

IndraDyn S Synchronous servo motors MS2N

intelligent | powerful | flexible

i4.0
CONNECTED
INDUSTRY

4EE
ENERGY
EFFICIENCY

**SAFETY
ON
BOARD**



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 new 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 was redeveloped from the ground up and, with more than 50 types of motors, 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 this new motor construction and optimized electromagnetic design. 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 new 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.

Reliability with completely digital engineering

A new dynamic temperature model in the IndraDrive drive controller device ensures reliable operation without limiting performance. The same temperature model is loaded onto the IndraSize design tool. In this way, mechanical engineers can design drives to the limit and, in doing so, can trust that these operation points are reached in real process.

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



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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

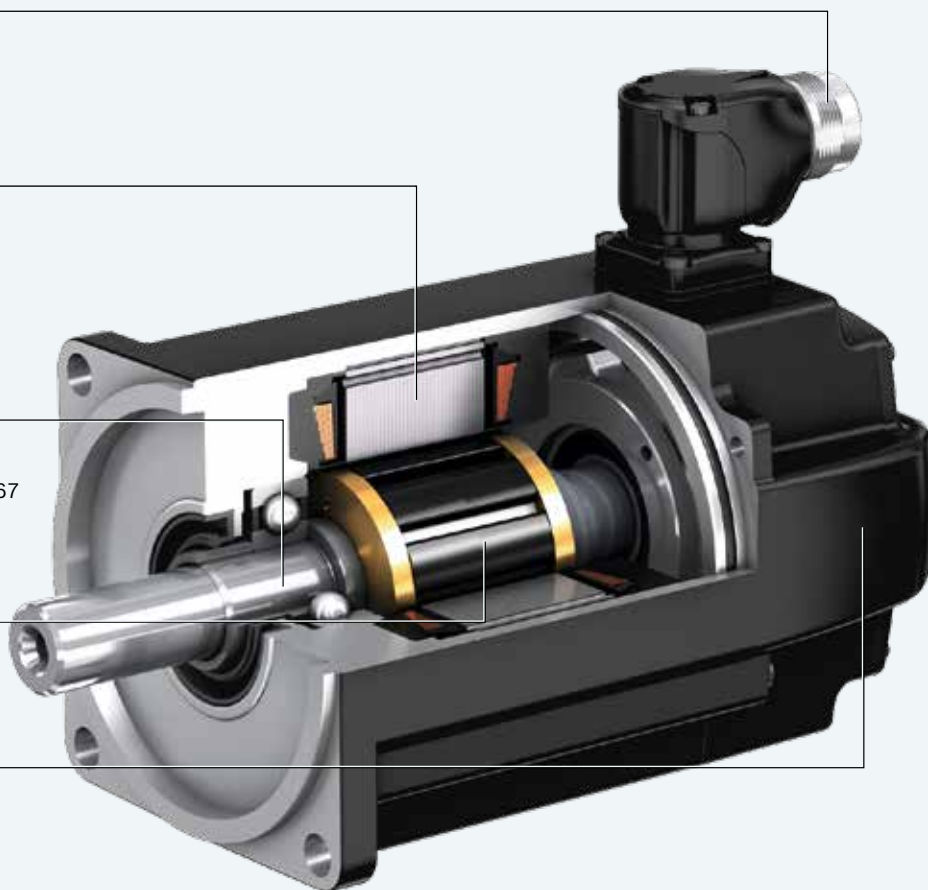
- ▶ Smooth shaft, keyway, shaft seal
- ▶ Degree of protection IP64, IP65 or IP67
- ▶ Energy-saving holding brake
- ▶ Increased flange accuracy
- ▶ Many additional options

Two motor designs

- ▶ Low rotor inertia for all sizes
- ▶ Medium rotor inertia beginning with MS2N06

Encoder types

- ▶ Four performance levels
- ▶ Singleturn/Multiturn
- ▶ Encoder performance B, C, D with functional safety SIL2 PLd
- ▶ Motor data memory



MS2N06
3.8 ... 16.3 Nm



MS2N07
7.8 ... 38.2 Nm



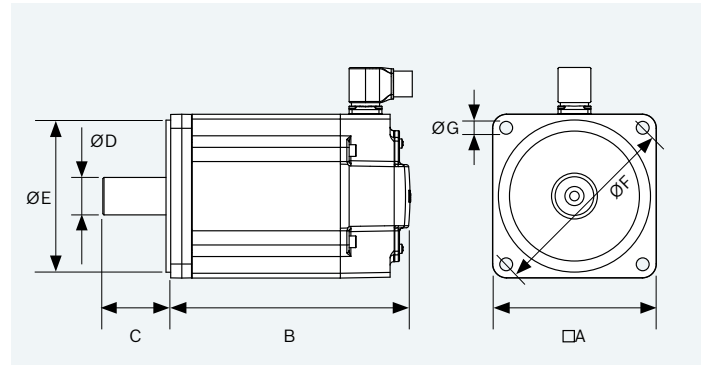
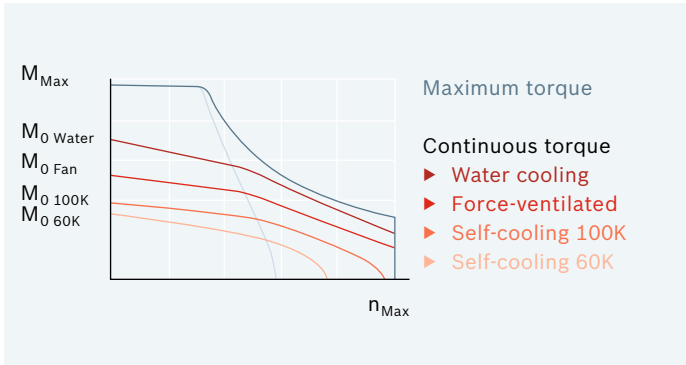
MS2N10
30.5 ... 103 Nm

Technical Data

		Torque [Nm]					Current [A]					Speed [min ⁻¹]	Moment of inertia [kgm ²]
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	0.00023
	MS2N03-D0BY	1.15	1.45	-	-	7.40	2.07	2.60	-	-	14.5	9000	0.00037
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	6.7	7.8	-	-	22.8	3.8	4.45	-	-	14.8	6000	0.00197
	MS2N07-C1BN	11.5	14.5	18.0	24.7	46.0	6.6	8.35	10.4	14.2	29.5	6000	0.00305
	MS2N07-C1BR						9.6	12.1	14.9	20.5	42.7	6000	
	MS2N07-C0BN	12.8	16.0	19.0	26.6	38.8	7.2	9.2	11.0	15.8	25.9	6000	0.00120
	MS2N07-C0BQ						10.1	12.9	15.4	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	79.7	8.55	11.1	14.0	23.1	36.4	4000	0.00210
	MS2N07-D0BN						11.6	15.0	19.9	31.0	49.5	6000	
	MS2N07-D0BR	25.8	32.2	43.5	76.5	140	17.1	22.3	28.2	46.3	72.7	6000	0.00752
	MS2N07-E1BH						8.8	11.4	15.3	26.6	54.1	4000	
	MS2N07-E1BN	29.2	38.2	49.5	83	119.5	14.1	17.7	23.9	42.0	85.4	6000	0.00300
MS2N07-E0BH	10.75						14.2	18.6	32.6	51.8	4000		
MS2N07-E0BN	15.6	16.7	-	-	41.3	15.1	20.0	26.2	45.7	72.7	6000	0.00520	
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	-	-	42.0	6000	0.00520
	MS2N10-C1BH	27.3	31.0	38.7	47	86.5	11.2	13.0	16.2	19.6	40.9	4000	0.00920
	MS2N10-C1BN						16.5	19.0	24.1	29.2	60.8	6000	
	MS2N10-C0BH	30.2	34.0	43.2	51.7	76.8	12.6	14.5	18.8	23	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	98.5	174	13.8	16.5	22.6	30.8	60.7	3000	0.01710
	MS2N10-D1BN						28.6	34.3	48.5	61.9	121.5	6000	
	MS2N10-D0BH	51.0	60.5	82.4	107.5	155	19.1	23.1	32.4	43.7	70	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	266	16.8	20.1	29.2	44.2	81	3000	0.02500
	MS2N10-E1BN						34.2	41.0	61.7	88	162	6000	
	MS2N10-E0BH	67.7	82.5	119.0	162	234	25.4	31.0	46.1	64.8	102.5	4000	0.01140
	MS2N10-E0BN						34.5	42.8	62.9	90	140	6000	
	MS2N10-F1BD	79.5	96.5	145.0	209	360	15.9	19.5	27.7	42.8	81	2000	0.03290
	MS2N10-F1BH						31.8	38.9	58.6	85.5	162	4000	
	MS2N10-F0BD	85.0	103.0	148.5	214	313	15.8	19.5	28.8	43.3	70	2000	0.01470
MS2N10-F0BH	32.0						39.4	58.6	87.5	140	4000		

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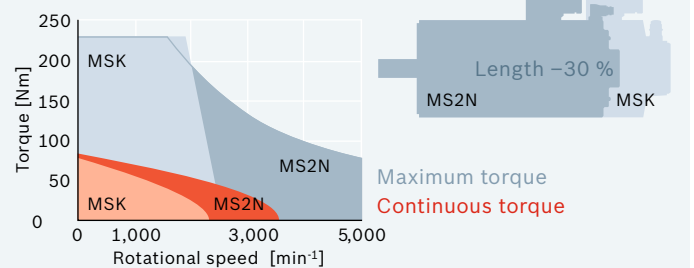


Moment of inertia [kg·m ²]	Dimensions [mm]											Mass [kg]	
	A	B					D	C	E	F	G	Self-cooling	
with brake	Flange	Encoder "A" length	Encoder "B/C" length	Encoder "D" length	Brake length	Forced ventilation	Shaft	Shaft length	Centering collar	Bolt circle	Mounting hole	without brake	with brake
0.000030	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	98	211	+18	-	+30	-	19	40	95	115	9	4.7	5.4
0.00028		170										4.0	5.1
0.00040	116	206	+0	+18	+37	-	24	50	95	130	9	5.9	7.0
0.00051		242										7.3	8.4
0.00059	140	164	+0	+16	+54	+121	32	58	130	165	11	5.1	6.2
0.00050		184										6.4	7.4
0.00154	196	224	+0	+0	+60	+98	38	80	180	215	14	9.0	10.5
0.00079		264										11.5	13.0
0.00103	196	176	+0	+0	+60	+98	38	80	180	215	14	9.5	11.5
0.00223		205										12.0	14.0
0.00331	196	263	+0	+0	+60	+98	38	80	180	215	14	17.5	20.0
0.00146		321										23.0	26.0
0.00570	196	194	+0	+0	+60	+98	38	80	180	215	14	17.5	21
0.00251		238										24.0	29.0
0.00793	196	238	+0	+0	+60	+98	38	80	180	215	14	23.5	28.5
0.00341		296										36.0	41.0
0.00561	196	354	+0	+0	+60	+98	38	80	180	215	14	34.0	39.0
0.01067		412										47.0	54.0
0.01740	196	354	+0	+0	+60	+98	38	80	180	215	14	45.0	52.0
0.03560		412										59.0	66.0
0.01740	196	412	+0	+0	+60	+98	38	80	180	215	14	55.0	62.0
0.03560		412										59.0	66.0

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.

Compare MS2N10-E to MSK101E



MS2N07 and MS2N10, force-ventilated



MS2N07 and MS2N10, water-cooled

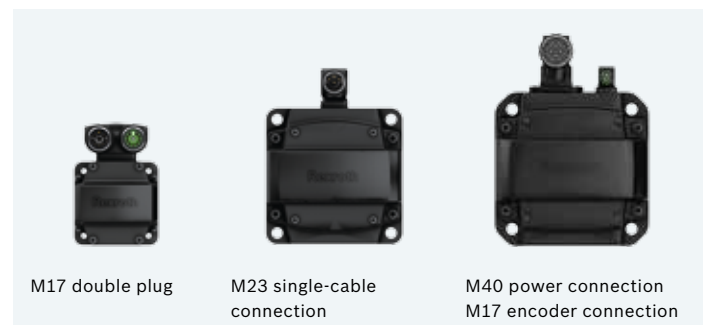
Self-cooled, force-ventilated or water-cooled

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.



Type Code

MS2N 05-COBNN-ASDH0-NNANN-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, analog, Hiperface®
B – STANDARD: 128 signal periods, analog, Hiperface®
C – ADVANCED: digital 20 bit, ACURO®link
D – HIGH: digital 24 bit, ACURO®link

Encoder design

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

Other design

N – None
P – Sealing air

Coating

N – Standard

Construction

A – IM B5/IM 3001, Sensor KTY
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

* Available from 3rd quarter 2017