

Linear Servomotors

SGLC

(Cylinder Type)



Model Designations

● Combination of Moving Coil and Magnetic Way

S G L C - D16 A 085 A P - 750 A

Linear Σ Series Linear Servomotor (1st digit) 2nd+3rd+4th digits (2nd+3rd+4th digits) 5th digit (5th digit) 6th+7th+8th digits (6th+7th+8th digits) 9th digit (9th digit) 10th digit (10th digit) 11th+12th+13th digits (11th+12th+13th digits) 14th digit (14th digit)

1st digit Servomotor Model

Code	Specifications
C	Cylinder type

2nd+3rd+4th digits Outer Diameter of Magnetic Way

Code	Specifications
D16	16 mm
D20	20 mm
D25	25 mm
D32	32 mm

5th digit Voltage

Code	Specifications
A	200 VAC

6th+7th+8th digits Length of Moving Coil

Code	Specifications	Outer Diameter Code of Magnetic Way
085	85 mm	D16
100	100 mm	D20
115	115 mm	D16
125	125 mm	D25
135	135 mm	D20
145	145 mm	D16
165	165 mm	D32
170	170 mm	D20, D25
215	215 mm	D25
225	225 mm	D32
285	285 mm	D32

9th digit Design Revision Order of Moving Coil
A, B...

10th digit Hall Sensor

Code	Specifications
P	With hall sensor (all models)

11th+12th+13th digits Length of Magnetic Way
(See the next page)

14th digit Design Revision Order of Magnetic Way
A, B...

● Moving Coil

SGL C W - D16 A 085 A P

Linear Σ Series Linear Servomotor (1st digit) 2nd digit (2nd digit) 3rd+4th+5th digits (3rd+4th+5th digits) 6th digit (6th digit) 7th+8th+9th digits (7th+8th+9th digits) 10th digit (10th digit) 11th digit (11th digit)

1st digit Servomotor Model (Same as above combination.) 3rd+4th+5th digits Outer Diameter of Magnetic Way (Same as above combination.) 10th digit Design Revision Order A, B...

2nd digit Moving Coil/ Magnetic Way

Code	Specifications
W	Moving Coil

6th digit Voltage (Same as above combination.)

7th+8th+9th digits Length of Moving Coil (Same as above combination.)

11th digit Hall Sensor

Code	Specifications
P	With hall sensor (all models)

● Magnetic Way

SGL C M - D16 750 A

Linear Σ Series Linear Servomotor (1st digit) 2nd digit (2nd digit) 3rd+4th+5th digits (3rd+4th+5th digits) 6th+7th+8th digits (6th+7th+8th digits) 9th digit (9th digit)

1st digit Servomotor Model (Same as above combination.) 3rd+4th+5th digits Outer Diameter of Magnetic Way (Same as above combination.) 9th digit Design Revision Order A, B...

2nd digit Moving Coil/ Magnetic Way

Code	Specifications
M	Magnetic Way

6th+7th+8th digits Length of Magnetic Way (See the next page)

Note: Order the moving coil and magnetic way as a set. Contact your Yaskawa representative before purchasing them separately.

Features

- Both coil assemblies supported, easy switching from ball screws.
- Compared to ball screw systems, high-speed and high-precision positioning greatly reduces tact time.
- Unlike ball screws, no contact with machines, no lubrication oil, easy maintenance.

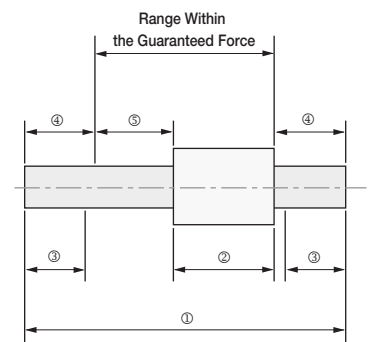
Application Examples

- Semiconductor equipment
- Electronic parts assembly
- Food packaging machines
- Metal processing machines
- General handling machines

◆ Magnetic Way Lengths

Moving Coil Model SGLCW-		Magnetic Way Dimensions mm					
		Standard Specifications				Special Orders	
		Code = ① mm				Length of Magnetic Way mm	
		②	③	④	⑤	Min. to Max.	
D16A	085AP 115AP 145AP	300	85	30	37.5	140	240 to 420 (30 mm increments)
			115			110	
			145			80	
	510	85	45	52.5	320	480 to 750 (30 mm increments)	
		115			290		
		145			260		
		85			560		
		115			530		
		145			500		
D20A	100AP 135AP 170AP	350	100	35	45	160	280 to 490 (35 mm increments)
			135			125	
			170			90	
	590	100	50	60	370	555 to 870 (35 mm increments)	
		135			335		
		170			300		
		100			650		
		135			615		
		170			580		
D25A	125AP 170AP 215AP	450	125	45	57.5	210	360 to 630 (45 mm increments)
			170			165	
			215			120	
	750	125	60	72.5	480	705 to 1110 (45 mm increments)	
		170			435		
		215			390		
		125			840		
		170			795		
		215			750		
D32A	165AP 225AP 285AP	600	165	60	75	285	480 to 840 (60 mm increments)
			225			225	
			285			165	
	1020	165	90	105	645	960 to 1500 (60 mm increments)	
		225			585		
		285			525		
		165			1125		
		225			1065		
		285			1005		

- ① Length of Magnetic Way
- ② Length of Moving Coil
- ③ Position of Support Section
- ④ Range Outside the Guaranteed Force
- ⑤ Effective Strokes



Note: ③ Range outside the guaranteed force: If any part of the moving coil is located within this range, characteristics indicated in *Force and Speed Characteristics* on page 184 cannot be satisfied.

< Calculating Length of Magnetic Way >

- ② Length of Moving Coil (mm)
- ④ Range Outside the Guaranteed Force (mm)
- ⑤ Effective Strokes (mm)

Formula

◆ Length of Magnetic Way
 $[② + ④ \times 2 + ⑤]$ (mm)

Ratings and Specifications

Time Rating: Continuous

Insulation Resistance: 500 VDC, 10 MΩ min.

Ambient Temperature: 0 to 40°C

Excitation: Permanent magnet

Withstand Voltage: 1500 VAC for one minute

Enclosure: Self-cooled

Ambient Humidity: 20% to 80% (no condensation)

Allowable Winding Temperature: 130°C (Thermal class B)

Linear Servomotor Model SGLC-		D16A			D20A			D25A			D32A		
		085A	115A	145A	100A	135A	170A	125A	170A	215A	165A	225A	285A
Peak Speed ³	m / s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Rated Force ¹	N	17	25	34	30	45	60	70	105	140	90	135	180
Rated Current ¹	Arms	0.59	0.53	0.66	0.98	0.98	1.19	1.42	1.75	3.49	1.57	2.79	2.79
Instantaneous Peak Force ¹	N	60	90	120	150	225	300	280	420	560	420	630	840
Instantaneous Peak Current ¹	Arms	2.07	2.07	2.52	4.90	4.90	5.95	5.68	6.98	12.96	7.32	13.01	13.01
Moving Coil Mass	kg	0.3	0.4	0.5	0.6	0.8	1.0	1.0	1.4	1.8	1.8	2.5	3.2
Force Constant	N / Arms	31.2	46.8	51.3	33.0	49.5	54.3	53.1	64.8	43.2	61.8	52.2	69.6
BEMF Constant	V / (m/s)	10.4	15.6	17.1	11.0	16.5	18.1	17.7	21.6	14.4	20.6	17.4	23.2
Motor Constant	N / √w	4.8	5.9	6.7	7.5	9.2	10.4	10.0	12.4	15.4	16.2	20.0	23.0
Electrical Time Constant	ms	0.18	0.18	0.17	0.38	0.32	0.41	0.18	0.59	0.65	0.76	1.18	1.58
Mechanical Time Constant	ms	13.1	11.7	11.3	10.70	9.50	9.30	10.1	9.2	7.6	6.9	6.3	6.0
Thermal Resistance With Heat Sink	K / W	3.35	2.9	1.64	1.66	1.45	1.29	1.00	0.68	0.61	0.77	0.53	0.49
Thermal Resistance Without Heat Sink	K / W	6.79	5.24	4.26	4.35	3.38	2.76	2.99	2.29	1.81	1.87	1.43	1.16
Magnetic Attraction ²	N	0	0	0	0	0	0	0	0	0	0	0	0
Applicable SERVOPACK	SGDV-	R70A	R70A	R90A	1R6A	1R6A	2R8A	1R6A	2R8A	5R5A	2R8A	5R5A	5R5A

*1: These items and "Force and Speed Characteristics" are the values at a motor winding temperature of 100°C during operation in combination with a SERVOPACK. The others are at 20°C.

*2: Logical magnetic attraction acting between the moving coil and the magnetic way. Because of the gap imbalance created after installing the moving coil and the magnetic way, a magnetic attraction is generated.

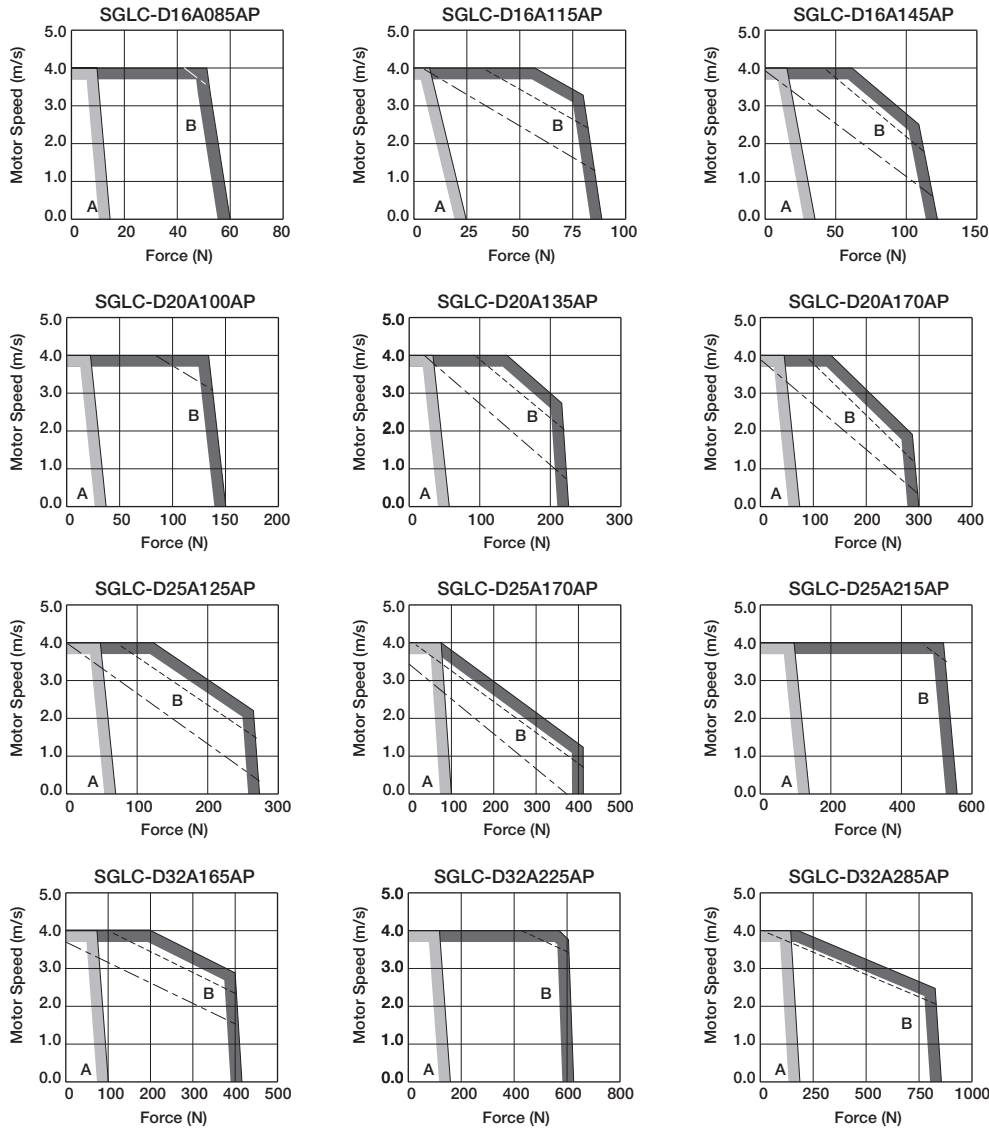
*3: The rated speed during operation by speed control with an analog voltage reference must be set to 1.5 m/s.

Note: These specifications show the values under the cooling conditions when a heat sink (aluminum board) listed in the following table is mounted on the moving coil.

Heat Sink Size	Applicable Models
100 mm × 200 mm × 12 mm	SGLC-D16A085A, -D16A115A
200 mm × 300 mm × 12 mm	SGLC-D16A145A, -D20A100A, -D20A135A, -D20A170A
300 mm × 400 mm × 12 mm	SGLC-D25A125A, -D32A165A
400 mm × 500 mm × 12 mm	SGLC-D25A170A, -D25A215A, -D32A225A, -D32A285A

Ratings and Specifications

● **Force and Speed Characteristics** [A]: Continuous Duty Zone [B]: Intermittent Duty Zone (Note)



Notes: 1 The characteristics of the intermittent duty zone differ depending on the supply voltages. The solid, dotted, and dashed-dotted lines of the intermittent duty zone indicate the characteristics when a servomotor runs with the following combinations:
 • The solid line: With a three-phase 200 V SERVOPACK
 • The dotted line: With a single-phase 200 V SERVOPACK
 • The dashed-dotted line: With a single-phase 100 V SERVOPACK
 SGLC-D16A085AP and SGLC-20A100AP servomotors combined with single-phase 200 V SERVOPACKs have the same characteristics as those combined with three-phase ones.
 2 When the effective force is within the rated force, the servomotor can be used within the intermittent duty zone.

● **Mechanical Specifications of Linear Servomotors**

(1) Impact Resistance

- Impact acceleration: 98 m/s²
- Impact occurrences: twice

(2) Vibration Resistance

The linear servomotors will withstand the following vibration acceleration in three directions: Vertical, side to side, and front to back.

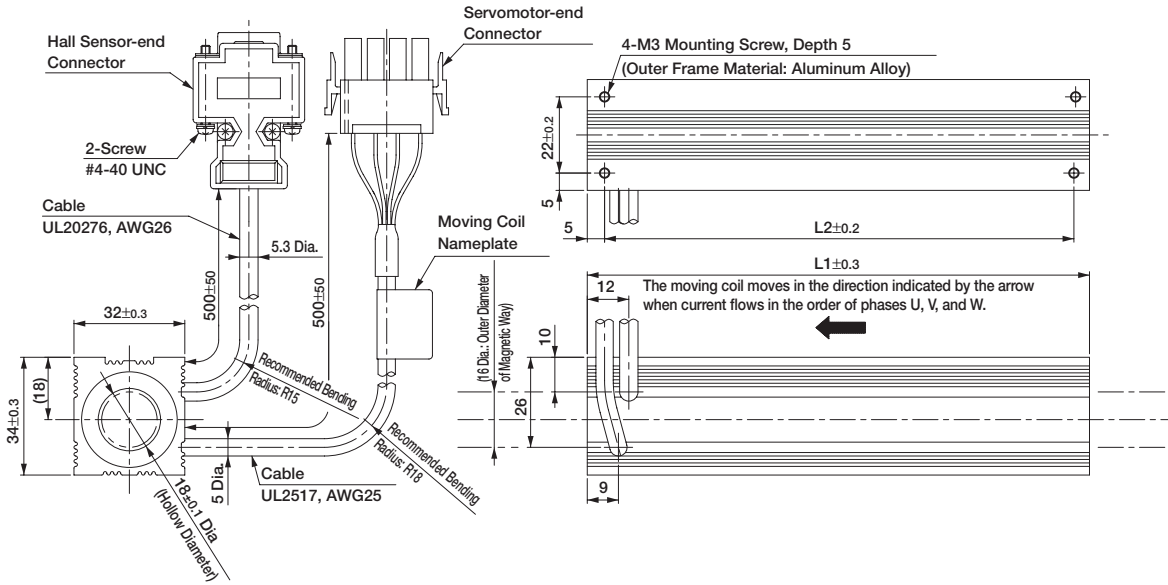
- Vibration acceleration: Moving Coil: 24.5 m/s²
 Magnetic Way: 24.5 m/s² in axis direction
 4.9 m/s² in vertically and horizontally

Linear Servomotors

External Dimensions Units: mm

(1) SGLC-D16

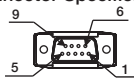
- Moving Coil: SGLCW-D16A□□□AP (With a connector by Tyco Electronics AMP K.K.)



Moving Coil Model SGLCW-	L1	L2	Approx. Mass* kg
D16A085AP	85	75	0.3
D16A115AP	115	105	0.4
D16A145AP	145	135	0.5

*: The values indicate the mass of moving coil with a hall sensor unit.

Hall Sensor Connector Specifications



Pin Connector:
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector

Socket Connector:
17JE-13090-02 (D8C)
Stud: 17L-002C or
17L-002C1

Pin No.	Name
1	+5V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor Connector Specifications



Plug: 350779-1
Pin : 350690-3 or
350561-3 (No.1 to 3)
770210-1 (No.4)

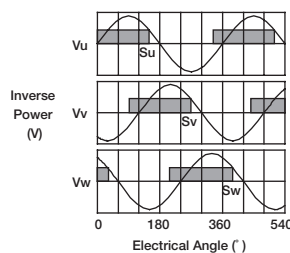
by Tyco
Electronics AMP K.K.
The Mating Connector

Cap: 350780-1
Socket: 350925-1 or
770673-1

Pin No.	Name	Wire Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG	Green

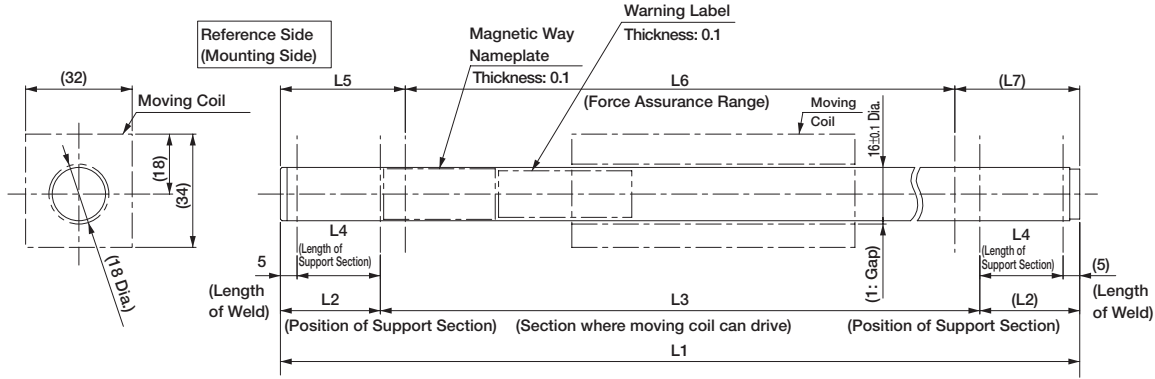
Hall Sensor Output Signals

When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



External Dimensions Units: mm

● Magnetic Way: SGLCM-D16□□□A



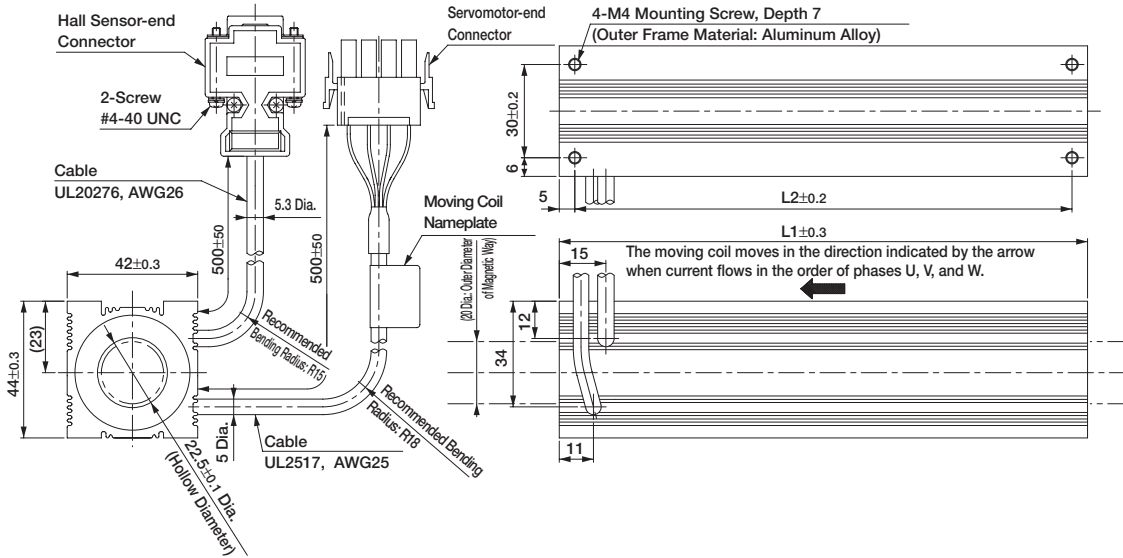
- Notes:1 The magnetic way will become deformed if a magnetic attraction with the moving coil is generated.
 Take measures over the entire driving range to prevent any interference between the magnetic way and the moving coil after installation.
 2 If you have a pacemaker or any other electronic medical device, do not go near the magnetic way of the linear servomotor.

Magnetic Way Model SGLCM-	L1	L2	L3	L4	L5	L6	L7	Approx. Mass kg	Remarks
D16240A	240±1.6	30	180	25	37.5±0.3	165±1.2	37.5	0.38	-
D16270A	270±1.6	30	210	25	37.5±0.3	195±1.2	37.5	0.43	-
D16300A	300±1.6	30	240	25	37.5±0.3	225±1.2	37.5	0.48	Standard
D16330A	330±1.6	30	270	25	37.5±0.3	255±1.2	37.5	0.53	-
D16360A	360±1.6	30	300	25	37.5±0.3	285±1.2	37.5	0.58	-
D16390A	390±1.6	30	330	25	37.5±0.3	315±1.2	37.5	0.63	-
D16420A	420±1.6	30	360	25	37.5±0.3	345±1.2	37.5	0.68	-
D16480A	480±2.5	45	390	40	52.5±0.3	375±2.1	52.5	0.75	-
D16510A	510±2.5	45	420	40	52.5±0.3	405±2.1	52.5	0.80	Standard
D16540A	540±2.5	45	450	40	52.5±0.3	435±2.1	52.5	0.85	-
D16570A	570±2.5	45	480	40	52.5±0.3	465±2.1	52.5	0.90	-
D16600A	600±2.5	45	510	40	52.5±0.3	495±2.1	52.5	0.95	-
D16630A	630±2.5	45	540	40	52.5±0.3	525±2.1	52.5	1.0	-
D16660A	660±2.5	45	570	40	52.5±0.3	555±2.1	52.5	1.05	-
D16690A	690±2.5	45	600	40	52.5±0.3	585±2.1	52.5	1.1	-
D16720A	720±2.5	45	630	40	52.5±0.3	615±2.1	52.5	1.15	-
D16750A	750±3	45	660	40	52.5±0.3	645±2.5	52.5	1.2	Standard

External Dimensions Units: mm

(2) SGLC-D20

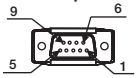
• Moving Coil: SGLCW-D20A□□□AP (With a connector by Tyco Electronics AMP K.K.)



Moving Coil Model SGLCW-	L1	L2	Approx. Mass* kg
D20A100AP	100	90	0.6
D20A135AP	135	125	0.8
D20A170AP	170	160	1.0

*: The values indicate the mass of moving coil with a hall sensor unit.

Hall Sensor Connector Specifications



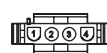
Pin Connector:
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector

Socket Connector:
17JE-13090-02 (D8C)
Stud: 17L-002C or
17L-002C1

Pin No.	Name
1	+5V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor Connector Specifications



Plug: 350779-1
Pin : 350690-3 or
350561-3 (No.1 to 3)
770210-1 (No.4)

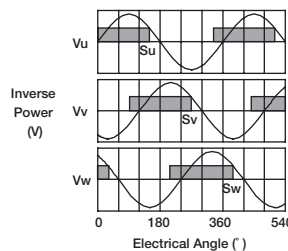
by Tyco
Electronics AMP K.K.
The Mating Connector

Cap: 350780-1
Socket: 350925-1 or
770673-1

Pin No.	Name	Wire Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG	Green

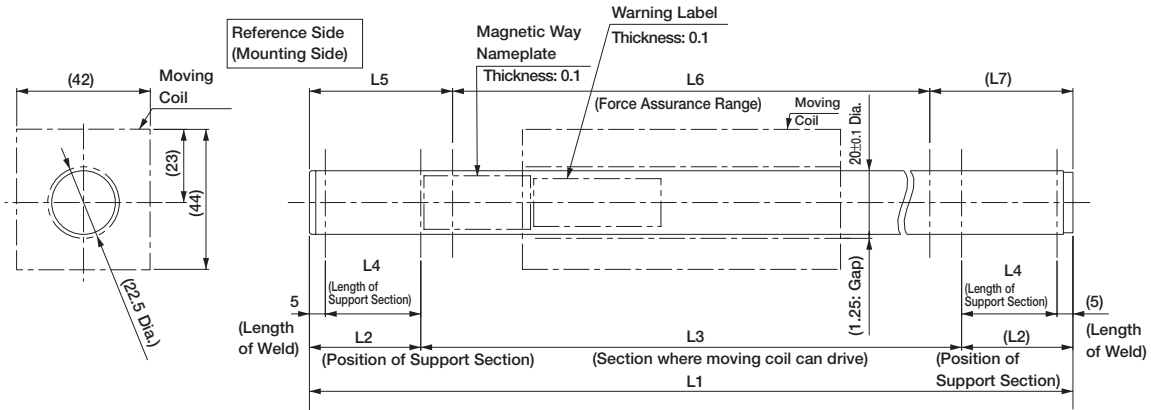
Hall Sensor Output Signals

When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals Su, Sv, Sw and the inverse power of each motor phase Vu, Vv, Vw becomes as shown in the figure below.



External Dimensions Units: mm

● Magnetic Way: SGLCM-D20□□□A



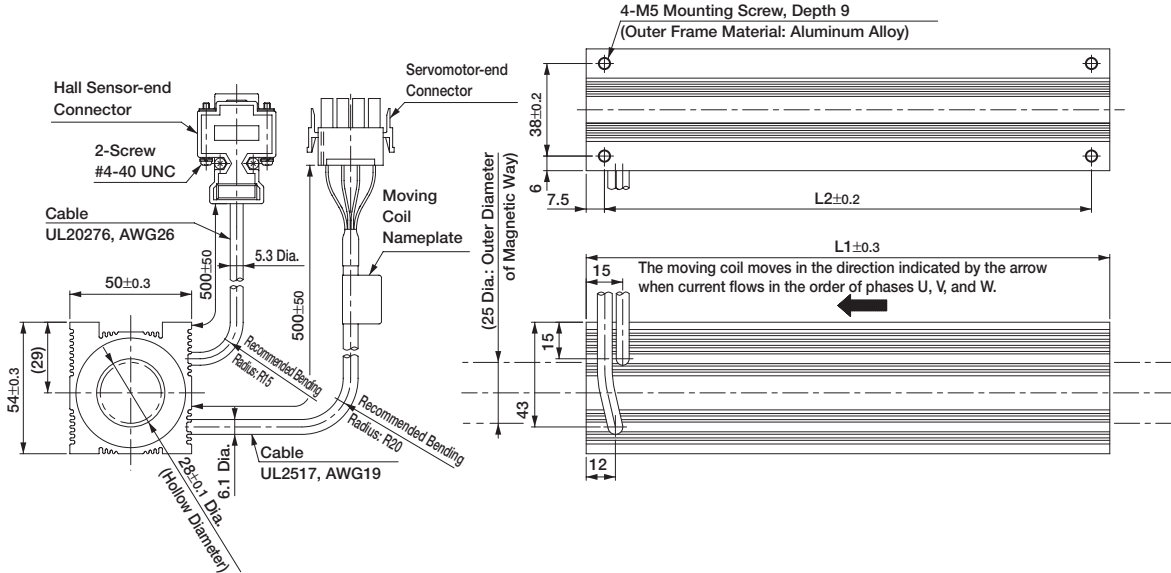
- Notes: 1 The magnetic way will become deformed if a magnetic attraction with the moving coil is generated.
 Take measures over the entire driving range to prevent any interference between the magnetic way and the moving coil after installation.
 2 If you have a pacemaker or any other electronic medical device, do not go near the magnetic way of the linear servomotor.

Magnetic Way Model SGLCM-	L1	L2	L3	L4	L5	L6	L7	Approx. Mass kg	Remarks
D20280A	280±1.6	35	210	30	45±0.3	190±1.2	45	0.68	-
D20315A	315±1.6	35	245	30	45±0.3	225±1.2	45	0.77	-
D20350A	350±1.6	35	280	30	45±0.3	260±1.2	45	0.86	Standard
D20385A	385±1.6	35	315	30	45±0.3	295±1.2	45	0.95	-
D20420A	420±1.6	35	350	30	45±0.3	330±1.2	45	1.0	-
D20455A	455±1.6	35	385	30	45±0.3	365±1.2	45	1.1	-
D20490A	490±1.6	35	420	30	45±0.3	400±1.2	45	1.2	-
D20555A	555±2.5	50	455	45	60±0.3	435±2.1	60	1.35	-
D20590A	590±2.5	50	490	45	60±0.3	470±2.1	60	1.45	Standard
D20625A	625±2.5	50	525	45	60±0.3	505±2.1	60	1.55	-
D20660A	660±2.5	50	560	45	60±0.3	540±2.1	60	1.6	-
D20695A	695±2.5	50	595	45	60±0.3	575±2.1	60	1.7	-
D20730A	730±2.5	50	630	45	60±0.3	610±2.1	60	1.8	-
D20765A	765±2.5	50	665	45	60±0.3	645±2.1	60	1.9	-
D20800A	800±2.5	50	700	45	60±0.3	680±2.1	60	2.0	-
D20835A	835±2.5	50	735	45	60±0.3	715±2.1	60	2.1	-
D20870A	870±3	50	770	45	60±0.3	750±2.5	60	2.2	Standard

External Dimensions Units: mm

(3) SGLC-D25

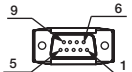
- Moving Coil: SGLCW-D25A□□□AP (With a connector by Tyco Electronics AMP K.K.)



Moving Coil Model SGLCW-	L1	L2	Approx. Mass* kg
D25A125AP	125	110	1.0
D25A170AP	170	153	1.4
D25A215AP	215	200	1.8

*: The values indicate the mass of moving coil with a hall sensor unit.

Hall Sensor Connector Specifications



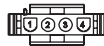
Pin Connector:
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector

Socket connector:
17JE-13090-02 (D8C)
Stud: 17L-002C or
17L-002C1

Pin No.	Name
1	+5V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor Connector Specifications



Plug: 350779-1
Pin: (No. 1 to 3)
350561-3 or 350690-3
(No. 4)
350654-1 or 350669-1

by Tyco Electronics AMP K.K.

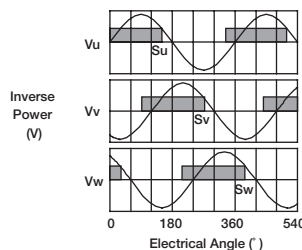
The Mating Connector

Cap : 350780-1
Socket: 350925-1 or
770673-1

Pin No.	Name	Wire Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG	Green

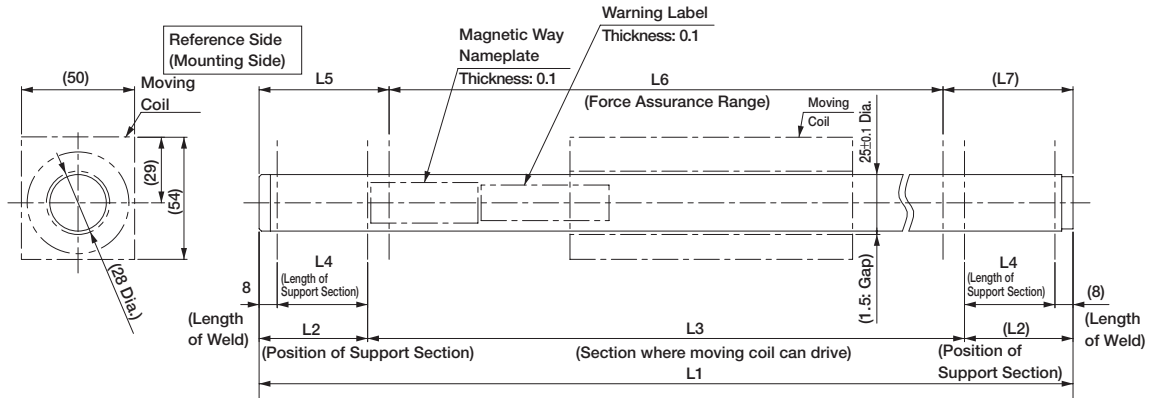
Hall Sensor Output Signals

When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals S_u , S_v , S_w and the inverse power of each motor phase V_u , V_v , V_w becomes as shown in the figure below.



External Dimensions Units: mm

● Magnetic Way: SGLCM-D25□□□A



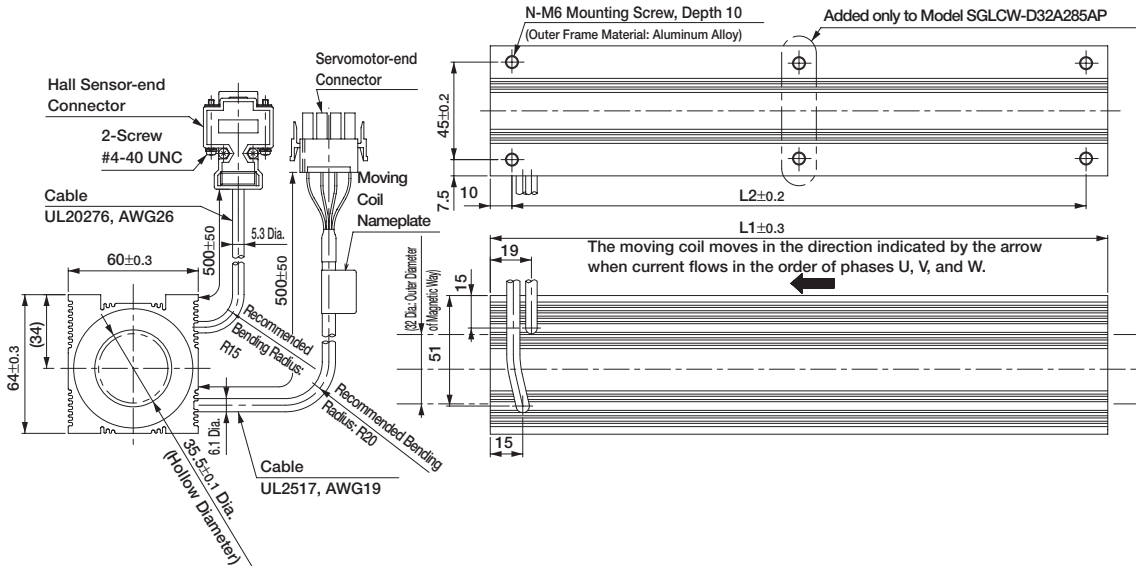
- Notes: 1 The magnetic way will become deformed if a magnetic attraction with the moving coil is generated.
 Take measures over the entire driving range to prevent any interference between the magnetic way and the moving coil after installation.
 2 If you have a pacemaker or any other electronic medical device, do not go near the magnetic way of the linear servomotor.

Magnetic Way Model SGLCM-	L1	L2	L3	L4	L5	L6	L7	Approx. Mass kg	Remarks
D25360A	360±1.6	45	270	37	57.5±0.3	245±1.2	57.5	1.5	-
D25405A	405±1.6	45	315	37	57.5±0.3	290±1.2	57.5	1.65	
D25450A	450±1.6	45	360	37	57.5±0.3	335±1.2	57.5	1.8	Standard
D25495A	495±1.6	45	405	37	57.5±0.3	380±1.2	57.5	1.95	-
D25540A	540±1.6	45	450	37	57.5±0.3	425±1.2	57.5	2.1	
D25585A	585±1.6	45	495	37	57.5±0.3	470±1.2	57.5	2.25	
D25630A	630±1.6	45	540	37	57.5±0.3	515±1.2	57.5	2.4	
D25705A	705±2.5	60	585	52	72.5±0.3	560±2.1	72.5	2.85	
D25750A	750±2.5	60	630	52	72.5±0.3	605±2.1	72.5	3.0	Standard
D25795A	795±2.5	60	675	52	72.5±0.3	650±2.1	72.5	3.15	-
D25840A	840±2.5	60	720	52	72.5±0.3	695±2.1	72.5	3.3	
D25885A	885±2.5	60	765	52	72.5±0.3	740±2.1	72.5	3.45	
D25930A	930±2.5	60	810	52	72.5±0.3	785±2.1	72.5	3.6	
D25975A	975±2.5	60	855	52	72.5±0.3	830±2.1	72.5	3.75	
D251020A	1020±2.5	60	900	52	72.5±0.3	875±2.1	72.5	3.9	
D251065A	1065±2.5	60	945	52	72.5±0.3	920±2.1	72.5	4.05	
D251110A	1110±3	60	990	52	72.5±0.3	965±2.5	72.5	4.2	

External Dimensions Units: mm

(4) SGLC-D32

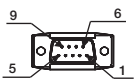
- Moving Coil: SGLCW-D32A□□□AP (With a connector by Tyco Electronics AMP K.K.)



Moving Coil Model SGLCW-	L1	L2	N	Approx. Mass* kg
D32A165AP	165	145	4	1.8
D32A225AP	225	205	4	2.5
D32A285AP	285	265	6	3.2

*: The values indicate the mass of moving coil with a hall sensor unit.

Hall Sensor Connector Specifications



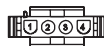
Pin Connector:
17JE-23090-02 (D8C)
by DDK Ltd.

The Mating Connector

Socket connector:
17JE-13090-02 (D8C)
Stud: 17L-002C or
17L-002C1

Pin No.	Name
1	+5V (Power supply)
2	Phase U
3	Phase V
4	Phase W
5	0V (Power supply)
6	Not used
7	Not used
8	Not used
9	Not used

Linear Servomotor Connector Specifications



Plug: 350779-1
Pin: (No. 1 to 3)
350561-3 or 350690-3
(No. 4)
350654-1 or 350669-1
by Tyco Electronics AMP K.K.

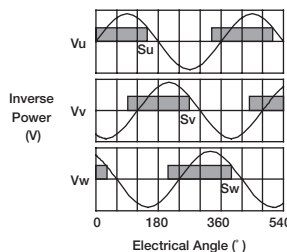
The Mating Connector

Cap: 350780-1
Socket: 350925-1 or
770673-1

Pin No.	Name	Wire Color
1	Phase U	Red
2	Phase V	White
3	Phase W	Blue
4	FG	Green

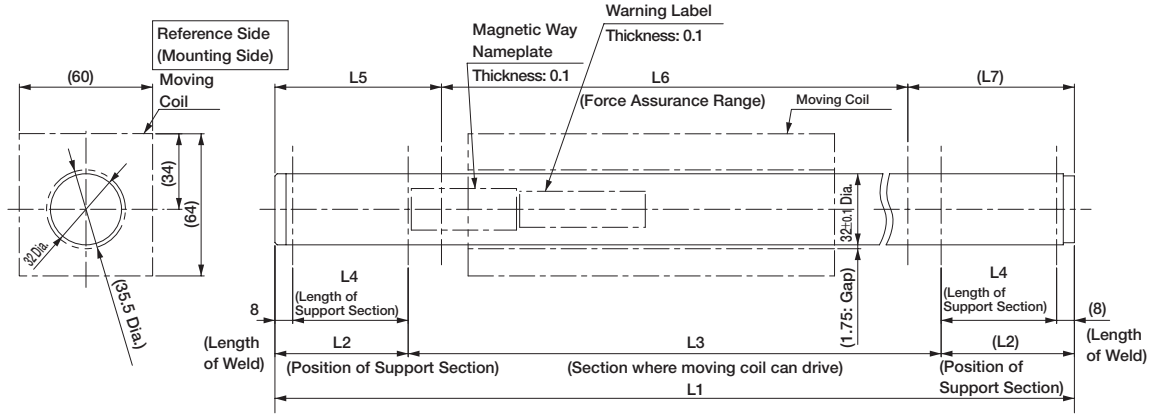
Hall Sensor Output Signals

When the moving coil moves in the direction indicated by the arrow in the figure, the relationship between the hall sensor output signals S_u , S_v , S_w and the inverse power of each motor phase V_u , V_v , V_w becomes as shown in the figure below.



External Dimensions Units: mm

● Magnetic Way: SGLCM-D32□□□A

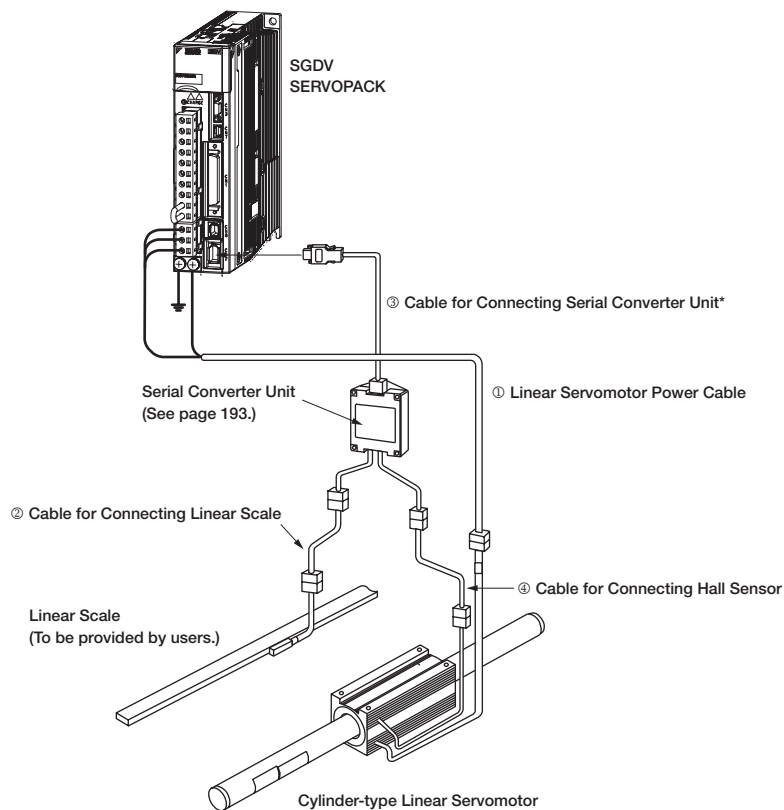


- Notes: 1 The magnetic way will become deformed if a magnetic attraction with the moving coil is generated.
 Take measures over the entire driving range to prevent any interference between the magnetic way and the moving coil after installation.
 2 If you have a pacemaker or any other electronic medical device, do not go near the magnetic way of the linear servomotor.

Magnetic Way Model SGLCM-	L1	L2	L3	L4	L5	L6	L7	Approx. Mass kg	Remarks
D32480A	480±1.6	60	360	52	75±0.3	330±1.2	75	3.0	-
D32540A	540±1.6	60	420	52	75±0.3	390±1.2	75	3.4	-
D32600A	600±1.6	60	480	52	75±0.3	450±1.2	75	3.8	Standard
D32660A	660±1.6	60	540	52	75±0.3	510±1.2	75	4.2	-
D32720A	720±1.6	60	600	52	75±0.3	570±1.2	75	4.6	-
D32780A	780±1.6	60	660	52	75±0.3	630±1.2	75	5.0	-
D32840A	840±1.6	60	720	52	75±0.3	690±1.2	75	5.4	-
D32960A	960±2.5	90	780	82	105±0.3	750±2.1	105	5.9	-
D321020A	1020±2.5	90	840	82	105±0.3	810±2.1	105	6.3	Standard
D321080A	1080±2.5	90	900	82	105±0.3	870±2.1	105	6.7	-
D321140A	1140±2.5	90	960	82	105±0.3	930±2.1	105	7.1	-
D321200A	1200±2.5	90	1020	82	105±0.3	990±2.1	105	7.5	-
D321260A	1260±2.5	90	1080	82	105±0.3	1050±2.1	105	7.9	-
D321320A	1320±2.5	90	1140	82	105±0.3	1110±2.1	105	8.3	-
D321380A	1380±2.5	90	1200	82	105±0.3	1170±2.1	105	8.7	-
D321440A	1440±2.5	90	1260	82	105±0.3	1230±2.1	105	9.1	-
D321500A	1500±3	90	1320	82	105±0.3	1290±2.5	105	9.5	Standard

Selecting Cables

● Cables Connections



*: A serial converter unit can be connected directly to an absolute linear scale.

● Cables

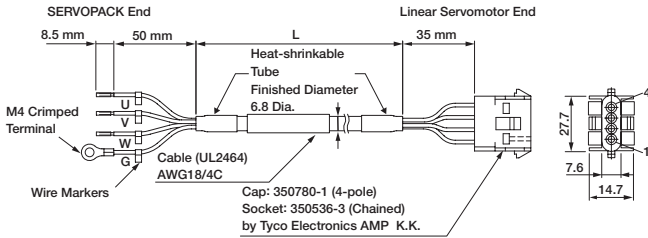
Name	Applicable Linear Servomotor Model	Length	Order No.	Specifications	Details
① Linear Servomotor Power Cables	All models	1 m	JZSP-CLN11-01-E	SERVOPACK End Linear Servomotor End 	(1)
		3 m	JZSP-CLN11-03-E		
		5 m	JZSP-CLN11-05-E		
		10 m	JZSP-CLN11-10-E		
		15 m	JZSP-CLN11-15-E		
② Cables for Connecting Linear Scales*	All models	1 m	JZSP-CLL00-01-E-G#	Serial Converter Unit End Linear Scale End 	(2)
		3 m	JZSP-CLL00-03-E-G#		
		5 m	JZSP-CLL00-05-E-G#		
		10 m	JZSP-CLL00-10-E-G#		
		15 m	JZSP-CLL00-15-E-G#		
③ Cables for Connecting Serial Converter Units	All models	1 m	JZSP-CLP70-01-E-G#	SERVOPACK End Serial Converter Unit End 	(3)
		3 m	JZSP-CLP70-03-E-G#		
		5 m	JZSP-CLP70-05-E-G#		
		10 m	JZSP-CLP70-10-E-G#		
		15 m	JZSP-CLP70-15-E-G#		
		20 m	JZSP-CLP70-20-E-G#		
④ Cables for Connecting Hall Sensors	All models	1 m	JZSP-CLL10-01-E-G#	Serial Converter Unit End Hall Sensor Unit End 	(4)
		3 m	JZSP-CLL10-03-E-G#		
		5 m	JZSP-CLL10-05-E-G#		
		10 m	JZSP-CLL10-10-E-G#		
		15 m	JZSP-CLL10-15-E-G#		

*: When using serial converter unit JZDP-G00□-□□□-E, the maximum cable length is 3 m.

Note: The digit "#" of the order number represents the design revision.

Selecting Cables

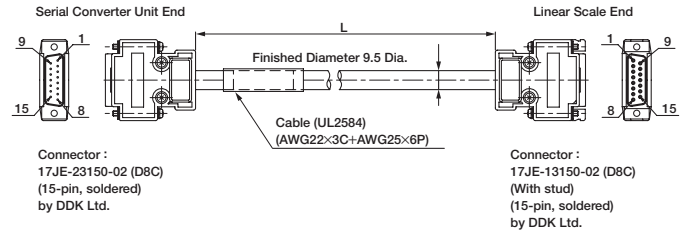
(1) Linear Servomotor Power Cables:
JZSP-CLN11-□□-E



• Wiring Specifications

SERVOPACK-end Leads		Linear Servomotor-end Connector	
Wire Color	Signal	Signal	Pin. No.
Black 1	Phase U	Phase U	1
Black 2	Phase V	Phase V	2
Black 3	Phase W	Phase W	3
Green/yellow	FG	FG	4

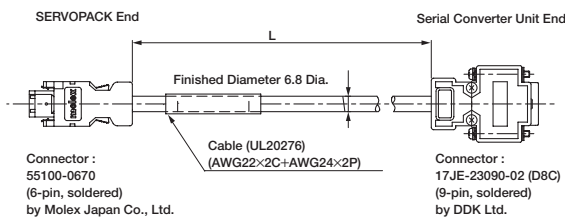
(2) Cables for Connecting Linear Scales:
JZSP-CLL00-□□-E-G#



• Wiring Specifications

Serial Converter Unit End		Linear Scale End	
Pin No.	Signal	Pin No.	Signal
1	/Cos(V1-)	1	/Cos(V1-)
2	/Sin(V2-)	2	/Sin(V2-)
3	Ref(V0+)	3	Ref(V0+)
4	+5V	4	+5V
5	5Vs	5	5Vs
6	BID	6	BID
7	Vx	7	Vx
8	Vq	8	Vq
9	Cos(V1+)	9	Cos(V1+)
10	Sin(V2+)	10	Sin(V2+)
11	/Ref(V0+)	11	/Ref(V0-)
12	0V	12	0V
13	0Vs	13	0Vs
14	DIR	14	DIR
15	Inner	15	Inner
Case	Shield	Case	Shield

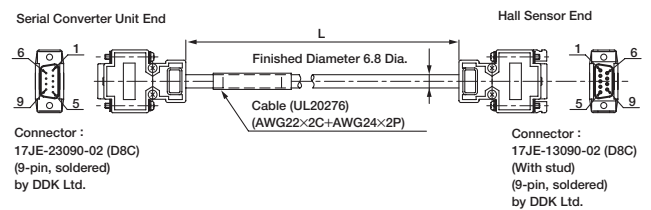
(3) Cables for Connecting Serial Converter Units:
JZSP-CLP70-□□-E-G#



• Wiring Specifications

SERVOPACK End			Serial Converter Unit End		
Pin No.	Signal	Wire Color	Pin No.	Signal	Wire Color
1	PG5V	Red	1	+5V	Red
2	PG0V	Black	5	0V	Black
3	-	-	3	-	-
4	-	-	4	-	-
5	PS	Light blue	2	Phase S output	Light blue
6	/PS	Light blue/white	6	Phase /S output	Light blue/white
Shell	Shield	-	Case	Shield	-
			7	-	-
			8	-	-
			9	-	-

(4) Cables for Connecting Hall Sensors:
JZSP-CLL10-□□-E-G#



• Wiring Specifications

Serial Converter Unit End		Hall Sensor End	
Pin No.	Signal	Pin No.	Signal
1	+5V	1	+5V
2	Phase U input	2	Phase U input
3	Phase V input	3	Phase V input
4	Phase W input	4	Phase W input
5	0V	5	0V
6	-	6	-
7	-	7	-
8	-	8	-
9	-	9	-
Case	Shield	Case	Shield

Linear Servomotors



Linear Servomotor General Instructions

Serial Converter Unit (Model: JZDP-□00□-□□□-E)

● Characteristics and Specifications

Items		JZDP-D00□-□□□-E	JZDP-G00□-□□□-E
Electrical Characteristics	Power Supply Voltage	+ 5.0 V ± 5%, ripple content 5% max.	
	Current Consumption ^{*1}	120 mA Typ. 350 mA max.	
	Signal Resolution	Input two-phase sine wave: 1/256 pitch	Input two-phase sine wave: 1/4096 pitch
	Max. Response Frequency	250 kHz	100 kHz
	Analog Input Signals ^{*2} (cos, sin, Ref)	Differential input amplitude: 0.4 to 1.2 V Input signal level: 1.5 to 3.5 V	
	Hall Sensor Input Signal	CMOS level	
	Output Signals ^{*3}	Position data, hall sensor information, and alarms	
	Output Method	Serial data transmission	
	Output Circuit	Balanced transceiver (SN75LBC176 or the equivalent) Internal terminal resistance: 120 Ω	
Mechanical Characteristics	Approx. Mass	150 g	
	Vibration Resistance	98 m/s ² max. (10 to 2500 Hz) in three directions	
	Impact Resistance	980 m/s ² , (11 ms) two times in three directions	
Environmental Conditions	Ambient Temperature	0 to 55°C	
	Storage Temperature	-20 to +80°C	
	Humidity	20% to 90% RH (no condensation)	

*1: The current consumption of the linear scale and hall sensor is not included in this value.
The current consumption of linear scale and hall sensor must be taken into consideration for the current capacity of host controller that supplies the power.
The current consumption of hall sensor: Approx. 40 mA.

*2: Input a value within the specified range. Otherwise, incorrect position information is output, and the device may be damaged.

*3: The power is turned on, and the transmission is enabled after 100 ms to 300 ms.

● Model Designations

JZDP - 00 - - E

Serial Converter Unit Model			
Code	Appearance	Applicable Linear Scale	Hall Sensor
D003 G003		Manufactured by HEIDENHAIN Corp.	None
D005 G005		Manufactured by RENISHAW plc.	None
D006 G006		Manufactured by HEIDENHAIN Corp.	Provided
D008 G008		Manufactured by RENISHAW plc.	Provided

Applicable Linear Servomotor					
Servomotor Model		Symbol	Servomotor Model		Symbol
SGLGW- (Coreless)	30A050C	250	SGLTW- (Iron core, T-type)	20A170A	011
	30A080C	251		20A320A	012
	40A140C	252		20A460A	013
	40A253C	253		35A170A	014
	40A365C	254		35A320A	015
	60A140C	258		35A460A	016
	60A253C	259		35A170H	105
	60A365C	260		35A320H	106
	90A200C	264		50A170H	108
	90A370C	265		50A320H	109
SGLGW- + SGLGM- <input type="text"/> -M (Coreless)	40A140C	255	SGLC-	40A400B	185
	40A253C	256		40A600B	186
	40A365C	257		80A400B	187
	60A140C	261		80A600B	188
	60A253C	262		35D170H	193
	60A365C	263		35D320H	194
SGLFW- (Iron core, F-type)	20A090A	017	SGLC-	50D170H	195
	20A120A	018		50D320H	196
	35A120A	019		40D400B	197
	35A230A	020		40D600B	198
	50A200B	181		80D400B	199
	50A380B	182		80D600B	200
	1ZA200B	183		D16A085AP	354
	1ZA380B	184		D16A115AP	373
	35D120A	211		D16A145AP	356
	35D230A	212		D20A100AP	357
	50D200B	189		D20A135AP	358
	50D380B	190		D20A170AP	359
	1ZD200B	191		D25A125AP	360
	1ZD380B	192		D25A170AP	374
	1ED380B	333		D25A215AP	362
	1ED560B	334		D32A165AP	363
			D32A225AP	364	
			D32A285AP	365	

Linear Servomotor General Instructions

Serial Converter Unit (Model: JZDP-□00□-□□□-E)

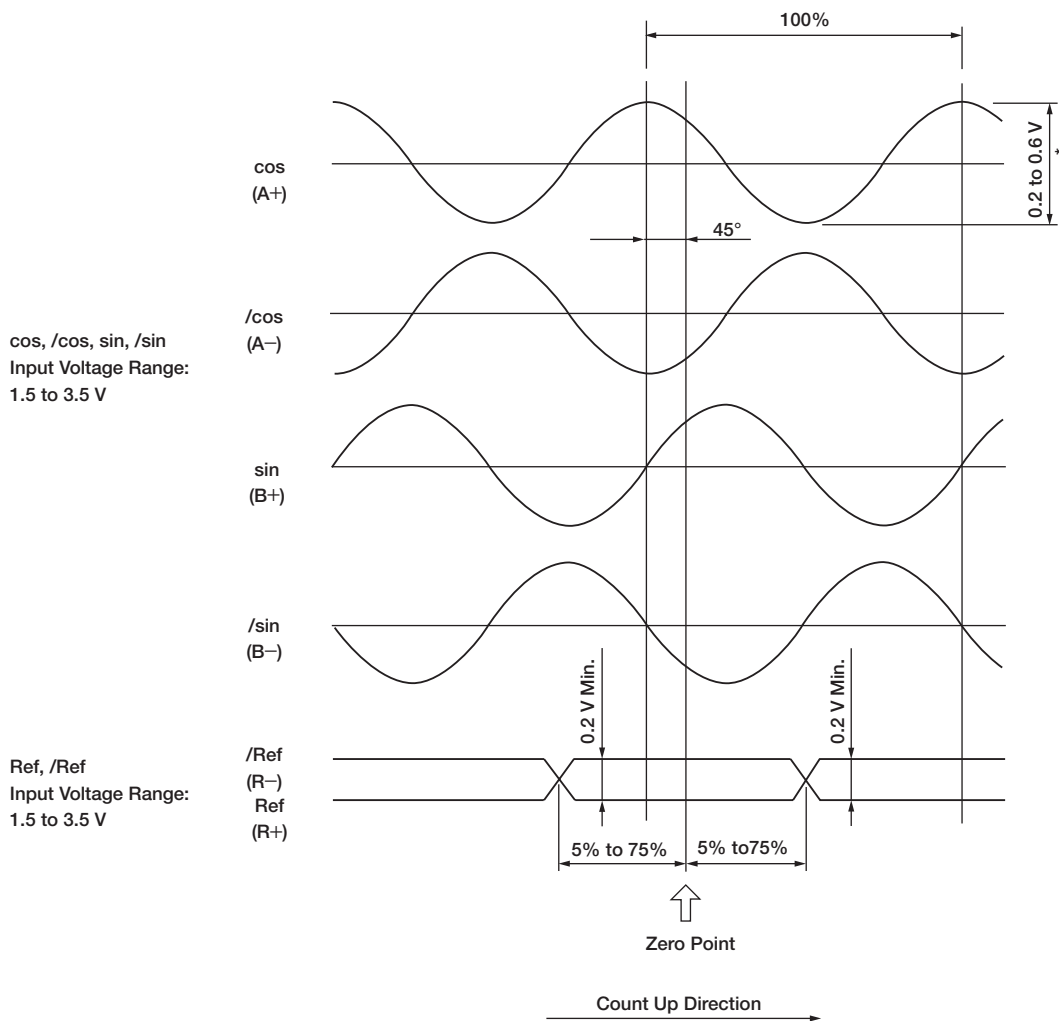
● Analog Signal Input Timing

The following figure shows the input timing of the analog signals.

When the cos and sin signals are shifted 180 degrees, the differential signals are the /cos and /sin signals.

The specifications of the cos, /cos, sin, and /sin signals are identical except for the phase.

Input the signals Ref and /Ref so that they shall cross each other as shown in the figure because they are input into the converter. When they are crossed, the output data will be counted up.



*:if the analog signal amplitude declines to about 0.35 V because of differential amplitude, the serial converter outputs an alarm.

IMPORTANT

● Precautions

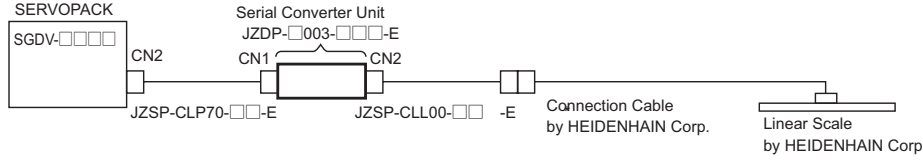
- 1 Never perform insulation resistance and withstand voltage tests.
- 2 When analog signals are input to the serial converter unit, noise influence on the analog signals affects the unit's ability to output correct position information. The analog cable must be as short as possible and shielded.
- 3 Use the serial converter unit without gases such as H₂S.
- 4 Do not connect or disconnect the unit while power is being supplied, or the unit may be damaged.
- 5 When using multiple axes, use a shield cable for each axis. Do not use a shield cable for multiple axes.

Serial Converter Unit (Model: JZDP-□00□-□□□-E)

● Without Cable for Hall Sensor (For Linear Scale by HEIDENHAIN Corporation)

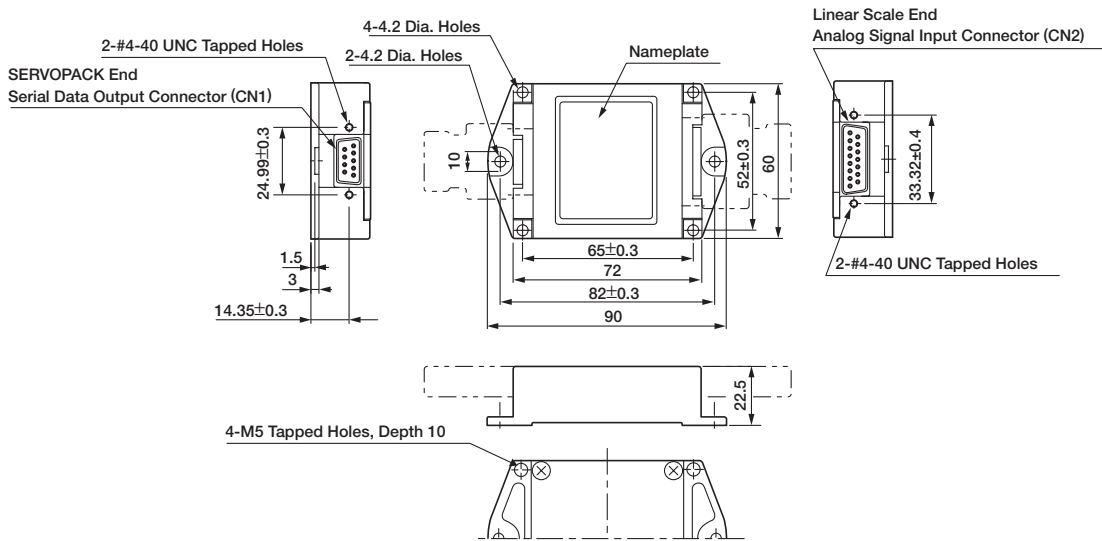
Serial Converter Unit Model: JZDP-□003-□□□-E

(1) Connection Example

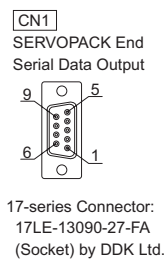


*: When using serial converter unit JZDP-G00□-□□□-E, the maximum cable length is 3 m.

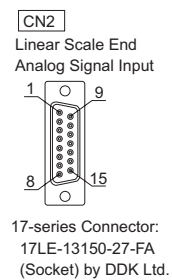
(2) External Dimensions (Units: mm)



Pin No.	Signal
1	+5V
2	Phase S output
3	Not used
4	Not used
5	0V
6	Phase /S output
7	Not used
8	Not used
9	Not used
Case	Shield



Pin No.	Signal
1	cos input (A+)
2	0V
3	sin input (B+)
4	+5V
5	Not used
6	Not used
7	/Ref input (R-)
8	Not used
9	/cos input (A-)
10	0V sensor
11	/sin input (B-)
12	5V sensor
13	Not used
14	Ref input (R+)
15	Not used
Case	Shield



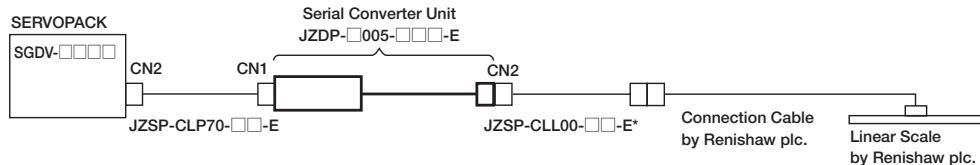
- Notes:
- 1 Do not use the unused pins.
 - 2 Contact HEIDENHAIN Corporation for details of connection cables (analog 1 Vp-p output, D-sub 15-pin, male) by HEIDENHAIN Corporation.
 - 3 Use the same terminal for 5-V sensor and phase-W input.
 - 4 Phase U, V, and W input are internally pulled up at 10 kΩ.

Serial Converter Unit (Model: JZDP-□00□-□□□-E)

● Without Cable for Hall Sensor (For Linear Scale by Renishaw plc.)

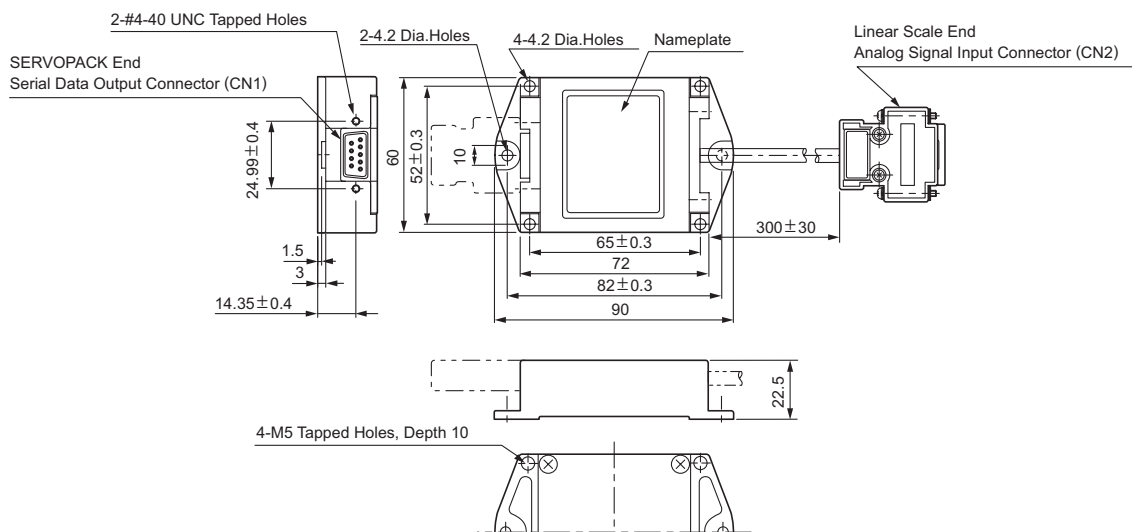
Serial Converter Unit Model: JZDP-□005-□□□-E

(1) Connection Example



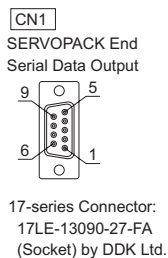
*: When using serial converter unit JZDP-G00□-□□□-E, the maximum cable length is 3 m.

(2) External Dimensions (Units: mm)

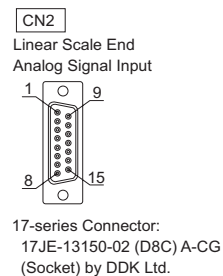


Pin No.	Signal
1	+5V
2	Phase S output
3	Not used
4	Not used
5	0V
6	Phase /S output
7	Not used
8	Not used
9	Not used
Case	Shield

SERVOPACK does not have the function to process Vq signals.



Pin No.	Signal
1	cos input (V1-)
2	sin input (V2-)
3	Ref input (V0+)
4	+5V
5	5Vs
6	Not used
7	Not used
8	Not used
9	cos input (V1+)
10	sin input (V2+)
11	/Ref input (V0-)
12	0V
13	0Vs
14	Not used
15	inner (0V)
Case	Shield



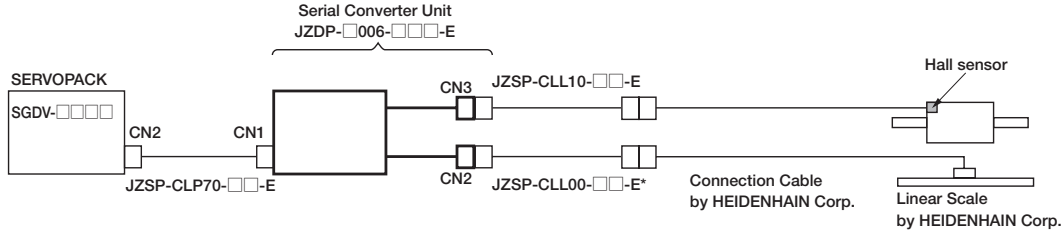
- Notes:
- 1 Do not use the unused pins.
 - 2 Contact Renishaw plc. for details of connection cables (analog 1 Vp-p output, D-sub 15-pin, male) by Renishaw plc. However, the BID and DIR signals are not connected.
 - 3 Use the linear scale-end connector to change the zero point specifications of the linear scale.

Serial Converter Unit (Model: JZDP-□00□-□□□-E)

● With Cable for Hall Sensor (For Linear Scale by HEIDENHAIN Corporation)

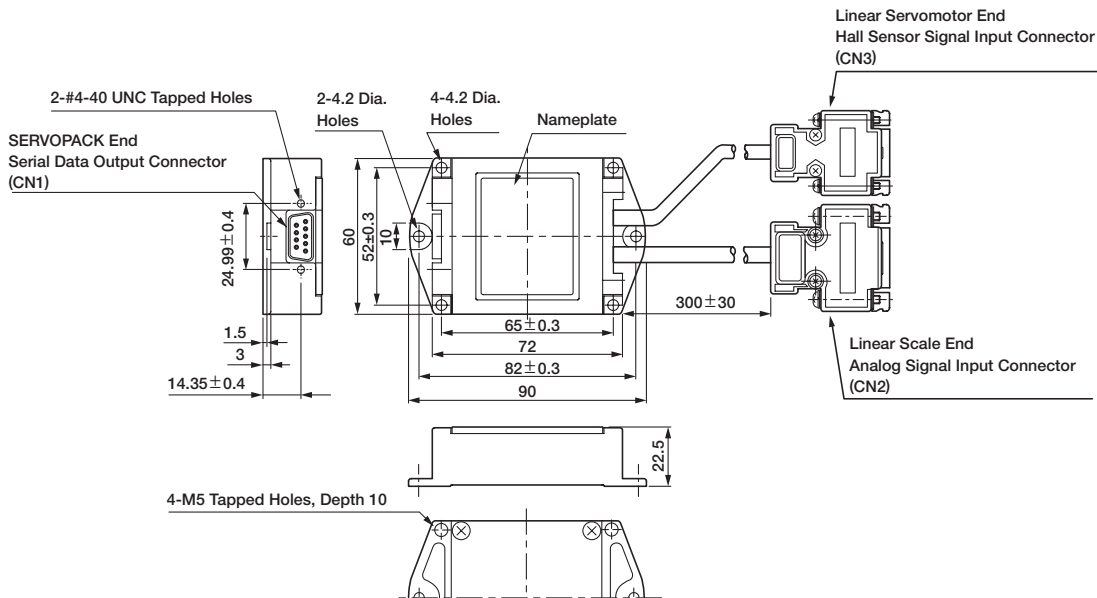
Serial Converter Unit Model: JZDP-□006-□□□-E

(1) Connection Example

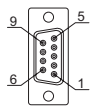


*: When using serial converter unit JZDP-G00□-□□□-E, the maximum cable length is 3 m.

(2) External Dimensions (Units: mm)

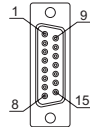


CN1
SERVOPACK End
Serial Data Output



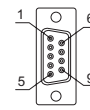
17-series Connector:
17LE-13090-27-FA
(Socket) by DDK Ltd.

CN2
Linear Scale End
Analog Signal Input



17-series Connector:
17JE-13150-02 (D8C) A-CG
(Socket) by DDK Ltd.

CN3
Linear Servomotor End
Hall Sensor Signal Input



17-series Connector:
17JE-13090-02 (D8C) A-CG
by DDK Ltd.

Pin No.	Signal
1	+5V
2	Phase S output
3	Not used
4	Not used
5	0V
6	Phase /S output
7	Not used
8	Not used
9	Not used
Case	Shield

Pin No.	Signal
1	cos input (A+)
2	0V
3	sin input (B+)
4	+5V
5	Not used
6	Not used
7	/Ref input (R-)
8	Not used
9	/cos input (A-)
10	0V sensor
11	/sin input (B-)
12	5V sensor
13	Not used
14	Ref input (R+)
15	Not used
Case	Shield

Pin No.	Signal
1	+5V
2	Phase U input
3	Phase V input
4	Phase W input
5	0V
6	Not used
7	Not used
8	Not used
9	Not used
Case	Shield

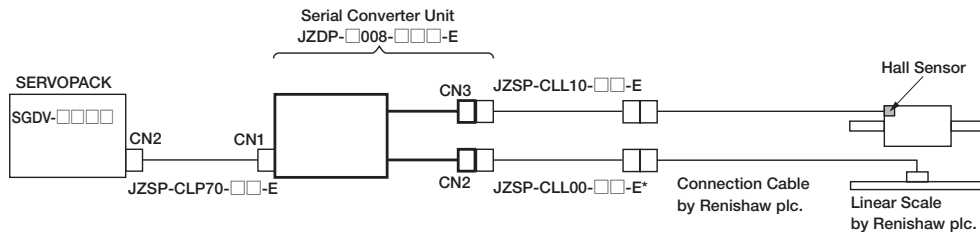
Notes: 1 Do not use the unused pins.
2 Contact HEIDENHAIN Corporation for details of connection cables (analog 1 Vp-p output, D-sub 15-pin, male) by HEIDENHAIN Corporation.
3 Phase U, V, and W input are internally pulled up at 10 kΩ.

Serial Converter Unit (Model: JZDP-□00□-□□□-E)

● With Cable for Hall Sensor (For Linear Scale by Renishaw plc.)

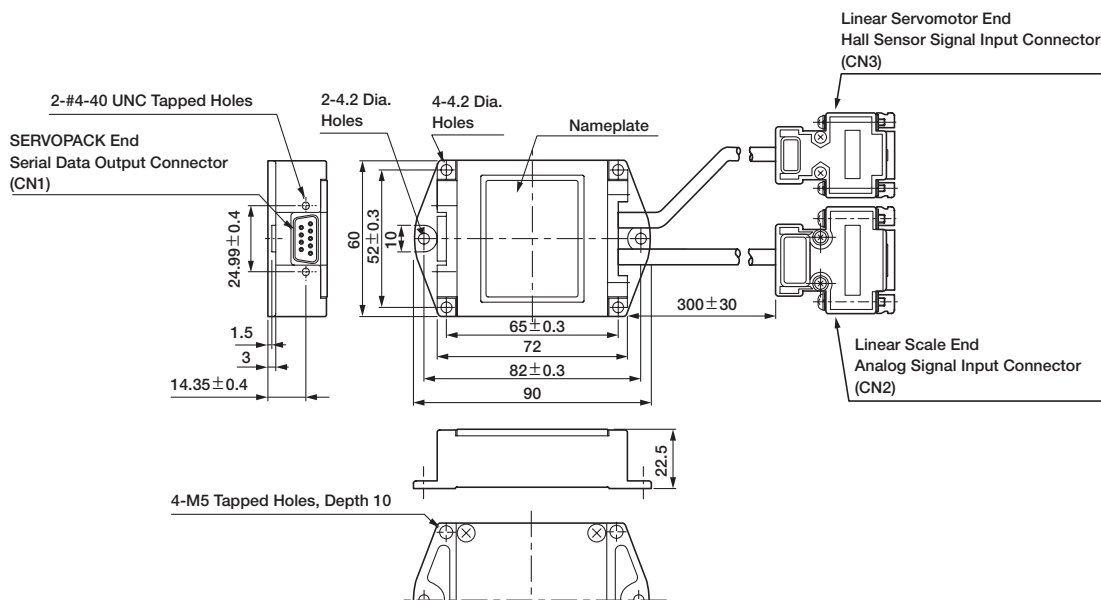
Serial Converter Unit Model: JZDP-□008-□□□-E

(1) Connection Example

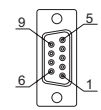


*: When using serial converter unit JZDP-G00□-□□□-E, the maximum cable length is 3 m.

(2) External Dimensions (Units: mm)

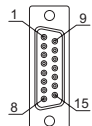


CN1
SERVOPACK End
Serial Data Output



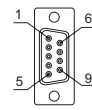
17-series Connector:
17LE-13090-27-FA
(Socket) by DDK Ltd.

CN2
Linear Scale End
Analog Signal Input



17-series Connector:
17JE-13150-02 (D8C) A-CG
(Socket) by DDK Ltd.

CN3
Linear Servomotor End
Hall Sensor Signal Input



17-series Connector:
17JE-13090-02 (D8C) A-CG
by DDK Ltd.

Pin No.	Signal
1	+5V
2	Phase S output
3	Not used
4	Not used
5	0V
6	Phase /S output
7	Not used
8	Not used
9	Not used
Case	Shield

Pin No.	Signal
1	/cos input (V1-)
2	/sin input (V2-)
3	Ref input (V0+)
4	+5V
5	5Vs
6	Not used
7	Not used
8	Not used
9	cos input (V1+)
10	sin input (V2+)
11	/Ref input (V0-)
12	0 V
13	0 Vs
14	Not used
15	Inner
Case	Shield

Pin No.	Signal
1	+5V
2	Phase U input
3	Phase V input
4	Phase W input
5	0V
6	Not used
7	Not used
8	Not used
9	Not used
Case	Shield

- Notes:
- 1 Do not use the unused pins.
 - 2 Contact Renishaw plc. for details of connection cables (analog 1 Vp-p output, D-sub 15-pin, male) by Renishaw plc. However, the BID and DIR signals are not connected.
 - 3 Use the linear scale-end connector to change the zero point specifications of the linear scale.
 - 4 Phase U, V, and W input are internally pulled up at 10 kΩ.

Flexible Cables

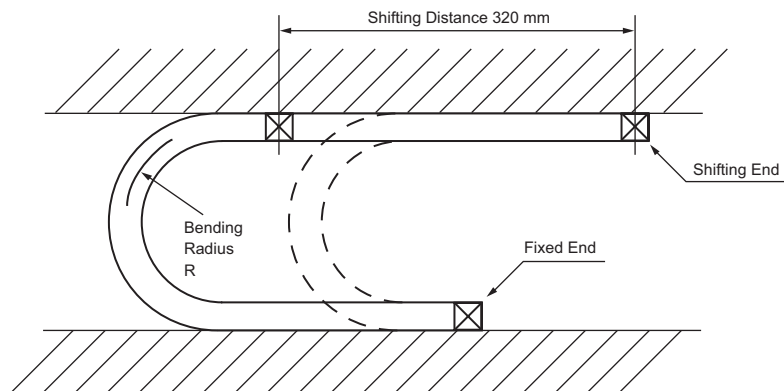
● Life of Flexible Cable

The flexible cable supports 10,000,000 or more operations of bending life with the recommended bending radius R or 10 times the cable diameter (whichever is greater) under the following test conditions.

● Conditions

1 Repeat moving one end of the cable forward and backward for 320 mm with using the test equipment shown in the following figure.

2 Connect the lead wires in parallel, and count the number of cable return motion times until a lead wire is disconnected. Note that one reciprocating is counted as one test.



- Notes:
- 1 The life of flexible cable differs largely depending on the amount of mechanical shocks, mounting to the cable, and fixing methods. The life of flexible cable is limited under the specified conditions.
 - 2 The life of flexible cable indicates the number of bending times in which lead wires are electrically conducted and by which no cracks and damages that affects the performance of cable sheathing are caused. Disconnecting the shield wire is not taken into account.

● Wiring Precautions

Even if the recommended bending radius R is respected in the mechanical design, incorrect wiring may cause early disconnection. Observe the following precautions when wiring.

- (1) Cable twisting
Straighten the flexible cables before wiring.
Twisted cables cause early disconnection. Check the indication on the cable surface to make sure that the cable is not twisted.
- (2) Fixing method
Do not fix the moving points of the flexible cable. Stress on the fixed points may cause early disconnection. Fix the cable at the minimum number of points.
- (3) Cable length
If the cable length is too long, it may cause the cable's sagging. Besides the cable length is too short, it may cause the excessive tension on the fixed points that will cause early disconnection. Use a flexible cable with the optimum length.
- (4) Interference between cables
Avoid interference between cables.
Interference limits the motion of flexible cable, which causes early disconnection. Keep enough distance between cables, or provide a partition when wiring.