In-Position Technologies

XtraforsBS
AC Servomotors under RADIATION exposure

INFRANOR MAVILOR

Features

Compact Size

High Torque

High Speed

Low Inertia

Radiation Resistance: up to 10^6 gray

Power

Rated torque: 0.7 to 82 Nm

Sizes: 57 to 190 mm

Versions

Wide range of standard models

Customised Versions

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.

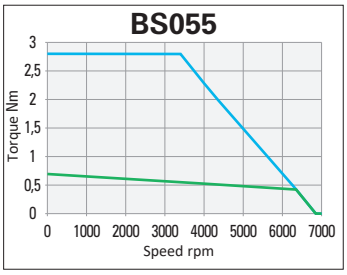
Xtrafors BS - Technical Data*

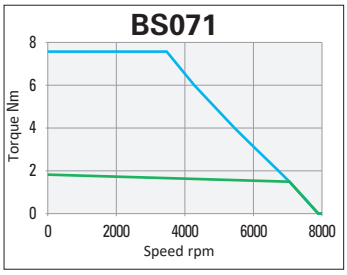
Winding 400 Vac (560 Vdc)	Units	BS055	BS071	BS072	BS073	BS074	BS111	BS112	BS113
Max Speed with no load	rpm	6.850	8.800	7.900	5.100	4.200	4.400	4100	4300
Nominal Speed	rpm	3.000	3.000	3.000	3.000	3.000	3.000	3.000	3.000
Stall Torque	Nm	0,7	0,8	1,9	2,7	3,4	2,9	5	8,4
Nominal Torque	Nm	0,54	0,69	1,76	2,41	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

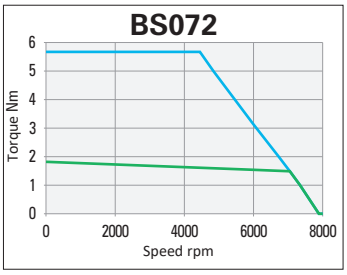
* All Characteristics measured at 25°C ambient temperature with the aluminum heat sink plate specified

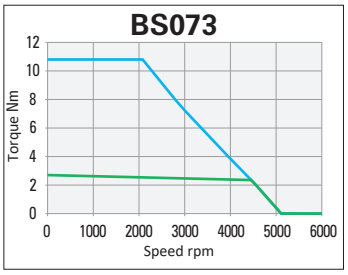
Winding 400 Vac (560 Vdc) - Torque vs. Speed curves

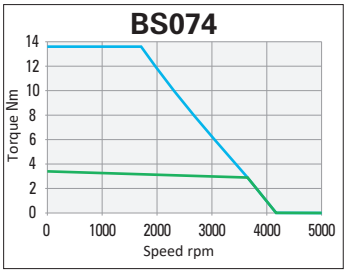
Permanent Torque Intermittent Torque

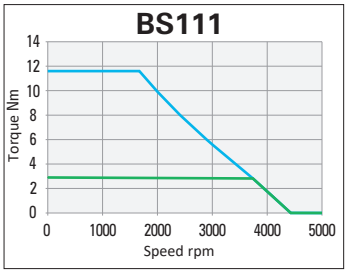


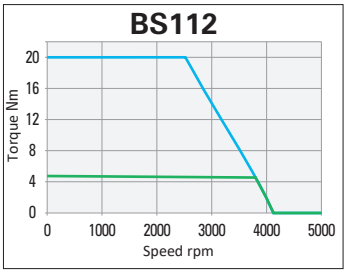


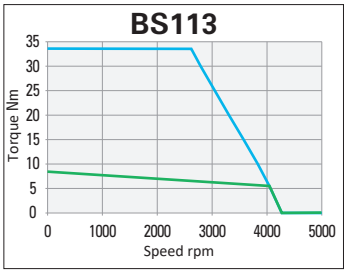












Radiation resistance levels: 10^6 grays

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.

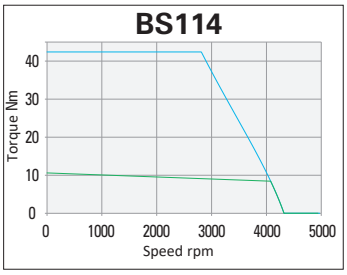
BS - Technical Data*

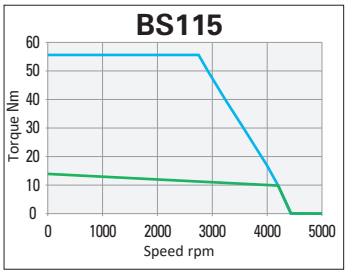
Winding 400 Vac (560 Vdc)	Units	BS114	BS115	BS141	BS142	BS143	BS144	BS191	BS192
Max Speed with no load	rpm	4.300	4.400	3.200	3.100	2.400	1.800	2.800	2.600
Nominal Speed	rpm	3.000	3.000	1.500	1.500	1.500	1.500	2.400	1.500
Stall Torque	Nm	10,6	13,9	13,6	17,4	26,8	33	56	82
Nominal Torque	Nm	9,1	11,2	12	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

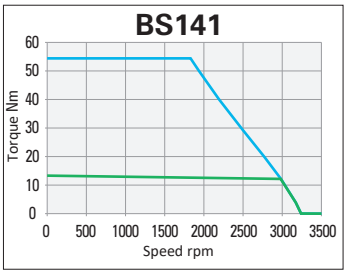
* All Characteristics measured at 25°C ambient temperature with the aluminum heat sink plate specified

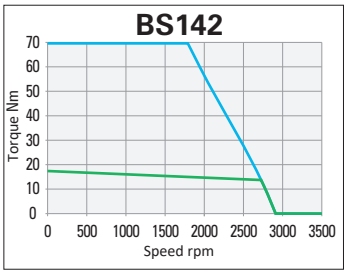
Winding 400Vac (560Vdc) - Torque vs. Speed curves

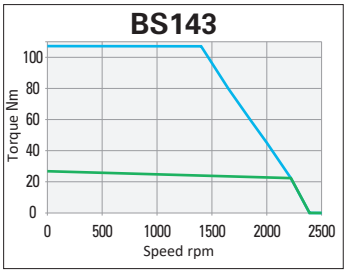
Permanent Torque Intermittent Torque

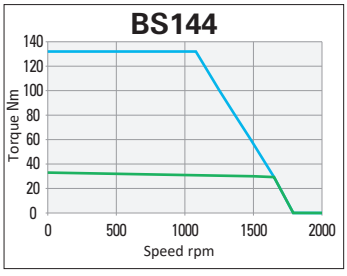


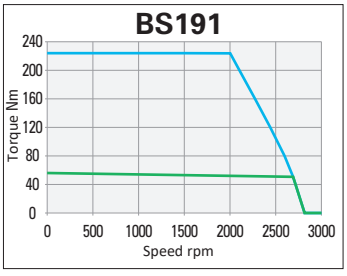


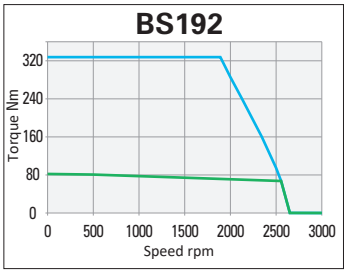












Standard Version

Feedback : resolver

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

Options