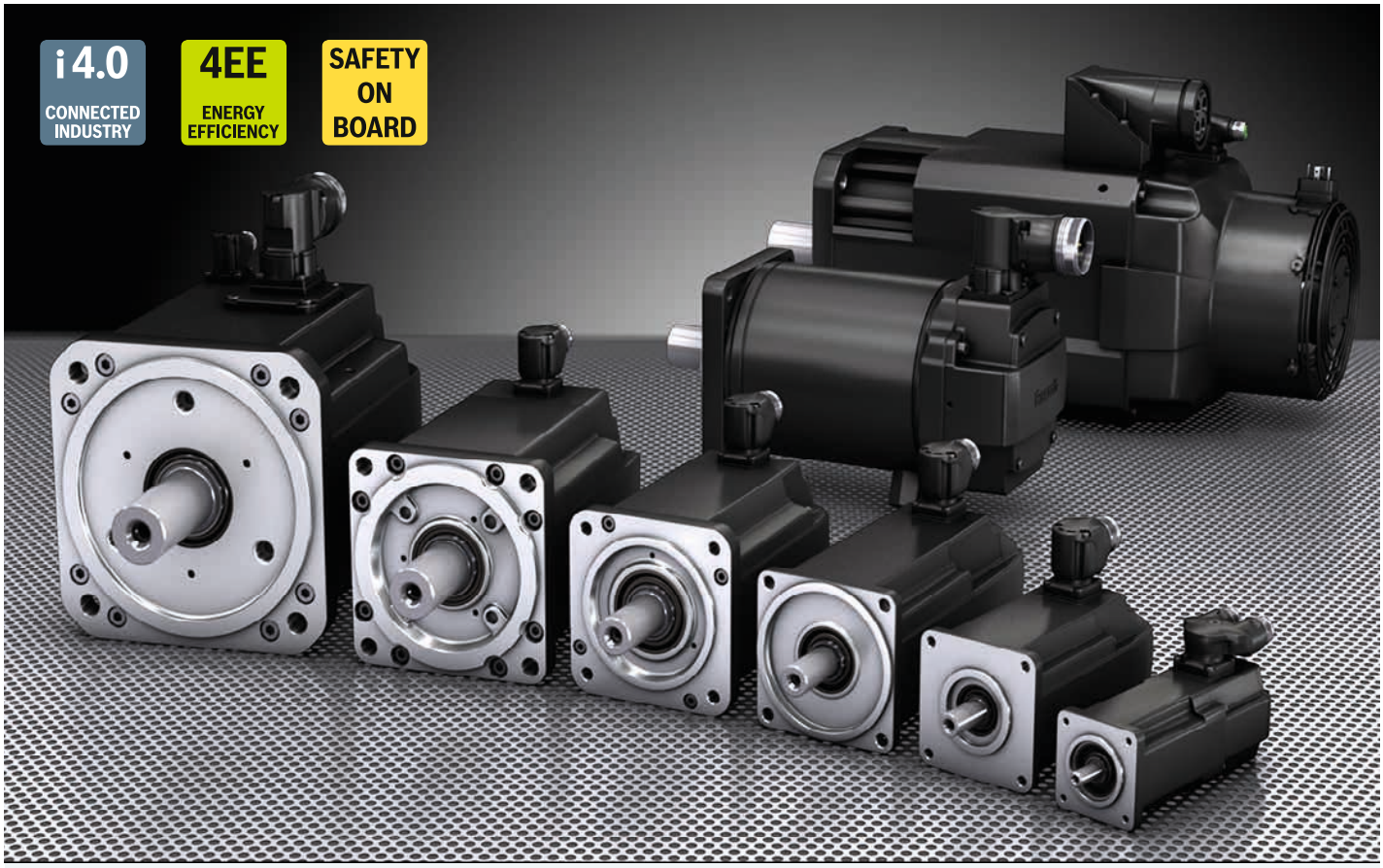
The Drive & Control Company

Rexroth
Bosch Group

MS2N
Synchronous servo motors

intelligent | powerful | flexible



Future-proof with power density, functionality and availability

More torque, higher rotational speeds, the practical single-cable connection, and an extensive option program: Rexroth's MS2N generation of motors connects ultimate dynamics with compact dimensions and the best of energy efficiency. Offering a selection of rotors with lower and medium inertia is available for optimal mass adaptation. The MS2N motors become a data source for intelligent solutions in the Industry 4.0 environment.

The new generation of servo motors
Rexroth's MS2N range of motors with more than 50 types, covers a maximum torque of up to 360 Nm and maximum rotational speeds of up to 9,000 rpm.

A high power density is achieved through optimized electromagnetic design and motor construction. With a finely graduated range of torques and rotational speeds, application-oriented encoder options, and optional single-cable connection, the motors flexibly meet the diverse requirements of modern automation. Forced ventilation and water cooling open up new areas of performance.

Intelligence in the system
In the MS2N product line, intelligence progresses all the way up to the motor by storing the individual readings of every single motor as well as the saturation and temperature data into the motor data memory.

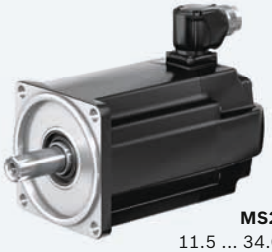
IndraDrive drive controllers process these values in real time, increasing the torque precision significantly and reducing the tolerance range during operation to a fraction of the values that had been standard up to now. Thus the servo motor can be used as a reliable sensor and as a data source. In this way, applications within the Industry 4.0 environment can be realized cost-effectively and without additional components.

Maximum safety in design and operation
The MS2N motor model in the IndraSize engineering tool enables simple, fast and safe drive configuration that corresponds exactly to real operation. In this way, mechanical engineers can optimal design drives for their application. The integrated encoders with up to SIL3 PLe ensure maximum safety for SafeMotion applications.

More than 50 motor types in 6 sizes with up to 5 lengths and 3 cooling types

MS2N03
M_{Max} 3.8 ... 7.4 Nm

MS2N04
6.4 ... 19.7 Nm



MS2N05
11.5 ... 34.0 Nm

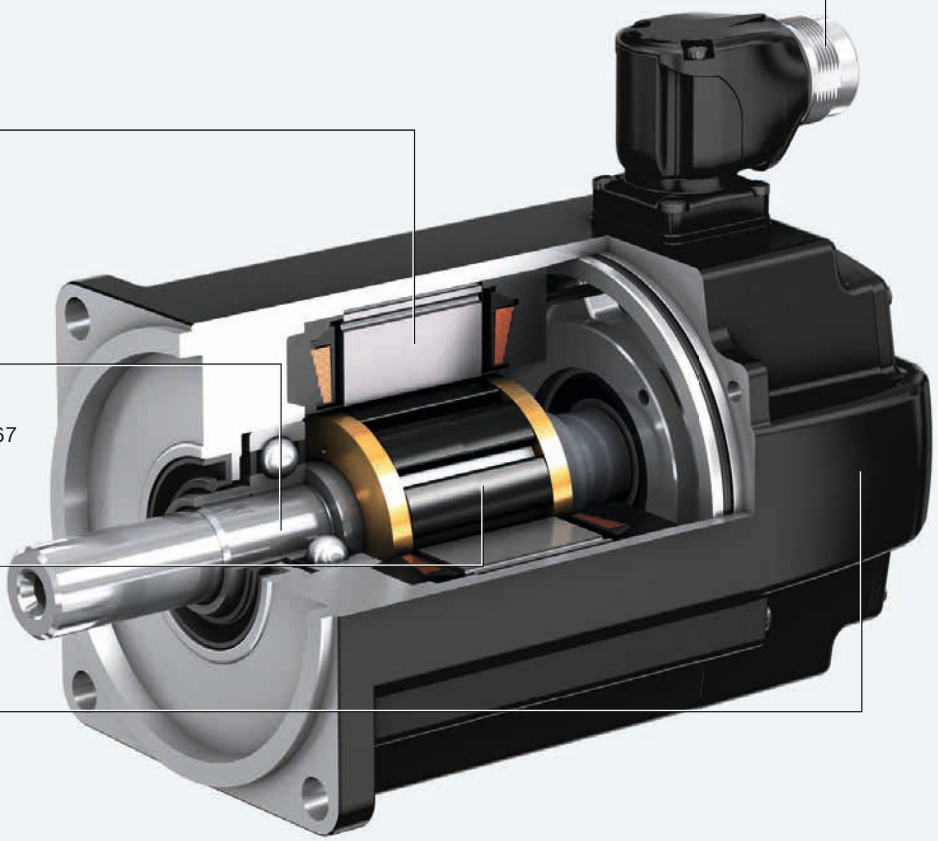
Single-cable connection
- Cable length of up to 75 m without additional components
- Plug with quick-lock
- Optional dual-cable connection

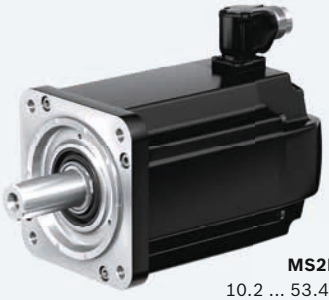
Powerful
- Compact motors
- High torque density
- Broader speed range
- High energy efficiency
- Optional forced ventilation and water cooling

Flexible configuration
- Smooth shaft, keyway, shaft seal
- Degree of protection IP64, IP65 or IP67
- Energy-saving holding brake
- Increased flange accuracy
- Many additional options

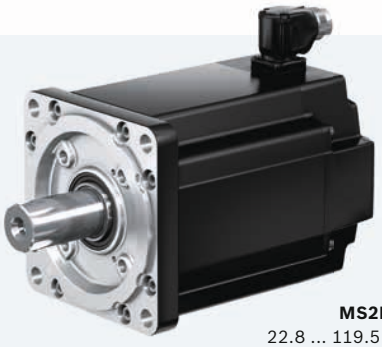
Two motor designs
- Low rotor inertia for all sizes
- Medium rotor inertia beginning with MS2N06

Encoder types
- Four performance levels
- Functional safety up to SIL3 PLe
- Singleturn/Multiturn
- Motor data memory

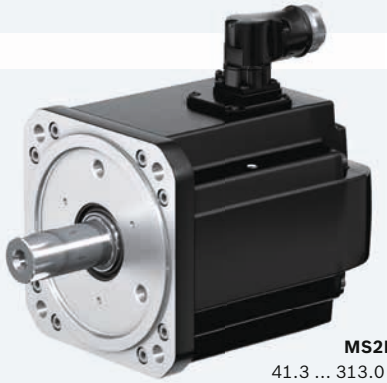




MS2N06
10.2 ... 53.4 Nm



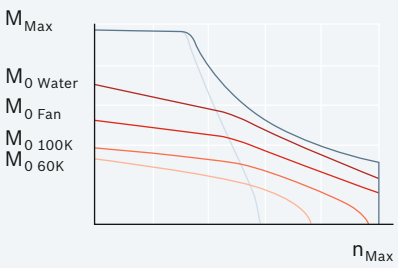
MS2N07
22.8 ... 119.5 Nm



MS2N10
41.3 ... 313.0 Nm

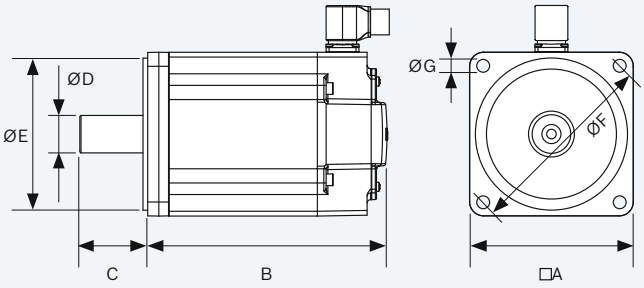
Technical Data

		Torque [Nm]					Current [A]					Speed [min^{-1}]	Moment o [kgm
Type		$M_{0\ 60K}$	$M_{0\ 100K}$	$M_{0\ Fan}$	$M_{0\ Water}$	M_{Max}	$I_{0\ 60K}$	$I_{0\ 100K}$	$I_{0\ Fan}$	$I_{0\ Water}$	I_{Max}	n_{Max}	without brake
03	MS2N03-B0BY	0.73	0.90	–	–	3.75	1.31	1.61	–	–	7.25	9000	0.000023
	MS2N03-D0BY	1.15	1.45			7.40	2.07	2.60			14.5	9000	0.000037
04	MS2N04-B0BN	1.75	2.15	–	–	6.4	1.11	1.36	–	–	4.9	6000	0.00007
	MS2N04-B0BT						2.20	2.70			9.8	6000	
	MS2N04-C0BN	2.80	3.50			13.0	1.78	2.24			9.7	6000	0.00011
	MS2N04-C0BT						3.11	3.90			17.3	6000	
	MS2N04-D0BH	3.85	4.65			19.7	1.61	1.96			9.7	4000	0.00016
	MS2N04-D0BQ						2.86	3.48			17.3	6000	
05	MS2N05-B0BN	3.75	4.45	–	–	11.5	2.29	2.75	–	–	8.4	6000	0.00017
	MS2N05-B0BT						4.55	5.45			16.8	6000	
	MS2N05-C0BN	6.10	7.15			22.6	3.53	4.16			15.1	6000	0.00029
	MS2N05-C0BT						7.10	8.35			30.2	6000	
	MS2N05-D0BH	7.90	9.35			34.0	3.05	3.63			15.2	4000	0.00040
	MS2N05-D0BR						6.05	7.20			30.3	6000	
06	MS2N06-B1BN	3.25	3.6	–	–	10.2	2.22	2.47	–	–	7.8	6000	0.00048
	MS2N06-C0BN	6.0	7.1			17.3	3.75	4.50			12.8	6000	0.00039
	MS2N06-C0BT						7.50	9.00			25.5	6000	
	MS2N06-D1BN	9.0	11.1			41.8	5.05	6.25			25.5	6000	0.00140
	MS2N06-D0BN	9.7	11.9			34.8	6.10	7.55			25.4	6000	0.00065
	MS2N06-D0BR						7.85	9.75			32.7	6000	
	MS2N06-E0BH	13.0	16.3			53.4	5.4	6.80			25.4	4000	0.00089
	MS2N06-E0BR						10.9	13.7			50.8	6000	
07	MS2N07-B1BN	7.4	8.2	–	–	22.8	4.25	4.74	–	–	14.8	6000	0.00197
	MS2N07-C1BN	11.5	14.5	18.0	25.0	46.0	6.6	8.35	10.4	14.2	29.5	6000	0.00305
	MS2N07-C1BR						9.6	12.1	14.9	20.8	42.7	6000	
	MS2N07-C0BN	12.8	16.0	19.8	26.6	38.8	6.9	8.8	11.0	15.8	24.8	6000	0.00120
	MS2N07-C0BQ						10.1	12.9	15.8	22.3	36.4	6000	
	MS2N07-D1BH	18.9	23.8	31.0	50.5	92.5	7.8	9.9	12.9	21.1	42.7	4000	0.00529
	MS2N07-D1BN						9.9	12.5	16.3	26.7	54.1	6000	
	MS2N07-D0BH	22.0	28.2	35.5	55.0	79.7	8.55	11.1	14.1	22.8	36.4	4000	0.00210
	MS2N07-D0BN						11.6	15.0	19.1	31.4	49.5	6000	
	MS2N07-D0BR						17.1	22.3	28.2	45.8	72.7	6000	
	MS2N07-E1BH	25.8	32.2	43.5	76.5	140.0	9.0	11.3	15.2	26.6	54.1	4000	0.00752
	MS2N07-E1BN						14.1	17.7	23.9	42.1	85.4	6000	
	MS2N07-E0BH	29.2	38.2	49.5	83.0	119.5	10.35	13.7	17.9	31.5	49.5	4000	0.00300
	MS2N07-E0BN						15.1	20.0	26.2	46.0	72.7	6000	
	MS2N07-E0BQ						19.1	25.3	33.3	58.3	92.3	6000	
10	MS2N10-B1BQ	15.6	16.7	–	–	41.3	13.1	14.2	–	–	41.3	6000	0.00520
	MS2N10-C1BH	27.3	31.0	40.0	48.0	86.5	11.1	12.8	16.7	19.6	40.9	4000	0.00920
	MS2N10-C1BN						16.5	19.0	24.7	29.9	60.8	6000	
	MS2N10-C0BH	30.2	34.0	43.2	51.7	76.8	12.6	14.5	18.8	23.0	38.5	4000	0.00480
	MS2N10-C0BN						16.8	19.3	25.1	30.8	51.3	6000	
	MS2N10-D1BF	47.2	56.0	78.0	101.0	174.0	14.3	17.2	24.2	30.8	60.7	3000	0.01710
	MS2N10-D1BN						28.6	34.3	48.5	63.3	121.5	6000	
	MS2N10-D0BH	51.0	60.5	82.4	107.5	155.0	19.1	23.1	32.4	43.7	70.0	4000	0.00810
	MS2N10-D0BN						28.2	34.1	48.0	64.7	102.5	6000	
	MS2N10-E1BF	64.0	76.0	113.0	159.0	266.0	17.1	20.5	30.8	44.2	81.0	3000	0.02500
	MS2N10-E1BN						34.2	41.0	61.7	88.0	162.0	6000	
	MS2N10-E0BH	67.7	82.5	119.0	162.0	234.0	25.0	31.0	46.1	65.4	102.5	4000	0.01140
	MS2N10-E0BN						34.5	42.8	62.9	90.0	140.0	6000	
	MS2N10-F1BD	79.5	96.5	145.0	209.0	360.0	15.9	19.5	29.5	42.8	81.0	2000	0.03290
	MS2N10-F1BH						31.8	38.9	58.6	86.0	162.0	4000	
	MS2N10-F0BD	85.0	103.0	148.5	214.0	313.0	15.8	19.5	28.8	43.3	70.0	2000	0.01470
	MS2N10-F0BH						32.0	39.4	58.6	87.5	140.0	4000	



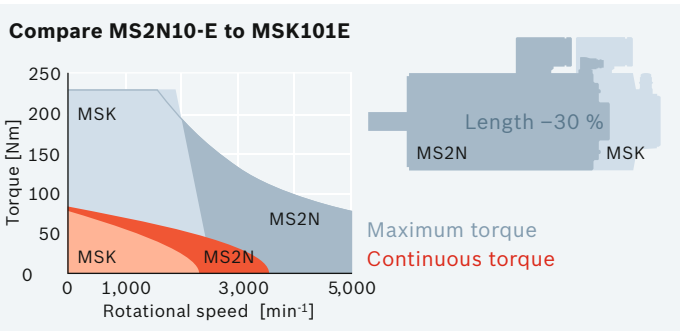
Maximum torque

Continuous torque
- Water cooling
- Force-ventilated
- Self-cooling 100K
- Self-cooling 60K



f inertia [kg·m²]	Dimensions [mm]											Mass [kg] Self-cooling	
	A	B					D	C	E	F	G		
with brake	Flange	Encoder "A" length	Encoder "B/C" length	Encoder "D" length	Brake length	Forced ventilation	Shaft diameter	Shaft length	Centering collar	Bolt circle	Mounting hole	without brake	with brake
0.000030	58	148	+15	–	+29	–	9	20	40	63	4.5	1.4	1.8
0.000044		188					11	23				2.0	2.4
0.00011	82	147	+15	–	+32.5	–	14	30	50	95	6.6	2.7	3.4
0.00016		179										3.7	4.4
0.00020		211										4.7	5.4
0.00028	98	170	+18	–	+30	–	19	40	95	115	9	4.0	5.1
0.00040		206										5.9	7.0
0.00051		242										7.3	8.4
0.00059	116	164	+0	+18	+37	–	24	50	95	130	9	5.1	6.2
0.00050		184										6.4	7.4
0.00154		224										9.0	10.5
0.00079													
0.00103		264										11.5	13.0
0.00223	140	176	+0	+16	+54	+121	32	58	130	165	11	9.5	11.5
0.00331		205										12.0	14.0
0.00146													
0.00570		263										17.5	20.0
0.00251													
0.00793		321										23.0	26.0
0.00341													
0.00561	196	194	+0	+0	+51	+98	38	80	180	215	14	17.5	21
0.01067		238			+60							24.0	29.0
0.00627												23.5	28.5
0,01857		296										36.0	41.0
0.00957												34.0	39.0
0.02770		354										47.0	54.0
0.01410												45.0	52.0
0.03560		412										59.0	66.0
0.01740												55.0	62.0

More torque and higher rotational speeds
Short coil heads and high-performance motors enable compact dimensions with minimal power loss. This leads to a significant improvement in energy efficiency and reduces operating costs over the long term. The available field weakening operation in conjunction with IndraDrive drive controllers extends the usable torque speed range beyond the voltage limit.




MS2N07 and MS2N10, force-ventilated


MS2N07 and MS2N10, water-cooled

Self-cooled, force-ventilated or water-cooled
The motors are optionally available with integrated fans or water cooling starting at size MS2N07. The nominal torque is increased significantly in the same construction size.
All fan motors offer degree of protection IP65, an integrated temperature sensor with certified intrinsic safety as well as optionally 115 V or 230 V connection voltage.

Water-cooled motors offer even more increased continuous torque and highest power density, for new machine concepts with minimum space and high requirements on effective heat dissipation. The robust design of the entire motor cooling in stainless steel allows the simple and reliable integration into a wide range of cooling circuits.

Connection technology
Whether conventional cabling with compact round connectors or a modern single-cable connection, MS2N offers the practical diversity for less installation work and space requirement. The size MS2N10 is also available with terminal box. All plugs are equipped with comfortable quick locking and can be rotated up to plug size M40.


M17 double plug

M23 single-cable connection

M40 power connection
M17 encoder connection

Type Code

MS2N 05-C0BNN-ASDH0-NNNNN-NN

Size
03, 04, 05, 06, 07, 10

Length
B, C, D, E, F

Rotor inertia
0 – Low inertia
1 – Medium inertia

Winding
BD – 1,000 min^{-1} **BQ** – 4,000 min^{-1}
BF – 1,500 min^{-1} **BR** – 4,500 min^{-1}
BH – 2,000 min^{-1} **BT** – 6,000 min^{-1}
BN – 3,000 min^{-1} **BY** – 9,000 min^{-1}

Cooling type
N – Self-cooling
A – Forced ventilation, Axial fan 230 V
B – Forced ventilation, Axial fan 115 V
L – Water cooling

Encoder performance
A – BASIC: 16 signal periods, Hiperface®
B – STANDARD: 128 signal periods, Hiperface®, SIL2
C – ADVANCED: digital 20 bit, ACURO®link, SIL2
H – ADVANCED: digital 20 Bit, ACURO®link, SIL3
D – HIGH: digital 24 bit, ACURO®link, SIL3

Encoder design
S – Singleturn, absolute 1 revolution
M – Multiturn, absolute 4,096 revolutions

Other design
N – None
P – Sealing air
E – Additional ground

Coating
N – Standard

Construction
N – IM B5/IM 3001, Sensor PT1000

Bearing
N – Standard

Flange perfection
N – Standard
R – increased perfection

Holding brake
0 – No holding brake
1, 2, 3 – With holding brake

Shaft
H – Smooth, no shaft seal
G – Smooth, with shaft seal
L – Keyway, no shaft seal
K – Keyway, with shaft seal

Electrical connection
D – M17 double plug, turnable
S – M23 single-cable connection, turnable
U – M23 angle plug, turnable
V – M40 angle plug, turnable
A – M58 angle plug, side A
B – M58 angle plug, side B
T – Terminal box, size 1
C – Terminal box, size 2

Available options and technical data: see product documentation

The Drive & Control Company

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R999000462 (2017-11)