

# Rexroth IndraDyn S Synchronous Motors MSM

R911329338  
Edition 01

Data Sheet



**Title** Rexroth IndraDyn S  
Synchronous Motors MSM

**Type of Documentation** Data Sheet

**Document Typecode** DOK-MOTOR\*-MSM\*\*\*\*\*-DA01-EN-P

**Internal File Reference** RS-e2609feaf2a631970a6846a0002c9d48-2-en-US-15

**Record of Revision**

Edition	Release Date	Notes
DOK-MOTOR*-MSM*****-DA01-EN-P	Edition 2009-07-30	First edition

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**Published by** Bosch Rexroth AG  
Bgm.-Dr.-Nebel-Str. 2 ■ D-97816 Lohr a. Main  
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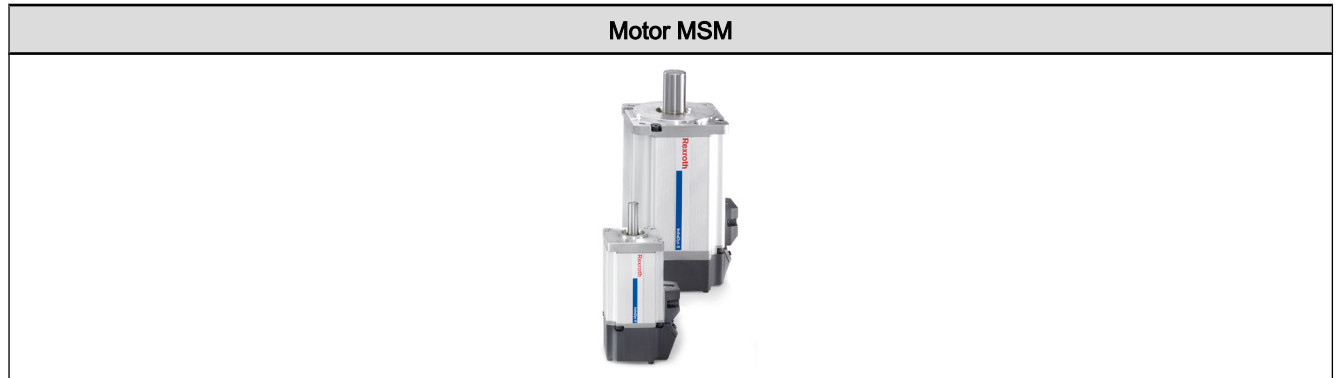
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# 1 Introduction


## 1.1 Introduction to the Product Rexroth IndraDyn S MSM



*Fig. 1-1: MSM motors: drive system Rexroth IndraDrive*

Basic features of MSM motors are

- dynamic response
- compact design
- degree of protection IP54
- accuracy due to optical single- and multiturn absolute value encoder
- holding brake
- connectors for encoder and power connection

 Motor MSM	Continuous power	Continuous torque	Maximum torque	Maximum speed	Degree of protection
	$P_N$ [W]	$M_O$ [Nm]	$M_{max}$ [Nm]	$n_{max}$ [min <sup>-1</sup> ]	
<b>019A</b>	50	0.16	0.48	5,000	IP54 (shaft IP40)
<b>019B</b>	100	0.32	0.95		
<b>031B</b>	200	0.64	1.91		
<b>031C</b>	400	1.3	3.8		
<b>041B</b>	750	2.4	7.1	4,500	

*Fig. 1-2: MSM motors: performance features*

This documentation provides information on

- selecting the motors
- describing the variants

## 1.2 Your Feedback



Your experience is important for our improvement processes of products and documentation.

## Introduction

Inform us about mistakes you discovered in this documentation and changes you suggest; we would be grateful for your feedback.

Please send your remarks to:

**Address for Your Feedback**

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97816 Lohr, Germany

E-mail: [dokusupport@boschrexroth.de](mailto:dokusupport@boschrexroth.de)

## 2 Operating Conditions

### 2.1 Ambient and Operating Conditions

MSM servo motors are designed for use in machines and installations.

#### Ambient and Operating Conditions

Description	Symbol	Unit	Value
Degree of protection (IEC529)			IP54
Use in the scope of CSA / UL			For use in NFPA 79 Applications only.
Temperature during storage			See chapter "Storage of the Components"
Temperature during transport			See chapter "Transport of the Components"
Allowed mounting position Definition of mounting positions: See index entry "Mounting positions"			IM B5 IM V1 IM V3
Ambient temperature range	$T_{a\_work}$	°C	0 ... 40
Installation altitude	$h_{nenn}$	m	1,000
<b>Derating vs. ambient temperature:</b> In the ambient temperature range $T_{a\_work\_red}$ , reduce the performance data <sup>3) 4)</sup> by the reduction factor $f_{Ta}$ . Use outside of $T_{a\_work}$ or $T_{a\_work\_red}$ is not allowed!			
	$T_{a\_work\_red}$	°C	40 ... 55
	$f_{Ta}$	%/K	2.0 See also Technical Data of the individual components

## Operating Conditions

Description	Symbol	Unit	Value
<p><b>Derating vs. installation altitude:</b></p> <p>With installation altitudes <math>h &gt; h_{nenn}</math>, the available performance data are reduced by the factor <math>f^{(2) 3)}</math>.</p> <p>With installation altitudes in the range of <math>h_{max\_ohne}</math> to <math>h_{max}</math>, an <b>overvoltage limiter</b> against transient overvoltage must be installed in the installation.</p> <p>Use above <math>h_{max}</math> is not allowed!</p>			
	$h_{max\_ohne}$	m	2,000
	$h_{max}$	m	4,000
<b>Simultaneous derating</b> for ambient temperature and installation altitude	Allowed; reduce with factors $f$ and $f_{Ta}$		
Relative humidity		%	5 ... 95
Absolute humidity		$g/m^3$	1 ... 29
Climatic category (IEC721)			3K3
Allowed pollution degree (EN50178)			2
Allowed dust, steam			EN50178 tab. A.2
Vibration sine: Acceleration at 10 ... 2000 Hz <sup>1)</sup> , axial		g	1
Vibration sine: Acceleration at 10 ... 2000 Hz <sup>1)</sup> , radial		g	3
Overvoltage category			III (according to IEC60664-1)

1) According to EN 60068-2-6

2) Reduced performance data for drive controllers: Allowed DC bus continuous power, braking resistor continuous power, continuous current

3) Reduced performance data for motors: Performance, torque S1 and S3

Fig.2-1: Ambient and Operating Conditions

## 2.2 Compatibility With Foreign Matters

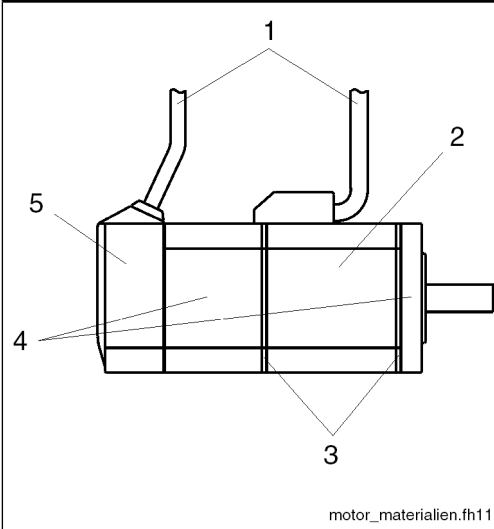
All Rexroth controls and drives are developed and tested according to the state-of-the-art technology.

As it is impossible to follow the continuing development of all materials (e.g. lubricants in machine tools) which may interact with the controls and drives, it cannot be completely ruled out that any reactions with the materials we use might occur.

For this reason, before using the respective material a compatibility test has to be carried out for new lubricants, cleaning agents etc. and our housings/materials.



## 2.3 Materials



motor\_materialien.fh11

No.	Material
1	Polyvinyl chloride resin (Oil resistance: according to standard "JIS C 3005"; test conditions: oil temperature: 70 °C; test duration (cable in oil): 4 hours; oil: machine oil 46 (by GENERAL))
2	Aluminum; anodized
3	Rubber
4	Aluminum diecasting; uncoated
5	Polyamide 46 (nylon 46)

Fig.2-2: Materials

## 2.4 Type of Construction and Mounting Positions

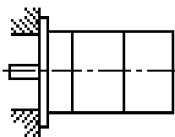
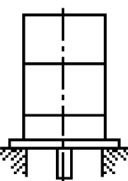
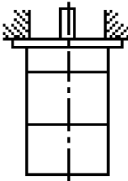
Type of construction of motor B05		
IM B5	IM V1	IM V3
		
Flange mounting on drive side of flange	Flange mounting on drive side of flange, drive side bottom	Flange mounting on drive side of flange, drive side top

Fig.2-3: Allowed types of installation according to EN 60034-7:1993



If motors are attached according to IM V3, fluid present at the output shaft over a prolonged time may enter into and cause damage to the motors.

Operating Conditions

## 2.5 Mounting Clearance

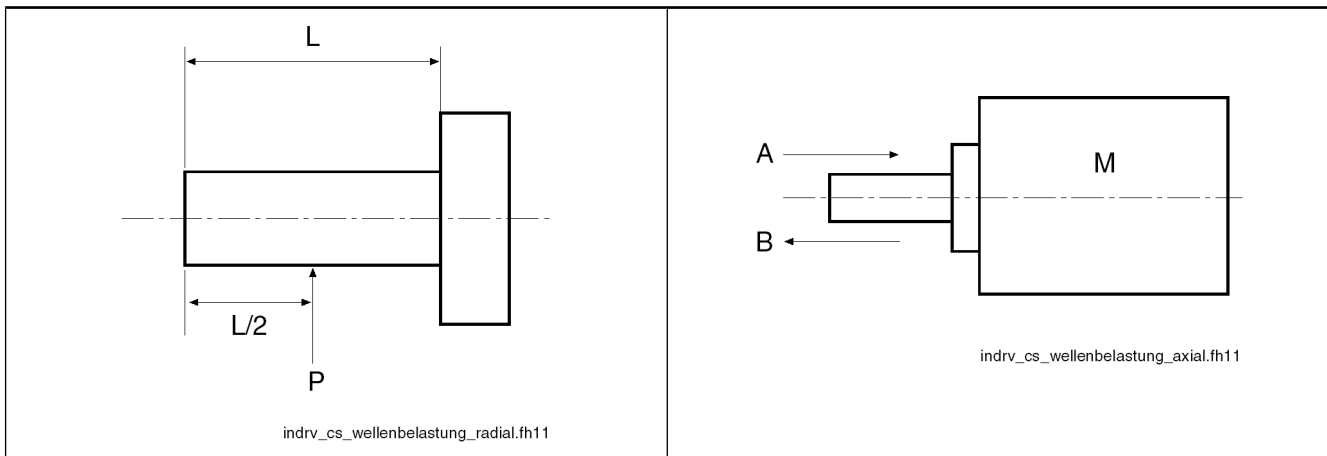
A self-cooling of the motor must not be avoided due to the positioning.

## 2.6 Output Shaft

**Plain Shaft** MSM motors provide a friction-locked shaft-hub connection without backlash and excellent running smoothness. Use clamping sets, clamping sleeves or clamping elements to couple the machine elements to be driven.

## 2.7 Bearings and Shaft Load

During operation, both radial and axial forces act upon the motor shaft and the motor bearings. The construction of the machine and the attachment of driving elements on the shaft side must be adapted to one another to ensure that the load limits specified are not exceeded.



L Length of shaft  
P Application point of radial force  
A, B Directions of axial force  
*Fig.2-4: Parameters of Shaft Load*

The table below shows the allowed shaft load of the individual motors.

Motor	For mounting			During operation	
	Radial force	Axial force		Radial force	Axial force
		Direction A	Direction B		
MSM019	147	88	117.6	68.6	58.8
MSM031	392	147	196	245	98
MSM041	686	294	392	392	147

All data in newton (N)

*Fig.2-5: Allowed Shaft Load*

**Lifetime of the Motor Bearing**



When operating the MSM motors within the specified limits for radial and axial load, the nominal bearing lifetime is  $L_{10h}$  **20.000 operating hours**.

When the allowed radial force is exceeded, the bearing service life is reduced to:

$$L_{10h} = \left( \frac{F_{\text{radial}}}{F_{\text{radial\_ist}}} \right)^3 \times 20000$$

$L_{10h}$  Bearing service life (according to ISO 281, ed. 12/1990)

$F_{\text{radial}}$  Determined allowed radial force in N (newton)

$F_{\text{radial\_ist}}$  Actually acting radial force in N (newton)

*Fig.2-6: Calculating the bearing service life  $L_{10h}$  if the allowed radial force  $F_{\text{radial}}$  is exceeded*



Under no circumstances may the actually acting radial force  $F_{\text{radial\_act}}$  be higher than the maximum allowed radial force  $F_{\text{radial\_max}}$ .

## 2.8 Holding Brakes

The following general details are decisive for all MSM motors. The size-dependent technical data of the holding brakes are defined in chapter "Technical data".

- The values given in the technical data are typical values, except for holding torque, tripping voltage and rated voltage.
- When the motor was moved, the backlash of the brake is  $\pm 1^\circ$  or less.
- The power supply of the holding brake is external.
- Maximum number of acceleration and deceleration processes with the highest allowed angular acceleration: 10 million.

## 2.9 Mounting of Drive Elements

Please observe the following notes regarding mounting of drive elements on the output shaft.

### Gearbox Mounting on Motors

When gearboxes are attached to motors, this changes the thermal connection of the motor to the machine or installation construction.

According to the gearbox type, the heat generation at the gearbox is different. In any case, gearbox attachment reduces the heat dissipation of the motor via the flange. This has to be taken into account when doing the project planning for the installation.

To avoid thermal overload of motors when using gearboxes, it is necessary to reduce the specified performance data.

## Operating Conditions

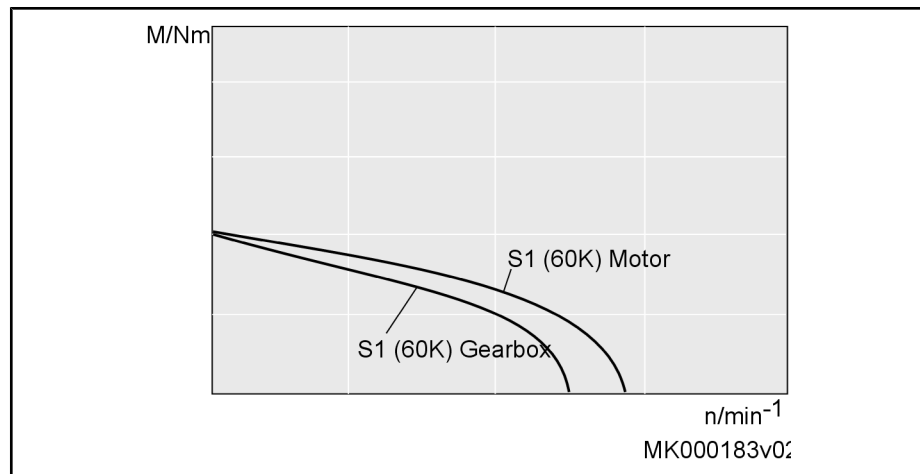


Fig.2-7: S1 characteristic of gearboxes



The torques indicated in the motor characteristics have to be reduced by approx. **10-20%** when gearboxes are attached.

Observe all other notes and requirements contained in the documentation on the gearboxes used.

#### Redundant Bearings

When mounting drive elements, avoid redundant bearing, because indispensably existing tolerances lead to additional forces onto the bearing of the motor shaft and if so lead to a significantly reduced bearing lifetime.



If redundant attachment cannot be avoided, it is absolutely necessary that you consult Bosch Rexroth.

#### Couplings

The machine construction and the attachment elements used must be carefully adapted to the motor type so that the load limits of shaft and bearing are not exceeded.



When connecting extremely stiff couplings, the radial force which constantly changes the angular position may cause an impermissibly high load on the shaft and bearing.

#### Bevel Gear Pinion or Helical Gear Drive

Owing to thermal effects, the flange-sided end of the output shaft may shift by 0.6 mm in relation to the motor housing. If helical drive pinions or bevel gear pinions directly attached to the output shaft are used, this change in position will lead to

- a shift in the position of the axis, if the driving pinions are not defined axially on the machine side,
- a thermally dependent component of the axial force, if the driving pinions are defined axially on the machine side. This causes the risk of exceeding the maximum permissible axial force or of the play within the gears increasing to an impermissible degree.
- damage of the motor bearing on the B-side due to exceeding of the maximum permissible axial force.




In such cases, drive elements should preferably be used with their own bearings which are connected to the motor drive shaft via axially compensating couplings.

## 2.10 Certifications

### Declaration of Conformity

Declarations of conformity (refer to [chapter 11 "Appendix" on page 47](#)) confirm that the components comply with the valid EN standards and EC directives.


#### MSM motors

 <small>DX000011v01_en.FH11</small>
CE conformity regarding
<b>EN 60034-1:</b> Rotating electrical machines - Part 1: Dimensioning and operating behavior (IEC 60034-1:2004); German version EN 60034-1:2004
<b>EN 60034-5:</b> Rotating electrical machines - Part 5: Degrees of protection due to total construction of rotating electrical machines (IP-cod) - classification (IEC 60034-5:2000 + Corrigendum 2001 + A1:2006); German version EN 60034-5:2001 + A1:2007

### C-UR-US Listing

The motors are listed by **UL** ("Underwriters Laboratories Inc.®"). You can find the evidence of certification on the Internet under <http://www.ul.com> under "Certifications" by entering the file number or the "Company Name: Rexroth".

#### MSM motors

 <small>CUR_Zeichen.fh11</small>
<b>Company Name</b>
BOSCH REXROTH ELECTRIC DRIVES & CONTROLS GMBH
Category Name:
Power Conversion Equipment
For file numbers, norms and standards refer to the table in "Technical Data"



#### Wiring material UL (ready-made cables of Rexroth)

In the scope of CSA / UL, use copper 60/75 °C only; class 6 or equivalent only.



#### Allowed pollution degree

Comply with the allowed pollution degree of the components (see "Ambient and Operating Conditions").

### CCC (China Compulsory Certification)

The CCC test symbol comprises a compulsory certification of safety and quality for certain products mentioned in the product catalog "First Catalogue of Products Subject to Compulsory Certification" and in the CNCA document "Application Scope for Compulsory Certification of Products acc. first Catalogue" and put in circulation in China. This compulsory certification has been existing since 2003.

## Operating Conditions

CNCA is the Chinese authority responsible for certification directives. When a product is imported in China, the certification will be checked at the customs by means of entries in a database. For the requirement of certification three criteria are normally relevant:

1. Customs tariff number (HS code) according to CNCA document "Application Scope for Compulsory Certification of Products acc. first Catalogue".
2. Scope of application according to CNCA document "Application Scope for Compulsory Certification of Products acc. first Catalogue".
3. For the IEC product standard used, the corresponding Chinese GB standard must exist.

For the Rexroth drive components described in this documentation, Rexroth **certification is not required at present**, thus they are not CCC certified. Negative certifications will not be issued.

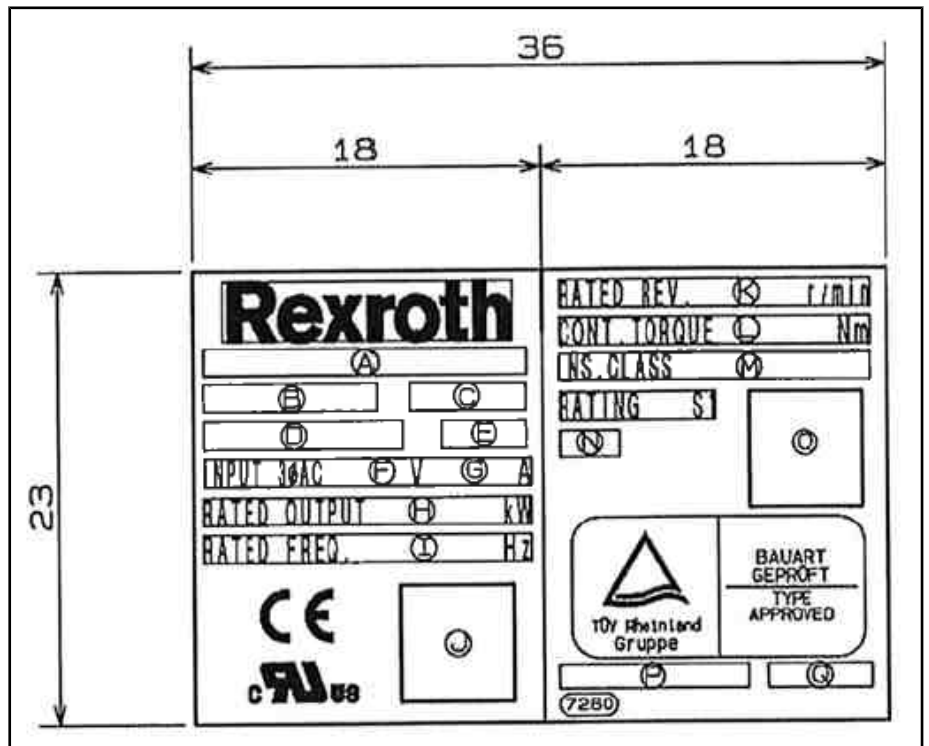
### 3 Identification and Type Code

#### 3.1 Identification

MSM motors have an individual type plate with device designation and technical details. The two-parts type plate is laterally fixed on the encoder housing.

The type plate is provided for

- Identification of the motor
- Procurement of spare parts in case of a fault
- Service information



- (A) Model number
- (B) Part number
- (C) Production date
- (D) Serial number
- (E) Hardware index
- (F) Rated voltage
- (G) Rated current
- (H) Rated power
- (I) Frequency
- (J) Serial number (Rexroth)
- (K) Speed
- (L) Torque
- (M) Insulation class
- (N) Degree of protection
- (O) Bar code
- (P) Country of origin
- (Q) UL file number

Fig. 3-1: Type plate MSM

Identification and Type Code

### 3.2 Type Code MSM019



The following figure illustrates the basic structure of the type code. Our sales representative will help you with the current status of available versions.

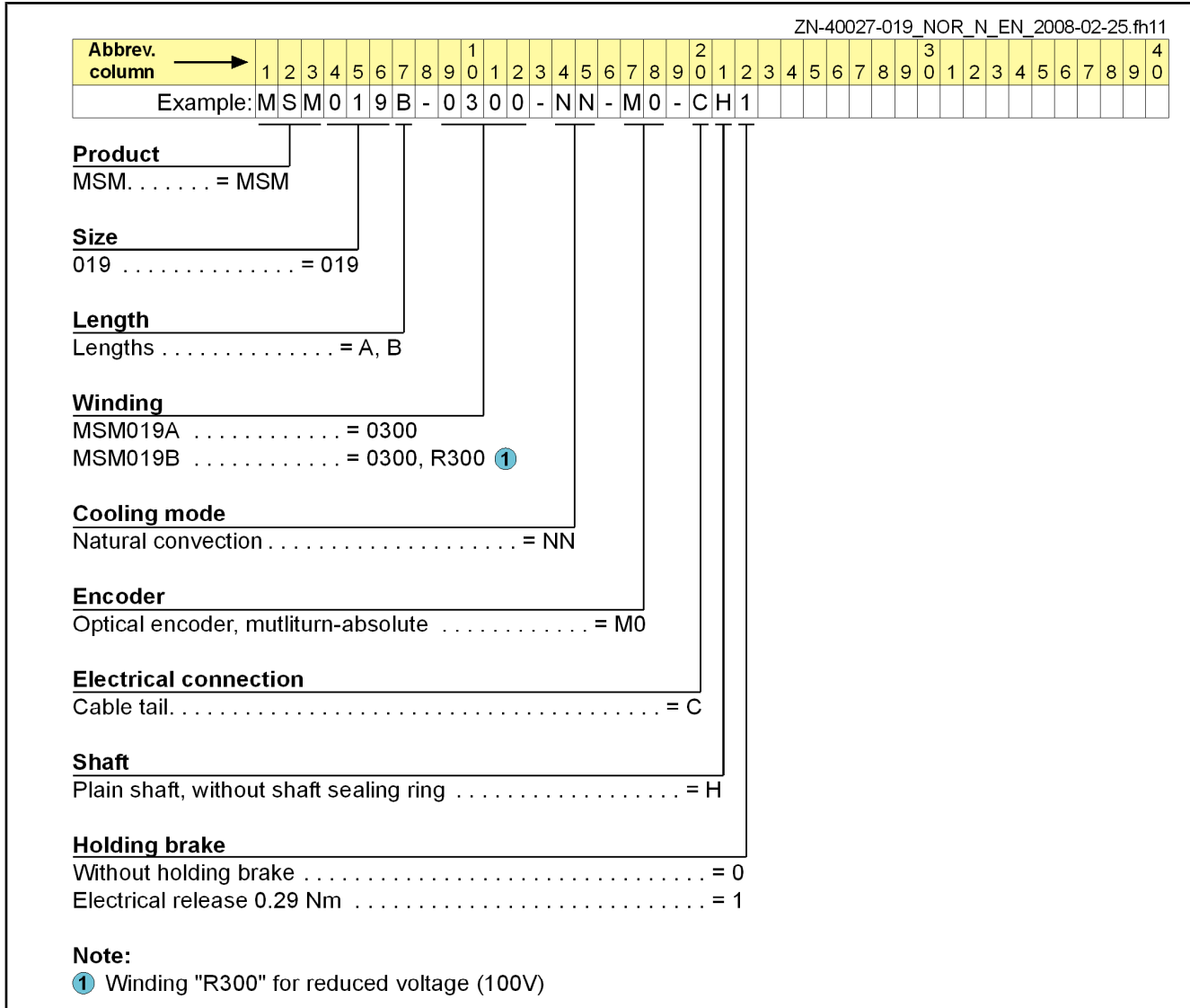


Fig.3-2: MSM019



### 3.3 Type Code MSM031



The following figure illustrates the basic structure of the type code. Our sales representative will help you with the current status of available versions.

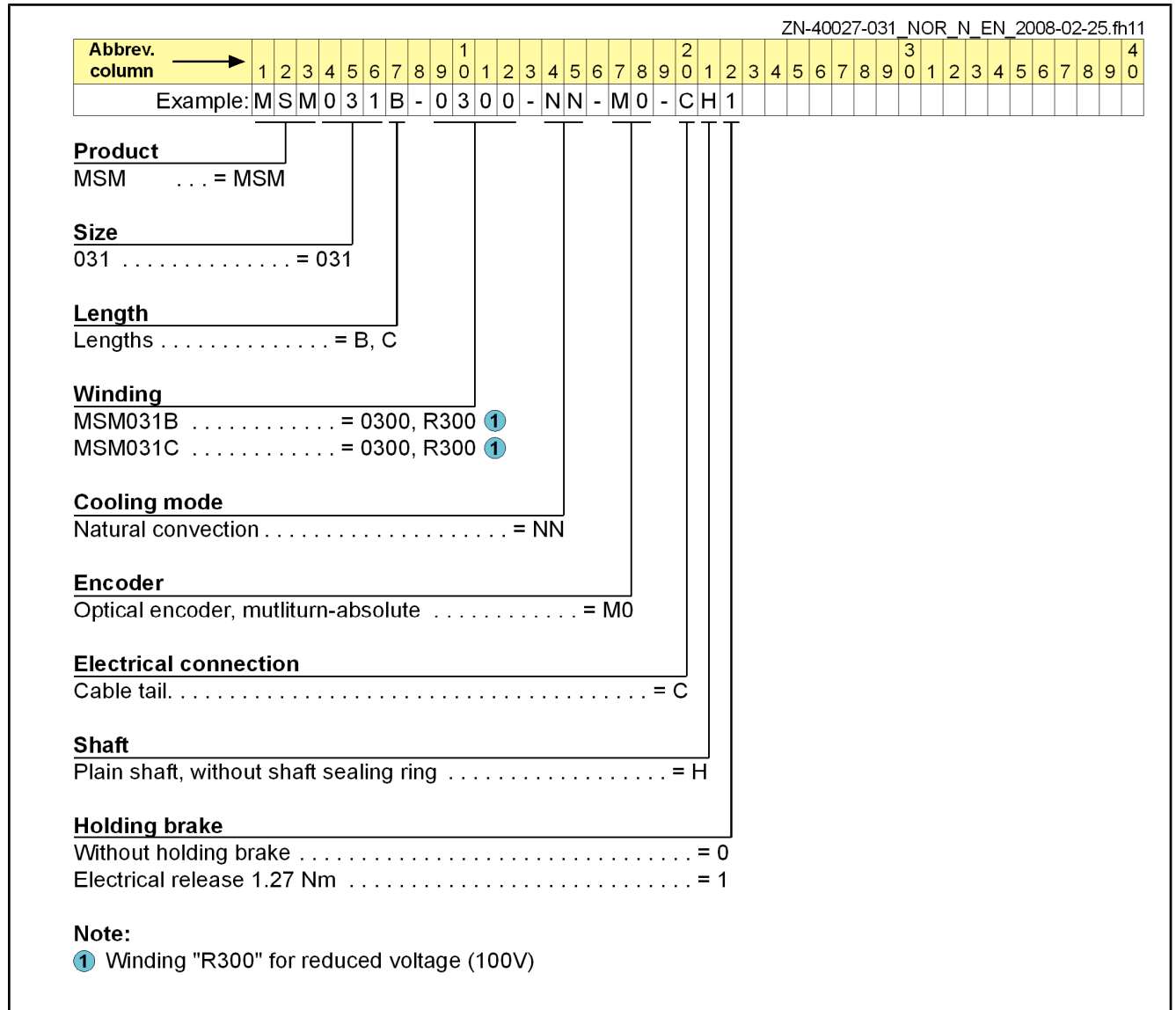


Fig.3-3: MSM031

Identification and Type Code

### 3.4 Type Code MSM041



The following figure illustrates the basic structure of the type code. Our sales representative will help you with the current status of available versions.

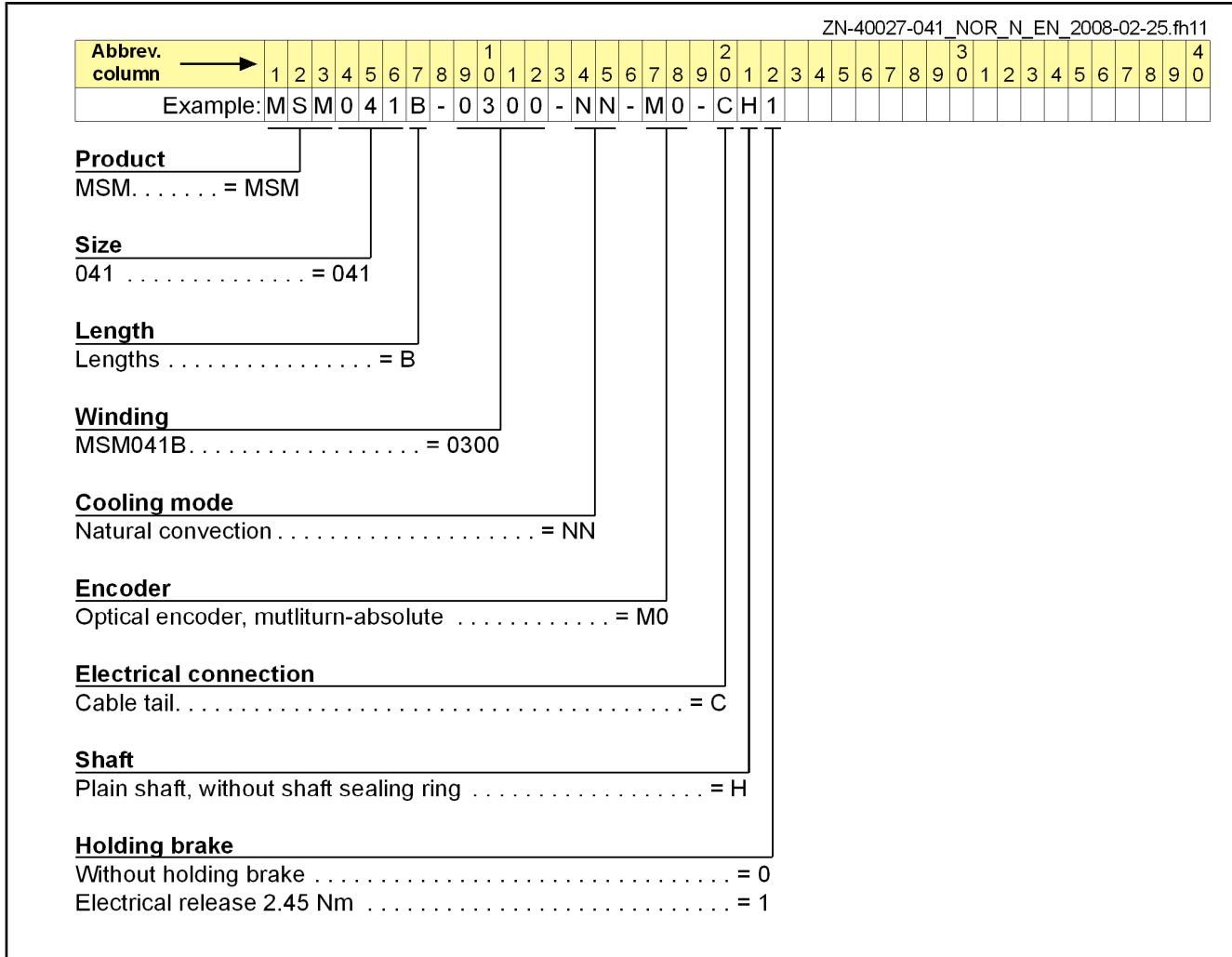


Fig.3-4: MSM041

## 4 Technical Data

### 4.1 Basic Principles

#### 4.1.1 Operation Modes

The motors are documented according to the test criteria and measuring methods of EN 60034-1. The specified characteristics correspond to operation modes S1.

#### 4.1.2 Duty Cycle

The operation mode S6 is only possible with a duty cycle  $ED \leq 100\%$ . The duty cycle is calculated as follows:

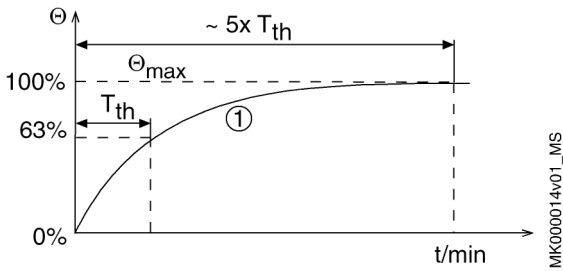
$$ED = \frac{\Delta t_P}{T_C} \times 100\% = \left( \frac{M_d}{M_{KB}} \right)^2 \times 100\%$$

ED	Duty cycle
$T_C$	Cycle duration
$\Delta T_P$	Operating time with constant load
$M_d$	Continuous torque
$M_{KB}$	Short-time service torque
<i>Fig.4-1:</i>	<i>Relative Duty Cycle</i>

#### 4.1.3 Definition of Characteristic Values

Description	Symbol	Unit	Definition
Cooling type according to EN 60034-6			Short designation according to EN
Listing according to UL standard (UL)			UL standard
Listing according to CSA standard (UL)			CSA standard
UL files (UL)			UL file number
<b>Electrical characteristic values</b>			
Continuous torque at standstill 60 K	$M_{0,60}$	Nm	Continuous torque that can be delivered at the motor output shaft at speed $n \geq 0.1$ Hz.
Continuous current at standstill 60 K	$I_{0,60(rms)}$	A	Phase current of motor at speed $n \geq 0.1$ Hz required for continuous torque at standstill $M_{0,60}$ .
Maximum current	$I_{max(rms)}$	A	Maximum, temporarily allowed phase current in the motor winding without damaging effect on the permanent-magnet circuit of the motor.
Maximum torque	$M_{max}$	Nm	Maximum torque that can be delivered for approx. 400 ms at maximum current $I_{max}$ . The maximum torque to be reached depends on the controller used.
Torque constant at 20 °C <sup>1)</sup>	$K_{M,N}$	Nm/A	Ratio of generated torque to motor phase current at motor temperature of 20°C. Valid up to approx. $i = 2 \times I_{0,60}$ .

## Technical Data

Description	Symbol	Unit	Definition
Constant voltage at 20 °C <sup>2)</sup>	$K_{EMK\_1000}$	V/min <sup>-1</sup>	R.m.s. value of the induced motor voltage at motor temperature 20 °C and 1000 revolutions per minute.
Winding resistance at 20 °C	$R_{12}$	ohm	Measured winding resistance between two winding ends.
Winding inductance	$L_{12}$	mH	Measured inductance between two phases.
Leakage capacitance of the component	$C_{ab}$	nF	Leakage capacitance
Number of pole pairs	p	-	Number of pole pairs
<b>Mechanical characteristic values</b>			
Rotor inertia	$J_{rot}$	kg*m <sup>2</sup>	Inertia of rotor without optional holding brake.
Power wire cross section	$A_{60}$		Minimum cross section of power wire of power cable to be connected to motor
Thermal time constant	$T_{th}$		Time of the temperature rise to 63% of the end temperature of the motor housing with the motor loaded with the allowed S1 continuous torque. The thermal time constant is determined by the cooling type used.
			 <p>① : Course of the motor housing temperature over time  <math>\Theta_{max}</math> : Highest temperature (motor housing)  <math>T_{th}</math> : Thermal time constant</p>
Maximum speed	$n_{max}$	min <sup>-1</sup>	Maximum allowed speed of the motor. Limiting factors can have mechanical (centrifugal forces, bearing stress) or electrical (DC bus voltage) causes.
Mass <sup>3)</sup>	m	kg	Mass of motor
Storage and transport temperature			Allowed temperature during storage and transport
Ambient temperature during operation	$T_{um}$		Allowed ambient temperature during operation
Installation altitude			Maximum installation altitude
Insulation class according to DIN EN 60034-1	---	-	Insulation class
Degree of protection according to IEC60529	---	-	Degree of protection IP
Sound pressure level	$L_p$		Value of sound emission

1) 2)

Manufacturing tolerance  $\pm 5\%$ 

3)

(...) Values for motors with holding brake, sorted (holding brake 1, holding brake 2 ...)

Fig.4-2:

Definition of Characteristic Values

## 4.2 MSM019

### 4.2.1 Technical Data MSM019

Description	Symbol	Unit	MSM019A-0300-NN preliminary	MSM019B-0300-NN preliminary
Cooling type according to EN 60034-6		-	IC00	
Listing according to UL standard (UL)		-	UL 1004; ANSI UL 840	
Listing according to CSA standard (UL)		-	CSA-C22.2 No. 100	
UL files (UL)			E223837	
<b>Electrical characteristic values</b>				
Continuous torque at standstill 60 K	$M_{0\_60}$	Nm	0.16	0.32
Continuous current at standstill 60 K	$I_{0\_60(rms)}$	A	1.10	
Maximum current	$I_{max(rms)}$	A	3.30	
Maximum torque	$M_{max}$	Nm	0.48	0.95
Torque constant at 20 °C <sup>1)</sup>	$K_{M\_N}$	Nm/A	0.14	0.30
Constant voltage at 20 °C <sup>2)</sup>	$K_{EMK\_1000}$	V/min <sup>-1</sup>	8.6	17.4
Winding resistance at 20 °C	$R_{12}$	ohm	9.30	13.20
Winding inductance	$L_{12}$	mH	5.650	9.250
Leakage capacitance of the component	$C_{ab}$	nF	0.3	0.7
Number of pole pairs	p	-	4	
<b>Mechanical characteristic values</b>				
Rotor inertia	$J_{rot}$	kg*m <sup>2</sup>	0.0000025	0.00001
Power wire cross section	$A_{60}$	mm <sup>2</sup>	0.75	
Thermal time constant	$T_{th}$	min	tbd	
Maximum speed	$n_{max}$	min <sup>-1</sup>	5,000	
Mass <sup>3)</sup>	m	kg	0.32 (0.53)	0.47 (0.68)
Storage and transport temperature	$T_L$	°C	-20 ... +60	
Ambient temperature during operation	$T_{um}$	°C	0 ... 40	
Installation altitude		m	0 ... 1,000	
Insulation class according to DIN EN 60034-1	---	-	130 (B)	

Last modification: 2008-11-20

Technical Data

Description	Symbol	Unit	MSM019A-0300-NN preliminary	MSM019B-0300-NN preliminary
Degree of protection according to IEC60529	---	-	IP54	
Sound pressure level	$L_p$	dB[A]	tbd	

Last modification: 2008-11-20

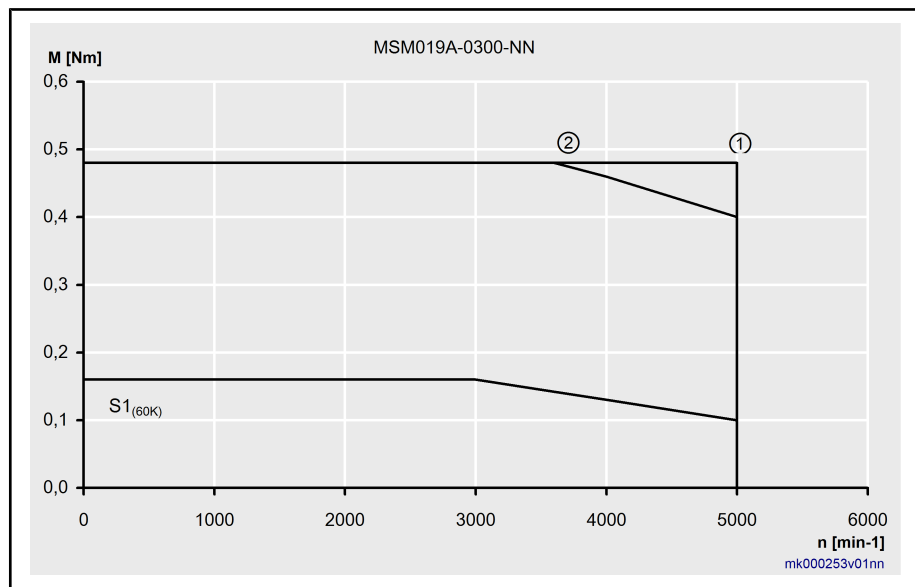
1) 2) Manufacturing tolerance  $\pm 5\%$   
 3) (...) Values for motors with holding brake, sorted (holding brake 1, holding brake 2 ...)  
*Fig.4-3: Technical data MSM*

Description	Symbol	Unit	Holding brake 1 (MSM019)
Holding torque	$M_4$	Nm	0.29
Rated voltage	$U_N$	V	$24 \pm 1.2$
Rated current	$I_N$	A	0.3
Clamping delay	$t_1$	ms	35
Release delay	$t_2$	ms	20
Inertia brake	$J_{rot}$	kg*m <sup>2</sup>	0.0000002

Last modification: 2008-10-16

*Fig.4-4: MSM019 Holding Brakes - Technical Data (Optional)*

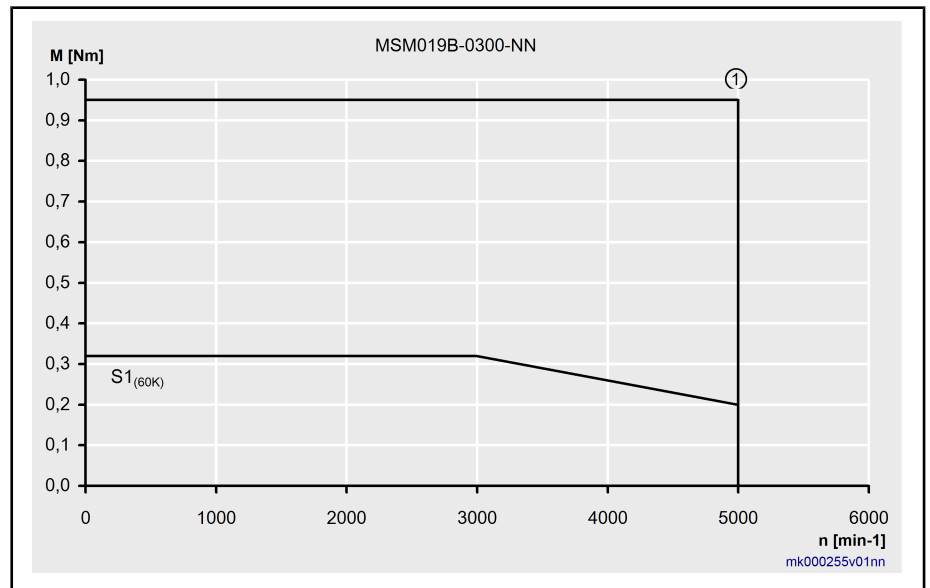
Status of the Characteristic Curve: preliminary



- ①  $M_{max}$  IndraDrive Cs, supply 3 \* 230 V
- ②  $M_{max}$  IndraDrive Cs, supply 3 \* 100 V -10%

*Fig.4-5: Torque-Speed Characteristic*

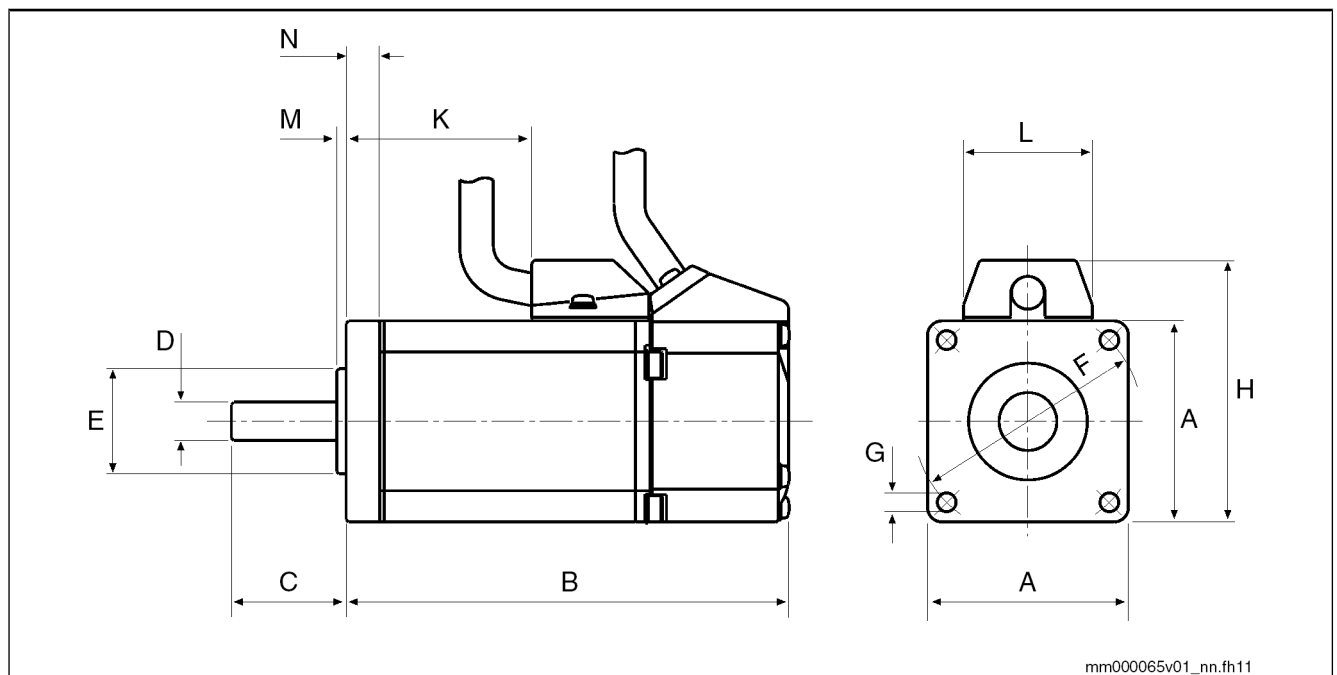
Status of the Characteristic Curve: preliminary



① M<sub>max</sub> IndraDrive Cs, supply 3 \* 230 V

Fig.4-6: Torque-Speed Characteristic

## 4.2.2 Dimensions MSM019



Motor	A	B	C	D	E	F	G	H	K	L	M	N
MSM019A-...-...CH0	38	72	25	∅8 <sup>h6</sup>	∅30 <sup>h7</sup>	∅45±0.20	∅3.5	51	20.8	27	3	6
MSM019A-...-...CH1	38	102	25	∅8 <sup>h6</sup>	∅30 <sup>h7</sup>	∅45±0.20	∅3.5	51	20.8	27	3	6
MSM019B-...-...CH0	38	92	25	∅8 <sup>h6</sup>	∅30 <sup>h7</sup>	∅45±0.20	∅3.5	51	40.8	27	3	6
MSM019B-...-...CH1	38	122	25	∅8 <sup>h6</sup>	∅30 <sup>h7</sup>	∅45±0.20	∅3.5	51	40.8	27	3	6

Fig.4-7: Dimensions MSM019

## Technical Data

**4.3 MSM031****4.3.1 Technical Data MSM031**

Description	Symbol	Unit	MSM031B-0300-NN preliminary	MSM031C-0300-NN preliminary
Cooling type according to EN 60034-6		-	IC00	
Listing according to UL standard (UL)		-	UL 1004; ANSI UL 840	
Listing according to CSA standard (UL)		-	CSA-C22.2 No. 100	CSA-C22.2 No. 100
UL files (UL)			E223837	
<b>Electrical characteristic values</b>				
Continuous torque at standstill 60 K	$M_{0,60}$	Nm	0.64	1.30
Continuous current at standstill 60 K	$I_{0,60(rms)}$	A	1.60	2.60
Maximum current	$I_{max(rms)}$	A	4.90	7.70
Maximum torque	$M_{max}$	Nm	1.91	3.80
Torque constant at 20 °C <sup>1)</sup>	$K_{M,N}$	Nm/A	0.41	0.51
Constant voltage at 20 °C <sup>2)</sup>	$K_{EMK,1000}$	V/min <sup>-1</sup>	24.5	30.6
Winding resistance at 20 °C	$R_{12}$	ohm	6.10	3.60
Winding inductance	$L_{12}$	mH	14.700	10.600
Leakage capacitance of the component	$C_{ab}$	nF	0.7	1.4
Number of pole pairs	$p$	-	4	
<b>Mechanical characteristic values</b>				
Rotor inertia	$J_{rot}$	kg*m <sup>2</sup>	0.00001	0.00003
Power wire cross section	$A_{60}$	mm <sup>2</sup>	0.75	
Thermal time constant	$T_{th}$	min	tbd	
Maximum speed	$n_{max}$	min <sup>-1</sup>	5,000	
Mass <sup>3)</sup>	$m$	kg	0.82 ( 1.3 )	1.2 ( 1.7 )
Storage and transport temperature	$T_L$	°C	-20 ... +60	
Ambient temperature during operation	$T_{um}$	°C	0 ... 40	
Installation altitude		m	0 ... 1,000	
Insulation class according to DIN EN 60034-1	---	-	130 (B)	

Last modification: 2008-11-20



Technical Data

Description	Symbol	Unit	MSM031B-0300-NN preliminary	MSM031C-0300-NN preliminary
Degree of protection according to IEC60529	---	-	IP54	
Sound pressure level	L <sub>P</sub>	dB[A]	tbd	

Last modification: 2008-11-20

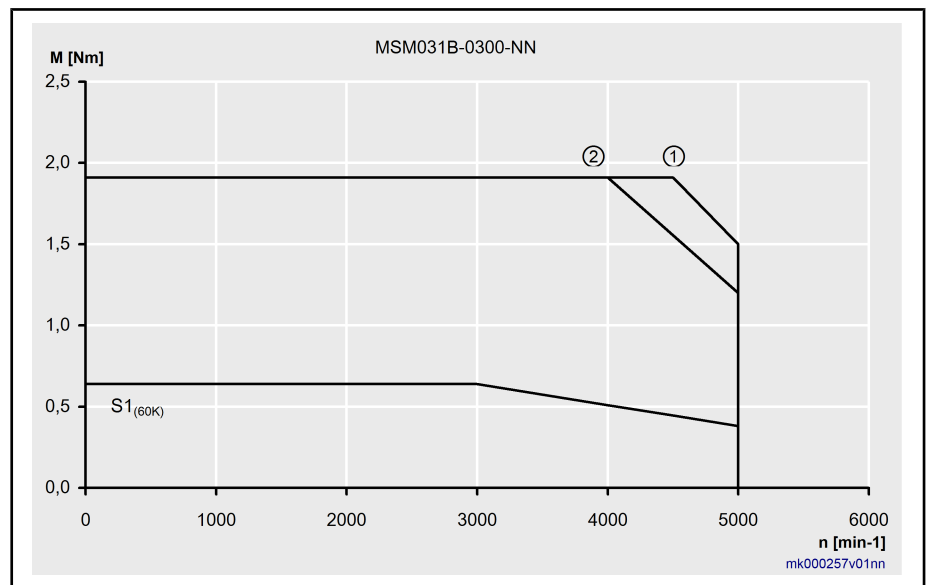
1) 2) Manufacturing tolerance ±5%  
 3) (...) Values for motors with holding brake, sorted (holding brake 1, holding brake 2 ...)  
*Fig.4-8: MSM031B-0300-NN, MSM031C-0300-NN*

Description	Symbol	Unit	Holding brake 1 (MSM031)
Holding torque	M <sub>4</sub>	Nm	1.27
Rated voltage	U <sub>N</sub>	V	24 ± 1.2
Rated current	I <sub>N</sub>	A	0.36
Clamping delay	t <sub>1</sub>	ms	50
Release delay	t <sub>2</sub>	ms	15
Inertia brake	J <sub>rot</sub>	kg*m <sup>2</sup>	0.0000018

Last modification: 2008-10-16

*Fig.4-9: MSM031 Holding Brakes - Technical Data (Optional)*

Status of the Characteristic Curve: preliminary

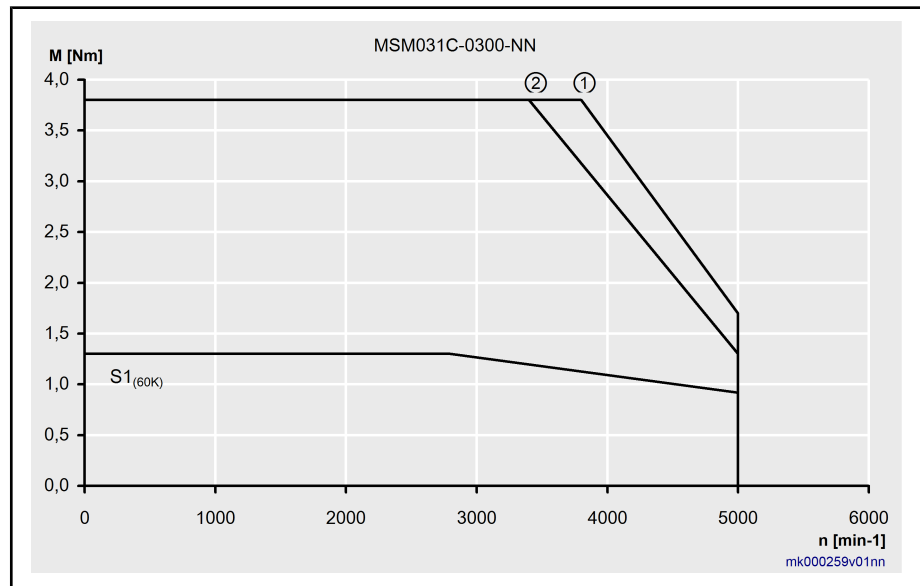


- ① M<sub>max</sub> IndraDrive Cs, supply 3 \* 230 V
- ② M<sub>max</sub> IndraDrive Cs, supply 3 \* 200 V -10%

*Fig.4-10: Torque-Speed Characteristic*

## Technical Data

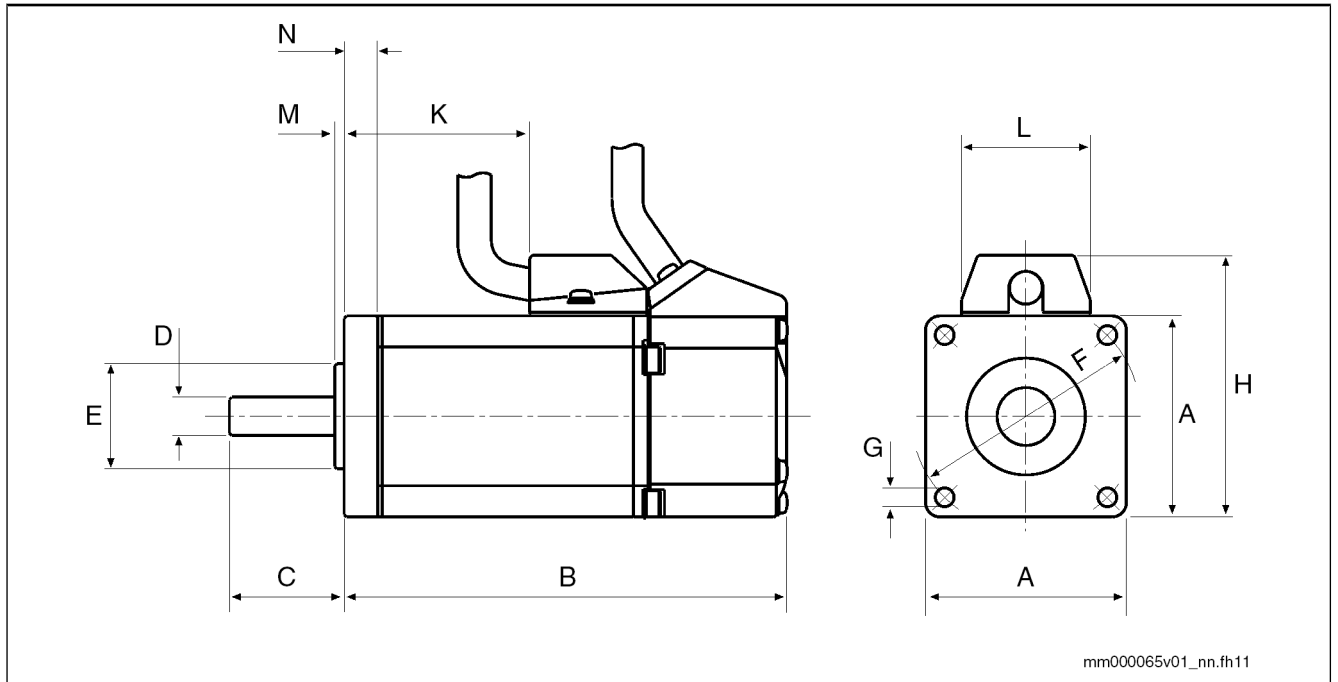
Status of the Characteristic Curve: preliminary



- ①  $M_{\max}$  IndraDrive Cs, supply 3 \* 230 V  
 ②  $M_{\max}$  IndraDrive Cs, supply 3 \* 200 V -10%

Fig.4-11: Torque-Speed Characteristic

### 4.3.2 Dimensions MSM031



Motor	A	B	C	D	E	F	G	H	K	L	M	N
MSM031B-...-...-CH0	60	79	30	ø11 <sup>h6</sup>	ø50 <sup>h7</sup>	ø70±0.20	ø4.5	71	22.5	36	3	6.5
MSM031B-...-...-CH1	60	115.5	30	ø11 <sup>h6</sup>	ø50 <sup>h7</sup>	ø70±0.20	ø4.5	71	22.5	36	3	6.5
MSM031C-...-...-CH0	60	98.5	30	ø14 <sup>h6</sup>	ø50 <sup>h7</sup>	ø70±0.20	ø4.5	71	42	36	3	6.5
MSM031C-...-...-CH1	60	135	30	ø14 <sup>h6</sup>	ø50 <sup>h7</sup>	ø70±0.20	ø4.5	71	42	36	3	6.5

Fig.4-12: Dimensions MSM031

## Technical Data

**4.4 MSM041****4.4.1 Technical Data MSM041**

Description	Symbol	Unit	MSM041B-0300-NN preliminary
Cooling type according to EN 60034-6		-	IC00
Listing according to UL standard (UL)		-	UL 1004; ANSI UL 840
Listing according to CSA standard (UL)		-	CSA-C22.2 No. 100
UL files (UL)			E223837
<b>Electrical characteristic values</b>			
Continuous torque at standstill 60 K	$M_{0,60}$	Nm	2.40
Continuous current at standstill 60 K	$I_{0,60(rms)}$	A	4.00
Maximum current	$I_{max(rms)}$	A	12.00
Maximum torque	$M_{max}$	Nm	7.10
Torque constant at 20 °C <sup>1)</sup>	$K_{M,N}$	Nm/A	0.64
Constant voltage at 20 °C <sup>2)</sup>	$K_{EMK,1000}$	V/min <sup>-1</sup>	37.6
Winding resistance at 20 °C	$R_{12}$	ohm	1.50
Winding inductance	$L_{12}$	mH	6.700
Leakage capacitance of the component	$C_{ab}$	nF	1.3
Number of pole pairs	$p$	-	4
<b>Mechanical characteristic values</b>			
Rotor inertia	$J_{rot}$	kg*m <sup>2</sup>	0.00009
Power wire cross section	$A_{60}$	mm <sup>2</sup>	0.75
Thermal time constant	$T_{th}$	min	tdb
Maximum speed	$n_{max}$	min <sup>-1</sup>	4,500
Mass <sup>3)</sup>	$m$	kg	2.3 ( 3.1 )
Storage and transport temperature	$T_L$	°C	-20 ... +60
Ambient temperature during operation	$T_{um}$	°C	0 ... 40
Installation altitude		m	0 ... 1,000
Insulation class according to DIN EN 60034-1	---	-	130 (B)

Last modification: 2008-11-05

Technical Data

Description	Symbol	Unit	MSM041B-0300-NN preliminary
Degree of protection according to IEC60529	---	-	IP54
Sound pressure level	L <sub>P</sub>	dB[A]	tbd

Last modification: 2008-11-05

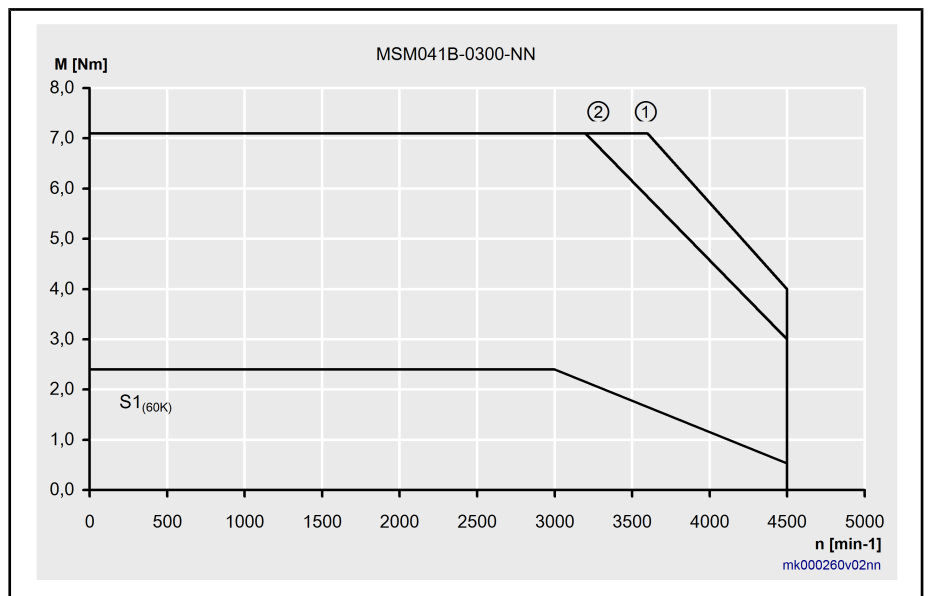
1) 2) Manufacturing tolerance ±5%  
 3) (...) Values for motors with holding brake, sorted (holding brake 1, holding brake 2 ...)  
 Fig.4-13: MSM041B-0300-NN

Description	Symbol	Unit	Holding brake 1 (MSM041)
Holding torque	M <sub>4</sub>	Nm	2.45
Rated voltage	U <sub>N</sub>	V	24 ± 1.2
Rated current	I <sub>N</sub>	A	0.42
Clamping delay	t <sub>1</sub>	ms	70
Release delay	t <sub>2</sub>	ms	20
Inertia brake	J <sub>rot</sub>	kg*m <sup>2</sup>	0.0000075

Last modification: 2008-10-16

Fig.4-14: MSM041 Holding Brakes - Technical Data (Optional)

Status of the Characteristic Curve: preliminary

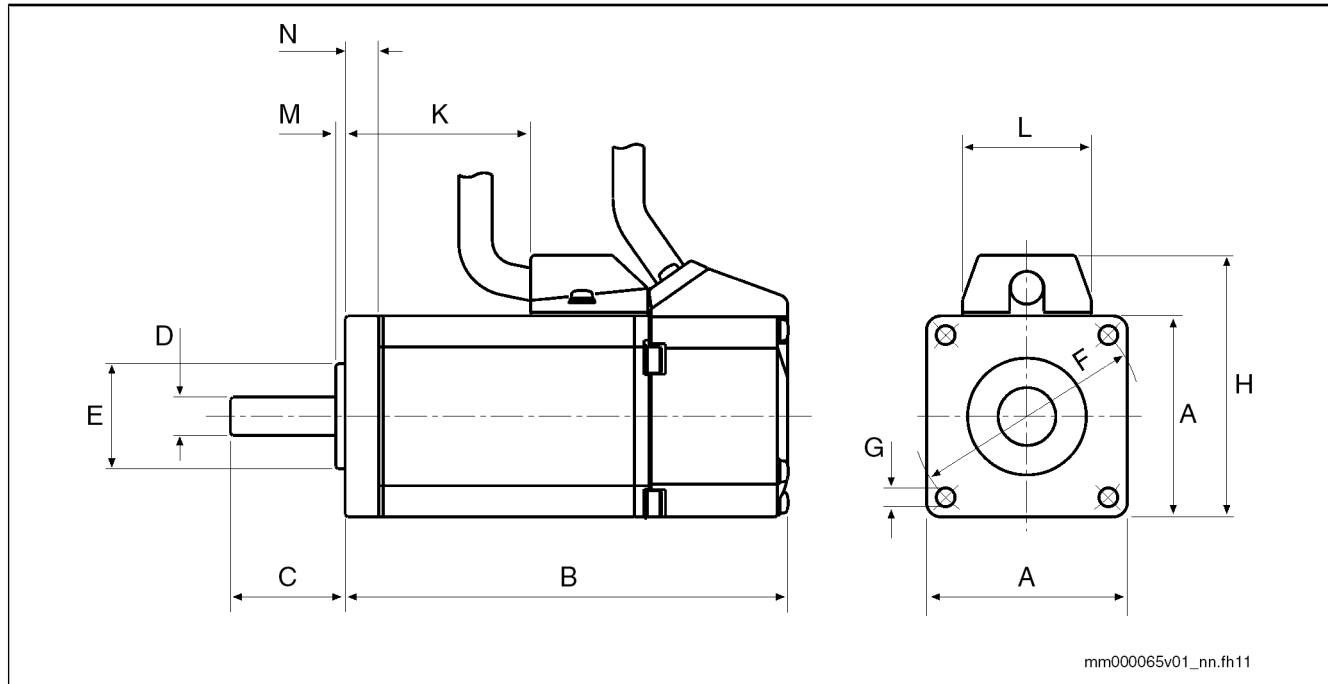


- ① M<sub>max</sub> IndraDrive Cs, supply 3 \* 230 V
- ② M<sub>max</sub> IndraDrive Cs, supply 3 \* 200 V -10%

Fig.4-15: Torque-Speed Characteristic

Technical Data

4.4.2 Dimensions MSM041



Motor	A	B	C	D	E	F	G	H	K	L	M	N
MSM041B-.....CH0	80	112	35	ø19 <sup>h6</sup>	ø70 <sup>h7</sup>	ø90±0.20	ø6	91	52.2	36	3	6
MSM041B-.....CH1	80	149	35	ø19 <sup>h6</sup>	ø70 <sup>h7</sup>	ø90±0.20	ø6	91	52.2	36	3	6

Fig.4-16: Dimensions MSM041

# 5 Motor Encoder

## Data Sheet - Encoder

Description	Symbol	Unit	GEBER-M0 (MSM)	
Battery box			No	Yes
Encoder design			Singleturn - absolute	Multiturn - absolute
Distinguishable revolutions			1	65,536
Incremental signals			Without	
Encoder resolution			17bit	17 + 16bit
System accuracy		"	±120	
Encoder accuracy differential		"	±40	
Encoder accuracy integral		"	±80	
Maximum encoder speed		min <sup>-1</sup>	6,000	
Supply voltage	VCC <sub>Encoder</sub>	V	4.75 ... 5.25	
Max. current consumption	I <sub>Encoder</sub>	mA	70	
Last modification: 2009-07-07				

" Angular seconds  
 Fig. 5-1: Encoder Data

### Singleturn Absolute Value Encoder

The singleturn absolute value encoder is used for absolute indirect position detection within 1 motor revolution.



The absolute axis position is lost after de-energization with this encoder variant.

### Multiturn Absolute Value Encoder

The multiturn absolute value encoder is used for absolute indirect position detection within 65,536 motor revolutions. It replaces a separate absolute value encoder at the motor.



With this encoder type, the absolute axis position is maintained due to its battery backup, even after the voltage has been switched off. When the motor is separated from the battery box, the information on the absolute axis position gets lost after approx. 1 minute.

### Details for Multiturn Signals

To use the multiturn-option, a buffer storage over an external battery is necessary. Therefore, the following accessory is available:

- SUP-E01\_MSM\_BATTERYBOX
- SUP\_E03\_DKC\*CS-BATTERY

### Service Life of the Encoder

When the MSM encoders are operated within the specified limiting data (ambient temperature: max. 70 °C, nominal speed 3,000 min<sup>-1</sup>, ...), the nominal bearing service life is:

**L<sub>10h</sub> = 20,000 operating hours**





## 6 Connection System

### 6.1 Connection for Power and Encoder

The connections for power and encoder of the MSM motors is made via flexible connection cables with connector (IP 54) and bayonet lock.

When connecting the connection cables, the bayonet lock must engage.

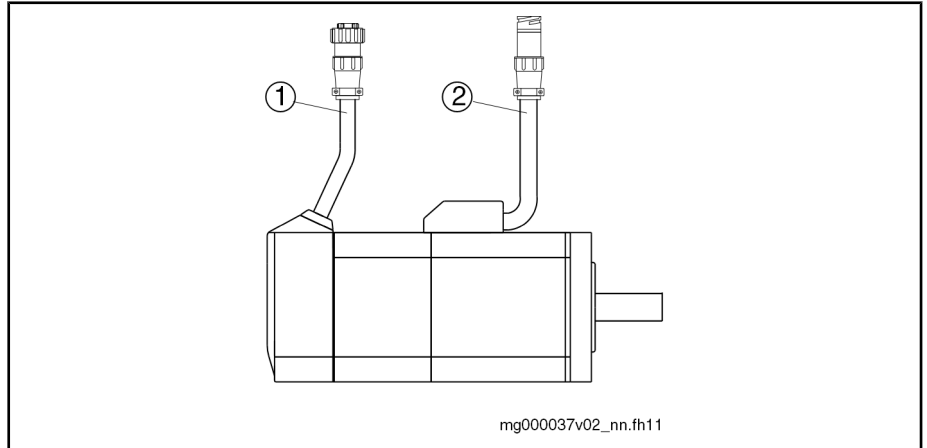


Fig. 6-1: MSM motor connection

For the length of the flexible connection cable, refer to the following table.

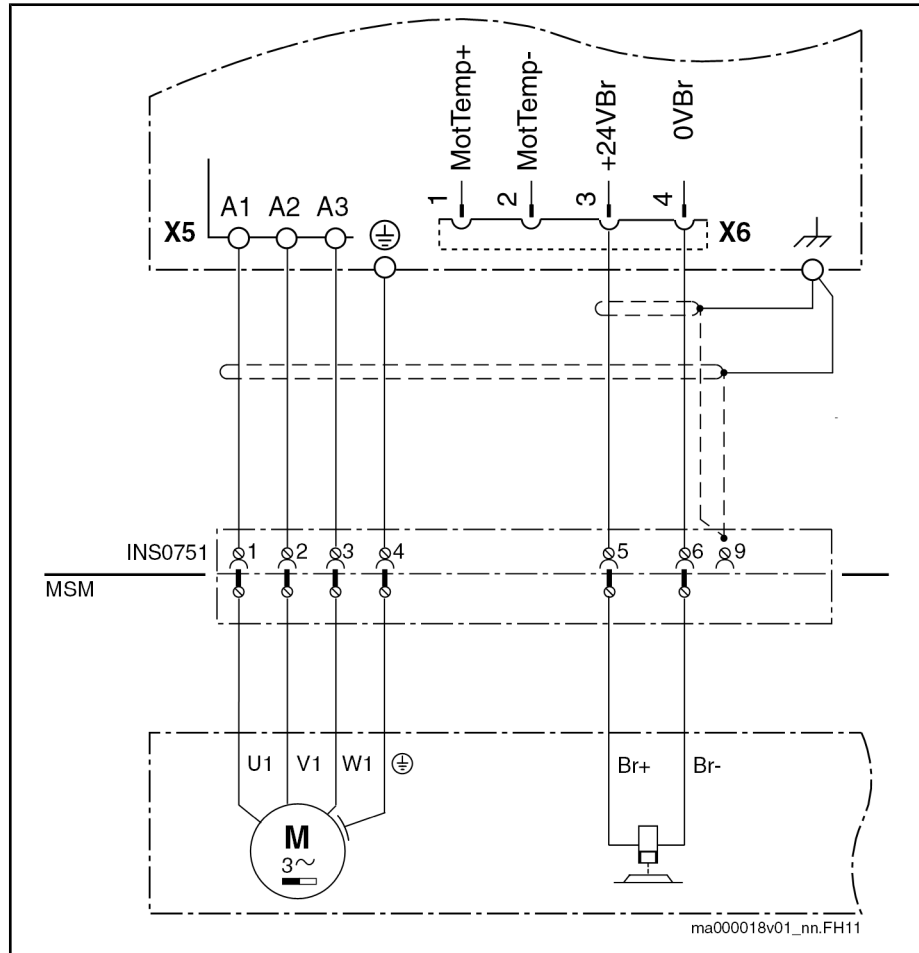
Motor	Length connection cable and connector	
	Performance ①	Encoder ②
MSM019	200 mm (+70 mm connector INS0757)	230 mm (+63 mm connector INS0758)
MSM031	200 mm (+70 mm connector INS0757)	220 mm (+63 mm connector INS0758)
MSM041	200 mm (+70 mm connector INS0757)	220 mm (+63 mm connector INS0758)

Fig. 6-2: MSM Motors: Connection Cable Length

## Connection System

## 6.2 Pin Assignment

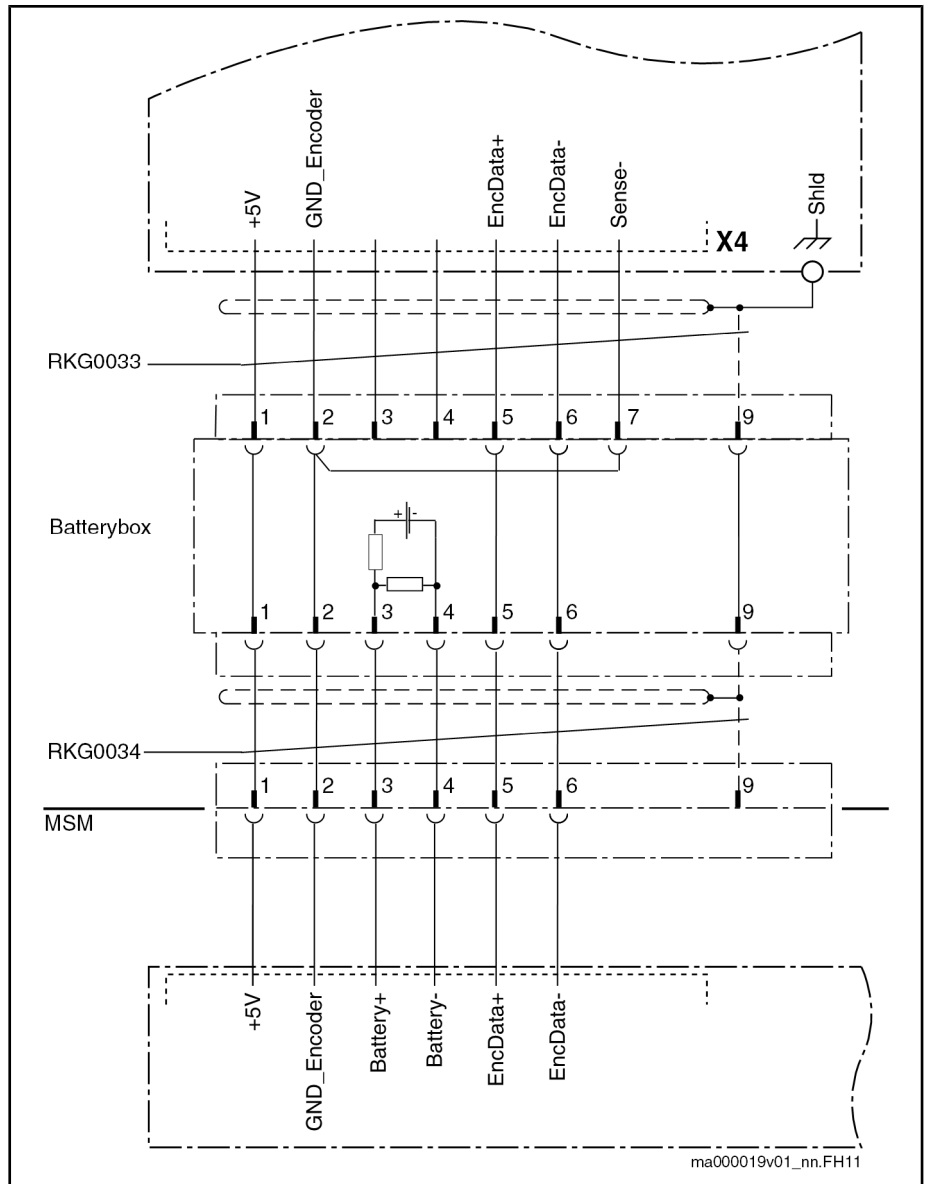
## Power Connection



Br Motor holding brake (can be ordered optionally, see type code)  
Fig.6-3: MSM Power Connection

Connection System

Encoder Connection



Batterybox necessary for multiturn-operation; not necessary for singleturn-operation

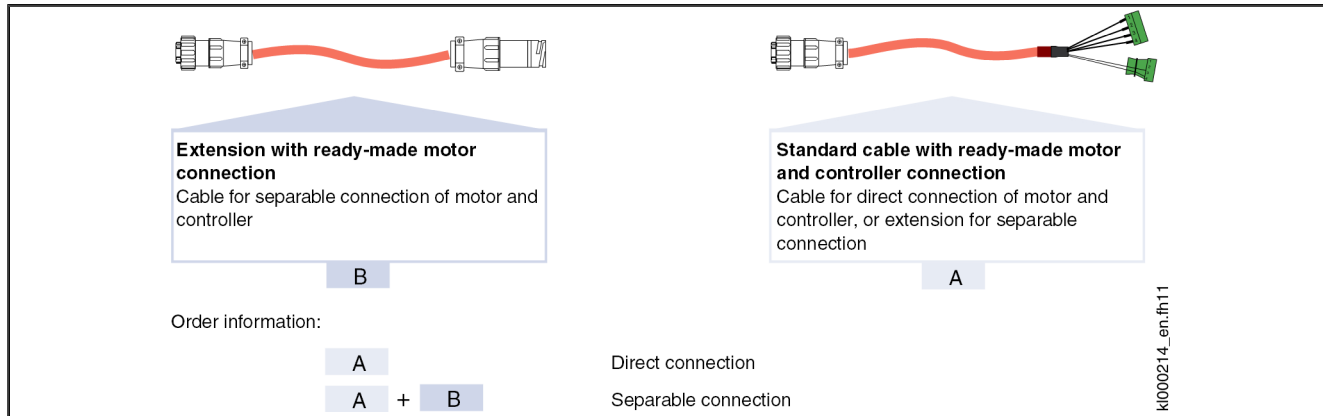
Fig.6-4: MSM Encoder Connection

Connection System

### 6.3 Ready-Made Connection Cable

#### 6.3.1 Power Cable

##### Overview



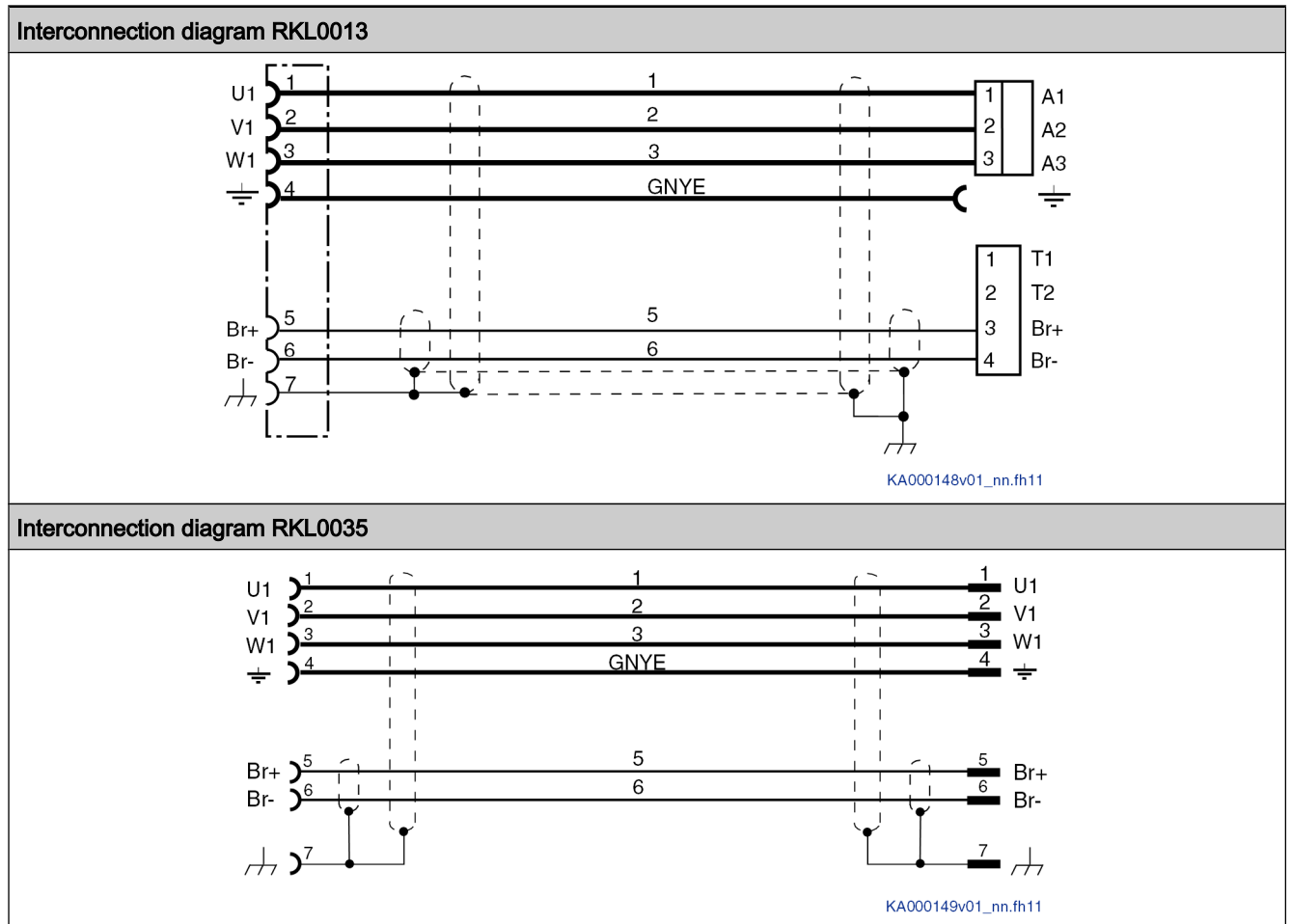
##### Selection

Power cable for 60K motor operation without fan unit <sup>1)</sup>

	HCS01.1E-...							
MSM	W0003	W0006	W0009	W0013	W0005	W0008	W0018	W0028
MSM019A	RKL0013 (RKL0035 extension optional)						-	-
MSM019B							-	-
MSM031B							-	-
MSM031C							-	-
MSM041B							-	-
	W0003	W0006	W0009	W0013	W0005	W0008	W0018	W0028

1) Motor operation with fan unit see cable selection DOK-CONNEC-CABLE\*INDRV-CAXx-xx-x  
 - Not possible  
 Fig.6-5: Power cable for converter HCS01 and MSM motors

### Interconnection diagram



### Technical Data of the Cables

#### Data Sheet - Bulk Cable

Description	Symbol	Unit	INK0670
Brief description of cable			[4x0.75mm <sup>2</sup> + (2x0.5mm <sup>2</sup> )StC]C
RoHS			
UL recognized (UL)			UL and CSA
UL files (UL)			
AWM style (UL)			
Diameter		mm	10.0 +/-0.4
Cross section of power wire		mm <sup>2</sup>	0.75
Material of cable jacket <sup>1)</sup>			PUR
Color of cable jacket			RAL 2003 (orange)
Specific cable weight	m	kg/m	0.132
Temperature range for storage		°C	-30°C to +40°C

Last modification: 2009-06-05

## Connection System

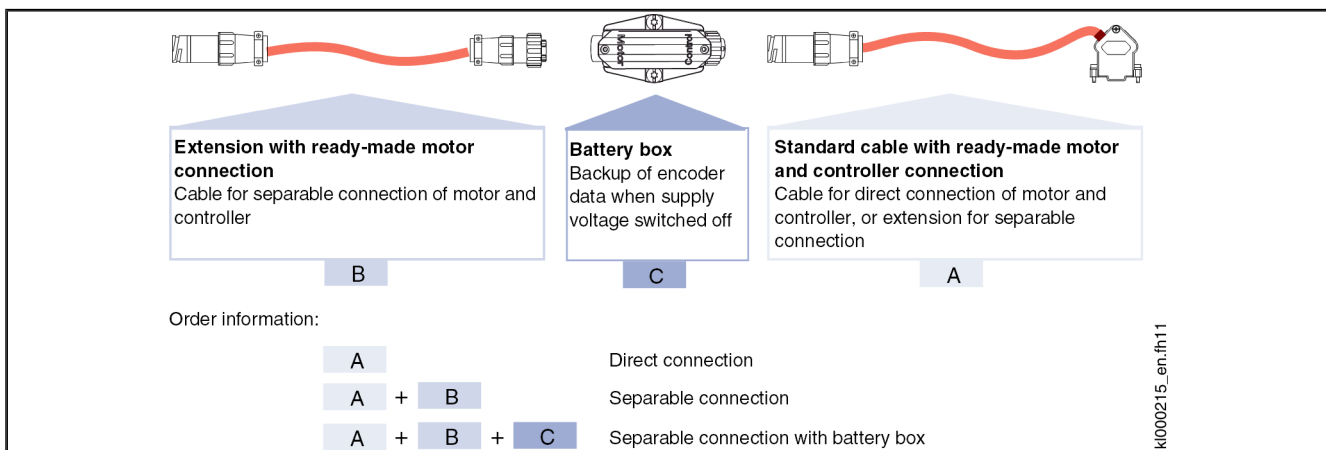
Description	Symbol	Unit	INK0670
Ambient temperature at operation (permanent installation)		°C	-30°C to +40°C
Ambient temperature at operation (flexible installation)		°C	-20°C to +40°C
Operating temperature at conductor (flexible/permanent)		°C	+80°C
Specific capacitance	$C_{Y\_K\_typ}$		
Conductor resistance at 20°C (EN 60228; class 6)	$R_{20}$	ohm/km	Acc. to VDE 0295 class 6
Operational voltage at power wires		V	300/500V (VDE); 600V/AC 80° (CUL)
Operational voltage at control wires		V	300/300V (VDE); 600V/AC 80° (CUL)
Suitable for application in flexible cable tracks			Yes
Bending cycles <sup>2)</sup>		mio.	Min. 5,000,000
Bending radius with flexible installation		mm	7.5 x AD
Bending radius with permanent installation		mm	5 x AD
Halogens			Halogen-free
Oil resistance			Acc. to DIN EN 60 811-2-1
Flammability			UL 758, section 40, Cable Flame Test Section 1061 acc. to UL 1581 and CSA C22.2 No. 210-05 Sec. 8.8.2 test acc. to DIN EN 60332-1-2

Last modification: 2009-06-05

- 1) Acc. to DIN EN 50363-10-2  
 2) Acceleration up to 10 m/s<sup>2</sup>; velocity up to 10 m/s; travel up to 50 m  
 Fig.6-6: *INK - Technical Data*

## 6.3.2 Encoder Cables

## Overview

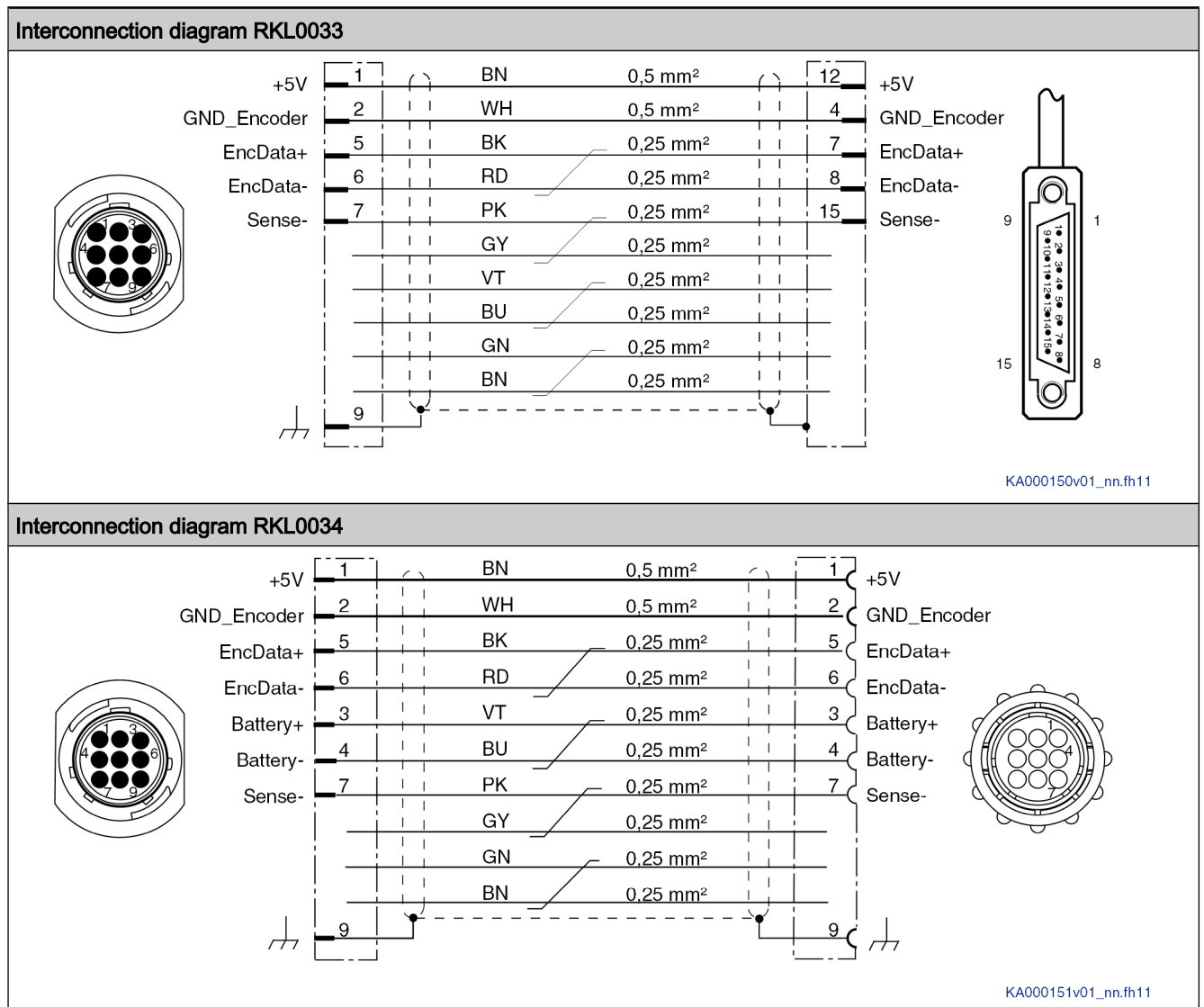


Selection

MSM	HCS01.1E-...							
	W0003	W0006	W0009	W0013	W0005	W0008	W0018	W0028
MSM019A	RKG0033 (RKG0034 extension optional)						-	-
MSM019B							-	-
MSM031B							-	-
MSM031C							-	-
MSM041B							-	-
	W0003	W0006	W0009	W0013	W0005	W0008	W0018	W0028

- Not possible  
 Fig. 6-7: Encoder Cable for Converter HCS01 and MSM Motors

Interconnection diagram



## Connection System

## Technical Data of the Cables

## Data Sheet - Bulk Cable

Description	Symbol	Unit	INK0448
Brief description of cable			(4x2x0.25mm <sup>2</sup> + 2x0.5mm <sup>2</sup> )C
RoHS			conform acc. to EU directive 2002/95/EG
UL recognized (UL)			UR, cUR
UL files (UL)			E140404; E42256; E73526
AWM style (UL)			20233, 20235
Diameter		mm	8.8 +/-0.3
Cross-section of control wire		mm <sup>2</sup>	0.25
Material of cable jacket <sup>1)</sup>			PUR (weakly adhesive, matt)
Color of cable jacket			RAL 2003 (orange)
Specific cable weight	m	kg/m	0.100
Temperature range for storage		°C	-30°C to +40°C
Ambient temperature at operation (permanent installation)		°C	-30°C to +40°C
Ambient temperature at operation (flexible installation)		°C	-20°C to +40°C
Operating temperature at conductor (flexible/permanent)		°C	+80°C / +90°C
Conductor resistance at 20°C (EN 60228; class 6)	R <sub>20</sub>	ohm/km	83.0 (0.25 mm <sup>2</sup> ) / 39.5 (0.5mm <sup>2</sup> )
Operational voltage at control wires		V	300/300V (VDE); 300V/AC (UL)
Suitable for application in flexible cable tracks			Yes
Bending cycles <sup>2)</sup>		mio.	5
Bending radius with flexible installation		mm	7.5 x D
Bending radius with permanent installation		mm	5 x D
Halogens			Halogen-free
Oil resistance			DIN EN 60 811-2-1 and HD 22.10 appendix A
Flammability			UL 758, section 40, Cable Flame Test Section 1061 acc. to UL 1581 and CSA C22.2 No. 210-05 Sec. 8.8.2 test acc. to DIN EN 60332-1-2
Last modification: 2009-06-05			

1) Acc. to DIN EN 50363-10-2

2) Acceleration up to 10 m/s<sup>2</sup>; velocity up to 10 m/s; travel up to 50 m

Fig.6-8: INK - Technical Data



## 7 Transport and Storage

### 7.1 Transport of the Motors

#### Ambient and Operating Conditions - Transport

Description	Symbol	Unit	Value
Temperature range	$T_{a\_tran}$	°C	-20 ... +80
Relative humidity		%	5 ... 95
Absolute humidity		g/m <sup>3</sup>	1 ... 60
Climatic category (IEC721)			2K3
Moisture condensation			Not allowed
Icing			Not allowed

Fig.7-1: Ambient and Operating Conditions - Transport

### 7.2 Storage of the Motors

#### Ambient and Operating Conditions - Storage

Description	Symbol	Unit	Value
Temperature range	$T_{a\_store}$	°C	-20 ... +60
Relative humidity		%	5 ... 95
Absolute humidity		g/m <sup>3</sup>	1 ... 29
Climatic category (IEC721)			1K3
Moisture condensation			Not allowed
Icing			Not allowed

Fig.7-2: Ambient and Operating Conditions - Storage



## 8 Assembly Kit

### Mounting Screws for Flange Mounting



Fastening screws are not in the scope of delivery.

The motors must be professionally and safely fastened to the machine. Use pan-head machine screws DIN 912 - M... x ... - 8.8 and the corresponding washers according to DIN EN 28738 for motor fastening. For some motors, it is not necessary to use washers, see table.



The screwed connections for flange assembly must be able to take up both the force due to weight of the motor and the forces acting during operation.

#### Recommended Screws for Flange Mounting of MSM Motors

	B05 (flange assembly)			
	Hole	Screw (8.8)		Washer DIN EN 28738
	Ø [mm]	Type <sup>1)</sup>	M <sub>GA</sub> [Nm]	Ø [mm]
MSM019	3.5	M3 x 16	1.3	None
MSM031	4.5	M4 x 20	3.1	None
MSM041	6.0	M5 x 20	6.1	None

① Mounting hole

M<sub>GA</sub> Tightening torque in Newton meters

1) Minimum screw length for screwing into steel.

Fig. 8-1: MSM Mounting Accessories (Flange Assembly)



If you use screws and washers different from the recommended ones, the property class of the screws and the hardness class of the washers must be equivalent to transmit the required tightening torques.



## 9 Environmental Protection and Disposal

### 9.1 Environmental Protection

<b>Production Processes</b>	The products are made with energy- and resource-optimized production processes which allow re-using and recycling the resulting waste. We regularly try to replace pollutant-loaded raw materials and supplies by more environment-friendly alternatives.														
<b>Prohibited Substances</b>	We guarantee that our products include no substances according to the chemicals-ban-decree. We furthermore declare that our products are free of mercury, asbestos, PCB and chlorinated hydrocarbons.														
<b>No Release of Hazardous Substances</b>	Our products do not contain any hazardous substances which may be released in the case of appropriate use. Normally, our products will not have any negativ influences on the environment.														
<b>Significant Components</b>	Basically, our products contain the following components: <table><tr><td><b>Electronic devices</b></td><td><b>Motors</b></td></tr><tr><td>• Steel</td><td>• Steel</td></tr><tr><td>• Aluminum</td><td>• Aluminum</td></tr><tr><td>• Copper</td><td>• Copper</td></tr><tr><td>• Synthetic materials</td><td>• Brass</td></tr><tr><td>• Electronic components and modules</td><td>• Magnetic materials</td></tr><tr><td></td><td>• Electronic components and modules</td></tr></table>	<b>Electronic devices</b>	<b>Motors</b>	• Steel	• Steel	• Aluminum	• Aluminum	• Copper	• Copper	• Synthetic materials	• Brass	• Electronic components and modules	• Magnetic materials		• Electronic components and modules
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• Steel	• Steel														
• Aluminum	• Aluminum														
• Copper	• Copper														
• Synthetic materials	• Brass														
• Electronic components and modules	• Magnetic materials														
	• Electronic components and modules														

### 9.2 Disposal

<b>Return of Products</b>	<p>Our products can be returned to our premises free of charge for disposal. It is a precondition, however, that the products are free of oil, grease or other dirt. Furthermore, the products returned for disposal must not contain any undue foreign material or foreign components.</p> <p>Send the products "free domicile" to the following address:</p> <p style="text-align: center;">Bosch Rexroth AG Electric Drives and Controls Buergermeister-Dr.-Nebel-Strasse 2 97816 Lohr am Main, Germany</p>
<b>Packaging</b>	<p>The packaging materials consist of cardboard, wood and polystyrene. These materials can be recycled anywhere without any problem.</p> <p>For ecological reasons, please refrain from returning the empty packages to us.</p>
<b>Recycling</b>	<p>Most of the products can be recycled due to their high content of metal. In order to recycle the metal in the best possible way, the products must be disassembled into individual modules.</p> <p>Metals contained in electric and electronic modules can also be recycled by means of special separation processes. The synthetic materials remaining after these processes can be thermally recycled.</p> <p>If the products contain batteries or accumulators, these have to be removed before recycling and disposed of.</p>



## 10 Service and Support

Our service helpdesk at our headquarters in Lohr, Germany, will assist you with all kinds of enquiries. Out of helpdesk hours please contact our German service department directly.

	Helpdesk	Service Hotline Germany	Service Hotline Worldwide
<b>Time</b> <sup>1)</sup>	Mo-Fr 7:00 am - 6:00 pm CET	Mo-Fr 6:00 pm - 7:00 am CET Sa-Su 0:00 am - 12:00 pm CET	Outwith Germany please contact our sales/service office in your area first.  For hotline numbers refer to the sales office addresses on the Internet.
<b>Phone</b>	+49 (0) 9352 40 50 60	+49 (0) 171 333 88 26 or +49 (0) 172 660 04 06	
<b>Fax</b>	+49 (0) 9352 40 49 41	–	
<b>e-mail</b>	<a href="mailto:service.svc@boschrexroth.de">service.svc@boschrexroth.de</a>	–	
<b>Internet</b>	<a href="http://www.boschrexroth.com">http://www.boschrexroth.com</a>		
	You will also find additional notes regarding service, maintenance (e.g. delivery addresses) and training.		

1) Central European Time (CET)

### Preparing Information

For quick and efficient help please have the following information ready:

- detailed description of the fault and the circumstances
- information on the type plate of the affected products, especially type codes and serial numbers
- your phone, fax numbers and e-mail address so we can contact you in case of questions.





# 11 Appendix

Electric Drives and Controls	Hydraulics	Linear Motion and Assembly Technologies	Pneumatics	Service																															
<h2 style="margin: 0;">Konformitätserklärung</h2> <p style="margin: 0;"><b>im Sinne der EG-Niederspannungsrichtlinie 2006/95/EG, Anhang III B</b></p> <p style="margin: 0;">Produkt/Product/Produit: MSM</p>				<p style="margin: 0;"><b>TC 30321-1</b></p> <p style="margin: 0;">2008-11-28</p>																															
<hr/> <p style="margin: 0;"><b>Declaration of Conformity as per EC Low-Voltage directive 2006/95/EC, Attachment III B</b></p> <p style="margin: 0;"><b>Déclaration du fabricant conformément à la directive "CE" relative à la basse tension 2006/95/EC, Annexe III B</b></p>																																			
Hiermit erklären wir in alleiniger Verantwortung, dass das Produkt		Assuming sole responsibility, we herewith declare that the product		Par la présente, nous déclarons sous notre propre et unique responsabilité que le produit																															
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 5%;"><b>1</b></td> <td style="width: 35%;"> <b>Produkt:</b>  <b>Product:</b>  <b>Produit:</b> </td> <td style="width: 60%;">                     AC-Motor                      AC motor                      Moteur AC                 </td> </tr> <tr> <td><b>2</b></td> <td> <b>Hersteller:</b>  <b>Manufacturer:</b>  <b>Constructeur:</b> </td> <td>                     Bosch Rexroth Electric Drives and Controls GmbH                      Bürgermeister-Dr.-Nebel-Straße 2                      97816 Lohr a. Main                      Germany                 </td> </tr> <tr> <td><b>3</b></td> <td> <b>Typ:</b>  <b>Type:</b>  <b>Type:</b> </td> <td> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">MSM019</td> <td>MSM020</td> </tr> <tr> <td>MSM030</td> <td>MSM031</td> </tr> <tr> <td>MSM040</td> <td>MSM041</td> </tr> </table> </td> </tr> <tr> <td><b>4</b></td> <td> <b>ab Herstellungsdatum:</b>  <b>from date of manufacture:</b>  <b>à partir de la date de fabrication:</b> </td> <td style="text-align: center;">2003-01-01</td> </tr> <tr> <td><b>5</b></td> <td colspan="2"> <b>Angewendete Normen / Applicable standard / Normes utilisées</b>  <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Norm / Standard / Norme</u></th> <th style="text-align: left;"><u>Titel / Title / Titre</u></th> <th style="text-align: left;"><u>Ausgabe / Edition</u></th> </tr> </thead> <tbody> <tr> <td>EN 60034-1</td> <td>Rotating electrical machines – Part 1: Ratings and performance</td> <td>2004</td> </tr> <tr> <td>EN 60034-5</td> <td>Rotating electrical machines – Part 5: Degrees of protection provided by integral design of rotating electrical machines (IP-Code) - Classification</td> <td>2001 + A1:2007</td> </tr> </tbody> </table> </td> </tr> </table>						<b>1</b>	<b>Produkt:</b> <b>Product:</b> <b>Produit:</b>	AC-Motor AC motor Moteur AC	<b>2</b>	<b>Hersteller:</b> <b>Manufacturer:</b> <b>Constructeur:</b>	Bosch Rexroth Electric Drives and Controls GmbH Bürgermeister-Dr.-Nebel-Straße 2 97816 Lohr a. Main Germany	<b>3</b>	<b>Typ:</b> <b>Type:</b> <b>Type:</b>	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">MSM019</td> <td>MSM020</td> </tr> <tr> <td>MSM030</td> <td>MSM031</td> </tr> <tr> <td>MSM040</td> <td>MSM041</td> </tr> </table>	MSM019	MSM020	MSM030	MSM031	MSM040	MSM041	<b>4</b>	<b>ab Herstellungsdatum:</b> <b>from date of manufacture:</b> <b>à partir de la date de fabrication:</b>	2003-01-01	<b>5</b>	<b>Angewendete Normen / Applicable standard / Normes utilisées</b> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;"><u>Norm / Standard / Norme</u></th> <th style="text-align: left;"><u>Titel / Title / Titre</u></th> <th style="text-align: left;"><u>Ausgabe / Edition</u></th> </tr> </thead> <tbody> <tr> <td>EN 60034-1</td> <td>Rotating electrical machines – Part 1: Ratings and performance</td> <td>2004</td> </tr> <tr> <td>EN 60034-5</td> <td>Rotating electrical machines – Part 5: Degrees of protection provided by integral design of rotating electrical machines (IP-Code) - Classification</td> <td>2001 + A1:2007</td> </tr> </tbody> </table>		<u>Norm / Standard / Norme</u>	<u>Titel / Title / Titre</u>	<u>Ausgabe / Edition</u>	EN 60034-1	Rotating electrical machines – Part 1: Ratings and performance	2004	EN 60034-5	Rotating electrical machines – Part 5: Degrees of protection provided by integral design of rotating electrical machines (IP-Code) - Classification	2001 + A1:2007
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einschließlich des erforderlichen Zubehörs den Bestimmungen der EG-Richtlinie 2006/95/EG entspricht.		including the accessories required, complies with the requirements specified by EC directive 2006/95/EC.		accessoires nécessaires compris, satisfait aux dispositions de la directive CE 2006/95/EC.																															
<p style="margin: 0;"><u>Erläuterungen:</u>                  Dieses Produkt ist eine Einbaueinheit, die auf Grund ihrer Einbaueigenschaften nicht vomeherein den Vorschriften für Endgeräte, Maschinen oder Anlagen entsprechen kann. Es darf daher nur zu Einbauzwecken verwendet werden.</p> <p style="margin: 0;">Die Bewertung der elektrischen und mechanischen Sicherheit, der Umwelteinflüsse (Fremdkörper, Feuchtigkeit) muss im eingebauten Zustand am Endprodukt erfolgen.</p>		<p style="margin: 0;"><u>Explanatory notes:</u>                  This product is a built-in unit which, owing to its installation characteristics, is not able to comply with the regulations for complete apparatus, machines or installations from the outset. For this reason, it may only be used for built-in purposes.</p> <p style="margin: 0;">The product may only be assessed with regard to its electrical and mechanical safety as well as to environmental effects (foreign bodies, moisture) after it has been installed in the product intended for the final user.</p>		<p style="margin: 0;"><u>Explications:</u>                  Ce produit est un composant devant être encastré et qui, en tant que tel, peut ne pas correspondre aux prescriptions imposées pour appareils finaux, machines ou installations. En conséquence, ce produit ne doit être utilisé qu'à l'état encastré.</p> <p style="margin: 0;">L'évaluation de la sécurité électrique et mécanique ainsi que celle de l'influence exercée par des conditions ambiantes extérieures (corps étrangers, humidité) doivent être effectuées sur l'appareil final, après encastrement du produit.</p>																															
<p style="margin: 0;"><b>Bosch Rexroth Electric Drives and Controls GmbH</b>                  Bürgermeister-Dr.-Nebel-Straße 2 • 97816 Lohr a. Main                  Germany</p>																																			
					Page 1 / 2																														

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Fig. 11-1: Declaration of conformity 1/2

## Appendix

Konformitätserklärung / Declaration of Conformity / Déclaration du fabricant conformément

Page 2 / 2

**MSM****TC 30321-1** : 2008-11-28

Im eingebauten Zustand können sich die EMV-Eigenschaften dieses Produktes ändern. Deshalb ist für das Endprodukt (Endgerät, Maschine, Anlagen) eine Überprüfung der EMV-Eigenschaften durch den Endprodukt-hersteller zweckmäßig.

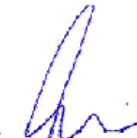
After the product has been installed, its EMC properties may change. Hence the product intended for the final user (complete apparatus, machines or installations) should be inspected with regard to its EMC properties by the manufacturer of the product intended for the final user.

En état monté, les propriétés CEM du présent produit peuvent subir des modifications. C'est pourquoi, il est recommandé au constructeur du produit final (appareils, machines, installations où est intégré le présent produit) d'effectuer un nouveau contrôle des propriétés CEM du produit final.

Lohr a. Main , den  
Ort/place/lieu

2008-11-28  
Datum/date

i.V.



Michael Steinbrecher  
Leiter Qualitäts-Management/  
Head of Quality Management/  
Directeur Gestion Qualité

i.V.



Eberhard Schemm  
Entwicklungsbereichsleiter Antriebe/  
Head of Development Drives/  
Directeur Développement

Änderungen im Inhalt der Konformitätserklärung sind vorbehalten. Derzeit gültige Ausgabe auf Anfrage.  
We reserve the right to make changes in the conformity declaration. Presently applicable edition can be obtained upon request.  
Le fabricant se réserve le droit de modifier le contenu de la déclaration. Edition actuellement en vigueur demande.

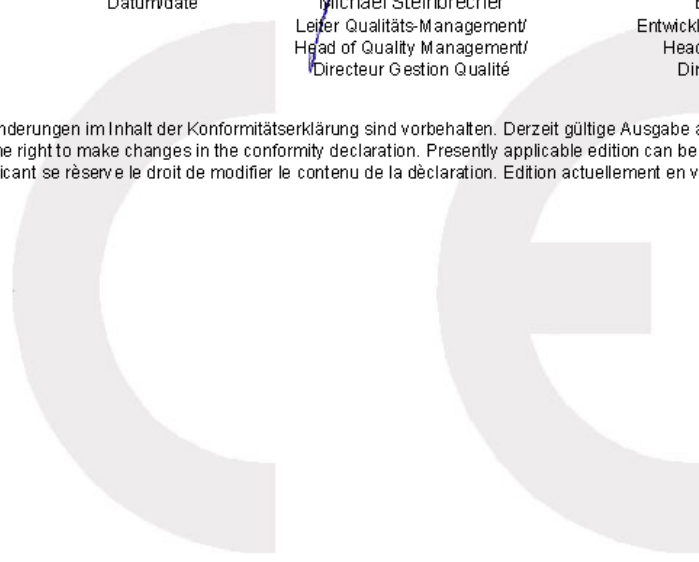


Fig. 11-2: Declaration of conformity 2/2

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# Notes

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