

12 Prefabricated cables

12.1 Description

SEW-EURODRIVE offers pre-fabricated cables with plugs for straightforward and reliable motor connection.

Cable and contact are connected using the crimp technique. Cables are available by the meter.

Prefabricated cables are divided into:

- Power cables such as motor cables, brakemotor cables, extension cables
- Encoder cables and their extension cables.

12.1.1 Preselection of cables

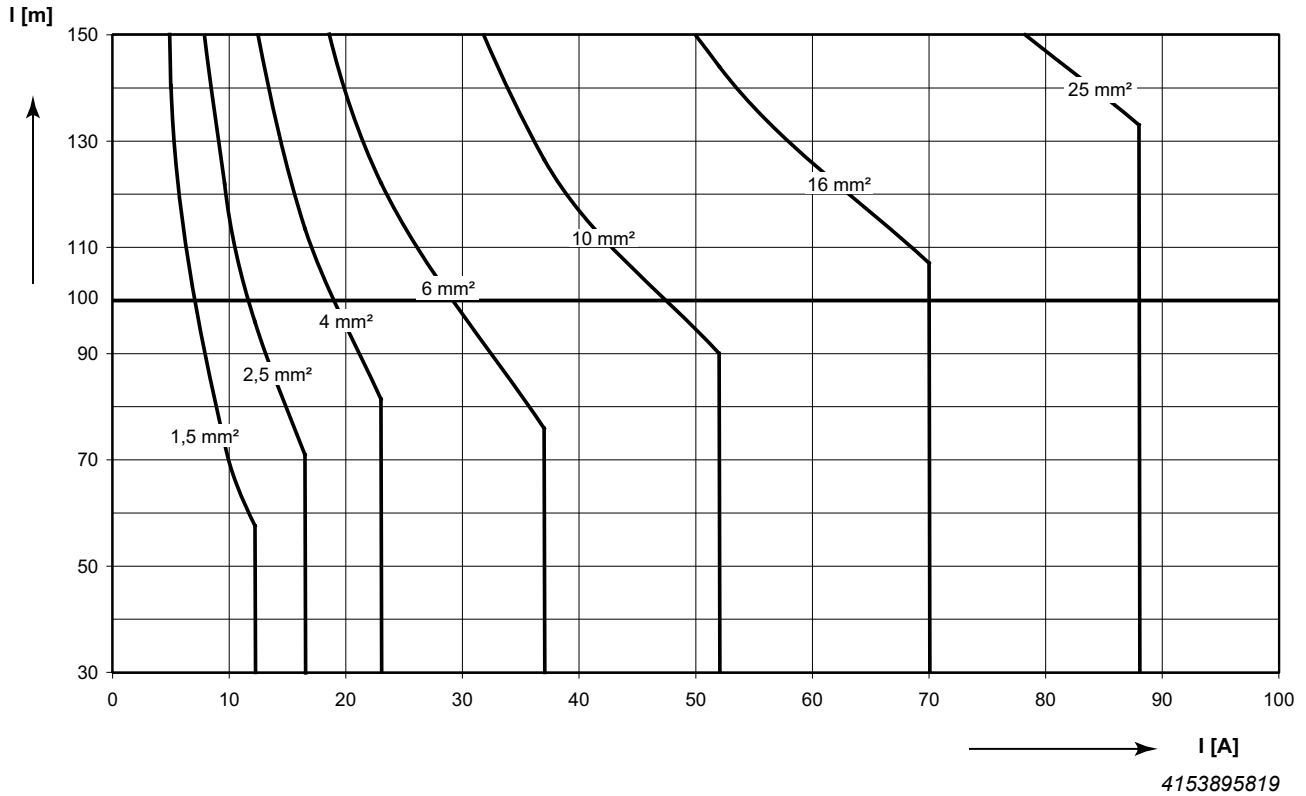
Prefabricated cables were preselected by SEW-EURODRIVE according to the standard EN 60204. The routing types "fixed installation" and "cable carrier installation" were considered.

Using other standards for the machine construction can result in diverging cross sections.

12.2 Project planning

12.2.1 Project planning for cable cross section

The following figure shows the minimum required cable cross section depending on cable length and current.



Prefabricated cables with cross sections of 1.5 mm² to 10 mm² can be ordered from SEW-EURODRIVE.

12.2.2 Cable dimensioning to EN 60204

Cable load table

Cable load through current I according to EN 60204-1:2006 table 6, ambient temperature 40 °C.

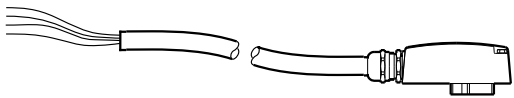
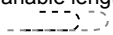
Cable cross section	Three-core sheathed cable in pipe or cable	Triple-core, plastic-sheathed cable on top of each other on wall	Triple-core, plastic-sheathed cable next to each other, horizontal
mm ²	A	A	A
1.5	13.1	15.2	16.1
2.5	17.4	21.0	22
4	23	28.0	30
6	30	36.0	37
10	40	50.0	52
16	54	66.0	70
25	70	84.0	88
35	86	104.0	114

This data comprises merely recommended values and is **no substitute for detailed project planning** of the cables, which is dependent on the specific application and takes into account the applicable regulations.

Observe the voltage drop that occurs along the cable in particular with the DC 24 V brake coil when dimensioning the cross sections for the brake cable. The acceleration current is decisive for the calculation.

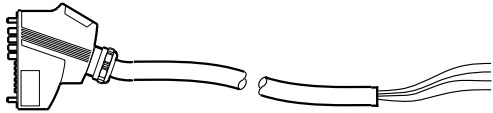
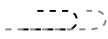
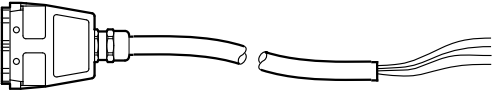
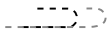
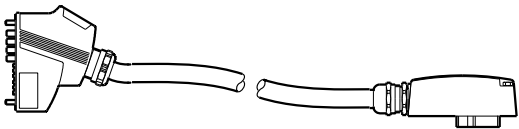
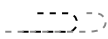
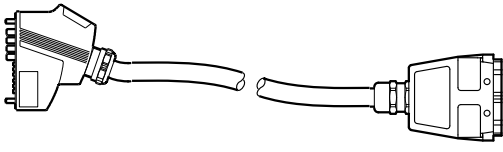
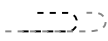
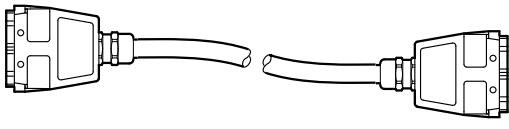
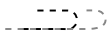
12.3 Overview of power cables for DR.. motors

12.3.1 Brakemotor cable with IS

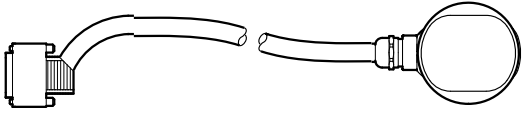
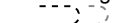
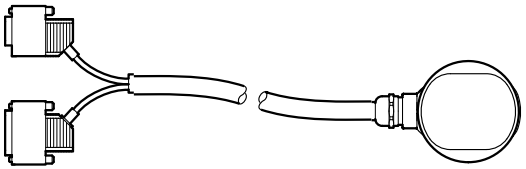
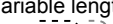
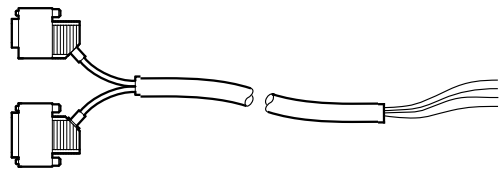
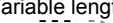
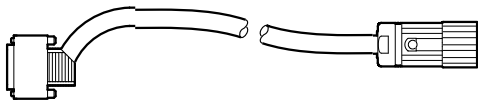
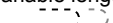
Connection cable			Length/installation type	Specification
Motor end				
			Set length, Variable length 	On the motor end, all 12 contacts of the integrated plug connector are used for connecting motor, brake, and motor protection. The cables are available with variable terminal link in star or delta connection. For wiring in the control cabinet and field distributors, the cores are fitted with ring-type cable lugs or conductor end sleeves. Detailed information: (→  572)
Open (conductor end sleeve and ring cable lug)		IS		

12.3.2 Brakemotor cable for decentralized MOVI-SWITCH®

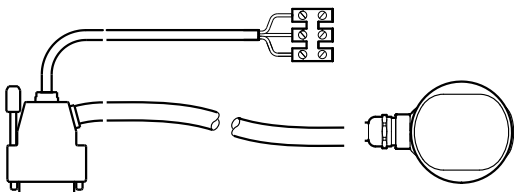
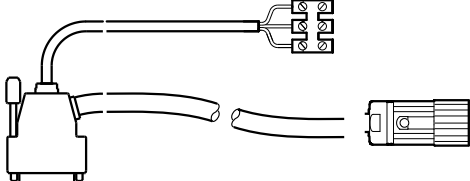
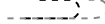
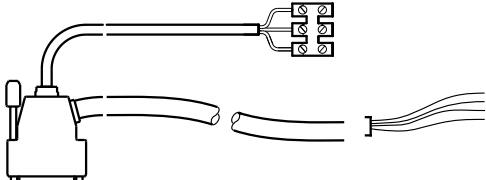
Prefabricated cables for motor side

Connection cable			Length/installation type	Specification
Motor end				
			Set length, Variable length 	Detailed information: (→ 574)
PLUSCON VC		Open (conductor end sleeve and ring cable lug)		
			Set length, Variable length 	Detailed information: (→ 575)
Han® 10E		Open (conductor end sleeve and ring cable lug)		
			Set length, Variable length 	Detailed information: (→ 576)
PLUSCON VC		IS		
			Set length, Variable length 	Detailed information: (→ 577)
PLUSCON VC		Han® 10E		
			Set length, Variable length 	Detailed information: (→ 578)
Han® 10E		Han® 10E		

12.4 Overview of encoder cables for DR.. motors – MOVIDRIVE®

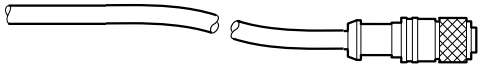
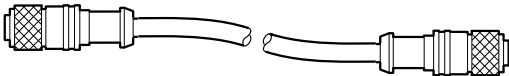
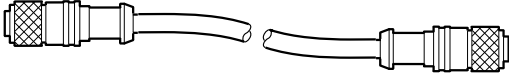
Connection cable			Length/installation type	Specification
Motor end				
			Set length, Variable length 	If the encoder on the motor is ordered and delivered without a connection cover, the prefabricated cable is fitted with a connection cover on the encoder end. Detailed information: (→ ■ 579)
D-sub, (15-pin)		Connection cover		
			Set length, Variable length 	The customer is responsible for connecting the terminal strip in the connection cover. The cable gland in the connection cover is included in the scope of delivery of the encoder. Connection with MOVIDRIVE® A 15-pin plug is available that matches the interface on the inverter. Detailed information: (→ ■ 580)
D-sub, (15-pin)		Open (conductor end sleeve and ring cable lug)		
			Set length, Variable length 	If the encoder on the motor is ordered and delivered without a connection cover, the prefabricated cable is fitted with a connection cover on the encoder end. Detailed information: (→ ■ 581)
D-sub (1 × 9-pole and 1 × 15-pole)		Connection cover		
			Set length, Variable length 	The customer is responsible for connecting the terminal strip in the connection cover. The cable gland in the connection cover is included in the scope of delivery of the encoder. Connection with MOVIDRIVE® A 9-pole or 15-pole plug is available to match the inverter in the interface. Detailed information: (→ ■ 583)
D-sub (1 × 9-pole and 1 × 15-pole)		Open (conductor end sleeve and ring cable lug)		
			Set length, Variable length 	Connection with MOVIDRIVE® A 15-pin plug is available that matches the interface on the inverter. Detailed information: (→ ■ 584)
D-sub, (15-pin)		M23		

12.5 Overview of encoder cables for DR.. motors – MOVIAxis®

Connection cable			Length/installation type	Specification
Motor end				
			Set length, Variable length 	If the encoder on the motor is ordered and delivered without a connection cover, the prefabricated cable is fitted with a connection cover on the encoder end. Connection with MOVIAxis®: A 15-pin plug is available that matches the interface on the inverter. Detailed information: (→  585)
D-sub, (15-pin)		Connection cover		
			Set length, Variable length 	Connection with MOVIAxis®: A 15-pin plug is available that matches the interface on the inverter. The motor protection is routed from the D-sub connector. Detailed information: (→  587)
D-sub, (15-pin)		M23		
			Set length, Variable length 	The customer is responsible for connecting the terminal strip in the connection cover. The cable gland in the connection cover is included in the scope of delivery of the encoder. Connection with MOVIAxis®: A 15-pin plug is available that matches the interface on the inverter. The motor protection is routed from the D-sub connector. Detailed information: (→  589)
D-sub, (15-pin)		Open (conductor end sleeve and ring cable lug)		

12.6 Overview of built-in encoder cable for DR.. motors

The used cable types for fixed and cable carrier installation are listed in chapter 'Cable specifications'.

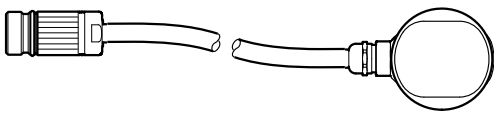
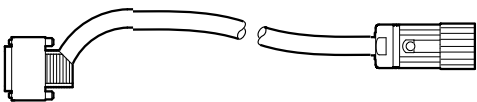
Connection cable		Length/installation type	Specification
Motor end			
		Set length, Variable length	4-pole, 8-pole. Cable is suitable for E17 encoder. Detailed information: (→ 591)
	M12		
		Set length, Variable length	4-pole, 8-pole. Cable is suitable for E17 encoder. Detailed information: (→ 593)
M12	M12		
		Set length, Variable length	8-pole. Cable can also be used for E17-FS en- coders. Detailed information: (→ 593)
M12	M12		

12.7 Overview of extensions for add-on encoder cables for DR.. motors

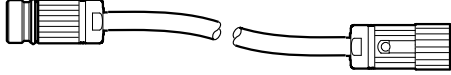
12.7.1 Intermediate sockets

Intermediate sockets are used whenever part of the wiring is routed in a cable carrier, or if connecting several cable sections is easier for very long distances. The encoder cables are available with intermediate sockets for this purpose.

The used cable types for fixed and cable carrier installation are listed in chapter 'Cable specifications'.

Connection cable			Length / Installation type	Specification
Motor end				
			Set length, Variable length 	Detailed information: (→ 595)
M23		Connection cover		
			Set length, Variable length 	The customer is responsible for connecting the terminal strip in the connection cover. The cable gland in the connection cover is included in the scope of delivery of the encoder. Detailed information: (→ 596)
M23		Open (conductor end sleeve and ring cable lug)		
			Set length, Variable length 	Connection with MOVIDRIVE® A 15-pin plug is available that matches the interface on the inverter. Detailed information: (→ 597)
D-sub, (15-pin)		M23		

Extension

Connection cable			Length / Installation type	Specification
Motor end				
			Set length, Variable length	Detailed information: (→ 598)
M23		M23		

12.8

Power cable

12.8.1

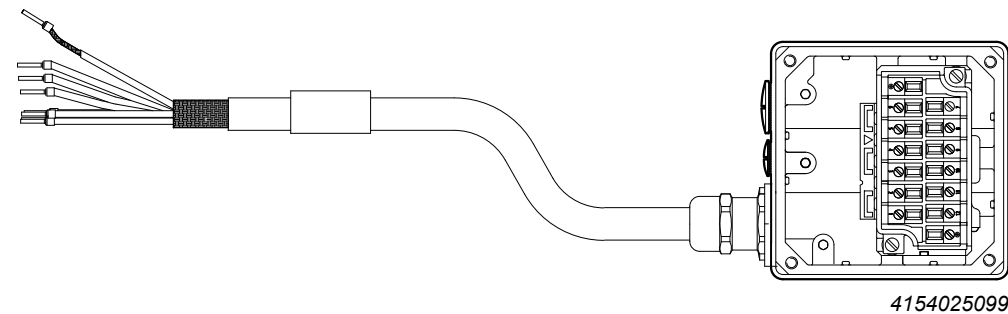
Brakemotor cable with IS

Brakemotor types

Motor type	Brake type	Connector
DR.71	BE05, BE1	/ISU
DR.80	BE05, BE1, BE2	
DR.90	BE1, BE2, BE5	
DR.100	BE2, BE5	
DR.112	BE5, BE11	
DR.132	BE5, BE11	

Cable drawing, wiring – ISU

IS brakemotor cable with motor protection, conductor end sleeves and ring-type cable lugs



	Cable core color	Signal	Contact	
			1	Delta connection
	Black (BK)	U1	2	
			3	
	Black (BK)	V1	4	
			5	
	Black (BK)	W1	6	
	Black (BK)		7	Star connection
			8	
	White (WH)		9	
	Red (RD)		10	
	Blue (BU)		11	
	Black (BK)		12	
	Green/yellow (GN/YE)		PE	

19290411/EN – 10/2014

Part numbers

Star connection	Delta connection	Variable terminal link
08178127	08178178	Fixed installation

12.8.2 Brakemotor cable for decentralized MOVI-SWITCH®

Brakemotor types

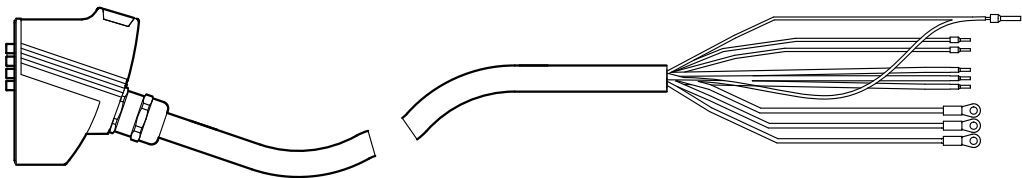
Motor type	Brake type	Connector
DR.71	BE05, BE1	/ISU /ASB4
DR.80	BE05, BE1, BE2	
DR.90	BE1, BE2, BE5	
DR.100	BE2, BE5	

MOVI-SWITCH®

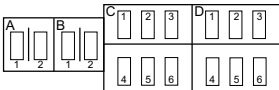
MOVI-SWITCH®	PLUSCON VC	Han® 10E
MSW-2S	.../APG4	.../ALA4

Cable drawing, wiring – PLUSCON VC

Brakemotor cable with motor protection; conductor end sleeves / ring-type cable lugs, PLUSCON VC



4154155531

	Contact	Signal	Cable core color	Contact
 PLUSCON VC	A1	U1	Black (BK)	CL
	A2	V1	Black (BK)	CL
	B1	W1	Black (BK)	CL
	B2	PE	Green/yellow (GN/YE)	CES
	C1	Brake 15	Blue (BU)	CES
	C3	Brake 13	Red (RD)	CES
	C5	Brake 14	White (WH)	CES
	D2		Shielding	
	D3	24 V	Black (BK)	CES
	D6	TH/TF	Black (BK)	CES

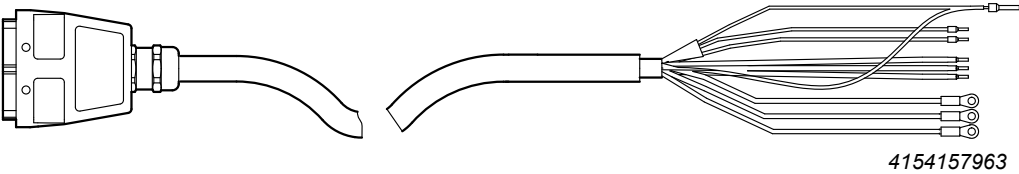
Part numbers

	MOVI-SWITCH®
Motor DR.71 – DR.100	PLUSCON VC
Fixed installation	04178879

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Cable drawing, wiring – Han® 10E

Brakemotor cable with motor protection; conductor end sleeves / ring-type cable lugs, HAN® 10E



Conductor end sleeves / ring-type cable lugs, HAN® 10E:

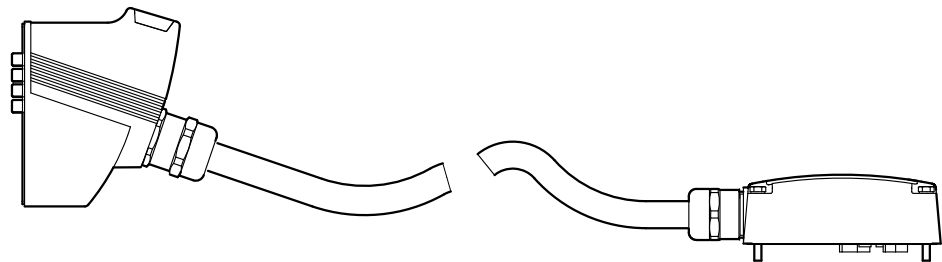
	Contact	Signal	Cable core color	Contact
	1	U1	Black (BK) \7	CL
	2	V1	Black (BK) \8	CL
	3	W1	Black (BK) \3	CL
	4	Brake 13	Black (BK) \5	CES
	5	Brake 15	Black (BK) \6	CES
	6	Brake 14	Black (BK) \4	CES
	7	nc		
	8	nc		
	9	24 V	Black (BK) \1	CES
	10	TH/TF	Black (BK) \2	CES
	PE		Shielding	
	PE		Green/yellow (GN/YE)	CES

Part numbers

	MOVI-SWITCH®
Motor DR.71 – DR.100	Han® 10E
Fixed installation	08178860

Cable drawing, wiring – ISU and PLUSCON VC

Brakemotor cable with motor protection; IS and PLUSCON VC



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IS and PLUSCON VC:

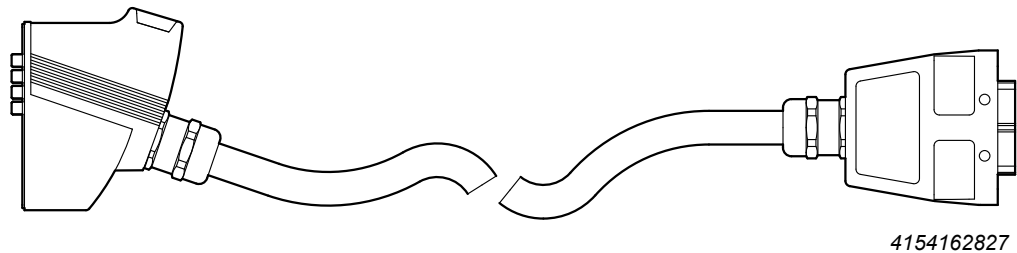
	Contact	Cable core color	Signal	Contact	
A B C D PLUSCON VC	A1	Black (BK)	U1	2	7 8 9 10 11 12 PE2 PE1 16 5 4 3 2 1

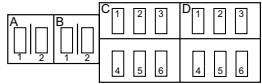
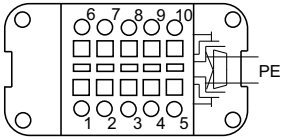
Part numbers

	MOVI-SWITCH®
Motor DR.71 – DR.100	PLUSCON VC
Fixed installation	05937558

Cable drawing, wiring – Han® 10E and PLUSCON VC

Brakemotor cable with motor protection; HAN® 10E and PLUSCON VC



	Contact	Cable core color	Signal	Contact	
 PLUSCON VC	A1	Black (BK) \7	U1	1	
	A2	Black (BK) \8	V1	2	
	B1	Black (BK) \3	W1	3	
	B2	Green/yellow (GN/YE)	PE	PE	
	C1	Black (BK) \6	Brake 15	5	
	C3	Black (BK) \5	Brake 13	4	
	C5	Black (BK) \4	Brake 14	6	
	D2	Shielding		PE	
	D3	Black (BK) \1	24 V	10	
	D6	Black (BK) \2	TH/TF	9	

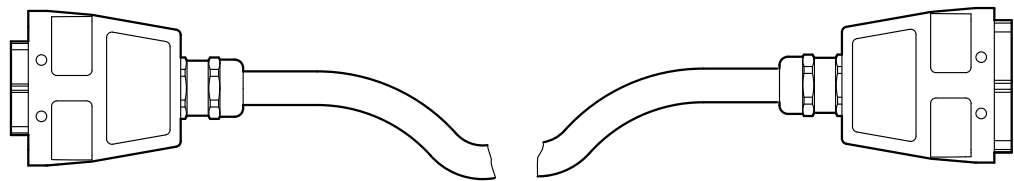
HAN® 10E and PLUSCON VC

Part numbers

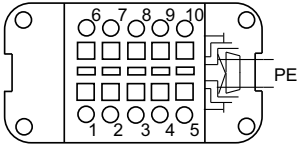
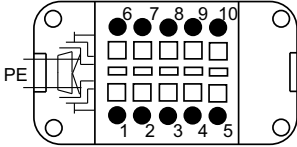
	MOVI-SWITCH®
Motor DR.71 – DR.100	PLUSCON VC
Fixed installation	08178895

Cable drawing, wiring – Han® 10E and Han 10E

Brakemotor cable with motor protection; HAN® 10E and Han® 10E



4154165259

	Contact	Signal	Cable core color	Contact	
	1	U1	Black (BK) \7	1	
	2	V1	Black (BK) \8	2	
	3	W1	Black (BK) \3	3	
	4	Brake 13	Black (BK) \5	4	
	5	Brake 15	Black (BK) \6	5	
	6	Brake 14	Black (BK) \4	6	
	7	nc		7	
	8	nc		8	
	9	24 V	Black (BK) \1	9	
	10	TH/TF	Black (BK) \2	10	
	PE		Shielding	PE	
	PE		Green/yellow (GN/YE)	PE	

Part numbers

	MOVI-SWITCH®
Motor DR.71 – DR.100	Han® 10E
Fixed installation	08178887

12.9 Add-on encoder cables for MOVIDRIVE®

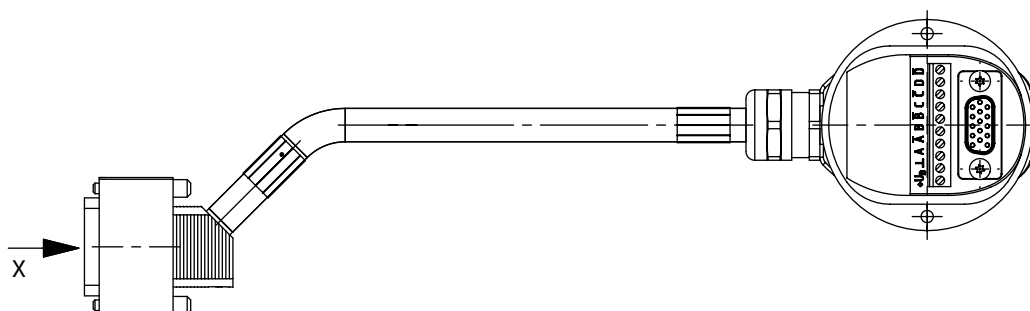
12.9.1 Encoder cable with connection cover and D-sub

Prefabricated cables for encoders

Encoder types	DR.71 – 132	DR.160 – 280
Sine encoder	ES7S	EG7S
TTL ($V_B = DC\ 9 - 30\ V$)	ES7R	EG7R
RS485	AS7W	AG7W

Cable drawing, wiring – connection cover and D-sub

Encoder cable with connection cover with D-sub



4158198411

Connection MOVIDRIVE® B				Motor connection side	
Plug connector view X	Contact	Signal	Cable core color	Signal	Contact
D-sub 15-pole	1	A	Red (RD)	cos +	A
	9	$\bar{A}$	Blue (BU)	cos-	$\bar{A}$
	2	B	Yellow (YE)	sin+	B
	10	$\bar{B}$	Green (GN)	sin-	$\bar{B}$
	3	C	Brown (BN)	C+	C
	11	$\bar{C}$	White (WH)	C-	$\bar{C}$
	4	S	Black (BK)	Data+	S
	12	$\bar{D}$	Violet (VT)	Data-	$\bar{D}$
	15	UB	Red/blue + gray (RD-BU + GY)	UB	+UB
	8		Gray-pink+pink (GY-PK +PK)	DGND	GND

Part numbers

Cable type	Connection cover and D-sub
Fixed installation	13617621
cable carrier installation	13617648

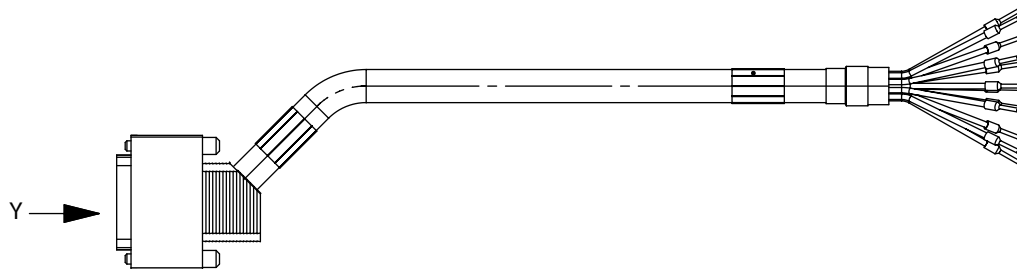
12.9.2 Encoder cable with conductor end sleeves and D-sub

Prefabricated cables for encoders

Encoder types	DR.71 – 132	DR.160 – 280
Sine encoder	ES7S	EG7S
TTL ($V_B = DC\ 9 - 30\ V$)	ES7R	EG7R
RS485	AS7W	AG7W

Cable drawing, wiring – conductor end sleeve and D-sub

Conductor end sleeves with sub-D



4158303499

Connection MOVIDRIVE® B						Motor connection side
Plug connector view Y	Contact	Signal	Cable core color	Signal	Contact	
D-sub 15-pole	1	A	Red (RD)	cos +	A	
	9	$\bar{A}$	Blue (BU)	cos-	$\bar{A}$	
	2	B	Yellow (YE)	sin+	B	
	10	$\bar{B}$	Green (GN)	sin-	$\bar{B}$	
	3	C	Brown (BN)	C+	C	
	11	$\bar{C}$	White (WH)	C-	$\bar{C}$	
	4	S	Black (BK)	Data+	S	
	12	$\bar{D}$	Violet (VT)	Data-	$\bar{D}$	
	15	UB	Red/blue + gray (RD-BU + GY)	UB	+UB	
	8	GND	Gray-pink+pink (GY-PK +PK)	GND	GND	

Part numbers

Cable type	Conductor end sleeves and D-sub
Fixed installation	13622021
cable carrier installation	13622048

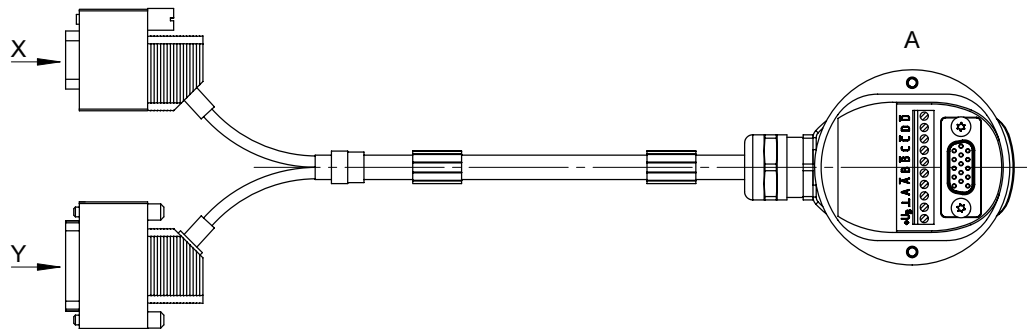
12.9.3 Encoder cable with connection cover and 2 D-sub

Prefabricated cables for encoders

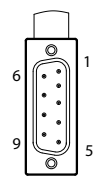
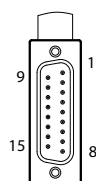
Encoder types	DR.71 – 132	DR.160 – 280	DR.315
M-SSI	AS7Y	AG7Y	AH7Y

Cable drawing, wiring – connection cover and 2 D-sub

Connection cover with 2 sub-D (1 × 9-pole and 1 × 15-pole)



9007203413047819

Connection MOVIDRIVE® B				Motor connection side	
Plug connectors	Contact	Signal	Cable core color	Signal	Contact
D-sub View X  9-pole	3	C	Brown (BN)	C+	C
	8	$\bar{C}$	White (WH)	C-	$\bar{C}$
	1	S	Black (BK)	Data+	S
	6	$\bar{D}$	Violet (VT)	Data-	$\bar{D}$
	9	UB	Red/blue + gray (RD-BU + GY)	UB	+UB
	5	GND	Gray-pink+pink (GY-PK +PK)	GND	GND
D-sub View Y  15-pole	1	A	Red (RD)	cos +	A
	9	$\bar{A}$	Blue (BU)	cos-	$\bar{A}$
	2	B	Yellow (YE)	sin+	B
	10	$\bar{B}$	Green (GN)	sin-	$\bar{B}$

Part numbers

Cable type	Connection cover or conductor end sleeve, 2 x D-sub
Fixed installation	13626299
cable carrier installation	13626302

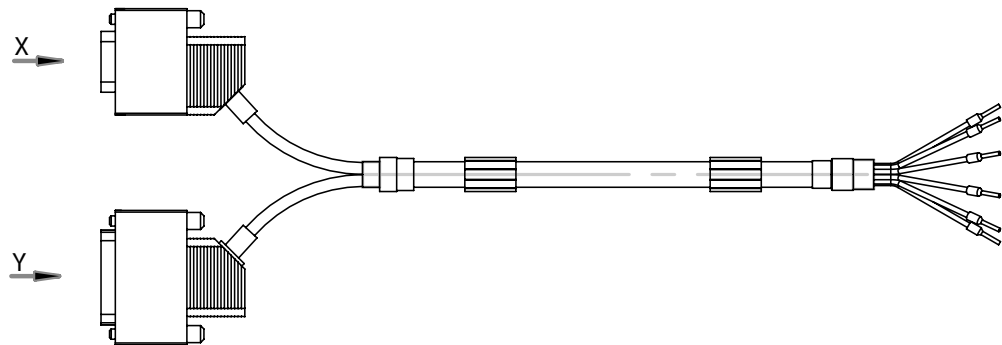
12.9.4 Encoder cable with conductor end sleeve and 2 D-sub

Prefabricated cables for encoders

Encoder types	DR.71 – 132	DR.160 – 280	DR.315
M-SSI	AS7Y	AG7Y	AH7Y

Cable drawing, wiring – conductor end sleeve and 2 D-sub

Conductor end sleeves with 2 sub-D (1 × 9-pole and 1 × 15-pole)



4158310795

Connection MOVIDRIVE® B					Motor connection side
Plug connectors	Contact	Signal	Cable core color	Signal	Contact
Sub-D View X 9-pole	1	Data+	Black (BK)	Data+	S
	6	Data-	Violet (VT)	Data-	$\bar{D}$
	3	C+	Brown (BN)	C+	C
	8	C-	White (WH)	C-	$\bar{C}$
	5	GND	Pink (PK)	GND	GND
	9	UB	Grey (GY)	UB	+UB
Sub-D View Y 15-pole	1	cos +	Red (RD)	cos +	A
	9	cos-	Blue (BU)	cos-	$\bar{A}$
	2	sin+	Yellow (YE)	sin+	B
	10	sin-	Green (GN)	sin-	$\bar{B}$

Part numbers

Cable type	Connection cover or conductor end sleeve, 2 x D-sub
Fixed installation	13602640
cable carrier installation	13623265

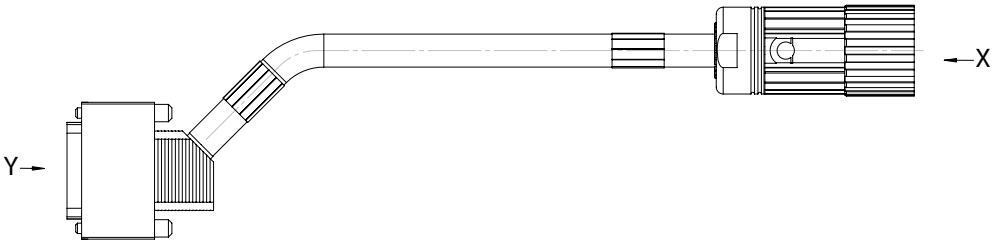
12.9.5 Encoder cable with M23 and D-sub

Prefabricated cables for encoders

Encoder types	DR.315
Sine encoder	EH7S

Cable drawing, wiring – M23 and D-sub

M23 and D-sub



4158314507

Connection MOVIDRIVE® B					Motor connection side	
Plug connectors View Y	Contact	Signal	Cable core color	Signal	Contact	Plug connectors View X
D-sub 15-pole	1	A cos+	Red (RD)	A cos+	5	
	9	$\overline{A}$ cos-	Blue (BU)	$\overline{A}$ cos-	6	
	2	B sin+	Yellow (YE)	B sin+	8	
	10	$\overline{B}$ sin-	Green (GN)	$\overline{B}$ sin-	1	
	3	C	Brown (BN)	C+	3	
	11	$\overline{C}$	White (WH)	C-	4	
	4	S	-	Data+	-	
	12	$\overline{D}$	-	Data-	-	
	15	UB	Black+gray (BK+GY)	UB	12	
	8	GND	Pink+violet (PK+VT)	GND	10	

Part numbers

Cable type	M23, D-sub 15
Fixed installation	13602659
cable carrier installation	13623206

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12.10 Add-on encoder cables for MOVIAXIS®

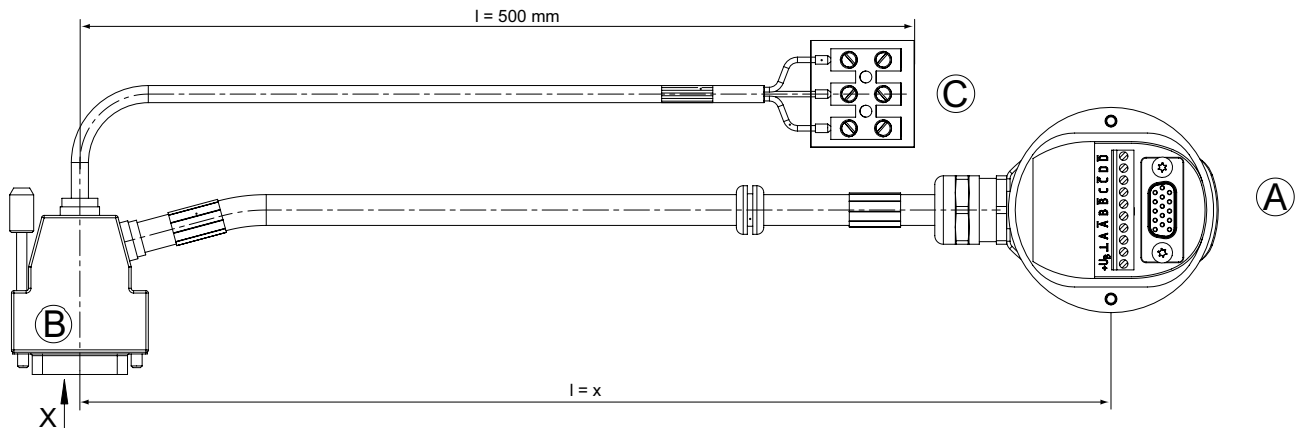
12.10.1 Encoder cable with connection cover and D-sub

Prefabricated cables for encoders

Encoder types

ES7S, EG7S, ES7R, EG7R, AS7W, AG7W

Cable drawing, wiring



27021600761130507

I = x: Length that can be ordered

MOVIAXIS®connection					Motor connection side	
Plug connectors View X	Contact B	Signal	Cable core color	Signal	Contact A	
D-sub 15-pole	1	A	Red (RD)	cos +	A	
	9	$\bar{A}$	Blue (BU)	cos-	$\bar{A}$	
	2	B	Yellow (YE)	sin+	B	
	10	$\bar{B}$	Green (GN)	sin-	$\bar{B}$	
	3	C	Brown (BN)	C+	C	
	11	$\bar{C}$	White (WH)	C-	$\bar{C}$	
	4	S	Black (BK)	Data+	S	
	12	$\bar{D}$	Violet (VT)	Data-	$\bar{D}$	
	15	UB	Gray (GY)	UB	+UB	
	15	UB	Red/blue (RD/BU)	UB	+UB	
	8	GND	Pink (PK)	GND	GND	
	8	GND	Gray/pink (GY/PK)	GND	GND	
	14	TF/TH/KTY+	Brown (BN)	TF/TH/KTY+	1	C
	6	TF/TH/KTY-	White (WH)	TF/TH/KTY-	2	
				Shielding	3	

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Part numbers

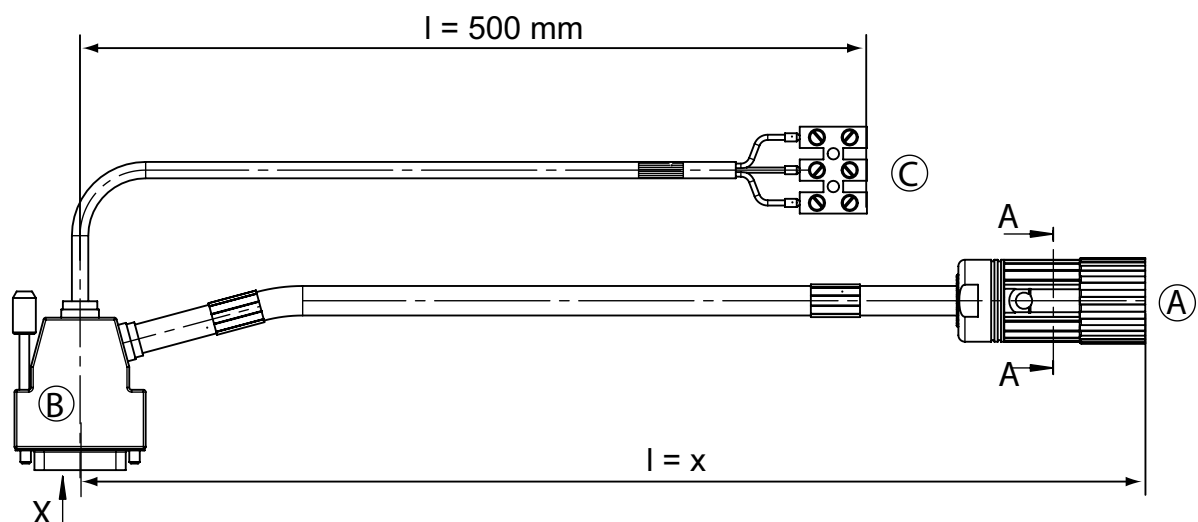
Cable type	Connection cover, D-sub 15
Fixed installation	13631632
cable carrier installation	13631640

12.10.2 Encoder cable with M23 and D-sub

Prefabricated cables for encoders

Encoder types
ES7S, EG7S, ES7R, EG7R, AS7W, AG7W

Cable drawing, wiring



18014401506392843

I = x: Length that can be ordered

MOVIAXIS® connection					Motor connection side	
Plug connectors View X	Contact B	Signal	Cable core color	Signal	Contact A	
D-sub 15-pole	1	A	Red (RD)	A cos+	3	ASTA 021 FR
	9	$\bar{A}$	Blue (BU)	$\bar{A}$ cos-	4	
	2	B	Yellow (YE)	B sin+	5	
	10	$\bar{B}$	Green (GN)	$\bar{B}$ sin-	6	
	3	C	Brown (BN)	C+	1	
	11	$\bar{C}$	White (WH)	C-	2	
	4	S	Black (BK)	Data+	8	
	12	$\bar{D}$	Violet (VT)	Data-	7	
	15	UB	Gray (GY)	UB	12	
	15	UB	Red/blue (RD/BU)	UB	12	
	8	GND	Pink (PK)	GND	11	
	8	GND	Gray/pink (GY/PK)	GND	11	
	14	TF/TH/KTY+	Brown (BN)	TF/TH/KTY+	1	C
	6	TF/TH/KTY-	White (WH)	TF/TH/KTY-	2	
				Shielding	3	

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Part numbers

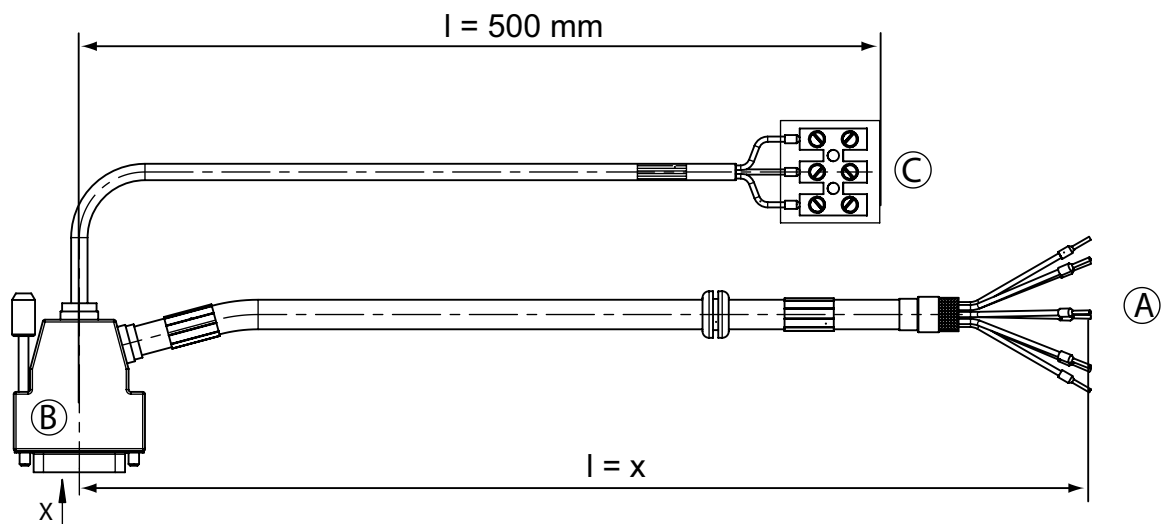
Cable type	M23, D-sub 15
Fixed installation	13631691
cable carrier installation	13631705

12.10.3 Encoder cable with conductor end sleeves and D-sub

Prefabricated cables for encoders

Encoder types
E.7., A.7.

Cable drawing, wiring



18014401506396555

I = x: Length that can be ordered

MOVIAXIS®connection					Motor connection side	
Plug connectors View X	Contact B	Signal	Cable core color	Signal	Contact A	
D-sub 15-pole	1	A	Red (RD)	A cos+	A	
	9	$\bar{A}$	Blue (BU)	$\bar{A}$ cos-	$\bar{A}$	
	2	B	Yellow (YE)	B sin+	B	
	10	$\bar{B}$	Green (GN)	$\bar{B}$ sin-	$\bar{B}$	
	3	C	Brown (BN)	C+	C	
	11	$\bar{C}$	White (WH)	C-	$\bar{C}$	
	4	S	Black (BK)	Data+	S	
	12	$\bar{D}$	Violet (VT)	Data-	$\bar{D}$	
	15	UB	Gray (GY)	UB	+UB	
	15	UB	Red/blue (RD/BU)	UB	+UB	
	8	GND	Pink (PK)	GND	GND	
	8	GND	Gray/pink (GY/PK)	GND	GND	
	14	TF/TH/KTY+	Brown (BN)	TF/TH/KTY+	1	
	6	TF/TH/KTY-	White (WH)	TF/TH/KTY-	2	
				Shielding	3	C

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Part numbers

Cable type	Conductor end sleeves, D-sub 15
Fixed installation	13631659
cable carrier installation	13631667

12.11 Built-in encoder cable

12.11.1 Encoder cable with an M12 connector

Prefabricated cables

Encoder types	DR.71 – 132
HTL	EI7C, EI76, EI72, EI71

Cable drawing, wiring

Encoder cable with one M12



9735112587

8-pole without TF

Inverter connection ¹⁾				Motor connection side	
Contact B	Signal	Cable core color	Signal	Contact A	
	A cos+	Brown (BN)	A cos+	3	
	$\bar{A}$ cos	White (WH)	$\bar{A}$ cos	4	
	B sin+	Yellow (YE)	B sin+	5	
	$\bar{B}$ sin	Green (GN)	$\bar{B}$ sin	6	
	n.c.	-	n.c.	7	
	n.c.	-	n.c.	8	
	UB	Gray (GY)	UB	1	
	GND	Pink (PK)	GND	2	

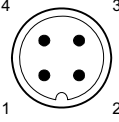
1) Assignment depends on the inverter used

8-pole with TF

Inverter connection ¹⁾				Motor connection side	
Contact B	Signal	Cable core color	Signal	Contact A	
	A cos+	Brown (BN)	A cos+	3	
	$\bar{A}$ cos	White (WH)	$\bar{A}$ cos	4	
	B sin+	Yellow (YE)	B sin+	5	
	$\bar{B}$ sin	Green (GN)	$\bar{B}$ sin	6	
	TS	Red (RD)	TS	7	
	TF-	Blue (BU)	TF-	8	
	UB	Gray (GY)	UB	1	
	GND	Pink (PK)	GND	2	

1) Assignment depends on the inverter used

4-pole

Inverter connection ¹⁾				Motor connection side	
Contact B	Signal	Cable core color	Signal	Contact A	
	UB	Gray (GY)	UB	1	
	B sin+	Yellow (YE)	B sin+	2	
	GND	Pink (PK)	GND	3	
	A cos+	Brown (BN)	A cos+	4	

1) Assignment depends on the inverter used

Part numbers

Cable type	Number of poles	Connection side inverter (B)	Connection side motor (A)	Part number
Fixed installation	4-pole	cut off	M12 connector, 4-pole, A-coded	18156746
	8-pole - with TF	Conductor end sleeve	M12 connector, 8-pole, A-coded	13623273
Cable carrier installation	8-pole - without TF	cut off		18156754
	8-pole - with TF	cut off		18156770
		Conductor end sleeves		13623281

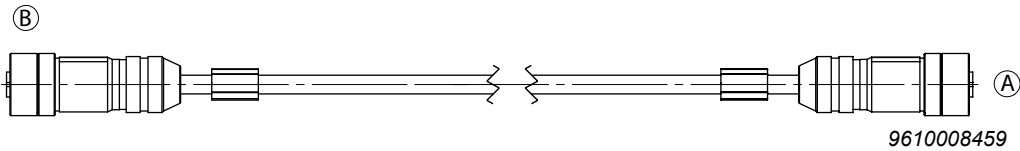
12.11.2 Encoder cable with two M12 connectors

Prefabricated cables

Encoder types	DR.71 – 132
HTL	EI7C, EI7C FS, EI76, EI72, EI71

Cable drawing, wiring

Encoder cable with two M12 connectors – 8- and 4-pole



8-pole without TF (EI7C FS)

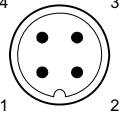
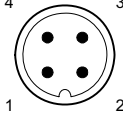
Inverter connection				Motor connection side		
	Contact B	Signal	Cable core color	Signal	Contact A	
	3	A cos+	Brown (BN)	A cos+	3	
	4	$\bar{A}$ cos	White (WH)	$\bar{A}$ cos	4	
	5	B sin+	Yellow (YE)	B sin+	5	
	6	$\bar{B}$ sin	Green (GN)	$\bar{B}$ sin	6	
	7	n.c.	-	n.c.	7	
	8	n.c.	-	n.c.	8	
	1	UB	Gray (GY)	UB	1	
	2	GND	Pink (PK)	GND	2	

8-pole

Inverter connection				Motor connection side		
	Contact B	Signal	Cable core color	Signal	Contact A	
	3	A cos+	Brown (BN)	A cos+	3	
	4	$\bar{A}$ cos	White (WH)	$\bar{A}$ cos	4	
	5	B sin+	Yellow (YE)	B sin+	5	
	6	$\bar{B}$ sin	Green (GN)	$\bar{B}$ sin	6	
	7	TS	Red (RD)	TS	7	
	8	TF-	Blue (BU)	TF-	8	
	1	UB	Gray (GY)	UB	1	
	2	GND	Pink (PK)	GND	2	

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4-pole

Inverter connection					Motor connection side	
	Contact B	Signal	Cable core color	Signal	Contact A	
	1	UB	Gray (GY)	UB	1	
	2	B sin+	Yellow (YE)	B sin+	2	
	3	GND	Pink (PK)	GND	3	
	4	A cos+	Brown (BN)	A cos+	4	

Part numbers

Cable type	Number of poles	Part number
Fixed installation	8-pole	18156762
	4-pole	18156738

Safety-rated EI7C FS encoder

Cable type	Number of poles	Part number
Fixed installation	8-pole	18148670
Cable carrier installation		18158013

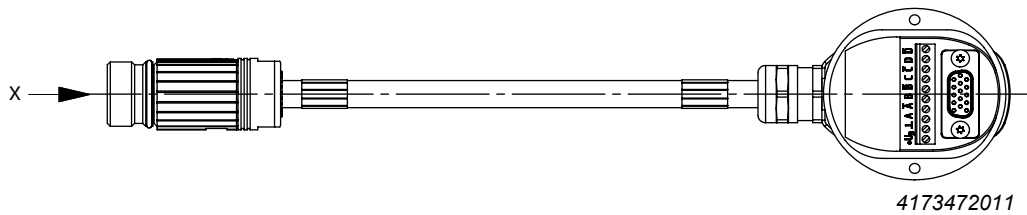
12.12 Extensions for add-on encoder cables

12.12.1 Encoder extension cable with connection cover and M23

Prefabricated cables for encoders

Encoder types	DR.71 – 132	DR.160 – 280
Sine encoder	ES7S	EG7S
TTL ($V_B = DC\ 9 - 30\ V$)	ES7R	EG7R
RS485	AS7W	AG7W

Cable drawing, wiring



Inverter connection					Motor connection side
Plug connectors View X	Contact	Signal	Cable core color	Signal	Contact
AKUA 020 90072040739390 83	3	A cos+	Red (RD)	A cos+	A
	4	$\bar{A}$ cos-	Blue (BU)	$\bar{A}$ cos-	$\bar{A}$
	5	B sin+	Yellow (YE)	B sin+	B
	6	$\bar{B}$ sin-	Green (GN)	$\bar{B}$ sin-	$\bar{B}$
	1	C+	Brown (BN)	C+	C
	2	C-	White (WH)	C-	$\bar{C}$
	8	Data+	Black (BK)	Data+	S
	7	Data-	Violet (VT)	Data-	$\bar{D}$
	12	UB	Red/blue + gray (RD-BU + GY)	UB	+UB
	11	GND	Gray-pink+pink (GY-PK+PK)	GND	GND

Part numbers

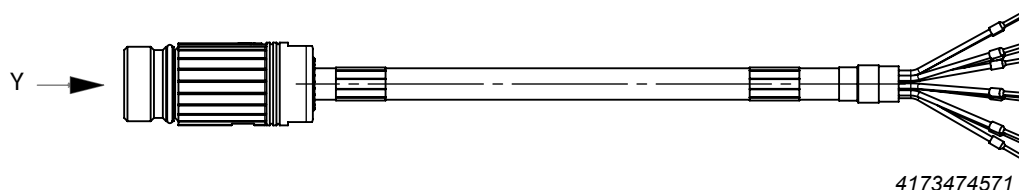
Cable type	Connection cover, M23
Fixed installation	13621963

12.12.2 Encoder extension cable with conductor end sleeves and M23

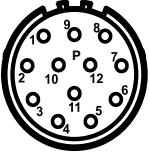
Prefabricated cables for encoders

Encoder types	DR.71 – 132	DR.160 – 280
Sine encoder	ES7S	EG7S
TTL ($V_B = DC\ 9 - 30\ V$)	ES7R	EG7R
RS485	AS7W	AG7W

Cable drawing, wiring



4173474571

Inverter connection					Motor connection side
Plug connectors View Y	Contact	Signal	Cable core color	Signal	Contact
AKUA 020  900720407393908 3	3	A cos+	Red (RD)	A cos+	A
	4	$\bar{A}$ cos-	Blue (BU)	$\bar{A}$ cos-	$\bar{A}$
	5	B sin+	Yellow (YE)	B sin+	B
	6	$\bar{B}$ sin-	Green (GN)	$\bar{B}$ sin-	$\bar{B}$
	1	C+	Brown (BN)	C+	C
	2	C-	White (WH)	C-	$\bar{C}$
	8	Data+	Black (BK)	Data+	S
	7	Data-	Violet (VT)	Data-	$\bar{D}$
	12	UB	Red/blue + gray (RD-BU + GY)	UB	+UB
	11	GND	Gray-pink+pink (GY-PK +PK)	GND	GND

Part numbers

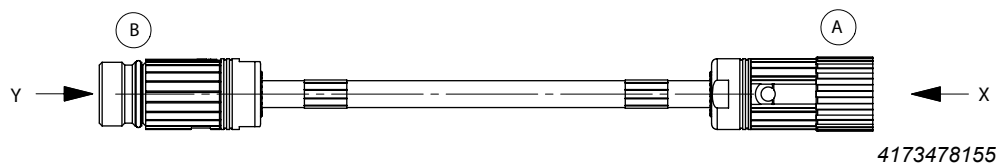
Cable type	Conductor end sleeves, M23
Fixed installation	13623184

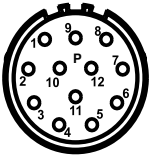
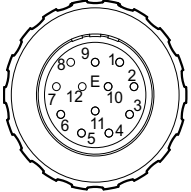
12.12.3 Encoder extension cable with two M23

Prefabricated cables for encoders

Encoder types	DR.71 – 132	DR.160 – 280
Sine encoder	ES7S	EG7S
TTL ($V_B = DC\ 9 - 30\ V$)	ES7R	EG7R
RS485	AS7W	AG7W

Cable drawing, wiring



Motor connection side					Inverter connection	
Plug connectors View Y	Contact	Signal	Cable core color	Signal	Contact	Plug connectors View X
AKUA 020  900720407393908 3	3	A cos+	Red (RD)	A cos+	3	ASTA 021FR 
	4	$\bar{A}$ cos-	Blue (BU)	$\bar{A}$ cos-	4	
	5	B sin+	Yellow (YE)	B sin+	5	
	6	$\bar{B}$ sin-	Green (GN)	$\bar{B}$ sin-	6	
	1	C+	Brown (BN)	C+	1	
	2	C-	White (WH)	C-	2	
	8	Data+	Black (BK)	Data+	8	
	7	Data-	Violet (VT)	Data-	7	
	12	UB	Red/blue + gray (RD-BU + GY)	UB	12	
	11	GND	Gray-pink+pink (GY-PK+PK)	GND	11	

Part numbers

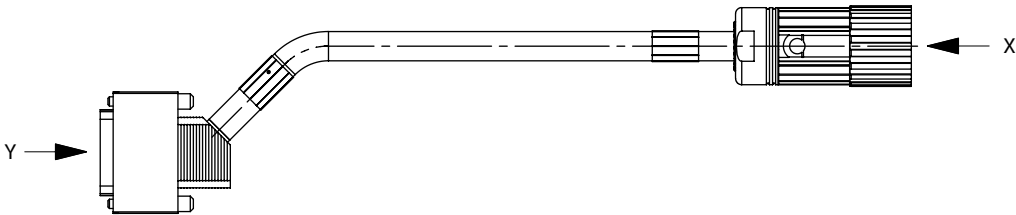
Cable type	M23 – M23
Fixed installation	13623192
Cable carrier installation	13621971

12.12.4 Encoder extension cable with M23 and D-sub

Prefabricated cables for encoders

Encoder types	DR.71 – 132	DR.160 – 280
Sine encoder	ES7S	EG7S
TTL ($V_B = DC\ 9 - 30\ V$)	ES7R	EG7R
RS485	AS7W	AG7W

Cable drawing, wiring



4173480971

Motor connection side							Inverter connection	
Plug connectors View Y	Contact	Signal	Cable core color	Signal	Contact	Plug connectors View X		
	1	A cos+	Red (RD)	A cos+	3	ASTA 021FR 		
	9	$\bar{A}$ cos-	Blue (BU)	$\bar{A}$ cos-	4			
	2	B sin+	Yellow (YE)	B sin+	5			
	10	$\bar{B}$ sin-	Green (GN)	$\bar{B}$ sin-	6			
	3	C+	Brown (BN)	C+	1			
	11	C-	White (WH)	C-	2			
	4	Data+	Black (BK)	Data+	8			
	12	Data-	Violet (VT)	Data-	7			
	15	UB	Red/blue + gray (RD-BU + GY)	UB	12			
	8	GND	Gray-pink+pink (GY-PK +PK)	GND	11			

Part numbers

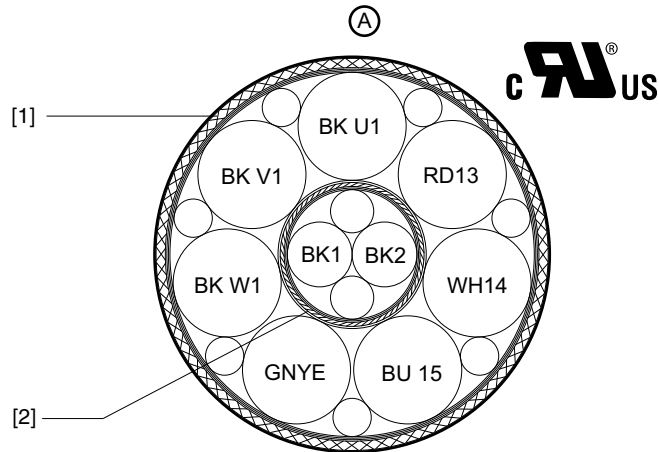
Cable type	M23 – D-sub
Fixed installation	13621998

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12.13 Cable specifications of the power cables

12.13.1 Cable type A

Mechanical design



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Cable type A: Connection between Z.7 or Z.8 field distributors and AC motors
Connection between MOVIMOT® or MOVI-SWITCH® 2S with AC motors
(for mounting close to the motor)

[1] Overall shield

[2] Shield

- SEW works standard W3251 (817 953 0)
- Supply cores: 7 x 1.5 mm²
- Control core pair: 2 x 0.75 mm²
- Insulation: TPE-U (polyurethane)
- Conductor: Bare E-Cu strand, extra fine wires with individual wire ≤ 0.1 mm
- Shield: Tinned E-Cu wire.
- Overall diameter: 13.2 – 15.9 mm
- Color of outer cable sheath: Schwarz

Electrical properties

- Conductor resistance for 1.5 mm² (20 °C): max. 13 Ω/km
- Conductor resistance for 0.75 mm² (20 °C): max. 26 Ω/km
- Operating voltage for conductor 1.5 mm²: max. 750 V ( US600 V)
- Operating voltage for conductor 0.75 mm²: max. 350 V ( US600 V)
- Insulation resistance at 20 °C: min. 20 MΩ x km

Mechanical properties

- Suitable for cable carriers
 - Bending cycles > 2.5 million
 - Travel speed ≤ 3 m/s
- Bending radius in the cable track: 10 x diameter
- Bending radius for fixed routing: 5 x diameter
- Torsional strength (e.g. rotary table applications)
 - Torsion ±180° for a cable length of > 1 m
 - Torsional cycles > 100.000

**INFORMATION**

You will have to check the mechanical marginal conditions if you encounter reversed bending and high torsional load for a length of < 3 m. Please contact SEW-EURODRIVE in such cases

Thermal properties

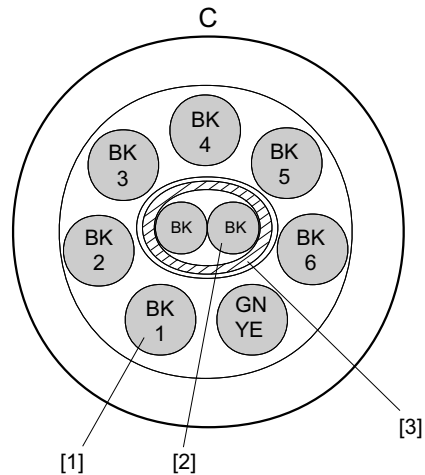
- Processing and operation: -30 °C to +90 °C (C  US: -30 °C to +80 °C)
- Transport and storage: -40 °C to +90 °C (C  US: -30 °C to +80 °C)
- Flame-retardant according to UL1581 Vertical Wiring Flame Test (VW1)
- Flame-retardant according to CSA C22.2 Vertical Wiring Flame Test

Chemical properties

- Oil-resistant according to VDE 0472 part 803 method B
- General fuel resistance (such as diesel, gasoline) according to DIN ISO 6722 parts 1 and 2
- General resistance to acids, alkalis, cleaning agents
- General resistance against dusts (e.g. bauxite, magnesite)
- Insulation and cable jacket material is halogen free according to VDE 0472 part 815 as well as silicone free
- Within the specified temperature range, free from substances interfering with wetting agents

12.13.2 Cable type C

Mechanical design



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Cable type C connection between MOVI-SWITCH® 2S with AC motor
(for mounting close to the motor with option P2.A)

[1] Conductors 2.5 mm²

[2] Conductors 0.75 mm²

[3] Shield

- SEW works standard W3251 (015 207 2)
- Supply cores: 7 x 2.5 mm²
- Control cores: 2 x 0.75 mm²
- Insulation: PVC / Special PVC
- Conductor: Fine wires to VDE class 5, copper strand conductor
- Shield: Braided tinned copper shield
- Overall diameter: 15.2 mm

Electrical properties

- Conductor resistance for 2.5 mm²: 8.5 Ω/km
- Conductor resistance for 0.75 mm²: 26 Ω/km
- Operating voltage for 2.5 mm² cores: 600 V/1000 V
- Operating voltage for conductors 0.75 mm²: AC 48 V
- Insulation resistance: 20 MΩ x km

Mechanical properties

- Bending radius in the cable track: 20 x diameter
- Bending radius for fixed routing: 6 x diameter

Thermal properties

- Processing and operation
 - Flexible routing: -5 °C to +70 °C
 - Fixed routing: -30 °C to +80 °C
- Transport and storage: -30 °C to +80 °C

12.14 Cable specification of encoder cables

12.14.1 Fixed installation

Accessory designation		ES7S / EG7S / ES7R / EG7R / ES7C / EG7C / AS7W / AG7W / AH7Y / AS7Y / AG7Y	EH7S / AH7Y	EI7C ¹⁾
Cable cross sections		6 x 2 x 0.25 mm ²	5 x 2 x 0.25 mm ²	
Manufacturer		HELUKABEL		
Manufacturer designation		LI9YCY		
Operating voltage V ₀ / V AC	V	230 / 350		
Temperature range	°C	Fixed installation -40 to +80		
Max. temperature	°C	+ 80		
Min. bending radius	mm	43	36.5	73
Outside diameter D	mm	8.6 ± 0.2	7.3 ± 0.2	
Core identification		DIN 47 100		
Sheath color		Green, similar to RAL 6018		
Approval(s)		DESINA / VDE / UL/CSA / CE		
Capacitance core/shield- ing	nF/km	110		
Capacitance core/core	nF/km	70		
Halogen-free		no		
Silicone-free		Yes		
CFC-free		Yes		
Inner insulation (core)		PP		
Outer insulation (sheath)		PVC		
Flame-inhibiting/self-extin- guishing		No		flame retardant ac- cording to VDE0472, Part 802, Test type B, according to IEC 60332-1
Conductor material		Cu blank		
Shielding		Braided tinned Cu		
Weight (cable)	kg/km	107	78	83

1) EI7C encoders require a maximum of 8 conductors, additional conductors potentially for temperature sensors

12.14.2 cable carrier installation

Accessory designation		ES7S / EG7S / ES7R / EG7R / ES7C / EG7C / AS7W / AG7W / AH7Y / AS7Y / AG7Y	EH7S / AH7Y / EI7C	EI7C ¹⁾
Cable cross sections		6 x 2 x 0.25 mm ²	5 x 2 x 0.25 mm ²	4 x 2 x 0.25 mm ²
Manufacturer		Nexans		HELUKABEL
Manufacturer's designation		SSL18YC11Y 6 x 2 x 0.25 SSL18YC11Y 5 x 2 x 0.25		Top encoder 503, 74419
Operating voltage V ₀ / V AC	V	300		
Temperature range	°C	-20 to +60		-20 to +80
Max. temperature	°C	+90 (+194) (on conductor)	+60	+80
Min. bending radius	mm	100	96	63
Outside diameter D	mm	9.8 ± 0.2	9.6 ± 0.2	8.4 ± 0.2
Maximum acceleration	m/s ²	20		50
Max. velocity	m/min	200		300
Core identification		DIN 47100		
Sheath color		Green similar to RAL 6018		
Approval(s)		DESINA / VDE /	DESINA / VDE / UL / CE	DESINA / VDE / UL/CSA / CE
Capacitance core/shielding	nF/km	100	85	110
Capacitance core/core	nF/km	58		70
Halogen-free		Yes		
Silicone-free		Yes		
CFC-free		Yes		
Inner insulation (core)		PP		
Outer insulation (sheath)		PUR		
Flame-inhibiting/self-extinguishing		yes		
Conductor material		E-Cu blank		
Shielding		Braided tinned Cu		
Weight	kg/km	130	114	89
Min. bending cycles		≥ 5 million		

1) EI7C encoders require a maximum of 8 conductors, additional conductors potentially for temperature sensors