LinMot®

Linear Motor Series P10-70

Peak force up to 2´500N

Velocity up to 5m/s

Acceleration up to 100g

Free positioning

Long life: Linear direct drive

The linear motor technology for industrial applications

High Force Linear Motor System

With the Linear Motor Family P10-70 LinMot extends the product range with bigger and more powerful actuators for 3x400VAC for forces up to 2'500N. Five different motor sizes from 500N to 2'500N will cover a wide range of high power applications with heavy loads. The motors are controlled by the new Series E1400 Servo Drives with Field bus and industrial Ethernet Interfaces. The E1400 Drives are directly supplied from the AC mains with a 3x340…480VAC input range.

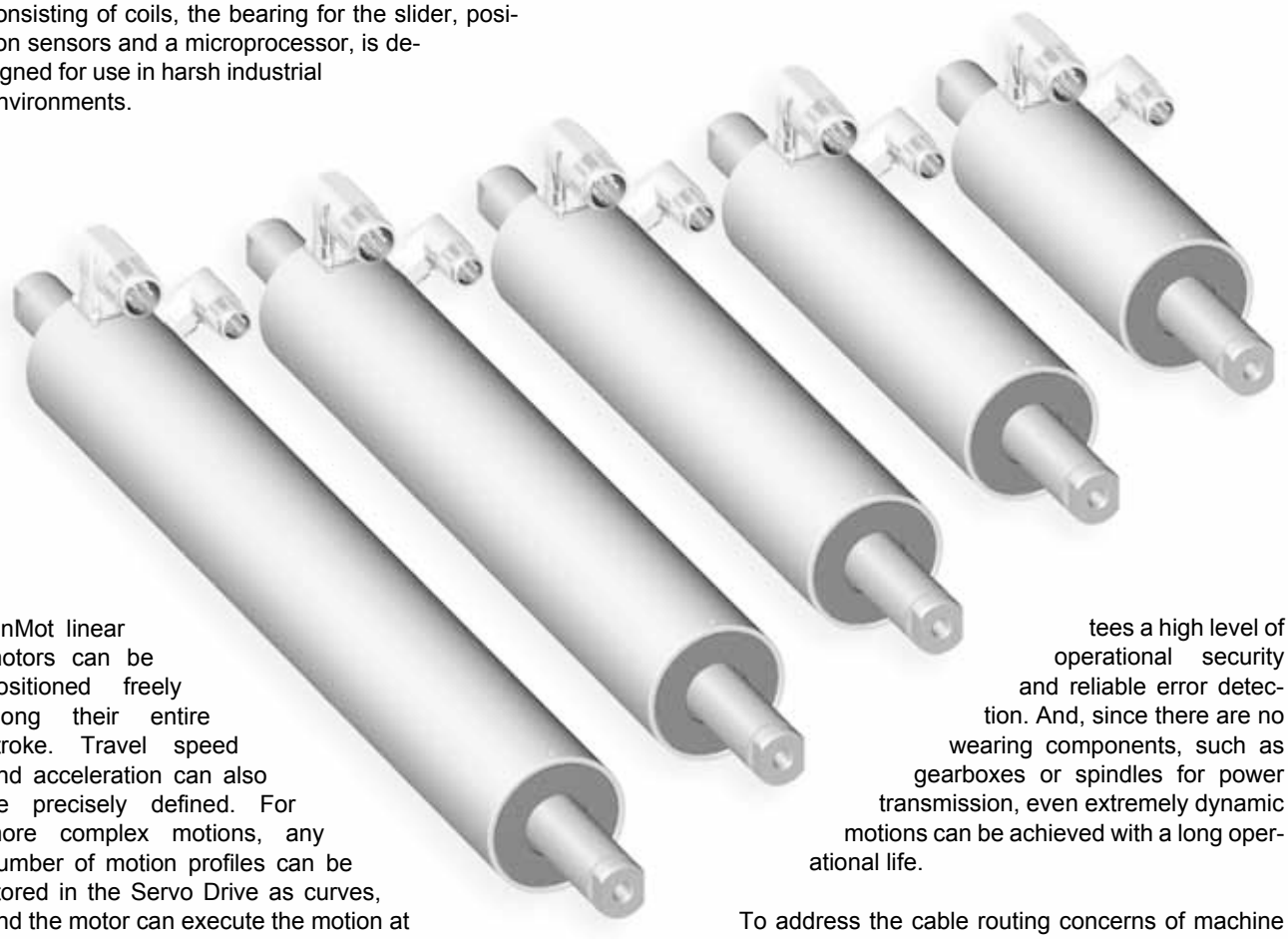
LinMot industrial linear motors are design elements that offer significant advantages over typical elements such as pneumatic cylinders, servomotors with spindles and belts, or mechanical solutions such as cam, discs or crank designs. LinMot industrial linear motors are new design elements that enable innovative solutions for new functional units, modules, or entire machines that were previously impractical using traditional elements. The high level of integration (bearings and position sensors are integrated in the motor) and the ability to integrate LinMot systems into a wide range of control systems shorten the design-in time.

Since the form factor of LinMot linear motors is similar to that of pneumatic cylinders, they are often used are replacements for pneumatic cylinders. This is especially the case when more than two positions are required, if the positions need to be changed via software, or if the dynamics or lifespan of the pneumatic cylinder is not sufficient.

The new LinMot Linear Motors size P10-70 will open the LinMot technology for new applications with higher forces and higher loads

Linear Motors
Series P10-70

LinMot linear motors employ a direct electromagnetic principle. Electromagnetic force provides direct linear movement without the use of cams, gears, belts, or other mechanical devices. The motor consists of only two parts: the slider and the stator. The slider is a precision assembly that consists of a stainless steel tube, which is filled with neodymium magnets, that has threaded attachment holes on each end. The stator, consisting of coils, the bearing for the slider, position sensors and a microprocessor, is designed for use in harsh industrial environments.



LinMot linear motors can be positioned freely along their entire stroke. Travel speed and acceleration can also be precisely defined. For more complex motions, any number of motion profiles can be stored in the Servo Drive as curves, and the motor can execute the motion at the desired speed. The motion of the linear motor can also be synchronized with another rotary or linear motion.

Extremely dynamic motions can be achieved with industrial linear motors. Velocities over 5m/s and accelerations of well over 100g provide very short positioning times and high cycle rates. With the elimination of components afflicted by mechanical play, such as gearboxes or gear racks, linear motors can be positioned as precisely as desired, consistent with the resolution of the measurement system.

The internal position sensors measure and monitor the current position of the linear motor, both at rest and in motion.

Deviations from desired position are captured immediately and reported to the control system. This guarantees a high level of operational security and reliable error detection. And, since there are no wearing components, such as gearboxes or spindles for power transmission, even extremely dynamic motions can be achieved with a long operational life.

To address the cable routing concerns of machine designers, LinMot provides motors with two rotatable IP67 connectors for signal and power mounted right on the motor.

The 3x400VAC motors are available in 5 different sizes with peak forces of from 500 to 2’500 N and strokes up to 1770 mm. In addition, the modular design of LinMot motors allows custom designs even in moderate quantities.

Motor Specification

		P10-70x80	P10-70x160	P10-70x240	P10-70x320	P10-70x400
Maximum stroke	mm	1770	1690	1610	1530	1450
Peak force	N	557	1104	1617	2162	2703
Continuous stall force [1]	N	65	126	183	250	312
Continuous stall force [2]	N	99	191	279	381	479
Continuous stall force [3]	N	174	337	488	673	862
Max. velocity	m/s	7.4	6.8	6.5	5.9	4.7
Max. acceleration	m/s^2	409	603	882	939	975

Electrical Specification

		P10-70x80	P10-70x160	P10-70x240	P10-70x320	P10-70x400
Nominal DC-Link Voltage	Vdc	560	560	560	560	560
Maximum DC-Link Voltage	Vdc	750	750	750	750	750
Peak current	A_{pk}	11	20	28	34	34
Peak current	A_{rms}	7.8	14.1	19.8	24.0	24.0
Continuous stall Current [1]	A_{rms}	0.9	1.7	2.3	2.9	2.9
Continuous stall Current [2]	A_{rms}	1.4	2.5	3.5	4.4	4.4
Continuous stall Current [3]	A_{rms}	2.5	4.5	6.2	7.8	8.0
Force constant	N/A_{rms}	71.6	78.1	81.6	89.9	112.4
Back EMF constant (ph-ph)	$V_{pk}/(m/s)$	60.5	66	69	76	95
Resistance @ 25°C (ph-ph)	Ohm	12.8	8.1	6.2	5.4	6.8
Resistance @ 100°C (ph-ph)	Ohm	16.54	10.47	8.01	6.98	8.79
Inductance (ph-ph)	mH	26	15.6	11.6	10.2	12.8

Thermal Specification

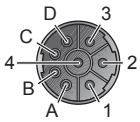
		P10-70x80	P10-70x160	P10-70x240	P10-70x320	P10-70x400
Max. winding temp.	°C	90	90	90	90	90
Max. Duration with peak current	s	4.2	4.1	4.2	4.6	4.6
Max. power dissipation [1/2/3]	W	21/49/153	42/98/306	63/146/447	85/196/611	106/250/809
Thermal resistance [1/2/3]	°C/W	2.6/1.12/0.36	1.3/0.56/0.18	0.87/0.377/0.123	0.65/0.28/0.09	0.52/0.22/0.068
Thermal time constant [1/2/3]	s	4200/1000/100	4200/1000/100	4200/1000/100	4200/1000/100	4200/1000/100
Thermal winding capacity [1]	°C/J	50	101	157	220	277

Mechanical Specification

		P10-70x80	P10-70x160	P10-70x240	P10-70x320	P10-70x400
Stator length	mm	180	260	340	420	500
Stator diameter	mm	70	70	70	70	70
Stator mass	kg	2.85	4.2	5.55	6.9	8.25
Slider length (min/max)	mm	290/1990	390/1990	390/1990	490/1990	590/1990
Slider diameter	mm	28	28	28	28	28
Slider mass	kg/m	4.7	4.7	4.7	4.7	4.7
Magnetic period (el. cycle)	mm	40	40	40	40	40

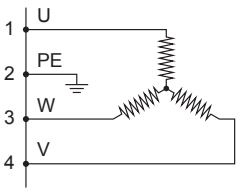
1) Passvie Cooling @ 25°C
2) Fan Cooling @ 25°C
3) Liquid Cooling @ 25°C

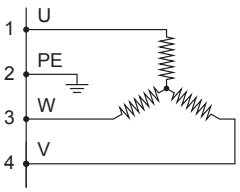
Power Connector



mating view

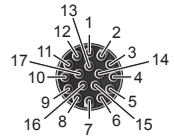
Connector:
Intercontec
SpeedTec Series 923
BEDC 110 NN00 0001 01 000
Cable:
screened motor cable
wire diameter =1.5mm²





	PS10-70x...	PS10-70x...-D01 and -D02
1	Phase U	Phase U
2	Protective Earth	Protective Earth
3	Phase W	Phase W
4	Phase V	Phase V
A	n.c.	n.c.
B	n.c.	n.c.
C	n.c.	n.c.
D	n.c.	n.c.

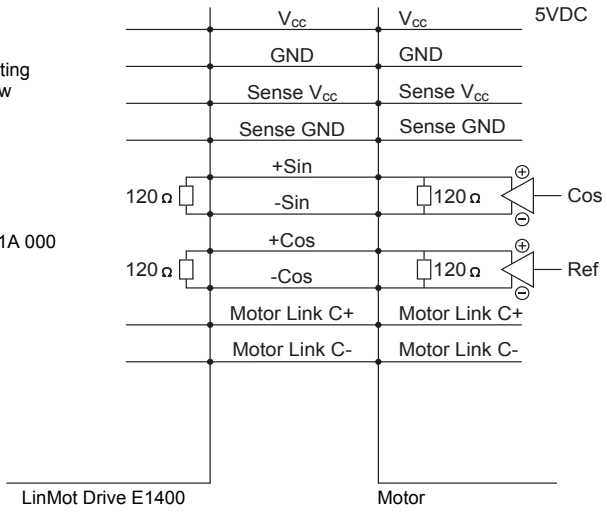
Encoder Connector

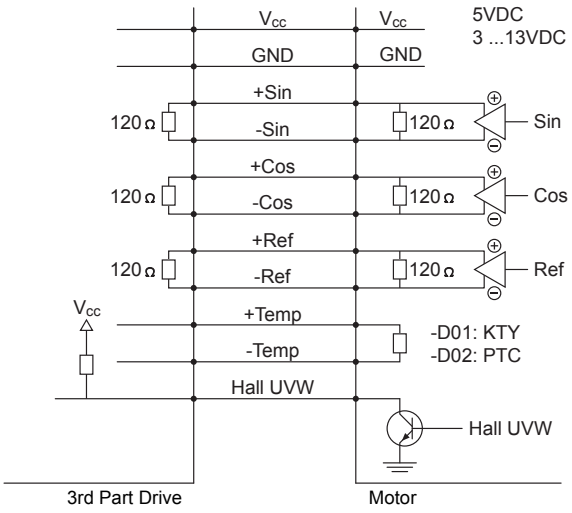


mating view

Connector:
Intercontec
SpeedTec, Series 617
AEDA 874 NN00 0005 1A 000

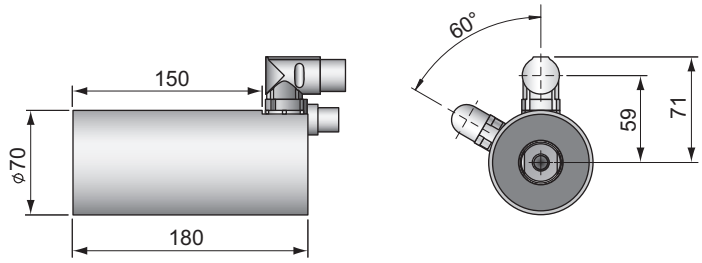
Cable:
screened twisted pair
encoder cable,
wire diameter =0.5mm²



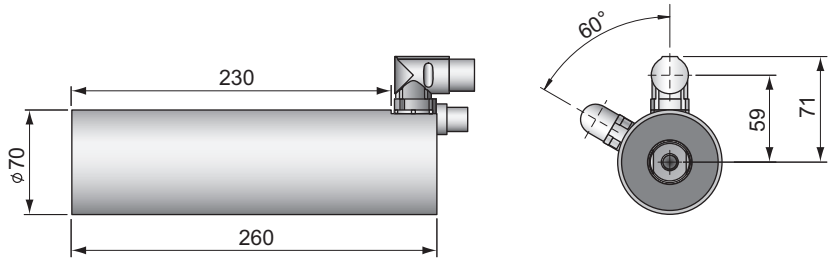


	PS10-70x...	PS10-70x...-D01 and -D02
1	+5VDC	3...13VDC
2	GND	GND
3	Sense +5V	Sense Vcc (optional)
4	Sense GND	Sense GND (optional)
5	Motor Link C+	n.c.
6	Motor Link C-	n.c.
7	Sin+	Sin+
8	Sin-	Sin-
9	Cos+	Cos+
10	Cos-	Cos-
11	n.c.	Ref.+
12	n.c.	Ref.-
13	n.c.	Hall U
14	n.c.	Hall V
15	n.c.	Hall W
16	n.c.	Temp+ (-D01: KTY984/130 -D02: PTC)
17	n.c.	Temp- (-D01: KTY984/130 -D02: PTC)

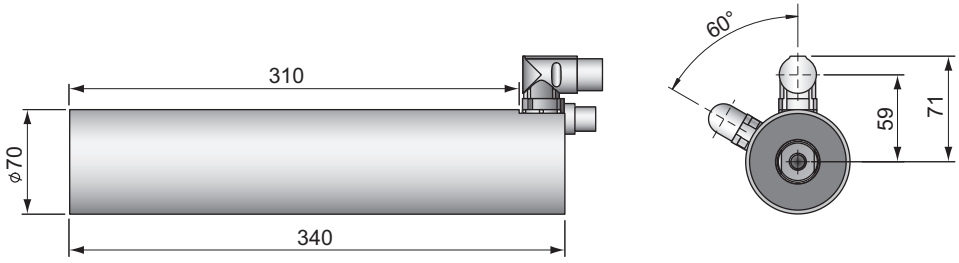
PS10-70x80



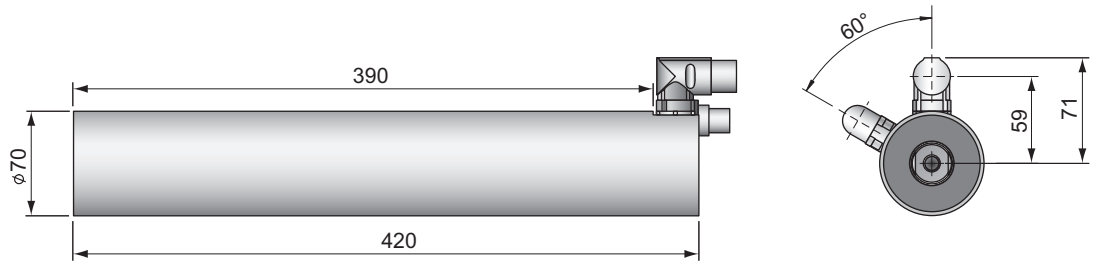
PS10-70x160



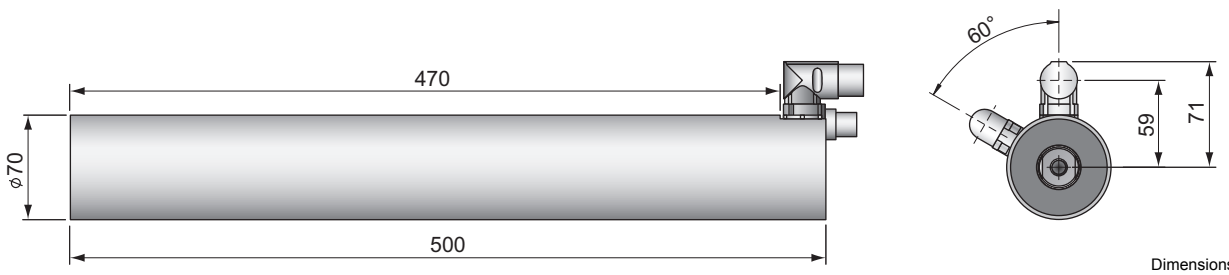
PS10-70x240



PS10-70x320

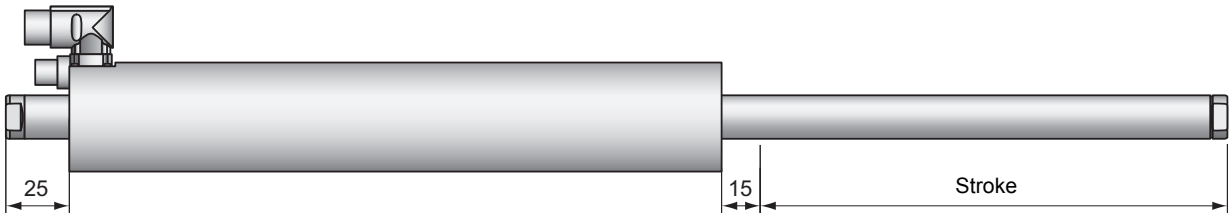


PS10-70x400



Dimensions in mm

Strokes



Dimensions in mm

Stator	PS10-70x80	PS10-70x160	PS10-70x240	PS10-70x320	PS10-70x400
Slider			Stroke in mm		
PL10-28x290/240	70				
PL10-28x390/340	170	90	10		
PL10-28x490/440	270	190	110	30	
PL10-28x590/540	370	290	210	130	50
PL10-28x690/640	470	390	310	230	150
PL10-28x790/740	570	490	410	330	250
PL10-28x890/840	670	590	510	430	350
PL10-28x990/940	770	690	610	530	450
PL10-28x1190/1140	970	890	810	730	650
PL10-28x1390/1340	1170	1090	1010	930	850
PL10-28x1590/1540	1370	1290	1210	1130	1050
PL10-28x1790/1740	1570	1490	1410	1330	1250
PL10-28x1990/1940	1770	1690	1610	1530	1450

Ordering information

Item	Description	Part Number
Stator Series PS10-70		
PS10-70x80U-BL-QJ	Stator 3x400VAC, LinMot Encoder	0150-1291
PS10-70x160U-BL-QJ	Stator 3x400VAC, LinMot Encoder	0150-1292
PS10-70x240U-BL-QJ	Stator 3x400VAC, LinMot Encoder	0150-1293
PS10-70x320U-BL-QJ	Stator 3x400VAC, LinMot Encoder	0150-1284
PS10-70x400U-BL-QJ	Stator 3x400VAC, LinMot Encoder	0150-1294
Stator Series PS10-70-D01 and -D02		
PS10-70x80U-BL-QJ-D01	Stator 3x400VAC, SinCos Encoder 1Vpp, KTY	0150-2282
PS10-70x160U-BL-QJ-D01	Stator 3x400VAC, SinCos Encoder 1Vpp, KTY	0150-2283
PS10-70x240U-BL-QJ-D01	Stator 3x400VAC, SinCos Encoder 1Vpp, KTY	0150-2284
PS10-70x320U-BL-QJ-D01	Stator 3x400VAC, SinCos Encoder 1Vpp, KTY	0150-2285
PS10-70x400U-BL-QJ-D01	Stator 3x400VAC, SinCos Encoder 1Vpp, KTY	0150-2286
PS10-70x80U-BL-QJ-D02	Stator 3x400VAC, SinCos Encoder 1Vpp, PTC	0150-2360
PS10-70x160U-BL-QJ-D02	Stator 3x400VAC, SinCos Encoder 1Vpp, PTC	0150-2361
PS10-70x240U-BL-QJ-D02	Stator 3x400VAC, SinCos Encoder 1Vpp, PTC	0150-2362
PS10-70x320U-BL-QJ-D02	Stator 3x400VAC, SinCos Encoder 1Vpp, PTC	0150-2343
PS10-70x400U-BL-QJ-D02	Stator 3x400VAC, SinCos Encoder 1Vpp, PTC	0150-2363
Slider Series PL10-28		
PL10-28x290/240	Slider for P10-70 “standard”	0150-2193
PL10-28x390/340	Slider for P10-70 “standard”	0150-2194
PL10-28x490/440	Slider for P10-70 “standard”	0150-2195
PL10-28x590/540	Slider for P10-70 “standard”	0150-2196
PL10-28x690/640	Slider for P10-70 “standard”	0150-2197
PL10-28x790/740	Slider for P10-70 “standard”	0150-2198
PL10-28x890/840	Slider for P10-70 “standard”	0150-2199
PL10-28x990/940	Slider for P10-70 “standard”	0150-2203
PL10-28x1190/1140	Slider for P10-70 “standard”	0150-2204
PL10-28x1390/1340	Slider for P10-70 “standard”	0150-2205
PL10-28x1590/1540	Slider for P10-70 “standard”	0150-2206
PL10-28x1790/1740	Slider for P10-70 “standard”	0150-2207
PL10-28x1990/1940	Slider for P10-70 “standard”	0150-2208

Flanges and ventilator

Item	Description	Part Number
Flanges PF10-70		
PF10-70x110	Flange for PS10-70x80	0150-2272
PF10-70x190	Flange for PS10-70x160	0150-2273
PF10-70x270	Flange for PS10-70x240	0150-2274
PF10-70x350	Flange for PS10-70x320	0150-2275
PF10-70x430	Flange for PS10-70x400	0150-2276
PF10-70x110-FC	Flange for PS10-70x80 fluid cooling	0150-2291
PF10-70x190-FC	Flange for PS10-70x160 fluid cooling	0150-2292
PF10-70x270-FC	Flange for PS10-70x240 fluid cooling	0150-2293
PF10-70x350-FC	Flange for PS10-70x320 fluid cooling	0150-2294
PF10-70x430-FC	Flange for PS10-70x400 fluid cooling	0150-2295
Ventilator		
HV01-37/48	Ventilatorkit for H01-37/48 & PF02-37/48	0150-5051

Cable

Item	Description	Part Number
Sensor Cable KSS05		
KSS05-02/08-D15/J-3	High Flex cable Sensor D15/J, 3m	0150-2263
KSS05-02/08-D15/J-5	High Flex cable Sensor D15/J, 5m	0150-2262
KSS05-02/08-D15/J-8	High Flex cable Sensor D15/J, 8m	0150-2264
KSS05-02/08-D15/J-12	High Flex cable Sensor D15/J, 12m	0150-2265
KSS05-02/08-D15/J-L	Special cable KSS05-02/08-D15/J	0150-3389
Power Cable KPS15		
KPS15-04-L/Q-3	High Flex cable Power L/Q, 3m	0150-2266
KPS15-04-L/Q-5	High Flex cable Power L/Q, 5m	0150-2261
KPS15-04-L/Q-8	High Flex cable Power L/Q, 8m	0150-2267
KPS15-04-L/Q-12	High Flex cable Power L/Q, 12m	0150-2268
KPS15-04-L/Q-L	Special cable KPS15-04-L/Q	0150-3388