



ABB servo motors  
9C series  
for ABB high performance machinery drives  
Catalog

Power and productivity  
for a better world™





## **ABB servo motors 9C series for ABB high performance machinery drives**

ABB servo motors .....	3
Technical specifications .....	4
Ordering information .....	6
Dimensions.....	8
Combined motor and drive performance .....	10
Cables.....	12
Motor speed/torque curves .....	13
Contact and web information.....	15



The 9C 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 9C series of ABB servo motors is ideal for operation with the ABB high performance machinery drives. The motors are manufactured using the most advanced technology:

- Concentrated windings
- Encapsulation of windings with epoxy resin under vacuum
- Motors' yoke is made of Soft Magnetic Composite (SMC) material
- Modular structure
- Smart solution on connections
- Low cogging torque

## ABB high performance machinery drives

ABB high performance machinery drives provide speed, torque and motion control for demanding applications. They can control induction, synchronous and asynchronous servo and high torque motors with a variety of feedback devices. The compact hardware and various control arrangements ensure optimum solutions for many different needs.

Feature	Advantage	Benefit
<b>9C series AC synchronous servo motors</b>		
<b>Concentrated windings</b>	Low energy consumption Extremely compact	Reduced running costs Space savings, easy to fit in restricted spaces
<b>Encapsulation of windings with epoxy resin under vacuum</b>	Motor winding partial discharge free up to 3 kV Uniform temperature on the motor windings	High product reliability
<b>Motors' yoke made of Soft Magnetic Composite (SMC) material</b>	Mechanical and electrical characteristics are better than standard laminated steel	Lower iron losses and higher nominal speed at high frequencies without losing performance
<b>Modular structure</b>	More variants with standard components	Short delivery time
<b>Flexible connection methods</b>	Connectors easy to turn back to front Easy-to-use plug-in connectors or cost-effective internal connections	Maximum connection flexibility Time savings Cost savings
<b>High stall and rated torque</b>	Excellent torque/dimensions ratio	Efficient space usage
<b>Very low rotor inertia</b>	High dynamic performance	High acceleration in very heavy duty cycle
<b>Most common feedback devices available</b>	Resolver Optical multiturn SinCos encoder, Endat 2.1	Cost-effective and very reliable solution in harsh environmental conditions Very high performance
<b>Optional integrated holding brake with high dynamic characteristics</b>	Permanent magnet brake Spring holding brake	Holding brake without any backlash Suitable for dynamic emergency braking
<b>Shaft with keyway - delivery contains half and full key</b>	Full key for belt and pulley transmission or half key for friction coupling transmission	Wide flexibility, one motor for two different applications
<b>Ready-made power and feedback cables</b>	Complete package solution	Guaranteed quality of final installation
<b>Motors delivered from centralized stock</b>	Well organized logistics	Motors available on customer site in a few days

# Technical specifications



## 9C series technical details

Type	Continuous torque at zero speed <sup>5)</sup> $T_{cs}$ [Nm]	Current at continuous torque <sup>1) 3) 5)</sup> $I_{cs}$ [A]	Rated torque <sup>5)</sup> $T_{rat}$ [Nm]	Rated current <sup>1) 3) 5)</sup> $I_{rat}$ [A]	Rated speed $n_{rat}$ [r/min]	Rated frequency $f_{rat}$ [Hz]	Mechanical rated power <sup>5)</sup> $P_{rat}$ [kW]	Peak torque $T_{pk}$ [Nm]	Current at peak torque <sup>1) 3)</sup> $I_{pk}$ [A]	Torque constant <sup>1) 2) 3)</sup> $k_T$ [Nm/A]	B.e.m.f. between phases at rated speed <sup>1) 2) 3)</sup> V [V]	Moment of inertia of rotor <sup>3)</sup> $J_M$ [kgcm <sup>2</sup> ]	Moment of inertia of rotor + brake <sup>3)</sup> $J_M$ with brake [kgcm <sup>2</sup> ]	Weight <sup>3) 4)</sup> W [kg]
9C1.1.30.. ..M	1.4	1.3	1.3	1.4	3000	250.0	0.41	4.1	4.5	1.147	208	0.57	0.62	3.0
9C1.2.30.. ..M	2.3	1.8	2	1.7	3000	250.0	0.63	6.9	6.1	1.440	261	1.04	1.09	4.0
9C1.3.30.. ..M	3.2	2.7	2.8	2.5	3000	250.0	0.88	9.6	9.0	1.350	245	1.51	1.56	5.0
9C1.4.30.. ..M	4.2	3.3	3.5	2.9	3000	250.0	1.10	12.6	11.1	1.440	261	1.99	2.04	6.0
9C1.1.60.. ..M	1.4	2.1	1.2	2.0	6000	500.0	0.75	4.1	7.1	0.720	261	0.57	0.62	3.0
9C1.2.60.. ..M	2.3	3.6	1.6	2.7	6000	500.0	1.01	6.9	12.1	0.720	261	1.04	1.09	4.0
9C1.3.60.. ..M	3.2	5.2	2.3	3.9	6000	500.0	1.45	9.6	17.3	0.702	255	1.51	1.56	5.0
9C1.4.60.. ..M	4.2	6.5	2.5	4.1	6000	500.0	1.57	12.6	21.6	0.738	268	1.99	2.04	6.0
9C4.1.30.. ..M	4.3	3.0	3.9	2.8	3000	250.0	1.23	12.9	9.8	1.654	300	4.0	4.7	5.6
9C4.2.30.. ..M	7.5	5.0	6.1	4.3	3000	250.0	1.92	22.5	16.7	1.704	309	7.6	8.3	7.9
9C4.3.30.. ..M	9.4	6.0	6.9	4.6	3000	250.0	2.17	28.2	19.9	1.786	324	11.1	11.8	10.2
9C4.4.30.. ..M	12.0	8.2	7.5	5.4	3000	250.0	2.36	36.0	27.3	1.665	302	14.7	15.4	12.5
9C4.1.40.. ..M	4.3	4.0	3.7	3.6	4000	333.3	1.55	12.9	13.2	1.232	298	4.0	4.7	5.6
9C4.2.40.. ..M	7.5	6.9	5.4	5.2	4000	333.3	2.26	22.5	23.1	1.232	298	7.6	8.3	7.9
9C4.3.40.. ..M	9.4	7.8	5.8	5.1	4000	333.3	2.43	28.2	26.1	1.365	330	11.1	11.8	10.2
9C4.4.40.. ..M	12.0	10.0	6.3	5.5	4000	333.3	2.64	36.0	33.3	1.365	330	14.7	15.4	12.5
9C5.2.20.. ..M	12.3	6.1	10.3	5.3	2000	166.7	2.16	36.9	20.2	2.307	279.0	21.8	23.6	15.5
9C5.3.20.. ..M	18.4	9.2	14.8	7.8	2000	166.7	3.10	55.2	30.7	2.272	274.7	31.6	33.4	19.2
9C5.4.20.. ..M	23.5	11.9	17.1	9.1	2000	166.7	3.58	70.5	39.6	2.249	272.0	41.4	43.2	22.9
9C5.5.20.. ..M	26.0	12.0	20.0	9.8	2000	166.7	4.19	78.0	40.2	2.452	296.5	51.2	53.0	26.6
9C5.6.20.. ..M	30.0	13.1	22.0	10.1	2000	166.7	4.61	90.0	43.8	2.596	313.9	61.0	62.8	30.3
9C5.2.30.. ..M	12.3	9.2	9.0	7.1	3000	250.0	2.83	36.9	30.8	1.515	274.7	21.8	23.6	15.5
9C5.3.30.. ..M	18.4	12.4	12.4	8.8	3000	250.0	3.90	55.2	41.3	1.688	306.1	31.6	33.4	19.2
9C5.4.30.. ..M	23.5	15.4	14.0	9.7	3000	250.0	4.40	70.5	51.4	1.731	313.9	41.4	43.2	22.9
9C5.5.30.. ..M	26.0	17.1	17.0	11.8	3000	250.0	5.34	78.0	56.9	1.731	313.9	51.2	53.0	26.6
9C5.6.30.. ..M	30.0	19.7	18.0	12.4	3000	250.0	5.65	90.0	65.7	1.731	313.9	61.0	62.8	30.3

<sup>1)</sup> Voltage and current values shown in table are RMS values.

<sup>2)</sup> All parts of motor at 20 °C.

<sup>3)</sup> Tolerance ±10%.

<sup>4)</sup> Weight without a holding brake. Please refer to table on page 5 for additional weight of the brake option.

<sup>5)</sup> Duty type S1, ambient temperature 40 °C, mounted on steel flange (dim. 300 x 300 x 20 mm), altitude ≤ 1000 m above sea level.



## General specifications

9C series AC synchronous servo motors	
Mounting	IMB5, V1, V3
Cooling	IC-0041 (EN 60034-6)
Motor pole pairs	5
Operating temperature range	0 to 40 °C, up to 50 °C (derating of 1% per 1 °C must be applied above 40 °C)
Storage temperature range	-30 to 85 °C
Operating humidity range	85% max w/o condensation
Insulation class	F
Thermal protection	PTC
Compliance	CE, UL recognized
Degree of protection	Body: IP65 Shaft: IP54 standard, IP64 with oil seal
Motor feedback	Resolver, one pole pair, size 15. Optical SinCos encoder, 1 V <sub>pp</sub> , 512 signal periods/revolution, absolute multiturn position (Endat), 4096 revolutions. Inductive encoder, 1 V <sub>pp</sub> , 32 signal periods/revolution, absolute multiturn position (Endat), 4096 revolutions.

## Optional holding brake specification

Motor type	Rated voltage [VDC]	Input power [W]	Input current [A]	Braking torque [Nm]	Armature release time [ms]	Armature pull-in time [ms]	Inertia [kgcm <sup>2</sup> ]	Additional weight with brake [kg]
9C1	24	6.3	0.26	2.5	30	50	0.102	0.6
9C4	24	19.5	0.81	16	30	70	0.73	1.5
9C5	24	28.0	1.17	30	30	75	1.82	2.2

Note: Release and pull-in time values apply with ABB varistor 5248 122-256 wired into electrical circuit.

# Ordering information



## 9C series type code

9	C	x	x	x	x	0	x	x	0	0	0	x	1	M	0	0
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

Character	Explanation	Alternatives	Made-to-stock			Made-to-order			Notes	
			9C1	9C4	9C5	9C1	9C4	9C5		
1 - 2	Product series	9C	x	x	x	x	x	x		
3	Motor size	1	x			x				
		4		x			x			
		5			x			x		
4	Motor length	1	x	x		x	x			
		2		x	x	x	x	x		
		3	x		x	x	x	x		
		4		x		x	x	x		
		5							x	
		6				x			x	
5 - 6	Rated speed	20						x	2000 r/min	
		30	x	x	x	x	x	x	3000 r/min	
		40					x		4000 r/min	
		60				x			6000 r/min	
7	Flange	0	x			x			F100	
		0		x			x		F115	
		0			x			x	F165	
8 - 9	Feedback device	R0	x	x	x	x	x	x	Resolver size 15	
		E0	x	x	x	x	x	x	Optical encoder EQN1325, 1 V <sub>pp</sub> , 512 signal periods, absolute multiturn position	
		E1				x	x	x	Inductive encoder EQI1331, 1 V <sub>pp</sub> , 32 signal periods, absolute multiturn position	
10	Connector	0	x	x	x	x	x	x	Signal connector 17 pins and power connector 8 pins	
		2				x	x	x	Cable glands for signal and power connections	
11	Mechanical and vibration tolerances	0	x	x	x	x	x	x	Class "N" DIN 42955 - "N" DIN 45665	
12	Shaft details	0	x	x	x	x	x	x	Shaft with keyway - half key fitted, full key included in the shipment	
13	Brake	0	x	x	x	x	x	x	No brake	
		1	x	x	x	x	x	x	Spring holding brake	
14	Thermal switch	1	x	x	x	x	x	x	PTC type	
15	DC bus voltage	M	x	x	x	x	x	x	560 V (drive supply 400 V)	
16 - 17	Special execution	00	x	x	x	x	x	x	No special execution	

# Ordering information for stock items



## Resolver motor without brake

Motor type code	Product ordering code
9C1.1.30.0.R0.0.0.0.0.1.M.00	68881358
9C1.3.30.0.R0.0.0.0.0.1.M.00	68881366
9C4.1.30.0.R0.0.0.0.0.1.M.00	68881374
9C4.2.30.0.R0.0.0.0.0.1.M.00	68881382
9C4.4.30.0.R0.0.0.0.0.1.M.00	68959951
9C5.2.30.0.R0.0.0.0.0.1.M.00	68881412
9C5.3.30.0.R0.0.0.0.0.1.M.00	68881421
9C5.6.30.0.R0.0.0.0.0.1.M.00	68881439

## Resolver motor with brake

Motor type code	Product ordering code
9C1.1.30.0.R0.0.0.0.1.1.M.00	68881528
9C1.3.30.0.R0.0.0.0.1.1.M.00	68881544
9C4.1.30.0.R0.0.0.0.1.1.M.00	68881552
9C4.2.30.0.R0.0.0.0.1.1.M.00	68881561
9C4.4.30.0.R0.0.0.0.1.1.M.00	68959985
9C5.2.30.0.R0.0.0.0.1.1.M.00	68881587
9C5.3.30.0.R0.0.0.0.1.1.M.00	68881595
9C5.6.30.0.R0.0.0.0.1.1.M.00	68881609

## Absolute encoder motor without brake

Motor type code	Product ordering code
9C1.1.30.0.E0.0.0.0.0.1.M.00	68881447
9C1.3.30.0.E0.0.0.0.0.1.M.00	68881455
9C4.1.30.0.E0.0.0.0.0.1.M.00	68881463
9C4.2.30.0.E0.0.0.0.0.1.M.00	68881471
9C4.4.30.0.E0.0.0.0.0.1.M.00	68959969
9C5.2.30.0.E0.0.0.0.0.1.M.00	68881498
9C5.3.30.0.E0.0.0.0.0.1.M.00	68881501
9C5.6.30.0.E0.0.0.0.0.1.M.00	68881510

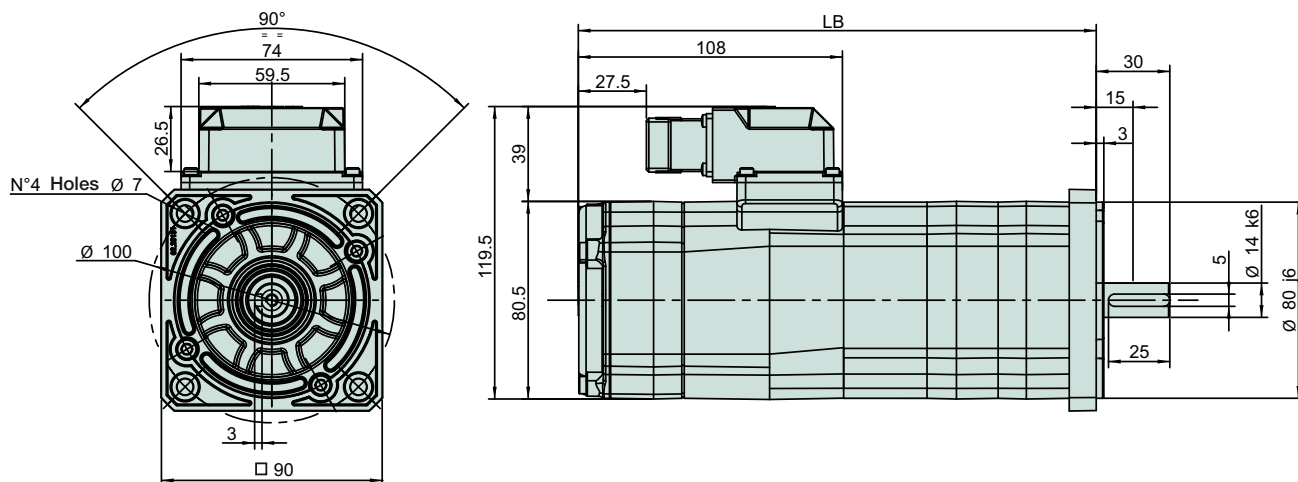
## Absolute encoder motor with brake

Motor type code	Product ordering code
9C1.1.30.0.E0.0.0.0.1.1.M.00	68881633
9C1.3.30.0.E0.0.0.0.1.1.M.00	68881650
9C4.1.30.0.E0.0.0.0.1.1.M.00	68881668
9C4.2.30.0.E0.0.0.0.1.1.M.00	68881676
9C4.4.30.0.E0.0.0.0.1.1.M.00	68959993
9C5.2.30.0.E0.0.0.0.1.1.M.00	68881692
9C5.3.30.0.E0.0.0.0.1.1.M.00	68881706
9C5.6.30.0.E0.0.0.0.1.1.M.00	68881714

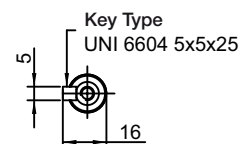
# Dimensions



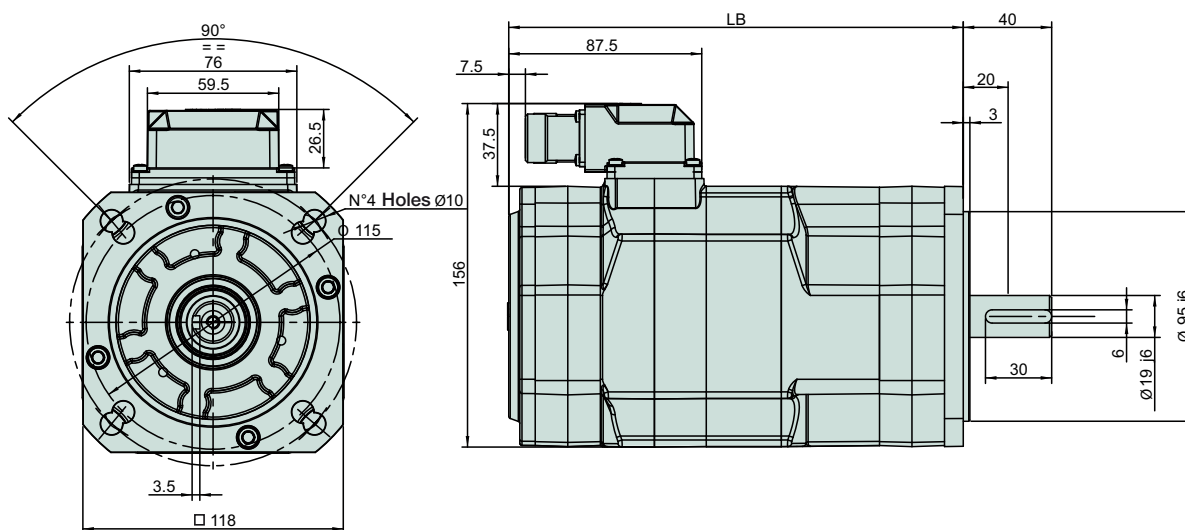
## 9C1



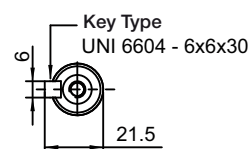
Motor Size	9C1.1	9C1.2	9C1.3	9C1.4
LB with resolver [mm]	152	186	220	254
LB with encoder [mm]	181	215	249	283
LB with brake [mm]	181	215	249	283
LB with brake + encoder [mm]	210	244	278	312



## 9C4



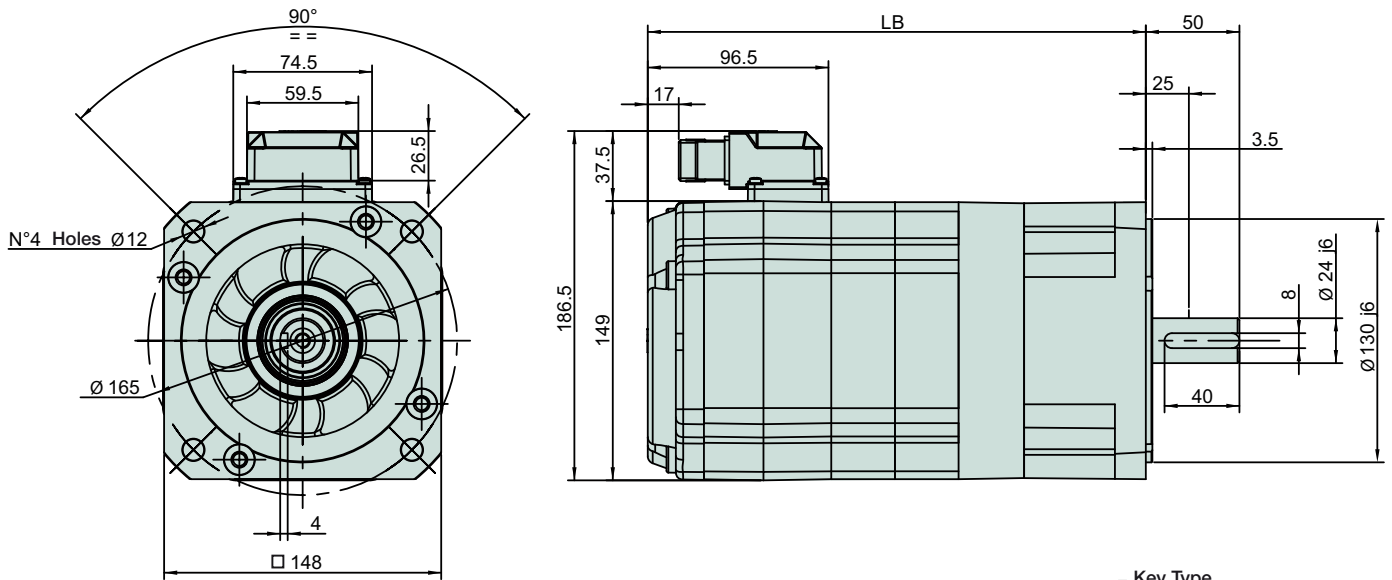
Motor Size	9C4.1	9C4.2	9C4.3	9C4.4
LB with resolver [mm]	147	181	215	249
LB with encoder [mm]	176.5	210.5	244.5	278.5
LB with brake [mm]	176.5	210.5	244.5	278.5
LB with brake + encoder [mm]	206	240	274	308



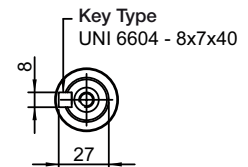
# Dimensions



## 9C5



Motor Size	9C5.2	9C5.3	9C5.4	9C5.5	9C5.6
LB [mm]	266	300	334	368	402
with resolver/encoder					
with/without brake					



# Combined motor and drive performance



## Combined motor and drive performance

The following two tables show which ACSM1 drives match which 9C series servo motor. The combined motor and drive performance helps to identify the best combination for your application. The first table lists the made-to-stock models, while the second table lists the made-to-order models of the 9C series of ABB servo motors.

## Highlights of ACSM1

- For demanding applications
- For synchronous and asynchronous motors
- Wide range of feedback interfaces
- Memory unit for easy drive management
- Safe torque-off function as standard

### Made-to-stock models

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]
9C1.1.30	1.3	4.1	1.4	4.6	ACSM1-04Ax <sup>(5)</sup> -02A5-4	1.9	5.3	1.3	4.1
	2.8	9.6	2.5	9.3	ACSM1-04Ax <sup>(5)</sup> -02A5-4	1.9	5.3	2.1	5.5
9C1.3.30	2.8	9.6	2.5	9.3	ACSM1-04Ax <sup>(5)</sup> -03A0-4	2.3	6.3	2.5	6.5
	2.8	9.6	2.5	9.3	ACSM1-04Ax <sup>(5)</sup> -04A0-4	3.0	8.4	2.8	8.7
	2.8	9.6	2.5	9.3	ACSM1-04Ax <sup>(5)</sup> -05A0-4	3.8	10.5	2.8	9.6
9C4.1.30	3.9	12.9	2.8	9.8	ACSM1-04Ax <sup>(5)</sup> -03A0-4	2.3	6.3	3.1	8.3
	3.9	12.9	2.8	9.8	ACSM1-04Ax <sup>(5)</sup> -04A0-4	3.0	8.4	3.9	11.1
	3.9	12.9	2.8	9.8	ACSM1-04Ax <sup>(5)</sup> -05A0-4	3.8	10.5	3.9	12.9
9C4.2.30	6.1	22.5	4.3	16.7	ACSM1-04Ax <sup>(5)</sup> -04A0-4	3.0	8.4	4.3	11.3
	6.1	22.5	4.3	16.7	ACSM1-04Ax <sup>(5)</sup> -05A0-4	3.8	10.5	5.3	14.1
	6.1	22.5	4.3	16.7	ACSM1-04Ax <sup>(5)</sup> -07A0-4	4.1	14.7	5.9	19.8
	6.1	22.5	4.3	16.7	ACSM1-04Ax <sup>(5)</sup> -09A5-4	7.1	16.6	6.1	22.4
9C4.4.30	7.5	36.0	5.4	27.3	ACSM1-04Ax <sup>(5)</sup> -012A-4	9.0	21.0	7.5	27.7
	7.5	36.0	5.4	27.3	ACSM1-04Ax <sup>(5)</sup> -016A-4	9.8	28.0	7.5	36.0
	7.5	36.0	5.4	27.3	ACSM1-04Ax <sup>(5)</sup> -024A-4	18.0	42.0	7.5	36.0
9C5.2.30	9.0	36.9	7.1	30.8	ACSM1-04Ax <sup>(5)</sup> -09A5-4	7.1	16.6	9.0	19.9
	9.0	36.9	7.1	30.8	ACSM1-04Ax <sup>(5)</sup> -012A-4	9.0	21.0	9.0	25.2
	9.0	36.9	7.1	30.8	ACSM1-04Ax <sup>(5)</sup> -016A-4	9.8	28.0	9.0	33.5
	9.0	36.9	7.1	30.8	ACSM1-04Ax <sup>(5)</sup> -024A-4	18.0	42.0	9.0	36.9
9C5.3.30	12.4	55.2	8.8	41.3	ACSM1-04Ax <sup>(5)</sup> -09A5-4	7.1	16.6	10.0	22.2
	12.4	55.2	8.8	41.3	ACSM1-04Ax <sup>(5)</sup> -012A-4	9.0	21.0	12.4	28.1
	12.4	55.2	8.8	41.3	ACSM1-04Ax <sup>(5)</sup> -016A-4	9.8	28.0	12.4	37.4
	12.4	55.2	8.8	41.3	ACSM1-04Ax <sup>(5)</sup> -024A-4	18.0	42.0	12.4	55.2
9C5.6.30	18.0	90.0	12.4	65.7	ACSM1-04Ax <sup>(5)</sup> -016A-4	9.8	28.0	14.2	38.4
	18.0	90.0	12.4	65.7	ACSM1-04Ax <sup>(5)</sup> -024A-4	18.0	42.0	18.0	57.5
	18.0	90.0	12.4	65.7	ACSM1-04Ax <sup>(5)</sup> -031A-4	23.3	54.0	18.0	74.0
	18.0	90.0	12.4	65.7	ACSM1-04Ax <sup>(5)</sup> -040A-4	26.3	70.0	18.0	90.0

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

#### Note!

The combined motor and drive performance in the table assumes 8 kHz switching frequency with cyclic load. The combined values are subject to ACSM1 supply voltage, ambient temperature and installation altitude de-ratings.

# Combined motor and drive performance



## Made-to-order models

Motor type	$T_{rat}^{(1)}$ [Nm]	$T_{pk}^{(2)}$ [Nm]	$I_{rat}^{(3)}$ [A]	$I_{pk}^{(4)}$ [A]	Drive type	$I_{2contIk}^{(6)}$ cyclic load	$I_{2max}^{(7)}$ [A]	Combined $T_{rat}^{(8)}$ [Nm]	Combined $T_{pk}^{(9)}$ [Nm]
9C1.1.60	1.2	4.1	2.0	7.3	ACSM1-04Ax <sup>®</sup> -02A5-4	1.9	5.3	1.1	3.0
	1.2	4.1	2.0	7.3	ACSM1-04Ax <sup>®</sup> -03A0-4	2.3	6.3	1.2	3.5
	1.2	4.1	2.0	7.3	ACSM1-04Ax <sup>®</sup> -04A0-4	3.0	8.4	1.2	4.1
9C1.2.30	2.0	6.9	1.7	6.3	ACSM1-04Ax <sup>®</sup> -02A5-4	1.9	5.3	2.0	5.8
	2.0	6.9	1.7	6.3	ACSM1-04Ax <sup>®</sup> -03A0-4	2.3	6.3	2.0	6.9
9C1.2.60	1.6	6.9	2.7	12.5	ACSM1-04Ax <sup>®</sup> -02A5-4	1.9	5.3	1.1	2.9
	1.6	6.9	2.7	12.5	ACSM1-04Ax <sup>®</sup> -03A0-4	2.3	6.3	1.3	3.5
	1.6	6.9	2.7	12.5	ACSM1-04Ax <sup>®</sup> -04A0-4	3.0	8.4	1.6	4.6
	1.6	6.9	2.7	12.5	ACSM1-04Ax <sup>®</sup> -05A0-4	3.8	10.5	1.6	5.8
	1.6	6.9	2.7	12.5	ACSM1-04Ax <sup>®</sup> -07A0-4	4.1	14.7	1.6	6.9
9C1.3.60	2.3	9.6	3.9	17.9	ACSM1-04Ax <sup>®</sup> -04A0-4	3.0	8.4	1.8	4.5
	2.3	9.6	3.9	17.9	ACSM1-04Ax <sup>®</sup> -05A0-4	3.8	10.5	2.2	5.6
	2.3	9.6	3.9	17.9	ACSM1-04Ax <sup>®</sup> -07A0-4	4.1	14.7	2.3	7.9
	2.3	9.6	3.9	17.9	ACSM1-04Ax <sup>®</sup> -09A5-4	7.1	16.6	2.3	8.9
	2.3	9.6	3.9	17.9	ACSM1-04Ax <sup>®</sup> -012A-4	9.0	21.0	2.3	9.6
9C1.4.30	3.5	12.6	2.9	11.4	ACSM1-04Ax <sup>®</sup> -03A0-4	2.3	6.3	2.7	7.0
	3.5	12.6	2.9	11.4	ACSM1-04Ax <sup>®</sup> -04A0-4	3.0	8.4	3.5	9.3
	3.5	12.6	2.9	11.4	ACSM1-04Ax <sup>®</sup> -05A0-4	3.8	10.5	3.5	11.6
	3.5	12.6	2.9	11.4	ACSM1-04Ax <sup>®</sup> -07A0-4	4.1	14.7	3.5	12.6
9C1.4.60	2.5	12.6	4.1	22.3	ACSM1-04Ax <sup>®</sup> -04A0-4	3.0	8.4	1.8	4.7
	2.5	12.6	4.1	22.3	ACSM1-04Ax <sup>®</sup> -05A0-4	3.8	10.5	2.3	5.9
	2.5	12.6	4.1	22.3	ACSM1-04Ax <sup>®</sup> -07A0-4	4.1	14.7	2.5	8.3
	2.5	12.6	4.1	22.3	ACSM1-04Ax <sup>®</sup> -09A5-4	7.1	16.6	2.5	9.4
	2.5	12.6	4.1	22.3	ACSM1-04Ax <sup>®</sup> -012A-4	9.0	21.0	2.5	11.9
9C4.1.40	3.7	12.9	3.6	13.2	ACSM1-04Ax <sup>®</sup> -016A-4	9.8	28.0	2.5	12.6
	3.7	12.9	3.6	13.2	ACSM1-04Ax <sup>®</sup> -04A0-4	3.0	8.4	3.1	8.2
	3.7	12.9	3.6	13.2	ACSM1-04Ax <sup>®</sup> -05A0-4	3.8	10.5	3.7	10.3
9C4.3.30	3.7	12.9	3.6	13.2	ACSM1-04Ax <sup>®</sup> -07A0-4	4.1	14.7	3.7	12.9
	6.9	28.2	4.6	19.9	ACSM1-04Ax <sup>®</sup> -05A0-4	3.8	10.5	5.6	14.9
	6.9	28.2	4.6	19.9	ACSM1-04Ax <sup>®</sup> -07A0-4	4.1	14.7	6.2	20.8
	6.9	28.2	4.6	19.9	ACSM1-04Ax <sup>®</sup> -09A5-4	7.1	16.6	6.9	23.5
9C4.2.40	6.9	28.2	4.6	19.9	ACSM1-04Ax <sup>®</sup> -012A-4	9.0	21.0	6.9	28.2
	5.4	22.5	5.2	23.1	ACSM1-04Ax <sup>®</sup> -07A0-4	4.1	14.7	4.3	14.3
	5.4	22.5	5.2	23.1	ACSM1-04Ax <sup>®</sup> -09A5-4	7.1	16.6	5.4	16.2
	5.4	22.5	5.2	23.1	ACSM1-04Ax <sup>®</sup> -012A-4	9.0	21.0	5.4	20.5
	5.4	22.5	5.2	23.1	ACSM1-04Ax <sup>®</sup> -016A-4	9.8	28.0	5.4	22.5
9C4.3.40	5.8	28.2	5.1	26.1	ACSM1-04Ax <sup>®</sup> -07A0-4	4.1	14.7	4.7	15.9
	5.8	28.2	5.1	26.1	ACSM1-04Ax <sup>®</sup> -09A5-4	7.1	16.6	5.8	17.9
	5.8	28.2	5.1	26.1	ACSM1-04Ax <sup>®</sup> -012A-4	9.0	21.0	5.8	22.7
	5.8	28.2	5.1	26.1	ACSM1-04Ax <sup>®</sup> -016A-4	9.8	28.0	5.8	28.2
9C4.4.40	6.3	36.0	5.5	33.3	ACSM1-04Ax <sup>®</sup> -07A0-4	4.1	14.7	4.7	15.9
	6.3	36.0	5.5	33.3	ACSM1-04Ax <sup>®</sup> -09A5-4	7.1	16.6	6.3	17.9
	6.3	36.0	5.5	33.3	ACSM1-04Ax <sup>®</sup> -012A-4	9.0	21.0	6.3	22.7
	6.3	36.0	5.5	33.3	ACSM1-04Ax <sup>®</sup> -016A-4	9.8	28.0	6.3	30.3
	6.3	36.0	5.5	33.3	ACSM1-04Ax <sup>®</sup> -024A-4	18.0	42.0	6.3	36.0
9C5.2.20	10.3	36.9	5.3	20.2	ACSM1-04Ax <sup>®</sup> -07A0-4	4.1	14.7	8.0	26.9
	10.3	36.9	5.3	20.2	ACSM1-04Ax <sup>®</sup> -09A5-4	7.1	16.6	10.3	30.3
	10.3	36.9	5.3	20.2	ACSM1-04Ax <sup>®</sup> -012A-4	9.0	21.0	10.3	36.9
9C5.3.20	14.8	55.2	7.8	30.7	ACSM1-04Ax <sup>®</sup> -09A5-4	7.1	16.6	13.5	29.8
	14.8	55.2	7.8	30.7	ACSM1-04Ax <sup>®</sup> -012A-4	9.0	21.0	14.8	37.8
	14.8	55.2	7.8	30.7	ACSM1-04Ax <sup>®</sup> -016A-4	9.8	28.0	14.8	50.3
	14.8	55.2	7.8	30.7	ACSM1-04Ax <sup>®</sup> -024A-4	18.0	42.0	14.8	55.2
	17.1	70.5	9.1	39.6	ACSM1-04Ax <sup>®</sup> -012A-4	9.0	21.0	16.9	37.4
9C5.4.20	17.1	70.5	9.1	39.6	ACSM1-04Ax <sup>®</sup> -016A-4	9.8	28.0	17.1	49.8
	17.1	70.5	9.1	39.6	ACSM1-04Ax <sup>®</sup> -024A-4	18.0	42.0	17.1	70.5
	20.0	78.0	9.8	40.2	ACSM1-04Ax <sup>®</sup> -012A-4	9.0	21.0	18.4	40.7
9C5.5.20	20.0	78.0	9.8	40.2	ACSM1-04Ax <sup>®</sup> -016A-4	9.8	28.0	19.9	54.3
	20.0	78.0	9.8	40.2	ACSM1-04Ax <sup>®</sup> -024A-4	18.0	42.0	20.0	78.0
	17.0	78.0	11.8	56.9	ACSM1-04Ax <sup>®</sup> -016A-4	9.8	28.0	14.0	38.4
	17.0	78.0	11.8	56.9	ACSM1-04Ax <sup>®</sup> -024A-4	18.0	42.0	17.0	57.6
9C5.5.30	17.0	78.0	11.8	56.9	ACSM1-04Ax <sup>®</sup> -031A-4	23.3	54.0	17.0	74.0
	17.0	78.0	11.8	56.9	ACSM1-04Ax <sup>®</sup> -040A-4	26.3	70.0	17.0	78.0
	22.0	90.0	9.9	42.7	ACSM1-04Ax <sup>®</sup> -016A-4	9.8	28.0	21.7	59.0
	22.0	90.0	9.9	42.7	ACSM1-04Ax <sup>®</sup> -024A-4	18.0	42.0	22.0	88.5
9C5.6.20	22.0	90.0	9.9	42.7	ACSM1-04Ax <sup>®</sup> -031A-4	23.3	54.0	22.0	90.0

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

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



## Ready-made motor cables for 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 DESINA<sup>®</sup> -standard
- Motor power cables include brake control leads

### Motor power cable

Product code	Conductor diameter [mm <sup>2</sup> ]	Cable diameter [mm]	Length [m]	Cable	Cable ratings <sup>1)</sup> [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

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

Electrical properties	
Working voltage Power cables Feedback cables	1000 V 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 <sup>2</sup>

Environmental properties	
Temperature range Static applications Dynamic applications	-40 to +80 °C -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

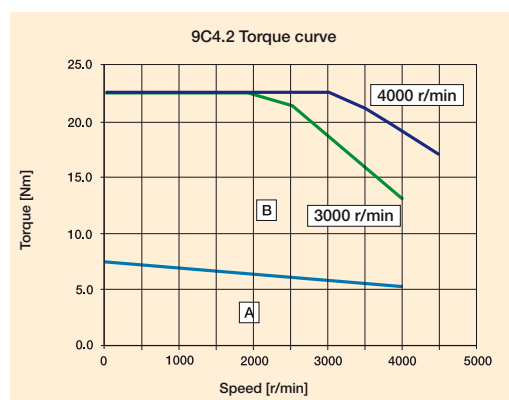
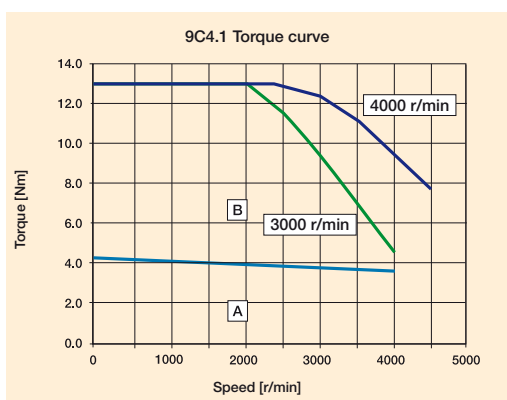
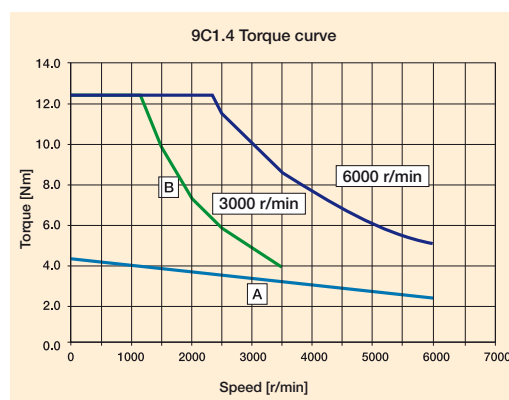
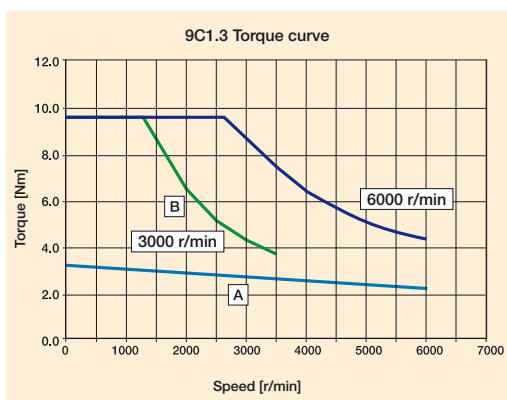
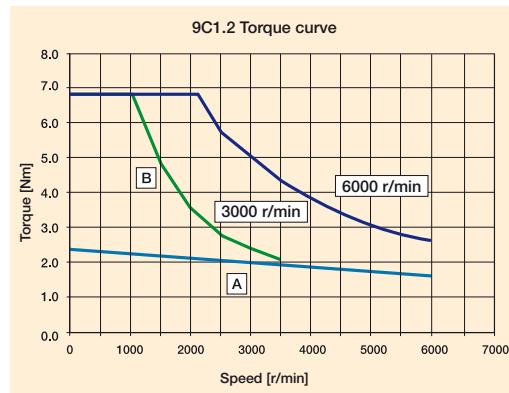
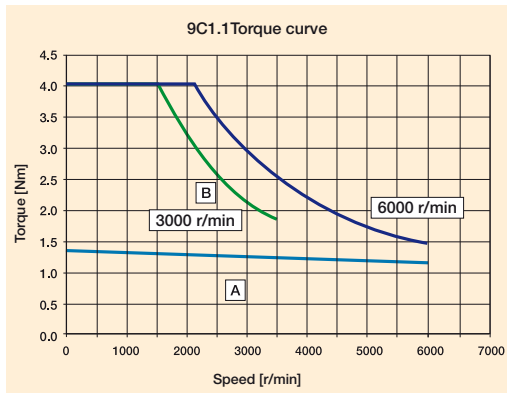
### Resolver feedback cable

Product code	Length [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))

### Encoder feedback cable

Product code	Length [m]	Cable diameter [mm]	Cable
68959187	5	8.7	(8x2x0,25)
68959209	10	8.7	(8x2x0,25)
68959217	15	8.7	(8x2x0,25)
68959225	20	8.7	(8x2x0,25)
68959233	25	8.7	(8x2x0,25)

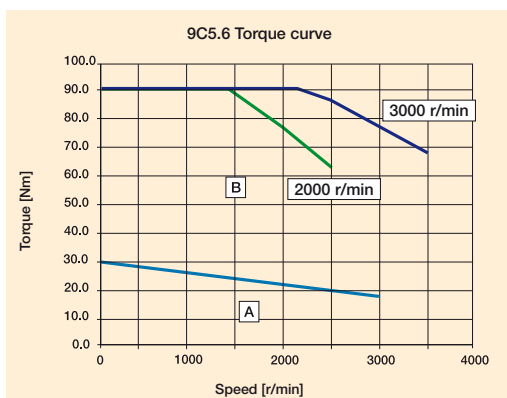
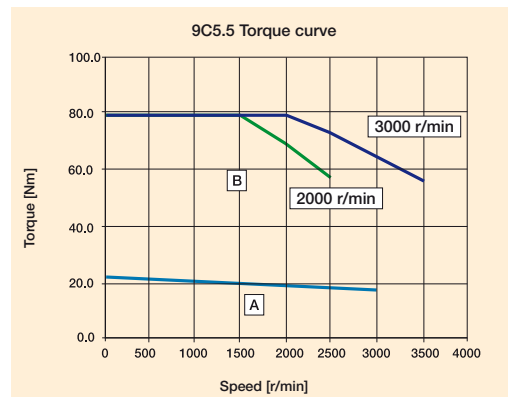
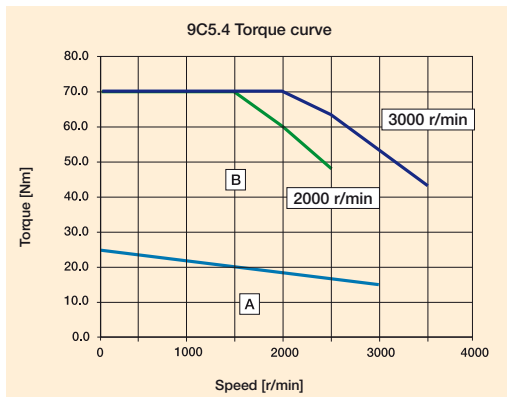
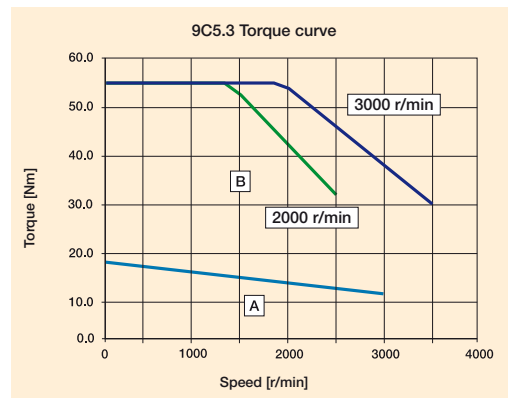
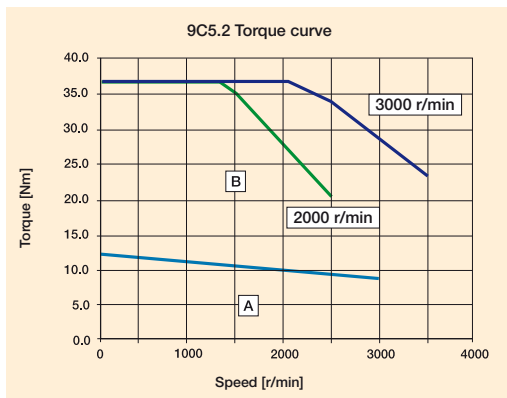
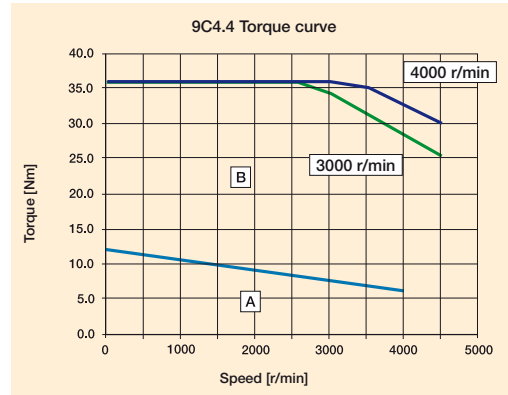
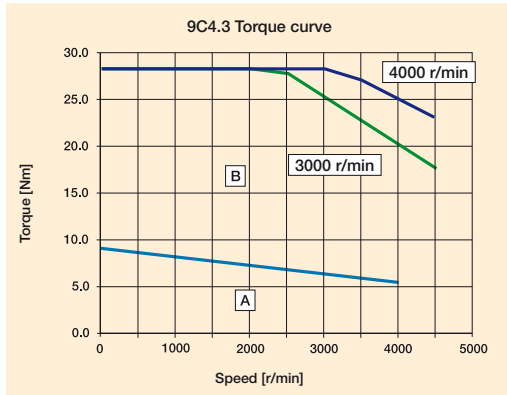
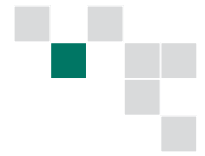
# Motor speed/torque curves



- A** Continuous operation zone
- B** Intermittent operation zone

Note!  
 All performance data is measured at duty type S1, ambient temperature 40 °C,  
 mounted on steel flange (dim. 300 x 300 x 20 mm), altitude ≤ 1000 m above sea level.

# Motor speed/torque curves



**A** Continuous operation zone

**B** Intermittent operation zone

Note!

All performance data is measured at duty type S1, ambient temperature 40 °C, mounted on steel flange (dim. 300 x 300 x 20 mm), altitude ≤ 1000 m above sea level.

# Contact and web information

[www.abb.com/drives](http://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](http://www.abb.com/drives) and [www.abb.com/drivespartners](http://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](mailto: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 5202

**Bahrain (Manama)**  
Tel: +973 725 377  
Fax: +973 725 332

**Bangladesh (Dhaka)**  
Tel: +88 02 8856468  
Fax: +88 02 8850906

**Belarus (Minsk)**  
Tel: +375 17 202 40 41, 202 40 42  
Fax: +375 17 202 40 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](mailto: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  
[drives@eg.abb.com](mailto: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](mailto:info@ee.abb.com)

**Ethiopia (Addis Abeba)**  
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](mailto: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: [freqconv@nl.abb.com](mailto:freqconv@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  
[motor@no.abb.com](mailto: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 8751 6090  
Fax: +886 2 8751 3790

**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



[www.abb.com/drives](http://www.abb.com/drives)  
[www.abb.com/drivespartners](http://www.abb.com/drivespartners)

© Copyright 2010 ABB. All rights reserved.  
Specifications subject to change without notice.

3AUA0000030840 REV C EN 29.4.2010. #14511