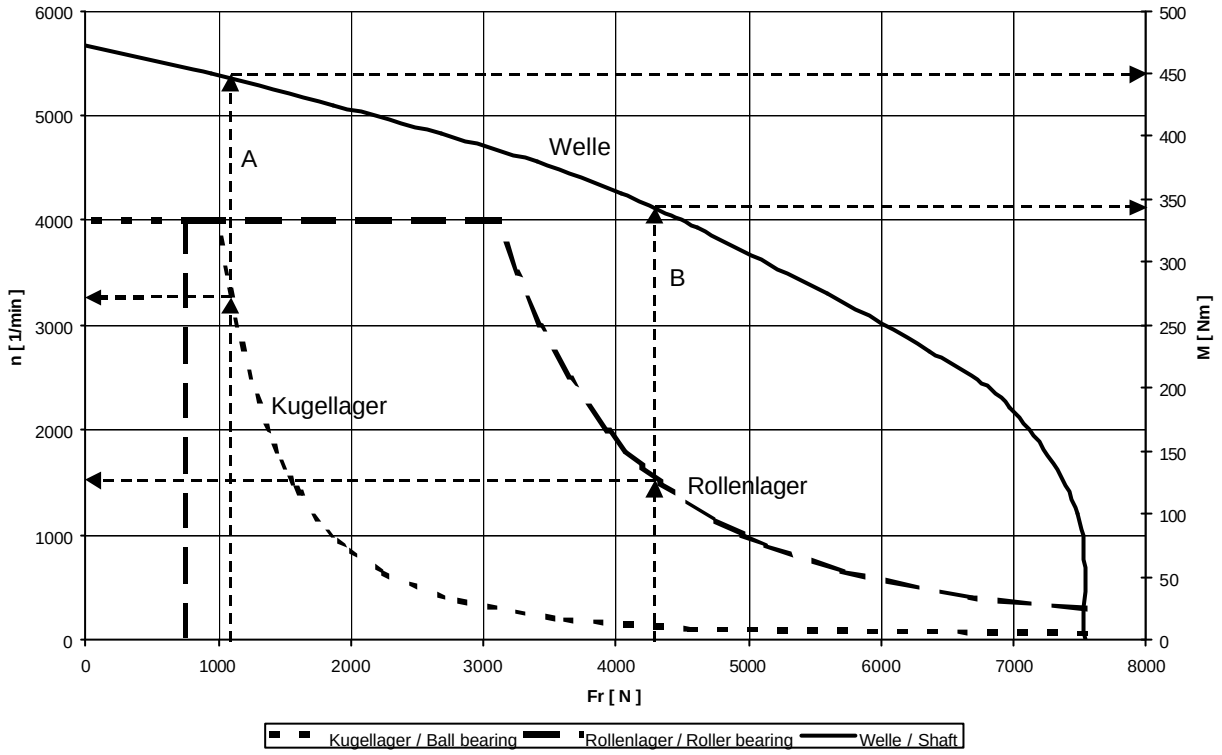
Permissible radial forces F_R at the shaft end
The ball bearings are dimensioned for a calculated service life of approx. 20,000 operating hours[1)]. The load values specified in the following must not be exceeded.
The specified permissible radial forces F_R are valid only for horizontal mounting of 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 < 75 °C, medium operating speed < 2000 U/min

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 x 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 => maximum speed 3250 min^{-1}

The maximum transmittable torque results from the "Shaft" characteristic.

Radial force 1100 N => 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.

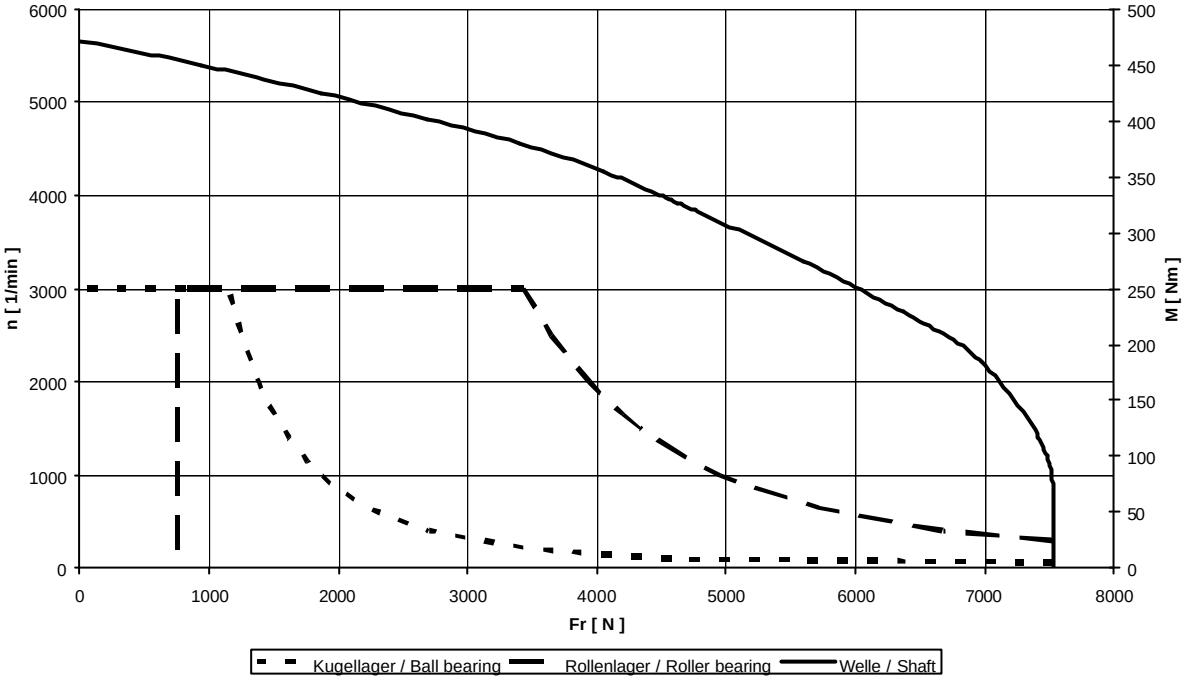
Radial force 4,300 N => maximum speed 1,500 min^{-1}

The maximum transmittable torque results from the "Shaft" characteristic.

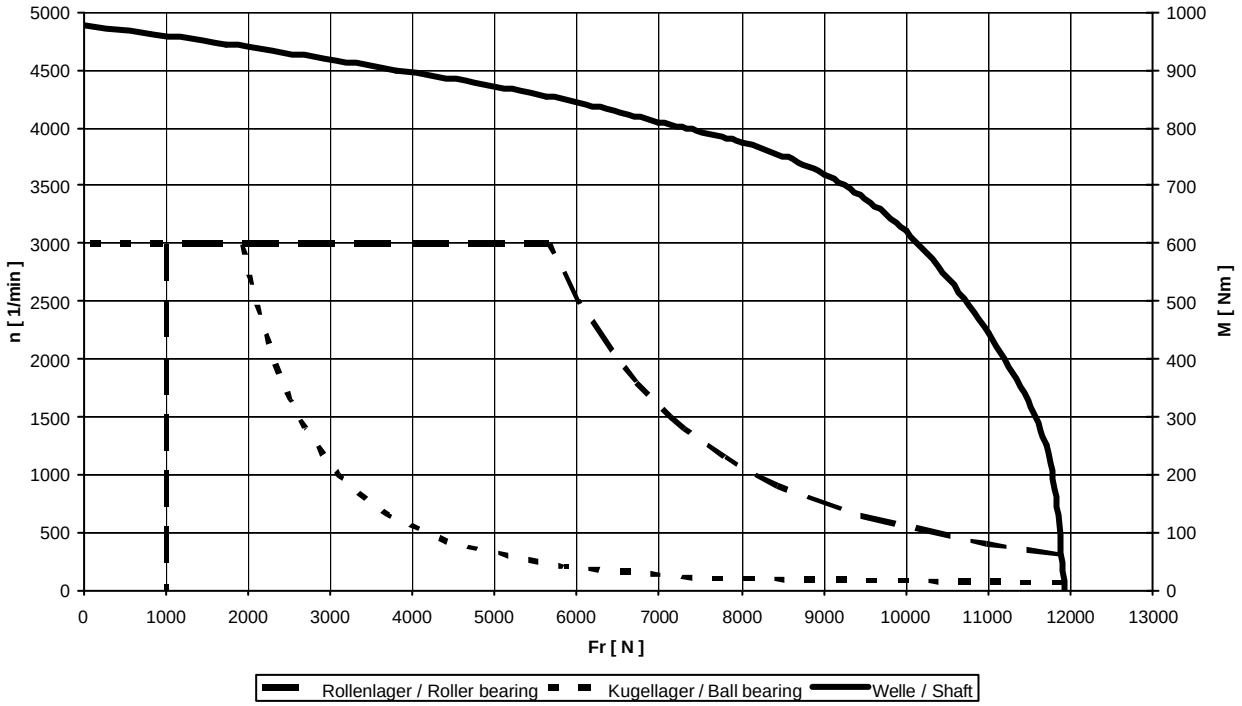
Radial force 4,300 N => maximum transmittable torque 345 Nm

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

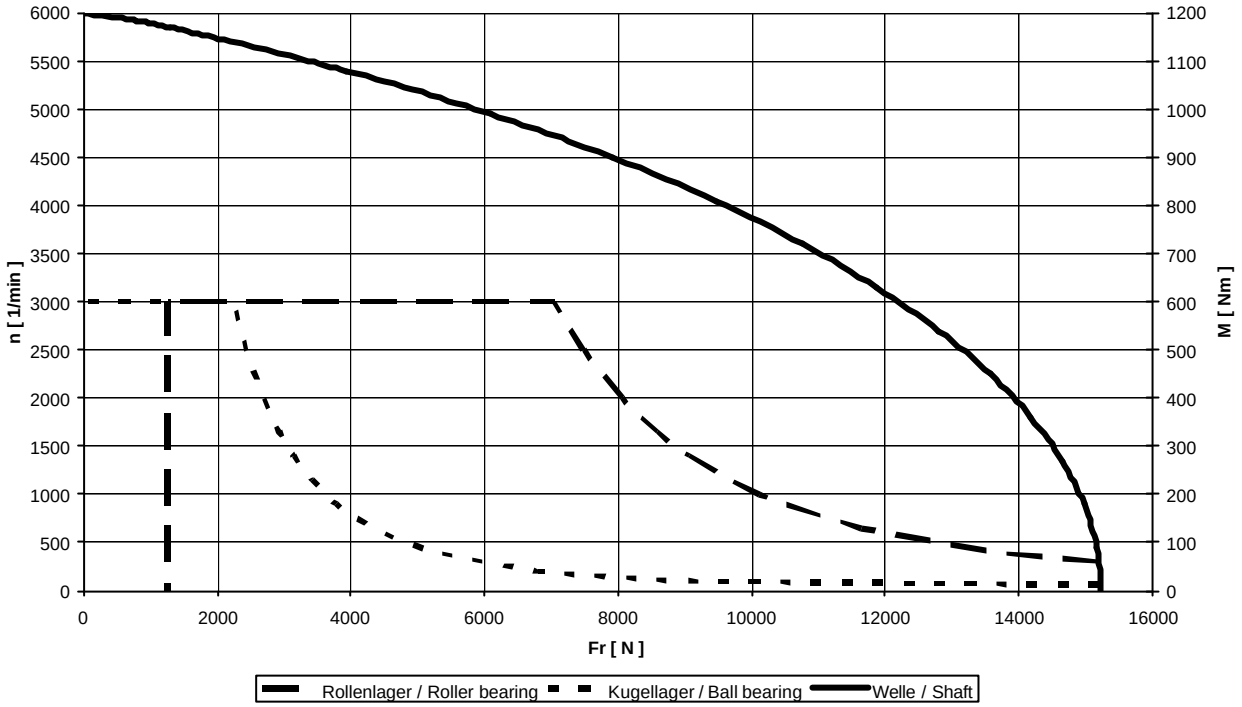
DS 100


n [1/min]
M [Nm]
Fr [N]
Kugellager / Ball bearing
Rollenlager / Roller bearing
Welle / Shaft

DS 132


n [1/min]
M [Nm]
Fr [N]
Rollenlager / Roller bearing
Kugellager / Ball bearing
Welle / Shaft

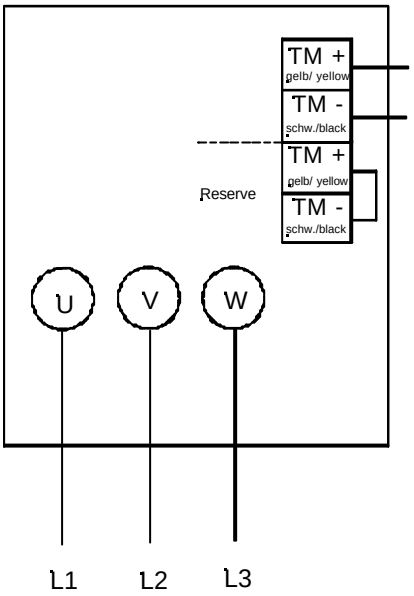
DS 160


n [1/min]
M [Nm]
Fr [N]
0
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
100
200
300
400
600
700
800
900
1000
1100
1200
2000
4000
6000
8000
10000
12000
14000
16000
Rollenlager / Roller bearing
Kugellager / Ball bearing
Welle / Shaft

Main connection – Terminal marking

Connection diagram

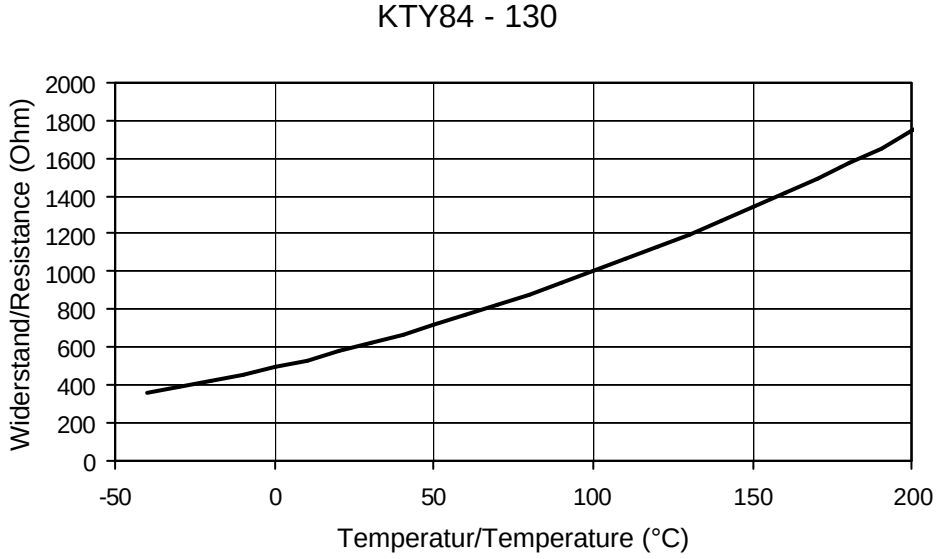
U V W ---------- Power connection
TM ---------- Thermal sensor



Frame size	100	132	160
Stud	8 M	10 M	12 M
Metric gland	1xM16 1xM40	3xM40 2xM25 2xM20	2xM63 2xM25

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.



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 ventilated motors do not exceed the noise intensity specified in EN 60034. The values of unventilated motors are clearly lower.

Vibration severity

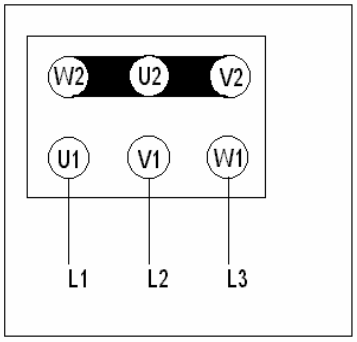
Vibration severity	Speed [min^{-1}]	Frame size 100-132 V_{eff}[mm/s]	Frame size 160 V_{eff}[mm/s]
N (normal)	600 - 1800		
	> 1800	1.8	2.8
R* (reduced)	600 - 1800	0.71	1.12
	> 1800	1.12	1.8
S* (special)	600 - 1800	0.45	0.71
	> 1800	0.71	1.12

The motors can be supplied in three vibration classes according to DIN ISO 5473.
* R and S are available with ball bearings only

Fan data

Fan connection via terminal box

Connection diagram



U V W----------Power connection

Radial fan

Frame size	Fan type	Nom. current [A] with Y
100	BFB 398	0.33
132	BFB 519	0.8
160	BFB 635	1.4

The fan motors are dimensioned for Δ/Y 200-265/345-460V 50/60Hz as a standard. Nominal currents are maximum values.

Brake assignment

for motor type	Brake type	Brake torque [Nm]			Input power [W]	max. perm. switching energy Wperm. per switching operation [J]			Switching power $P_{perm.}$ [kJ/h]	Disengaging time [s]	Engaging time [ms]	Inertia [kgm²]	max. perm. speed [min^{-1}]	Weight [kg]
		Operating brake [M2]	Holding brake [M4]	Peak load brake [M4]		Operating brake	Holding brake	Peak load brake	for operating brake	Switching operation	Indiv. braking	Indiv. braking		
DS..100	SB 50	30	50	-	80	4500	10000	-	470	120	160	0.0005	4000	5
DS..100	SB 100	60	100	60	106	5000	18000	70000	560	180	250	0.0015	3500	9.5
DS..132	SB 200	135	200	140	170	8000	20000	90000	630	225	300	0.0040	3000	13
DS..160	On request													

For use as a holding brake the following must be observed:
Brake has a considerably increased brake torque
3 emergency stops (individual braking operations) per hour 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
M2 ... dynamic torque, 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.

Braking time / switching energy / switching capacity
It is useful to check that the brake is suited for its application. To do this, the brake energy and braking power must be determined.

Determination of the braking time [t_B]

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

$\sum J$ Total moment of inertia in kgm² = $J_{mot} + J_{add}$ (referred to motor shaft)
J_{mot} Motor moment of inertia in kgm²
J_{add} Additional moment of inertia in kgm² (referred to motor shaft)
?n 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)
t_0 Time in s from the switching instant to the full extent of the braking torque (response time)
i Number of cycles per hour

Determining the switching energy [W_R]

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

Determining the switching capacity [P_R]

$$P_R = \frac{W_R \cdot i}{1000} \quad \text{in} \quad \frac{kJ}{h}$$

$W_{Rperm} \leq$ value from table

$P_{Rperm} \leq$ Value from table

In most cases, t_0 is negligible. If this is not the case and the time t_0 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.

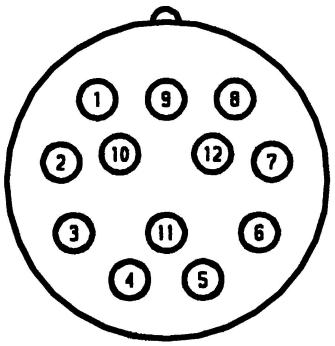
Brake supply
Normal voltage: 24; 96 - 120; 176V- (other voltages on request), 24 V: Supply with transformer and rectifier, 96 – 120 and 176 V: Supply using brake supply unit
The brakes can alternatively be equipped with microswitch or mechanical ventilation.
Switching capacity of microswitches
Ohmic 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

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 Ω ± 10%
Stator resistance	28 Ω ± 10%
Rotor impedance for no-load operation	70 + j 74 Ω ± 15%
Rotor impedance at short-circuit	62 + j 66 Ω ± 15%
Stator impedance for no-load operation with min. coupling	108 + j 206 Ω ± 15%
Stator impedance at short-circuit and maximum coupling	97 + j 183 Ω ± 15%
Phase shift	8°
Zero voltage	15 mV
Phase error referred to zero position	10’

Resolver connection



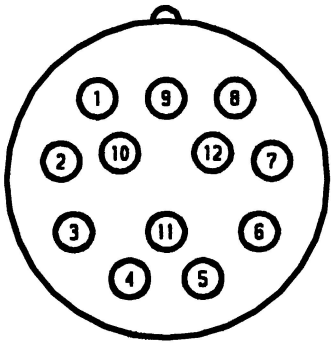
Pin	Signal
1	cos -
2	
3	
4	
5	sin –
6	sin +
7	
8	cos +
9	
10	Ref +
11	
12	Ref -

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



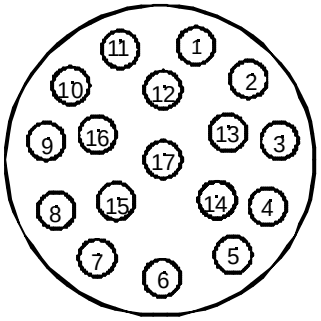
Pin	Signal
1	ref cos
2	+ 485
3	
4	
5	sin
6	ref sin
7	- 485
8	cos
9	Screening
10	Gnd
11	
12	+ U

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 5%	
Current consumption without load (mA)	≤ 150	≤ 250

ECN 1313 EQN 1325 connection

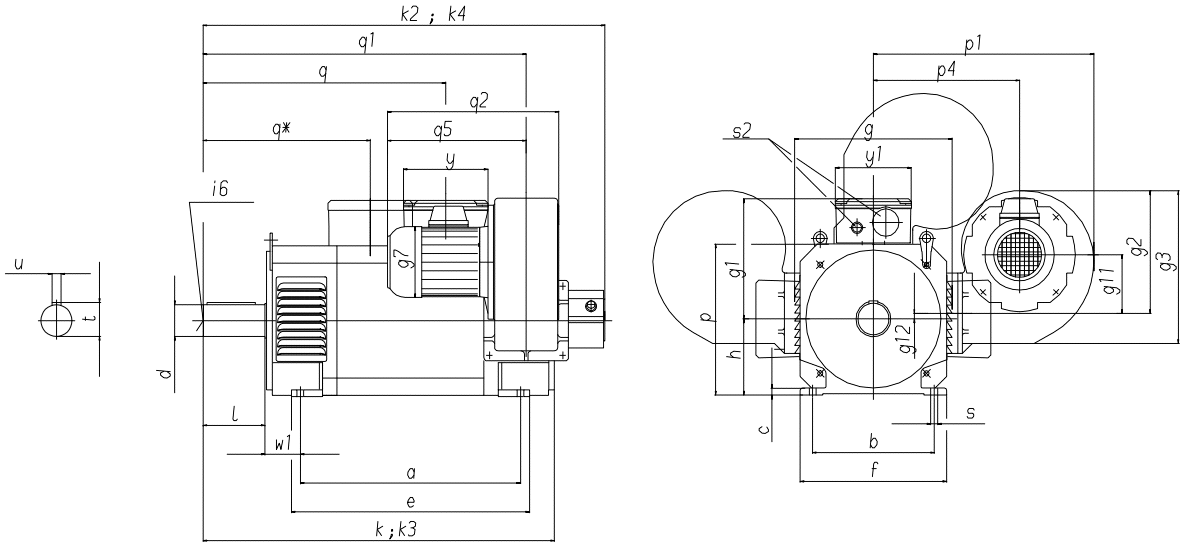


Pin	Signal
1	U_p
2	
3	
4	0V
5	
6	
7	U_p
8	Clock
9	Clock inv.
10	0V
11	
12	B+
13	B-
14	Data
15	A+
16	A-
17	Data inv.

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

Dimension drawings

DS 100 / 132 / 160 IP 23 internally ventilated



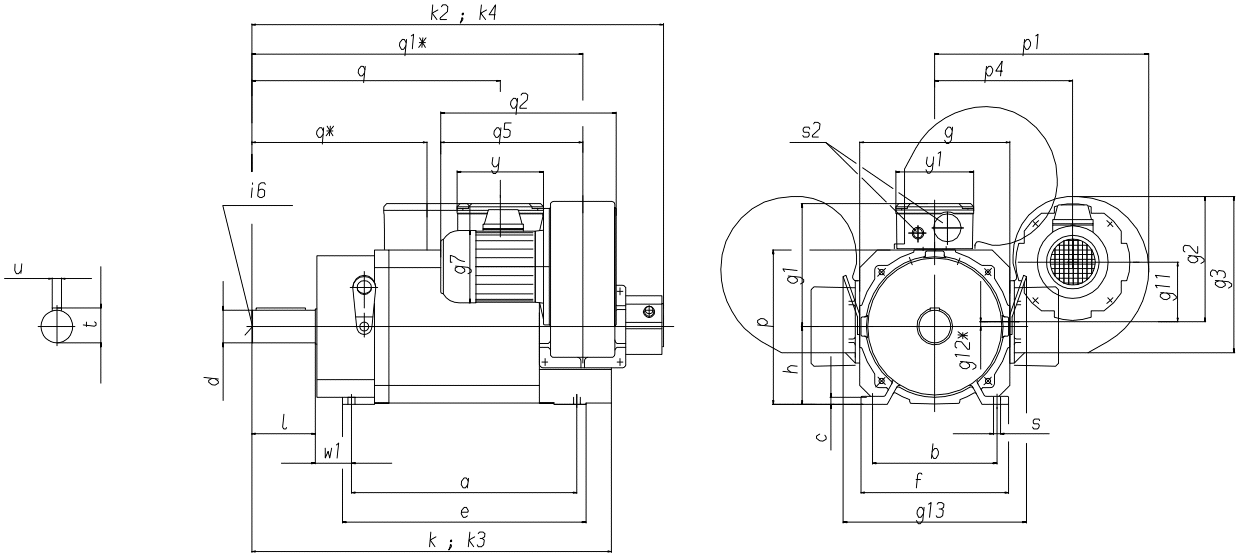
k = without brake
k2 = with encoder
k3 = with brake
k4 = with encoder and brake
i6 = Centring with internal thread acc. to DIN 332 form D

Type	Shaft					Motor		
	d	l	t	u	i_6	y	y_1	S_2
100	42	110	45	12	M16	150	135	1M40 1M16
132	55	110	59	16	M20	235	235	3M40 2M25 2M20
160	60	140	64	18	M20	252	252	2M63 2M25

Type	Foot							Motor																			
	a	b	c	e	f	s	w_1	g	g_1	g_2	g_3	g_7	g_{11}	g_{12}	h	k	k_2	k_3	k_4	p	p_1	p_4	q*	q	q_1	q_2	q_5
100 K	273	160	10	330	200	12	50	220	190	172	220	108	78	10	100	480	600	578	698	210	320	215	283	310	451	230	181
100 M	323			380												530	650	628	748					360	501		
100 L	373			430												580	700	678	798					410	551		
100 B	423			480												630	750	728	848					460	601		
132 K	365	216	12	423	264	12	63	285	285	213	265	125	102	15	132	595	715	703	823	270	395	264	338	373	550	311	250
132 M	415			473												645	765	753	873					423	600		
132 L	465			523												695	815	803	923					473	650		
132 B	515			573												745	865	853	973					523	700		
160 K	464	254	12	508	312	14	70	340	276	237	295	145	114	19	160	738	858	888	1008	324	450	297	380	504	667	339	280
160 M	514			558												788	908	938	1058					554	717		
160 L	564			608												838	958	988	1108					604	767		
160 B	614			658												888	1008	1038	1158					654	817		

Version IM B3	Type of protection IP 23	Cooling method IC 06		

DS 100 / 132 IP 54 surface-cooled



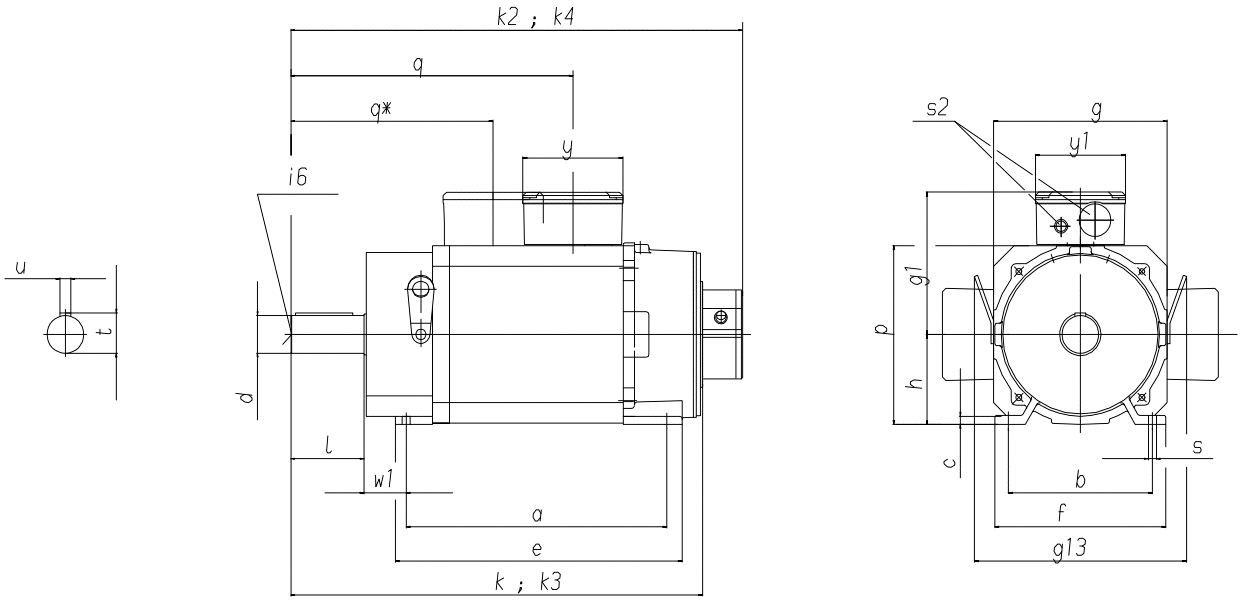
k = without brake
k2 = with encoder
k3 = with brake
k4 = with encoder and brake
i6 = Centring with internal thread acc. to DIN 332 form D

Type	Shaft					Motor		
	d	l	t	u	i_6	y	y_1	S_2
100	42	110	45	12	M16	150	135	1M40 1M16
132	55	110	59	16	M20	235	235	3M40 2M25 2M20

Type	Foot							Motor																			
	a	b	c	e	f	s	w_1	g	g_1	g_2	g_3	g_7	g_{11}	g_{12}*	g_{13}	h	k	k_2	k_3	k_4	p	p_1	p_4	q*	q	q_1*	q_2	q_5
100 K	273	160	10	330	200	12	50	220	190	172	220	108	78	8	260	100	480	600	578	698	210	320	215	283	310	451	230	181
100 M	323			380													530	650	628	748					360	501		
100 L	373			430													580	700	678	798					410	551		
100 B	423			480													630	750	728	848					460	601		
132 K	365	216	12	423	264	12	63	285	276	213	265	125	102	10	324	132	595	715	703	823	270	395	264	338	373	557	311	250
132 M	415			473													645	765	753	873					423	607		
132 L	465			523													695	815	803	923					473	657		
132 B	515			573													745	865	853	973					523	707		

Version IM B3	Type of protection IP 54	Cooling method IC 06		

DS 100 / 132 IP 54 self-cooled



k = without brake
k2 = with encoder
k3 = with brake
k4 = with encoder and brake
i6 = Centring with internal thread acc. to DIN 332 form D

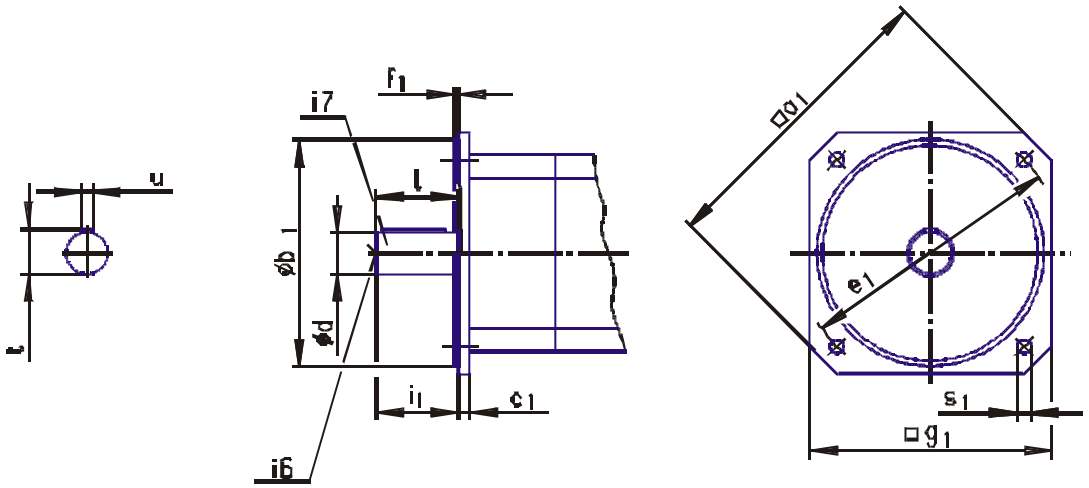
Type	Shaft					Motor		
	d	l	t	u	i_6	y	y_1	S_2
100	42	110	45	12	M16	150	135	1M40 1M16
132	55	110	59	16	M20	235	235	3M40 2M25 2M20

Type	Foot							Motor													
	a	b	c	e	f	s	w_1	g	g_1	g_{13}	h	k	k_2	k_3	k_4	p	q*	q	y	y_1	S_2
100K	273	160	10	330	200	12	50	220	190	260	100	480	600	578	698	210	283	310	150	135	1M40
100M	323			380								530	650	628	748			360			1M16
100L	373			430								580	700	678	798			410			
100B	423			480								630	750	728	848			460			
132 K	365	216	12	423	264	12	63	285	285	324	132	595	715	703	823	270	338	373	235	235	3M40
132 M	415			473								645	765	753	873			423			2M25
132 L	465			523								695	815	803	923			473			2M20
132 B	515			573								745	865	853	973			523			

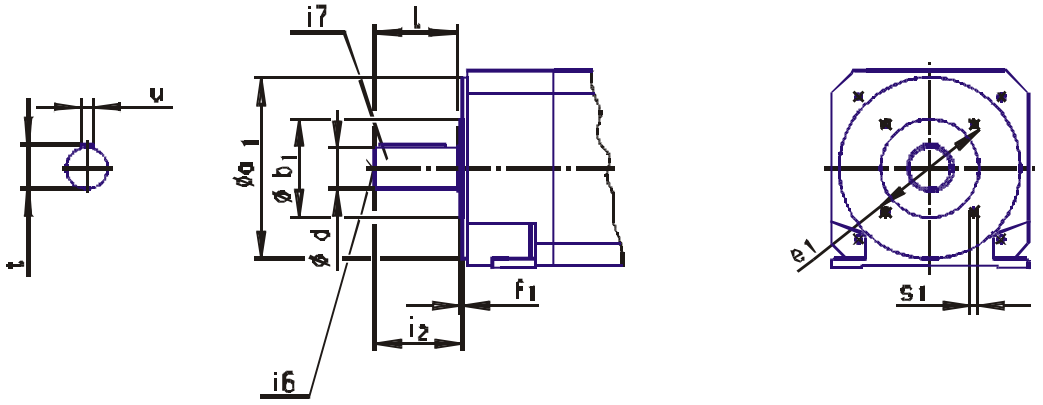
Version IM B3	Type of protection IP 54	Cooling method IC 00		

Flange dimensions of frame size 100 / 132 / 160

Version IM B 5



Version IM B 14



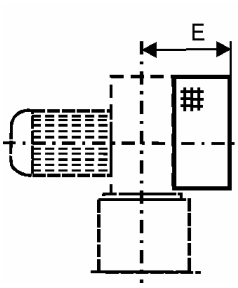
i6 = Centring with internal thread acc. to DIN 332 form D
i7 = Tolerances of shaft ends acc. to DIN 748 T3

Type	Shaft				Flange B5								Flange B 14						
	d	l	t	u	a_1	b_1	c_1	e_1	f_1	g_1	i_1	s_1	a_1	b_1	e_1	f_1	i_2	s_1	
100 K 100 M 100 L 100 B	42	110	45	12	300	230	12	265	4	240	110	14	177	110	130	2	115	M8	IM B35 only IP54 in B5 only
132 K 132 M 132 L 132 B	55	110	59	16	400 350	300 250	16 13	350 300	5 5	312 260	110 110	18 18	239	130	165	2	115	M10	IM B35 only IM B5; IM B35
160 K 160 M 160 L 160 B	60	140	64	18	400	300	20	350	5	316	140	18							IM B35 only

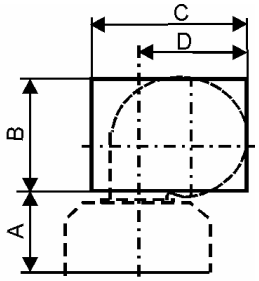
Version IM B5, B35, B14		30893015b

Filters frame size 100 / 1332 / 160

Rectangular filter



Filter towards N-end



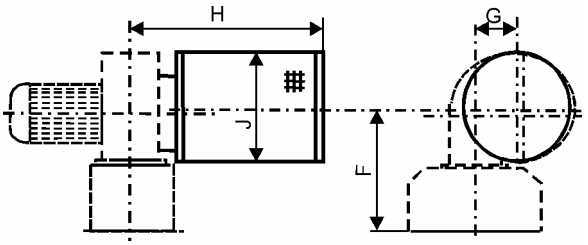
View to D-end

Dimension when fan at the top in [mm]

Motor frame size	Fan type	A	B	C	D	E
100	BFB 398	124	176	246	162	145
132	BFB 519	175	206	306	213	163
160	BFB 635	215	546	336	545	189

Round filter

With frame size 132 - 160 filter towards drive end



Filter towards N-end

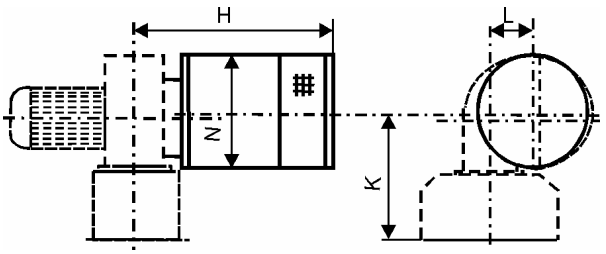
View to D-end

With frame size 100 filter towards non-drive end

Dimension when fan at the top in [mm]

Motor frame size	Fan type	F	G	H	J
100	BFB 398	218	78	311	174
132	BFB 519	265	92	298	205
160	BFB 635	310	100	458	213

Silencer



Filter towards N-end View to D-end

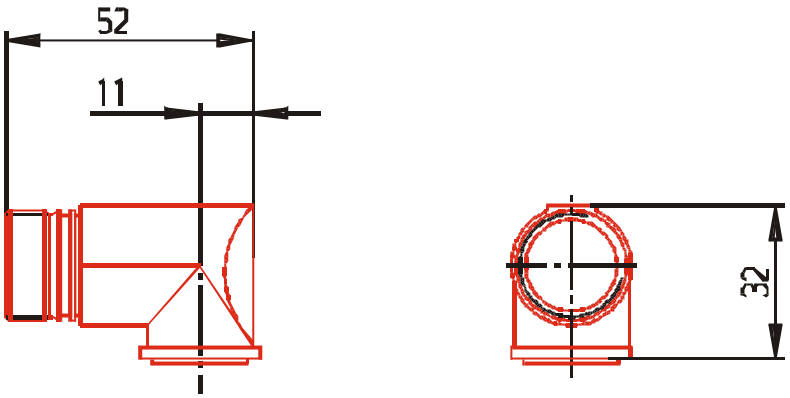
Dimension when fan at the top in [mm]

Motor frame size	Fan type	K	L	M	N
160	BFB 635	310	92	450	256

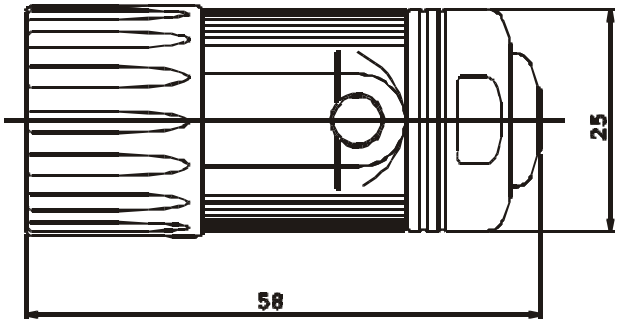
When silencer on the non-drive end, it must be supported by the customer.

Encoder male and female connectors

Female connector



Male connector



Motor cables

General
The motor cables are highly flexible trailing cables with overall shielding. They comply with the regulations VDE, UL and CSA.
The brake is controlled via the brake connection (terminal box, brake), the thermal sensor is connected via the main connection.
The cables are particularly suitable for the optimum use of cable racks thanks to their low cross-section, low weight and non-impeding surface. They can thus be efficiently used in trailing chains.
The overall shielding with an optical coverage of more than 85% makes it an EMC uncritical cable.

Technical description
- Sheath resistance against media such as coolants, machine and gearbox oils
- Abrasion resistance because of a special surface in cable racks and trailing chains
- High-flexible, trailing cable
- Sheath surface not blocking, satin-finish
- Shield made of tinned copper braid with optical coverage of ≥ 85 %
- Core insulation made of TPE or polyester, sheath material PUR halogene-free
- Cable FCF-free and silicone-free
- Behavior in case of fire: fire-inhibiting, halogene-free
- Cable color in RAL 1028, melon yellow
- Labelling with Baumüller sign, VDE, UL and CSA sign
- Minimum bending radius for flexible use 12 x D

Nominal voltage
Uo/U 600 / 1000 V (power cores)
U 24 V DC (control cores)

Core lettering
Power cores U, VV, WWW
Colored control cable pairs as star-quads in red, white, black, yellow
Assignment of pairs red – black (brake),
white – yellow (temperature)

Cable data

Cable cross-section	Nominal current [A][1)]	Cable diameter [mm]
4×1.5 mm^2 4×0.75 mm^2	15	11.7 – 12.3
4×2.5 mm^2 4×0.75 mm^2	21	12.7 – 14.6
4×4 mm^2 4×0.75 mm^2	28	14.2 – 15.4
4×6 mm^2 4×0.75 mm^2	36	16.6 – 17.9
4×10 mm^2 4×0.75 mm^2	50	20.5 – 21.5
4×16 mm^2 4×0.75 mm^2	66	54.0 – 25.8
4×25 mm^2 2×(2×1.5 mm^2)	84	26.3 – 29.7
4×35 mm^2 2×(2×1.5 mm^2)	104	30.8 – 32.5

1) Current carrying capacity acc. to table 5 laying type C or E
(VDE 0113 / EN 60 204 Part 1 issue 1997)
Ambient temperature 40°C

Cables of 1.5 / 2.5 mm^2 can be laid up to 100 m without additional filters, when larger cross-sections used, cable lengths up to 40 m are permissible. The terminal voltage at the motor must be < 1kV, however. If the terminal voltages exceed 1 kV, filters must be installed between converter and motor.

Application notes

Operating temperature
The cables can be operated within a temperature range from –20°C to +80°C.

Cable laying at the motor
The cables must not touch the motor surface.

Smallest permissible bending radii
12 times outer cable diameter.
Smaller bending radii are possible with reduced service life.

Encoder cables

General

A fully preassembled encoder cable is used for all encoder systems. Motor connection is via a 12-pin round signal connector and converter connection via a 15-pin sub-D plug. The encoder cables are available as 'trailing' and 'non-trailing' cables.

The trailing cable is suitable for use in trailing chains, for example. As opposed to the 'non-trailing' cable, the cable sheath consists of tougher PUR for use in environments with acids and bases (coolants) instead of PVC.

Up to a length of 10 m, the cables are available in 1 m sections (1 m, 2 m, 10 m). From a cable length of 10 m, the sections come in 5 m intervals (10 m, 15 m, …).

In the case of servo motors, the resolver encoder system links the temperature sensor with the converter via the encoder cable.

Technical data

1. Technical description – non-trailing

- LiYCY, 5x (2x0.14mm²) + 2 x 0.5mm² copper lead, twisted pair
- PVC sheath, grey
- 1st end: 12-pin signal circular connector with 12 female contacts
- 2nd end: 15-pin D-Sub connector with male contacts and locking screws 4-4OUNC
- Baumüller labelling, black
- Outer diameter 9.0 mm (+/-3mm)
- Bending radius: $r \geq 60$ mm (fixed installation), $r \geq 135$ mm (flexible use)
- Nominal voltage: $250V_{AC}$

2. Technical description – trailing

- Li12YC11Y, 5x (2x0.14mm²) + 2 x 0.5mm² copper lead, twisted pair
- PU sheath, black
- 1st end: 12-pin signal circular connector with 12 female contacts
- 2nd end: 15-pin D-Sub connector with male contacts and locking screws 4-4OUNC
- Baumüller labelling, white
- Outer diameter 9.0 mm (+/-3mm)
- Bending radius: $r \geq 70$ mm (fixed installation), $r \geq 100$ mm (flexible use)
- Nominal voltage: $300V_{AC}$

Application notes

- Operating temperature

	trailing	non-trailing
Limit temperature	at the surface	at the surface
no / few movements	-40 °C to +80 °C	- 30 °C to +80 °C
continuous movements	- 30 °C to +80 °C	-5 °C to + 70 °C

- Cable laying at the motor

The cables must not touch the motor surface.

Ordering data

Encoder cables / preassembled cables with connector

Encoder cable
non-trailing, preassembled
Cable 5 x (2x014mm^2) + 2 x 0.5 mm^2
with connector

Length in m	Article number
1	243601
2	211338
3	219333
4	541166
5	209879
6	220197
7	216455
8	220429
10	210052
15	215716
20	218568
25	218569
30	217094
35	216444
40	217095
45	217567
50	217568
55	217569
60	217570
70	542088

Encoder cable
trailing, preassembled
Cable 5 x (2x014mm^2) + 2 x 0.5 mm^2
with connector

Length in m	Article number
3	246658
4	243379
5	549540
6	242954
8	549541
10	549542
15	549543
20	549544
25	549545
30	549546
35	549547
40	240520
45	240521
50	240522
55	244033
60	245484

Encoder connector	Article number
Encoder connector	201833

Commissioning and maintenance instructions

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

Drive Center National

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Tel +49- (0)2154-487-0 • Fax +49- (0)2154-487-59

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