

Catalog

ABB servo motors
MS series
for ABB high performance machinery drives

Power and productivity
for a better world™





ABB servo motors MS series for ABB high performance machinery drives

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The MS series servo motor and the ABB high performance machinery drive ACSM1 provide a compact and powerful package for machine building and other applications requiring high precision.

The MS series servo motors are robust and are designed for operation in harsh environmental conditions. The resolver feedback is highly reliable, even under demanding mechanical stress levels and in high ambient temperatures. The series comprises four frame sizes, each available in various lengths, totaling ten variants. Ready-made power and feedback cables are also available. The motors are delivered from stock, guaranteeing quick and reliable delivery.

ABB high performance machinery drives

ABB high performance machinery drives provide speed, torque and motion control for demanding machines. The drives can control induction, synchronous and asynchronous servo and high torque motors with various feedback devices. The compact hardware and programming flexibility ensure the optimum solution. The innovative memory unit concept enables flexible drive configuration.

Feature	Advantage	Benefit
MS series AC synchronous servo motors		
Compact and low weight	Considerably more compact design than conventional servo motors	Enables space savings within a given design
Rotor's high performance magnetic material	Powerful and responsive motors with dynamic performance	Enables machinery with higher production output and improved product quality
Brushless resolver as feedback sensor	Highly reliable motors with maintenance-free operation	Low maintenance cost and reduced machine downtime
Shaft with keyway - motor delivered with half and full key	Universal solution suitable for most applications	Flexible assembly
DriveSize sizing tool	Simple selection of optimal motor and drive combination	Optimally dimensioned and cost-effective combination of motor and drive
Ready-made power and feedback cables with connectors	All-included delivery	Easy cabling and reliable operation
Stocked item	Fast delivery	Better logistics flow

Technical specifications



MS series technical details

MS Series Servo Motor AC 400 V										
Flange size [mm]	95		115			142		190		
Motor type	MS4612	MS4614	MS4813	MS4815	MS4817	MS4836	MS4839	MS4884	MS4887	MS4889
T_{rat}, T_{cs} [Nm] ¹⁾	1.1	2.0	3.3	4.8	6.8	10.5	15.5	19.1	28.6	35.8
T_{pk} [Nm] ²⁾	3.82	7.16	9.9	14.3	20.4	31.5	47.7	47.7	71.5	89.5
n_{rat} [r/min] ³⁾	3000	3000	3000	3000	3000	3000	3000	2000	2000	2000
n_{max} [r/min] ⁴⁾	5000	5000	4500	4500	4500	4500	4500	3000	3000	3000
P [kW] ⁵⁾	0.345	0.628	1.0	1.5	2.0	3.3	4.9	4.0	6.0	7.5
I_{cs} [A] ⁶⁾	2.3	2.2	3.0	4.3	6.1	9.1	13.9	11.2	17.7	20.3
I_{rat} [A] ⁷⁾	2.5	2.3	3.4	4.7	6.5	9.5	14.4	11.7	18.1	20.9
I_{pk} [A] ⁸⁾	8.3	8.0	9.3	13.3	18.7	27.8	43.3	28.6	44.8	51.3
k_T [Nm/A $\pm 10\%$] ⁹⁾	0.47	0.91	1.11	1.12	1.12	1.15	1.121	1.69	1.612	1.76
f_{rat} [Hz] ¹⁰⁾	200	200	200	200	200	200	200	133.3	133.3	133.3
Back EMF at n_{rat} [V] ¹¹⁾	85.4	164.9	202.3	202.6	203.2	208.7	203.5	204.8	195.1	212.9
J_M [kgm ² x 10 ⁻⁴] ¹²⁾	0.61	1.08	2.59	3.60	4.70	11.60	17.20	29.50	43.30	57.00
J_M with brake [kgm ² x 10 ⁻⁴] ¹³⁾	0.77	1.24	2.77	3.77	4.87	11.70	17.20	29.98	44.00	57.70
W [kg] ¹⁴⁾	1.6/2	2.5/3.1	4.7/6.2	5.7/7.2	6.7/8.2	8/10.7	11.2/13.9	15/22	17/24	21/28
Max. shaft load [N] - Radial ¹⁵⁾	196.0	343.0	490.0	490.0	490.0	490.0	490.0	784.0	784.0	784.0
Max. shaft load [N] - Thrust ¹⁶⁾	68.6	98.0	98.0	98.0	98.0	98.0	98.0	392.0	392.0	39.02

- 1) Rated and continuous stall torque
 2) Intermittent peak torque
 3) Rated speed
 4) Maximum speed
 5) Rated power
 6) Continuous stall current
 7) Rated current
 8) Intermittent peak current

- 9) Torque constant
 10) Rated frequency
 11) Back EMF (Electro Magnetic Force)
 12) Moment of inertia
 13) Moment of inertia with holding brake
 14) Motor weight without / with holding brake
 15) Maximum shaft load - Radial
 16) Maximum shaft load - Thrust

All performance data is measured at 40 °C with aluminum heat sink sized:

- 305 x 305 x 12 mm for MS4612 and MS4614
- 450 x 450 x 25 mm for MS4813, MS4815 and MS4817
- 450 x 450 x 25 mm for MS4836 and MS4839
- 600 x 600 x 25 mm for MS4884, MS4887 and MS4889

General specifications

MS series AC synchronous servo motors	
Mounting	IM B5, V1, V3
Cooling	Self cooling IC 0041
Motor pole pairs	4
Operating temperature range	0...+40 °C
Storage temperature range	-10...+85 °C
Operating humidity range	85% max. w/o condensation
Insulation class	F, resistance 100 MΩ min at DC 500V
Thermal protection	PTC thermistor in stator winding ¹⁾
Compliance	CE, UL recognized
Degree of protection	IP 65, except for shaft entry part

¹⁾ MS4612 and 4614 without thermistor

Optional holding brake specification

Motor Type	Rated voltage [VDC]	Input power [W]	Input current [A]	Static torque [Min Nm]	Armature release time [Max ms]	Armature pull-in time [Max ms]
MS4612	24	8.0	0.33	1.27	30	60
MS4614	24	8.0	0.33	2.39	30	60
MS4813, MS4815, MS4817	24	17.9	0.75	9.3	20	90
MS4836, MS4839	24	30.0	1.25	13.5	20	90
MS4884	24	34.7	1.45	32	50	170
MS4887, MS4889	24	25.0	1.05	50	140	110

* The brake will engage, when its supply power is off

* Brakes are intended only for holding static rotor position, not for emergency stop or dynamic braking

Ordering information



Motor without brake

Motor type code	Product ordering code
MS4612N4008E43F10	68846781
MS4614N4008E43F10	68847133
MS4813N4008E43C10	68847141
MS4815N4008E43C10	68847150
MS4817N4008E43C10	68847168
MS4836N4008E43C10	68847184
MS4839N4008E43C10	68847192
MS4884N4008E42C10	68847206
MS4887N4008E42C10	68847214
MS4889N4008E42C10	68847222

Motor with brake

Motor type code	Product ordering code
MS4612N9008E43F10	68847257
MS4614N9008E43F10	68847265
MS4813N9008E43C10	68847273
MS4815N9008E43C10	68847290
MS4817N9008E43C10	68847303
MS4836N9008E43C10	68847320
MS4839N9008E43C10	68847338
MS4884N9008E42C10	68847346
MS4887N9008E42C10	68847354
MS4889N9008E42C10	68847371

MS series type code

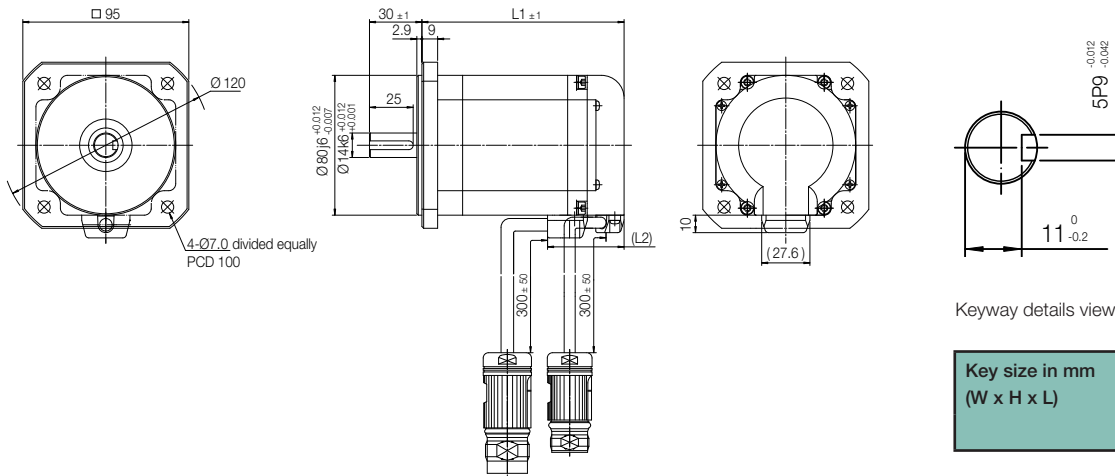
MS	XXXX	N	X	0	08	E4	X	X	10
(1)	(2)	-	(3)	(4)	(5)	-	(6)	(7)	-

Selection	Alternatives	Note
(1) Product series	MS	MS series servo motors
(2) Motor size	461X 481X 483X 488X	Four flange sizes, each having motors with different lengths and torque characteristics (see technical specification details)
(3) Holding brake	4 9	Motor without holding brake Motor equipped with holding brake
(4) Feedback device (not selectable, only for information)	0	Resolver
(5) Output shaft (not selectable, only for information)	08	Shaft with keyway, without oil seal
(6) Nominal speed (not selectable, only for information)	1 2 3	1500 rpm 2000 rpm 3000 rpm
(7) Cable connector type (not selectable, only for information)	F C	Connectors in 300 mm flying leads Connectors in motor frame

Dimensions



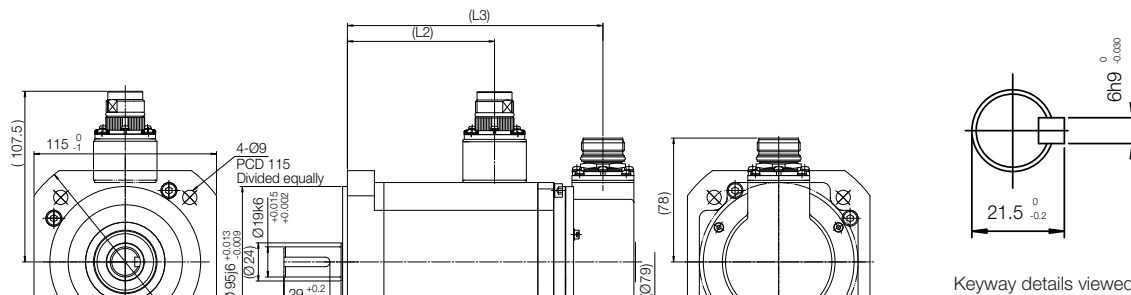
MS 4612/4614



Key size in mm (W x H x L)	Full	5 x 5 x 25
	Half	5 x 2.5 x 25

Motor size	MS4612		MS4614	
	Motor with brake	No	Yes	No
L1 Motor length [mm]	90.1	121.1	115.7	152.3
L2 Cable entry position [mm]	39.2	70.2	43.8	80.4

MS 4813/4815/4817



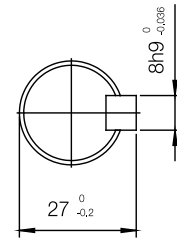
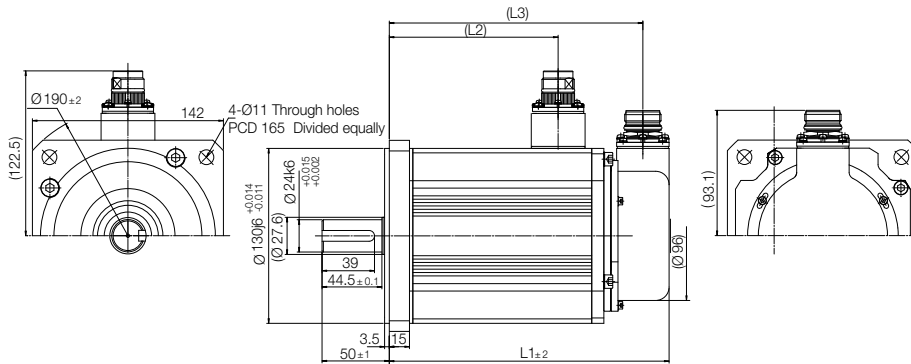
Key size in mm (W x H x L)	Full	6 x 6 x 25
	Half	6 x 3 x 25

Motor size	MS4813		MS4815		MS4817	
	Motor with brake	No	Yes	No	Yes	No
L1 Motor length [mm]	162	194	180	212	198	230
L2 Power connector position [mm]	74.7	103.7	92.7	121.7	110.7	139.7
L3 Feedback connector position [mm]	143	171	161	189	179	207

Dimensions



MS 4836/4839

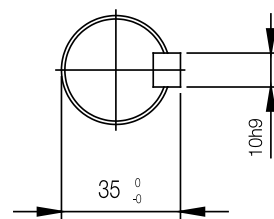
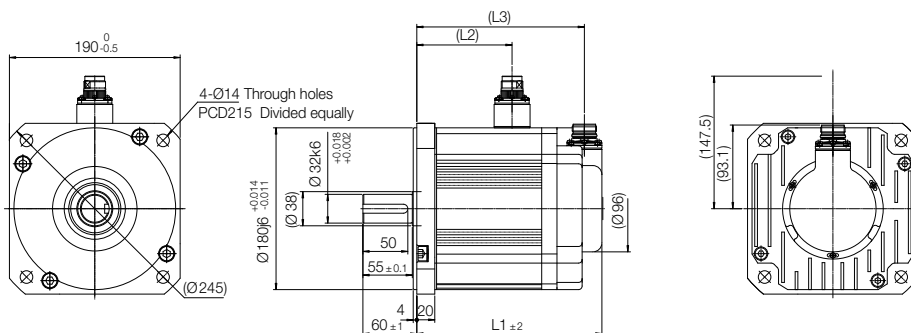


Keyway details viewed from shaft end

Key size in mm (W x H x L)	Full	8 x 7 x 35
	Half	8 x 3 x 35

Motor size	MS4836		MS4839	
	Motor with brake	No	Yes	No
L1 Motor length [mm]	175.5	213.5	208	246
L2 Power connector position [mm]	93	127	125.5	159.5
L3 Feedback connector position [mm]	156	194	188.5	226.5

MS 4884/4887/4889



Keyway details viewed from shaft end

Key size in mm (W x H x L)	Full	10 x 8 x 45
	Half	10 x 4 x 45

Motor size	MS4884		MS4887		MS4889	
	Motor with brake	No	Yes	No	Yes	No
L1 Motor length [mm]	182	231	206	252	230	276
L2 Power connector position [mm]	82	84	106	128	130	152
L3 Feedback connector position [mm]	162.5	211.5	186.5	232.5	210.5	256.5

Combined motor and drive performance



Combined motor and drive performance Highlights of ACSM1

The table below shows which ACSM1 drives match which MS series servo motor. The combined motor and drive performance helps to identify the best combination for your application.

- For demanding machinery applications
- For synchronous and induction motors
- Wide range of feedback interfaces
- Memory unit for easy drive management
- Safe torque off

Motor type	$T_{rat}^{1)}$ [Nm]	$T_{pk}^{2)}$ [Nm]	$I_{rat}^{3)}$ [A]	$I_{pk}^{4)}$ [A]	Drive type	$I_{2cont8k}^{6)}$ cyclic load	$I_{2max}^{7)}$ [A]	Combined $T_{rat}^{8)}$ [Nm]	Combined $T_{pk}^{9)}$ [Nm]
MS4612	1.1	3.82	2.5	8.3	ACSM1-04Ax ⁵⁾ -02A5-4	1.9	5.3	0.8	2.4
					ACSM1-04Ax ⁵⁾ -03A0-4	2.3	6.3	1.0	2.9
					ACSM1-04Ax ⁵⁾ -04A0-4	3.0	8.4	1.1	3.8
MS4614	2	7.16	2.3	8	ACSM1-04Ax ⁵⁾ -02A5-4	1.9	5.3	1.6	4.7
					ACSM1-04Ax ⁵⁾ -03A0-4	2.3	6.3	2.0	5.6
					ACSM1-04Ax ⁵⁾ -04A0-4	3.0	8.4	2.0	7.2
MS4813	3.3	9.9	3.4	9.3	ACSM1-04Ax ⁵⁾ -03A0-4	2.3	6.3	2.2	6.7
					ACSM1-04Ax ⁵⁾ -04A0-4	3.0	8.4	2.9	8.9
					ACSM1-04Ax ⁵⁾ -05A0-4	3.8	10.5	3.3	9.9
MS4815	4.8	14.3	4.7	13.3	ACSM1-04Ax ⁵⁾ -05A0-4	3.8	10.5	3.8	11.3
					ACSM1-04Ax ⁵⁾ -07A0-4	4.1	14.7	4.2	14.3
					ACSM1-04Ax ⁵⁾ -09A5-4	7.1	16.6	4.8	14.3
MS4817	6.8	20.4	6.5	18.7	ACSM1-04Ax ⁵⁾ -07A0-4	4.1	14.7	4.3	16.0
					ACSM1-04Ax ⁵⁾ -09A5-4	7.1	16.6	6.8	18.1
					ACSM1-04Ax ⁵⁾ -012A-4	9.0	21.0	6.8	20.4
MS4836	10.5	31.5	9.5	27.8	ACSM1-04Ax ⁵⁾ -09A5-4	7.1	16.6	7.9	18.8
					ACSM1-04Ax ⁵⁾ -012A-4	9.0	21.0	9.9	23.8
					ACSM1-04Ax ⁵⁾ -016A-4	9.8	28.0	10.5	31.5
MS4839	15.5	47.7	14.8	43.3	ACSM1-04Ax ⁵⁾ -024A-4	18.0	42.0	15.5	46.3
					ACSM1-04Ax ⁵⁾ -031A-4	23.3	54.0	15.5	47.7
MS4884	19.1	47.7	11.7	28.6	ACSM1-04Ax ⁵⁾ -012A-4	9.0	21.0	14.7	35.0
					ACSM1-04Ax ⁵⁾ -016A-4	9.8	28.0	15.9	46.7
					ACSM1-04Ax ⁵⁾ -024A-4	18.0	42.0	19.1	47.7
MS4887	28.6	71.5	18.1	44.8	ACSM1-04Ax ⁵⁾ -024A-4	18.0	42.0	28.4	67.0
					ACSM1-04Ax ⁵⁾ -031A-4	23.3	54.0	28.6	71.5
MS4889	35.8	89.5	20.9	51.3	ACSM1-04Ax ⁵⁾ -024A-4	18.0	42.0	30.8	73.3
					ACSM1-04Ax ⁵⁾ -031A-4	23.3	54.0	35.8	89.5

- | | |
|--|---|
| 1) Rated torque of the motor | 6) Continuous output current of ACSM1 at a switching frequency of 8 kHz at 40 °C (104 °F) |
| 2) Intermittent peak torque of the motor | 7) Maximum short time output current of ACSM1 |
| 3) Rated current of motor | 8) Combined rated torque |
| 4) Intermittent peak current of the motor | 9) Combined intermittent peak torque |
| 5) Control type (torque, speed, motion) of the drive | |

Note! Combined motor and drive performance in the table is at 8 kHz switching frequency with cyclic loads. The combined values are subject to ACSM1 supply voltage, ambient temperature and installation altitude de-ratings.



Ready-made motor cables with ACSM1

Cable properties

- Polyurethane (PUR) outer sheath with good flexibility and low adhesion
- Flame retardant and halogen-free
- Resistant to abrasion and oil
- Conformity to the UL and DESINA[®] -standards
- Motor power cables include brake control leads

Motor power cable

Product code	Conductor diameter [mm ²]	Cable diameter [mm]	Lenght [m]	Cable	Cable ratings ¹⁾ [A]
68822742	1.5	11.5	5	(4x1,5+(2x1,0))	16
68823285	1.5	11.5	10	(4x1,5+(2x1,0))	16
68823307	1.5	11.5	15	(4x1,5+(2x1,0))	16
68823323	1.5	11.5	20	(4x1,5+(2x1,0))	16
68823331	1.5	11.5	25	(4x1,5+(2x1,0))	16
68867029	2.5	12.0	5	(4x2,5+(2x1,0))	22
68867037	2.5	12.0	10	(4x2,5+(2x1,0))	22
68867053	2.5	12.0	15	(4x2,5+(2x1,0))	22
68867061	2.5	12.0	20	(4x2,5+(2x1,0))	22
68867070	2.5	12.0	25	(4x2,5+(2x1,0))	22
68867088	4.0	14.0	5	(4x4,0+(2x1,0))	30
68867096	4.0	14.0	10	(4x4,0+(2x1,0))	30
68867100	4.0	14.0	15	(4x4,0+(2x1,0))	30
68867118	4.0	14.0	20	(4x4,0+(2x1,0))	30
68867126	4.0	14.0	25	(4x4,0+(2x1,0))	30

¹⁾ The cable current ratings are for reference only and subject to local regulations and method of installation.

Resolver feedback cable

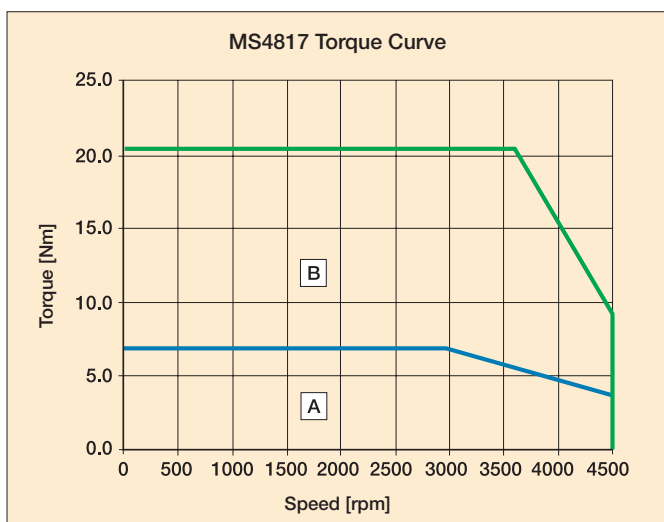
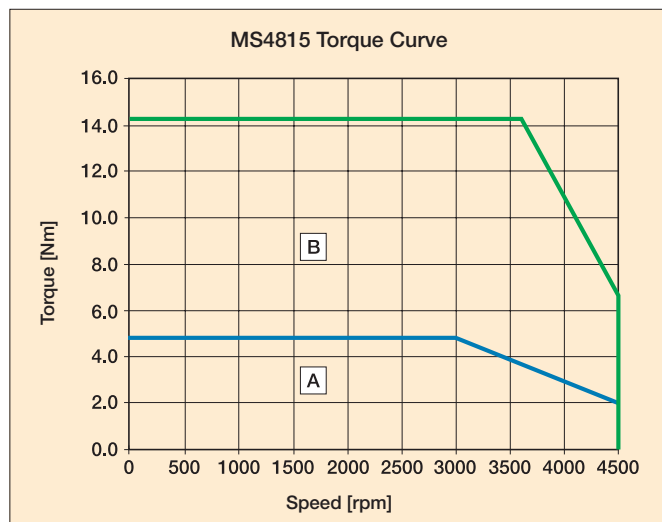
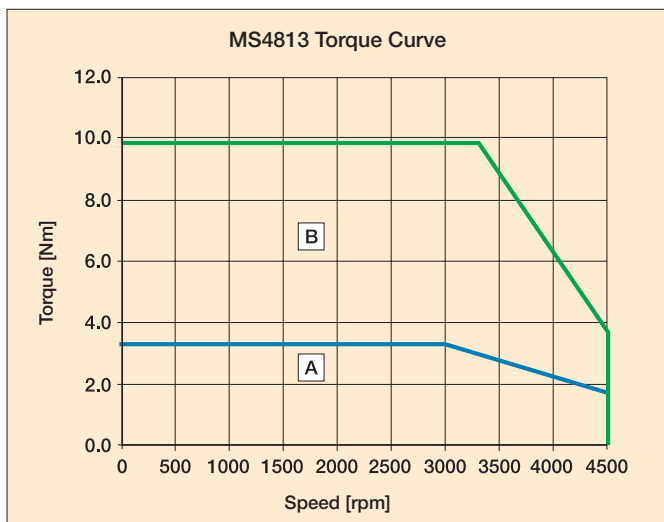
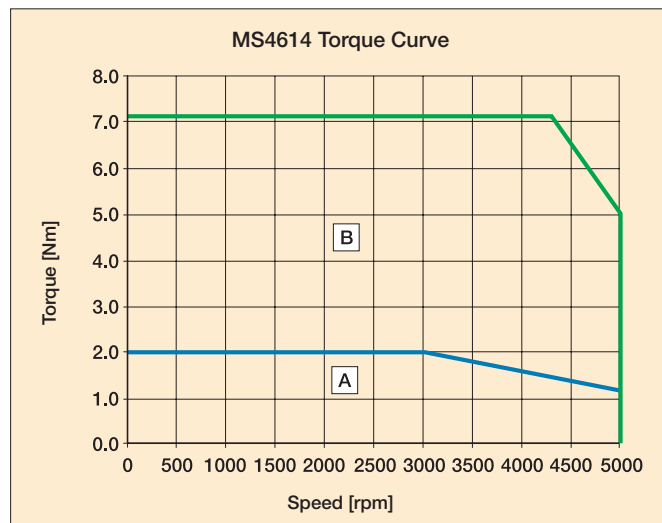
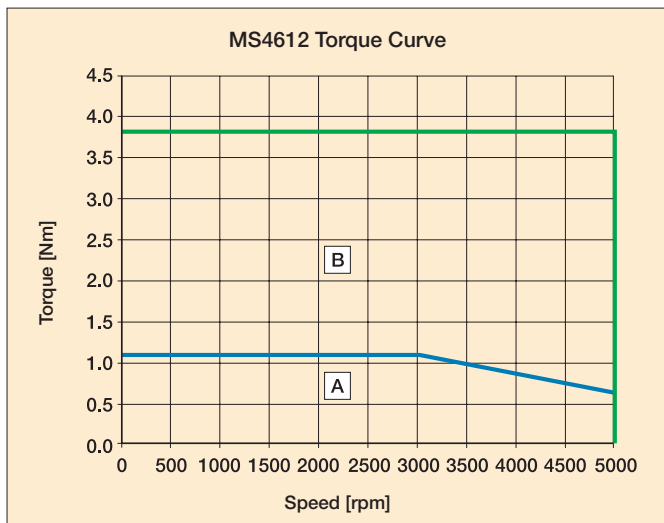
Product code	Lenght [m]	Cable diameter [mm]	Cable
68861721	5	8.5	(3x(2x0,14)+(2x0,14))
68861730	10	8.5	(3x(2x0,14)+(2x0,14))
68861748	15	8.5	(3x(2x0,14)+(2x0,14))
68861756	20	8.5	(3x(2x0,14)+(2x0,14))
68861764	25	8.5	(3x(2x0,14)+(2x0,14))

Electrical properties	
Working voltage	1000 V
Power cables	300 V
Feedback cables	300 V
Insulation resistance min	20 MΩ x km at 20 °C

Mechanical properties	
Minimum bending radius	12 x cable diameter
Minimum endurance	5 million bending cycles
Maximum travelling speed	180 m/min
Maximum acceleration	10 m/s ²

Environmental properties	
Temperature range	-40 to +80 °C
Static applications	-40 to +80 °C
Dynamic applications	-30 to +80 °C
Flame resistance	According IEC 60332.1 and VDE 0472-804 test B and VW1 (UL 1581)
Oil resistance	According VDE 0472-803 test B
Halogen free	According VDE 0742-815 and IEC 754-1

Motor speed/torque curves



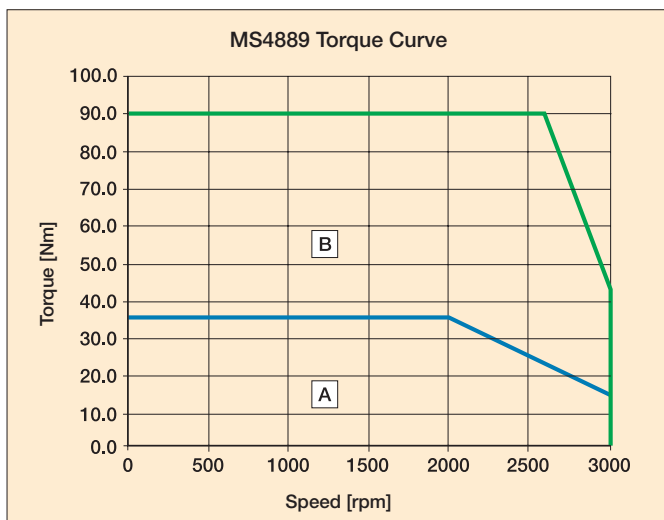
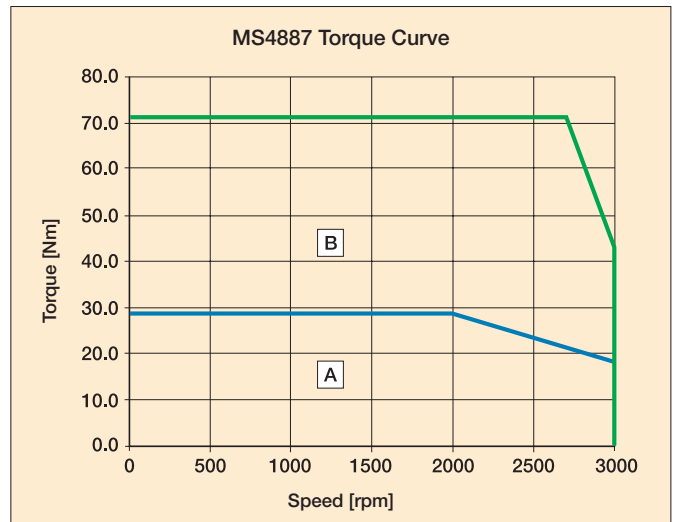
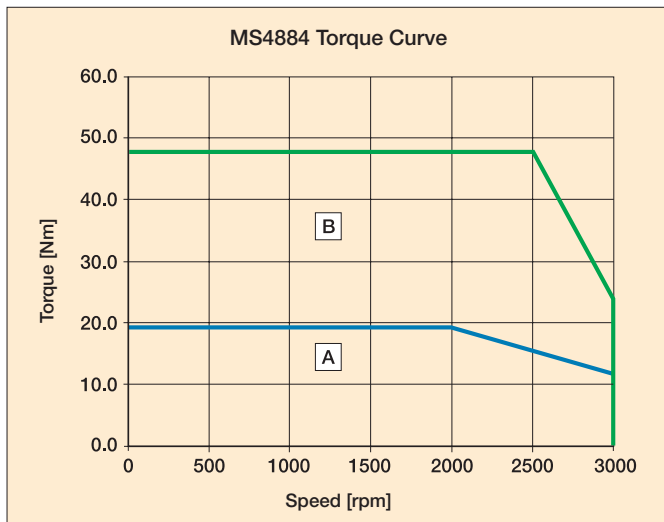
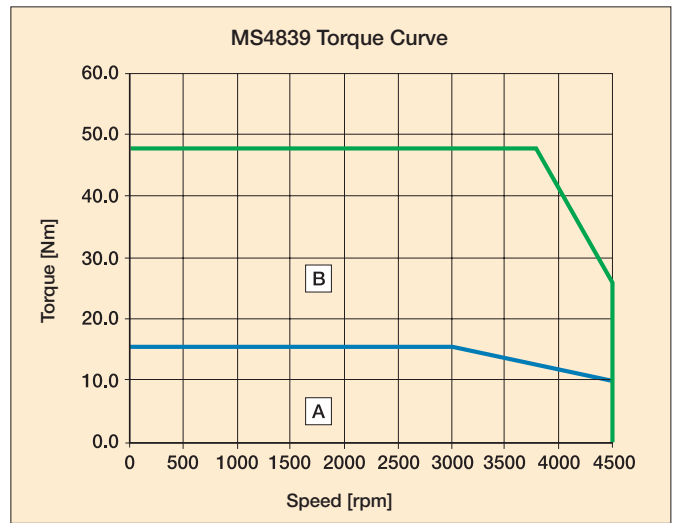
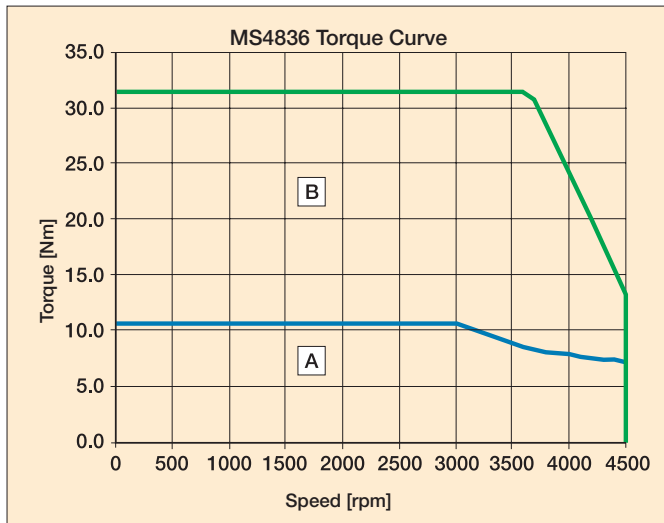
A Continuous operation zone

B Intermittent operation zone

Note! The characteristics are based on line-to-line voltage of 480 V DC (rectified from 400 V AC)

Note! All performance data is measured at 40 °C with aluminum heat sink sized:
 - 305 x 305 x 12 mm for MS4612 and MS4614
 - 450 x 450 x 25 mm for MS4813, MS4815 and MS4817

Motor speed/torque curves



A Continuous operation zone

B Intermittent operation zone

Note! The characteristics are based on line-to-line voltage of 480 V DC (rectified from 400 V AC)

Note! All performance data is measured at 40 °C with aluminum heat sink sized:
 - 450 x 450 x 25 mm for MS4836 and MS4839
 - 600 x 600 x 25 mm for MS4884, MS4887 and MS4889

Contact and web information

www.abb.com/drives



ABB's worldwide presence is built on strong local companies working together with the channel partner network. By combining the experience and know-how gained in local and global markets, we ensure that our customers in all industries can gain the full benefit from our products.

For further details about all our low voltage AC drives and services please contact your nearest ABB office or ABB drives channel partner or visit the websites www.abb.com/drives and www.abb.com/drivespartners.

Albania (Tirana)

Tel: +355 42 241 492
Fax: +355 42 234 368

Algeria

Tel: +213 21 553 860
Fax: +213 21 552 330

Argentina (Valentin Alsina)

Tel: +54 11 4229 5500
Fax: +54 11 4229 5784

Australia (Victoria - Notting Hill)

Tel: +1800 222 435
Tel: +61 3 8544 0000
e-mail: drives@au.abb.com

Austria (Vienna)

Tel: +43 1 60109 0
Fax: +43 1 60109 8312

Azerbaijan (Baku)

Tel: +994 12 404 5200
Fax: +994 12 404 5022

Bahrain (Manama)

Tel: +973 725 377
Fax: +973 725 332

Bangladesh (Dhaka)

Tel: +88 02 8856468
Fax: +88 02 8850906

Belarus (Minsk)

Tel: +375 228 12 40, 228 12 42
Fax: +375 228 12 43

Belgium (Zaventem)

Tel: +32 2 718 6320
Fax: +32 2 718 6664

Bolivia (La Paz)

Tel: +591 2 278 8181
Fax: +591 2 278 8184

Bosnia Herzegovina (Tuzla)

Tel: +387 35 246 020
Fax: +387 35 255 098

Brazil (Osasco)

Tel: 0800 014 9111
Tel: +55 11 3688 9282
Fax: +55 11 3688 9421

Bulgaria (Sofia)

Tel: +359 2 807 5500
Fax: +359 2 807 5599

Canada (Montreal)

Tel: +1 514 420 3100
Fax: +1 514 420 3138

Chile (Santiago)

Tel: +56 2 471 4391
Fax: +56 2 471 4399

China (Beijing)

Tel: +86 10 5821 7788
Fax: +86 10 5821 7618

Colombia (Bogotá)

Tel: +57 1 417 8000
Fax: +57 1 413 4086

Costa Rica (San Jose)

Tel: +506 288 5484
Fax: +506 288 5482

Croatia (Zagreb)

Tel: +385 1 600 8550
Fax: +385 1 619 5111

Czech Republic (Prague)

Tel: +420 234 322 327
e-mail: motors&drives@cz.abb.com

Denmark (Skovlunde)

Tel: +45 44 504 345
Fax: +45 44 504 365

Dominican Republic (Santo Domingo)

Tel: +809 562 9010
Fax: +809 562 9011

Ecuador (Quito)

Tel: +593 2 2500 645
Fax: +593 2 2500 650

Egypt (Cairo)

Tel: +202 2 6251630
e-mail: drives@eg.abb.com

El Salvador (San Salvador)

Tel: +503 2264 5471
Fax: +503 2264 2497

Estonia (Tallinn)

Tel: +372 6801 800
e-mail: info@ee.abb.com

Ethiopia (Addis Ababa)

Tel: +251 1 669506, 669507
Fax: +251 1 669511

Finland (Helsinki)

Tel: +358 10 22 11
Tel: +358 10 222 1999
Fax: +358 10 222 2913

France (Montluel)

Tel: +33 (0)4 37 40 40 00
Fax: +33 (0)4 37 40 40 72

Germany (Ladenburg)

Tel: +01805 222 580 (Service)
Tel: +49 (0)6203 717 717
Fax: +49 (0)6203 717 600

Greece (Athens)

Tel: +30 210 289 1 651
Fax: +30 210 289 1 792

Guatemala (Guatemala City)

Tel: +502 2 363 3814
Fax: +502 2 363 3624

Hungary (Budapest)

Tel: +36 1 443 2224
Fax: +36 1 443 2144

India (Bangalore)

Tel: +91 80 2294 9585
Fax: +91 80 2294 9389

Indonesia (Jakarta)

Tel: +62 21 2551 5555
e-mail: automation@id.abb.com

Iran (Tehran)

Tel: +98 21 2222 5120
Fax: +98 21 2222 5157

Ireland (Dublin)

Tel: +353 1 405 7300
Fax: +353 1 405 7307

Israel (Haifa)

Tel: +972 4 850 2111
Fax: +972 4 850 2112

Italy (Milan)

Tel: +39 02 2414 3085
Fax: +39 02 2414 3979

Ivory Coast (Abidjan)

Tel: +225 21 21 7575
Fax: +225 21 35 0414

Japan (Tokyo)

Tel: +81(0)3 5784 6010
Fax: +81(0)3 5784 6275

Jordan (Amman)

Tel: +962 6 562 0181
Fax: +962 6 5621369

Kazakhstan (Almaty)

Tel: +7 727 2583838
Fax: +7 727 2583839

Kenya (Nairobi)

Tel: +254 20 828811/13 to 20
Fax: +254 20 828812/21

Kuwait (Kuwait city)

Tel: +965 2428626 ext. 106
Fax: +965 2403139

Latvia (Riga)

Tel: +371 7 063 600
Fax: +371 7 063 601

Lithuania (Vilnius)

Tel: +370 5 273 8300
Fax: +370 5 273 8333

Luxembourg (Leudelange)

Tel: +352 493 116
Fax: +352 492 859

Macedonia (Skopje)

Tel: +389 23 118 010
Fax: +389 23 118 774

Malaysia (Kuala Lumpur)

Tel: +603 5628 4888
Fax: +603 5635 8200

Mauritius (Port-Louis)

Tel: +230 208 7644, 211 8624
Fax: +230 211 4077

Mexico (Mexico City)

Tel: +52 (55) 5328 1400 ext. 3008
Fax: +52 (55) 5328 7467

Morocco (Casablanca)

Tel: +212 52 234 5540
Fax: +212 52 234 2099

The Netherlands (Rotterdam)

Tel: +31 (0)10 407 8886
e-mail: frequconv@nl.abb.com

New Zealand (Auckland)

Tel: +64 9 356 2160
Fax: +64 9 357 0019

Nigeria (Ikeja, Lagos)

Tel: +234 1 4937 347
Fax: +234 1 4937 329

Norway (Oslo)

Tel: +47 03500
e-mail: motor@no.abb.com

Oman (Muscat)

Tel: +968 2456 7410
Fax: +968 2456 7406

Pakistan (Lahore)

Tel: +92 42 6315 882-85
Fax: +92 42 6368 565

Panama (Panama City)

Tel: +507 209 5400, 2095408
Fax: +507 209 5401

Peru (Lima)

Tel: +51 1 415 5100
Fax: +51 1 561 2902

The Philippines (Metro Manila)

Tel: +63 2 821 7777
Fax: +63 2 823 0309, 824 4637

Poland (Lodz)

Tel: +48 42 299 3000
Fax: +48 42 299 3340

Portugal (Oeiras)

Tel: +351 21 425 6000
Fax: +351 21 425 6390, 425 6354

Qatar (Doha)

Tel: +974 4253888
Fax: +974 4312630

Romania (Bucharest)

Tel: +40 21 310 4377
Fax: +40 21 310 4383

Russia (Moscow)

Tel: +7 495 960 22 00
Fax: +7 495 960 22 20

Saudi-Arabia (Al Khobar)

Tel: +966 (0)3 882 9394, ext. 240, 254, 247
Fax: +966 (0)3 882 4603

Senegal (Dakar)

Tel: +221 832 1242, 832 3466
Fax: +221 832 2057, 832 1239

Serbia (Belgrade)

Tel: +381 11 3094 320, 3094 300
Fax: +381 11 3094 343

Singapore (Singapore)

Tel: +65 6776 5711
Fax: +65 6778 0222

Slovakia (Banska Bystrica)

Tel: +421 48 410 2324
Fax: +421 48 410 2325

Slovenia (Ljubljana)

Tel: +386 1 2445 440
Fax: +386 1 2445 490

South Africa (Johannesburg)

Tel: +27 11 617 2000
Fax: +27 11 908 2061

South Korea (Seoul)

Tel: +82 2 528 2794
Fax: +82 2 528 2338

Spain (Barcelona)

Tel: +34 (9)3 728 8500
Fax: +34 (9)3 728 7659

Sri Lanka (Colombo)

Tel: +94 11 2399304/6
Fax: +94 11 2399303

Sweden (Västerås)

Tel: +46 (0)21 32 5000
Fax: +46 (0)21 14 8671

Switzerland (Zürich)

Tel: +41 (0)58 586 0000
Fax: +41 (0)58 586 0603

Syrian Arab Republic

Tel: +963 11 212 7018 / 9551
Fax: +963 11 212 8614

Taiwan (Taipei)

Tel: +886 2 2577 6090
Fax: +886 2 2577 9467, 2577 9434

Tanzania (Dar es Salaam)

Tel: +255 51 2136750, 2136751, 2136752
Fax: +255 51 2136749

Thailand (Bangkok)

Tel: +66 (0)2665 1000
Fax: +66 (0)2665 1042

Tunisia (Tunis)

Tel: +216 71 860 366
Fax: +216 71 860 255

Turkey (Istanbul)

Tel: +90 216 528 2200
Fax: +90 216 365 2944

Uganda (Nakasero, Kampala)

Tel: +256 41 348 800
Fax: +256 41 348 799

Ukraine (Kiev)

Tel: +380 44 495 22 11
Fax: +380 44 495 22 10

The United Arab Emirates (Dubai)

Tel: +971 4 3147500, 3401777
Fax: +971 4 3401771, 3401539

United Kingdom (Daresbury, Warrington)

Tel: +44 1925 741 111
Fax: +44 1925 741 693

Uruguay (Montevideo)

Tel: +598 2 707 7300
Tel: +598 2 707 7466

USA (New Berlin)

Tel: +1 800 752 0696
Tel: +1 262 785 3200
Fax: +1 262 785 0397

Venezuela (Caracas)

Tel: +58 212 2031949
Fax: +58 212 237 6270

Vietnam (Hochiminh)

Tel: +84 8 8237 972
Fax: +84 8 8237 970

Zimbabwe (Harare)

Tel: +263 4 369 070
Fax: +263 4 369 084

Contact us



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