



DYNASYN
Hightorque-Servomotors DT

Dynamic. Compact. Powerful.

AMK



Top-class dynamic response: DT compact high-torque motors

The DYNASYN DT series of high-torque motors meets the highest requirements made by modern drive technology in terms of high dynamic response and precision, while boasting extremely compact dimensions.

All these motors have been developed and manufactured in-house. AMK is able to draw on decades of experience in the servo motor business and this, together with its extensive expertise and inventiveness, enables the company to create efficient, flexible and innovative drive solutions.

The DT series of motors stands out from the crowd thanks to the following performance data:

- Continuous power range of 280 W to 24 kW
- Continuous standstill torques of 0.5 to 220 Nm
- Maximum torques of up to 430 Nm
- Convection-cooled or liquid-cooled
- Standard or short version
- With resolver or inductive optical absolute encoders

These figures combine to produce an integrated drive concept, from the auxiliary axis right through to the main drive. The motors have a high overload capacity for peak loads thanks to the use of an optimized winding and magnet technology.

The maximum torque can be utilized over a wide speed range, thus facilitating extremely fast motor acceleration and deceleration. This makes DT motors ideal for use in dynamic positioning applications. The innovative concept also benefits from being largely maintenance-free and from a long service life.

DT compact synchronous servo motors are available in convection-cooled and liquid-cooled versions. The parts of the motors that carry liquids are made from stainless steel to ensure that they do not have to be maintained and that they can offer high system availability.

In the convection-cooled version, the DYNASYN DT high torque motors are also available in a short design. The DTK model has been designed specifically for applications in which space is at a premium and as such is ideal for use as a drive for linear axes, for example.

A variety of encoder systems supports rapid and accurate motor positioning. Simple drive tasks and those requiring an average degree of accuracy can be performed using a resolver. Motor encoders with EnDAT® interfaces are available for applications calling for greater precision.

No matter what sector of industry you are working in, AMK can provide you with the right motor for every application.

Whether used as direct drives or with gear reduction, their excellent features mean that DT motors are ideally suited to meet the requirements of a wide variety of sectors. These include:

- Injection molding machines
- Printing presses
- Paper processing machines
- Packaging machines
- Handling and assembly systems
- Materials handling and RSU technology systems
- Automation systems
- Presses
- Machine tools
- Special machines

The motors can be fitted with a holding brake and/or a gearbox as an option.

Special models, integrated motors or designs featuring hollow shafts or flange outputs are also possible.

In conjunction with digital servo converters from the AMKASYN KE/KW series, these motors form the basis of an intelligent drive system that can be used in a positive, efficient way for all drive tasks such as torque, speed and position control, positioning and synchronous control wherever space is at a premium. On motors with EnDAT® encoders, inverters detect motor-specific parameters automatically. System-specific data can be stored in the motor encoder.

Features

- High dynamic performance due to an outstanding torque-inertia ratio
- High power density due to a high number of poles and optimized plate geometry
- High overload capacity for peak loads
- Largely maintenance-free, very reliable, long service life
- Motor well protected against dust and water due to the high degree of protection
- Winding temperature monitoring further improves safety and reliability
- Low risk of contamination due to smooth surface
- Flexible mounting options in all positions due to compact housing dimensions and rotating connectors
- Lifetime lubrication for all mounting positions
- Simple, straightforward commissioning thanks to AMK motor data found in the encoder (electronic nameplate)

Options

- Single/multiturn absolute encoder
- Shaft with feather key
- Holding brake

Special designs

The following special designs can be selected on request subject to our agreement:

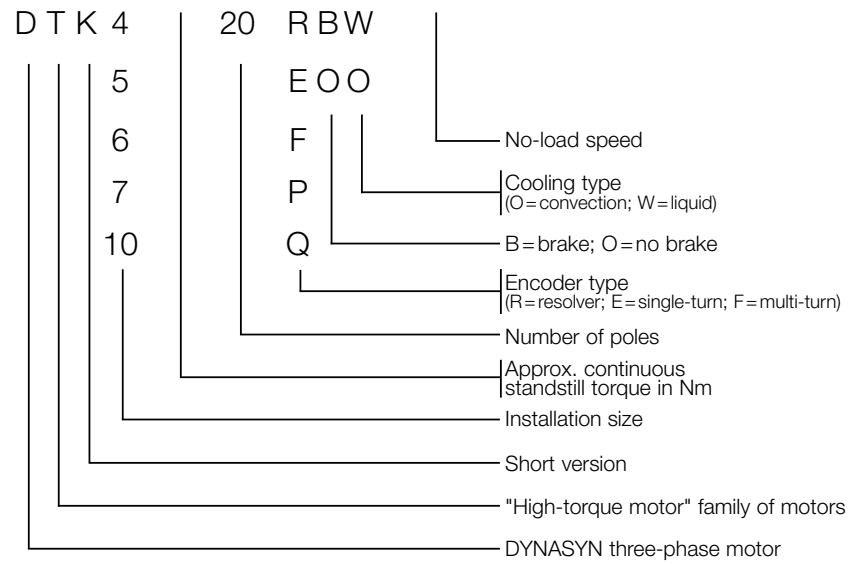
- Gearbox
- Integrated motors
- Special winding
- Hollow shaft



Overview

Type key

D T 3 - x - 10 - x x x - xxxx



Convection-cooled motors

Motor type	Square flange	Standstill data		Rating					Maximum-data		Electr. data		Mechanical data					
	mm	M ₀ [Nm]	I ₀ [A]	M _N [Nm]	P _N [kW]	I _N [A]	n _N [rpm]	k _T [Nm/A]	M _{max} [Nm]	I _{max} [A]	L _{tt} [mH]	R _{tt} [Ω]	n _{max} [rpm]	J [kgcm ²]	L [mm]	L _{BR} [mm]	m [kg]	
DT3-0,5-10-RxO-9000	55	0,64	1,14	0,5	0,31	0,9	6.000	0,56	1,9	4,0	46,5	32,0	10.000	0,1	114,0	144,0	0,8	
DT3-1-10-RxO-9000		1,59	3,24	0,94	0,59	2,18		0,49	4,5	9,6	4,7	4,3		0,3	174,0	204,0	1,9	
DT4-1-10-RxO-6000	70	1,25	1,32	1,0	0,44	1,1	4.000	0,95	3,9	4,0	43,0	25,0	8.000	0,36	110,5	143,5	2,3	
DT4-2-10-RxO-6000		2,4	2,55	1,9	0,8	2,0		0,94	6,4	6,3	15,9	8,5		6.000	0,68	142,0	175,0	2,7
DT4-4-10-RxO-6000		3,9	4,53	2,33	0,98	2,7		0,86	14,0	16,0	5,4	3,0			1,44	205,0	238,0	3,5
DT5-3-10-RxO-5000	100	2,4	2,1	1,7	0,8	1,5	4.500	1,14	10,0	10,0	35,0	7,0	5.000	1,72	157,0	192,0	4,4	
DT5-5-10-RxO-5000		4,5	4,0	3,3	1,2	2,8	3.500	1,13	20,0	20,0	15,0	2,7		3,05	187,0	222,0	4,9	
DT5-9-10-RxO-4000		8,4	5,7	6,0	1,9	4,1	3.000	1,47	41,0	33,0	11,0	1,75		4.000	5,7	247,0	282,0	7,4
DT6-13-10-RxO-3500	140	14,4	11,9	7,9	2,5	6,5	3.000	1,21	47,0	46,0	3,4	0,58	4.000	11,3	285,0	315,0	12,2	
DT6-20-10-RxO-3500		25,0	19,2	11,0	3,4	8,5		1,3	72,0	67,0	2,5	0,32	5.000	18,7	345,0	375,0	17,0	
DT7-11-20-RxO-3500	142	10,0	6,6	6,6	1,9	4,4	2.800	1,51	39,0	33,0	8,4	2,48	3.500	14,9	204,0	233,0	9,3	
DT7-17-20-RxO-3500		17,0	11,3	11,0	2,8	7,2	2.500	1,5	65,0	50,0	4,1	0,92		33,0	234,0	263,0	14,2	
DT7-28-20-RxO-2000		28,0	10,4	19,0	3,0	7,2	1.500	2,68	140,0	67,0	6,0	1,2		4.000	57,0	294,0	323,0	18,9
DT7-40-20-RxO-2000		42,0	15,2	29,0	3,0	10,5	1.000	2,76	210,0	100,0	3,1	0,66		2.000	85,0	354,0	383,0	25,4
DT10-54-20-RxO-1500	190	55,0	10,6	34,0	2,8	6,4	800	5,2	150,0	33,0	11,6	1,2	2.500	174,0	298,0	359,0	42,0	
DT10-95-20-RxO-700		95,0	12,8	54,0	3,4	7,3	600	7,4	240,0	33,0	11,4	1,1	1.000	380,0	418,0	479,0	61,0	

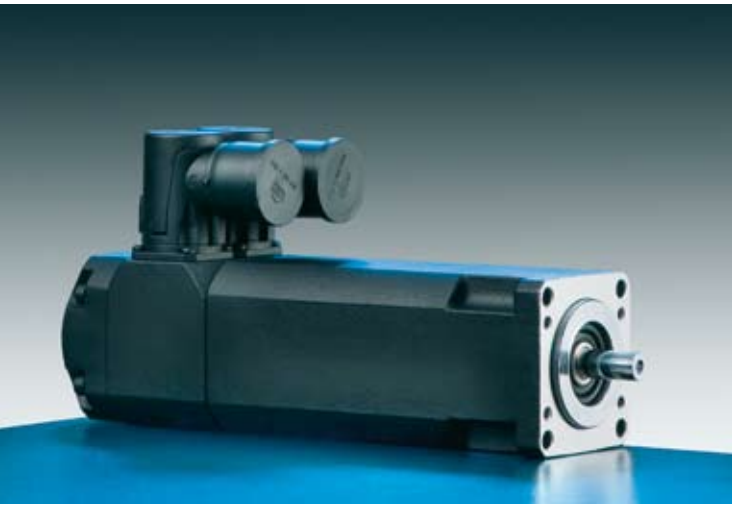
Convection-cooled motors, short version

Motor type DTK	Square flange	Standstill data		Rating					Maximum-data		Electr. data		Mechanical data				
	mm	M ₀ [Nm]	I ₀ [A]	M _N [Nm]	P _N [kW]	I _N [A]	n _N [rpm]	k _T [Nm/A]	M _{max} [Nm]	I _{max} [A]	L _{tt} [mH]	R _{tt} [Ω]	n _{max} [rpm]	J [kgcm ²]	L [mm]	L _{BR} [mm]	m [kg]
DTK5-3-10-RxO-6000	100	2,4	3,1	1,7	0,7	2,2	4.000	0,77	9,0	16,0	20,0	5,25	6.000	1,72	114,5	150,0	3,5
DTK7-11-20-RxO-3500	142	10,0	6,6	6,6	1,9	4,4	2.800	1,5	39,0	33,0	8,4	2,48	3.500	14,9	145,0	180,5	7,3

Liquid-cooled motors

Motor type DT	Square flange	Standstill data		Rating					Maximum-data		Electr. data		Mechanical data				
	mm	M ₀ [Nm]	I ₀ [A]	M _N [Nm]	P _N [kW]	I _N [A]	n _N [rpm]	k _T [Nm/A]	M _{max} [Nm]	I _{max} [A]	L _{tt} [mH]	R _{tt} [Ω]	n _{max} [rpm]	J [kgcm ²]	L [mm]	L _{BR} [mm]	m [kg]
DT5-15-10-RxW-6000	100	15,0	16,5	8,9	4,3	8,9	4.000	0,91	32,0	40,0	4,5	0,87	6.000	7,4	246,5	266,0	14,0
DT5-23-10-RxW-6500		23,0	25,6	13,5	7,1	15,0	5.000	0,9	47,0	67,0	2,9	0,45		8,3	353,5	375,0	17,0
DT7-55-20-RxW-5200	150	60,0	60,0	38,0	14,0	38,0	3.500	1,0	110,0	132,0	0,8	0,166	5.000	57,0	288,0	332,0	21,0
DT7-72-20-RxW-5000		88,0	73,0	52,0	18,0	43,0	3.000	1,21	160,0	200,0	0,4	0,1		85,0	348,0	392,0	25,0
DT10-100-20-RxW-3000	200	95,0	54,0	66,0	11,0	38,0	1.500	1,75	160,0	132,0	1,3	0,16	3.000	175,0	292,0	354,0	43,0
DT10-145-20-RxW-2000		160,0	66,7	120,0	18,0	50,0		2,4	310,0	200,0	1,16	0,11	2.500	330,0	412,0	473,0	64,0
DT10-200-20-RxW-2500		220,0	78,6	153,0	24,1	55,0		2,8	430,0	200,0	1,07	0,1	3.500	480,0	532,0	593,0	83,0

DT3 convection-cooled servo motors



Features

- Very high standstill torques in relation to the shaft height
- High torque and power density
- High overload capacity
- Maximum dynamic response with acceleration values of up to 160,000 rad/s²
- IP54 degree of protection

Applications

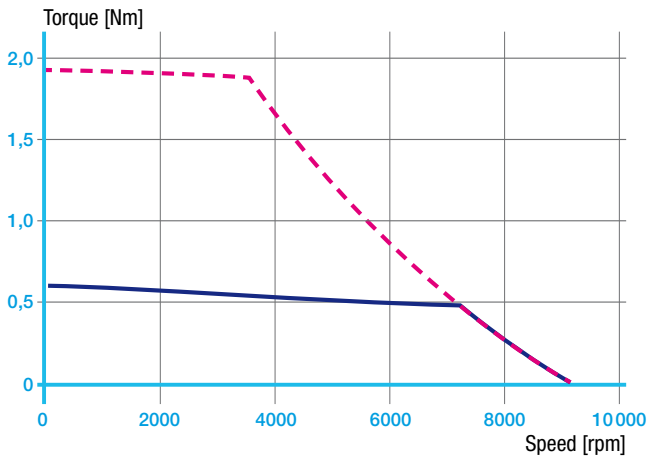
- Positioning and actuating drive for drive tasks with or without gearbox
- For intermittent operation
- Variable-speed drive for continuous running

Equipment

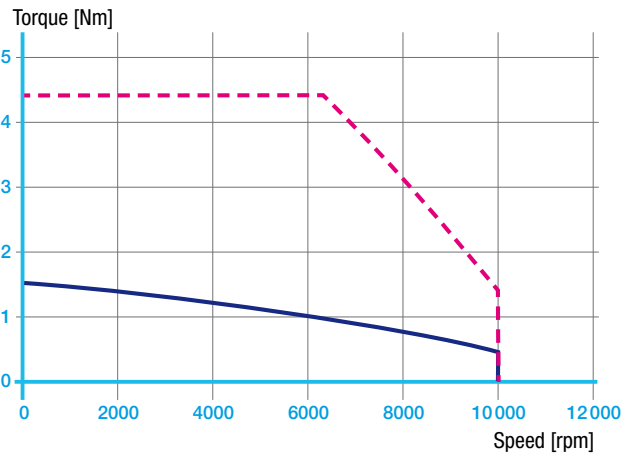
	Standard	Option
Brake	–	1.1 Nm
Encoder	Resolver	E, F, P, Q
Shaft	smooth	Shaft key DIN6885 A3x3x12

Connection cable: Copper conductor rated cross-section 1.5 mm², power connector size 1

Characteristics



DT3-0,5-10-xxO-9000-B5



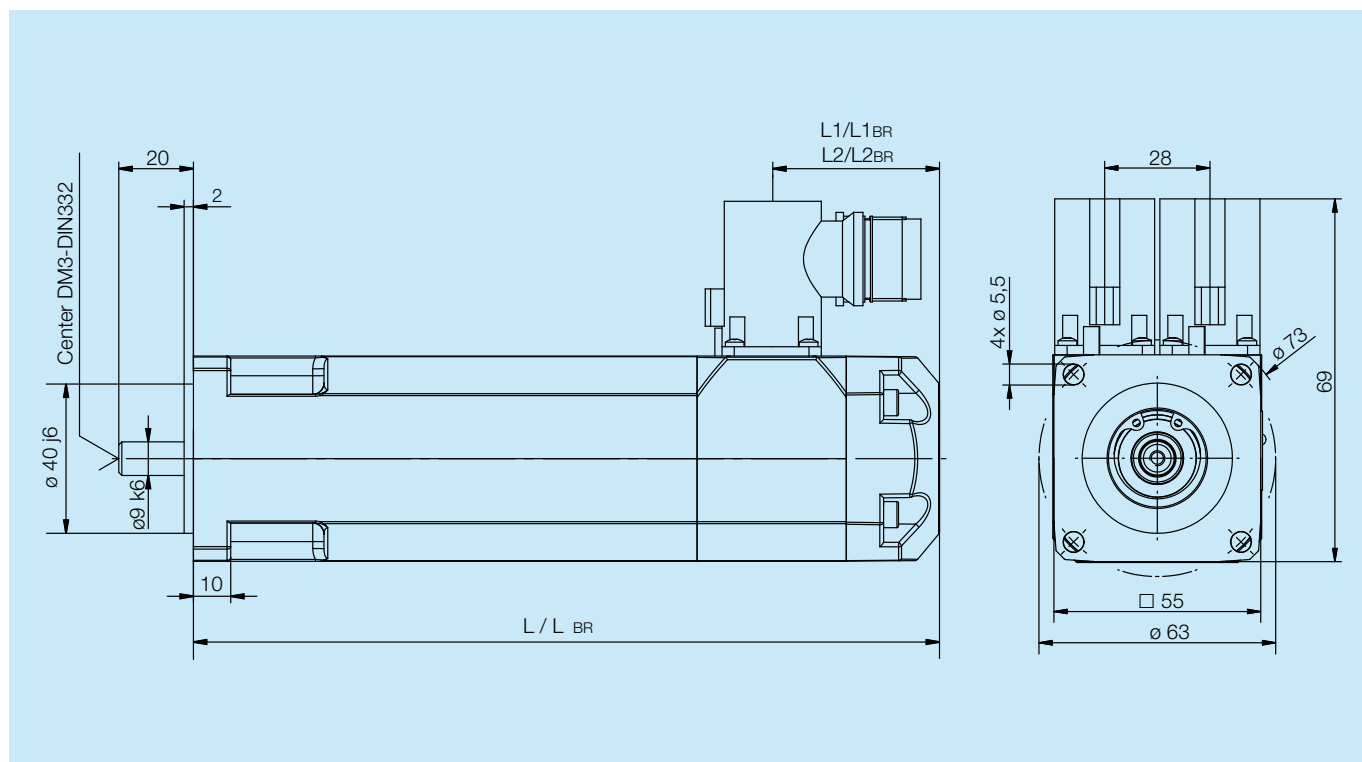
DT3-1-10-xxO-9000-B5

Technical data

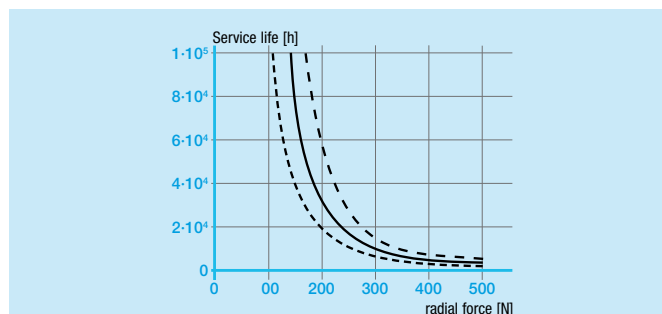
Motor type	Standstill-data		Rating					Maximum data		Electr. data		Mechanical data								
	M ₀ [Nm]	I ₀ [A]	M _N [Nm]	P _N [kW]	I _N [A]	n _N [rpm]	k _T [Nm/A]	M _{max} [Nm]	I _{max} [A]	L _{tt} [mH]	R _{tt} [Ω]	η _{max} [rpm]	J [kgcm ²]	L [mm]	L1 [mm]	L2 [mm]	L _{BR} [mm]	L1 _{BR} [mm]	L2 _{BR} [mm]	m [kg]
DT3-0,5-10-RxO-9000 ¹	0,64	1,14	0,5	0,31	0,9	6.000	0,56	1,9	4,0	46,5	32,0	10.000	0,1	114,0	23,7	23,7	144,0	53,7	53,7	0,8
DT3-0,5-10-xxO-9000														126,0	35,7	35,7	156,0	65,7	65,7	0,8
DT3-1-10-RxO-9000 ¹	1,59	3,24	0,94	0,59	2,18	6.000	0,49	4,5	9,6	4,7	4,3	10.000	0,3	174,0	23,7	23,7	204,0	53,7	53,7	1,9
DT3-1-10-xxO-9000														186,0	35,7	35,7	216,0	65,7	65,7	1,9

¹) Shorter overall length on motors with resolver as position encoder

Dimensions



Bearing service life (L10h)



DT3-0,5-10-xxO-9000-B5 · DT3-1-10-xxO-9000-B5

DT4 convection-cooled servo motors



Features

- Very high standstill torques in relation to the shaft height
- High torque and power density
- Maximum dynamic response with acceleration values of up to 100,000 rad/s²
- IP54 degree of protection

Applications

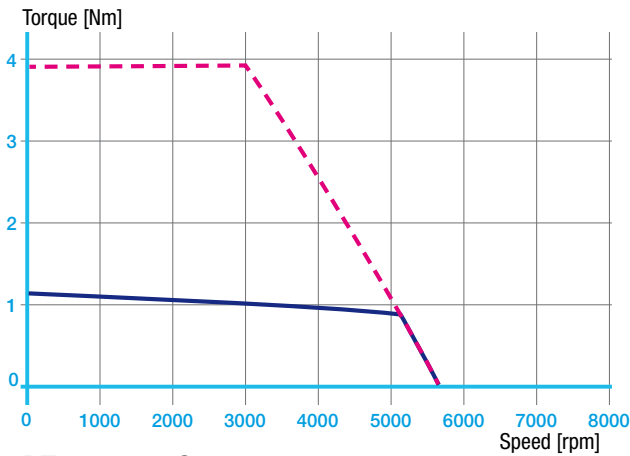
- Positioning and actuating drive for drive tasks with or without gearbox
- For intermittent operation
- Variable-speed drive for continuous running

Equipment

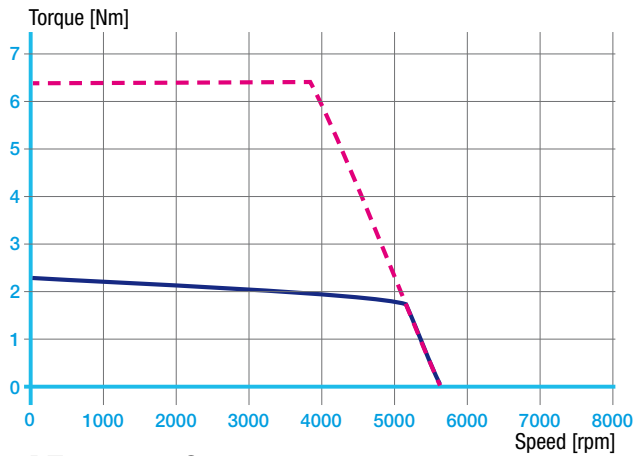
	Standard	Option
Brake	–	4.5 Nm
Encoder	Resolver	E, F, P, Q
Shaft	Smooth	Shaft key For shaft diameter 11mm the size of the shaft key is A4x4x16mm according to DIN 6885 For shaft diameter 14 mm the size of the shaft key is 5x5x20mm according to DIN 6885.

Connection cable: Copper conductor rated cross-section 1.5 mm², power connector size 1

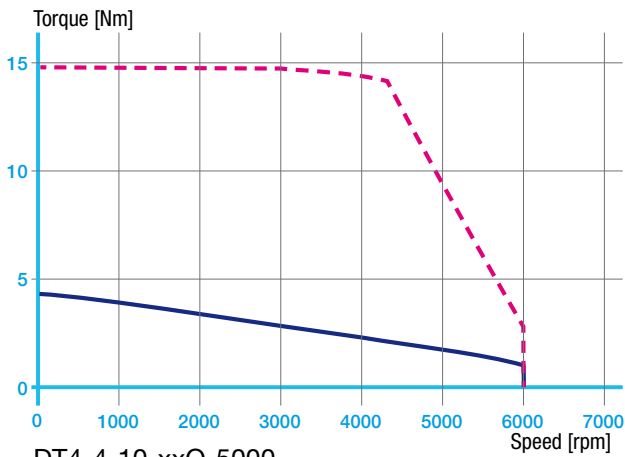
Characteristics



DT4-1-10-xxO-5000



DT4-2-10-xxO-5000



DT4-4-10-xxO-5000

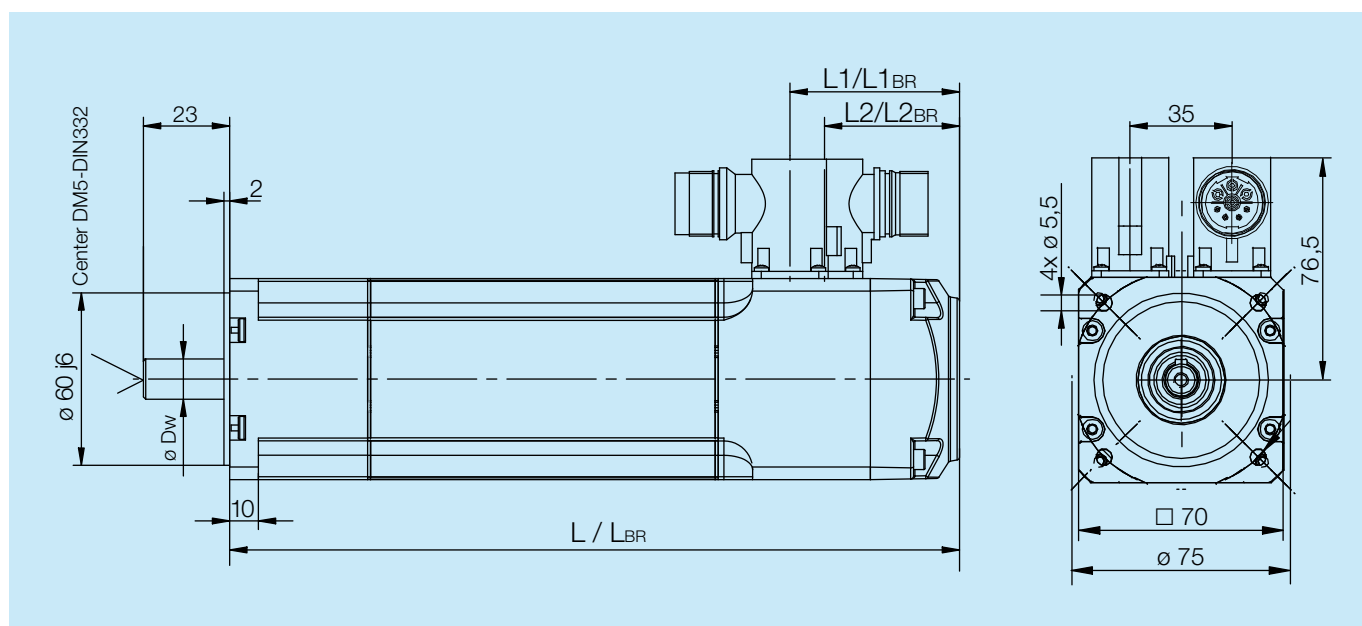
Technical data

Motor type	Standstill data		Rating					Maximum data		Electr. data		Mechanical data									
	M ₀ [Nm]	I ₀ [A]	M _N [Nm]	P _N [kW]	I _N [A]	n _N [rpm]	k _T [Nm/A]	M _{max} [Nm]	I _{max} [A]	L _{tt} [mH]	R _{tt} [Ω]	n _{max} [rpm]	J [kgcm ²]	D _w ² [mm]	L [mm]	L1 [mm]	L2 [mm]	L _{BR} [mm]	L1 _{BR} [mm]	L2 _{BR} [mm]	m [kg]
DT4-1-10-RxO-6000 ¹	1,25	1,32	1,0	0,44	1,1	4.000	0,95	3,9	4,0	43,0	25,0	8.000	0,36	11K6	110,5	19,5	16,5	143,5	19,5	16,5	2,3
DT4-1-10-xxO-6000															131,5	40,5	37,5	164,5	40,5	37,5	
DT4-2-10-RxO-6000 ¹	2,4	2,55	1,9	0,8	2,0	4.000	0,94	6,4	6,3	15,9	8,5	6.000	0,68	11K6	142,0	19,5	16,5	175,0	19,5	16,5	2,7
DT4-2-10-xxO-6000															163,0	40,5	37,5	196,0	40,5	37,5	
DT4-4-10-RxO-6000 ¹	3,9	4,53	2,33	0,98	2,7	4.000	0,86	14,0	16,0	5,4	3,0	6.000	1,44	14K6	205,0	19,5	16,5	238,0	19,5	16,5	3,5
DT4-4-10-xxO-6000															226,0	40,5	37,5	259,0	40,5	37,5	

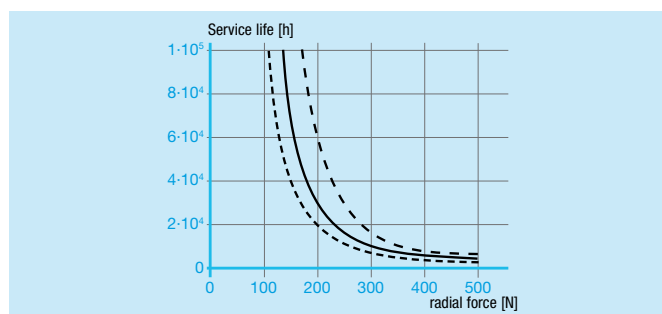
¹) Shorter overall length on motors with resolver as position encoder

²) Length of shaft with shaft diameter of 11 mm = 23 mm, length of shaft with shaft diameter of 14 mm = 30 mm

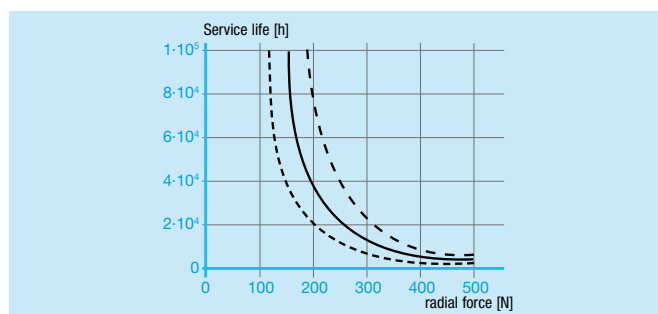
Dimensions



Bearing service life (L10h)



DT4-1-10-xxO-5000 · DT4-2-10-xxO-5000



DT4-4-10-xxO-5000

DT5 convection-cooled servo motors



Features

- High standstill torques
- High torque and power density
- Maximum dynamic response with acceleration values of up to 65,000 rad/s²
- IP65 degree of protection

Applications

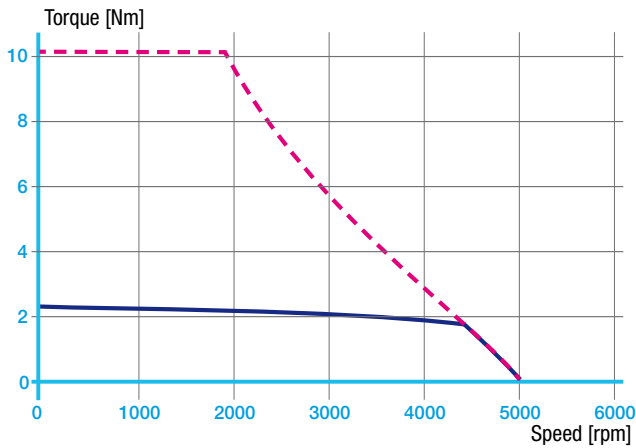
- Positioning and actuating drive for drive tasks with or without gearbox
- For intermittent operation
- Variable-speed drive for continuous running

Equipment

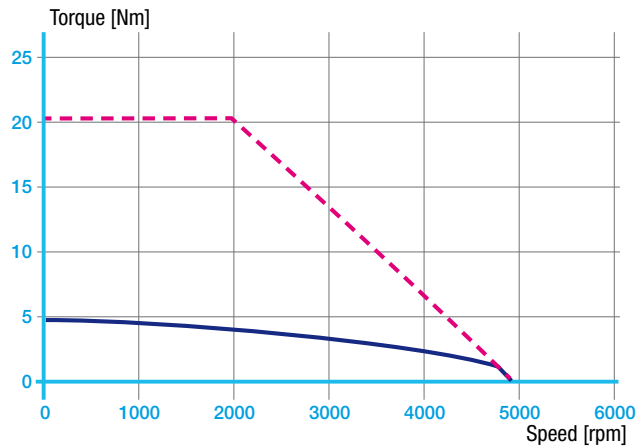
	Standard	Option
Brake	–	12 Nm
Encoder	Resolver	E, F, P, Q
Shaft	Smooth	Shaft key DIN6885 A6x6x30

Connection cable: Copper conductor rated cross-section 1.5 mm², power connector size 1

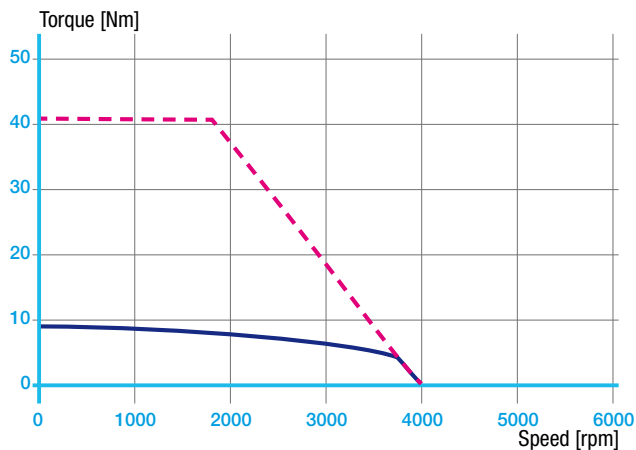
Characteristics



DT5-3-10-xxO-5000-B5



DT5-5-10-xxO-5000-B5



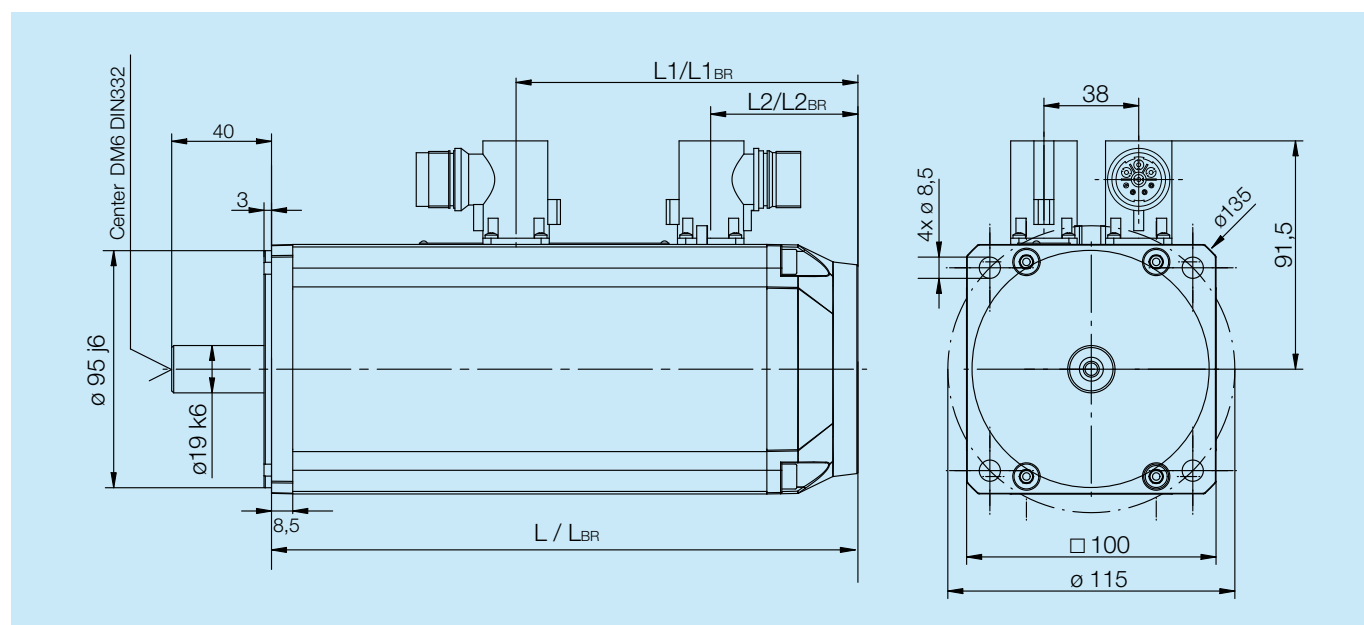
DT5-9-10-xxO-4000-B5

Technical data

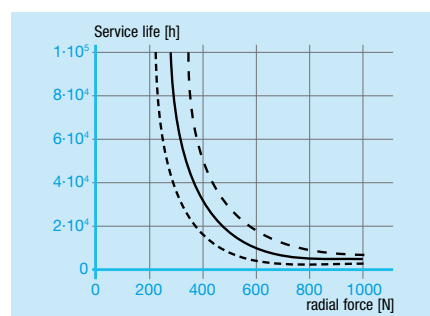
Motor type	Standstill data		Rating					Maximum data		Electr. data		Mechanical data								
	M ₀ [Nm]	I ₀ [A]	M _N [Nm]	P _N [kW]	I _N [A]	n _N [rpm]	k _T [Nm/A]	M _{max} [Nm]	I _{max} [A]	L _{tt} [mH]	R _{tt} [Ω]	η _{max} [rpm]	J [kgcm ²]	L [mm]	L1 [mm]	L2 [mm]	L _{BR} [mm]	L1 _{BR} [mm]	L2 _{BR} [mm]	m [kg]
DT5-3-10-RxO-5000 ¹	2,4	2,1	1,7	0,8	1,5	4.500	1,14	10,0	10,0	35,0	7,0	5.000	1,72	157,0	69,0	26,0	192,0	104,0	26,0	4,4
DT5-3-10-xxO-5000														200,0	102,0	59,0	235,0	137,0	59,0	4,8
DT5-5-10-RxO-5000 ¹	4,5	4,0	3,3	1,2	2,8	3.500	1,13	20,0	20,0	15,0	2,7	5.000	3,05	187,0	69,0	26,0	222,0	104,0	26,0	4,9
DT5-5-10-xxO-5000														230,0	102,0	59,0	265,0	137,0	59,0	5,4
DT5-9-10-RxO-4000 ¹	8,4	5,7	6,0	1,9	4,1	3.000	1,47	41,0	33,0	11,0	1,75	4.000	5,7	247,0	69,0	26,0	282,0	104,0	26,0	7,4
DT5-9-10-xxO-4000														290,0	102,0	59,0	325,0	137,0	59,0	7,9

¹) Shorter overall length on motors with resolver as position encoder

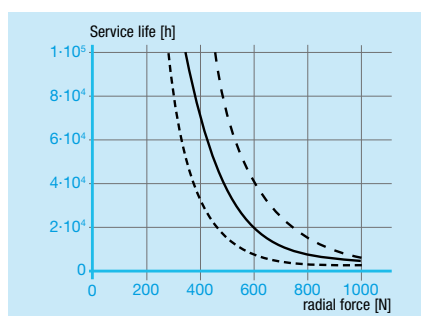
Dimensions



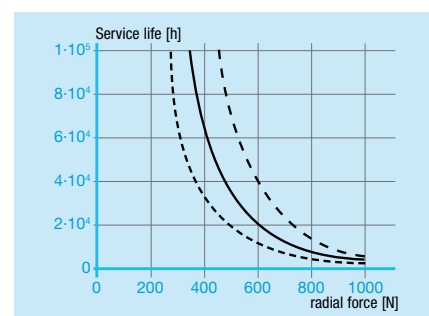
Bearing service life (L10h)



DT5-3-10-xxO-5000-B5



DT5-5-10-xxO-5000-B5



DT5-9-10-xxO-5000-B5

DT6 convection-cooled servo motors



Features

- High power density
- Maximum dynamic response with acceleration values of up to 42,000 rad/s²
- IP65 degree of protection

Applications

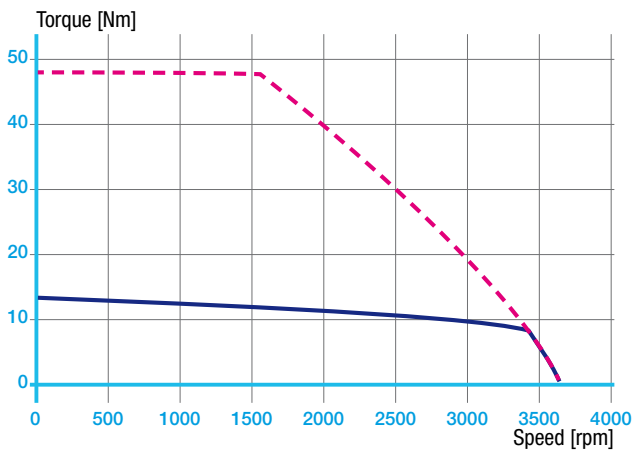
- Positioning and actuating drive for drive tasks with or without gearbox
- Variable-speed drive for continuous running

Equipment

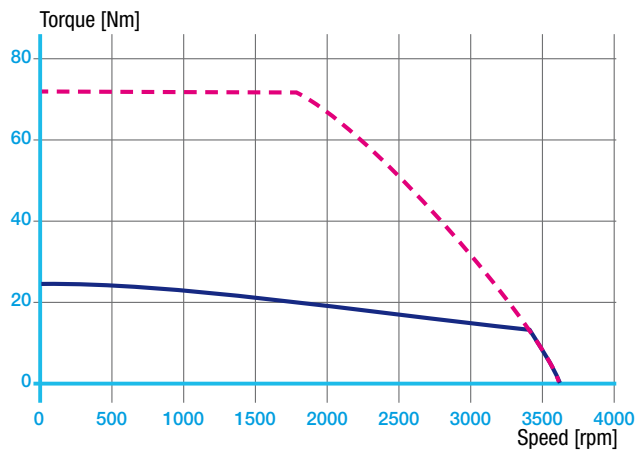
	Standard	Option
Brake	–	12 Nm
Encoder	Resolver	E, F, P, Q
Shaft	Smooth	Shaft key DIN6885 A8x7x36

Connection cable: Copper conductor rated cross-section 1.5 mm², power connector size 1

Characteristics



DT6-13-10-xxO-3500-B5

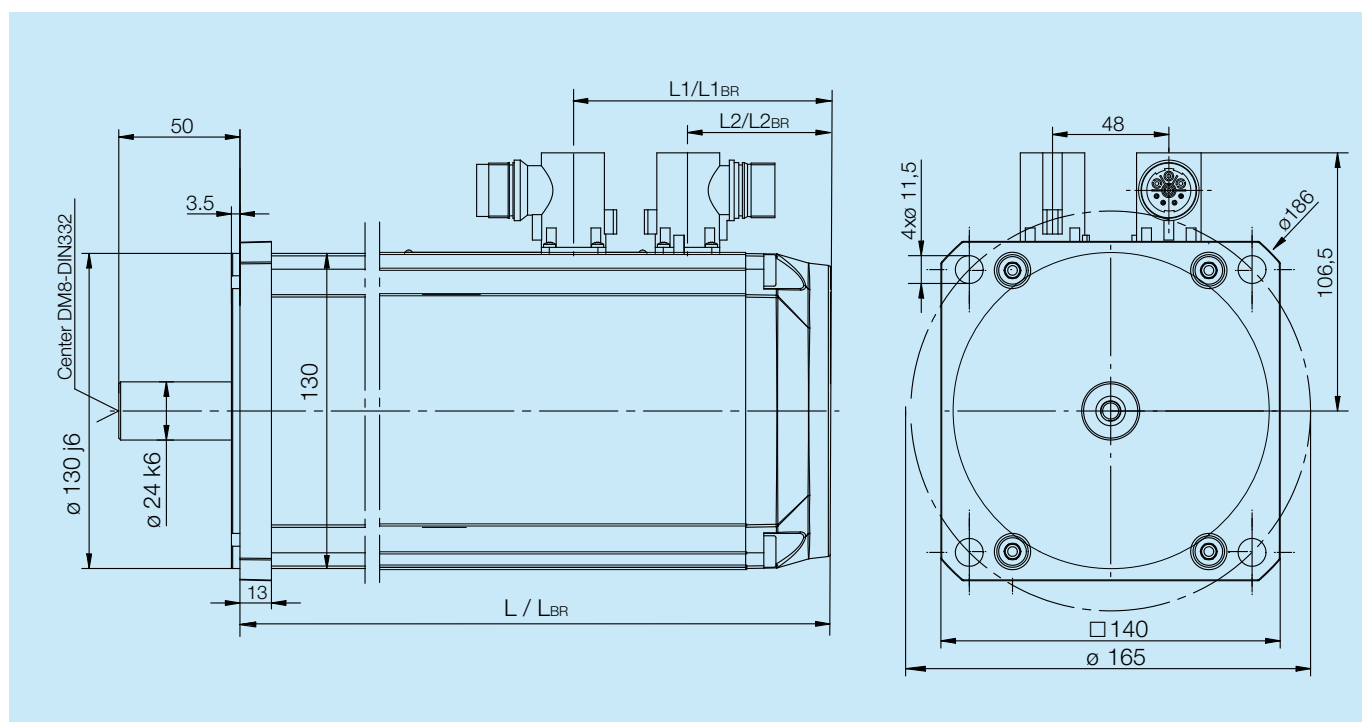


DT6-20-10-xxO-3500-B5

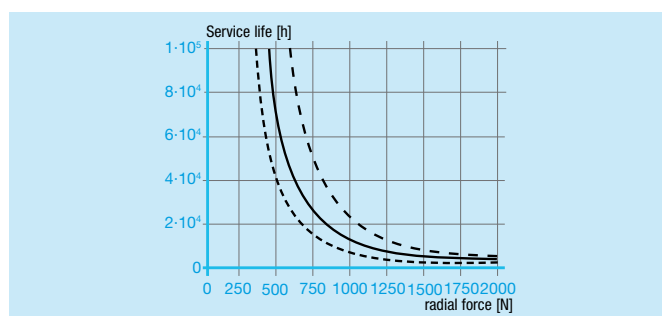
Technical data

Motor type	Standstill data		Rating					Maximum data		Electr. data		Mechanical data								
	M ₀ [Nm]	I ₀ [A]	M _N [Nm]	P _N [kW]	I _N [A]	n _N [rpm]	k _T [Nm/A]	M _{max} [Nm]	I _{max} [A]	L _{tt} [mH]	R _{tt} [Ω]	n _{max} [rpm]	J [kgcm ²]	L [mm]	L ₁ [mm]	L ₂ [mm]	L _{BR} [mm]	L _{1BR} [mm]	L _{2BR} [mm]	m [kg]
DT6-13-10-xxO-3500	14,4	11,9	7,9	2,5	6,5	3.000	1,21	47,0	46,0	3,4	0,58	4.000	11,3	285,0	106,0	59,0	315,0	106,0	59,0	12,2
DT6-20-10-xxO-3500	25,0	19,2	11,0	3,4	8,5	3.000	1,3	72,0	67,0	2,5	0,32	5.000	18,7	345,0	106,0	59,0	375,0	106,0	59,0	17,0

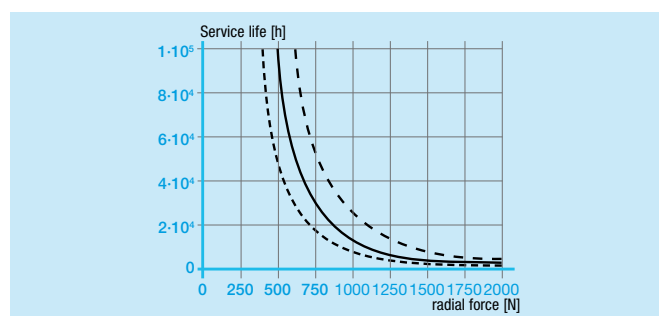
Dimensions



Bearing service life (L10h)



DT6-13-10-xxO-3500-B5



DT6-20-10-xxO-3500-B5

DT7 convection-cooled servo motors



Features

- High standstill torques
- High overload capacity with no real saturation effect
- Extremely rigid mechanical construction
- IP65 degree of protection

Applications

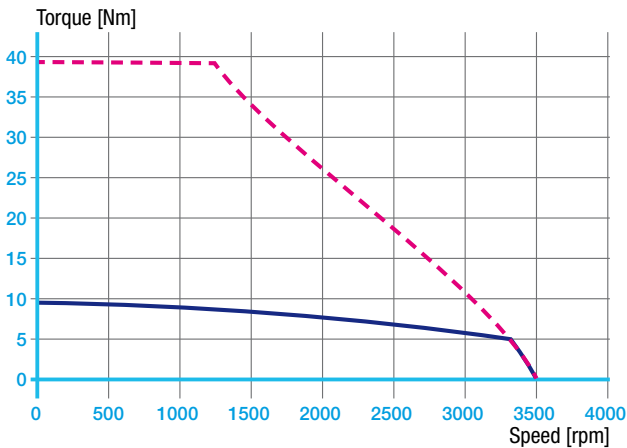
- Direct drive for positioning and actuating tasks without gearbox or with low reduction ratio for intermittent operation
- Drive suitable for large load inertias
- Variable-speed drive for continuous running at low and medium speeds

Equipment

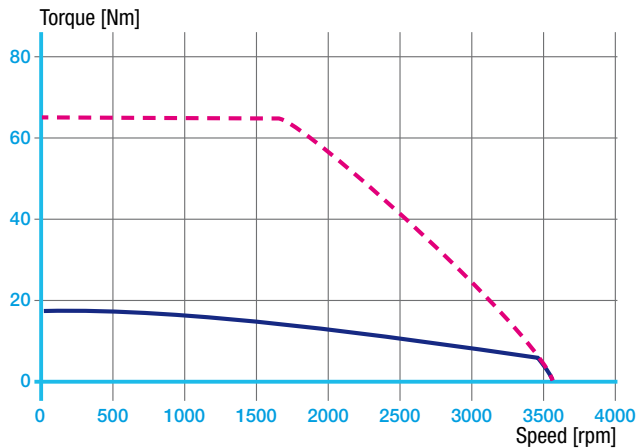
	Standard	Option
Brake	–	18 Nm
Encoder	Resolver	E, F, P, Q
Shaft	Smooth	Shaft key DIN6885 A8x7x36

Connection cable: Copper conductor rated cross-section 1.5 mm², power connector size 1

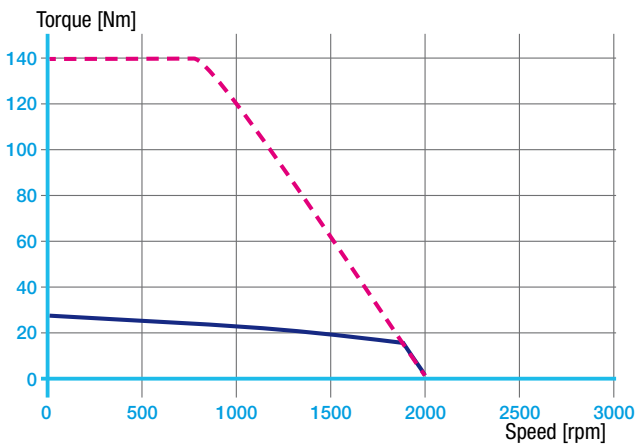
Characteristics



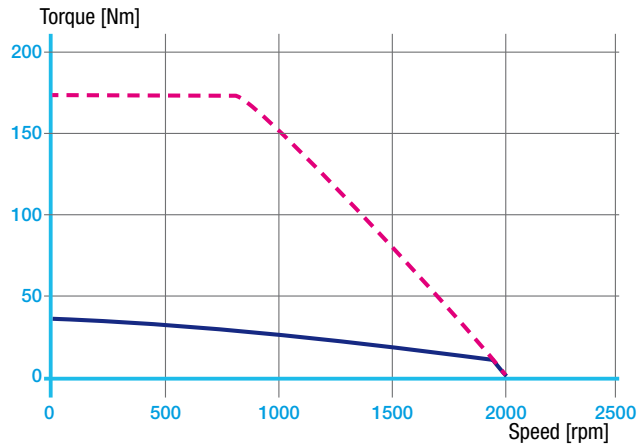
DT7-11-20-xxO-3500-B5



DT7-17-20-xxO-3500-B5



DT7-28-20-xxO-2000-B5

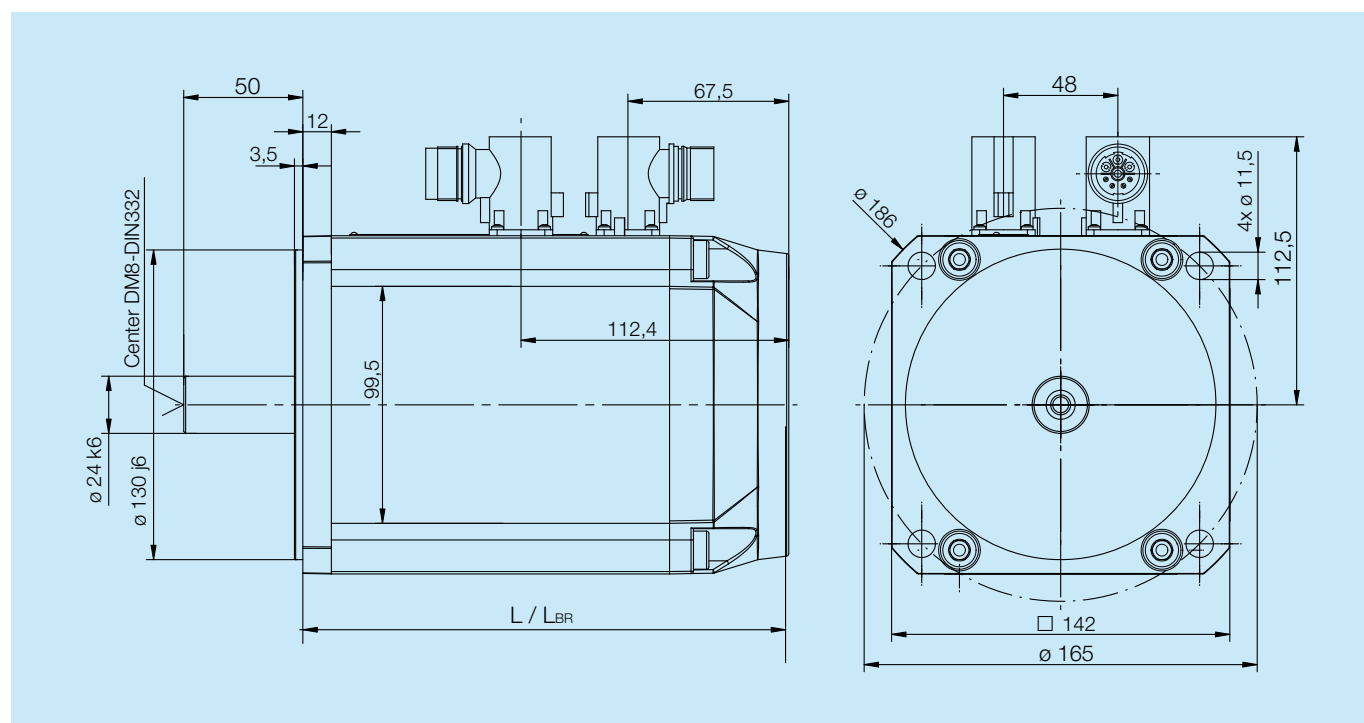


DT7-40-20-xxO-2000-B5

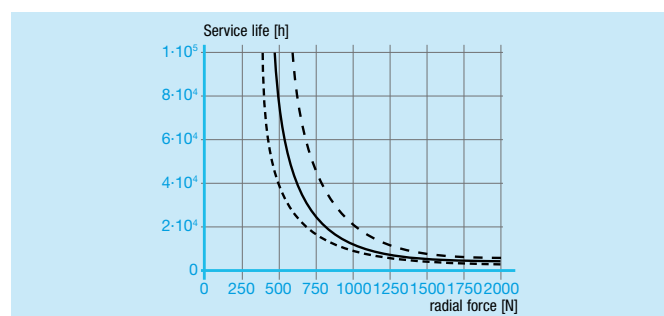
Technical data

Motor type	Standstill data		Rating					Maximum data		Electr. data		Mechanical data								
	M ₀ [Nm]	I ₀ [A]	M _N [Nm]	P _N [kW]	I _N [A]	n _N [rpm]	k _T [Nm/A]	M _{max} [Nm]	I _{max} [A]	L _{tt} [mH]	R _{tt} [Ω]	n _{max} [rpm]	J [kgcm ²]	L [mm]	L1 [mm]	L2 [mm]	L _{BR} [mm]	L1 _{BR} [mm]	L2 _{BR} [mm]	m [kg]
DT7-11-20-xxO-3500	10,0	6,6	6,6	1,9	4,4	2.800	1,51	39,0	33,0	8,4	2,48	3.500	14,9	204,0	112,4	67,5	233,0	112,4	67,5	9,3
DT7-17-20-xxO-3500	17,0	11,3	11,0	2,8	7,2	2.500	1,5	65,0	50,0	4,1	0,92	3.500	33,0	234,0	112,4	67,5	263,0	112,4	67,5	14,2
DT7-28-20-xxO-2000	28,0	10,4	19,0	3,0	7,2	1.500	2,68	140,0	67,0	6,0	1,2	4.000	57,0	294,0	112,4	67,5	323,0	112,4	67,5	18,9
DT7-40-20-xxO-2000	42,0	15,2	29,0	3,0	10,5	1.000	2,76	210,0	100,0	3,1	0,66	2.000	85,0	354,0	112,4	67,5	383,0	112,4	67,5	25,4

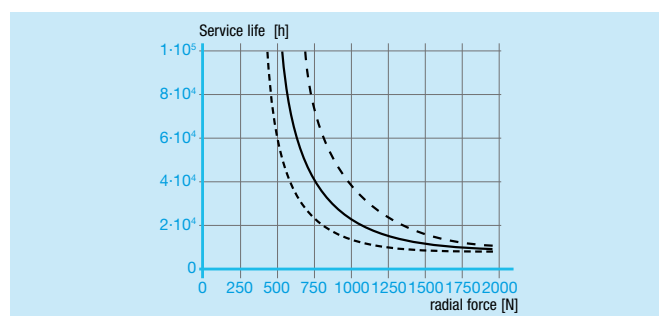
Dimensions



Bearing service life (L10h)



DT7-11-20-xxO-3500-B5 · DT7-17-20-xxO-3500-B5



DT7-28-20-xxO-2000-B5 · DT7-40-20-xxO-2000-B5

DT10 convection-cooled servo motors



Features

- High standstill torques
- High overload capacity with no real saturation effect
- Extremely rigid mechanical construction
- IP65 degree of protection

Applications

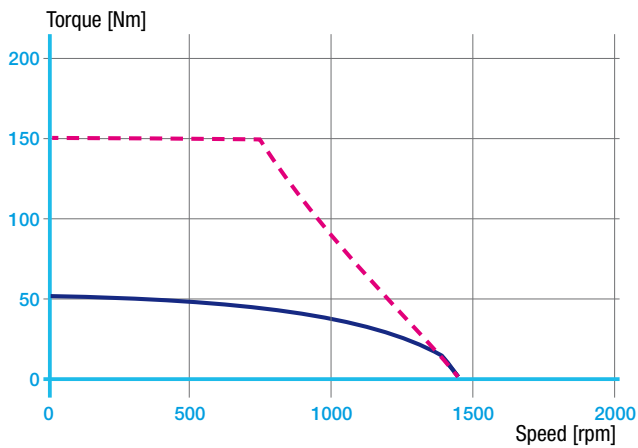
- Direct drive for positioning and actuating tasks without gearbox or with low reduction ratio for intermittent operation
- Drive suitable for large load inertias
- Variable-speed drive for continuous running

Equipment

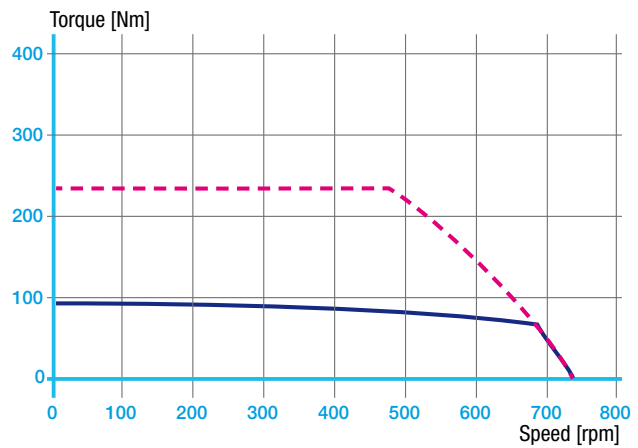
	Standard	Option
Brake	–	120 Nm
Encoder	Resolver	E, F, P, Q
Shaft	Smooth	Shaft key DIN6885 A10x8x60

Connection cable: Copper conductor rated cross-section 6 mm², power connector size 1.5

Characteristics



DT10-54-20-xxO-1500-B5

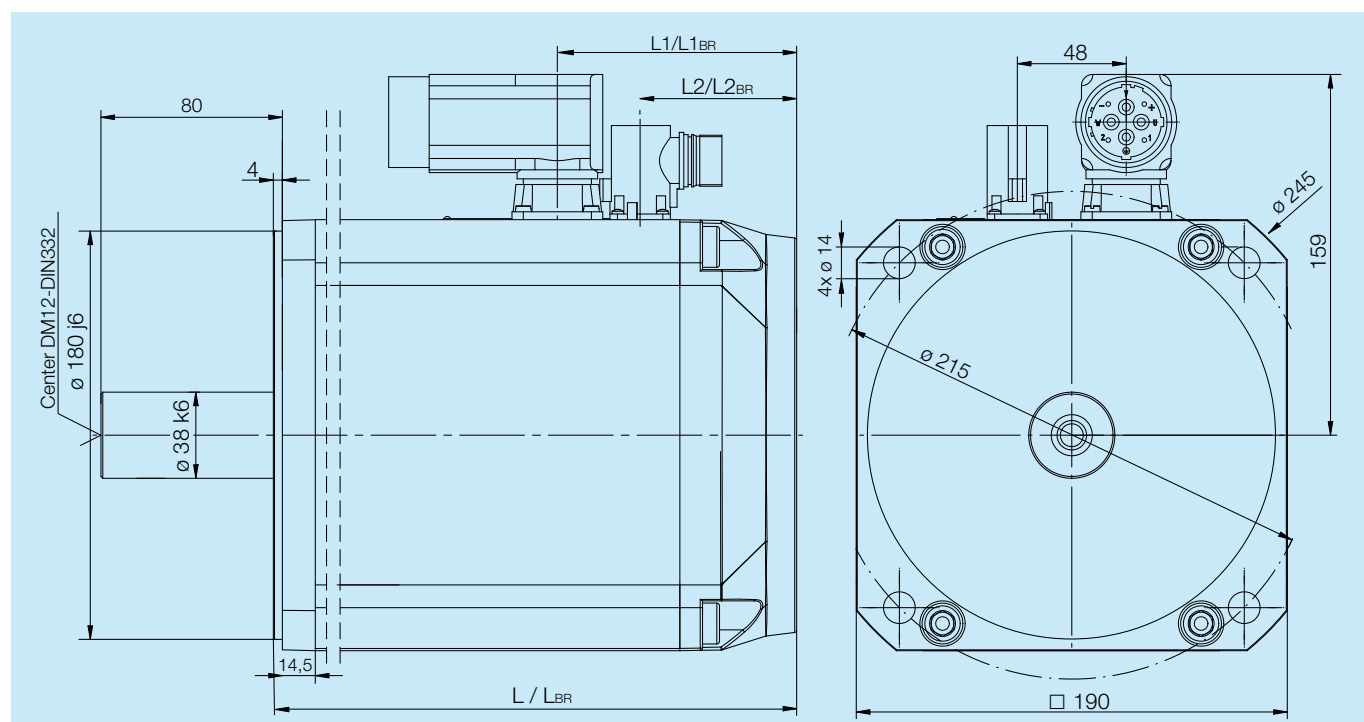


DT10-95-20-xxO-700-B5

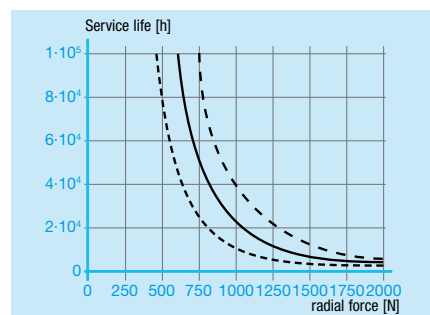
Technical data

Motor type	Standstill data		Rating					Maximum data		Electr. data		Mechanical data								
	M ₀ [Nm]	I ₀ [A]	M _N [Nm]	P _N [kW]	I _N [A]	n _N [rpm]	k _T [Nm/A]	M _{max} [Nm]	I _{max} [A]	L _{tt} [mH]	R _{tt} [Ω]	η _{max} [rpm]	J [kgcm ²]	L [mm]	L1 [mm]	L2 [mm]	L _{BR} [mm]	L1 _{BR} [mm]	L2 _{BR} [mm]	m [kg]
DT10-54-20-xxO-1500	55,0	10,6	34,0	2,8	6,4	800	5,2	150,0	33,0	11,6	1,2	2.500	174,0	298,0	105,5	69,0	359,0	166,5	130,0	42,0
DT10-95-20-xxO-700	95,0	12,8	54,0	3,4	7,3	600	7,4	240,0	33,0	11,4	1,1	1.000	380,0	418,0	105,5	69,0	479,0	166,5	130,0	61,0

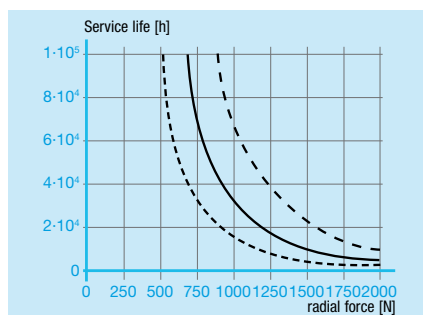
Dimensions



Bearing service life (L10h)



DT10-54-20-xxO-1500-B5



DT10-95-20-xxO-700-B5

DTK5 convection-cooled servo motor



Features

- High static torque
- High torque and power density
- Maximum dynamic response with acceleration values of up to 65.000 rad/s²
- IP65 degree of protection

Applications

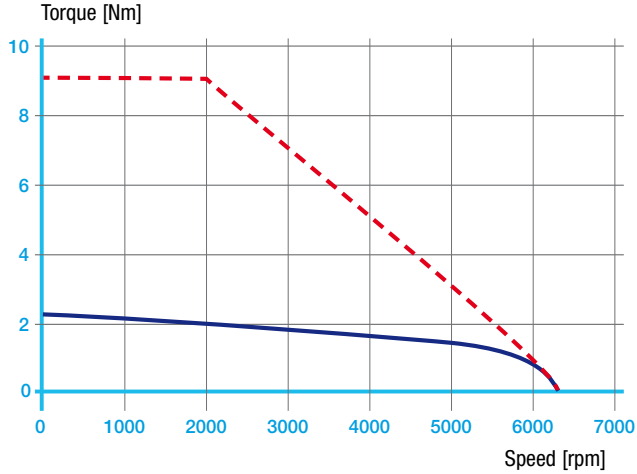
- For applications where space is at a premium, e.g. linear axes
- Positioning and actuating drive for drive tasks, particularly in the case of clutch or gearbox output

Equipment

	Standard	Option
Brake	—	4,5 Nm
Encoder	Resolver	E, F, P, Q
Shaft	Smooth	Feather key DIN6885 A6x6x30

Connection cable: Copper conductor rated cross-section 1.5 mm², power connector size 1

Characteristics

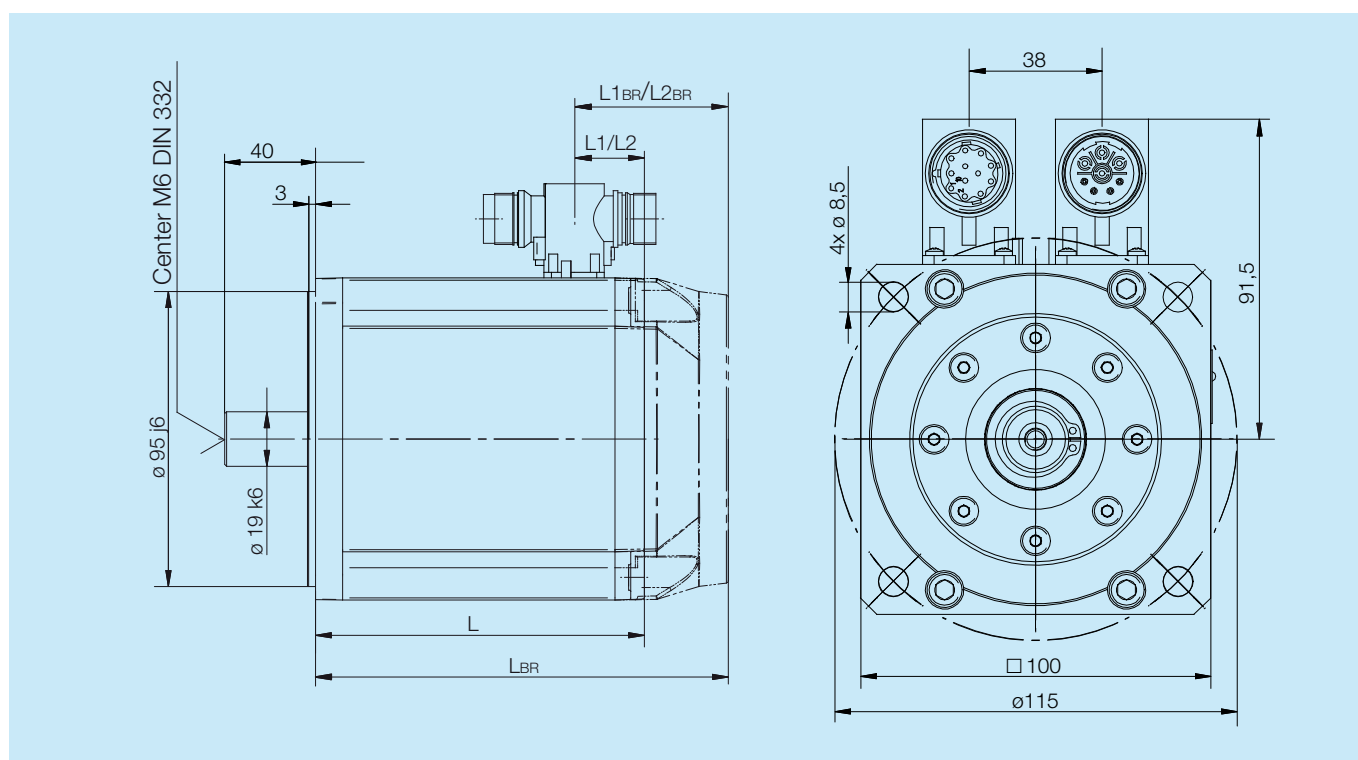


DTK5-3-10-xxO-6000

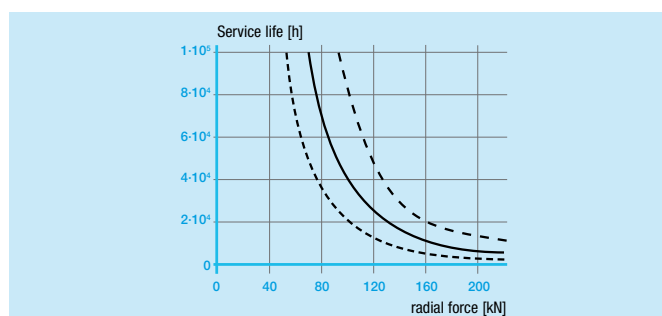
Technical data

Motor type	Standstill-data		Rating					Maximum data		Electr. data		Mechanical data								
	M ₀ [Nm]	I ₀ [A]	M _N [Nm]	P _N [kW]	I _N [A]	n _N [rpm]	k _T [Nm/A]	M _{max} [Nm]	I _{max} [A]	L _{tt} [mH]	R _{tt} [Ω]	n _{max} [rpm]	J [kgcm ²]	L [mm]	L1 [mm]	L2 [mm]	L _{BR} [mm]	L1 _{BR} [mm]	L2 _{BR} [mm]	m [kg]
DTK5-3-10-xxO-6000	2,4	3,1	1,7	0,7	2,2	4.000	0,77	9,0	16,0	20,0	5,25	6.000	1,72	114,5	35,5	35,5	150,0	64,5	64,5	3,5

Dimensions



Bearing service life (L10h)



DTK5-3-10-xxO-6000

DTK7 convection-cooled servo motor



Features

- High static torque
- High overload capacity with no real saturation effect
- Extremely rigid mechanical construction
- IP65 degree of protection

Applications

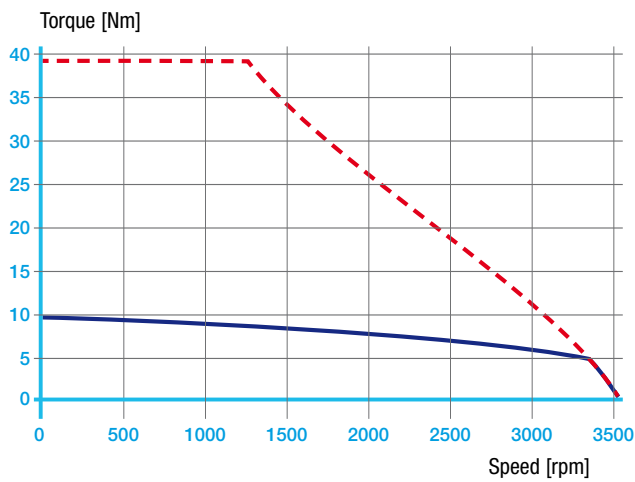
- For applications where space is at a premium, e.g. linear axes
- Positioning and actuating drive for drive tasks, particularly if clutches and brakes are being used

Equipment

	Standard	Option
Brake	—	12Nm
Encoder	Resolver	E, F, P, Q
Shaft	Smooth	Shaft key DIN6885 A8x7x36

Connection cable: Copper conductor rated cross-section 1.5 mm², power connector size 1

Characteristic

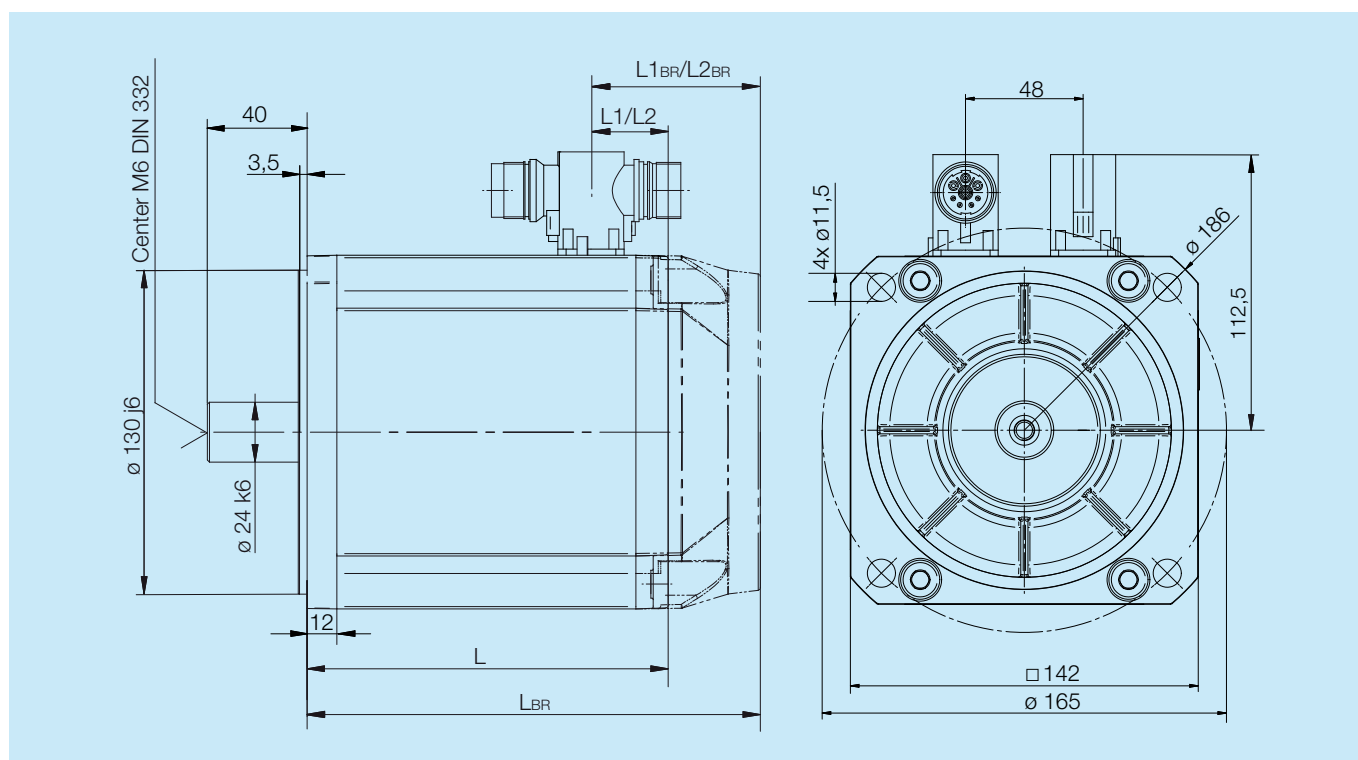


DTK7-11-20-xxO-3500

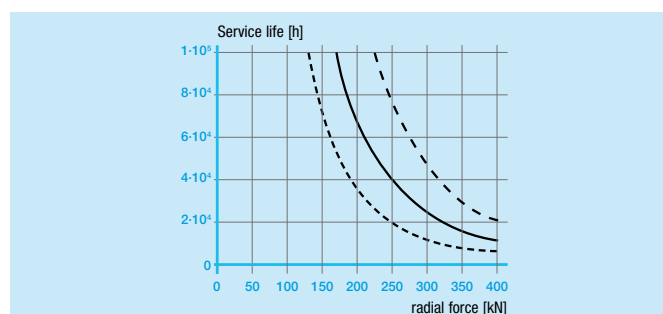
Technical data

Motor type	Standstill-data		Rating					Maximum data		Electr. data		Mechanical data								
	M ₀ [Nm]	I ₀ [A]	M _N [Nm]	P _N [kW]	I _N [A]	n _N [rpm]	k _T [Nm/A]	M _{max} [Nm]	I _{max} [A]	L _{tt} [mH]	R _{tt} [Ω]	n _{max} [rpm]	J [kgcm ²]	L [mm]	L1 [mm]	L2 [mm]	L _{BR} [mm]	L1 _{BR} [mm]	L2 _{BR} [mm]	m [kg]
DTK7-11-20-xxO-3500	10,0	6,6	6,6	1,9	4,4	2.800	1,5	39,0	33,0	8,4	2,48	3.500	14,9	145,0	31,0	31,0	180,5	66,5	66,5	7,3

Dimensions



Bearing service life (L10h)



DTK7-11-20-xxO-3500

DT5 liquid-cooled servo motors



Features

- High standstill torques
- Maximum torque and power density
- Maximum dynamic response even at very short repetitive cycles
- IP65 degree of protection

Applications

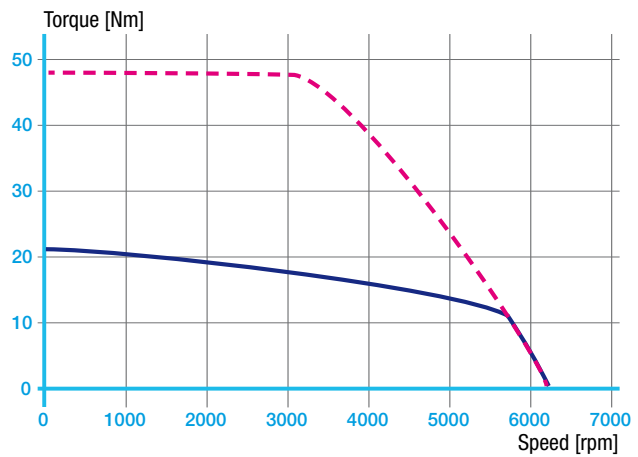
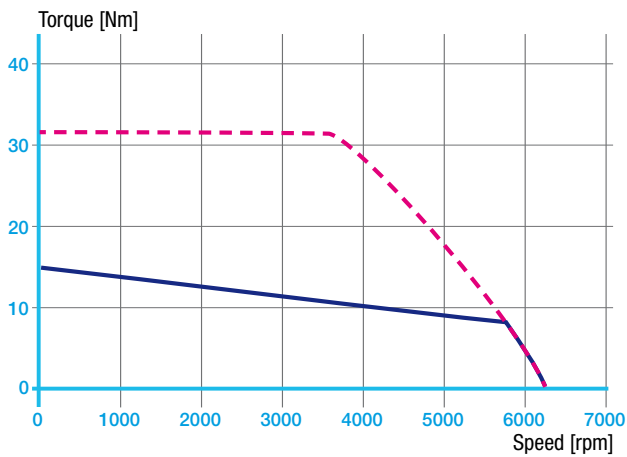
- Positioning and actuating drive for drive tasks with extremely high dynamic response and power density requirements
- Variable-speed drive for continuous running
- For applications running under difficult cooling conditions due to a high integration density, contamination or ambient temperature conditions

Equipment

	Standard	Option
Brake	–	12 Nm
Encoder	Resolver	E, F, P, Q
Shaft	Smooth	Shaft key DIN6885 A6x6x30

Connection cable: DT 5-15 = 2,5mm² · DT 5-23 = 4mm²
power connector size 1

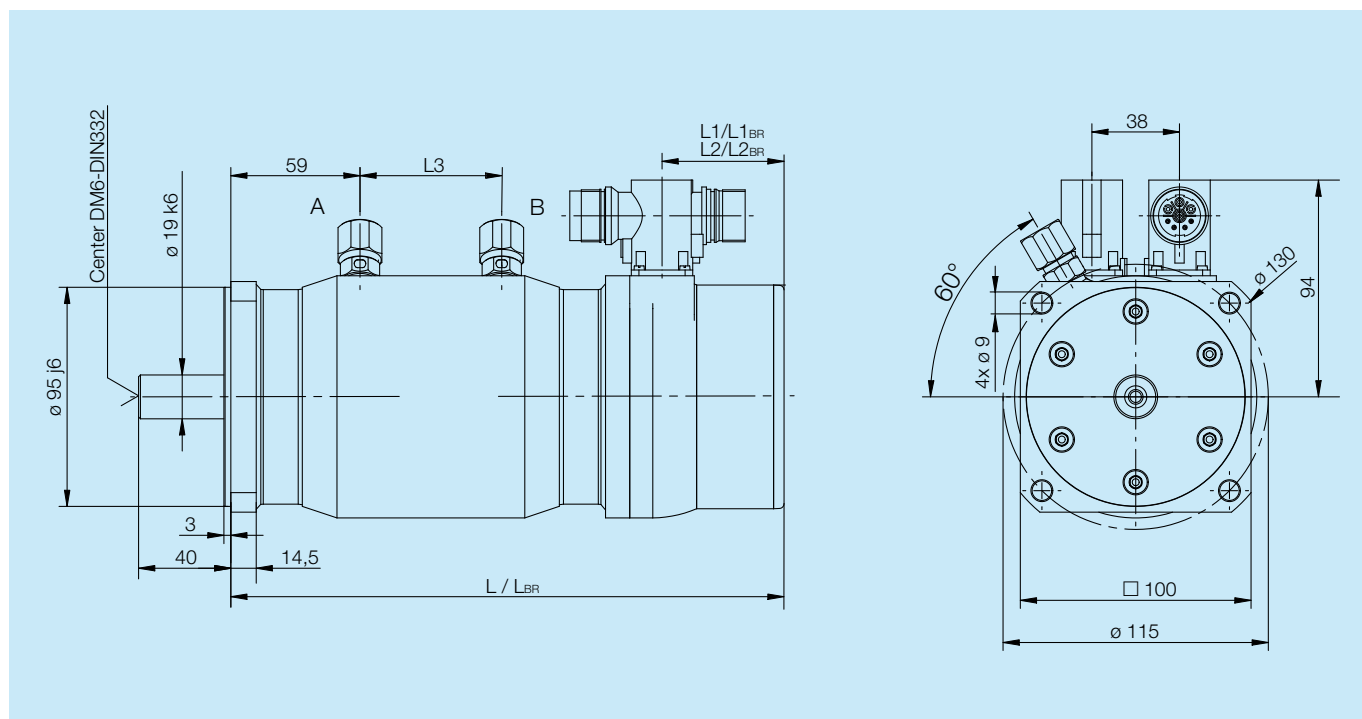
Characteristics



Technical data

Motor type	Standstill data		Rating					Maximum data		Electr. data		Mechanical data									
	M ₀ [Nm]	I ₀ [A]	M _N [Nm]	P _N [kW]	I _N [A]	n _N [rpm]	k _T [Nm/A]	M _{max} [Nm]	I _{max} [A]	L _{tt} [mH]	R _{tt} [Ω]	η _{max} [rpm]	J [kgcm ²]	L [mm]	L1 [mm]	L2 [mm]	L3 [mm]	L _{BR} [mm]	L1 _{BR} [mm]	L2 _{BR} [mm]	m [kg]
DT5-15-10-xxW-6000	15,0	16,5	8,9	4,3	8,9	4.000	0,91	32,0	40,0	4,5	0,87	6.000	7,4	246,5	32,0	32,0	83,0	266,0	53,5	53,5	14,0
DT5-23-10-xxW-6500	23,0	25,6	13,5	7,1	15,0	5.000	0,9	47,0	67,0	2,9	0,45	6.000	8,3	353,5	32,0	32,0	143,0	375,0	53,5	53,5	17,0

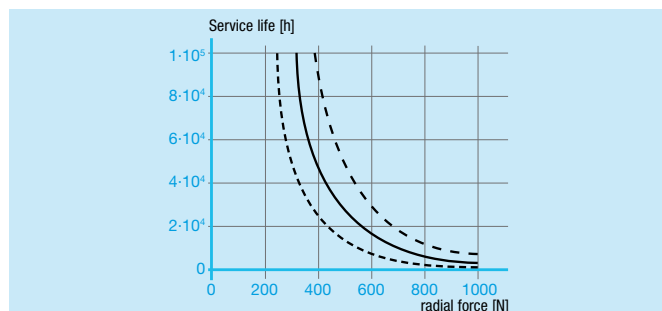
Dimensions



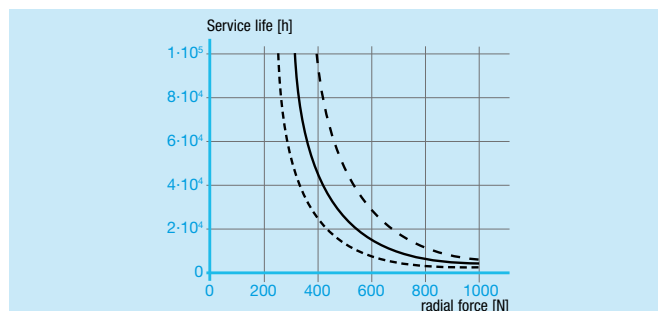
Cooling

- Ermeto water supply connection AS10-PL 10 mm, pipe connection
- Minimum coolant flow rate 2.0 l/min; max. inlet temperature 40°C

Bearing service life (L10h)



DT5-15-10-xxW-5000-B5



DT5-23-10-xxW-4500-B5

DT7 liquid-cooled servo motors



Features

- Excellent standstill torques
- Excellent torque and power density
- High power at low speeds
- IP54 degree of protection

Applications

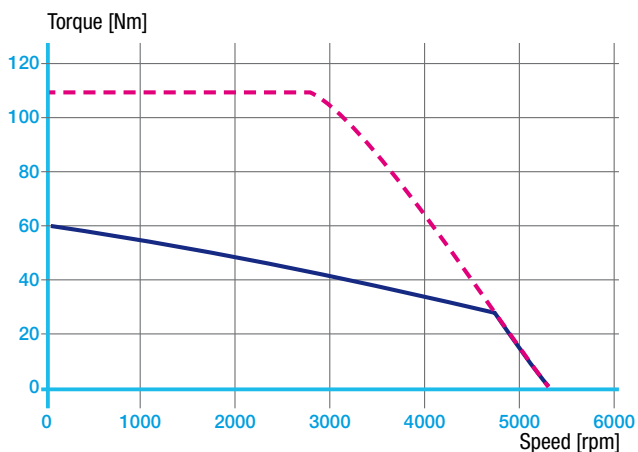
- Positioning and actuating drive for drive tasks with extremely high dynamic response and power density requirements
- Variable-speed drive for continuous running
- For applications running under difficult cooling conditions due to a high integration density, contamination or ambient temperature conditions

Equipment

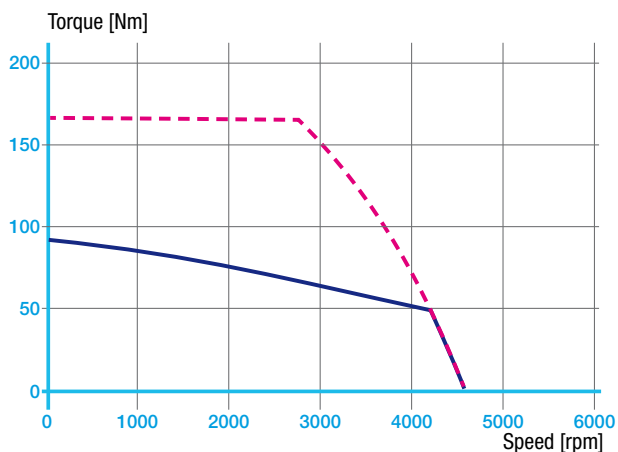
	Standard	Option
Brake	–	18 Nm
Encoder	Resolver	E, F, P, Q
Shaft	Smooth	Shaft key DIN6885 A10x8x36

Connection cable: Copper conductor rated cross-section 10 mm², power connector size 1.5

Characteristics



DT7-55-20-xxW-5200-B5

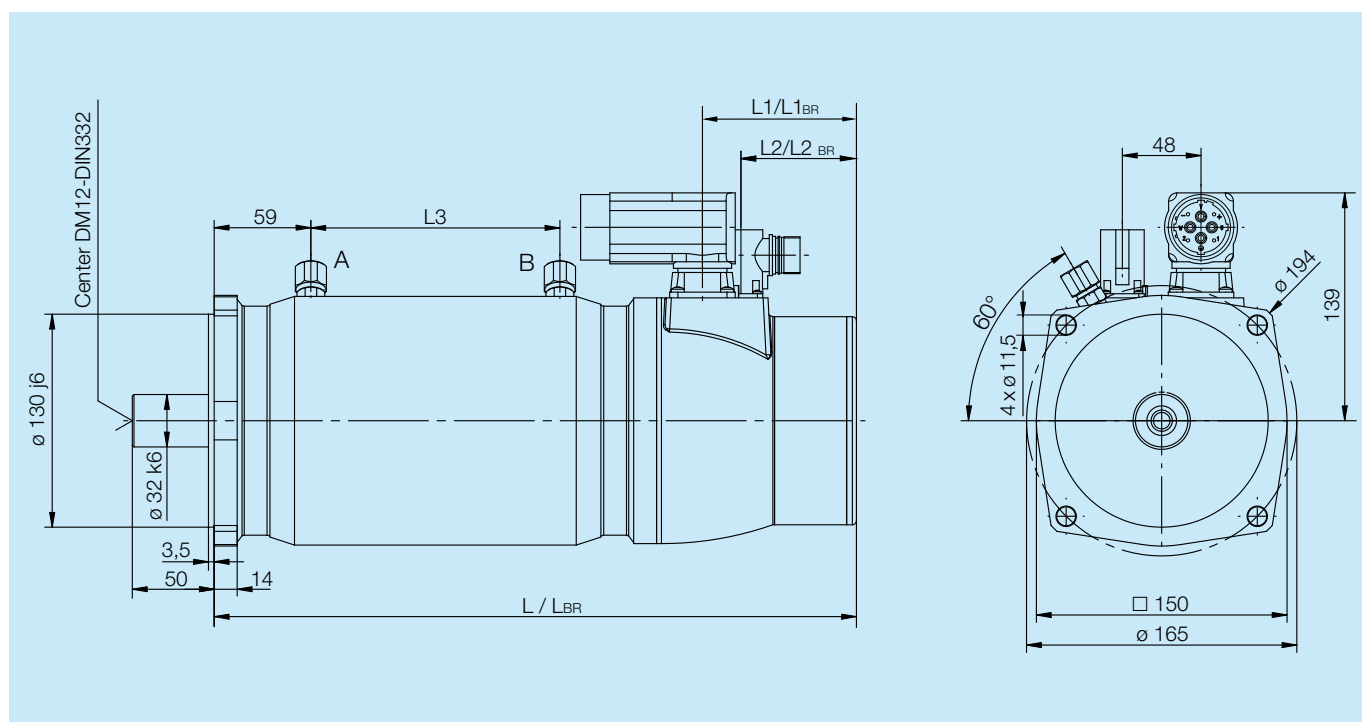


DT7-72-20-xxW-5000-B5

Technical data

Motor type	Standstill-data		Rating					Maximum data		Electr. data		Mechanical data									
	M ₀ [Nm]	I ₀ [A]	M _N [Nm]	P _N [kW]	I _N [A]	n _N [rpm]	k _T [Nm/A]	M _{max} [Nm]	I _{max} [A]	L _{tt} [mH]	R _{tt} [Ω]	η _{max} [rpm]	J [kgcm ²]	L [mm]	L1 [mm]	L2 [mm]	L3 [mm]	L _{BR} [mm]	L1 _{BR} [mm]	L2 _{BR} [mm]	m [kg]
DT7-55-20-xxW-5200	60,0	60,0	38,0	14,0	38,0	3.500	1,0	110,0	132,0	0,8	0,166	5.000	57,0	288,0	50,0	26,0	108,0	332,0	94,0	70,5	21,0
DT7-72-20-xxW-5000	88,0	72,7	52,0	18,0	43,0	3.000	1,21	160,0	200,0	0,4	0,1	5.000	85,0	348,0	50,0	26,0	152,0	392,0	94,0	70,5	25,0

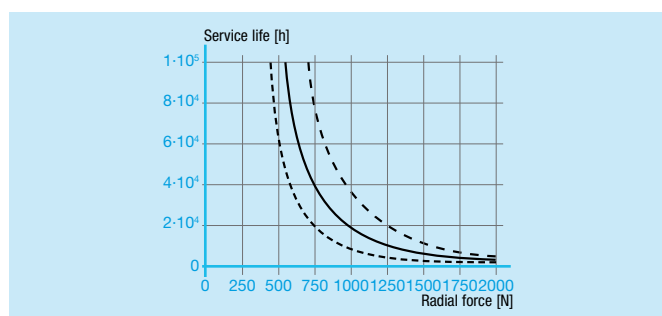
Dimensions



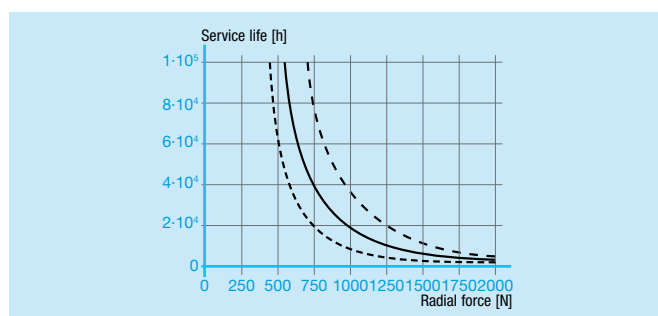
Cooling

- Ermeto-Water connection AS10-PL, 10 mm pipe connection
- Cooling liquid minimum 2,0 l/min; max. inlet temperature 40°C

Bearing service life (L10h)



DT7-55-20-xxW-5200-B5



DT7-72-20-xxW-5000-B5

DT10 liquid-cooled servo motors



Features

- Excellent standstill torques
- Excellent torque and power density
- High power at low speeds
- IP65 degree of protection

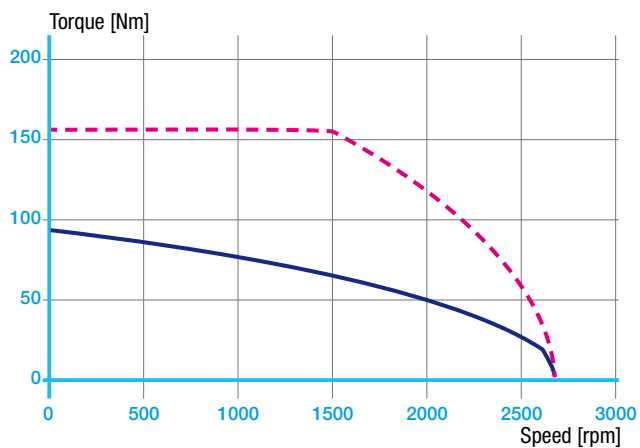
Applications

- Positioning and actuating drive for drive tasks with extremely high dynamic response and power density requirements
- Variable-speed drive for continuous running at low and medium speeds
- For applications running under difficult cooling conditions due to a high integration density, contamination or ambient temperature conditions

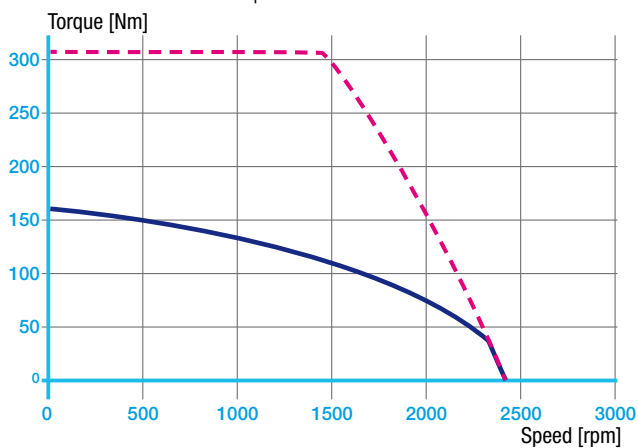
Equipment

	Standard	Option
Brake	–	120 Nm
Encoder	Resolver	E, F, P, Q
Shaft	Smooth	Shaft key DIN6885 A10x8x60

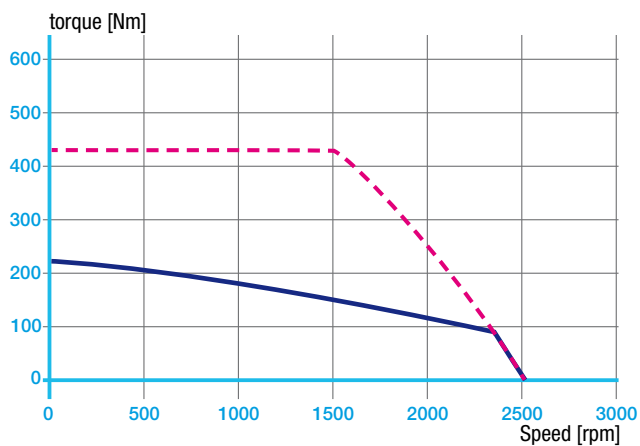
Characteristics



DT10-100-20-xxW-3000-B5



DT10-145-20-xxW-2000-B5



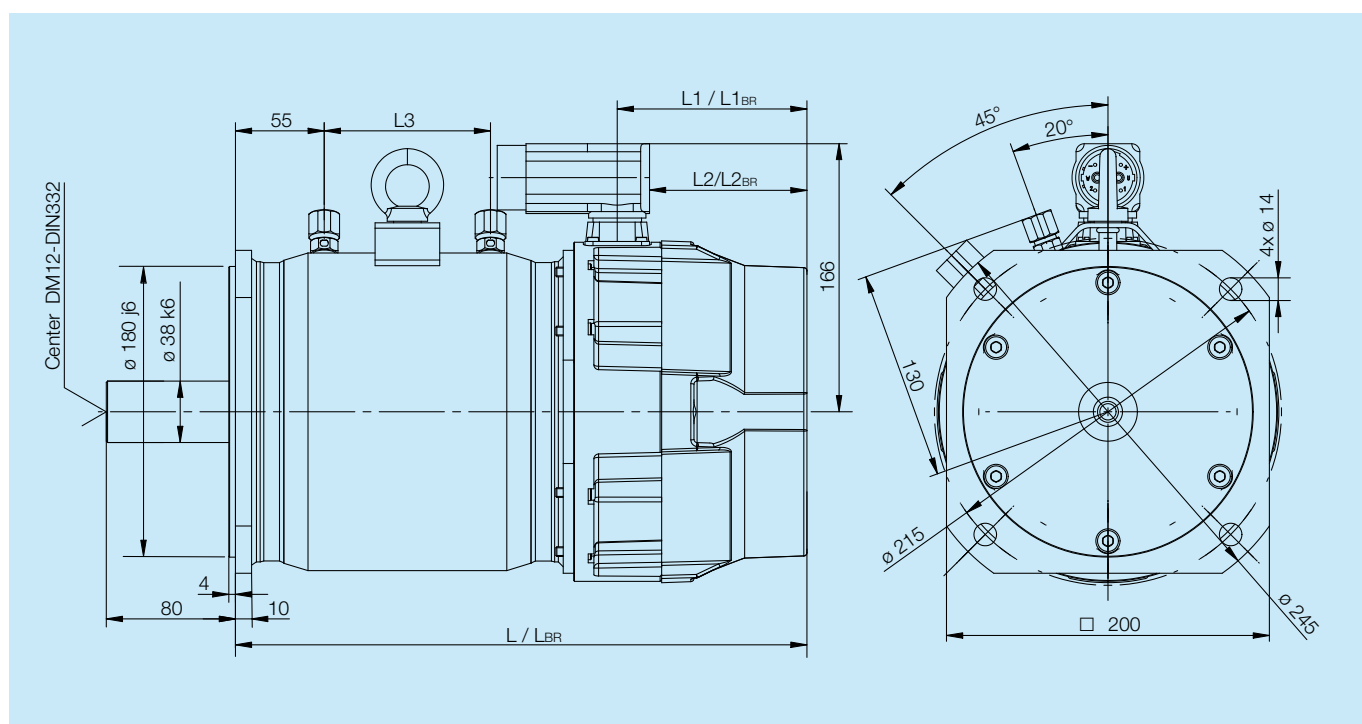
DT10-200-20-xxW-2500-B5

Connection cable: Copper conductor rated cross-section 16 mm², power connector size 1.5

Technical data

Motor type	Standstill-data		Rating					Maximum data		Electr. data		Mechanical data									
	M ₀ [Nm]	I ₀ [A]	M _N [Nm]	P _N [kW]	I _N [A]	n _N [rpm]	k _T [Nm/A]	M _{max} [Nm]	I _{max} [A]	L _{tt} [mH]	R _{tt} [Ω]	n _{max} [rpm]	J [kgcm ²]	L [mm]	L1 [mm]	L2 [mm]	L3 [mm]	L _{BR} [mm]	L1 _{BR} [mm]	L2 _{BR} [mm]	m [kg]
DT10-100-20-xxW-3000	95,0	54,3	66,0	11,0	38,0	1.500	1,75	160,0	132,0	1,3	0,16	3.000	175,0	292,0	55,5	47,5	97,0	354,0	117,5	109,5	43,0
DT10-145-20-xxW-2000	160,0	66,7	120,0	18,0	50,0	1.500	2,4	310,0	200,0	1,16	0,11	2.500	330,0	412,0	55,5	47,5	217,0	473,0	117,5	109,5	64,0
DT10-200-20-xxW-2500	220,0	78,6	153,0	24,1	55,0	1.500	2,8	430,0	200,0	1,07	0,1	3.500	480,0	532,0	55,5	47,5	337,0	593,0	117,5	109,5	83,0

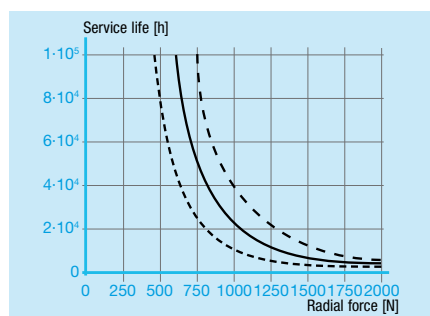
Dimensions



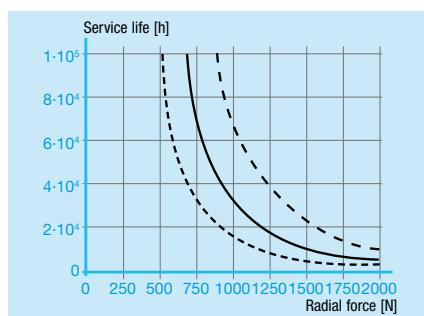
Cooling

- Ermeto-Water connection AS10-PL, 10 mm pipe connection
- Cooling liquid minimum 2,0 l/min; max. inlet temperature 40°C

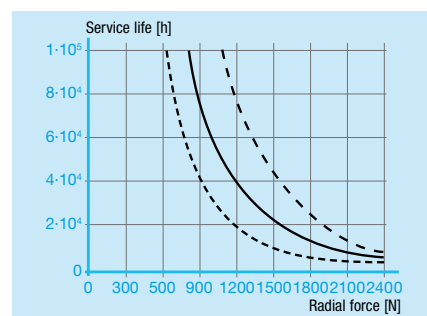
Bearing service life (L10h)



DT10-100-20-xxW-3000-B5



DT10-145-20-xxW-2000-B5



DT10-200-20-xxW-2500-B5

Position encoder



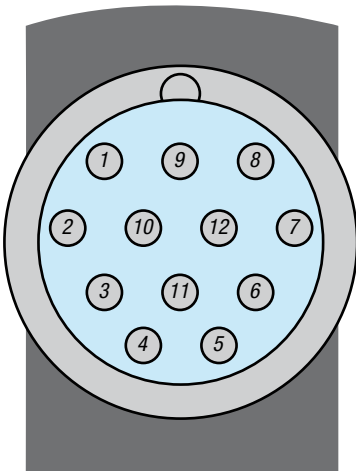
Encoder overview

The motors can be fitted with various position encoders.

Type	Technical data	Max. speed [rpm]
R	Resolver, 1 cycle/revolution	15.000
E	EnDAT 2.1 single-turn Optical absolute encoder 512 cycles/revolution ± 25" system accuracy	12.000
F	EnDAT 2.1 multi-turn Optical absolute encoder 512 cycles/revolution Multi-turn resolution 4096 revolutions ± 25" system accuracy	12.000
P	EnDAT 2.1 single-turn Inductive absolute encoder 16/21 cycles/revolution 18/19-bit resolution/revolution* ± 480" /280" system accuracy * dependent upon the size of the motor	12.000
Q	EnDAT 2.1 multi-turn Inductive absolute encoder 16/32 cycles/revolution 18/19-bit resolution/revolution* Multi-turn resolution 4096 revolutions ± 480" /280" system accuracy * dependent upon the size of the motor	12.000

1) Higher resolution available on request

Connector pin assignment on motor side



View from outside on pins of motor connector

PIN Motor connector	Resolver	E/F encoder	
	Signal	Signal	Meaning
1	+ sin	G2N	Channel 2 not inverted
2	- sin	G2I	Channel 2 inverted
3	+cos	G1N	Channel 1 not inverted
4	- cos	G1I	Channel 1 inverted
5	-	05P	Supply 5 V DC, max. 250 mA
6	-	GND	Reference for supply
7	-	CLK+	EnDat encoder interface
8	-	CLK-	EnDat encoder interface
9	+ Uref	DAT+	EnDat encoder interface
10	- Uref	DAT-	EnDat encoder interface
11	-	05P	Supply 5 V DC, max. 250 mA
12	-	GND	Reference for supply
Shield	Connector housing		



Encoder cable

Prefabricated cables are available for connecting position encoders to KE/KW or KU series servo controllers. The cables are shielded twisted pair type cables. Lengths can be purchased in 1 m increments (the minimum available length is 2 m).

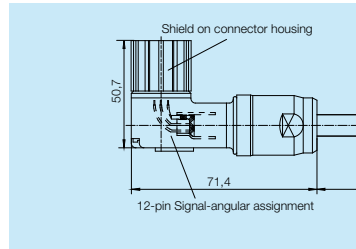
Features

Sheath: Polyurethane, TPE core

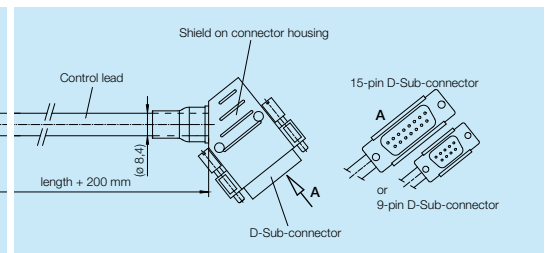
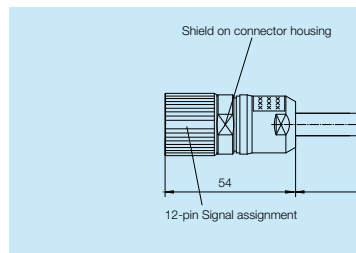
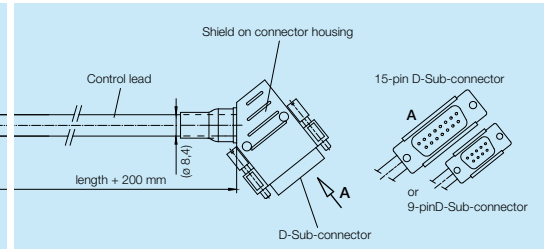
Trailing cable properties:

- Min. bending radius 100 mm
- Max. speed 1 m/s
- Max. acceleration 4 m/s²

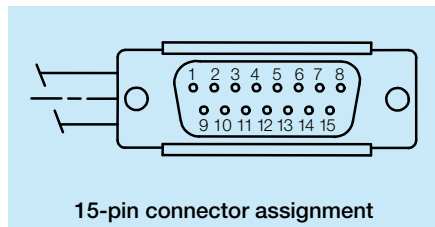
Motor side



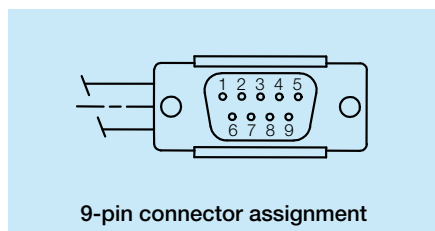
Device side



Connector pin assignment on encoder side



15-pin connector assignment

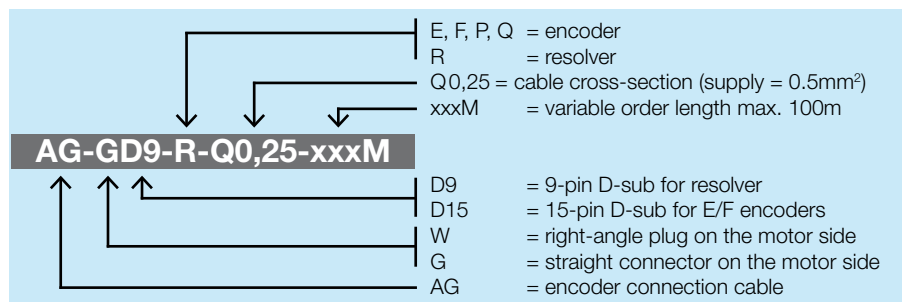


9-pin connector assignment

View on pins from outside on cable connector

Connector pin assignment Motor side	Connector pin assignment on device side					
	Resolver		E/F encoder		P/Q encoder	
	9-pin D-sub	15-pin D-sub	9-pin D-sub	Signal	PIN	
1	+ sin	3	G2N	6	-	-
2	- sin	4	G2I	5	-	-
3	+ cos	5	G1N	4	-	-
4	- cos	6	G1I	3	-	-
5	-	-	05P	13	05P	1
6	-	-	GND	8	GND	8
7	-	-	CLK+	12	CLK+	3
8	-	-	CLK-	11	CLK-	4
9	+ Uref (R1)	7	DAT+	10	DAT+	5
10	- Uref (R2)	8	DAT-	9	DAT-	6
11	-	-	05P	7	05P	9
12	-	-	GND	14	GND	2
Shield	Connector housing					

Encoder cable order designation



Holding brake

The motors can be fitted with a holding brake as an option. This is **not** suitable for use as an operational brake. The brakes are released with 24 V of unfiltered DC voltage.

Note: The maximum brake speed must also be taken into account when considering the maximum motor speed.



Motor Type	Holding brake							
	M _{BR} [Nm]	U _{BR} [V]	I _{BR} [A]	m _{BR} [kg]	n _{maxBR} [1/min]	J _{BR} [kgcm ²]	T _{on} [ms]	T _{off} [ms]
DT3	1,1	24	0,3	0,28	10.000	0,013	35	55
DT4	4,5	24	0,4	0,45	7.000	0,027	35	55
DT5	12,0	24	0,7	0,80	6.000	0,294	30	60
DTK5	4,5	24	0,4	0,45	7.000	0,027	35	55
DT6	12,0	24	0,7	0,80	6.000	0,294	30	60
DT7	18,0	24	0,8	1,10	6.000	0,540	30	70
DTK7	12,0	24	0,7	0,80	6.000	0,294	30	60
DT10	120,0	24	2,3	8,00	6.000	5,898	30	70

Power cable

Pre-fabricated cables with power connectors and various cable cross-sections are available for the power supply, temperature sensor and brake. The cable sheathing is removed from the ends of the wires on the device side. The cables are available in any length measured in complete meters.

Properties:

Sheath: Polyurethane, TPE core

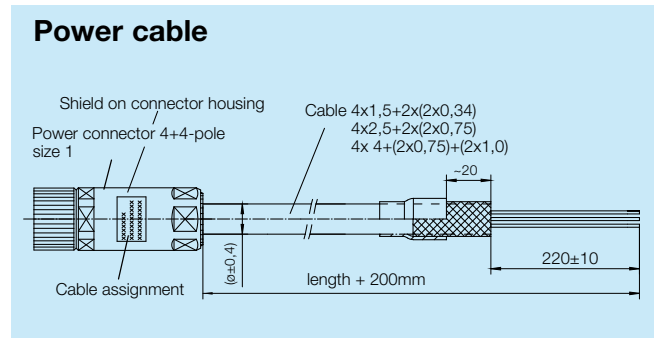
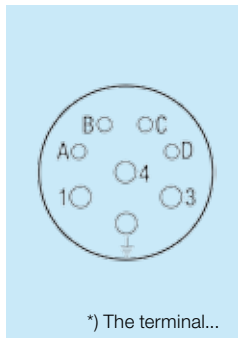
Trailing cable properties:

- Min. bending radius: 12 x external cable diameter



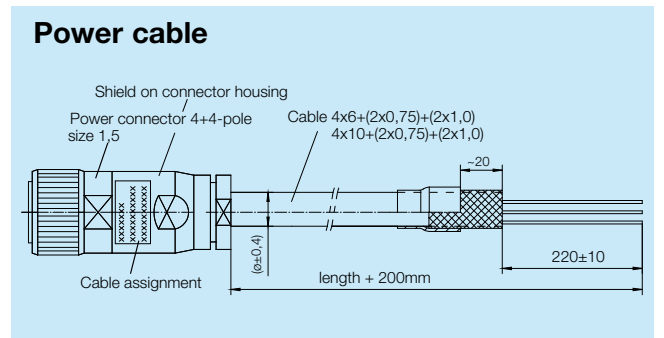
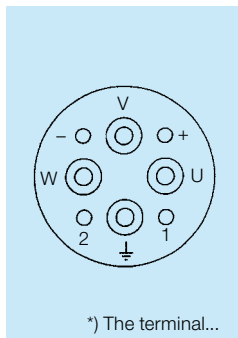
Connector pin assignment and power cable size 1

PIN	Terminal
A	Temperature sensor
B	Temperature sensor
C	Brake +
D	Brake 0 V
1	Motor phase u
3	Motor phase w
4	Motor phase v
⊥	Protective conductor

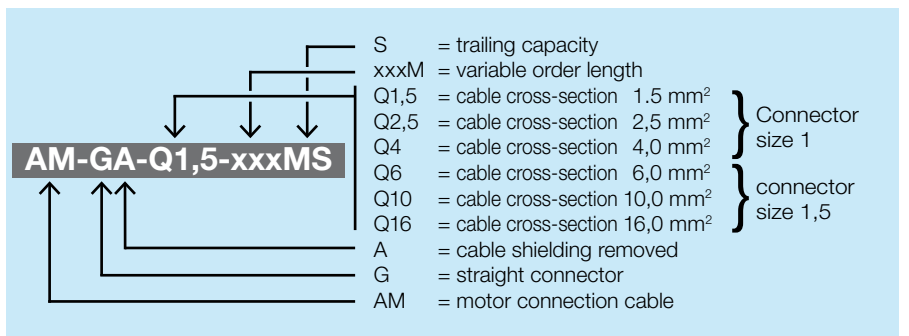


Connector pin assignment and power cable size 1.5

PIN	Terminal
u	Motor phase u
v	Motor phase v
w	Motor phase w
1	Temperature sensor
2	Temperature sensor
+	Brake + 24 V
-	Brake 0 V
⊥	Protective conductor



Power cable order designation



*) Pinout is as shown from outside on motor connector.

The terminal assignment is as shown on the motor mounting box. All dimensions are given in mm.

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AMK

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Abbreviations

Symbol	Unit	Meaning
D_w	mm	Shaft diameter
I_{BR}	A	Braking current
I_{max}	A	Maximum current
I_N	A	Rated current
I_o	A	Continuous standstill current
J	kgcm ²	Motor moment of inertia
J_{BR}	kgcm ²	Braking moment of inertia
k_T	Nm/A	Torque constant ($M=I*k_T$)
L	mm	Motor length
$L1$	mm	Distance between power connector and end of motor
$L2$	mm	Distance between encoder connector and end of motor
$L3$	mm	Distance between water supply connectors
L_{BR}	mm	Length of motor with brake
$L1_{BR}$	mm	Distance between power connector and end of motor with brake
$L2_{BR}$	mm	Distance between encoder connector and end of motor with brake
L_{tt}	mH	Terminal inductance
m	kg	Motor mass
m_{BR}	kg	Brake mass
M_{BR}	Nm	Min. static braking torque
M_{max}	Nm	Maximum torque
M_N	Nm	Rated torque
M_o	Nm	Continuous static torque
n_{max}	rpm	Maximum speed
n_{maxBR}	rpm	Maximum brake speed
n_N	rpm	Rated speed
P_N	kW	Rated power
R_{tt}	Ω	Terminal resistance
T_{on}	ms	Brake application time
T_{off}	ms	Release time Brake
U_{BR}	V	Braking voltage

Characteristics

 Maximum torque
 Thermal continuous torque

Bearing service life

 $0,5 \times n_N$
 n_N
 $2 \times n_N$

Ambient conditions

Ambient temperature:

+5 ... +40°C. In the case of higher ambient temperatures up to a maximum of 60°C, the rating must be reduced by 1% per increase in temperature of 1 K.

Site altitude:

Up to 1000 m a.m.s.l. In the case of altitudes above 1000 m, the ambient temperatures compliant with DIN VDE 0530 and listed in Table 4 are taken as a basis.

Humidity:

Maximum 85% relative humidity, non-condensing.

General technical data

Degree of protection:

IP54/IP65. Higher degree of protection on request

Rating:

The rating refers to a winding overtemperature of 80 K. The motor is checked by means of a thermally insulating flange.

Insulation class:

F in accordance with DIN VDE 0530

Thermal protection:

Thermistor (PTC), cold resistance approx. 150-800 Ω.

Motor bearings:

Ball bearings lubricated for life; axial runout, shaft runout. N in accordance with DIN 42955.

Balance quality:

G 2.5 in accordance with VDI 2056.

Vibrational quality:

N in accordance with DIN ISO 2373.

Paint:

RAL 9005, black matt finish.

Cooling:

Convection cooling or liquid cooling

All motors with feather keys have full-key balancing.