

# MOTOR CABLES FOR P10 MOTORS



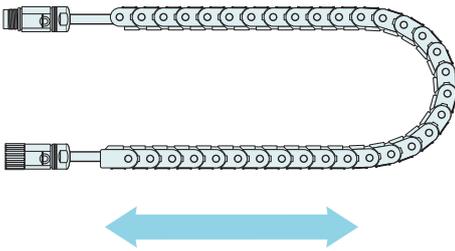
- ✓ High-flex cables for cable chain applications
- ✓ Tested under high voltage
- ✓ Completely prefabricated
- ✓ With quick-connect plugs
- ✓ Very good EMC properties

## Motor cables for P10 Motors

For type P10 three-phase linear motors, LinMot uses the conventional two-cable solution. The connection is made using one power cable and one signal cable. Both cables have external shielding and can be used in moving cable carriers. The use of twisted conductor pairs in the signal cable provides even better signal transmission. The influence of external interference from oscillating fields is greatly reduced.



### HIGH FLEX KS MOTOR CABLES



The high-flex type KS motor cable is suitable for applications where the motor cable moves, where the cable is routed through a cable carrier and undergoes a roll-up motion.

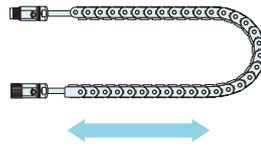
### BY LENGTH OR COMPLETELY PREFABRICATED



The LinMot cable for P10 motors is available by length. It can be cut to the desired length or ordered in large quantities on rolls. LinMot carries all of the motor plugs for customers to assemble their own motor cables.

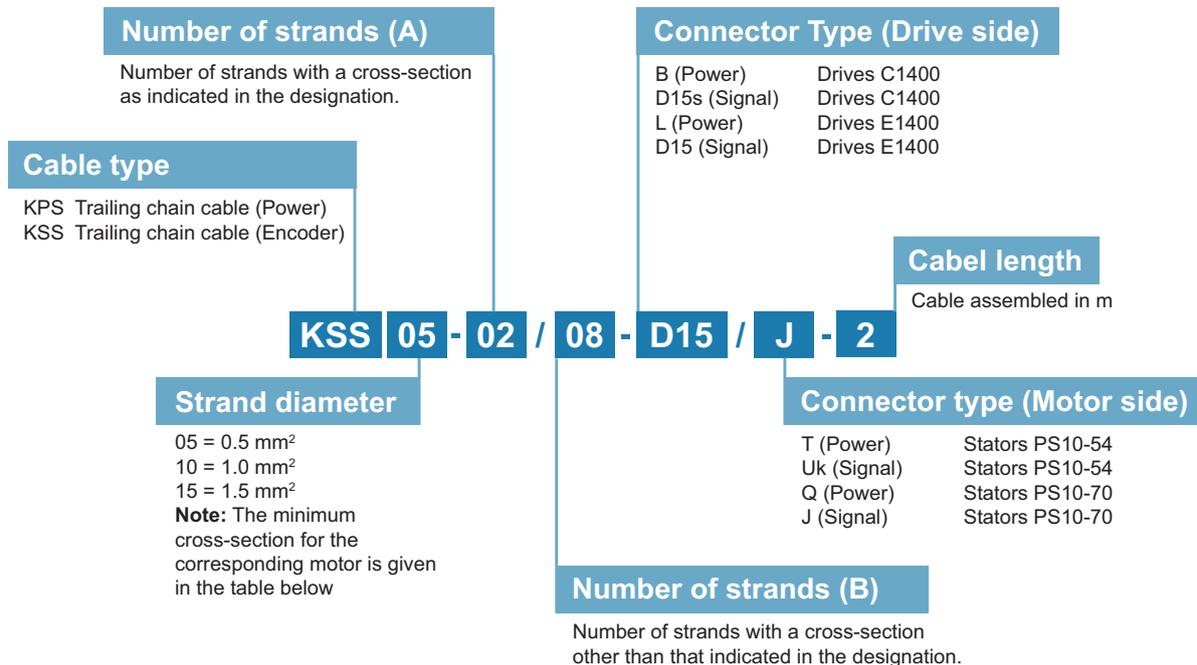
Fully assembled motor cables can be shipped in lengths up to 50 m. Order the motor cable in the desired length together with the matching motor plugs (assembled.) Prefabricated motor cables with the most commonly used plug combinations can be shipped from stock in standard lengths. LinMot motor cables are produced using only crimped contacts and are tested under high voltage prior to shipment.

High flex trailing chain cable for P10 Stators



Cable type	KSS05-02/06	KSS05-02/08	KSS05-02/13	KPS07-04/02	KPS15-04	KPS15-04/04
Wire cross-section Motor phases	0.5 mm <sup>2</sup> (AWG20)	0.5 mm <sup>2</sup> (AWG20)	0.5 mm <sup>2</sup> (AWG20)	0.75 mm <sup>2</sup> (AWG18)	1.5 mm <sup>2</sup> (AWG15)	1.5 mm <sup>2</sup> (AWG15)
Wire cross-section Sensor signal	0.25 mm <sup>2</sup> (AWG23)	0.25 mm <sup>2</sup> (AWG23)	0.25 mm <sup>2</sup> (AWG23)	0.25 mm <sup>2</sup> (AWG23)	(-)	0.75 mm <sup>2</sup> (AWG18)
Material Wire insulation	PP	TPE	PE	PES	TPE	TPE
Material Cable sheath	PUR	TPU	PUR	PUR	TPU	PUR
Colour Cable sheath	green	green	green	orange	orange	orange
Cable cross section	7.7 mm (0.3 in)	8.9 mm (0.35 in)	9 mm (0.35 in)	9.1 mm (0.36 in)	10.2 mm (0.4 in)	12.3 mm (0.48 in)
Weight	76 kg/km (270 lb/mi)	106 kg/km (376 lb/mi)	100 kg/km (355 lb/mi)	116 kg/km (412 lb/mi)	167 kg/km (593 lb/mi)	228 kg/km (809 lb/mi)
Copper number	49.8 kg/km	59 kg/km	68.4 kg/km	73 kg/km	81.3 kg/km	170.1 kg/km
Approvals	UL / CSA 300V E465739	UL / CSA 300V E465739	UL / CSA 300V E172204	UL / CSA 1000V / 300V E465739	UL / CSA 1000V E465739	UL / CSA 1000V / 300V E172204
AWM-Style	20549	20233	20236	21223	20234	20235
Minimum bending radius static	60 mm (2.36 in)	45 mm (1.75)	45 mm (1.75)	70 mm (2.76 in)	50 mm (2 in)	60 mm (2.36 in)
Minimum bending radius moving	120 mm (4.72 in)	90 mm (3.54 in)	90 mm (3.54 in)	140 mm (5.52 in)	100 mm (4 in)	120 mm (4.72 in)
Temperature range	-20°...+70°C	-20°...+70°C	-20°...+70°C	-20°...+70°C	-20°...+70°C	-40°...+80°C
Oil resistance	very good acc. DIN VDE 0282 Part 10 + HD 22.10	very good acc. DIN VDE 0282 Part 10 + HD 22.10	very good acc. DIN VDE 0282 Part 10 + HD 22.10	very good acc. DIN VDE 0282 Part 10 + HD 22.10	very good acc. DIN VDE 0282 Part 10 + HD 22.10	very good acc. DIN VDE 0282 Part 10 + HD 22.10
Chemical resistance	good to acids, alkalis, solvents, hydraulic fluids, etc.					

**TYPE CODE OF MOTOR CABLE FOR P10 MOTORS**



Minimum Strand Diameter Power Cable						
	Max. Cont. Force [A rms]		Strand diameter according to DIN		Strand diameter according to UL	
	Passive cooling	Fluid cooling	Passive cooling	Fluid cooling	Passive cooling	Fluid cooling
<b>P10-54x120U</b>	1.4	2.7	KPS07	KPS07	KPS07	KPS07
<b>P10-54x180U</b>	2.6	5.1	KPS07	KPS07	KPS07	KPS07
<b>P10-54x240U</b>	2.6	5.1	KPS07	KPS07	KPS07	KPS07
<b>P10-54x300U</b>	3.2	6.5	KPS07	KPS07	KPS07	KPS07
<b>P10-70x80U</b>	1.3	3.7	KPS15	KPS15	KPS15	KPS15
<b>P10-70x160U</b>	2.4	6.6	KPS15	KPS15	KPS15	KPS15
<b>P10-70x240U</b>	3.4	9.1	KPS15	KPS15	KPS15	KPS15
<b>P10-70x320U</b>	3.0	8.0	KPS15	KPS15	KPS15	KPS15
<b>P10-70x400U</b>	4.2	11.5	KPS15	KPS15	KPS15	KPS15

Encoder cable	
<b>P10-54x120U</b>	KSS05 encoder cable is used for all P10 motors.
<b>P10-54x180U</b>	
<b>P10-54x240U</b>	
<b>P10-54x300U</b>	
<b>P10-70x80U</b>	
<b>P10-70x160U</b>	
<b>P10-70x240U</b>	
<b>P10-70x320U</b>	
<b>P10-70x400U</b>	

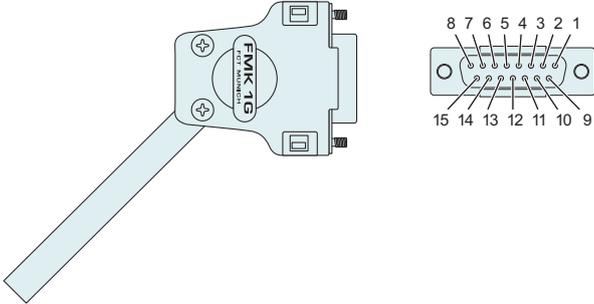
MOTOR CABLE PER M		
Item	Description	Item-No.
<b>KSS05-02/08</b>	Encoder trailing chain cable LinMot (per m)	<a href="#">0150-2258</a>
<b>KSS05-02/08-100</b>	Encoder trailing chain cable LinMot (100 m)	<a href="#">0150-3575</a>
<b>KSS05-02/13</b>	Encoder trailing chain cable P10-...-Dxx (per m)	<a href="#">0150-2259</a>
<b>KSS05-02/06</b>	Encoder trailing chain cable P10-...-Dx3 (per m)	<a href="#">0150-2490</a>
<b>KPS15-04</b>	Power trailing chain cable P10-70 (per m)	<a href="#">0150-2257</a>
<b>KPS15-04-100</b>	Power trailing chain cable P10-70 (100 m)	<a href="#">0150-3576</a>
<b>KPS07-04/02</b>	Power trailing chain cable P10-54 (per m)	<a href="#">0150-2372</a>
<b>KPS15-04/04</b>	Power trailing chain cable P10-...-Dx3 (per m)	<a href="#">0150-2269</a>

POWER & ENCODER CABLES FOR LINEAR MOTORS P10-54		
Item	Description	Item-No.
<b>KPS07-04/02-L/Tk-3</b>	Power trailing chain cable L/Tk, 3 m for Servo Drive E1400	<a href="#">0150-2670</a>
<b>KPS07-04/02-L/Tk-5</b>	Power trailing chain cable L/Tk, 5 m for Servo Drive E1400	<a href="#">0150-2671</a>
<b>KPS07-04/02-L/Tk-8</b>	Power trailing chain cable L/Tk, 8 m for Servo Drive E1400	<a href="#">0150-2672</a>
<b>KPS07-04/02-L/Tk-12</b>	Power trailing chain cable L/Tk, 12 m for Servo Drive E1400	<a href="#">0150-2673</a>
<b>KPS07-04/02-B/Tk-3</b>	Power trailing chain cable B/Tk, 3 m for Servo Drive C1400	<a href="#">0150-3648</a>
<b>KPS07-04/02-B/Tk-5</b>	Power trailing chain cable B/Tk, 5 m for Servo Drive C1400	<a href="#">0150-3657</a>
<b>KPS07-04/02-B/Tk-8</b>	Power trailing chain cable B/Tk, 8 m for Servo Drive C1400	<a href="#">0150-3658</a>
<b>KPS07-04/02-B/Tk-12</b>	Power trailing chain cable B/Tk, 12 m for Servo Drive C1400	<a href="#">0150-3659</a>
<b>KSS 05-02/08-D15s/Uk-3</b>	Encoder trailing chain cable D15s/Uk, 3 m	<a href="#">0150-2650</a>
<b>KSS 05-02/08-D15s/Uk-5</b>	Encoder trailing chain cable D15s/Uk, 5 m	<a href="#">0150-2651</a>
<b>KSS 05-02/08-D15s/Uk-8</b>	Encoder trailing chain cable D15s/Uk, 8 m	<a href="#">0150-2652</a>
<b>KSS 05-02/08-D15s/Uk-12</b>	Encoder trailing chain cable D15s/Uk, 12 m	<a href="#">0150-2653</a>
<b>KPS07-04/02-./Tk-10</b>	Power trailing chain cable ./Tk, 10 m	<a href="#">0150-3626</a>
<b>KSS 05-02/13-./Uk-10</b>	Encoder trailing chain cable ./Uk, 10 m	<a href="#">0150-3627</a>

POWER & ENCODER CABLES FOR LINEAR MOTORS P10-70		
Item	Description	Item-No.
<b>KPS15-04-L/Q-3</b>	Power trailing chain cable L/Q, 3 m for Servo Drive E1400	<a href="#">0150-2266</a>
<b>KPS15-04-L/Q-5</b>	Power trailing chain cable L/Q, 5 m for Servo Drive E1400	<a href="#">0150-2261</a>
<b>KPS15-04-L/Q-8</b>	Power trailing chain cable L/Q, 8 m for Servo Drive E1400	<a href="#">0150-2267</a>
<b>KPS15-04-L/Q-12</b>	Power trailing chain cable L/Q, 12 m for Servo Drive E1400	<a href="#">0150-2268</a>
<b>KPS15-04-B/Q-3</b>	Power trailing chain cable B/Q, 3 m for Servo Drive C1400	<a href="#">0150-3660</a>
<b>KPS15-04-B/Q-5</b>	Power trailing chain cable B/Q, 5 m for Servo Drive C1400	<a href="#">0150-3661</a>
<b>KPS15-04-B/Q-8</b>	Power trailing chain cable B/Q, 8 m for Servo Drive C1400	<a href="#">0150-3662</a>
<b>KPS15-04-B/Q-12</b>	Power trailing chain cable B/Q, 12 m for Servo Drive C1400	<a href="#">0150-3663</a>
<b>KSS 05-02/08-D15/J-3</b>	Encoder trailing chain cable D15/J, 3 m	<a href="#">0150-2263</a>
<b>KSS 05-02/08-D15/J-5</b>	Encoder trailing chain cable D15/J, 5 m	<a href="#">0150-2262</a>
<b>KSS 05-02/08-D15/J-8</b>	Encoder trailing chain cable D15/J, 8 m	<a href="#">0150-2264</a>
<b>KSS 05-02/08-D15/J-12</b>	Encoder trailing chain cable D15/J, 12 m	<a href="#">0150-2265</a>
<b>KPS15-04-..../Q-10</b>	Power trailing chain cable .../Q, 10m for D0x	<a href="#">0150-2376</a>
<b>KPS15-04/04..../Q-10</b>	Power trailing chain cable .../Q, 10m for D03	<a href="#">0150-3654</a>
<b>KSS 05-02/13-./J-10</b>	Encoder trailing chain cable ./J, 10m for D0x	<a href="#">0150-2377</a>
<b>KSS 05-02/06-./J-10</b>	Encoder trailing chain cable ./J, 10m for D03	<a href="#">0150-3655</a>

**D15-45° - CONNECTOR**

**MC10-D15-45°/f**

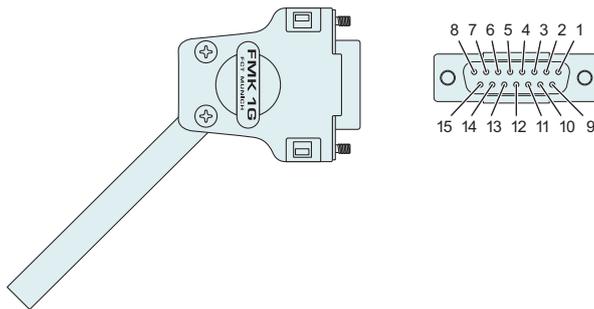


1	+5V	red
2	Sine-	orange
3	Cosine-	blue
4	GND Sense	brown
5	GND	black
6	Not connected	n.c.
7	Not connected	n.c.
8	Motor Link C-	grey
9	Sine+	yellow
10	Cosine+	green
11	+5V Sense	white
12	Not connected	n.c.
13	Not connected	n.c.
14	Not connected	n.c.
15	Motor Link C+	pink
Housing		all shields

Item	Description	Item-No.
<b>MC10-D15-45°/f</b>	Connector encoder C1400/E1400/X3	<a href="#">0150-3397</a>

**D15S-45° - CONNECTOR**

**MC10-D15s-45°/f**



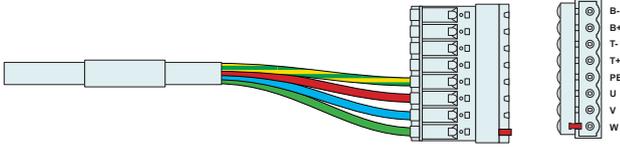
1	+5V	red
2	Sine-	orange
3	Cosine-	blue
4	Not connected	n.c.
5	GND	black
6	GND Sense	brown
7	Not connected	n.c.
8	Motor Link C-	grey
9	Sine+	yellow
10	Cosine+	green
11	Not connected	n.c.
12	Not connected	n.c.
13	+5V Sense	white
14	Not connected	n.c.
15	Motor Link C+	pink
Housing		all shields

Item	Description	Item-No.
<b>MC10-D15s-45°/f-as</b>	Connector encoder C1400/E1400/X3 assembled	<a href="#">0150-3632</a>

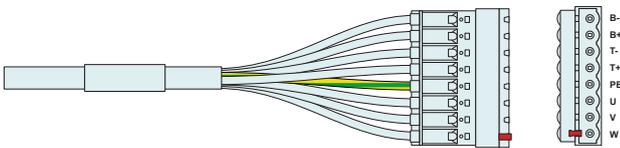
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**B-CONNECTOR**

**MC10-B/m**



**MC10-B/m**



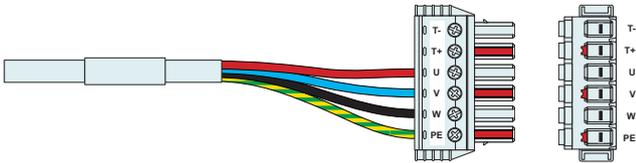
Connector Wiring (without brake)		
PE	Protective Earth	yellow-green
W	Motor Phase W	green
V	Motor Phase V	blue
U	Motor Phase U	red
T+	Temperature Sensor T+	n.c.
T-	Temperature Sensor T-	n.c.
B+	Motor Brake+	n.c.
B-	Motor Brake-	n.c.

Connector Wiring (with brake)		
PE	Protective Earth	yellow-green
W	Motor Phase W	black (Nr. 3)
V	Motor Phase V	black (Nr. 2)
U	Motor Phase U	black (Nr. 1)
T+	Temperature Sensor T+	black (Nr. 5)
T-	Temperature Sensor T-	black (Nr. 6)
B+	Motor Brake+	black (Nr. 7)
B-	Motor Brake-	black (Nr. 8)

Item	Description	Item-No.
<b>MC10-B/m</b>	Connector Power C1400/X2	<a href="#">0150-3605</a>

**L-CONNECTOR**

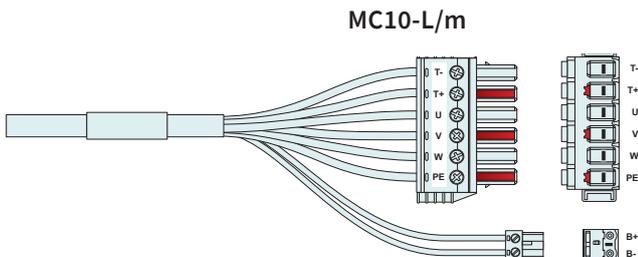
**MC10-L/m**



Connector Wiring		
PE	Protective Earth	yellow-green
W	Motor Phase W	black (previously: green)
V	Motor Phase V	blue
U	Motor Phase U	red
T+	Temperature Sensor T+	n.c.
T-	Temperature Sensor T-	n.c.

Item	Description	Item-No.
<b>MC10-L/m</b>	Connector Power E1400/X2	<a href="#">0150-3382</a>

**Lb-CONNECTOR**



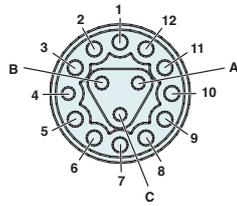
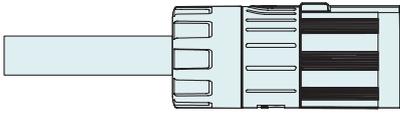
**DC01-E1400/X32**

Connector Wiring (with brake)		
PE	Protective Earth	yellow-green
W	Motor Phase W	black (Nr. 3)
V	Motor Phase V	black (Nr. 2)
U	Motor Phase U	black (Nr. 1)
T+	Temperature Sensor T+	black (Nr. 5)
T-	Temperature Sensor T-	black (Nr. 6)
B+	Brake B+	black (Nr. 7)
B-	Brake B-	black (Nr. 8)

Item	Description	Item-No.
<b>MC10-L/m</b>	Connector Power E1400/X2	<a href="#">0150-3382</a>
<b>DC01-E1400/X32</b>	Drive Connector Brake	<a href="#">0150-3450</a>

**Uk-CONNECTOR**

**MC10-Uk/f**



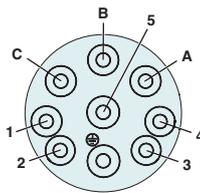
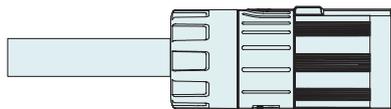
	PS10-54	
1	+Vcc	red
2	GND	black
3	Sin+	yellow
4	Sin-	orange
5	Cos+	green
6	Cos-	blue
7	Motor Link C+	pink
8	Motor Link C+	grey
9	n.c.	n.c.
10	n.c.	n.c.
11	n.c.	n.c.
12	n.c.	n.c.
A	n.c.	n.c.
B	n.c.	n.c.
C	n.c.	n.c.

	PS10-54...D24	PS10-54...D25	PS10-54...D25S	
1	+Vcc	+Vcc	+Vcc	white
2	GND	GND	GND	brown
3	A	A	A	grey
4	/A	/A	/A	pink
5	B	B	B	blue
6	/B	/B	/B	red
7	-	-	-	do not connect
8	-	-	-	do not connect
9	Pt1000+	PTC+	PTC+	yellow-brown
10	Pt1000-	PTC-	PTC-	white-yellow
11	REF+	REF+	REF+	black
12	REF-	REF-	REF-	violett
A	Hall U	Hall U	Hall U	grey-red
B	Hall V	Hall V	Hall V	red-blue
C	Hall W	Hall W	Hall W	white-green

Item	Description	Item-No.
<b>MC10-U/f</b>	Connector encoder PS10-54	<a href="#">0150-3471</a>

**Tk-CONNECTOR**

**MC10-Tk/f**

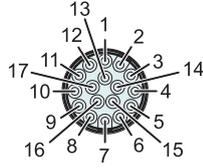


	PS10-54	PS10-54...D24	PS10-54...D25	PS10-54...D25S	
A	Phase U	Phase U	Phase U	Phase U	red
PE	Protective Earth	Protective Earth	Protective Earth	Protective Earth	yellow-green
B	Phase V	Phase V	Phase V	Phase V	blue
C	Phase W	Phase W	Phase W	Phase W	black (previously: green)
1	n.c.	Pt1000+	PTC+	PTC+	turquoise
2	n.c.	Pt1000-	PTC-	PTC-	grey
3	n.c.	n.c.	n.c.	n.c.	n.c.
4	n.c.	n.c.	n.c.	n.c.	n.c.
5	n.c.	n.c.	n.c.	n.c.	n.c.

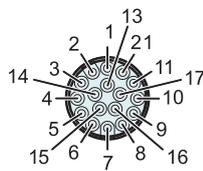
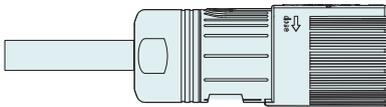
Item	Description	Item-No.
<b>MC10-T/f</b>	Connector Power PS10-54	<a href="#">0150-3470</a>

**J-CONNECTOR**

**MC10-J/m**



**MC10-J/f**



Item	Description	Item-No.
<b>MC10-J/m</b>	Connector encoder PS10-70/m	<a href="#">0160-2407</a>
<b>MC10-J/f</b>	Connector encoder PS10-70	<a href="#">0160-2269</a>

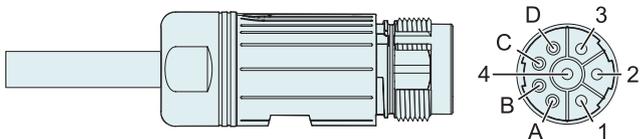
	P10-70	
1	+5 VDC	red
2	GND	black
3	Sense +5V	white
4	Sense GND	brown
5	Motor Link C+	pink
6	Motor Link C-	grey
7	Sine+	yellow
8	Sine-	orange
9	Cosine+	green
10	Cosine-	blue
11	n.c.	-
12	n.c.	-
13	n.c.	-
14	n.c.	-
15	n.c.	-
16	n.c.	-
17	n.c.	-

	P10-70...D01	P10-70...D02	
1	3...13 VDC	3...13 VDC	white
2	GND	GND	brown
3	Vcc Sense (opt.)	Vcc Sense (opt.)	green
4	GND Sense (opt.)	GND Sense (opt.)	yellow
5	Do not connect	Do not connect	-
6	Do not connect	Do not connect	-
7	Sine+	Sine+	grey
8	Sine-	Sine-	pink
9	Cosine+	Cosine+	blue
10	Cosine-	Cosine-	red
11	Ref+	Ref+	black
12	Ref-	Ref-	violett
13	Hall U	Hall U	grey-red
14	Hall V	Hall V	red-blue
15	Hall W	Hall W	white-green
16	KTY+	PTC+	yellow-brown
17	KTY-	PTC-	white-yellow

	P10-70...D03	
1	3...13 VDC	red
2	GND	black
3	Vcc Sense (opt.)	white
4	GND Sense (opt.)	brown
5	Do not connect	-
6	Do not connect	-
7	Sine+	yellow
8	Sine-	orange
9	Cosine+	green
10	Cosine-	blue
11	n.c.	n.c.
12	n.c.	n.c.
13	n.c.	n.c.
14	Do not connect	n.c.
15	n.c.	n.c.
16	n.c.	n.c.
17	n.c.	n.c.

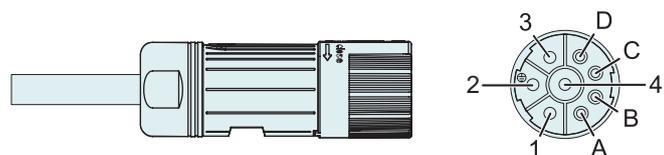
**Q-CONNECTOR**

**MC10-Q/m**



	P10-70	P10-70...D01/D02	
1	Phase U	Phase U	red
2	Protective Earth	Protective Earth	yellow-green
3	Phase W	Phase W	black (previously: green)
4	Phase V	Phase V	blue
A	n.c.	n.c.	-
B	n.c.	n.c.	-
C	n.c.	n.c.	-
D	n.c.	n.c.	-

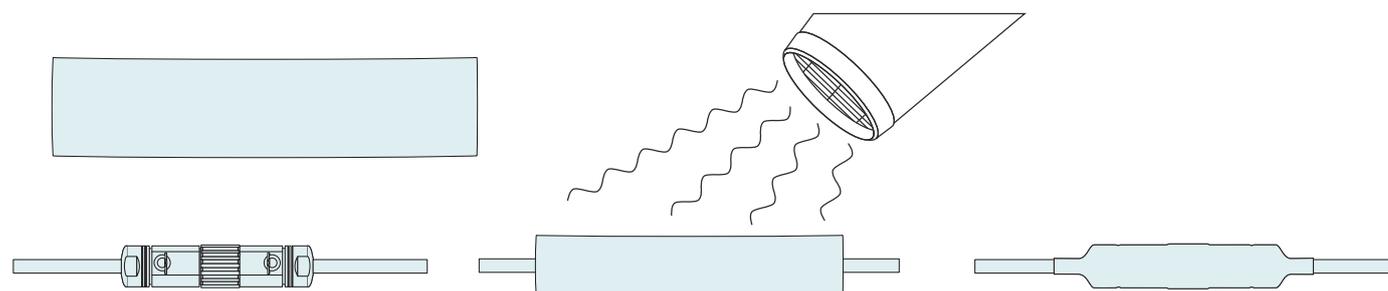
**MC10-Q/f**



	P10-70...D03		
		Wire Color Motor Cable Variant colored (new)	Wire Color Motor Cable Variant black
1	Phase U	red	black 1
2	Protective Earth	yellow-green	yellow-green
3	Phase W	black (previously: green)	black 3
4	Phase V	blue	black 2
A	KTY+	purple	black 5
B	KTY-	grey	black 6
C	n.c.	yellow	black 7
D	n.c.	brown	black 8

Item	Description	Item-No.
<b>MC10-Q/m</b>	Connector Power PS10-70/m	<a href="#">0160-2405</a>
<b>MC10-Q/f</b>	Connector Power PS10-70	<a href="#">0160-2268</a>

**SHRINK TUBING FOR IP67 CONNECTOR**



Item	Material	Item-No.
<b>MCP01-18</b> Shrink tubing (with hot glue coating) for additional protection of IP67 connectors	Polyolefin	<a href="#">0150-3089</a>

## GUIDELINES FOR THE LAYING OF CABLES IN CABLE CHAINS

The laying of cables in cable chains has to be done carefully. In general the following points have to be considered:

- It is recommended to lay the cables separately side by side. In case that cables with different diameters are laid on top of each other or side by side, we recommend the use of separators.
- The cables should be movable in the track. There must be at least 10% - 20% of the cable diameter as free space between the cables and the internal dimensions of the cable chain for safety reasons.
- Please observe that the cables pass the bend radius without being forced. In case of several cable layers, the cables need a corresponding clearance among each other in the bend so that relative movements of the cables among each other and in the chain are possible. In principle the cables must be able to move freely lengthwise at any time and there shall be no tensile force on the cable in the radius. After a short operating time it is recommended to control in regular intervals the position of the cable - particular with long travel paths (control must be executed in push and pull direction). Furthermore, it has to be paid attention to an efficient installation and aspects of wear.
- A torsion-free laying of the cables in the cable chain has to be observed (non-rotational). Therefore, the cables have to be unwound from reels before being installed. (Do not lift off the cables in loops). The ideal case is to take the cable directly from the drum. The cable imprint can't be used for a torsion free adjustment of the cable, as the imprint runs slightly helical around the cable due to production reasons.
- The weight arrangement in the cable chain or in the links has to be done symmetrically. Heavy cables have to be laid towards the outside of the cable chain and the smaller ones in the middle. After the rupture of the chain, all cables have to be exchanged due to excessive elongation.
- All cables have to be strain-relieved at the fixed point and at the driver, at least at the movable end of the chain. For use in long chains (sliding application), please contact our staff as there are no general regulations. It has to be observed with clamping that there is only large-surface pressure on the outer jacket. Careful clamping avoids any squeezing of the conductors and at the same time any displacement of the cable. It has to be avoided to move the cable up to the fixing point. The distance between the final point of the flexion to the fixing point should be as large as possible (10 - 20 x cable diameter are taken as relaxation zone).
- In general only cable chain cables should be used. The allowed bending radius has to be strictly observed. The information on the minimum bending radius for the cables are based on the application at normal temperatures (approx. 20 °C). Under circumstances other bending radii can be recommended. The choice of a bigger radius as the minimum radius will have a positive effect on the service life.