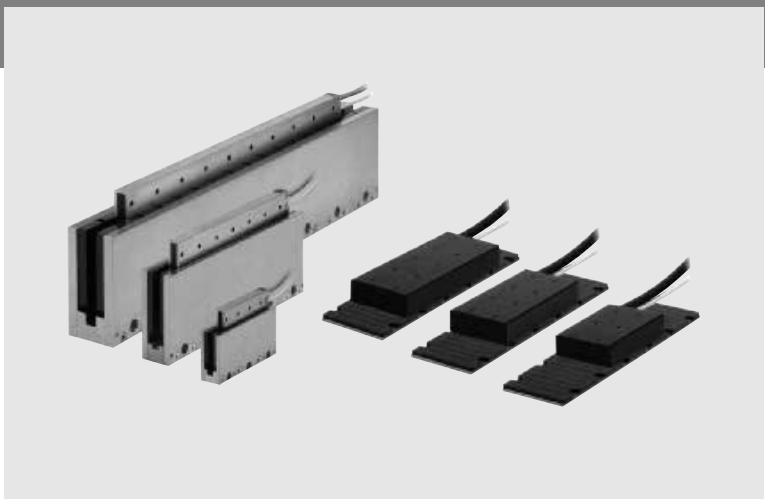
R88L-EC-FW/GW-□

Accurax linear motor



New linear motors with optimised efficiency
Iron-core motors for high speed and high duty cycle operations and Ironless motors for cogging-free and high dynamic applications. Both motor and families deliver unparalleled accuracy and performance benefits.

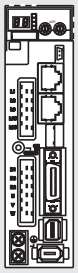
- Ironless and iron-core types available
- High dynamic and precise positioning
- Compact and flat design iron-core motors
- Excellent force-to-weight ratio ironless motors
- Weight-optimised magnet track
- Optional digital hall-sensor and connectors
- Temperature sensors included

Ratings

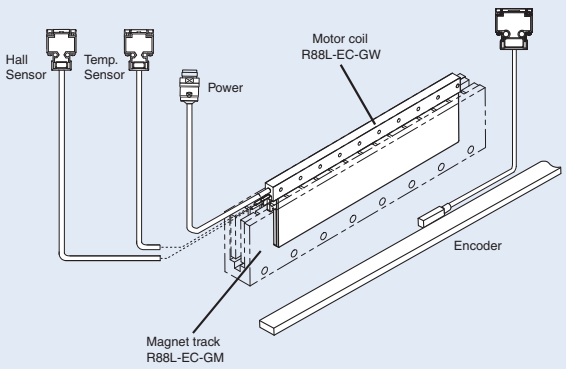
- Iron-core motors - 48 to 760 N (2000 N peak force)
- Ironless motors - 29 to 423 N (2100 N peak force)

System configuration

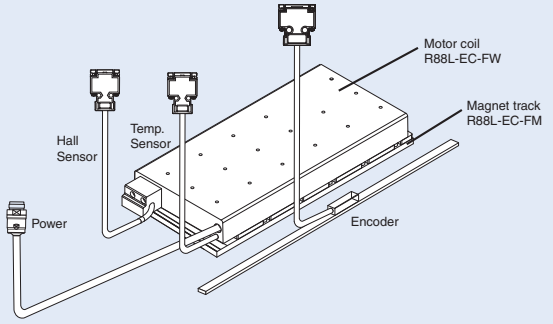
(Refer to servo drive chapter)



Accurax G5 servo drive
EtherCAT model



Ironless linear motor



Iron-core linear motor

Linear motor / Servo drive combination

Linear motor coil					Linear Servo drive Accurax G5 EtherCAT model	
Type	Rated force	Peak force	Model		230V	400V
R88L-EC-FW-□ Iron-core motors  230 V/400 V	48 N	105 N	Coil without connectors	R88L-EC-FW-0303-ANPC	R88D-KN02H-ECT-L	R88D-KN06F-ECT-L
	96 N	210 N		R88L-EC-FW-0306-ANPC	R88D-KN04H-ECT-L	R88D-KN10F-ECT-L
	160 N	400 N		R88L-EC-FW-0606-ANPC	R88D-KN08H-ECT-L	R88D-KN15F-ECT-L
	240 N	600 N		R88L-EC-FW-0609-ANPC	R88D-KN10H-ECT-L	R88D-KN20F-ECT-L
	320 N	800 N		R88L-EC-FW-0612-ANPC	R88D-KN15H-ECT-L	R88D-KN30F-ECT-L
	608 N	1600 N		R88L-EC-FW-1112-ANPC	R88D-KN15H-ECT-L	R88D-KN30F-ECT-L
	760 N	2000 N		R88L-EC-FW-1115-ANPC	R88D-KN15H-ECT-L	R88D-KN30F-ECT-L
	48 N	105 N	Coil with connectors	R88L-EC-FW-0303-APLC	R88D-KN02H-ECT-L	R88D-KN06F-ECT-L
	96 N	210 N		R88L-EC-FW-0306-APLC	R88D-KN04H-ECT-L	R88D-KN10F-ECT-L
	160 N	400 N		R88L-EC-FW-0606-APLC	R88D-KN08H-ECT-L	R88D-KN15F-ECT-L
	240 N	600 N		R88L-EC-FW-0609-APLC	R88D-KN10H-ECT-L	R88D-KN20F-ECT-L
	320 N	800 N		R88L-EC-FW-0612-APLC	R88D-KN15H-ECT-L	R88D-KN30F-ECT-L
	608 N	1600 N		R88L-EC-FW-1112-APLC	R88D-KN15H-ECT-L	R88D-KN30F-ECT-L
	760 N	2000 N		R88L-EC-FW-1115-APLC	R88D-KN15H-ECT-L	R88D-KN30F-ECT-L
R88L-EC-GW-□ Ironless motors  230 V	29 N	100 N	Coil without connectors	R88L-EC-GW-0303-ANPS	R88D-KN02H-ECT-L	–
	58 N	200 N		R88L-EC-GW-0306-ANPS	R88D-KN08H-ECT-L	–
	87 N	300 N		R88L-EC-GW-0309-ANPS	R88D-KN10H-ECT-L	–
	70 N	240 N		R88L-EC-GW-0503-ANPS	R88D-KN02H-ECT-L	–
	140 N	480 N		R88L-EC-GW-0506-ANPS	R88D-KN04H-ECT-L	–
	210 N	720 N		R88L-EC-GW-0509-ANPS	R88D-KN08H-ECT-L	–
	141 N	700 N		R88L-EC-GW-0703-ANPS	R88D-KN04H-ECT-L	–
	282 N	1400 N		R88L-EC-GW-0706-ANPS	R88D-KN08H-ECT-L	–
	423 N	2100 N		R88L-EC-GW-0709-ANPS	R88D-KN10H-ECT-L	–
	29 N	100 N	Coil with connectors	R88L-EC-GW-0303-APLS	R88D-KN02H-ECT-L	–
	58 N	200 N		R88L-EC-GW-0306-APLS	R88D-KN08H-ECTL	–
	87 N	300 N		R88L-EC-GW-0309-APLS	R88D-KN10H-ECT-L	–
	70 N	240 N		R88L-EC-GW-0503-APLS	R88D-KN02H-ECT-L	–
	140 N	480 N		R88L-EC-GW-0506-APLS	R88D-KN04H-ECT-L	–
	210 N	720 N		R88L-EC-GW-0509-APLS	R88D-KN08H-ECT-L	–
	141 N	700 N		R88L-EC-GW-0703-APLS	R88D-KN04H-ECT-L	–
	282 N	1400 N		R88L-EC-GW-0706-APLS	R88D-KN08H-ECT-L	–
	423 N	2100 N		R88L-EC-GW-0709-APLS	R88D-KN10H-ECT-L	–

Type designation

Linear motor coil

R88L-EC-FW-0303-ANPC

Accurax linear motor component

Motor type	
Code	Specifications
FW	Iron-core motor coil
GW	Ironless motor coil

Magnet width	
Code	Specifications
03	30 mm active magnet width
05	50 mm active magnet width
06	60 mm active magnet width
07	70 mm active magnet width
11	110 mm active magnet width

Coil model	
Code	Specifications
03	3-coil model
06	6-coil model
09	9-coil model
12	12-coil model
15	15-coil model

Motor series	
Code	Specifications
C	Compact (Iron-core models)
S	Standard (Ironless models)

Connector options	
Code	Specifications
NP	No connectors
PL	With connectors

Design Revision No.

Magnet track

R88L-EC-FM-03□□□ -A

Accurax linear motor component

Magnet track type	
Code	Specifications
FM	Iron-core magnet track
GM	Ironless magnet track

Design Revision No.

Length of magnet track in mm

Magnet width	
Code	Specifications
03	30 mm active magnet width
05	50 mm active magnet width
06	60 mm active magnet width
07	70 mm active magnet width
11	110 mm active magnet width

Hall sensor

R88L-EC-FH-NNNN-A

Accurax linear motor component

Hall sensor type	
Code	Specifications
FH	Iron-core digital Hall-sensor
GH	Ironless digital Hall-sensor

Design Revision No.

Placeholder

Magnet width for Ironless type	
Code	Specifications
03	30 mm active magnet width
05	50 mm active magnet width
07	70 mm active magnet width
NN	Placeholder

Linear servomotor specifications

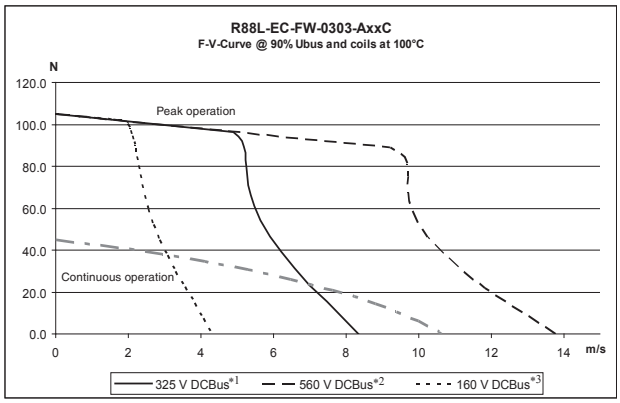
Iron-core motors R88L-EC-FW-□ (230/400 VAC)

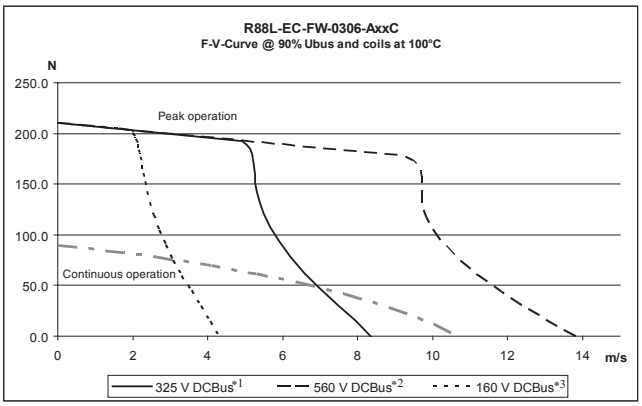
Voltage		**230/400V**						
Linear motor model	**R88L-EC-FW-□**	**0303-□**	**0306-□**	**0606-□**	**0609-□**	**0612-□**	**1112-□**	**1115-□**
Maximum speed (100 V)	**m/s**	2,5		2			1	
Maximum speed (200 V)	**m/s**	5		4			2	
Maximum speed (400 V)	**m/s**	10		8			4	
Peak force[*1]	**N**	105	210	400	600	800	1600	2000
Peak current[*1]	**Arms**	3.1	6.1	10	15	20	20	25
Continuous force[*2]	**N**	48	96	160	240	320	608	760
Continuous current[*2]	**Arms**	1.24	2.4	3.4	5.2	6.9	6.5	8.2
Motor force constant	**N/A_{rms}**	39.7		46.5			93	
BEMF	**V/m/s**	32		38			76	
Motor constant	**N/$\sqrt{W}$**	9.75	13.78	19.49	23.87	27.57	41.47	46.37
Phase resistance	**Ω**	5.34	2.68	1.83	1.23	0.92	1.6	1.29
Phase Inductance	**mH**	34.7	17.4	13.7	9.2	6.9	12.8	10.3
Electrical time constant	**ms**	6,5		7,5			8	
Max. cont. power dissipation (all coils)	**W**	32	63	88	131	175	279	349
Thermal resistance	**K/W**	2.20	1.10	0.78	0.52	0.39	0.23	0.18
Thermal time constant	**s**	110		124			126	
Magnetic attraction force	**N**	300	500	1020	1420	1820	3640	4440
Magnet pole pitch	**mm**	24						
Weight coil unit[*3]	**kg**	0.48	0.78	1.31	1.84	2.37	4.45	5.45
Weight magnet track	**kg/m**	2.1		3.8			10.5	
Dimension cooling plate (l × w × h)	**mm**	238×220×10		250×287×12			371×330×14	
Protection methods[*4]		Temperature sensors (KTY-83/121 & PTC 110C), self cooling						
Hall sensor		Digital (optional)						
Insulation class		Class B						
Max. bus voltage		560 VDC						
Insulation resistance		500 VDC, min. 10 MΩ						
Di-electric strength		2750V for 1sec						
Max. allowable coil temperature		130°C						
Ambient humidity		20 to 80% (non-condensing)						
Max. allowable magnet temperature		70°C						

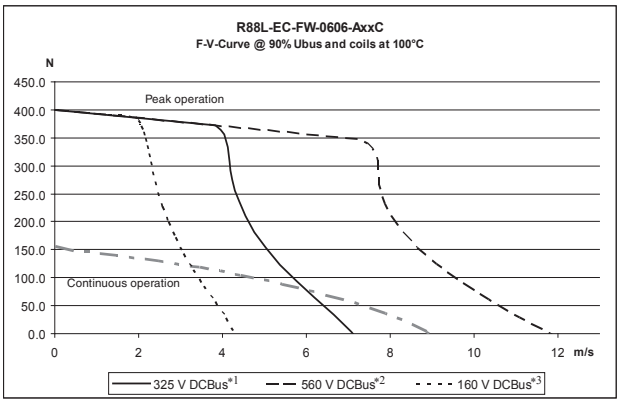
[*1] Coil temperature rising by 6K/s.
[*2] Values at 100°C coil temperature and magnets at 25°C. Coil unit must be attached to the given cooling plate sizes in the table and an airstream of 2.5 m/s (25°C) has to be applied.
[*3] Weight without connector and cable.
[*4] I^2t has to be set properly for high current applications.

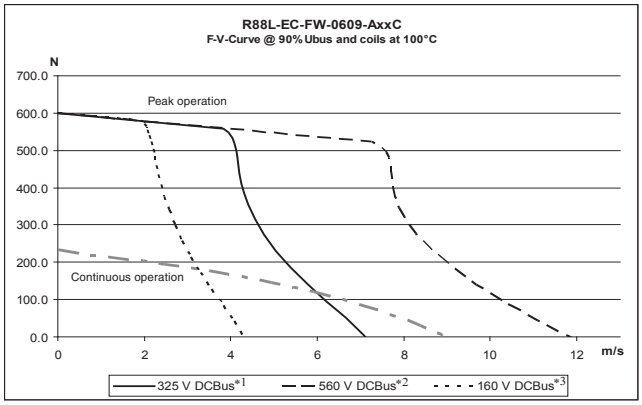
All other values at 25ºC (±10%).

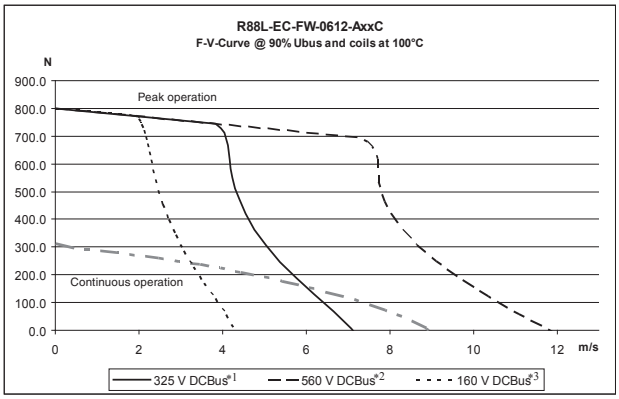
Force-speed characteristics

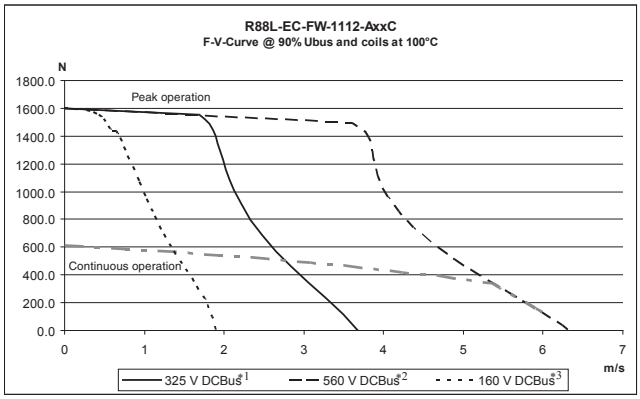


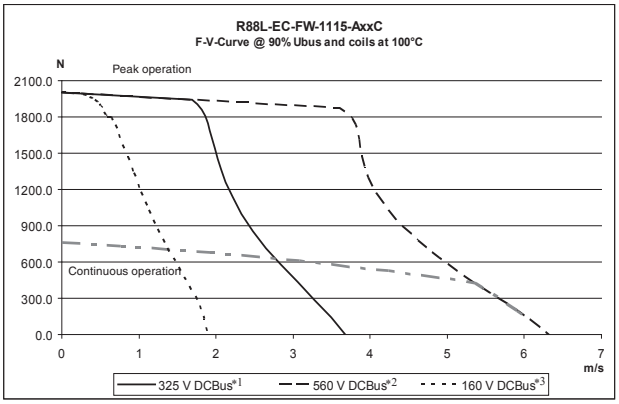












*1 The DCBus voltage corresponds to an AC voltage input (V_{ACIN}) of 235 V or more.
*2 The DCBus voltage corresponds to an AC voltage input (V_{ACIN}) of 400 V or more.
*3 The DCBus voltage corresponds to an AC voltage input (V_{ACIN}) of 115 V or more.

Note: The DCBus value is calculated from the below formula (where is the AV voltage drop in the DC Bus):

$$DCBuS = V_{ACIN} \times \sqrt{2} - \Delta V$$

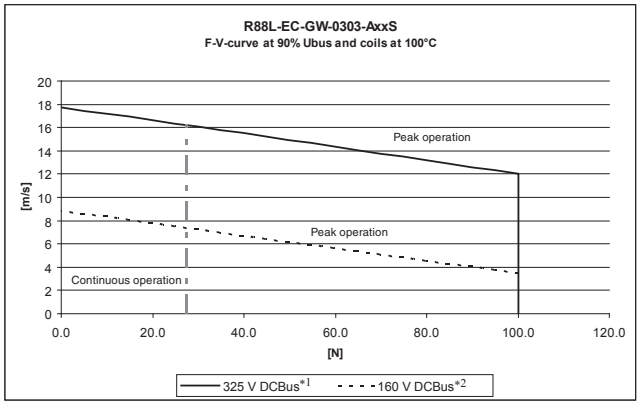
Ironless motors R88L-EC-GW-□ (230 VAC)

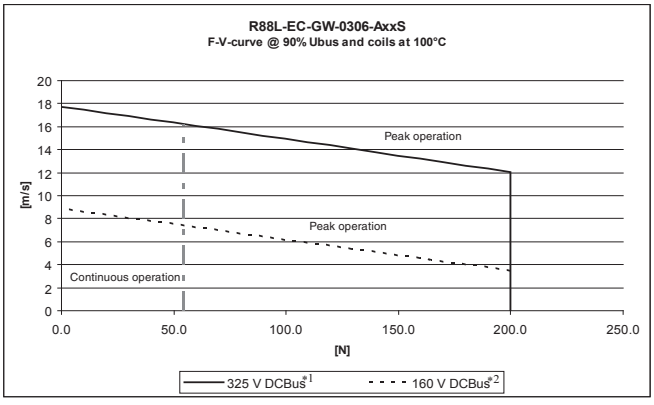
Voltage		230V								
Linear motor model	**R88L-EC-GW-□**	**0303-□**	**0306-□**	**0309-□**	**0503-□**	**0506-□**	**0509-□**	**0703-□**	**0706-□**	**0709-□**
Maximum speed (100V)	**m/s**	8			2.2			1.2		
Maximum speed (200V)	**m/s**	16			4.4			2.4		
Peak force[*1]	**N**	100	200	300	240	480	720	700	1400	2100
Peak current[*1]	**Arms**	5	10	15	3.5	7.0	10.5	5.6	11.3	16.9
Continuous force[*2]	**N**	26.5	53	80	58	117	175	117	232	384
Continuous force (forced cooling)[*2 *3]	**N**	29	58	87	70	140	210	141	282	423
Continuous current[*2]	**Arms**	1.33	2.66	4	0.87	1.76	2.6	0.94	1.87	2.81
Continuous current (forced cooling)[*2 *3]	**Arms**	1.5	2.9	4.4	1.03	2.1	3.1	1.14	2.27	3.4
Motor force constant	**N/A_{rms}**	19.9			68			124		
BEMF	**V/m/s**	16			55.5			101		
Motor constant	**$N/\sqrt{W}$**	5.07	7.16	8.78	9.74	13.77	17.13	18.15	25.67	32.02
Phase resistance	**Ω**	5.5	2,8	1.8	15.9	8	5,3	15.8	7.9	5.3
Phase Inductance	**mH**	1.8	0.9	0.6	13	6.5	4.2	28	14	9
Electrical time constant	**ms**	0.35			0.8			1.8		
Max. cont. power dissipation (all coils)	**W**	47	95	142	67	134	200	82	165	247
Thermal resistance[*2]	**K/W**	2.1	1.06	0.71	0.65	0.85	0.65	1.56	1.04	0.52
Thermal resistance (forced cooling)[*2 *3]	**K/W**	1.8	0.90	0.6	1.3	0.65	0.43	1.04	0.52	0.35
Thermal time constant	**s**	36			72			156		
Magnetic attraction force	**N**	0								
Magnet pole pitch	**mm**	30			42			57		
Weight coil unit[*4]	**kg**	0.084	0.162	0.240	0.25	0.47	0.69	0.55	0.95	1.35
Weight magnet track	**kg/m**	4.8			11.2			24		
Protection methods[*5]		Temperature sensors NTC10k, PTC110C, self cooling								
Hall sensor		Digital (optional)								
Insulation class		Class B								
Max. bus voltage		325 VDC								
Insulation resistance		500 VDC, min. 10 MΩ								
Di-electric strength		2250 V for 1 sec								
Max. allowable coil temperature		110°C								
Ambient humidity		20 to 80% non-condensing								
Max. allowable magnet temperature		70°C								

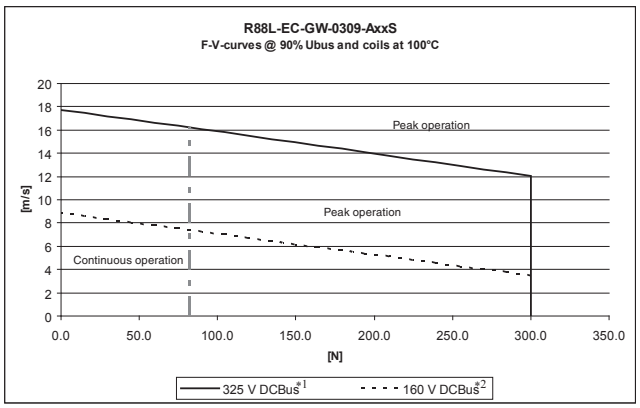
[*1] Coil temperature rising 03-series by 40K/s, 05-series by 20K/s and 07-series by 20K/s.
[*2] Values at 110°C coil temperature and magnets at 25°C. Coil unit installed on an alumininium surface. Attention: All other values at 25°C. Values can have a tolerance of 10%.
[*3] Values when water cooling is installed on the aluminium surface. To use these settings you have to manually enter the values in Sysmac Studio Linear Motor setup.
[*4] Weight without connector and cable.
[*5] I^2t has to be set properly for high current overload applications.

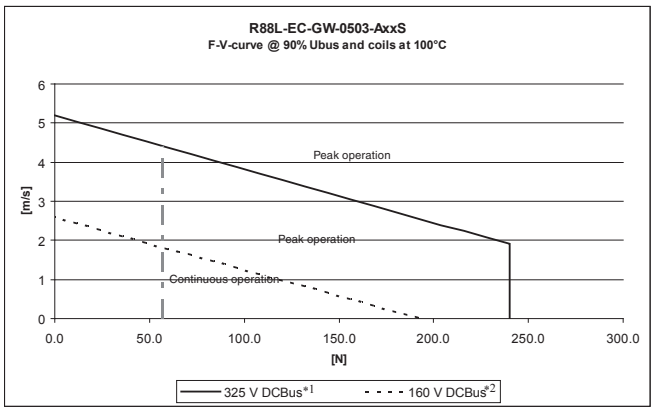
All other values at 25ºC (±10%).

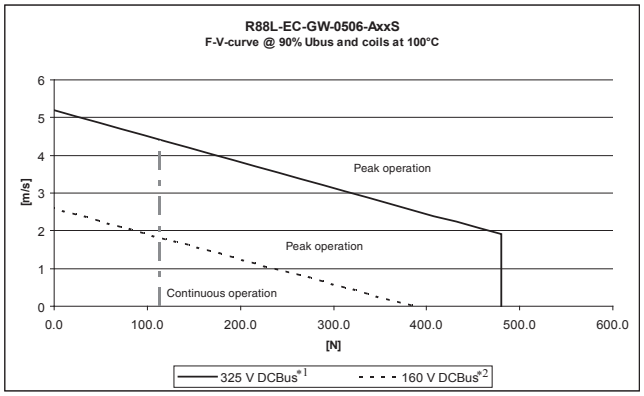
Force-speed characteristics

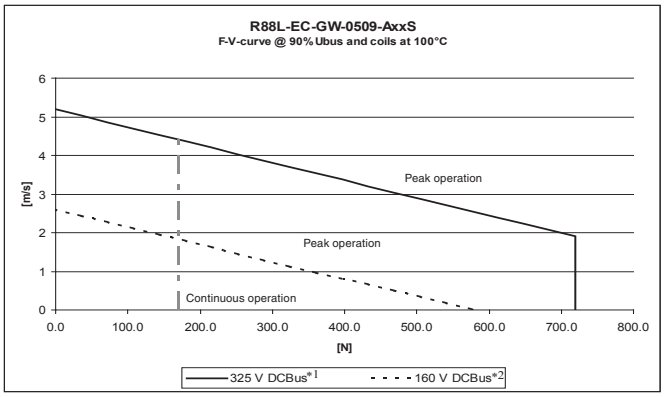


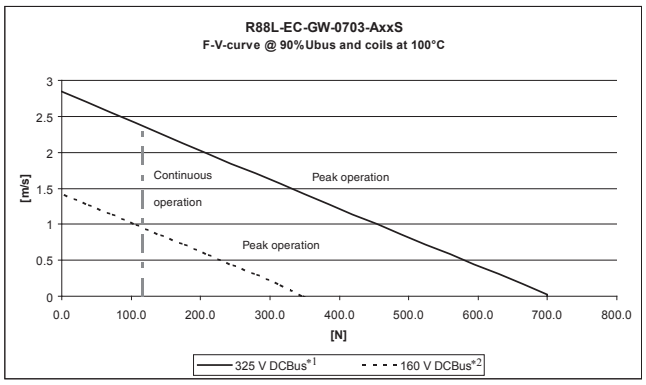


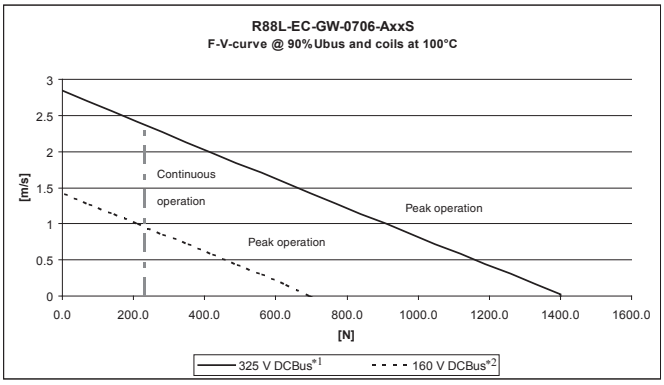


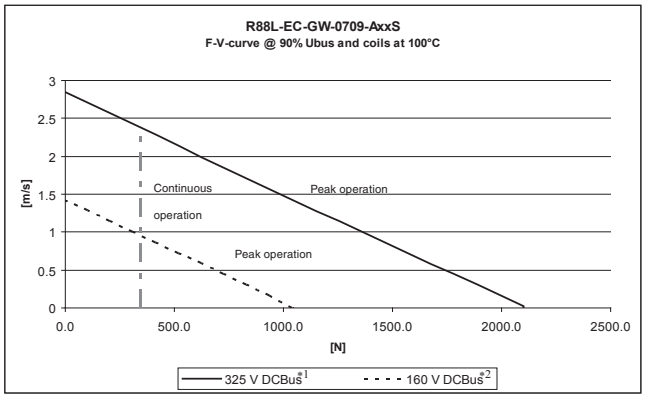












*1 The DCBus voltage corresponds to an AC voltage input (V_{ACIN}) of 235V or more.
*2 The DCBus voltage corresponds to an AC voltage input (V_{ACIN}) of 115V or more.

Note: The DCBus value is calculated from the below formula:

$$DCBuS = V_{ACIN} \times \sqrt{2} - \Delta V$$

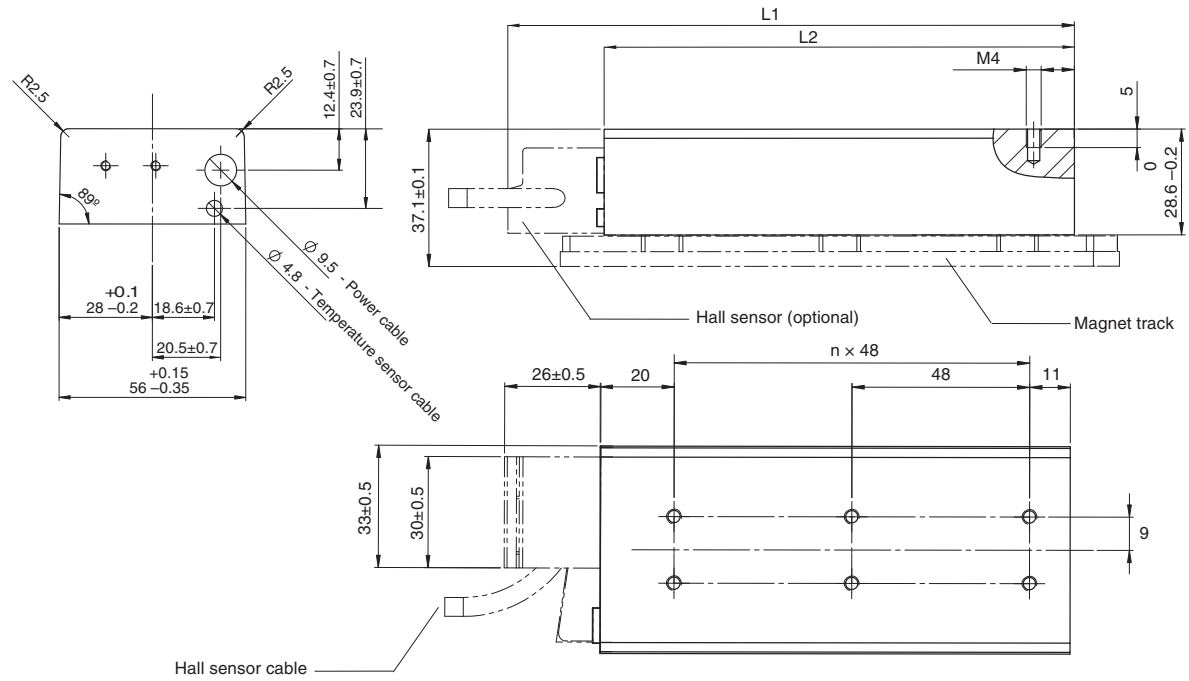
Dimensions

Iron-core R88L-EC-FW-03□

Motor coil

Model	L1 (mm)	L2 (mm)	n
R88L-EC-FW-0303-□	105 ±0.5	79 +0.15/–0.35	1
R88L-EC-FW-0306-□	153 ±0.5	127 +0.15/–0.35	2

Motor coil dimensions with magnet track and hall sensor (optional)



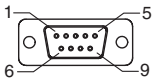
Units: mm

Wiring specifications for motor with connectors

Cable length 500±30
Connector optional
Made by Hypertac
LRRA06AMRPN182 (MALE)
Pin article code: 021.279.1020

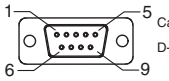
Power connector		
Pin No.	Wire	Function
1	Black-1	Phase U
2	Black-2	Phase V
3	Green/Yellow	Ground
4	Black-3	Phase W
5	Not used	–
6	Not used	–

Mating connector:
Plug type: LPRA06BFRBN170



Cable length 500±30
Connector optional
D-Sub 9-pin (FEMALE)

Temperature sensor connector		
Pin No.	Wire	Function
1	Not used	–
2	Not used	–
3	Not used	–
4	Not used	–
5	Not used	–
6	White	PTC
7	Brown	PTC
8	Green	KTY
9	Yellow	KTY
Case	Shield	–

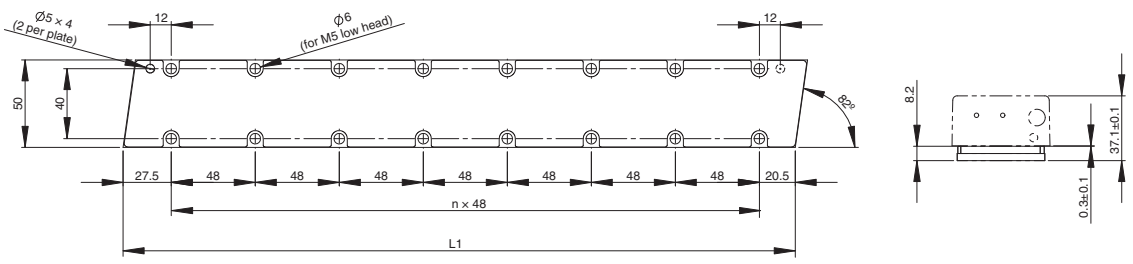


Cable length 500±30
D-Sub 9-pin (FEMALE)

Hall sensor connector (optional)		
Pin No.	Wire	Function
1	Brown	5V
2	Red	Hall U
3	Grey	Hall V
4	Yellow	Hall W
5	White	GND
6	Not used	Not used
7	Not used	Not used
8	Not used	Not used
9	Not used	Not used
Case	Shield	–

Magnet track

Model	L1 (mm)	n	Approx. weight (kg/m)
R88L-EC-FM-03096-A	96	1	2.1
R88L-EC-FM-03144-A	144	2	
R88L-EC-FM-03384-A	384	7	

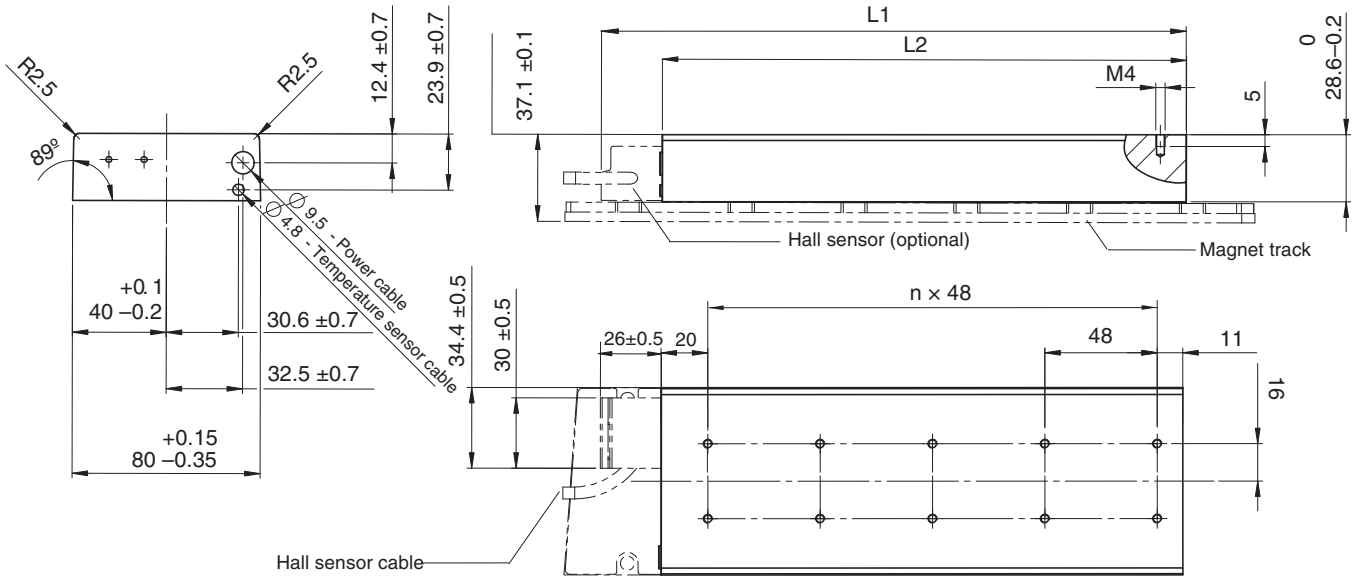


Iron-core R88L-EC-FW-06□

Motor coil

Model	L1 (mm)	L2 (mm)	n
R88L-EC-FW-0606-□	153 ±0.5	127 +0.15/–0.35	2
R88L-EC-FW-0609-□	201 ±0.5	175 +0.15/–0.35	3
R88L-EC-FW-0612-□	249 ±0.5	223 +0.15/–0.35	4

Motor coil dimensions with magnet track and hall sensor (optional)



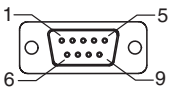
Units: mm

Wiring specifications for motor with connectors

Cable length 500±30
Connector optional
Made by Hypertac
LRRA06AMRPN182 (MALE)
Pin article code: 021.279.1020

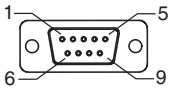
Power connector		
Pin No.	Wire	Function
1	Black-1	Phase U
2	Black-2	Phase V
3	Green/Yellow	Ground
4	Black-3	Phase W
5	Not used	–
6	Not used	–

Mating connector:
Plug type: LPRA06BFRBN170



Cable length 500±30
Connector optional
D-Sub 9-pin (FEMALE)

Temperature sensor connector		
Pin No.	Wire	Function
1	Not used	–
2	Not used	–
3	Not used	–
4	Not used	–
5	Not used	–
6	White	PTC
7	Brown	PTC
8	Green	KTY
9	Yellow	KTY
Case	Shield	–

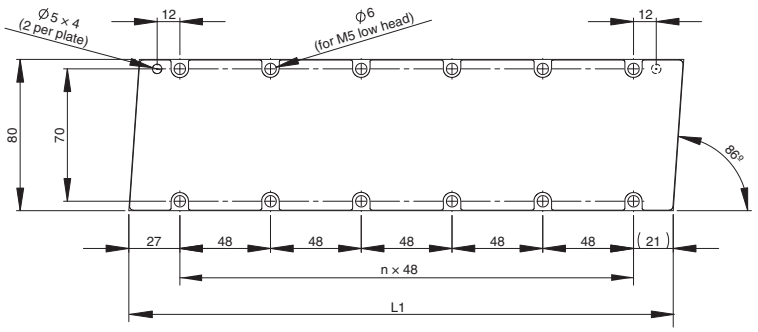


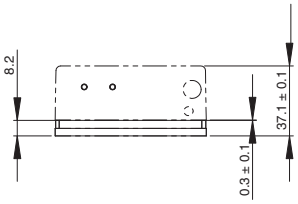
Cable length 500±30
D-Sub 9-pin (FEMALE)

Hall sensor connector (optional)		
Pin No.	Wire	Function
1	Brown	5 V
2	Red	Hall U
3	Grey	Hall V
4	Yellow	Hall W
5	White	GND
6	Not used	Not used
7	Not used	Not used
8	Not used	Not used
9	Not used	Not used
Case	Shield	–

Magnet track

Model	L1 (mm)	n	Approx. weight (kg/m)
R88L-EC-FM-06192-A	192	3	3.8
R88L-EC-FM-06288-A	288	5	



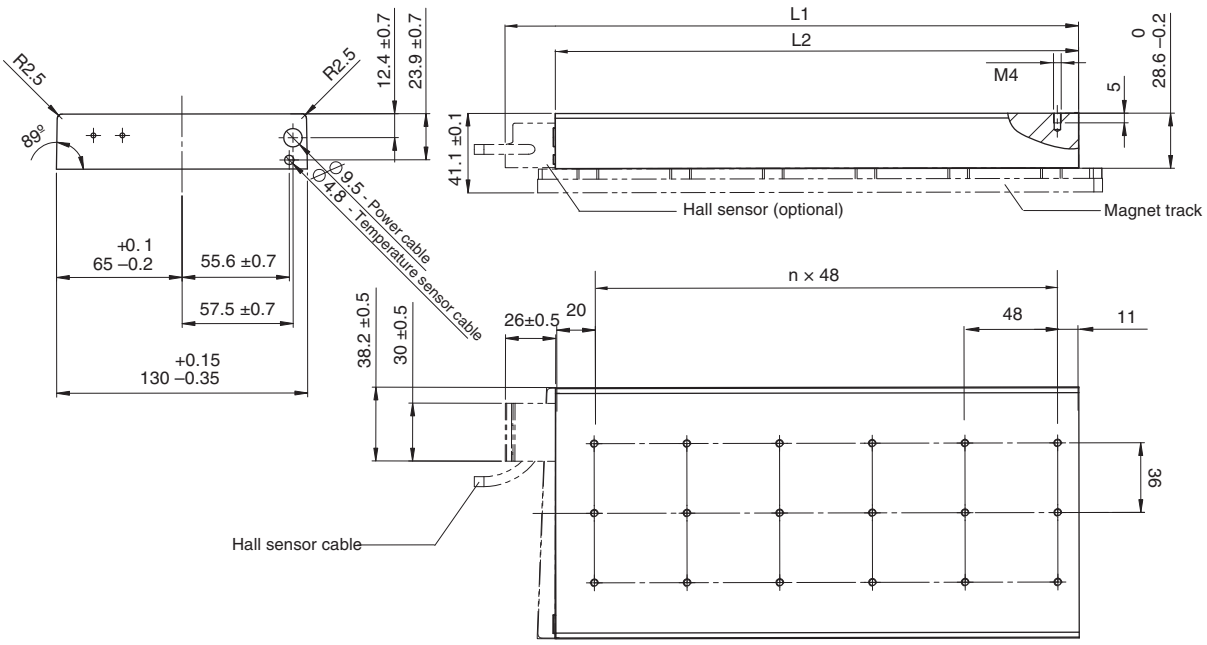


Iron-core R88L-EC-FW-11□

Motor coil

Model	L1 (mm)	L2 (mm)	n
R88L-EC-FW-1112-□	249 ±0.5	223 +0.15/–0.35	4
R88L-EC-FW-1115-□	297 ±0.5	271 +0.15/–0.35	5

Motor coil dimensions with magnet track and hall sensor (optional)



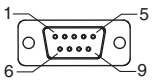
Units: mm

Wiring specifications for motor with connectors

Cable length 500±30
Connector optional
Made by Hypertac
LRRA06AMRPN182 (MALE)
Pin article code: 021.279.1020

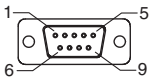
Power connector		
Pin No.	Wire	Function
1	Black-1	Phase U
2	Black-2	Phase V
3	Green/Yellow	Ground
4	Black-3	Phase W
5	Not used	–
6	Not used	–

Mating connector:
Plug type: LPRA06BFRBN170



Cable length 500±30
Connector optional
D-Sub 9-pin (FEMALE)

Temperature sensor connector		
Pin No.	Wire	Function
1	Not used	–
2	Not used	–
3	Not used	–
4	Not used	–
5	Not used	–
6	White	PTC
7	Brown	PTC
8	Green	KTY
9	Yellow	KTY
Case	Shield	–

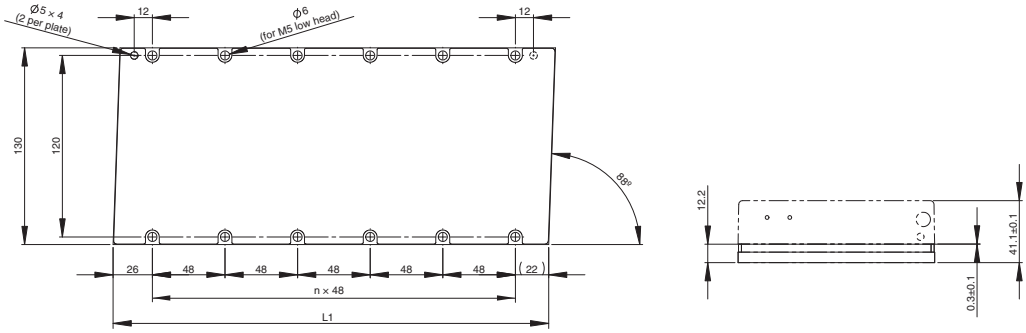


Cable length 500±30
D-Sub 9-pin (FEMALE)

Hall sensor connector (optional)		
Pin No.	Wire	Function
1	Brown	5 V
2	Red	Hall U
3	Grey	Hall V
4	Yellow	Hall W
5	White	GND
6	Not used	Not used
7	Not used	Not used
8	Not used	Not used
9	Not used	Not used
Case	Shield	–

Magnet track

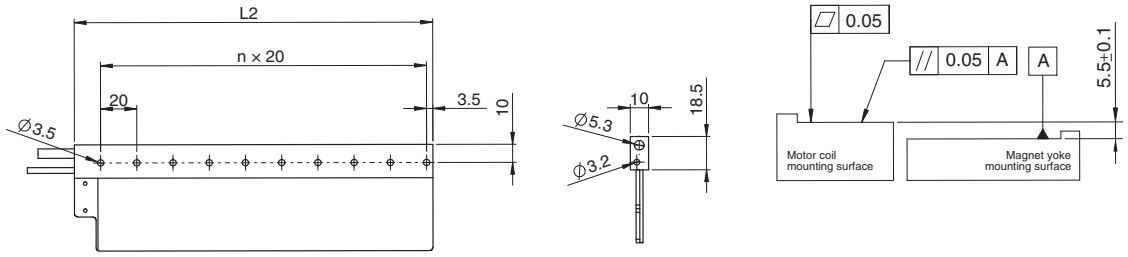
Model	L1 (mm)	n	Approx. weight (kg/m)
R88L-EC-FM-11192-A	192	3	10.5
R88L-EC-FM-11288-A	288	5	



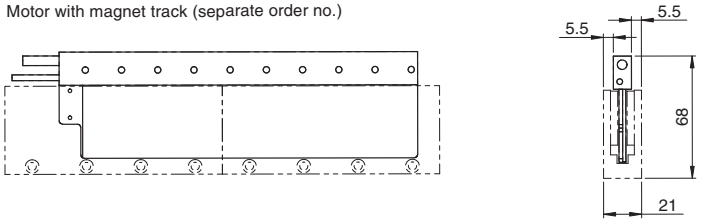
Ironless R88L-EC-GW-03□

Motor coil

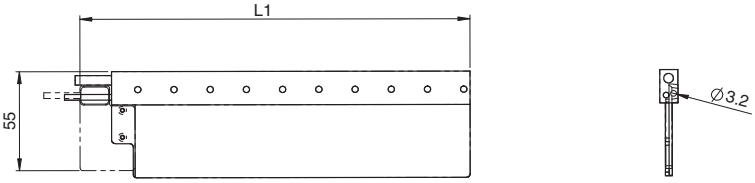
Model	L1 (mm)	L2 (mm)	n
R88L-EC-GW-0303-□	95.4	78	3
R88L-EC-GW-0306-□	155.4	138	6
R88L-EC-GW-0309-□	215.4	198	9



Motor with magnet track (separate order no.)

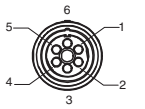


Motor with hall sensor (optional)



Units: mm

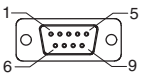
Wiring specifications for motor with connectors



Cable length 1000±30
Connector optional
Made by Hypertac
SROC06JMSCN169 (MALE)
Pin article code: 021.423.1020

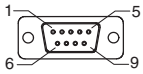
Power connector		
Pin No.	Wire	Function
1	Black	Phase U
2	Red	Phase V
3	White	Phase W
4	Not used	–
5	Not used	–
6	Green	Ground

Mating connector:
Plug type: SPOC06KFSDN169



Cable length 500±30
Connector optional
D-Sub 9-pin (FEMALE)

Temperature sensor connector		
Pin No.	Wire	Function
1	Not used	–
2	Not used	–
3	Not used	–
4	Not used	–
5	Not used	–
6	White	PTC
7	Brown	PTC
8	Green	NTC
9	Yellow	NTC
Case	Shield	–

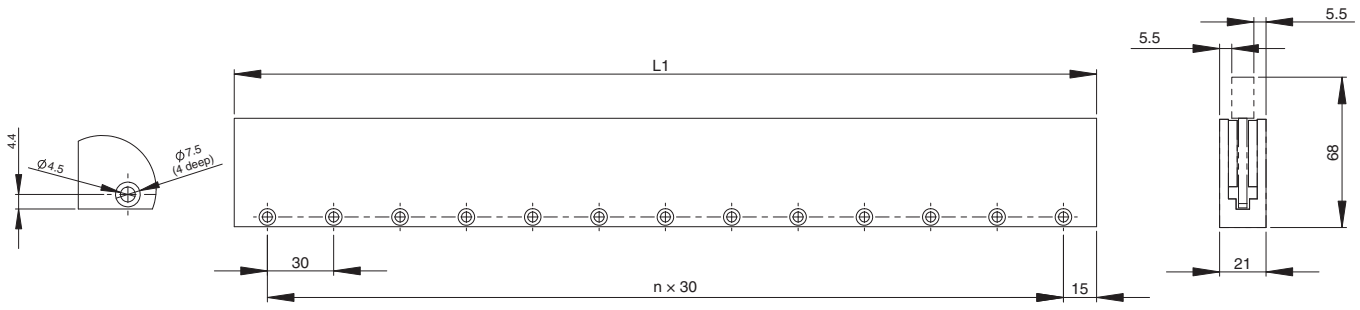


Cable length 500±30
D-Sub 9-pin (FEMALE)

Hall sensor connector (optional)		
Pin No.	Wire	Function
1	Brown	5 V
2	Red	Hall U
3	Grey	Hall V
4	Yellow	Hall W
5	White	GND
6	Not used	Not used
7	Not used	Not used
8	Not used	Not used
9	Not used	Not used
Case	Shield	–

Magnet track

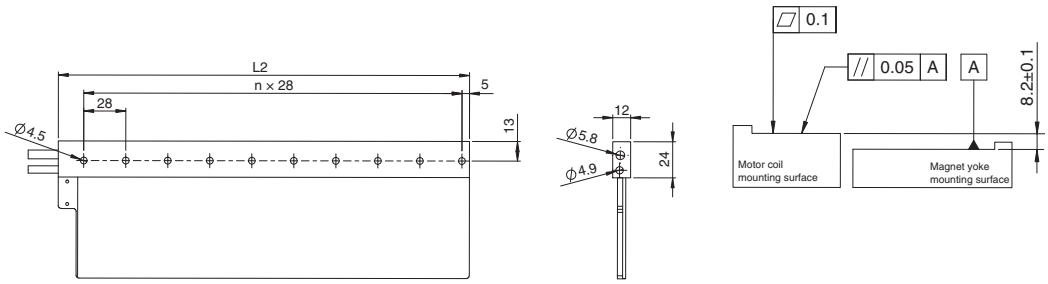
Model	L1 (mm)	n	Approx. weight (kg/m)
R88L-EC-GM-03090-A	90	2	4.8
R88L-EC-GM-03120-A	120	3	
R88L-EC-GM-03390-A	390	12	



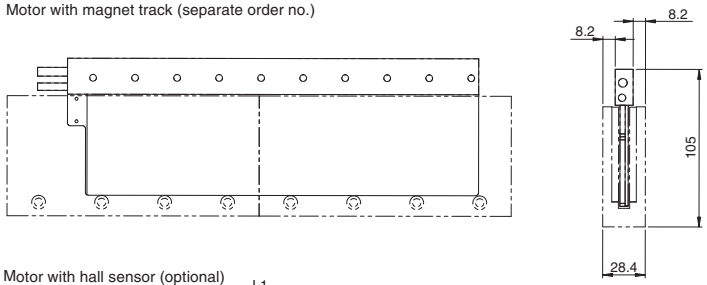
Ironless R88L-EC-GW-05□

Motor coil

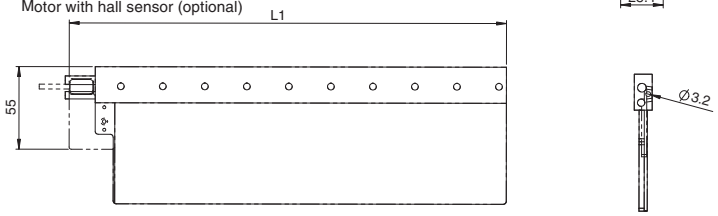
Model	L1 (mm)	L2 (mm)	n
R88L-EC-GW-0503-□	123.4	106	3
R88L-EC-GW-0506-□	207.4	190	6
R88L-EC-GW-0509-□	291.4	274	9



Motor with magnet track (separate order no.)

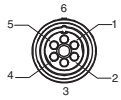


Motor with hall sensor (optional)



Units: mm

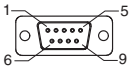
Wiring specifications for motor with connectors



Cable length 1000±30
Connector optional
Made by Hypertac
SROC06JMSCN169 (MALE)
Pin article code: 021.423.1020

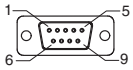
Power connector		
Pin No.	Wire	Function
1	Black	Phase U
2	Red	Phase V
3	White	Phase W
4	Not used	–
5	Not used	–
6	Green	Ground

Mating connector:
Plug type: SPOC06KFSDN169



Cable length 500±30
Connector optional
D-Sub 9-pin (FEMALE)

Temperature sensor connector		
Pin No.	Wire	Function
1	Not used	–
2	Not used	–
3	Not used	–
4	Not used	–
5	Not used	–
6	White	PTC
7	Brown	PTC
8	Green	NTC
9	Yellow	NTC
Case	Shield	–

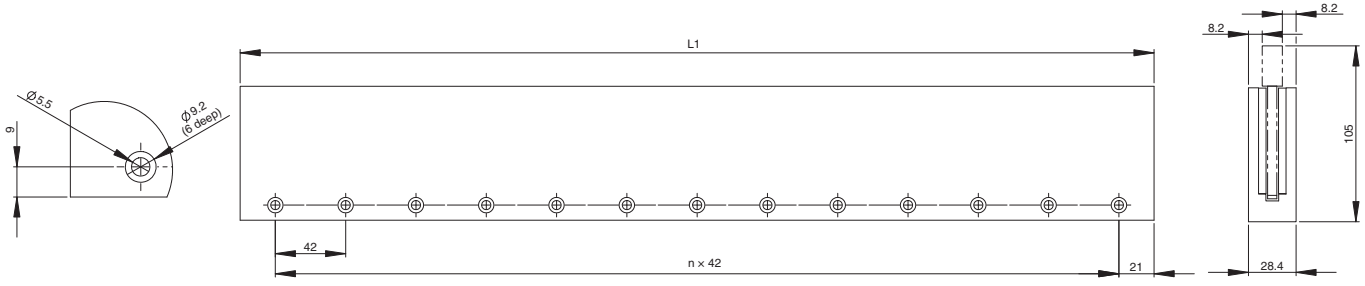


Cable length 500±30
D-Sub 9-pin (FEMALE)

Hall sensor connector (optional)		
Pin No.	Wire	Function
1	Brown	5 V
2	Red	Hall U
3	Grey	Hall V
4	Yellow	Hall W
5	White	GND
6	Not used	Not used
7	Not used	Not used
8	Not used	Not used
9	Not used	Not used
Case	Shield	–

Magnet track

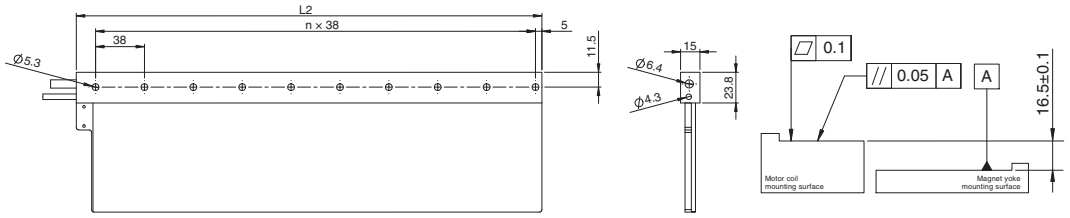
Model	L1 (mm)	n	Approx. weight (kg/m)
R88L-EC-GM-05126-A	126	2	11.2
R88L-EC-GM-05168-A	168	3	
R88L-EC-GM-05210-A	210	4	
R88L-EC-GM-05546-A	546	12	



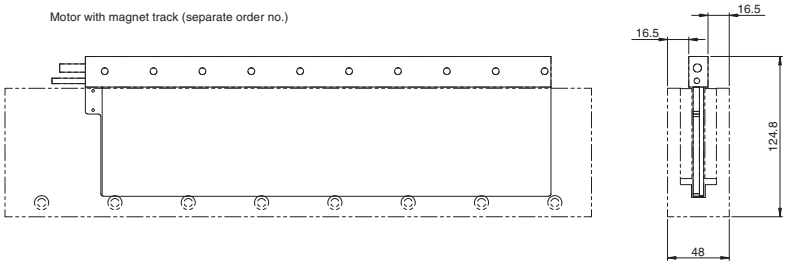
Ironless R88L-EC-GW-07□

Motor coil

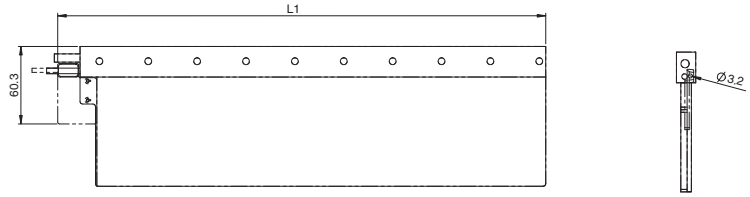
Model	L1 (mm)	L2 (mm)	n
R88L-EC-GW-0703-□	151.4	134	3
R88L-EC-GW-0706-□	265.4	248	6
R88L-EC-GW-0709-□	379.4	362	9



Motor with magnet track (separate order no.)

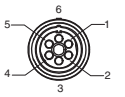


Motor with hall sensor (optional)



Units: mm

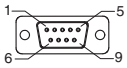
Wiring specifications for motor with connectors



Cable length 1000±30
Connector optional
Made by Hypertac
SROC06JMSCN169 (MALE)
Pin article code: 021.423.1020

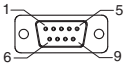
Power connector		
Pin No.	Wire	Function
1	Black	Phase U
2	Red	Phase V
3	White	Phase W
4	Not used	–
5	Not used	–
6	Green	Ground

Mating connector:
Plug type: SPOC06KFSDN169



Cable length 500±30
Connector optional
D-Sub 9-pin (FEMALE)

Temperature sensor connector		
Pin No.	Wire	Function
1	Not used	–
2	Not used	–
3	Not used	–
4	Not used	–
5	Not used	–
6	White	PTC
7	Brown	PTC
8	Green	NTC
9	Yellow	NTC
Case	Shield	–

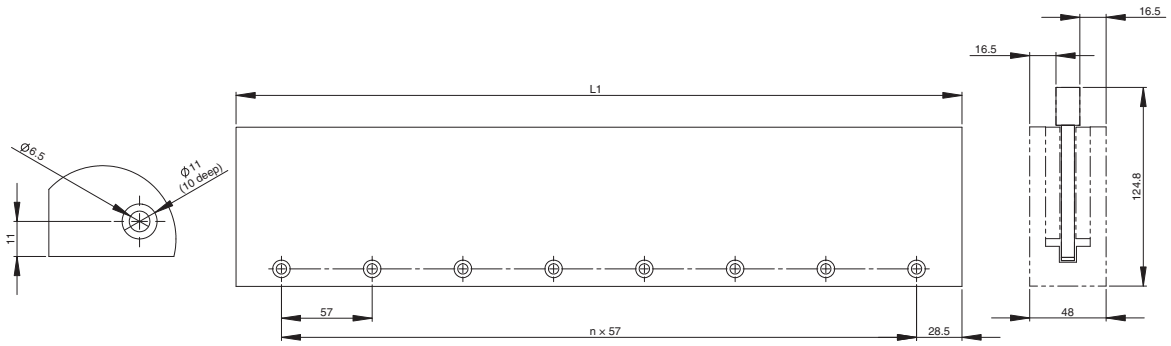


Cable length 500±30
D-Sub 9-pin (FEMALE)

Hall sensor connector (optional)		
Pin No.	Wire	Function
1	Brown	5V
2	Red	Hall U
3	Grey	Hall V
4	Yellow	Hall W
5	White	GND
6	Not used	Not used
7	Not used	Not used
8	Not used	Not used
9	Not used	Not used
Case	Shield	–

Magnet track

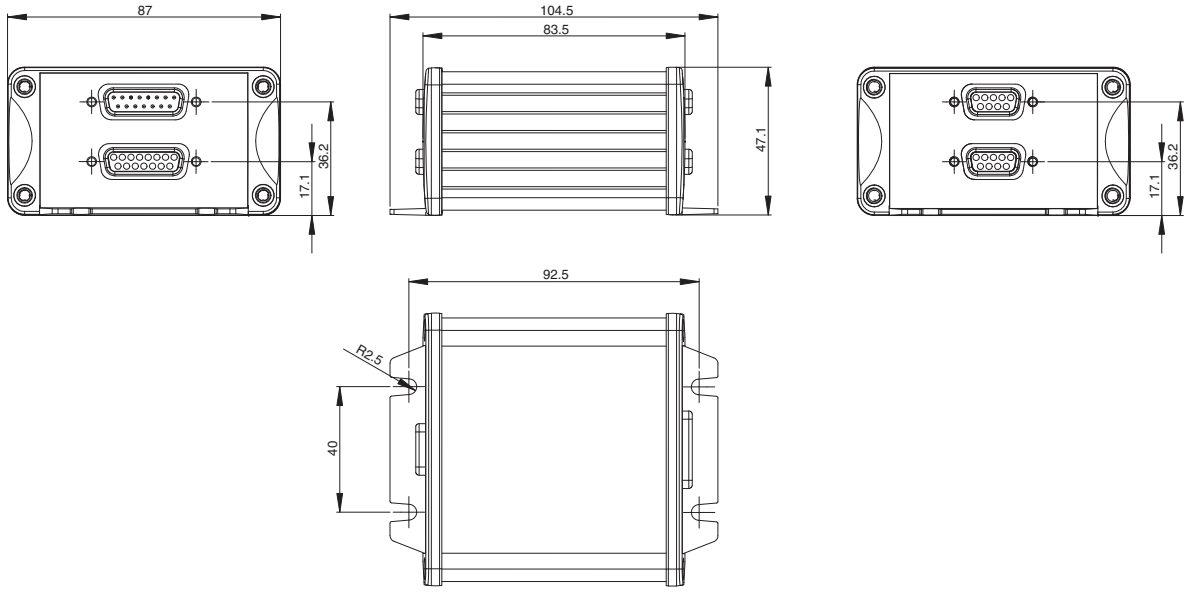
Model	L1 (mm)	n	Approx. weight (kg/m)
R88L-EC-GM-07114-A	114	1	25.5
R88L-EC-GM-07171-A	171	2	
R88L-EC-GM-07456-A	456	7	



Optional serial converter unit

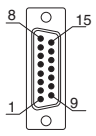
Specifications

Serial converter model R88A-		SC01K-E	SC02K-E
Description		Serial converter from 1 Vpp to G5 serial data transmission and with hall sensor input	
Temperature sensor		KTY sensor detection of iron-core motor coil	NTC sensor detection of ironless motor coil
Electrical characteristics	Power supply voltage	5 VDC, max. 250 mA supplied by the drive	
	Standard resolution	Interpolation factor 100 plus quadrature count	
	Max. input frequency	400 kHz 1 Vpp	
	Analog input signals (cos, sin, Ref)	Differential input amplitude: 0.4 V to 1.2 V Input signal level: 1.5 V to 3.5 V	
	Output signals	Position data, hall & temperature sensor information, and alarms	
	Output method	Serial data transmission	
	Transmission cycle	<42 µs	
Mechanical characteristics	Vibration resistance	98 m/s^2 max. (1 to 2500 Hz) in three directions	
	Shock resistance	980 m/s^2, (11 ms) two times in three directions	
Environmental conditions	Operating temperature	0 to 55°C	
	Storage temperature	–20 to +80°C	
	Humidity	20% to 90% relative humidity (without condensation)	



CN4

Serial data output to linear servo drive

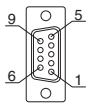


Connector D-Sub 15-pin (male)

Pin No.	Signal
1	PS
2	/PS
3	Not used
4	Not used
5	Not used
6	Not used
7	Not used
8	5 V
9	0 V
10	Not used
11	Not used
12	Not used
13	Not used
14	Not used
15	Inner shield
Case	Shield

CN3

Temperature sensor interface without Hall sensor

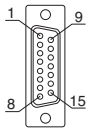


Connector D-Sub 9-pin (female)

Pin No.	Signal
1	Not used
2	Not used
3	Not used
4	Not used
5	Not used
6	PTC
7	PTC
8	KTY/ NTC
9	KTY/NTC
Case	Shield

CN1

Encoder input 1Vpp with programmable lines NUMERIK JENA standard

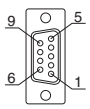


Connector D-Sub 15-pin (female)

Pin No.	Signal
1	SDA*
2	SCL*
3	Not used
4	/Ref signal (U_{0-})
5	/Cos signal (U_{2-})
6	/Sin signal (U_{1-})
7	Not used
8	5 V
9	0 V
10	Not used
11	Not used
12	Ref signal (U_0)
13	Cos signal (U_2)
14	Sin signal (U_1)
15	Inner shield (IS)
Case	Shield

CN2

Hall & temperature sensors interface



Connector D-Sub 9-pin (female)

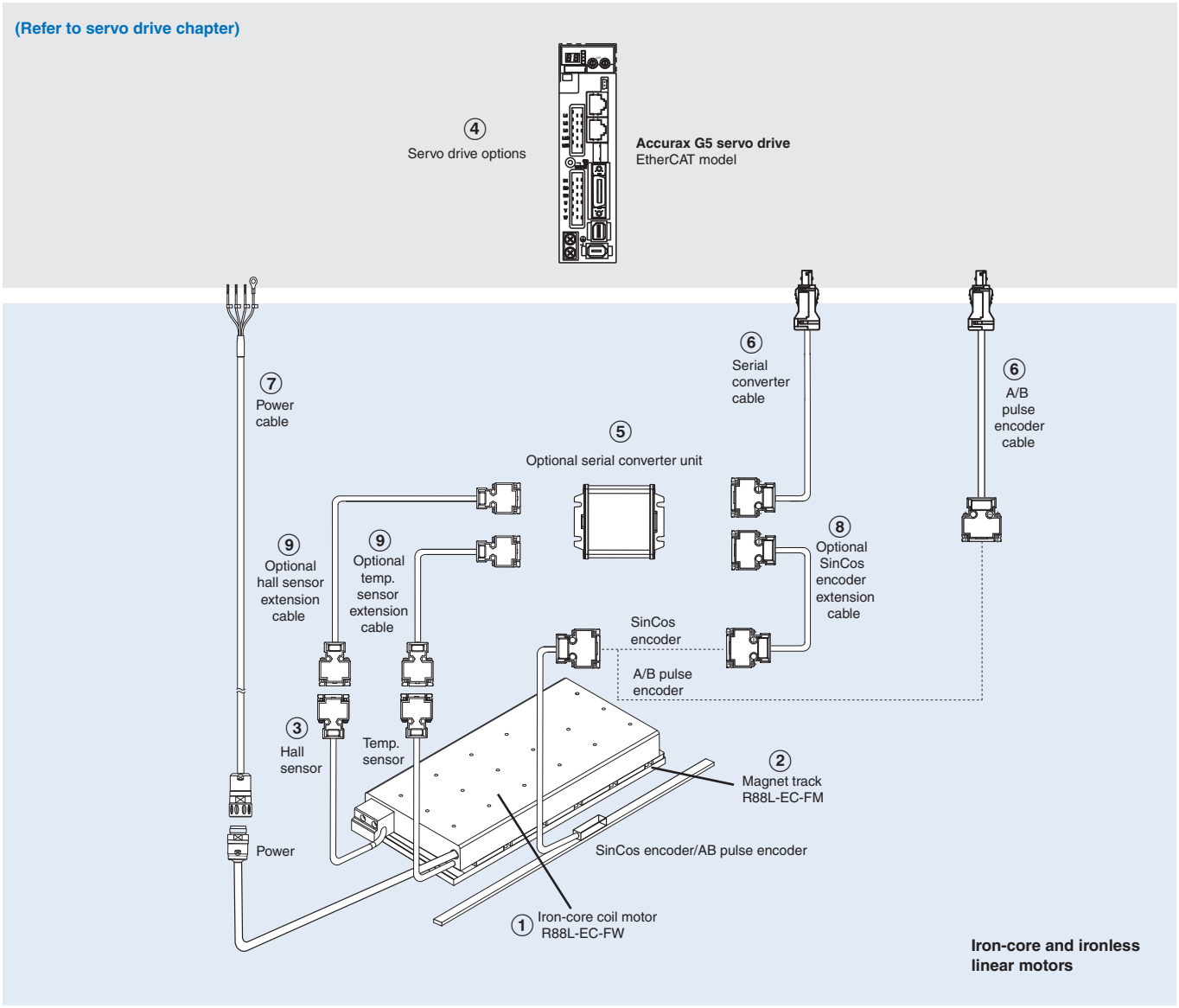
Pin No.	Signal
1	5V
2	Hall U
3	Hall V
4	Hall W
5	GND
6	PTC
7	PTC
8	KTY/NTC
9	KTY/NTC
Case	Shield

*Reserved. Please do not use

Note: As the 6,7,8,9 pins in the CN2 and CN3 connectors are internally wired, the Temperature sensor can be connected to both connectors. When the Hall sensor is also required, use the same cable for Hall & Temperature signals and the CN2 connector.

Ordering information

(Refer to servo drive chapter)



Note: The symbols ①②③... show the recommended sequence to select the linear motor, cables and serial converter for a linear motor system.

Linear motors

R88L-EC-FW-□ Iron-core type

230 VAC single phase/three phase, 400 VAC three phase

Linear motor parts							Linear Servo drive ④ Accurax G5 EtherCAT	
Symbol	Rated force	Peak force	① Iron-core motor coil		② Magnet track	③ Hall Sensor	230 V	400 V
①②③④ 	48 N	105 N	Coil without connectors	R88L-EC-FW-0303-ANPC	R88L-EC-FM-03096-A R88L-EC-FM-03144-A R88L-EC-FM-03384-A	R88L-EC-FH-NNNN-A	R88D-KN02H-ECT-L	R88D-KN06F-ECT-L
	96 N	210 N		R88L-EC-FW-0306-ANPC			R88D-KN04H-ECT-L	R88D-KN10F-ECT-L
	160 N	400 N		R88L-EC-FW-0606-ANPC	R88L-EC-FM-06192-A R88L-EC-FM-06288-A		R88D-KN08H-ECT-L	R88D-KN15F-ECT-L
	240 N	600 N		R88L-EC-FW-0609-ANPC			R88D-KN10H-ECT-L	R88D-KN20F-ECT-L
	320 N	800 N		R88L-EC-FW-0612-ANPC			R88D-KN15H-ECT-L	R88D-KN30F-ECT-L
	608 N	1600 N		R88L-EC-FW-1112-ANPC	R88L-EC-FM-11192-A R88L-EC-FM-11288-A		R88D-KN15H-ECT-L	R88D-KN30F-ECT-L
	760 N	2000 N		R88L-EC-FW-1115-ANPC			R88D-KN15H-ECT-L	R88D-KN30F-ECT-L
	48 N	105 N	Coil with connectors	R88L-EC-FW-0303-APLC	R88L-EC-FM-03096-A R88L-EC-FM-03144-A R88L-EC-FM-03384-A		R88D-KN02H-ECT-L	R88D-KN06F-ECT-L
	96 N	210 N		R88L-EC-FW-0306-APLC			R88D-KN04H-ECT-L	R88D-KN10F-ECT-L
	160 N	400 N		R88L-EC-FW-0606-APLC	R88L-EC-FM-06192-A R88L-EC-FM-06288-A		R88D-KN08H-ECT-L	R88D-KN15F-ECT-L
	240 N	600 N		R88L-EC-FW-0609-APLC			R88D-KN10H-ECT-L	R88D-KN20F-ECT-L
	320 N	800 N		R88L-EC-FW-0612-APLC			R88D-KN15H-ECT-L	R88D-KN30F-ECT-L
	608 N	1600 N		R88L-EC-FW-1112-APLC	R88L-EC-FM-11192-A R88L-EC-FM-11288-A		R88D-KN15H-ECT-L	R88D-KN30F-ECT-L
	760 N	2000 N		R88L-EC-FW-1115-APLC			R88D-KN15H-ECT-L	R88D-KN30F-ECT-L

R88L-EC-GW-□ Ironless type

230 VAC single phase/three phase

Linear motor parts							Linear Servo drive
							④ Accurax G5 EtherCAT
Type	Rated force	Peak force	① Ironless motor coil		② Magnet track	③ Hall Sensor	230V
①②③④ 	29 N	100 N	Coil without connectors	R88L-EC-GW-0303-ANPS	R88L-EC-GM-03090-A R88L-EC-GM-03120-A R88L-EC-GM-03390-A	R88L-EC-GH-03NN-A	R88D-KN02H-ECT-L
	58 N	200 N		R88L-EC-GW-0306-ANPS			R88D-KN08H-ECT-L
	87 N	300 N		R88L-EC-GW-0309-ANPS			R88D-KN10H-ECT-L
	70 N	240 N		R88L-EC-GW-0503-ANPS	R88L-EC-GM-05126-A R88L-EC-GM-05546-A R88L-EC-GM-05168-A R88L-EC-GM-05210-A	R88L-EC-GH-05NN-A	R88D-KN02H-ECT-L
	140 N	480 N		R88L-EC-GW-0506-ANPS			R88D-KN04H-ECT-L
	210 N	720 N		R88L-EC-GW-0509-ANPS			R88D-KN08H-ECT-L
	141 N	700 N		R88L-EC-GW-0703-ANPS	R88L-EC-GM-07114-A R88L-EC-GM-07171-A R88L-EC-GM-07456-A	R88L-EC-GH-07NN-A	R88D-KN04H-ECT-L
	282 N	1400 N		R88L-EC-GW-0706-ANPS			R88D-KN08H-ECT-L
	423 N	2100 N		R88L-EC-GW-0709-ANPS			R88D-KN10H-ECT-L
	29 N	100 N	Coil with connectors	R88L-EC-GW-0303-APLS	R88L-EC-GM-03090-A R88L-EC-GM-03120-A R88L-EC-GM-03390-A	R88L-EC-GH-03NN-A	R88D-KN02H-ECT-L
	58 N	200 N		R88L-EC-GW-0306-APLS			R88D-KN08H-ECT-L
	87 N	300 N		R88L-EC-GW-0309-APLS			R88D-KN10H-ECT-L
	70 N	240 N		R88L-EC-GW-0503-APLS	R88L-EC-GM-05126-A R88L-EC-GM-05546-A R88L-EC-GM-05168-A R88L-EC-GM-05210-A	R88L-EC-GH-05NN-A	R88D-KN02H-ECT-L
	140 N	480 N		R88L-EC-GW-0506-APLS			R88D-KN04H-ECTL
	210 N	720 N		R88L-EC-GW-0509-APLS			R88D-KN08H-ECT-L
	141 N	700 N		R88L-EC-GW-0703-APLS	R88L-EC-GM-07114-A R88L-EC-GM-07171-A R88L-EC-GM-07456-A	R88L-EC-GH-07NN-A	R88D-KN04H-ECTL
	282 N	1400 N		R88L-EC-GW-0706-APLS			R88D-KN08H-ECT-L
	423 N	2100 N		R88L-EC-GW-0709-APLS			R88D-KN10H-ECT-L

Servo drive

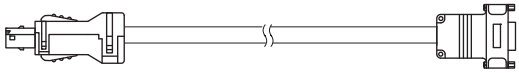
④ Refer to Accurax G5 servo drive chapter for detailed drive specifications and selection of drive accessories.

Serial converter unit

Symbol	Specifications	Model
⑤	Serial converter unit from 1 Vpp to G5 serial data transmission (with KTY sensor detection of iron-core motor coil)	R88A-SC01K-E
	Serial converter unit from 1 Vpp to G5 serial data transmission (with NTC sensor detection of ironless motor coil)	R88A-SC02K-E

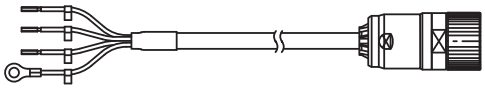
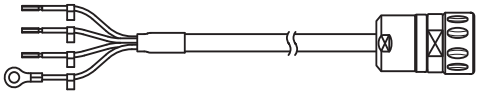
Note: If no temperature sensor is needed, then it does not matter which converter you use.

Serial converter cable to servo drive

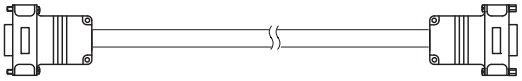
Symbol	Specifications		Model	Appearance
⑥	Accurax G5-Linear drive to serial converter cable. (Connectors R88A-CNK41L and DB-15)	1.5 m	R88A-CRKN001-5CR-E	
		3 m	R88A-CRKN003CR-E	
		5 m	R88A-CRKN005CR-E	
		10 m	R88A-CRKN010CR-E	
		15 m	R88A-CRKN015CR-E	
		20 m	R88A-CRKN020CR-E	

Note: This cable can be used also for A/B pulse encoder Numerik Jena standard pinout.

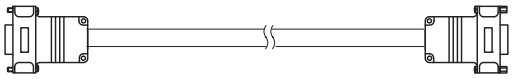
Power cable

Symbol	Specifications		Model	Appearance
⑦	For iron-core linear motors R88L-EC-FW-0303-□ R88L-EC-FW-0306-□	1.5 m	R88A-CAWK001-5S-DE	
		3 m	R88A-CAWK003S-DE	
		5 m	R88A-CAWK005S-DE	
		10 m	R88A-CAWK010S-DE	
		15 m	R88A-CAWK015S-DE	
		20 m	R88A-CAWK020S-DE	
	For iron-core linear motors R88L-EC-FW-0606-□ R88L-EC-FW-0609-□ R88L-EC-FW-0612-□ R88L-EC-FW-1112-□ R88L-EC-FW-1115-□	1.5 m	R88A-CAWL001-5S-DE	
		3 m	R88A-CAWL003S-DE	
		5 m	R88A-CAWL005S-DE	
		10 m	R88A-CAWL010S-DE	
		15 m	R88A-CAWL015S-DE	
		20 m	R88A-CAWL020S-DE	
	For ironless linear motors R88L-EC-GW-□	1.5 m	R88A-CAWB001-5S-DE	
		3 m	R88A-CAWB003S-DE	
		5 m	R88A-CAWB005S-DE	
		10 m	R88A-CAWB010S-DE	
		15 m	R88A-CAWB015S-DE	
		20 m	R88A-CAWB020S-DE	

Linear encoder cable to serial converter

Symbol	Specifications		Model	Appearance
⑧	Extension cable for **Numerik Jena** linear encoder to R88A-SC0□K-E serial converter (Connector DB-15) (This extension cable is optional)	1.5 m	R88A-CFKA001-5CR-E	
		3 m	R88A-CFKA003CR-E	
		5 m	R88A-CFKA005CR-E	
		10 m	R88A-CFKA010CR-E	
		15 m	R88A-CFKA015CR-E	
	Extension cable for **Renishaw** linear encoder to R88A-SC0□K-E serial converter (Connector DB-15) (This extension cable is optional)	1.5 m	R88A-CFKC001-5CR-E	
		3 m	R88A-CFKC003CR-E	
		5 m	R88A-CFKC005CR-E	
		10 m	R88A-CFKC010CR-E	
		15 m	R88A-CFKC015CR-E	
	Extension cable for **Heidenhain** linear encoder to R88A-SC0□K-E serial converter (Connector DB-15) (This extension cable is optional)	1.5 m	R88A-CFKD001-5CR-E	
		3 m	R88A-CFKD003CR-E	
		5 m	R88A-CFKD005CR-E	
		10 m	R88A-CFKD010CR-E	
		15 m	R88A-CFKD015CR-E	

Hall and temperature sensors cable to serial converter

Symbol	Specifications		Model	Appearance
⑨	Extension cable from hall and temperature sensors to R88A-SC0□K-E serial converter. (Connector DB-9) (This extension cable is optional)	1.5 m	R88A-CFKB001-5CR-E	
		3 m	R88A-CFKB003CR-E	
		5 m	R88A-CFKB005CR-E	
		10 m	R88A-CFKB010CR-E	
		15 m	R88A-CFKB015CR-E	

Connectors

Specification	Model
Accurax G5 servo drive encoder connector (for CN4)	R88A-CNK41L
Hypertac power cable connector IP67 for iron-core linear motors	LPRA-06B-FRBN170
Hypertac power cable connector IP67 for ironless linear motors	SROC06JMSCN169

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. SysCat_I160E-EN-03 In the interest of product improvement, specifications are subject to change without notice.