

XtraforsBS, Servomotors under radiation exposure

Motors under radiation exposure require special protections; adhesives, insulating varnishes, cables and bearings must withstand a certain level of radiation exposure (Computerised Tomography, X ray machines, etc).

With many years of experience, MAVILOR MOTORS has developed a range of brushless servomotors for operation under radiation exposure.

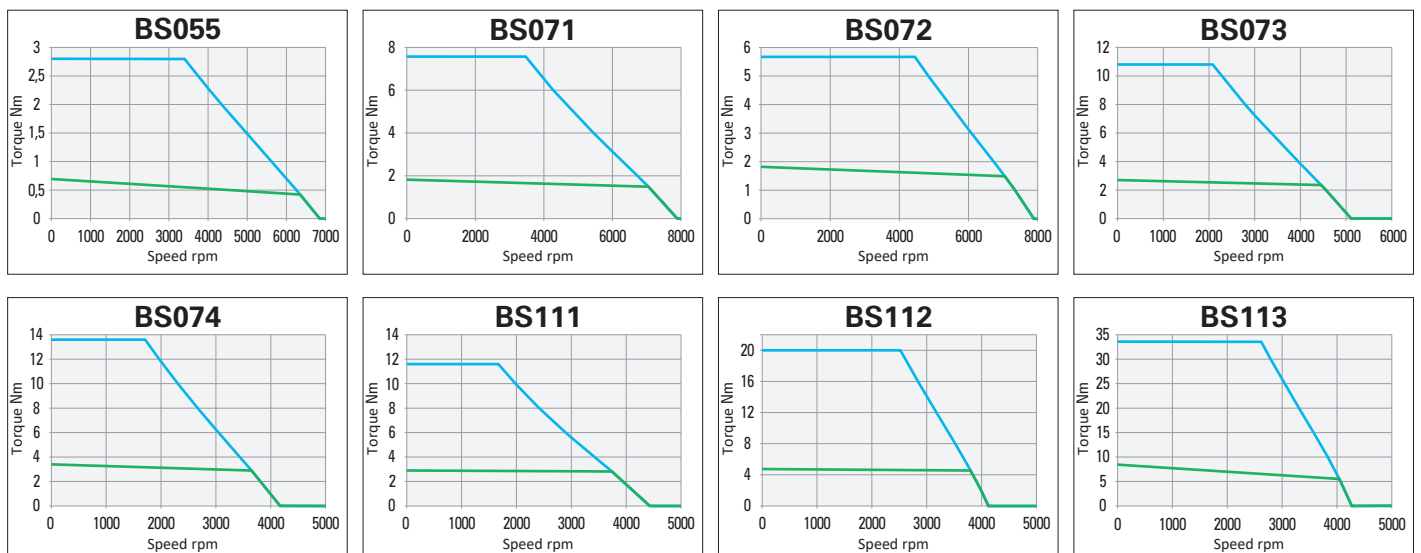
Xtrafors BS - Technical Data*

Winding 400 Vac (560Vdc)	Units	BS055	BS071	BS072	BS073	BS074	BS111	BS112	BS113
Max Speed with no load	rpm	6.850	8.800	7.900	5.100	4.200	4.400	4100	4300
Nominal Speed	rpm	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
Stall Torque	Nm	0,7	0,8	1,9	2,7	3,4	2,9	5	8,4
Nominal Torque	Nm	0,54	0,69	1,76	2,41	2,6	2,8	4,8	8,1
Peak Torque	Nm	2,8	3,2	7,6	10,8	13,6	11,6	20	33,6
Stall Current	A	0,77	1,13	2,37	2,2	2,25	2,04	3,29	5,71
EMF constant (± 10%)	Vs/Rad	0,53	0,41	0,46	0,71	0,87	0,73	0,88	0,85
Torque constant (± 10%)	Nm/A	0,91	0,71	0,8	1,23	1,51	1,42	1,52	1,47
Winding Resistance (± 10 %)	Ω	47	33,8	15,5	18,9	18,5	20,6	7,1	3,79
Winding Inductance (± 10 %)	mH	61	24	13,2	20	22	31	13,2	8,5
Rotor Inertia	Kgm ² 10 ⁻³	0,017	0,027	0,051	0,074	0,097	0,2	0,38	0,56
Mechanical Time Constant	ms	1,66	3,14	2,15	1,6	1,37	3,54	2,02	1,7
Electrical Time Constant	ms	1,3	0,71	0,85	1,06	1,18	1,5	1,86	2,24
Thermal Time Constant	s	1.120	1.100	1.280	1.560	1.990	2.520	1910	2260
Thermal Resistance	°C/W	2,06	1,34	0,69	0,63	0,61	0,67	0,75	0,46
Pole Pair		2	4	4	4	4	4	4	4
Insulation		F	F	F	F	F	F	F	F
Protection		IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54
Weight without brake	Kg	1,4	1,5	1,9	2,3	2,8	4	5	6,3
Brake 24 Vdc	Nm	0,75	1,5	1,5	3	3	8	8	12
Weight with brake	kg	1,6	1,7	2,1	2,6	3,1	4,8	5,8	7,1
Heat Sink Plate	mm	300x300x10	300x300x10	300x300x10	300x300x10	300x300x10	400x400x10	400x400x10	400x400x10

* All Characteristics measured at 25°C ambient temperature with the aluminum heat sink plate specified

Winding 400 Vac (560Vdc) - Torque vs. Speed curves

— Permanent Torque — Intermittent Torque



Radiation resistance levels: 10⁶ grays

In the CEA's POSEIDON industrial irradiator at SACLAY (91), these motors were exposed to cobalt-60 radiation for an exposure time of 180 hours and an average dose rate of 5.6 kGy / h, ie a total dose of 1,000 kGy.

An independent control office checked the mechanical and electrical characteristics of each irradiated engine and certified the radiation resistance.

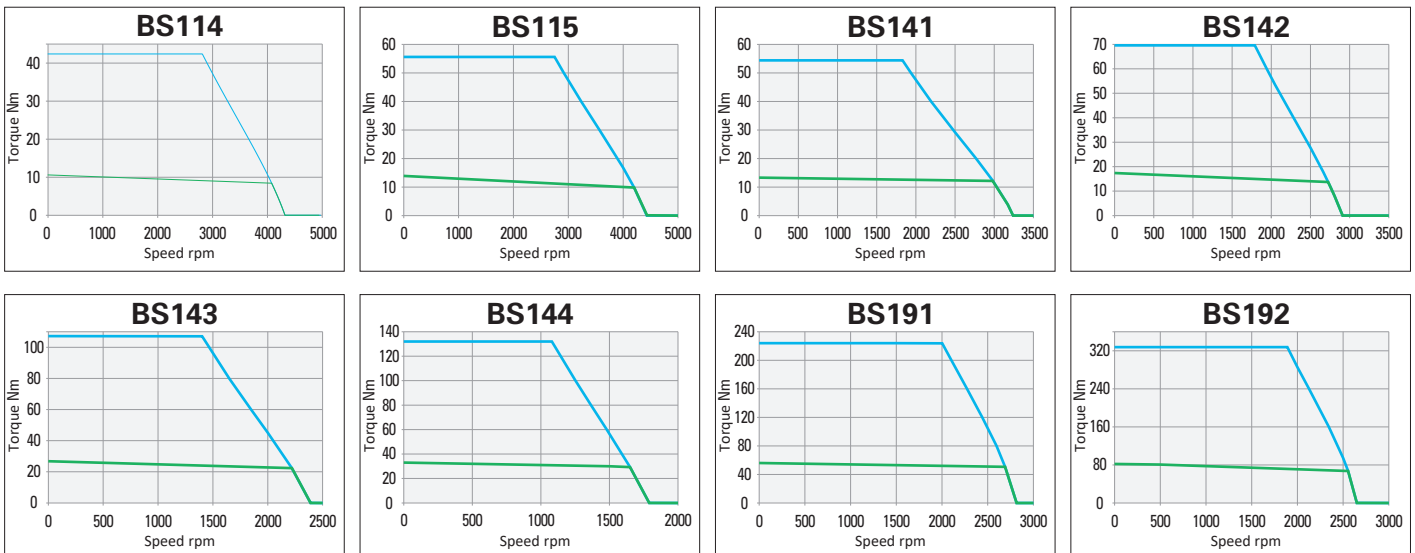
BS - Technical Data*

Winding 400 Vac (560 Vdc)	Units	BS114	BS115	BS141	BS142	BS143	BS144	BS191	BS192
Max Speed with no load	rpm	4.300	4.400	3.200	3.100	2.400	1.800	2.800	2.600
Nominal Speed	rpm	3.000	3.000	1.500	1.500	1.500	1.500	2.400	1.500
Stall Torque	Nm	10,6	13,9	13,6	17,4	26,8	33	56	82
Nominal Torque	Nm	9,1	11,2	12	15,2	23,7	32	52	78
Peak Torque	Nm	42,4	55,6	54,4	69,6	107,2	132	224	328
Stall Current	A	7,31	9,79	7,01	8,02	10,19	9,38	25,11	34,6
EMF Constant (± 10 %)	Vs/Rad	0,84	0,82	1,12	1,25	1,52	2,03	1,29	2,1
Torque Constant (± 10 %)	Nm/A	1,45	1,42	1,94	2,17	2,63	3,52	2,23	2,37
Winding Resistance (± 10 %)	Ω	2,58	1,84	2,9	2,46	2,04	2,5	0,39	0,26
Winding Inductance (±10 %)	mH	5,8	5,1	11,5	9	9,6	11	1,9	1,5
Rotor Inertia	Kgm ² 10 ⁻³	0,74	0,93	1,71	2,34	3,34	4,59	14,7	22
Mechanical Time Constant	ms	1,57	1,47	2,28	2,12	1,7	1,61	1,99	1,76
Electrical Time Constant	ms	2,25	2,77	3,97	3,66	4,71	4,4	4,87	5,77
Thermal Time Constant	s	2.510	3.700	3.740	4.500	4.626	4.800	4.400	4.090
Thermal Resistance	°C/W	0,42	0,33	0,4	0,36	0,27	0,26	0,23	0,18
Pole Pair		4	4	4	4	4	4	6	6
Insulation		F	F	F	F	F	F	F	F
Protection		IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54
Weight without brake	Kg	7,4	8,5	10,5	12,3	16,4	20,1	28,5	39
Brake 24 Vdc	Nm	12	12	20	20	20	20	72	72
Weight with brake	kg	8,2	9,3	12,4	14,2	18,3	22	31,5	42
Heat Sink Plate	mm	400x400x10	400x400x10	700x700x20	700x700x20	700x700x20	700x700x20	700x700x20	700x700x20

* All Characteristics measured at 25°C ambient temperature with the aluminum heat sink plate specified

Winding 400Vac (560Vdc) - Torque vs. Speed curves

— Permanent Torque — Intermittent Torque



Standard Version

Feedback : resolver

Shaft with keyway - Straight connector - temperature probe - with or without brake

Options

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: o MA FP

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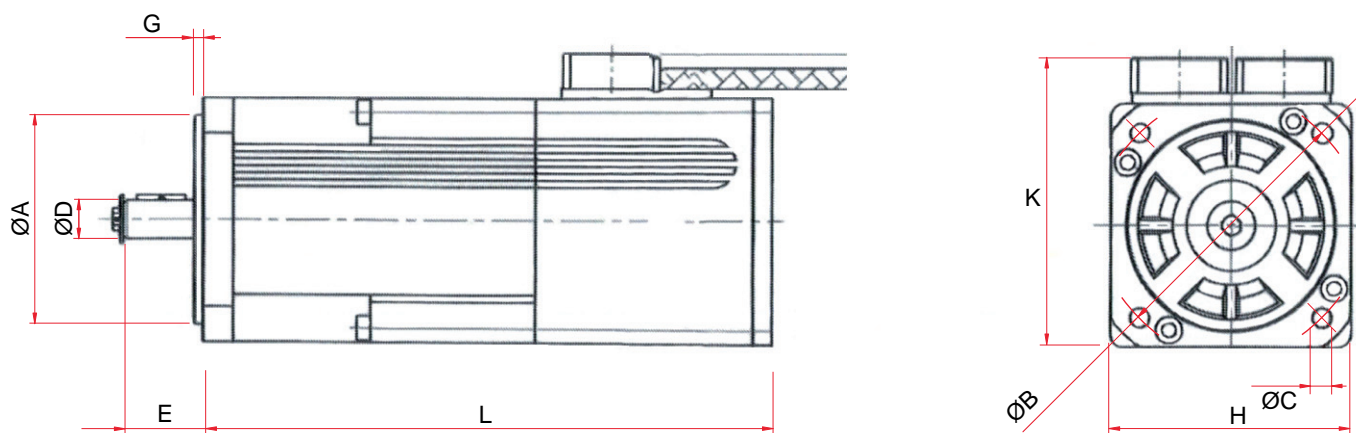
) #o : o ries MO MS

" o : o MA FP



Servomotor MA Series with Radiation Exposure option

Mechanical Dimensions



Dimensions (mm)	Ø A	Ø B	Ø C	Ø D	E	F	G	H	K	L without brake	L with brake
BS055	40j6	65-66,6	5,6-6,4	9k6	20	A3x3x12	2,5	57	70	142	170
BS071	60j6	75	5,5	11k6	23	A4x4x14	2,5	70	83	100	128
BS072	60j6	75	5,5	11k6	23	A4x4x14	2,5	70	83	120	148
BS073	60j6	75	5,5	11k6	23	A4x4x14	2,5	70	83	138	166
BS074	80j6	75	5,5	11k6	23	A4x4x14	2,5	70	83	156	184
BS111	95j6	115	9	19k6	40	A6x6x30	3	110	122	165	165
BS112	95j6	115	9	19k6	40	A6x6x30	3	110	122	190	190
BS113	95j6	115	9	19k6	40	A6x6x30	3	110	122	215	215
BS114	95j6	115	9	19k6	40	A6x6x30	3	110	122	240	240
BS115	95j6	115	9	19k6	40	A6x6x30	3	110	122	265	265
BS141	130j6	165	11	24k6	50	A8x7x32	3,5	140	152	235	235
BS142	130j6	165	11	24k6	50	A8x7x32	3,5	140	152	256	256
BS143	130j6	165	11	24k6	50	A8x7x32	3,5	140	152	300	300
BS144	130j6	165	11	24k6	50	A8x7x32	3,5	140	152	342	342
BS191	Please contact our sales department										
BS192	Please contact our sales department										

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