rexroth
A Bosch Company

Product information
Edition 07

Motor cables and connections

with IndraDrive

R911401938

Change notice edition 07

- Auxiliary motor power & adapter cables with different plug sizes and cross-sections
- New hybrid cables RH2 with cross-section 2,5 mm²
- Cables for kit motors and BA1N
- Some updates in text and layout

Legal note

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Table of contents

1. Product information

1.1. Cables overview

Rexroth motors connect to drive controllers with ready-made cables for motor power, encoders or with hybrid cables, combining both power and encoder function. Following product lines are currently available:

Cable type	Motor	Drive Controller	Cable product line	Extension cable
Power cable	MS2N	IndraDrive (HMS, HMD, HCS)	RL2	RL2-5...
		IndraDrive Cs (HCS01)		
		IndraDrive Mi (KSM)		
		EFC5610	RLB3	
		MTX micro	RLB4	
	1MB/MBS/MBT/MLF	IndraDrive/ IndraDrive Cs/ IndraDrive Mi	RL2	RL2-5...
	ML3		RLC1	RLC1-5...
	BA1N		RL2	RL2-5...
Encoder cable	MS2N	All	RG2	RG2-5...
Hybrid cable	MS2N, MS2E	IndraDrive (HMS, HMD, HCS)	RH2	RH2-5...
		IndraDrive Cs (HCS01)		
		IndraDrive Mi (KSM)		
		MTX micro	RHB4	

Cable selection in combination with Rexroth drive & control equipment requires consulting the product manuals of the equipment, concerning cable length restrictions or installation of auxiliar components. Observe cable length specifications and other cable information given by these manuals.

All Rexroth product manuals are available online on www.boschrexroth.com/mediadirectory.

1.2. Product warranty and safety

The cable material, cable design and cable shield system of genuine Rexroth-cables are tailor-made and 100% tested for the indicated combinations of motors and drive controllers. Any modification on these cables may cause functional faults, unsafe operation or equipment damage.

The same applies if using self-made cables or third-party cables and connectors with Bosch Rexroth equipment. Bosch Rexroth does not provide any kind of coverage, warranty or liability for safety, operability or functions of the entire drive and control equipment if third party or self-made cables, connectors or modified components are used, also for any case of service actions and resulting costs connected to the use of such components.

1.3. Cable type code RL2, RG2, RH2

Sample type RL2-001CBB-NN-005,0

R	L	2	-	0	0	1	C	B	B	-	N	N	-	0	0	5	,	0

R L 2	Power cable	→ encoder cable RG2, hybrid cable RH2
0 0 1	Cable number	→ cable number assigned to a specific drive-motor combination, see selection list references in following chapters
C	Code for cable cross-section	→ optional codes see list in chapter 9.1
B	Cable type, defined by Rexroth	
B	Cable design option "B" option "T"	→ "Basic", standard for all cross-sections → "Torsion-proof", available only for power cable RL2 with 1,0 mm² cross-section and encoder cable RG2
N N	*not specified*	
0 0 5 , 0	sample length 5,0 m	→ all lengths orderable from 0,5 m minimum length with 0,1 m increment

1.4. Cable type code RL, RH

Sample type RLB4-001CBB-NN-005,0

R	L	B	4	-	0	0	1	C	B	B	-	N	N	-	0	0	5	,	0

RL, RH	Power cable, Hybrid cable	→ optional RLB3, RLB4, RHB4
B	Motor reference	B = MS2N, MS2E
4	Controller reference	3 = EFC, 4 = MTXµ
0 0 1	Cable number	→ cable number assigned to a specific drive-motor combination, see selection lists in following chapters
C	Code for cable cross-section	→ optional codes see list in chapter 9.1
B	Cable type, defined by Rexroth	
B	Cable design option "B" option "T"	→ "Basic", standard for all cross-sections → "Torsion-proof", available only for power cable RL2 with 1,0 mm² cross-section and encoder cable RG2
N N	*not specified*	
0 0 5 , 0	sample length 5,0 m	→ all lengths orderable from 0,5 m minimum length with 0,1 m increment

1.5. Cable selection

Choose suitable sheet for cable selection from following chapters → choose motor or encoder type from left column in list → choose drive controller or encoder interface column → pick indicated cable number → complete cable type code and add desired length

Note the yellow markings in selection table indicating certain limitations:

- If the drive controller's rated current is lower than the rated current of the motor, then the cable cross-section does not need to be larger than necessary for the drive controller's current.
- If the motor's rated current is lower than the drive controller's current, then the motor determines the necessary cable cross-section.
- Cable cross-sections and the reference type code are indicated in chapter *9.1 Cable cross-sections*.

Some new cable types have already been added to the selection list, but might not be orderable yet at the time this document has been published. Before finalizing equipment and order scope, please check the availability of desired cable types and lengths.

1.6. Cable extensions

The entire cable line between drive controller and motor can be set up with one cable only or with a limited number of extension segments. Extension cable segments could be practical e.g. when using moving cable carriers.

Within a cable line, the lengths of all cable segments are added for total cable length L (see *9.5.1 Total cable length L* for definitions). The maximum permissible cable length and the number of cable segments for a specific drive-motor-combination depend on individual conditions:

- Technical specification of drive controller or interface
- PWM-frequency used for this axis
- EMC conditions on site

Note:

→ The maximum cable length permitted for a specific drive-motor combination applies for the total length of all cable segments in this axis. Additional extension cables must not exceed the permissible maximum length for the entire cable line.
→ Observe the specifications from the drive controller manuals and do not exceed indicated limits.

Exceeding the permissible cable length for your specific equipment may cause an unsafe operational state. If you are in doubt about length limits for your individual configuration contact your Bosch Rexroth sales partner for assistance.

Following illustrations show the schematic arrangement of power cables. Extensions for encoder and hybrid cables are similar to cables with power plug.

1.6.1. Cable arrangement for motors with power plug

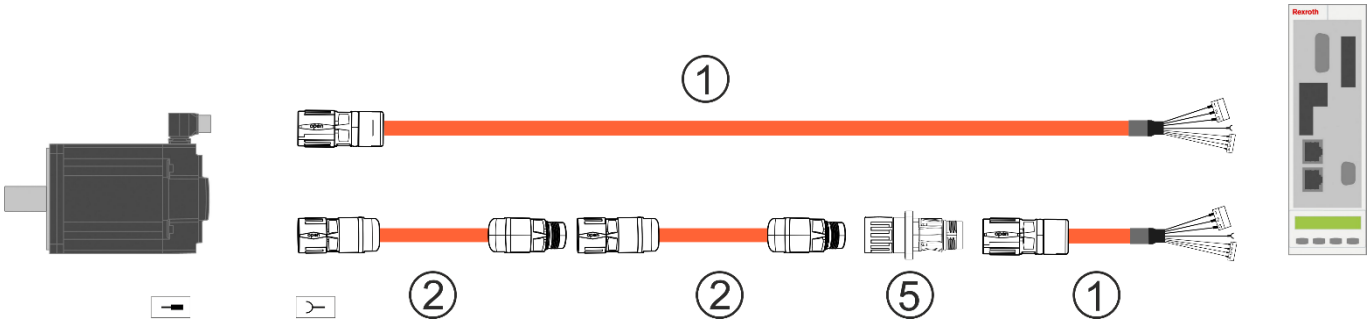


Figure 1-1 Cable extensions plugs

Standard connection:	Use standard cable ① as indicated in selection list
Extensions:	Add extension cable ② from cable selection list at motor side and connect to standard cable ①.
More extension:	Add optional cable segment ② of identical type in between.
Panel feed-through	Add optional accessory connector ⑤, no change of cable segment or cable type. (see chapter *12.1 Accessories* for details)

1.6.2. Cable arrangements for motors with terminal box

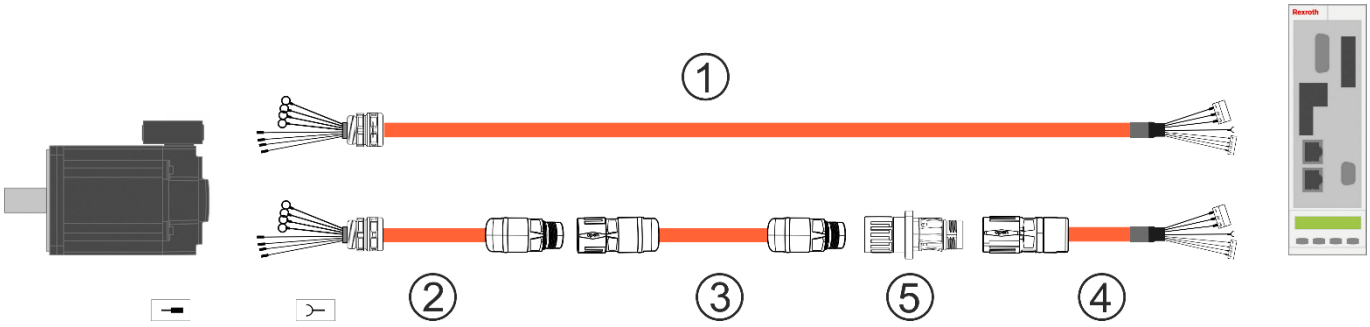


Figure 1-2 Cable extensions terminal box

Standard connection:	Use standard cable ① as indicated in selection list
Extensions:	Add first extension cable ② from selection list at motor side and connect to standard power cable ④. Choose power cable ④ from standard selection list with respect to motor and drive controller type.
More extensions:	Add optional cable segments ③ of new type in between. Get this type from the selection list of extension cables, observe cable cross-section and plug size selection.
Panel feed-through	Add optional accessory connector ⑤, no change of cable segment or cable type. (see chapter *12.1 Accessories* for details)

2. Power cables for MS2N with IndraDrive

For general selection of cables following pages present several lists. These lists are separated in individual sheets:

- Power cables RL2
  - 60K operation
  - 100K operation
  - force-ventilated motors
  - water-cooled motors
- Encoder cables RG2
- Hybrid cables RH2 for motors with single-cable connection

Some power cable types RL2 with 1,0 mm² cross-section and some encoder cables RG2 are available in torsion-proof design, also the respective extension cables. See selection lists and cable data sheets for details.

- RL2-xxxxxB-NN-xxx,x - Basic cable type
- RL2-xxxxxT-NN-xxx,x - Torsion cable type

2.1. RL2 power cables for 60K operation

Power cable | Leistungskabel RL2-xxxxx**B**-NN-xxx,x - Basic RL2-xxxxx**T**-NN-xxx,x - Torsion				HCS01.1E-W0003 HCS01.1E-W0005 HCS01.1E-W0006 HCS01.1E-W0008 HCS01.1E-W0009 HCS01.1E-W0013	HCS02.1E-W0012 HCS02.1E-W0028 HMD01.1N-W0012 HMD01.1N-W0020 HMD01.1N-W0036 HMS01.1N-W0020 HMS01.1N-W0036 HMS02.1N-W0028	HCS01.1E-W0018 HCS01.1E-W0028	HCS01.1E-W0054	HCS02.1E-W0054 HCS02.1E-W0070 HCS03.1E-W0070 HMS01.1N-W0054 HMS01.1N-W0070 HMS02.1N-W0054	HCS03.1E-W0100 HCS03.1E-W0150 HMS01.1N-W0110 HMS01.1N-W0150 HMS01.1N-W0210 HMS01.1N-W0300	HCS03.1E-W0210 HCS03.1E-W0280 HCS03.1E-W0350	HMS01.1E-W0350	KMS03.1	KMS02.1	Extension Verlängerung
60K Self cooling N Selbstkühlung N	∅ [mm²]	Plug Stecker	Type Code Typenschlüssel	RLS0745	RLS0722	RLS0746	RLS0749	RLS0721	RLS0723	RLS0724	RLS0727	RLS0725	RLS2302		
MS2N03-B0BY	1,0	M17	D	001CBB 001CBT	002CBB 002CBT	003CBB 003CBT	004CBB 004CBT	005CBB 005CBT				009CBB 009CBT	010CBB 010CBT		500CBB 500CBT
MS2N03-D0BY	1,0	M17	D												
MS2N04-B0BN	1,0	M17	D												
MS2N04-B0BT	1,0	M17	D												
MS2N04-C0BN	1,0	M17	D												
MS2N04-C0BT	1,0	M17	D												
MS2N04-D0BH	1,0	M17	D												
MS2N04-D0BQ	1,0	M17	D												
MS2N05-B0BN	1,0	M17	D												
MS2N05-B0BT	1,0	M17	D												
MS2N05-C0BN	1,0	M17	D												
MS2N05-C0BT	1,0	M17	D												
MS2N05-D0BH	1,0	M17	D												
MS2N05-D0BR	1,0	M17	D												
MS2N06-B1BN	1,0	M23	U	021CBB 021CBT	022CBB 022CBT	023CBB 023CBT	024CBB 024CBT	025CBB 025CBT				029CBB 029CBT	521CBB 521CBT	542DB	KMS02: 521CBB 521CBT 542EB
MS2N06-C0BN	1,0	M23	U												
MS2N06-C0BT	1,0	M23	U												
MS2N06-D0BN	1,0	M23	U												
MS2N06-D0BR	1,0	M23	U												
MS2N06-D0BT	1,0	M23	U												
MS2N06-D1BN	1,0	M23	U												
MS2N06-E0BH	1,0	M23	U												
MS2N06-E0BR	1,0	M23	U												
MS2N07-B1BN	1,0	M23	U												
MS2N07-C0BN	1,0	M23	U												
MS2N07-C0BQ	1,0	M23	U												
MS2N07-C1BN	1,0	M23	U												
MS2N07-C1BR	1,0	M23	U												
MS2N07-D0BH	1,0	M23	U												
MS2N07-D0BN	1,0	M23	U												
MS2N07-D1BH	1,0	M23	U												
MS2N07-D1BN	1,0	M23	U												
MS2N07-E0BH	1,0	M23	U												
MS2N07-E1BH	1,0	M23	U												
MS2N10-B1BQ	1,0	M23	U												
MS2N07-E0BN	1,5	M40	V		042DB	043DB	044DB	045DB	046DB			049DB	541CBB 541CBT	542DB	KMS02: 521CBB 521CBT 542EB
MS2N07-E1BN	1,5	M40	V												
MS2N10-C0BH	1,5	M40	V												
MS2N10-C1BH	1,5	M40	V												
MS2N10-D1BF	1,5	M40	V												
MS2N10-F1BD	1,5	M40	V												
MS2N07-D0BR	2,5	M40	V		042EB	043DB	044EB	045EB	046EB			049EB	541CBB 541CBT	542EB	
MS2N07-E0BQ	2,5	M40	V												
MS2N10-C0BN	2,5	M40	V												
MS2N10-C1BN	2,5	M40	V												
MS2N10-D0BH	2,5	M40	V												
MS2N10-E1BF	2,5	M40	V												
MS2N10-F0BD	2,5	M40	V												
MS2N10-D0BN	4,0	M40	V		042EB	043DB	044EB	045FB	046FB			049EB		542FB	
MS2N10-D1BN	4,0	M40	V												
MS2N10-E0BH	4,0	M40	V												
MS2N10-E0BN	6,0	M58	A or B					065GB	066GB					563GB	
MS2N10-E1BN	6,0	M58	A or B												
MS2N10-F0BH	6,0	M58	A or B												
MS2N10-F1BH	6,0	M58	A or B												

Cable cross-section limited by rated current of motor or drive controller | Kabelquerschnitt begrenzt durch Motor- oder Regelgerätenennstrom

2.2. RL2 power cables for 100K operation

Power cable | Leistungskabel RL2-xxxxx**B**-NN-xxx,x - Basic RL2-xxxxx**T**-NN-xxx,x - Torsion				HCS01.1E-W0003 HCS01.1E-W0005 HCS01.1E-W0006 HCS01.1E-W0008 HCS01.1E-W0009 HCS01.1E-W0013	HCS02.1E-W0012 HCS02.1E-W0028 HMD01.1N-W0012 HMD01.1N-W0020 HMD01.1N-W0036 HMS01.1N-W0020 HMS01.1N-W0036 HMS02.1N-W0028	HCS01.1E-W0018 HCS01.1E-W0028	HCS01.1E-W0054	HCS02.1E-W0054 HCS02.1E-W0070 HCS03.1E-W0070 HMS01.1N-W0054 HMS01.1N-W0070 HMS02.1N-W0054	HCS03.1E-W0100 HCS03.1E-W0150 HMS01.1N-W0110 HMS01.1N-W0150 HMS01.1N-W0210 HMS01.1N-W0300	HCS03.1E-W0210 HCS03.1E-W0280 HCS03.1E-W0350	HMS01.1E-W0350	KMS03.1	KMS02.1		
100K Self cooling N Selbstkühlung N	∅ [mm²]	Plug Stecker	Type Code Typenschlüssel	RLS0745	RLS0722	RLS0746	RLS0749	RLS0721	RLS0723	RLS0724	RLS0727	RLS0725	RLS2302	Extension Verlängerung	
MS2N03-B0BY	1,0	M17	D	001CBB 001CBT	002CBB 002CBT	003CBB 003CBT	004CBB 004CBT	005CBB 005CBT				009CBB 009CBT	010CBB 010CBT	500CBB 500CBT	
MS2N03-D0BY	1,0	M17	D												
MS2N04-B0BN	1,0	M17	D												
MS2N04-B0BT	1,0	M17	D												
MS2N04-C0BN	1,0	M17	D												
MS2N04-C0BT	1,0	M17	D												
MS2N04-D0BH	1,0	M17	D												
MS2N04-D0BQ	1,0	M17	D												
MS2N05-B0BN	1,0	M17	D												
MS2N05-B0BT	1,0	M17	D												
MS2N05-C0BN	1,0	M17	D												
MS2N05-C0BT	1,0	M17	D												
MS2N05-D0BH	1,0	M17	D												
MS2N05-D0BR	1,0	M17	D												
MS2N06-B1BN	1,0	M23	U	021CBB 021CBT	022CBB 022CBT	023CBB 023CBT	024CBB 024CBT	025CBB 025CBT				029CBB 029CBT	521CBB 521CBT	521CBB 521CBT	
MS2N06-C0BN	1,0	M23	U												
MS2N06-C0BT	1,0	M23	U												
MS2N06-D0BN	1,0	M23	U												
MS2N06-D0BR	1,0	M23	U												
MS2N06-D1BN	1,0	M23	U												
MS2N06-E0BH	1,0	M23	U												
MS2N07-B1BN	1,0	M23	U												
MS2N07-C0BN	1,0	M23	U												
MS2N07-C0BQ	1,0	M23	U												
MS2N07-C1BN	1,0	M23	U												
MS2N07-C1BR	1,0	M23	U												
MS2N07-D0BH	1,0	M23	U												
MS2N07-D1BH	1,0	M23	U												
MS2N07-D1BN	1,0	M23	U												
MS2N07-E1BH	1,0	M23	U												
MS2N06-D0BT	1,5	M23	U		022DB	023CB	024DB	025DB				029DB	521CBB 521CBT	521DB	KMS02: 521CBB 521CBT
MS2N06-E0BR	1,5	M23	U												
MS2N07-D0BN	1,5	M23	U												
MS2N07-E0BH	1,5	M23	U												
MS2N10-B1BQ	1,5	M23	U												
MS2N10-C0BH	1,5	M40	V		042DB	043DB	044DB	045DB	046DB			049DB	541CBB 541CBT	542DB	
MS2N10-C1BH	1,5	M40	V												
MS2N07-D0BR	2,5	M40	V		042EB	043DB	044EB	045EB	046EB			049EB		542EB	
MS2N07-E0BN	2,5	M40	V												
MS2N07-E1BN	2,5	M40	V												
MS2N10-C0BN	2,5	M40	V												
MS2N10-C1BN	2,5	M40	V												
MS2N10-D1BF	2,5	M40	V												
MS2N10-E1BF	2,5	M40	V												
MS2N10-F0BD	2,5	M40	V												
MS2N10-F1BD	2,5	M40	V												
MS2N07-E0BQ	4,0	M40	V		042EB	043DB	044EB	045FB	046FB			049EB		542FB	
MS2N10-D0BH	4,0	M40	V												
MS2N10-D0BN	6,0	M40	V		042EB	043DB	044EB	045GB	046GB			049EB		542GB	
MS2N10-D1BN	6,0	M40	V												
MS2N10-E0BH	6,0	M40	V												
MS2N10-E0BN	10,0	M58	A or B					065HB	066HB	067HB				563HB	
MS2N10-E1BN	10,0	M58	A or B												
MS2N10-F0BH	10,0	M58	A or B												
MS2N10-F1BH	10,0	M58	A or B												

Cable cross-section limited by rated current of motor or drive controller | Kabelquerschnitt begrenzt durch Motor- oder Regelgerätenennstrom

2.3. RL2 power cables for force-ventilated motors with plug

Power cable | Leistungskabel RL2-xxxxx**B**-NN-xxx,x - Basic				HCS01.1E-W0003 HCS01.1E-W0005 HCS01.1E-W0006 HCS01.1E-W0008 HCS01.1E-W0009 HCS01.1E-W0013	HCS02.1E-W0012 HCS02.1E-W0028 HMD01.1N-W0012 HMD01.1N-W0020 HMD01.1N-W0036 HMS01.1N-W0020 HMS01.1N-W0036 HMS02.1N-W0028	HCS01.1E-W0018 HCS01.1E-W0028	HCS01.1E-W0054	HCS02.1E-W0054 HCS02.1E-W0070 HCS03.1E-W0070 HMS01.1N-W0054 HMS01.1N-W0070 HMS02.1N-W0054	HCS03.1E-W0100 HCS03.1E-W0150 HMS01.1N-W0110 HMS01.1N-W0150 HMS01.1N-W0210 HMS01.1N-W0300	HCS03.1E-W0210 HCS03.1E-W0280 HCS03.1E-W0350	HMS01.1E-W0350	KMS03.1	KMS02.1	Extension Verlängerung	
A, B Forced vent. Fremdbelüftung	∅ [mm²]	Plug Stecker	Type Code Typenschlüssel	RLS0745	RLS0722	RLS0746	RLS0749	RLS0721	RLS0723	RLS0724	RLS0727	RLS0725	RLS2302		
MS2N07-C0BN	1,5	M40	V		042DB	043DB	044DB	045DB	046DB			049DB	541CBB 541CBT	542DB	KMS02: 521CBB 521CBT
MS2N07-C1BN	1,5	M40	V											542EB	542FB
MS2N07-C1BR	1,5	M40	V												
MS2N07-D0BH	1,5	M40	V												
MS2N07-D1BH	1,5	M40	V												
MS2N07-E1BH	1,5	M40	V												
MS2N07-C0BQ	2,5	M40	V												
MS2N07-D0BN	2,5	M40	V		042EB	043DB	044EB	045EB	046EB			049EB	541CBB 541CBT		
MS2N07-D1BN	2,5	M40	V												
MS2N07-E0BH	2,5	M40	V												
MS2N10-C0BH	2,5	M40	V												
MS2N10-C1BH	2,5	M40	V												
MS2N07-D0BR	4,0	M40	V												
MS2N07-E0BN	4,0	M40	V												
MS2N07-E1BN	4,0	M40	V												
MS2N10-C0BN	4,0	M40	V		042EB	043DB	044EB	045FB	046FB			049EB		542GB	563HB
MS2N10-C1BN	4,0	M40	V												
MS2N10-D1BF	4,0	M40	V												
MS2N10-F0BD	4,0	M40	V												
MS2N10-F1BD	4,0	M40	V												
MS2N07-E0BQ	6,0	M40	V												
MS2N10-D0BH	6,0	M40	V		042EB	043DB	044EB	045GB	046GB			049EB			
MS2N10-E1BF	6,0	M40	V												
MS2N10-D0BN	10,0	M58	A or B					065HB	066HB	067HB				563HB	
MS2N10-D1BN	10,0	M58	A or B												
MS2N10-E0BH	10,0	M58	A or B												
MS2N10-E0BN	16,0	M58	A or B					065HB	066JB	067JB				563JB	
MS2N10-E1BN	16,0	M58	A or B												
MS2N10-F0BH	16,0	M58	A or B												
MS2N10-F1BH	16,0	M58	A or B												

Cable cross-section limited by rated current of motor or drive controller | Kabelquerschnitt begrenzt durch Motor- oder Regelgerätenennstrom

2.4. RL2 power cables for force-ventilated motors with terminal box

Power cable | Leistungskabel RL2-xxxxx**B**-NN-xxx,x - Basic				HCS01.1E-W0003 HCS01.1E-W0005 HCS01.1E-W0006 HCS01.1E-W0008 HCS01.1E-W0009 HCS01.1E-W0013	HCS02.1E-W0012 HCS02.1E-W0028 HMD01.1N-W0012 HMD01.1N-W0020 HMD01.1N-W0036 HMS01.1N-W0020 HMS01.1N-W0036 HMS02.1N-W0028	HCS01.1E-W0018 HCS01.1E-W0028	HCS01.1E-W0054	HCS02.1E-W0054 HCS02.1E-W0070 HCS03.1E-W0070 HMS01.1N-W0054 HMS01.1N-W0070 HMS02.1N-W0054	HCS03.1E-W0100 HCS03.1E-W0150 HMS01.1N-W0110 HMS01.1N-W0150 HMS01.1N-W0210 HMS01.1N-W0300	HCS03.1E-W0210 HCS03.1E-W0280 HCS03.1E-W0350	HMS01.1E-W0350	KMS03.1	KMS02.1	Extension [1] Verlängerung	
A, B Forced vent. Fremdbelüftung	∅ [mm²]	Terminal box Klemmenkasten	Type Code Typenschlüssel	RLS0745	RLS0722	RLS0746	RLS0749	RLS0721	RLS0723	RLS0724	RLS0727	RLS0725	RLS2302		
MS2N10-C0BH	2,5	M32	T		102EB		104EB	105EB						601EB	02xEB
MS2N10-C1BH	2,5	M32	T												
MS2N10-C0BN	4,0	M32	T		102EB		104EB	105FB						602FB	04xFB
MS2N10-F0BD	4,0	M32	T												
MS2N10-D0BH	6,0	M32	T		102EB		104EB	105GB						602GB	04xGB
MS2N10-D0BN	10,0	M40	T					085HB	086HB	087HB				583HB	06xHB
MS2N10-E0BH	10,0	M40	T												
MS2N10-E0BN	16,0	M40	T					085HB	086JB	087JB				583JB	06xJB
MS2N10-F0BH	16,0	M40	T												
MS2N13-B1BH	16,0	M50	C					145JB	146JB	147JB	148JB			613JB	06xJB
MS2N13-B1BN	25,0	M50	C						146KB	147KB	148KB			613KB	06xKB
MS2N13-C1BH	25,0	M50	C												
MS2N13-C1BN	35,0	M50	C						146LB	147LB	148LB			613LB	06xLB
MS2N13-D1BH	35,0	M50	E						166LB	167LB	168LB			623LB	06xLB
MS2N13-D1BN	50,0	M50	E						166NB	167NB	168NB				
MS2N13-E1BH	50,0	M50	E												
MS2N13-E1BN	2 x 35,0	M50	E						166LB	167LB	168LB			623LB	06xLB

Cable cross-section limited by rated current of motor or drive controller | Kabelquerschnitt begrenzt durch Motor- oder Regelgerätenennstrom

1) Choose second cable like standard cable for the drive controller type used | Zweites Kabel wie Standardkabel für verwendete Reglertype auswählen

2.5. RL2 power cables for water-cooled motors with plug

Power cable | Leistungskabel RL2-xxxxx**B**-NN-xxx,x - Basic				HCS01.1E-W0003 HCS01.1E-W0005 HCS01.1E-W0006 HCS01.1E-W0008 HCS01.1E-W0009 HCS01.1E-W0013	HCS02.1E-W0012 HCS02.1E-W0028 HMD01.1N-W0012 HMD01.1N-W0020 HMD01.1N-W0036 HMS01.1N-W0020 HMS01.1N-W0036 HMS02.1N-W0028		HCS01.1E-W0018 HCS01.1E-W0028		HCS01.1E-W0054	HCS02.1E-W0054 HCS02.1E-W0070 HCS03.1E-W0070 HMS01.1N-W0054 HMS01.1N-W0070 HMS02.1N-W0054	HCS03.1E-W0100 HCS03.1E-W0150 HMS01.1N-W0110 HMS01.1N-W0150 HMS01.1N-W0210 HMS01.1N-W0300	HCS03.1E-W0210 HCS03.1E-W0280 HCS03.1E-W0350	HMS01.1E-W0350	KMS03.1		KMS02.1	Extension Verlängerung
L Water cooled Wasserkühlung	∅ [mm²]	Plug Stecker	Type Code Typenschlüssel	RLS0745	RLS0722	RLS0746	RLS0749		RLS0721	RLS0723	RLS0724	RLS0727	RLS0725		RLS2302	
MS2N07-C0BN	2,5	M40	V		042EB	043DB	044EB		045EB	046EB			049EB			542EB
MS2N07-C0BQ	2,5	M40	V													
MS2N07-C1BN	2,5	M40	V													
MS2N07-C1BR	2,5	M40	V													
MS2N07-D1BH	2,5	M40	V													
MS2N07-D0BH	4,0	M40	V		042EB	043DB	044EB		045FB	046FB			049EB			542FB
MS2N07-D1BN	4,0	M40	V													
MS2N07-E1BH	4,0	M40	V													
MS2N07-D0BN	6,0	M40	V		042EB	043DB	044EB		045GB	046GB			049EB			542GB
MS2N07-E0BH	6,0	M40	V													
MS2N10-C1BH	2,5	M58	A or B						065EB	066EB			069EB	563GB	KMS03: n.a.	
MS2N10-C0BH	4,0	M58	A or B						065GB	066GB			069EB	563GB		
MS2N10-C1BN	6,0	M58	A or B													
MS2N10-C0BN	6,0	M58	A or B						065GB	066GB						563GB
MS2N10-D1BF	6,0	M58	A or B													
MS2N07-D0BR	10,0	M58	A or B													
MS2N07-E0BN	10,0	M58	A or B								067HB					
MS2N07-E1BN	10,0	M58	A or B						065HB	066HB						563HB
MS2N10-D0BH	10,0	M58	A or B													
MS2N10-E1BF	10,0	M58	A or B													
MS2N10-F0BD	10,0	M58	A or B													
MS2N10-F1BD	10,0	M58	A or B													
MS2N07-E0BQ	16,0	M58	A or B													
MS2N10-D0BN	16,0	M58	A or B						065HB	066JB	067JB					563JB
MS2N10-D1BN	16,0	M58	A or B													
MS2N10-E0BH	16,0	M58	A or B													
MS2N10-E0BN	25,0	M58	A or B													
MS2N10-E1BN	25,0	M58	A or B													
MS2N10-F0BH	25,0	M58	A or B							066KB	067KB	068KB				563KB
MS2N10-F1BH	25,0	M58	A or B													

Cable cross-section limited by rated current of motor or drive controller | Kabelquerschnitt begrenzt durch Motor- oder Regelgerätenennstrom

2.6. RL2 power cables for water-cooled motors with terminal box

Power cable | Leistungskabel RL2-xxxxx**B**-NN-xxx,x - Basic				HCS01.1E-W0003 HCS01.1E-W0005 HCS01.1E-W0006 HCS01.1E-W0008 HCS01.1E-W0009 HCS01.1E-W0013	HCS02.1E-W0012 HCS02.1E-W0028 HMD01.1N-W0012 HMD01.1N-W0020 HMD01.1N-W0036 HMS01.1N-W0020 HMS01.1N-W0036 HMS02.1N-W0028	HCS01.1E-W0018 HCS01.1E-W0028	HCS01.1E-W0054	HCS02.1E-W0054 HCS02.1E-W0070 HCS03.1E-W0070 HMS01.1N-W0054 HMS01.1N-W0070 HMS02.1N-W0054	HCS03.1E-W0100 HCS03.1E-W0150 HMS01.1N-W0110 HMS01.1N-W0150 HMS01.1N-W0210 HMS01.1N-W0300	HCS03.1E-W0210 HCS03.1E-W0280 HCS03.1E-W0350	HMS01.1E-W0350	KMS03.1	KMS02.1	Extension [1] Verlängerung	
L Water cooled Wasserkühlung	∅ [mm²]	Terminal box Klemmenkasten	Type Code Typenschlüssel	RLS0745	RLS0722	RLS0746	RLS0749	RLS0721	RLS0723	RLS0724	RLS0727	RLS0725	RLS2302		
MS2N10-C0BH	4,0	M32	T				104FB	105FB						602FB	04xFB
MS2N10-C0BN	6,0	M32	T				104FB	105GB	106GB					602GB	04xGB
MS2N10-C0BQ	10,0	M40	T					085HB	086HB	087HB				583HB	06xHB
MS2N10-D0BH	10,0	M40	T												
MS2N10-F0BD	10,0	M40	T												
MS2N10-D0BN	16,0	M40	T					085HB	086JB	087JB				583JB	06xJB
MS2N10-E0BH	16,0	M40	T												
MS2N10-E0BN	25,0	M50	C						146KB	147KB	148KB			613KB	06xKB
MS2N10-F0BH	25,0	M50	C												
MS2N13-B1BH	16,0	M50	C					145JB	146JB	147JB	148JB			613JB	06xJB
MS2N13-B1BN	35,0	M50	C						146LB	147LB	148LB			613LB	06xLB
MS2N13-C1BH	25,0	M50	C						146KB	147KB	148KB			613KB	06xKB
MS2N13-C1BN	50,0	M50	C						146NB	147NB	148NB				
MS2N13-D1BH	50,0	M50	E						166NB	167NB	168NB				
MS2N13-D1BN	2 x 35,0	M50	E						166LB	167LB	168LB			623LB	06xLB
MS2N13-E1BH	2 x 25,0	M50	E						166KB	167KB	168KB			623KB	06xKB
MS2N13-E1BN	2 x 35,0	M50	E						166LB	167LB	168LB			623LB	06xLB

Cable cross-section limited by rated current of motor or drive controller | Kabelquerschnitt begrenzt durch Motor- oder Regelgerätenennstrom

1) Choose second cable like standard cable for the drive controller type used | Zweites Kabel wie Standardkabel für verwendete Reglertype auswählen

2.7. RL2 auxiliary power cables & adapters

There are additional cable types available, which may provide a solution for different cross-sections or plug sizes within a cable segment, if the local installation conditions or standards in the plant require this.

Note:

It is responsibility of the OEM to make sure all local installation conditions and requirements are considered for the cable selection.

2.7.1. Adapter cables

The adapter cables for motor power connections use different plug sizes on both ends. With the larger plug size at the extension side of the cable, it is possible to use power cables with larger plugs and cross-sections in extension segments. With the smaller plug size at the extension side of the cable, it is possible to connect motors with larger plugs.

Power adapter cable Leistungskabel-Adapter				Extension side Verlängerungsseite		
Motor side Motorseite	∅ [mm²]	Plug Stecker	Type Code Typenschlüssel	M23	M40	M58
MS2N...	1,0	M17	D	010CB/CBT		
	2,5	M23	U		522EB	
	1,0	M40	V	541CB/CBT		
	6,0	M40	V			543GB

CB = standard cable
CBT = torsion-proof cable

2.7.2. Auxiliary power cables

Auxiliar power cables Zusätzliche Leistungskabel				HCS01.1E-W0003 HCS01.1E-W0005 HCS01.1E-W0006 HCS01.1E-W0008 HCS01.1E-W0009 HCS01.1E-W0013	HCS02.1E-W0012 HCS02.1E-W0028 HMD01.1N-W0012 HMD01.1N-W0020 HMD01.1N-W0036 HMS01.1N-W0020 HMS01.1N-W0036 HMS02.1N-W0028	HCS01.1E-W0018 HCS01.1E-W0028	HCS01.1E-W0054	HCS02.1E-W0054 HCS02.1E-W0070 HCS03.1E-W0070 HMS01.1N-W0054 HMS01.1N-W0070 HMS02.1N-W0054	HCS03.1E-W0100 HCS03.1E-W0150 HMS01.1N-W0110 HMS01.1N-W0150 HMS01.1N-W0210 HMS01.1N-W0300	HCS03.1E-W0210 HCS03.1E-W0280 HCS03.1E-W0350	HMS01.1E-W0350	KMS03.1	KMS02.1	Extension [1] Verlängerung
	∅ [mm²]	Plug/Term.box x Stecker/ Klemmenkasten	Type Code Typenschlüssel	RLS0745	RLS0722	RLS0746	RLS0749	RLS0721	RLS0723	RLS0724	RLS0727	RLS0725	RLS2302	
MS2N...	1,5	M23	U			023DB								521DB
	2,5	M23	U		022EB	023EB	024EB	025EB						521EB
	2,5	M40	V			043EB								542EB
	4,0	M40	V			043FB	044FB							542FB
	6,0	M40	V			043GB	044GB							542GB
	10,0	M40	V					045HB						542HB
	1,5	M58	A or B									069DB		563GB
	6,0	M58	A or B									069GB		563GB
	10,0	M58	A or B				064HB	065JB						563HB
	16,0	M58	A or B						066LB	067LB				563JB
	35,0	M58	A or B											563LB
	6,0	M32	T											603GB (M58)

1) Choose second cable like standard cable for the drive controller type used | Zweites Kabel wie Standardkabel für verwendete Reglertype auswählen

3. Power cables for MS2N with EFC5610

Power cables for MS2N with standard frequency converters EFC5610 come with a new type code RLB3. For general information on type codes see chapter 1.4.

Following cable list covers a limited range of synchronous servo motors MS2N with standard frequency converters EFC5610, separated into individual sheets for

- 100K operation
- force-ventilated motors

Some cable type additions might still be in work. Before ordering cable types being in preparation please check availability with your local Rexroth sales representative.

Extension cables for RLB3 are taken from the RL2 cable series.

3.1. RLB3 power cables

Power cable | Leistungskabel RLB3-xxxxx**B**-NN-xxx,x - Basic				EFC5610-0K40 EFC5610-0K75 EFC5610-1K50 EFC5610-2K20	EFC5610-3K EFC5610-4K	EFC5610-5K5 EFC5610-7K5	EFC5610-11K EFC5610-15K	EFC5610-18K EFC5610-22K	EFC5610-30K EFC5610-37K	EFC5610-45K EFC5610-55K	EFC5610-75K EFC5610-90K	Extension RL2 Verlängerung
100K Cooling N Kühlart N	∅ [mm²]	Plug Stecker	Type Code Typenschlüssel	RLS0751	RLS0752	RLS0753	RLS0754	RLS0755	RLS0756	RLS0757	RLS0758	
MS2N10-C0BN	2,5	M40	V				044EC					542EB

Forced vent. Fremdbelüftung A, B	∅ [mm²]	Plug Stecker	Type Code Typenschlüssel	RLS0751	RLS0752	RLS0753	RLS0754	RLS0755	RLS0756	RLS0757	RLS0758	
MS2N10-D0BN	10,0	T (M40)	T					085HD				
MS2N10-E0BN	16,0	T (M40)	T						086JE			not available
MS2N10-F1BH	16,0	T (M40)	T									

4. Power cables for MS2N with IndraMotion MTX micro

IndraMotion MTX micro is the compact, simple, powerful low-cost CNC solution from Rexroth for standard turning and milling machines. It consists of a custom HMI interface and a compact multi-axis drive controller (HCQ/HCT) with high-capacity CNC control and PLC.

Power cables for MS2N servo motors with HCQ/HCT come with a new type code RLB4. For general information on type codes see chapter 1. Some cable type additions might still be in work. Before ordering cable types being in preparation please check availability with your local Rexroth sales representative.

Extension cables for RLB4 are taken from the RL2 cable series.

4.1. RLB4 power cables

Power cable | Leistungskabel RLB4-xxxxx**B**-NN-xxx,x - Basic				HCQ02.1E-W0025 X5.1 X5.2 X5.3 X5.4	HCT02.1E-W0025 X5.1 X5.2 X5.3	
60K Cooling N Kühlart N	∅ [mm²]	Plug Stecker	Type Code Typenschlüssel	X5.2	X5.2	Extension RL2 Verlängerung
MS2N06-B1BN	1,0	M23	U	021CB	021CB	521CB
MS2N06-D1BN	1,0	M23	U			
MS2N07-B1BN	1,0	M23	U			
MS2N07-C1BN	1,0	M23	U			
MS2N07-C1BR	1,0	M23	U			
MS2N07-D1BH	1,0	M23	U			
MS2N07-D1BN	1,0	M23	U			
MS2N07-E1BH	1,0	M23	U			
MS2N10-B1BQ	1,0	M23	U			
MS2N07-E1BN	1,5	M40	V	041DB	041DB	542DB
MS2N10-C1BH	1,5	M40	V			
MS2N10-D1BF	1,5	M40	V			
MS2N10-F1BD	2,5	M40	V	041EC	041EC	542EB
MS2N10-C1BN	2,5	M40	V			
MS2N10-E1BF	2,5	M40	V			

5. Power cables for kit motors

Kit motors usually consist of an active and a passive motor part, requiring the OEM to integrate these motor components in the machine design and to design a solution for the electrical connection.

There are two general solutions for the electrical connection:

Terminal box

The terminal box can provide an individual solution for specific machine designs, but separate terminal boxes are not in scope of Rexroth product portfolio. Contact local terminal box distributors if such components are required.

Connectors & ready-made cables

Connector solutions provide easy handling and servicing once they have been established in the machine design. Cable connectors are part of Rexroth ready-made cables and the counterpart cable coupling at the motor side has to be selected from the Rexroth connector portfolio acc. to the individual needs.

The following selection list provides only solutions with ready-made power cables. Selection procedure:

- Get motor rated current from motor data sheet or manual
- Go to table on next page and pick line with respective current
- Select cable type in column with corresponding drive controller type

The ready-made cable needs a counterpart coupling at the kit motor or machine. For selection of the suitable connector to be mounted at the kit motor contact your local Rexroth sales partner.

Notes:

Standard types of ready-made motor power cables always have 4 wires with smaller cross-sections used for temperature signals and brake control. If there is no external brake used in this kit motor axis, both brake wires no. of the ready-made cable should be disconnected and securely terminated at the drive-controller side of the cable.

→ Disconnect brake wires 3 (BD+) and 4 (BD-) at the drive-controller side of the cable and secure these against electrical contact. Refer to chapter "Cable connections" later in this document for wiring details.

For the encoder preferably choose cables and connectors from the Rexroth portfolio

→ Check cable compatibility questions on 3rd-party encoders or kit motors with your Rexroth sales partner.

5.1. RL2 power cable selection for kit motors 1MB, MBS, MBT, MLF

Power cable | Leistungskabel RL2-xxxxx**B**-NN-xxx,x - Basic				HCS01.1E-W0003 HCS01.1E-W0005 HCS01.1E-W0006 HCS01.1E-W0008 HCS01.1E-W0009 HCS01.1E-W0013	HCS02.1E-W0012 HMD01.1N-W0012 HMD01.1N-W0020 HMD01.1N-W0036 HMS01.1N-W0020 HMS01.1N-W0036 HMS02.1N-W0028		HCS01.1E-W0018 HCS01.1E-W0028		HCS01.1E-W0054	HCS02.1E-W0054 HCS02.1E-W0070 HCS03.1E-W0070 HMS01.1N-W0054 HMS01.1N-W0070 HMS02.1N-W0054	HCS03.1E-W0100 HCS03.1E-W0150 HMS01.1N-W0110 HMS01.1N-W0150 HMS01.1N-W0210 HMS01.1N-W0300	HCS03.1E-W0210 HCS03.1E-W0280 HCS03.1E-W0350	HMS01.1E-W0350	KMS03.1	KMS02.1	Extension Verlängerung
Rated current Nennstrom [A]	Ø [mm²]	Cross-sect. Querschnitt	Plug size Steckergrösse	RLS0745	RLS0722	RLS0746	RLS0749	RLS0721	RLS0723	RLS0724	RLS0727	RLS0725	RLS2302	
≤ 13,0	1,0	C	M17	001CB	002CB	003CB	004CB	005CB				009CB	010CB	500CBB
≤ 15,6	1,5	D	M23		022DB	023CB	024DB	025DB				029DB	521CB	521DB | 521CB
≤ 22,6	2,5	E	M40		042EB	043DB	044EB	045EB	046EB			049EB	541CB	542EB | 521CB
≤ 29,5	4,0	F	M40		042EB	043DB	044EB	045FB	046FB			049EB		542FB
≤ 38,2	6,0	G	M40		042EB	043DB	044EB	045GB	046GB			049EB		542EB | 542GB
≤ 53,0	10,0	H	M58					065HB	066HB	067HB				563HB
≤ 71,3	16,0	J	M58					065HB	066JB	067JB				563JB
≤ 93,9	25,0	K	M58						066KB	067KB	068KB			563KB
≤ 116,0	35,0	L	M58						066LB	067LB				563LB

Cable cross-section limited by rated current of motor or drive controller | Kabelquerschnitt begrenzt durch Motor- oder Regelgerätenennstrom

5.2. RLC1 power cable selection for kit motors ML3

RLC1 cables for ML3 motors are of the connector type, terminal box variants are not available. For the cable selection the mounting situation at the machine has to be considered (see header in left column). Get more information from the ML3 product manuals and observe the mounting instructions.

Motor mounting A

Power cable | Leistungskabel RLC1-xxxxx**B**-NN-xxx,x - Basic				HCS01.1E-W0003 HCS01.1E-W0005 HCS01.1E-W0006 HCS01.1E-W0008 HCS01.1E-W0009 HCS01.1E-W0013	HCS01.1E-W0018 HCS01.1E-W0028	HCS01.1E-W0054	HCS02.1E-W0054 HCS02.1E-W0070 HCS03.1E-W0070 HMS01.1N-W0054 HMS01.1N-W0070 HMS02.1N-W0054	HCS02.1E-W0012 HCS02.1E-W0028 HMD01.1N-W0012 HMD01.1N-W0020 HMD01.1N-W0036 HMS01.1N-W0020 HMS01.1N-W0036 HMS02.1N-W0028	
A Mounting Anbauart	∅ [mm²]	Plug Stecker	Type Code Typenschlüssel	RLS0745	RLS0746	RLS0749	RLS0721	RLS0722	Extension RLC1 Verlängerung
ML3P03-ANBWN	4x0,75	M23	A	121BG	122BG		124BG	125BG	532BG
ML3P03-BNBWN	4x0,75	M23	A						
ML3P03-DNBWN	4x0,75	M23	A						
ML3P03-FNBNN	4x0,75	M23	A						
ML3P03-FNBUN	4x0,75	M23	A						
ML3P06-BNBKU	4x0,75	M23	A						
ML3P06-BNBRU	4x0,75	M23	A						
ML3P06-CNBCU	4x0,75	M23	A						
ML3P06-CNBRU	4x0,75	M23	A						
ML3P06-DNBKU	4x0,75	M23	A						
ML3P06-DNBRU	4x0,75	M23	A						
ML3P06-ENBKU	4x0,75	M23	A						
ML3P06-FNBKU	4x0,75	M23	A						
ML3P06-HNBKU	4x0,75	M23	A						
ML3P11-DNBFN	4x0,75	M23	A						
ML3P11-DNBQN	4x0,75	M23	A						
ML3P11-ENBCN	4x0,75	M23	A						
ML3P11-ENBQN	4x0,75	M23	A						
ML3P11-FNBFN	4x0,75	M23	A						
ML3P11-HNBCN	4x0,75	M23	A						
ML3P11-LNBCN	4x0,75	M23	A						
ML3P06-ENBRU	4x2,5	M23	A			123EC	124EC		532EC
ML3P06-FNBRU	4x2,5	M23	A						
ML3P06-HNBRU	4x2,5	M23	A						
ML3P11-LNBQN	4x2,5	M23	A						

Motor mounting B, C or D

Power cable | Leistungskabel RLC1-xxxxx**B**-NN-xxx,x - Basic				HCS01.1E-W0003 HCS01.1E-W0005 HCS01.1E-W0006 HCS01.1E-W0008 HCS01.1E-W0009 HCS01.1E-W0013	HCS01.1E-W0018 HCS01.1E-W0028	HCS01.1E-W0054	HCS02.1E-W0054 HCS02.1E-W0070 HCS03.1E-W0070 HMS01.1N-W0054 HMS01.1N-W0070 HMS02.1N-W0054	HCS02.1E-W0012 HCS02.1E-W0028 HMD01.1N-W0012 HMD01.1N-W0020 HMD01.1N-W0036 HMS01.1N-W0020 HMS01.1N-W0036 HMS02.1N-W0028	
B, C, D Mounting Anbauart	∅ [mm²]	Plug Stecker	Type Code Typenschlüssel	RLS0745	RLS0746	RLS0749	RLS0721	RLS0722	Extension RLC1 Verlängerung
ML3P03-ANBWN	4x0,75	M23	A	121BG	122BG		124BG	125BG	532BG
ML3P03-BNBWN	4x0,75	M23	A						
ML3P03-DNBWN	4x0,75	M23	A						
ML3P03-FNBNN	4x0,75	M23	A						
ML3P03-FNBUN	4x0,75	M23	A						
ML3P06-BNBKU	4x0,75	M23	A						
ML3P06-BNBRU	4x0,75	M23	A						
ML3P06-CNBCU	4x0,75	M23	A						
ML3P06-CNBRU	4x0,75	M23	A						
ML3P06-DNBKU	4x0,75	M23	A						
ML3P06-DNBRU	4x0,75	M23	A						
ML3P06-ENBKU	4x0,75	M23	A						
ML3P06-ENBRU	4x0,75	M23	A						
ML3P06-FNBKU	4x0,75	M23	A						
ML3P06-HNBKU	4x0,75	M23	A						
ML3P11-DNBFN	4x0,75	M23	A						
ML3P11-DNBQN	4x0,75	M23	A						
ML3P11-ENBCN	4x0,75	M23	A						
ML3P11-ENBQN	4x0,75	M23	A						
ML3P11-FNBFN	4x0,75	M23	A						
ML3P11-HNBCN	4x0,75	M23	A						
ML3P11-LNBCN	4x0,75	M23	A						
ML3P06-FNBRU	4x2,5	M23	A			123EC	124EC		532EC
ML3P06-HNBRU	4x2,5	M23	A						
ML3P11-LNBQN	4x2,5	M23	A						

6. Power cables for BA1N

BA1N is a product line of kinetic energy buffers, based on asynchronous housing motors with power plug connection. There is no encoder cable required.

6.1. RL2 Power cables for BA1N

Power cable | Leistungskabel RL2-xxxxx**B**-NN-xxx,x - Basic				HCS03.1E-W0100 HCS03.1E-W0150 HMS01.1N-W0110 HMS01.1N-W0150 HMS01.1N-W0210 HMS01.1N-W0300	HCS03.1E-W0210 HCS03.1E-W0280 HCS03.1E-W0350
A / L Forced ventilation /Water Fremdbelüftung/Wasserkühlung	∅ [mm²]	Plug Stecker	Type Code Typenschlüssel	RLS0723	RLS0724
BA1N16-C3BHA	25,0	M58	A or B	066KB	067KB
BA1N16-C3BHL	35,0	M58	A or B	066LB	067LB

Extension Verlängerung
563KB
563LB

7. Encoder cables

Encoder cables RG2 are standardized to cover the available encoder portfolio over several motor product lines. Some encoder cables RG2 are also available in torsion-proof design RG2-.....T, extension cables are also of the RG2 type. See selection lists and cable data sheets for details.

For compatibility of encoders and drive controllers additional interfaces or accessory cards might be necessary. Please consult the drive controller manuals for details.

7.1. RG2 encoder cables

Encoder cable | Geberkabel RG2-xxxxx**B**-NN-xxx,x - Basic RG2-xxxxx**T**-NN-xxx,x - Torsion					IndraDrive CSB02, CDB02, CSH02	IndraDrive Mi KMS03.1	IndraDrive Mi KMS02.1	Frequency converter EFC36, EFC56	MTX micro HCQ/HCT
					EC	END	ENH	EN2	
Encoder Geber		Interface Schnittstelle	Plug Stecker	Cable Kabel	RGS0010	RGS0725	RGS2302	RGS0011	RGS0010
analog	AS/AM, BS/BM	Hiperface®	M17	Basic	002ABB	003ABB	004ABB		010AB
				Torsion	002ABT	003ABT	004ABT		
digital	CS/CM, HS/HM, DS/DM	Acuro®link	M17	Basic	002AA	003AA			010AA
analog	Pump unit MPA02	Hiperface®	M17	Basic				006AB	

Extension RG2 Verlängerung
500ABB
500ABT
510AAB

8. Hybrid cables

Hybrid cables combine separate power and digital encoder signals in a single cable.

Please note:

- Hybrid cables RH2 for servo motors MS2N are sized acc. to 100K motor operation
- Hybrid cables RH2 for ATEX-compliant servo motors MS2E are to be used in 60K operation only
- Hybrid cables RHB4 for use with MTX micro controllers are to be used in 60K operation only
- For all selections the standard cross-section is 1,5 mm²

Extension cables are taken from the RH2 cable series.

8.1. RH2 hybrid cables for MS2N with IndraDrive

Hybrid cable | Hybridkabel RH2-xxxxx**B**-NN-xxx,x - Basic				HCS01.1E-W0003 HCS01.1E-W0005 HCS01.1E-W0006 HCS01.1E-W0008 HCS01.1E-W0009 HCS01.1E-W0013	HMD01.1N-W0012 HMD01.1N-W0020 HMD01.1N-W0036 HMS01.1N-W0020 HMS01.1N-W0036 HMS02.1N-W0028	HCS01.1E-W0018 HCS01.1E-W0028	HCS01.1E-W0054	HCS02.1E-W0054 HCS02.1E-W0070 HCS03.1E-W0070 HMS01.1N-W0054 HMS01.1N-W0070 HMS02.1N-W0054	HCS03.1E-W0100 HCS03.1E-W0150 HMS01.1N-W0110 HMS01.1N-W0150 HMS01.1N-W0210 HMS01.1N-W0300	HCS03.1E-W0210	HCS04.1E-W0500 HMS01.1E-W0350	KMS03.1	KMS02.1	HCS02.1E-W0012 HCS02.1E-W0028	
100K Cooling N Kühlart N	Ø [mm²]	Plug Stecker	Type Code Typenschlüssel	RHS0745	RHS0722	RHS0746	RHS0749	RHS0721	RLS0723	RLS0724	RLS0727	RHS0725	RLS2302	RHS0822	Extension Verlängerung
MS2N03-B0BY	1,5	M23-Hybrid	S												
MS2N03-D0BY	1,5	M23-Hybrid	S												
MS2N04-B0BN	1,5	M23-Hybrid	S												
MS2N04-B0BT	1,5	M23-Hybrid	S												
MS2N04-C0BN	1,5	M23-Hybrid	S												
MS2N04-C0BT	1,5	M23-Hybrid	S												
MS2N04-D0BH	1,5	M23-Hybrid	S												
MS2N04-D0BQ	1,5	M23-Hybrid	S												
MS2N05-B0BN	1,5	M23-Hybrid	S												
MS2N05-B0BT	1,5	M23-Hybrid	S												
MS2N05-C0BN	1,5	M23-Hybrid	S												
MS2N05-C0BT	1,5	M23-Hybrid	S												
MS2N05-D0BH	1,5	M23-Hybrid	S												
MS2N05-D0BR	1,5	M23-Hybrid	S												
MS2N06-B1BN	1,5	M23-Hybrid	S												
MS2N06-C0BN	1,5	M23-Hybrid	S												
MS2N06-C0BT	1,5	M23-Hybrid	S	021DB	022DB	023DB	024DB	025DB				029DB	030DB	031DB	521DB
MS2N06-D0BN	1,5	M23-Hybrid	S												
MS2N06-D0BR	1,5	M23-Hybrid	S												
MS2N06-D1BN	1,5	M23-Hybrid	S												
MS2N06-E0BH	1,5	M23-Hybrid	S												
MS2N06-E0BR	1,5	M23-Hybrid	S												
MS2N07-B1BN	1,5	M23-Hybrid	S												
MS2N07-C0BN	1,5	M23-Hybrid	S												
MS2N07-C0BQ	1,5	M23-Hybrid	S												
MS2N07-C1BN	1,5	M23-Hybrid	S												
MS2N07-C1BR	1,5	M23-Hybrid	S												
MS2N07-D0BH	1,5	M23-Hybrid	S												
MS2N07-D1BH	1,5	M23-Hybrid	S												
MS2N07-E1BH	1,5	M23-Hybrid	S												
MS2N07-D1BN	1,5	M23-Hybrid	S												
MS2N07-D0BN	1,5	M23-Hybrid	S												
MS2N07-E0BH	1,5	M23-Hybrid	S												
MS2N...	2,5	M23-Hybrid	S	021EB	022EB	023EB	024EB	025EB							521EB

8.2. RH2 hybrid cables for MS2E with IndraDrive

Hybrid cable | Hybridkabel RH2-xxxxx**B**-NN-xxx,x - Basic				HCS01.1E-W0003 HCS01.1E-W0005 HCS01.1E-W0006 HCS01.1E-W0008 HCS01.1E-W0009 HCS01.1E-W0013	HMD01.1N-W0012 HMD01.1N-W0020 HMD01.1N-W0036 HMS01.1N-W0020 HMS01.1N-W0036 HMS02.1N-W0028	HCS01.1E-W0018 HCS01.1E-W0028	HCS01.1E-W0054	HCS02.1E-W0054 HCS02.1E-W0070 HCS03.1E-W0070 HMS01.1N-W0054 HMS01.1N-W0070 HMS02.1N-W0054	HCS03.1E-W0100 HCS03.1E-W0150 HMS01.1N-W0110 HMS01.1N-W0150 HMS01.1N-W0210 HMS01.1N-W0300	HCS03.1E-W0210	HCS04.1E-W0500 HMS01.1E-W0350	KMS03.1	KMS02.1	HCS02.1E-W0012 HCS02.1E-W0028	Extension Verlängerung
60K Cooling N Kühlart N	∅ [mm²]	Plug Stecker	Type Code Typenschlüssel	RHS0745	RHS0722	RHS0746	RHS0749	RHS0721	RLS0723	RLS0724	RLS0727	RHS0725	RLS2302	RHS0822	
MS2E03-B0BYN	1,5	M23+Hybrid	S												
MS2E03-D0BYN	1,5	M23+Hybrid	S												
MS2E04-B0BNN	1,5	M23+Hybrid	S												
MS2E04-B0BTN	1,5	M23+Hybrid	S												
MS2E04-C0BNN	1,5	M23+Hybrid	S												
MS2E04-C0BTN	1,5	M23+Hybrid	S												
MS2E05-B0BTN	1,5	M23+Hybrid	S												
MS2E05-C0BTN	1,5	M23+Hybrid	S												
MS2E05-D0BRN	1,5	M23+Hybrid	S												
MS2E06-C0BNN	1,5	M23+Hybrid	S												
MS2E06-D0BNN	1,5	M23+Hybrid	S												
MS2E06-D0BRN	1,5	M23+Hybrid	S												
MS2E06-E0BRN	1,5	M23+Hybrid	S												
MS2E07-C0BNN	1,5	M23+Hybrid	S												
MS2E07-C0BQN	1,5	M23+Hybrid	S												
MS2E07-D0BNN	1,5	M23+Hybrid	S												
MS2E07-D0CRN	1,5	M23+Hybrid	S												
MS2E07-E0CNN	1,5	M23+Hybrid	S												
MS2E07-E0CQN	1,5	M23+Hybrid	S												
MS2E...	2,5	M23+Hybrid	S	021EB	022EB	023EB	024EB	025EB							521EB
					022DB	023DB	024DB	025DB				029DB	030DB	031DB	521DB

8.3. RHB4 hybrid cables for MS2N with MTX micro

Hybrid cable | Hybridkabel RHB4-XXXXX**B**-NN-xxx,x - Basic				HCQ02.1E-W0025 X5.1 X5.2 X5.3 X5.4	HCT02.1E-W0025 X5.1 X5.2 X5.3	Extension RL2 Verlängerung
60K Cooling N Kühlart N	∅ [mm²]	Plug Stecker	Type Code Typenschlüssel	RLS0747	RLS0747	
MS2N06-B1BN	1,0	M23	S	021DD	021DD	RH2-521DB
MS2N06-D1BN	1,0	M23	S			
MS2N07-B1BN	1,0	M23	S			
MS2N07-C1BN	1,0	M23	S			
MS2N07-C1BR	1,0	M23	S			
MS2N07-D1BH	1,0	M23	S			
MS2N07-D1BN	1,0	M23	S			
MS2N07-E1BH	1,0	M23	S			

9. Cable specifications

9.1. Cable cross-sections

The cable cross-section of the largest conductor defines the cable's cross-section type code.

Cross-section type code	Cable design	Cable type inside			Ø IEC / DIN EN 60228		Current load	
		Power	Encoder	Hybrid	mm^2	AWG	A_{eff}	Reference
A	Basic	–	REG0012	–	0,5	20	–	not relevant for encoder cable
			REG0013					
	Torsion		REG0748					
B	Basic	–	–	–	0,75	18	10,4	Rexroth-Standard
C	Basic	REL0105	–	–	1,0	17	13,0	DIN VDE 0298-4 (table 11) T_{amb} = 40 °C T_L = 90 °C
	Torsion	REL0753						
D	Basic	REL0106	–	REH0804	1,5	16	15,6	
E	Basic	REL0107	–	–	2,5	14	22,6	
F	Basic	REL0108	–	–	4,0	12	29,5	
G	Basic	REL0109	–	–	6,0	10	38,2	
H	Basic	REL0110	–	–	10,0	8	53,0	
J	Basic	REL0111	–	–	16,0	6	71,3	
K	Basic	REL0112	–	–	25,0	4	93,9	
L	Basic	REL0113	–	–	35,0	2	116	IEC 60364-5-52 T_{amb} = 40 °C, T_L = 90 °C Installation type B
N	Basic	INK0668	–	–	50,0	1	140	

See chapter *1.3 Cable type code RL2, RG2, RH2* for more type code details.

9.2. Cable sizing

The cable sizes indicated in this document are only basic guiding information for motor power cable selection. Select each power cable and the size of each cable segment according to the respective technical standards.

Standard norms to consider:

- DIN VDE 0298-4 (German standard)
- HD 60364-5-52 (EU harmonized standard)
- IEC 60364-5-52 (Global standard)

Current load and cross-section refer to an ambient temperature of + 40°C at the site of operation. For higher or lower ambient temperatures there are cable ampacity correcting factors, providing either a derating (higher ambient temp.) or even an ampacity uprating (lower ambient temp.). Refer to the indicated standard for appropriate correcting factors.

→ Observe other technical standards and directives for installation and sizing, which apply in the country and at the site of operation, as well as specific local conditions for installation and environment.

9.3. Transportation and storage

Observe following environmental conditions for transportation, handling and storage for all cable types.

General conditions	Transportation & Handling	Storage
Technical standard	DIN EN IEC 60721-3-2	DIN EN IEC 60721-3-1
Classified groups	2K11, 2B1, 2C1, 2S5, 2M4	1K21, 1B1, 1C1, 1S10, 1M11
Deviations from classified groups:		
Ambient temperature[1]	-25 ... +70 °C	-25 ... +55 °C
Relative humidity	5 ... 75 %	5 ... 75 %
Absolute humidity	-	1 ... 29 g/m³
Direct sunlight exposure	Not permitted	Not permitted

9.4. General installation guidelines

All cable installations must meet the technical standards and requirements valid at the site of operation, as well as the directives given by the manufacturers of the machine and its equipment. Wrong or poor installation can cause extended wear, damages and unsafe operation.

Observe following general handling rules:

- → Consult the product manual of the machine equipment or the manufacturer for directions on the appropriate use and installation of cables with that equipment, e.g. the appropriate arrangement of cables inside of moving cable carriers and rigid cable trays.
- → Before installing, lay down cable in full length and remove any twist. Install cable only without twist.
- → Do not bend cables tighter than smallest permissible bending radius. Do not fold cables.
- → Do not install any damaged cables.
- → Prevent any tensile load or excessive torsional load on cables (for torsion load limit see data sheets).
- → Prevent forces and motion on installed cable plugs and motor plugs by supporting and fixing cables appropriately.
- → Disconnect electrical connections by unlocking and pulling the cable plug, but not pulling at the cable itself.
- → Do not pack too many cables in moving cable carriers or rigid cable trays. Do not cross cables in moving cable carriers or rigid cable trays. Observe installation guidelines given by manufacturers of the equipment.
- → Keep minimum distances between power and encoder cables for EMC immunity. Observe installation guidelines given by drive controller manuals.
- → Only qualified staff must work on electrical equipment.
- → Observe all safety rules.

[1] Recommended temperature range

9.5. Cable carriers & trays

For cables and installations in moving cable carriers or rigid cable trays, a few additional guidelines have to be observed. Fig. 7-1 gives a symbolic representation.

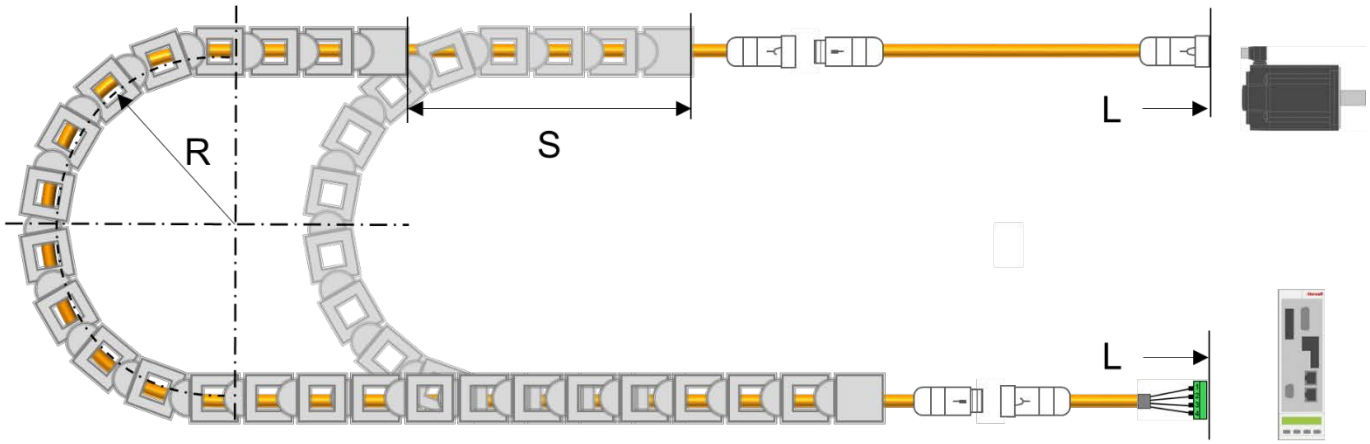


Figure 9-1: Cable and cable carrier

9.5.1. Total cable length L

The cable between a motor and the drive controller are built from one cable segment only or from several segments, combining motor cables with respective extension cables. The total cable length "L" includes all cable segments from drive controller to motor.

The individual maximum length of cables for a certain drive-motor combination must not be exceeded. See respective drive controller manuals for information on max. cable length.

Reducing the number of cable segments and keeping the cable lengths as short as possible will preserve the noise immunity, operational safety and helps to reduce costs.

9.5.2. Travel distance S

The cable parameters for dynamic motion (cable acceleration, travelling speed, travel distance and bending cycles) may only be applied over the travel distance "S" and must not be exceeded.

9.5.3. Bending radius R

The effective bending radius always refers to the inner radius of the bended cable and must never go below the specific minimum, see respective cable data sheet. This applies on moving or rigid installations as well as transportation and storage.

If several cables with different bending radius are installed in the same cable carrier, the cable with the largest outer diameter defines the minimum bending radius for all cables in that carrier.

9.5.4. Bending cycle

Bending cycle = completed motion cycle over travel distance "S" or shorter distance, with one cable motion forward + one cable motion reverse

9.6. Moving cable parameters

In moving installations, individual parameters for acceleration, travelling speed and travel distance apply and also have influence on each other. Exceeding one or more of these parameter limits can cause extended wear, damages and unsafe operation. Observe the following parameter limits: [2]

Cable type			Travel distance (S)	Travelling speed	Acceleration	Bending cycles
Power cables	BASIC	cross-section ≤ 16 mm²	50 m	300 m/min	50 m/s²	≥ 5 Mio
		cross-section ≥ 25 mm²	20 m			
Encoder cables	BASIC		50 m	300 m/min	50 m/s²	≥ 5 Mio
Power cables	TORSION		5 m	180 m/min	20 m/s²	≤ 5 Mio
Encoder cables	TORSION		5 m	180 m/min	20 m/s²	≤ 5 Mio
Hybrid cables	BASIC		20 m	240 m/min	30 m/s²	≥ 5 Mio.

Figure 9-2 Moving cable parameters

The acceleration limits and reference to travel distance are indicated in following diagram:

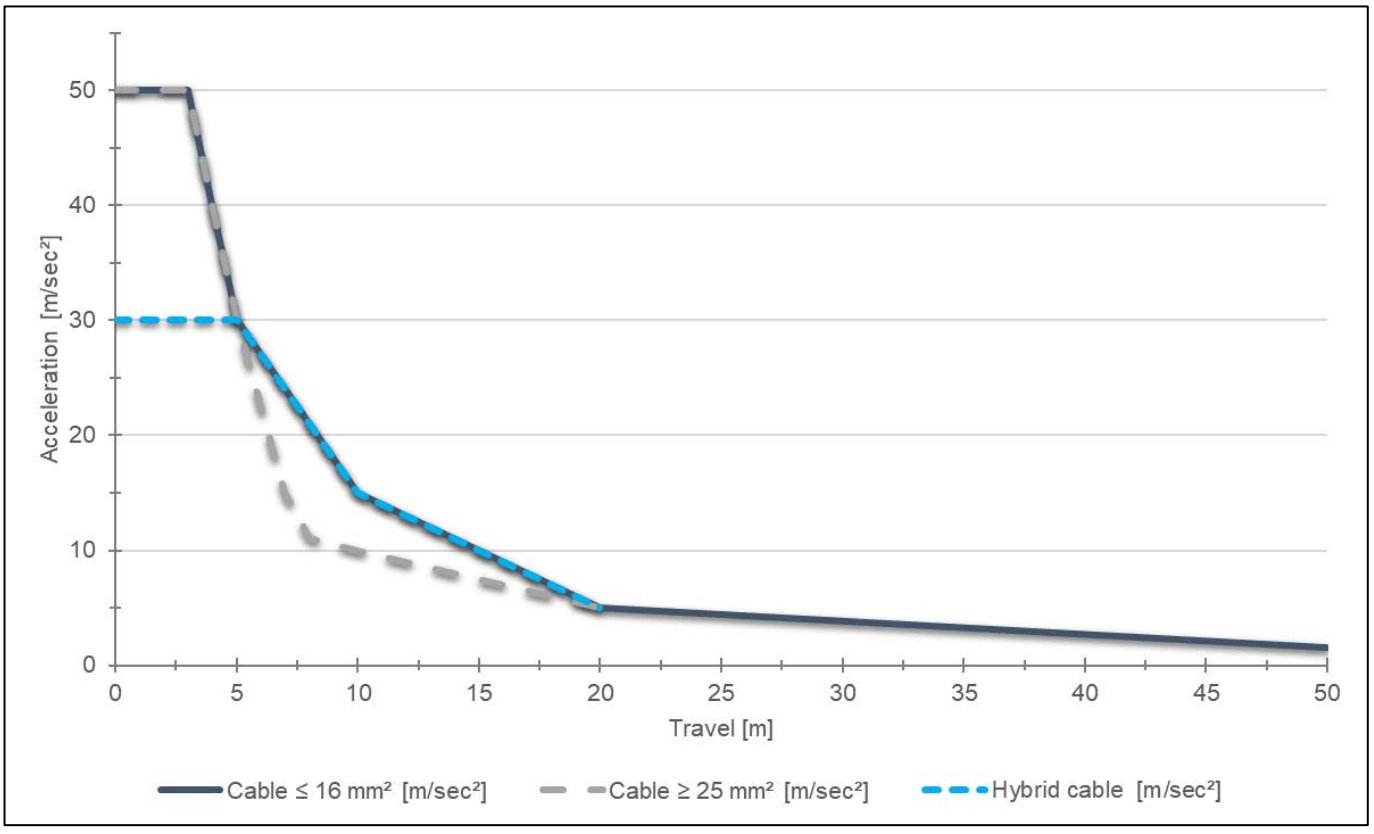


Figure 9-3: Cable acceleration vs. travel

[2] See the individual cable type data sheet for full specifications.

9.7. Cable wear and lifetime

Cables are wear parts and suffer from mechanical, electrical, thermal and chemical stress. The lifetime is reduced if cables are used with other parameters as specified or exposed to conditions beyond the cable's individual specification, but can also improve under favorable conditions. There is no established method for the prediction or calculation of the effectively usable lifetime, but it may vary in every individual case.

The standard lifetime parameters for cables are

- 30,000 hours of operation
- 5 Mio. bending cycles

These are only standard guiding values, which vary depending on effective operational and environmental conditions, and thus are not valid for every possible application.

9.8. Cable length

Some motor and encoder cables with IndraDrive can be up to 75 m long. But the effectively usable cable length may vary, depending on the individual combination of drive equipment, operating parameters, auxiliary components and local installation conditions. See also 1.6 Cable extensions.

→ The maximum cable length permitted for a specific drive-motor combination applies for the total length of all cable segments in this axis. Additional extension cables must not exceed the permissible maximum length for the entire cable line.
→ Observe the specifications from the drive controller manuals and do not exceed indicated limits.

Exceeding the permissible cable length for your specific equipment may cause an unsafe operational state. If you are in doubt about length limits for your individual configuration contact your Bosch Rexroth sales partner for assistance.

9.8.1. Order length

The minimum orderable length is 0.5 m, the minimum length increment is 0.1 m. The effective cable order length is measured from end to end, as indicated in following picture.

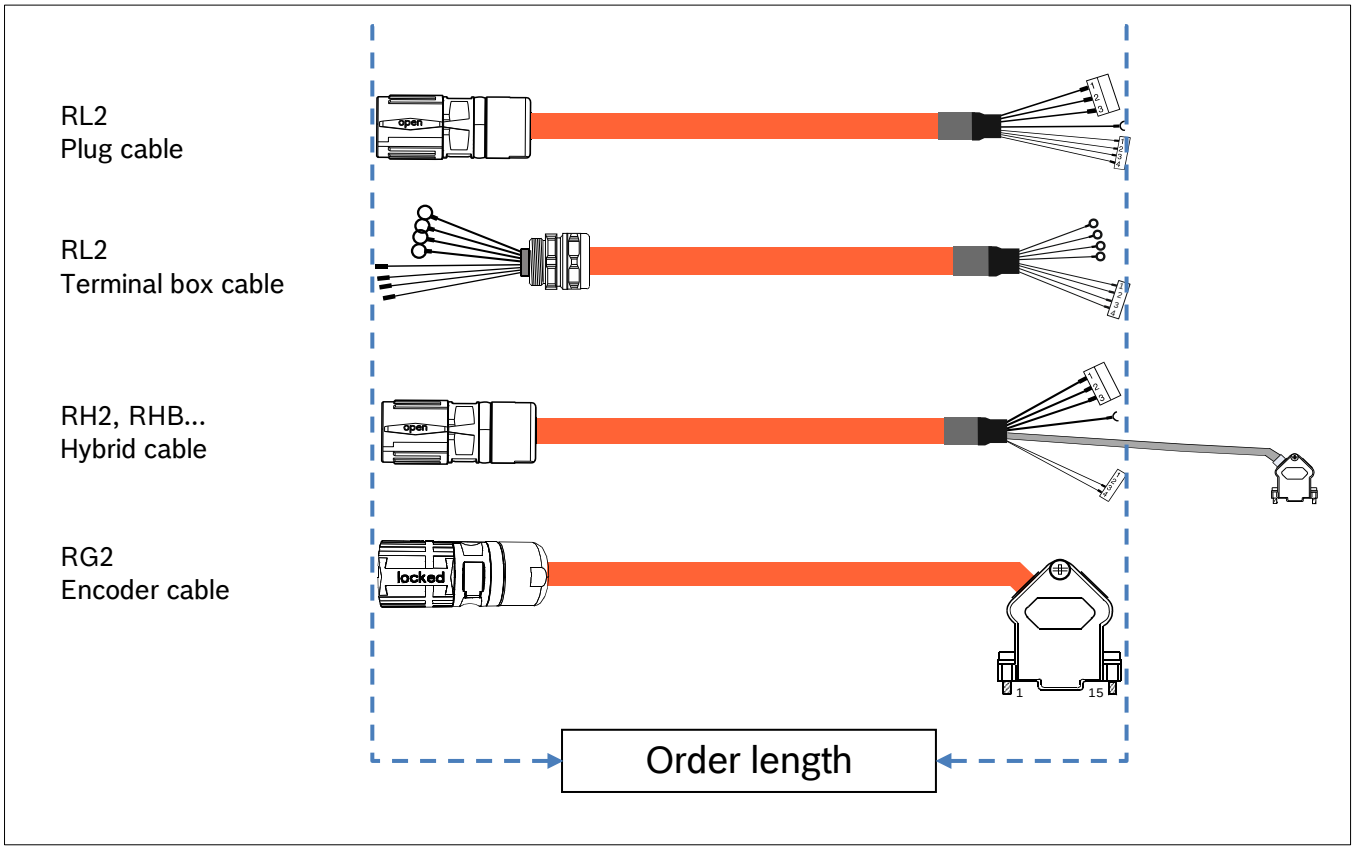


Figure 9-4: Cable order length

9.8.2. Tolerances

The cable length tolerance is specified as a positive value only, thus a cable should never be delivered shorter than ordered.

- Cable length ≤ 5 m + 0,05 m
- Cable length > 5 m + 1 % of ordered length

9.9. Maintenance

For keeping the safety of operation and the best lifetime, observe following cable maintenance checks:

→ Frequently check all electrical cable connections and connectors on appropriate, tight and secure connection, corrosion, breakages, appropriate installation etc., according to technical standards and safety regulations.

→ Frequently check all electrical cables on signs of wear, e.g. abrasion of cable jacket or corkscrew deformation in cable carriers etc.

→ Replace cables and connectors immediately if signs of wear or damage indicate that the component cannot be used safely anymore. Install cables in cable carriers appropriately acc. to manufacturer guidelines.

→ During operation, cables dissipate heat over the entire cable length. Keep cables clean from dirt and dust to support heat dissipation and to prevent temperature-related derating or overheating.

→ For all maintenance instructions & intervals refer to the maintenance plan of the machine manufacturer.

10. Cable connections

Cable and pin assignment of Rexroth motors and drive controllers follow a general wiring scheme for all motor and cable sizes.

Notes

The cable material, cable design and cable shield system of genuine Rexroth-cables are tailor-made and 100% tested for the indicated combinations of motors and drive controllers. Any modification on these cables may cause functional faults, unsafe operation or equipment damage.

The same applies if using self-made cables or third-party cables and connectors with Bosch Rexroth equipment. Bosch Rexroth does not provide any kind of coverage, warranty or liability for safety, operability or functions of the entire drive and control equipment if third-party or self-made cables, connectors or modified components are used, also for any case of service actions and resulting costs connected to the use of such components.

10.1. Power cables RL2/RL.. for dual-cable connection

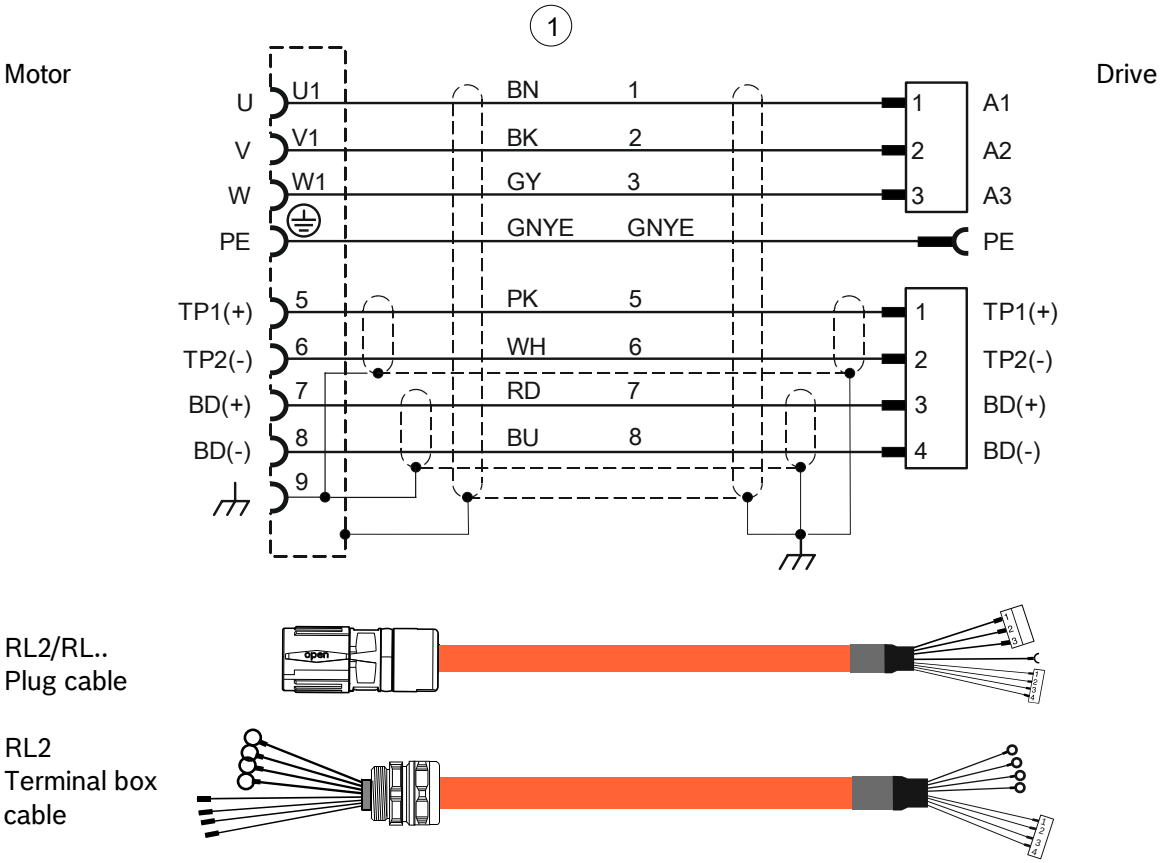


Figure 8-1: Power cable RL2

① Notes

Power cable 1,0 mm²:	colored wires
Power cables ≥ 1,5 mm²:	numbered wires

10.2. Encoder cables RG2 for dual-cable connection

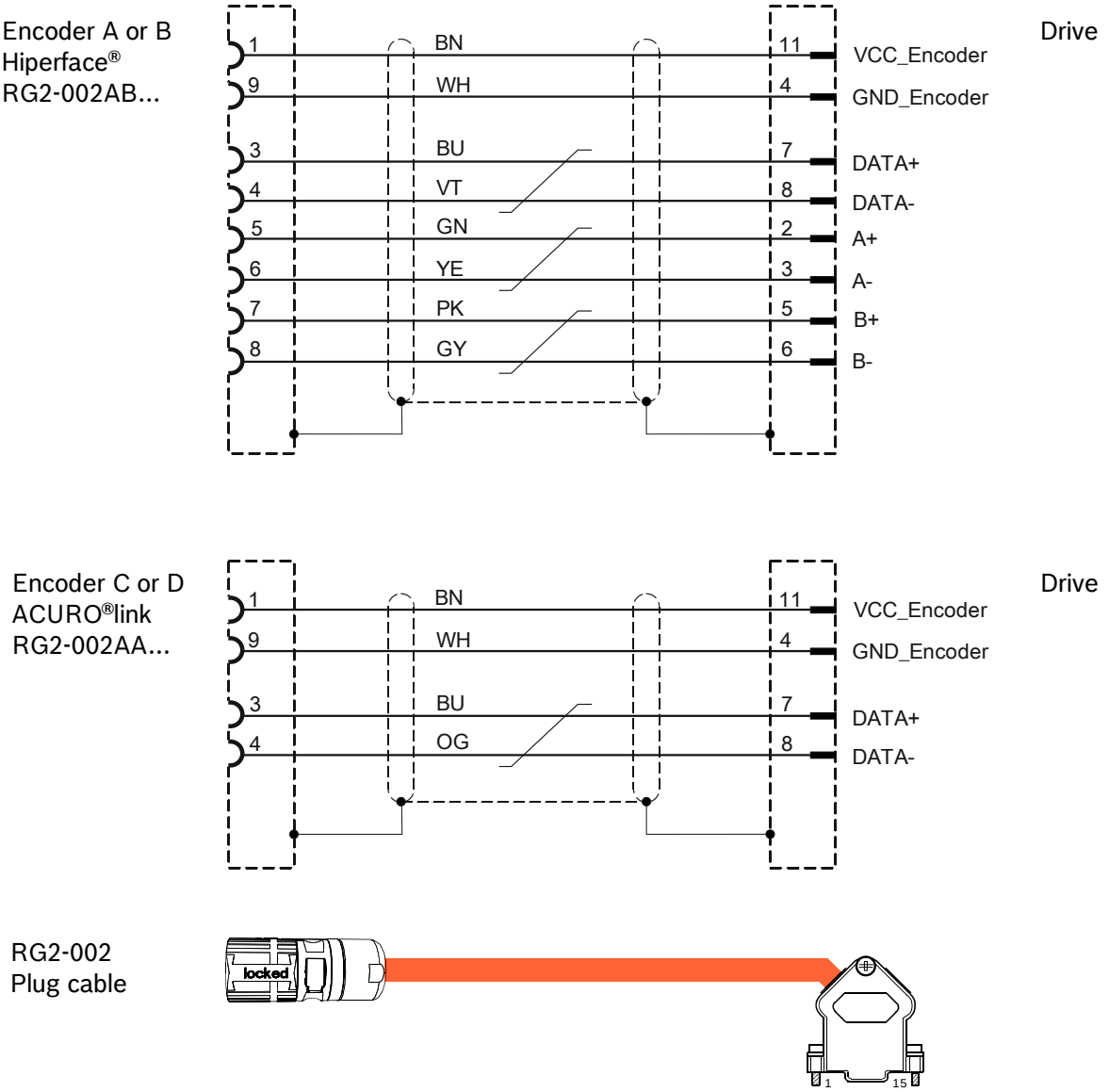


Figure 8-2: Encoder cable RG2

10.3. Hybrid cable RH2/RH.. for single-cable connection

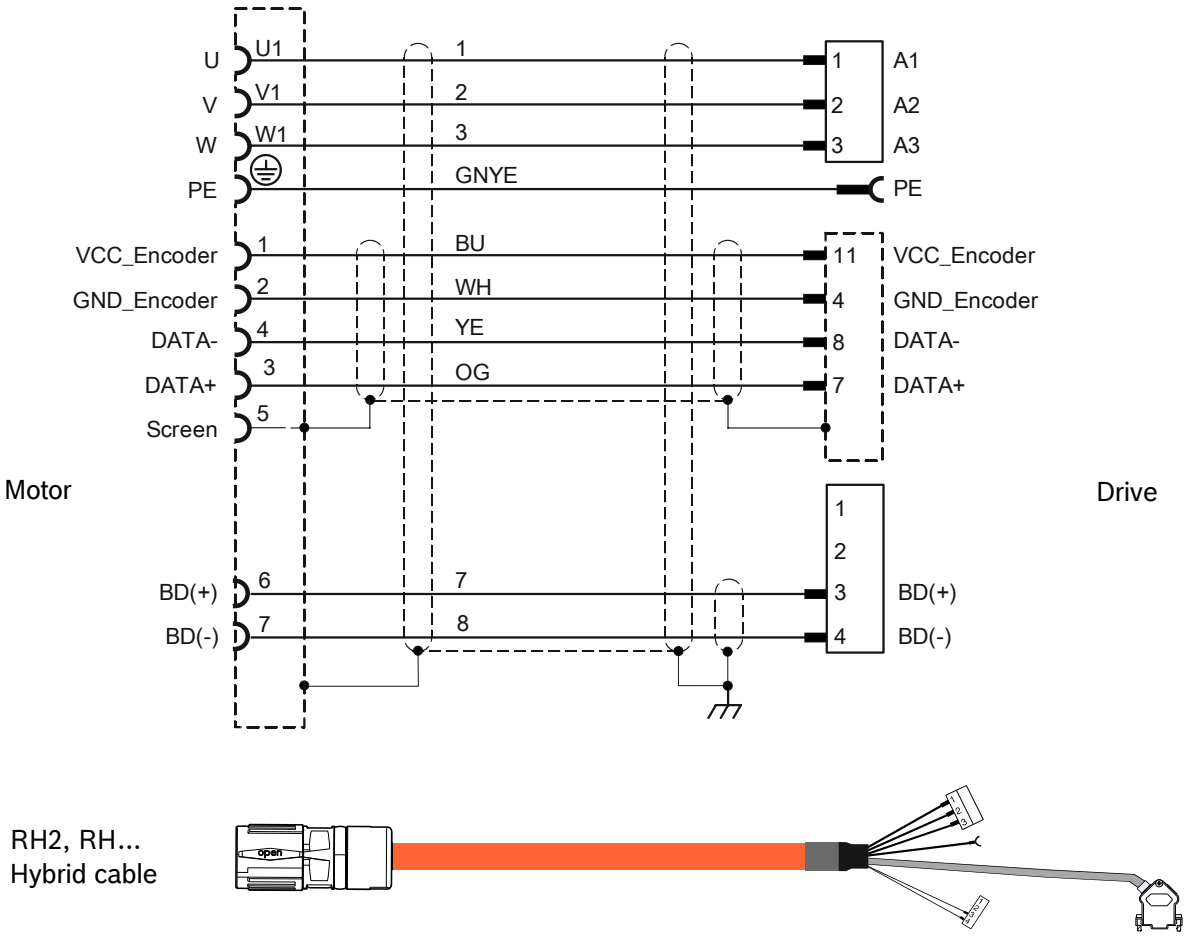


Figure 8-3: Hybrid cable RH2

10.4. Extension cables

Figure 8-4: Extension cable RL2

Extension cables for RL2, RG2 and RH2 have a similar setup with plugs on both sides. Internal connections are routed 1:1 between the two plugs.

The maximum cable length permitted for a specific drive-motor combination applies for the entire length of all cable segments in this axis. Additional extension cables must not exceed the permissible maximum length for the entire cable line.

11. Cable data sheets

11.1. RL2 Power cable Basic

Rated voltage of power wires U_0/U	600/1000 V
Rated voltage of signal wires U_0/U	450/750 V
Insulation resistance (+20°C)	≥ 20 MΩ/km
Temperature range flexible use	-20 ... +60 °C
Temperature range fixed installation	-30 ... +80 °C
Conductor max. temperature (flexible/fixed)	+80 / +90 °C
Cable jacket	PUR (orange RAL 2003)
Conductor insulation	PP
Certification, Approbation	CE, cURus (UL/CSA)
UL/CSA style (rating)	21223 (1000 V/AC 80°C)
RoHS	compliant to EU-directive 2011/65/EU
Chemical characteristics	Halogen-free, Silicone-free, CFC-free acc. to VDE 0472-815 and IEC 60754-1 Oil resistance acc. to EN 60811-2-1, EN 50363-10-2
Flammability ratings	IEC/DIN EN 60332-1/2 UL AWM 758 VW1/FT1, UL 1581/2556, CSA C22.2/2556
Bending cycles	> 5 Mio
Bending radius min. (flexible installation)	7,5 x D
Bending radius min. (fixed installation)	5 x D
Travel speed horizontal	≤ 300 m/min
Travel distance horizontal	≤ 50 m
Acceleration	≤ 50 m/s²
Torsion	≤ ± 30 °/m

Cable data

Cable	Design	Outer diameter D	Leakage capacitance	Cable weight (ca.)
REL0105	(4 x 1,0 mm² + 2 x (2 x 0,75 mm²))	12,0 +/-0,5 mm	0,4 nF/m	0,2 kg/m
REL0106	(4 x 1,5 mm² + 2 x (2 x 0,75 mm²))	12,2 +/-0,5 mm	0,4 nF/m	0,23 kg/m
REL0107	(4 x 2,5 mm² + 2 x (2 x 1,0 mm²))	14,8 +/-0,5 mm	0,4 nF/m	0,33 kg/m
REL0108	(4 x 4,0 mm² + 2 x (2 x 1,0 mm²))	17,0 +/-0,5 mm	0,5 nF/m	0,45 kg/m
REL0109	(4 x 6,0 mm² + (2 x 1,0 mm²) + (2 x 1,5 mm²))	18,2 +/-0,6 mm	0,5 nF/m	0,58 kg/m
REL0110	(4 x 10,0 mm² + (2 x 1,0 mm²) + (2 x 1,5 mm²))	22,2 +/- 1,0 mm	0,5 nF/m	0,84 kg/m
REL0111	(4 x 16,0 mm² + 2 x (2 x 1,5 mm²))	25,5 +/- 1,0 mm	0,6 nF/m	1,2 kg/m
REL0112	(4 x 25,0 mm² + 2 x (2 x 1,5 mm²))	29,8 +/- 1,0 mm	0,6 nF/m	1,5 kg/m
REL0113	(4 x 35,0 mm² + 2 x (2 x 1,5 mm²))	30,8 +/- 1,0 mm	0,6 nF/m	1,9 kg/m
INK0668	(4 x 50,0 mm² + 2 x (2 x 2,5 mm²))	36,8 +/- 1,0 mm	1,3 nF/m	3,2 kg/m

11.2. RL2 Power cable Torsion

Rated voltage of power wires U_0/U	600/1000 V
Rated voltage of signal wires U_0/U	450/750 V
Insulation resistance (+20°C)	≥ 20 MΩ/km
Temperature range flexible use	-20 ... +60 °C
Temperature range fixed installation	-30 ... +80 °C
Conductor max. temperature (flexible/fixed)	+80 / +90 °C
Cable jacket	PUR (orange RAL 2003)
Conductor insulation	PP
Certification, Approbation	CE, cURus (UL/CSA)
UL/CSA style (rating)	21223 (1000 V/AC 80°C)
RoHS	compliant to EU-directive 2011/65/EU
Chemical characteristics	Halogen-free, Silicone-free, CFC-free acc. to VDE 0472-815 and IEC 60754-1 Oil resistance acc. to EN 60811-2-1, EN 50363-10-2
Flammability ratings	IEC/DIN EN 60332-1/2 UL AWM 758 VW1/FT1, UL 1581/2556, CSA C22.2/2556
Bending cycles	≤ 5 Mio
Bending radius min. (flexible installation)	7,5 x D
Bending radius min. (fixed installation)	5 x D
Travel speed horizontal	≤ 180 m/min
Travel distance horizontal	≤ 5 m
Acceleration	≤ 20 m/s²
Torsion	≤ ± 180 °/30 cm

Cable data

Cable	Design	Outer diameter D	Leakage capacitance	Cable weight (ca.)
REL0753	(4 x 1,0 mm^2 + 2 x (2 x 0,75 mm^2))	12,2 +/-0,5 mm	0,4 nF/m	0,2 kg/m

11.3. RG2 Encoder cable Basic

Rated voltage of power wires U_0/U	300 V
Rated voltage of signal wires U_0/U	300 V
Insulation resistance (+20°C)	≥ 500 MΩ/km
Temperature range flexible use	-20 ... +60 °C
Temperature range fixed installation	-30 ... +80 °C
Conductor max. temperature (flexible/fixed)	+80 / +90 °C
Cable jacket	PUR (orange RAL 2003)
Conductor insulation	PP
Certification, Approbation	CE, cURus (UL/CSA)
UL/CSA style (rating)	21223
RoHS	compliant to EU-directive 2011/65/EU
Chemical characteristics	Halogen-free, Silicone-free, CFC-free acc. to VDE 0472-815 and IEC 60754-1 Oil resistance acc. to EN 60811-2-1, EN 50363-10-2
Flammability ratings	IEC/DIN EN 60332-1/2 UL AWM 758 VW1/FT1, UL 1581/2556, CSA C22.2/2556
Bending cycles	> 5 Mio
Bending radius min. (flexible installation)	7,5 x D
Bending radius min. (fixed installation)	4 x D
Travel speed horizontal	≤ 300 m/min
Travel distance horizontal	≤ 50 m
Acceleration	≤ 50 m/s²
Torsion	≤ ± 30 °/m

Cable data

Cable	Design	Outer diameter D	Cable weight (ca.)
REG0012 (digital)	(2 x 2 x 0,20 mm^2 + 2 x 0,5 mm^2)	7,2 +/-0,2	0,08 kg/m
REG0013 (analog)	(4 x 2 x 0,25 mm^2 + 2 x 0,5 mm^2)	8,5 +/-0,3	0,1 kg/m

11.4. RG2 Encoder cable Torsion

Rated voltage of power wires U_0/U	300 V
Rated voltage of signal wires U_0/U	300 V
Insulation resistance (+20°C)	≥ 20 MΩ/km
Temperature range flexible use	-20 ... +60 °C
Temperature range fixed installation	-30 ... +80 °C
Conductor max. temperature (flexible/fixed)	+80 / +90 °C
Cable jacket	PUR (orange RAL 2003)
Conductor insulation	PP
Certification, Approbation	CE, cURus (UL/CSA)
UL/CSA style (rating)	20317
RoHS	compliant to EU-directive 2011/65/EU
Chemical characteristics	Halogen-free acc. to VDE 0472, Part 815 Silicone-free, CFC-free Oil resistance acc. to EN 60811-2-1, EN 50363-10-2
Flammability ratings	IEC/DIN EN 60332-1/2 UL AWM 758 VW1/FT1, UL 1581/2556, CSA C22.2/2556
Bending cycles	≤ 5 Mio
Bending radius min. (flexible installation)	7,5 x D
Bending radius min. (fixed installation)	5 x D
Travel speed horizontal	≤ 180 m/min
Travel distance horizontal	≤ 5 m
Acceleration	≤ 20 m/s²
Torsion	≤ ± 180 °/30 cm

Cable data

Cable	Design	Outer diameter D	Cable weight (ca.)
REG0748 (analog)	(4 x 2 x 0,25 mm^2 + 2 x 0,5 m^2)	8,5 +/-0,3 mm	0,2 kg/m

11.5. RH2 Hybrid cable Basic

Rated voltage of power wires U_0/U	600/1000 V	
Rated voltage of signal wires U_0/U	450/750 V	
Insulation resistance (+20°C)	≥ 500 MΩ/km	
Temperature range flexible use	-20 ... +80 °C	
Temperature range fixed installation	-30 ... +80 °C	
Conductor max. temperature (flexible/fixed)	+80 / +90 °C	
Cable jacket	PUR (orange RAL 2003)	
Conductor insulation	PP	
Certification, Approbation	CE, cURus (UL/CSA)	
UL/CSA style (rating)	21223 (1000 V/AC 80°C)	
RoHS	compliant to EU-directive 2011/65/EU	
Chemical characteristics	Halogen-free, Silicone-free, CFC-free acc. to VDE 0472-815 and IEC 60754-1 Oil resistance acc. to EN 60811-2-1, EN 50363-10-2	
Flammability ratings	IEC/DIN EN 60332-1/2 UL AWM 758 VW1/FT1, UL 1581/2556, CSA C22.2/2556	
Bending cycles	> 5 Mio	
Bending radius min. (flexible installation)	7,5 x D	
Bending radius min. (fixed installation)	5 x D	
Travel speed horizontal	≤ 240 m/min	
Travel distance horizontal	≤ 20 m	
Acceleration	up to 5 m travel	30 m/s²
	up to 10 m travel	15 m/s²
	up to 20 m travel	5 m/s²
Torsion	≤ ± 30 °/m	

Cable data

Cable	Design	Outer diameter D	Leakage capacitance	Cable weight (ca.)
REH0804	(4 x 1,5 mm2 + (2 x 0,75 m2) + (4 x AWG24))	13,0 +/-0,3	0,38 nF/m	0,26 kg/m
REH0805	(4 x 2,5 mm2 + (2 x 0,75 m2) + (4 x AWG24))	15,8 +/-0,3	t.b.d.	0,37 kg/m

12. Appendix

12.1. Accessories

Panel feed-through accessories are available from stock and provide a good solution for solid cable fixture, pull relief and quick installation. Individual data sheets with mounting details for each part are available from your Rexroth sales partner. Please note the standard mounting screws are not in the scope of delivery.

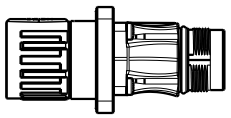
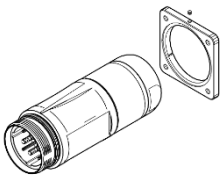
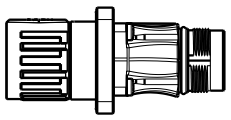
Cable type	Plug size	Part code	Material number	Type	
Power cable	M17	RLS1705/A01	R911381137		Ready-to-use component
	M23	RLS2305/A0	R911380888		
	M40	STECKERZUBEHOER Z-SONS**-MONTAGEFLANSCH	R911388659		Accessory flange for mounting on cable plug (plug not incl.)
	M58	Not available			
Encoder cable	M17	RGS1705/A01	R911381138		Ready-to-use component
Hybrid cable	M23	RHS2305/A03	R911384340		

Figure 12-1 Accessories

12.2. EU Declaration of conformity / EU-Herstellererklärung

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EU-Konformitätserklärung - *Original*

Dok.-Nr.: DCTC-30317-001
Datum: 2019-07-17

- ☐ nach Maschinenrichtlinie 2006/42/EG
- ☒ nach Niederspannungsrichtlinie 2014/35/EU
- ☐ nach EMV-Richtlinie 2014/30/EU
- ☐ nach ATEX-Richtlinie 2014/34/EU

Hiermit erklärt der Hersteller,
Bosch Rexroth AG
Bürgermeister-Dr.-Nebel-Straße 2
97816 Lohr am Main / Germany,

dass die nachstehenden Produkte

Bezeichnung: Komponenten des elektrischen Antriebssystems
Baureihen: Nach angefügter Liste
Handelsbezeichnung: Rexroth

Ab Herstelldatum: 2019-07-17

in Übereinstimmung mit den oben genannten EU-Richtlinien entwickelt, konstruiert und gefertigt wurden.
Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.

Angewandte harmonisierte Normen:

Norm	Titel	Ausgabe
EN 61800-5-1 *(IEC 61800-5-1)*	Elektrische Leistungsantriebssysteme mit einstellbarer Drehzahl – Teil 5-1: Anforderungen an die Sicherheit – Elektrische, thermische und energetische Anforderungen	2007+A1:2017 *(2007+A1:2016)*

Lohr am Main , den 2019-07-17 ppa. i.V.
Ort Datum Joachim Hennig, Werkleitung LoP2 Thomas Schmid, Leitung Entwicklung Hardware

Änderungen im Inhalt der EU-Konformitätserklärung sind vorbehalten. Derzeit gültige Ausgabe auf Anfrage.

EU-Konformitätserklärung

Seite 2 / 2
DCTC 30317-001 : 2019-07-17

Liste der Komponenten des elektrischen Antriebssystems (PDS)

Hinweise zur Zusammenstellung des elektrischen Antriebssystems sind zu beachten → siehe Rexroth-Dokumentation

Versorgungsgeräte
HMV01.1E..., HMV01.1R..., HMV02.1R..., HNA05.1..., HMU05.1..., KMV03.1...

Antriebsregelgeräte
HMS01.1..., HMS02.1..., HMD01.1...HCS01.1..., HCS02.1..., HCS03.1..., HCT02.1..., HCQ02.1..., HCP02.1..., HMP01.1..., HMU05.1...

Ansteuerelektroniken
KCU01.2..., KCU02.1..., KCU02.2...

Dezentrale Servoantriebe
KSM01.2..., KSM02.1...

Dezentrale Antriebsregelgerät
KMS01.2..., KMS02.1..., KMS03.1...

Bremseinheiten
HLB01.1..., HLT01.1..., HLT05.1...

Bremswiderstände
HLR01.1..., HLR01.2..., HLR05.1...

Kapazitätsmodule
HLC01.1..., HLC01.2..., KLC03.1....

Netzkondensator
HNC05.1...

Netzdrosseln
HNL01.1E..., HNL01.2E..., HNL01.1R..., HNL01.2R..., HNL02.1R..., HNL05.1R...

Gleichstromdrosseln
HLL01.1N..., HLL01.1A..., HLL05.1F...

EMV-Filter
HNS02.1..., NFE01.1..., NFE02.1..., NFD03.1..., HNF01.1..., HNF01.2..., HMF01.1..., HNK01.1..., KNK03.1...

Kabel
INK..., IKG..., IKL..., RKG..., RKL..., RKH..., RL2..., RG2..., RH2..., RLB..., RLC..., RH...

2020-03-24 - SOCOS

Figure 12-2: EU Declaration of conformity

12.3. Certification marks

CE

The CE-Marking acc. to EU directives is printed on the outer cable jacket.

UL, CSA

Cables RL2, RG2, RH2, RL and RH as well as the corresponding connectors are "registered components", approved acc. to standards of UL (USA) and CSA (Canada). The corresponding marking and the UL file number of the cables are printed on the outer cable jacket. The UL file number of the plug components are E153698, E335019 and E151413. Details on file numbers can be retrieved from the UL file database at www.ul.com.

RoHS

All cable and plug components of RL2, RG2, RH2, RL and RH comply with the European directive 2011/65/EU (“Restriction of the use of certain hazardous substances in electrical and electronic equipment”).

China-RoHS

All cables RL2, RG2, RH2, RL... and RH... have been reviewed acc. to Chinese RoHS directive SJ/T 11364. These cables do not need a China-RoHS label, just an internal list of the material used. This internal document is available through your local Bosch Rexroth sales representative upon request.

The EFUP ("Environment-Friendly Use Period") is 25 years in case one or more substances are above the limit value.

CCC ("China Compulsory Certificate")

Ready-made cables RL2, RG2, RH2, RL and RH do not fall under CCC regulation.

CCC lists other materials for cable and insulation, which are not used in Rexroth cables. For further details or questions consult CCC authorities and regulations here:
http://www.cqc.com.cn/www/english/ProductCertification/CCC/

12.4. Index

12.5. List of figures

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