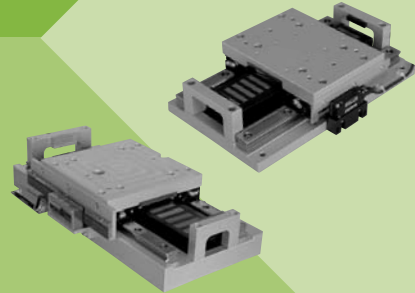


# Linear Sliders

# Σ-Trac-MAG



## Model Designations

### ● With Incremental Linear Scales

**S G T M F4 A - 027 A H 20 A**

Σ-Trac Series  
Linear Slider

1st digit

2nd+3rd digits

4th digit

5th+6th+7th digits

8th digit

9th digit

10th+11th digits

12th digit

1st digit

Code	Specifications
M	Moving Magnet Type

2nd+3rd digits Armature Code  
(Armature not integrally mounted)

Code	Specifications
F4	SGLFW-35A230A-F
F5	SGLFW-50A380A-F

4th digit Table Length

Code	Specifications	Armature Code	Effective Stroke
A	Short	F4	100 mm
		F5	185 mm
B	Long	F4	65 mm
		F5	110 mm

5th+6th+7th digits Peak Force

Code	Specifications
027	270 N
036	360 N
054	540 N
072	720 N

10th+11th digits Linear Scale Resolution

Code	Specifications
20	20 μm

12th digit Design Revision Order  
A, B, C

8th digit Linear Scale Output Form

Code	Specifications
A	Analog output 1 Vp-p

9th digit Linear Scale Manufacturer

Code	Specifications
H	HEIDENHAIN Corporation

### ● With Absolute (ABS) Linear Scales

**S G T M F4 A - 027 ABS 1 A**

Σ-Trac Series  
Linear Slider

1st digit

2nd+3rd digits

4th digit

5th+6th+7th digits

8th+9th+10th digits

11th digit

12th digit

1st digit

(Same as that of the incremental type.)

2nd+3rd digits Armature Code  
(Armature not integrally mounted)  
(Same as that of the incremental type.)

4th digit Table Length

(Same as that of the incremental type.)

5th+6th+7th digits Peak Force  
(Same as that of the incremental type.)

8th+9th+10th digits

Code	Specifications
ABS	With an absolute linear scale

11th digit Linear Scale

Code	Specifications
1	ST781A (by Mitutoyo Corporation, resolution: 0.5 μm)
2	ST783A (by Mitutoyo Corporation, resolution: 0.1 μm)

12th digit Design Revision Order

A, B, C

## Features

- Optimum drive for high-acceleration and high-tact operations because of its lightweight moving member.
- For short strokes (65 mm to 185 mm)
- Cooling units (pipes, etc.) for forced-air or liquid cooling systems can be placed on the fixed side.
- Linear scale options: Incremental or absolute.
- Improved stroke efficiency\*

\*: Ratio of effective stroke to the total length of drive system

## Model Classification

### ● Force

SERVOPACK Model		SGDV-	Σ-Trac-MAG Series Linear Sliders					
Single-phase 100 VAC	Three-phase 200 VAC	Model	Force	200 N	400 N	600 N	800 N	1000 N
2R1F	1R6A	SGTMF4A-027						
2R1F	1R6A	SGTMF4B-036						
-	5R5A	SGTMF5A-054						
-	5R5A	SGTMF5B-072						

Rated force    Peak force

### ● Stroke Length

Model	Stroke Length	50 mm	100 mm	150 mm	200 mm
SGTMF4A-027			● 100 mm		
SGTMF4B-036		● 65 mm			
SGTMF5A-054					● 185 mm
SGTMF5B-072			● 110 mm		

SGTMF4 Linear Sliders

● Ratings and Specifications

Time Rating: Continuous  
 Insulation Resistance: 500 VDC, 10 MΩ min.  
 Ambient Temperature: 0°C 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)  
 Vibration Resistance: 24.5 m/s<sup>2</sup>  
 Shock Resistance: 294 m/s<sup>2</sup>, 2 times

Linear Slider Model		With Incremental Linear Scales		With Absolute Linear Scales	
		SGTMF4A-027AH20A	SGTMF4B-036AH20A	SGTMF4A-027ABS1A	SGTMF4B-036ABS1A
Applicable SERVOPACK Model	SGDV-	2R1F, 1R6A			
Applicable Serial Converter Unit Model	JZDP-	□003-243-E	□003-244-E	-	-
Maximum Speed	m/s	3			
Rated Force	N	90	120	90	120
Peak Force	N	270	360	270	360
Force Constant	N/Arms	66.9	89.2	66.9	89.2
Motor Constant	N/√W	11	14.6	11	14.6
Maximum Payload*1	kg	40	55	40	55
Effective Stroke	mm	100	65	100	65
Resolution	μm	Incremental linear scale: 0.078 (20 μm/256)		Absolute linear scale*3: 0.5	
Movable Member Mass	kg	1.72	2.52	1.72	2.52
Total Mass (excluding cables)	kg	6.8	8.05	6.8	8.05
Repeatability*2	μm	±1.0	±1.0	±1.0	±1.0

\*1: Values obtained when the acceleration is 4.9 m/s<sup>2</sup>.

\*2: Values obtained when the ambient temperature is constant.

\*3: An absolute linear scale with a resolution of 0.1 μm is also available. Contact your Yaskawa representative for details.

● Performance Curves

● Force - Speed

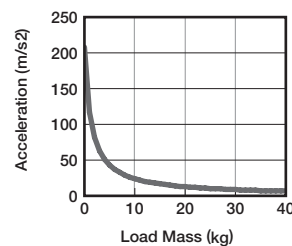
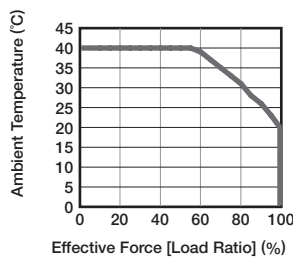
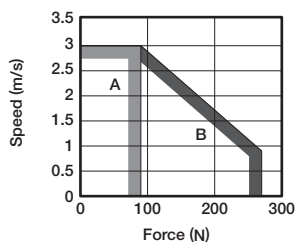
● Effective Force - Ambient Temperature

● Load Mass - Acceleration

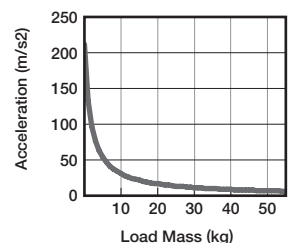
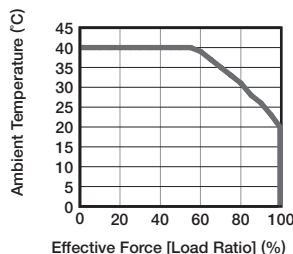
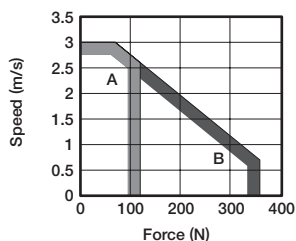
**A** : Continuous Duty Zone  
**B** : Intermittent Duty Zone (Note)

When the sensor temperature is 50 °C or less  
 — Ambient temperature

(1) SGTMF4A-027



(2) SGTMF4B-036

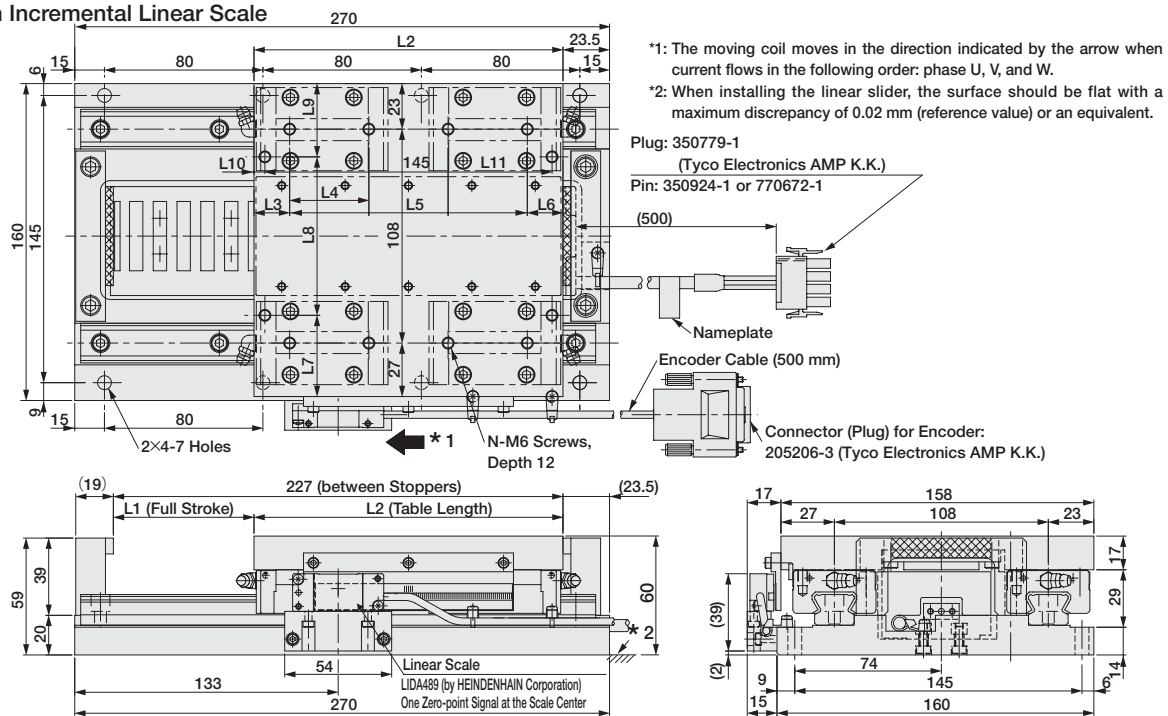


Note: When the effective force is within the rated force, the servomotor can be used within the intermittent duty zone.

SGTMF4 Linear Sliders

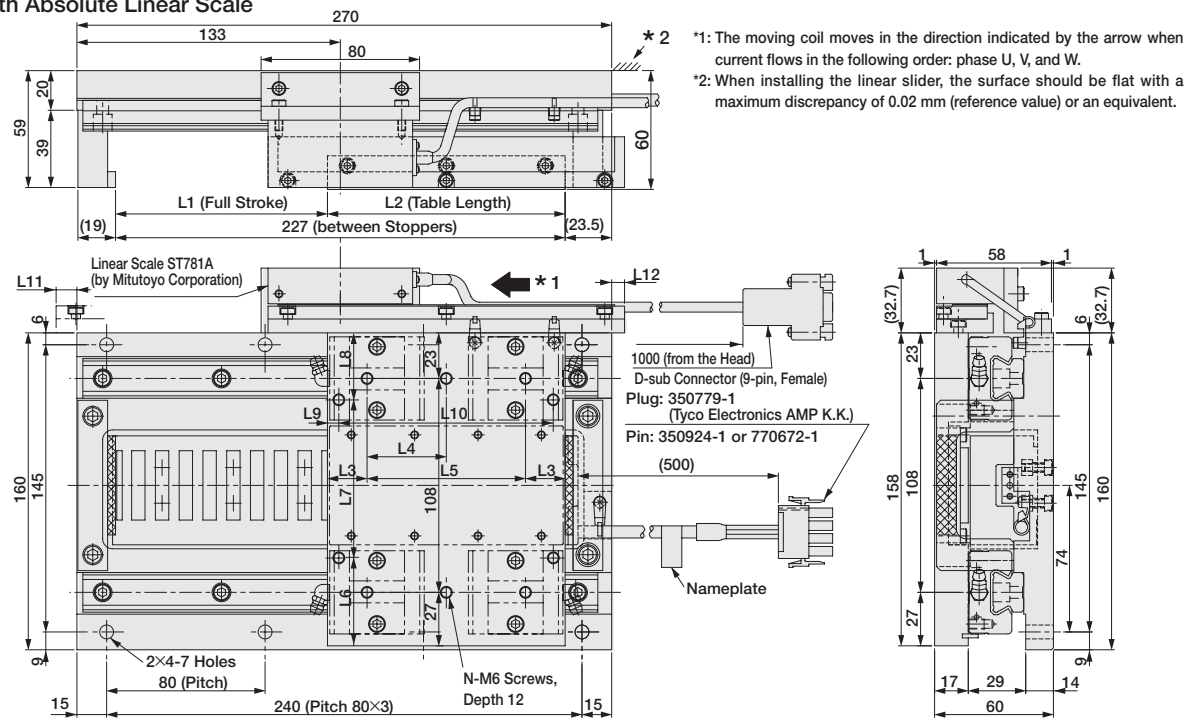
● External Dimensions (Units: mm)

● With Incremental Linear Scale



Linear Slider Model	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	N
SGTMF	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
4A-027AH20A	107	120	20	40	80	20	-	-	-	-	-	6
4B-036AH20A	71	156	18	40	120	18	41	80	37	5.5	145	12

● With Absolute Linear Scale



Linear Slider Model	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11	L12	N
SGTMF	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
4A-027ABS1A	107	120	20	40	80	-	-	-	-	-	10.5	6.5	6
4B-036ABS1A	71	156	18	40	120	41	80	37	5.5	145	-	-	12

Linear Sliders

SGTMF5 Linear Sliders

● Ratings and Specifications

Time Rating: Continuous

Insulation Resistance: 500 VDC, 10 MΩ min.

Ambient Temperature: 0°C 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)

Vibration Resistance: 24.5 m/s<sup>2</sup>

Shock Resistance: 294 m/s<sup>2</sup>, 2 times

Linear Slider Model	With Incremental Linear Scales		With Absolute Linear Scales	
	SGTMF5A-054AH20A	SGTMF5B-072AH20A	SGTMF5A-054ABS1A	SGTMF5B-072ABS1A
Applicable SERVOPACK Model	SGDV-5R5A			
Applicable Serial Converter Unit Model	JZDP-□003-245-E	JZDP-□003-246-E	-	-
Maximum Speed	4		3.7	
Rated Force	150	200	150	200
Peak Force	540	720	540	720
Force Constant	59.4	79.1	59.4	79.1
Motor Constant	18.5	24.7	18.5	24.7
Maximum Payload*1	85	110	85	110
Effective Stroke	185	110	185	110
Resolution	Incremental linear scale: 0.078 (20 μm/256)		Absolute linear scale*3: 0.5	
Movable Member Mass	4.2	6.84	4.2	6.84
Total Mass (excluding cables)	19.8	22.5	19.8	22.5
Repeatability*2	±1.0	±1.0	±1.0	±1.0

\*1: Values obtained when the acceleration is 4.9 m/s<sup>2</sup>.

\*2: Values obtained when the ambient temperature is constant.

\*3: An absolute linear scale with a resolution of 0.1 μm is also available. Contact your Yaskawa representative for details.

● Performance Curves

● Force - Speed

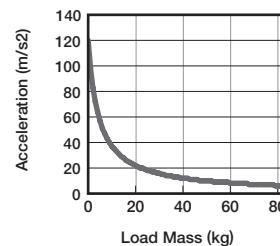
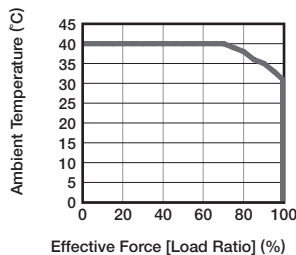
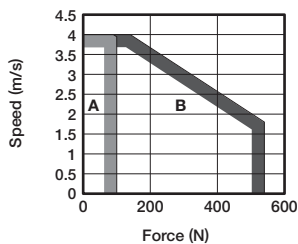
● Effective Force - Ambient Temperature

● Load Mass - Acceleration

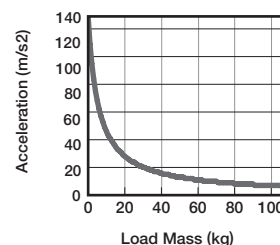
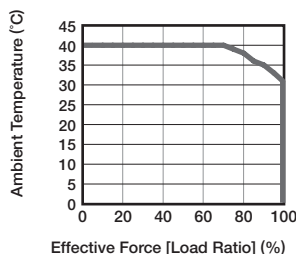
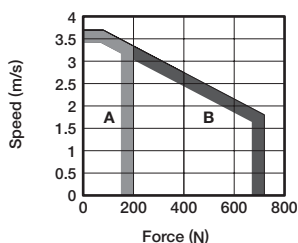
**A**: Continuous Duty Zone  
**B**: Intermittent Duty Zone

When the linear scale temperature is 50 °C or less  
— Ambient temperature

(1) SGTMF5A-054



(2) SGTMF5B-072

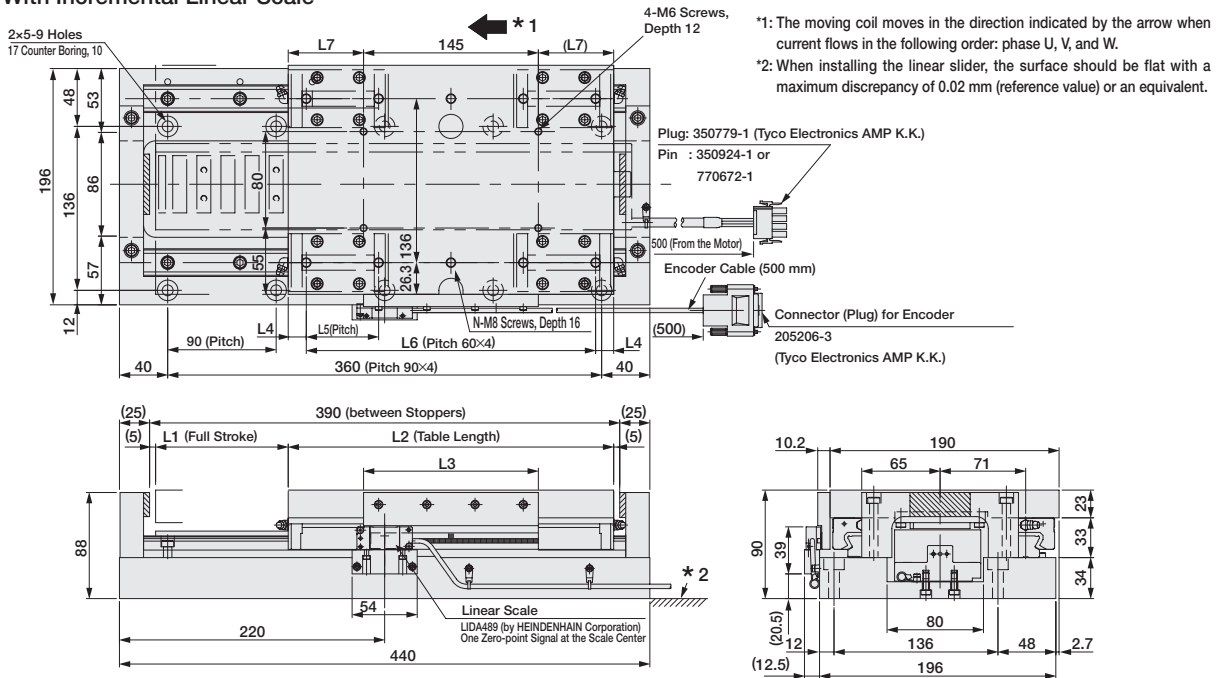


Note: When the effective force is within the rated force, the servomotor can be used within the intermittent duty zone.

SGTMF5 Linear Sliders

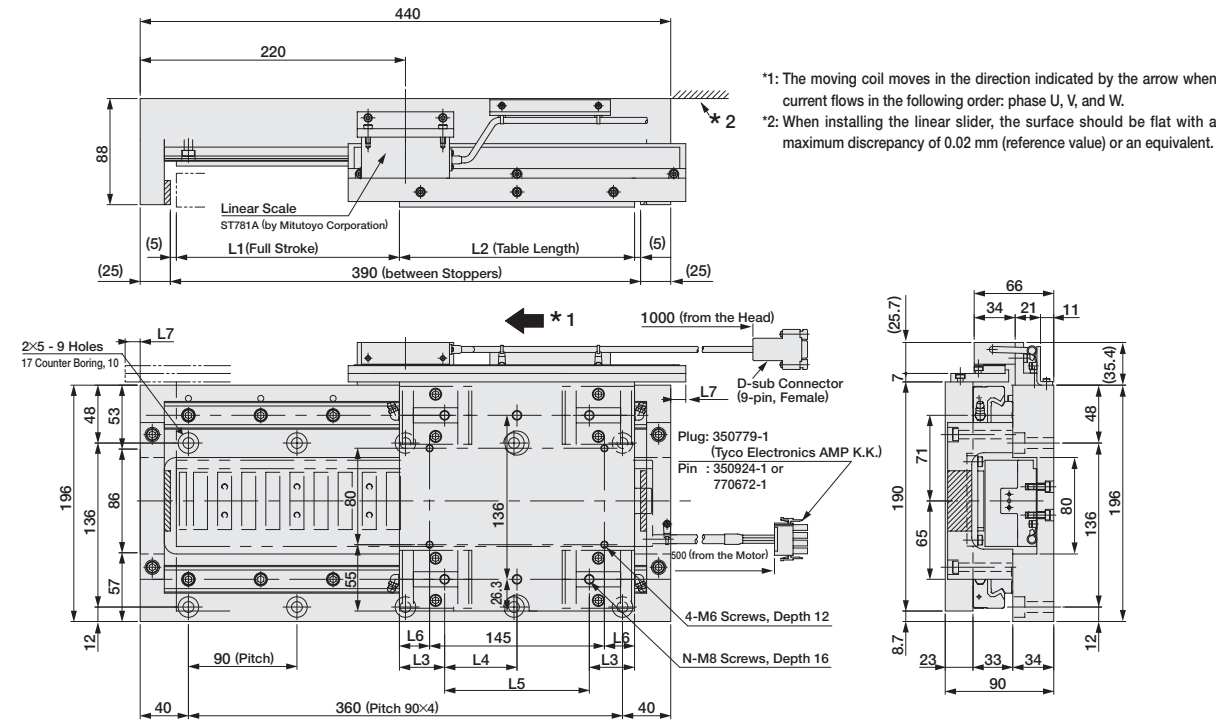
● External Dimensions (Units: mm)

● With Incremental Linear Scale



Linear Slider Model	L1	L2	L3	L4	L5	L6	L7	N
SGTMF	mm	mm	mm	mm	mm	mm	mm	
5A-054AH20A	185	195	220	37.5	60	120	25	6
5B-072AH20A	110	270	145	15	60	240	62.5	10

● With Absolute Linear Scale

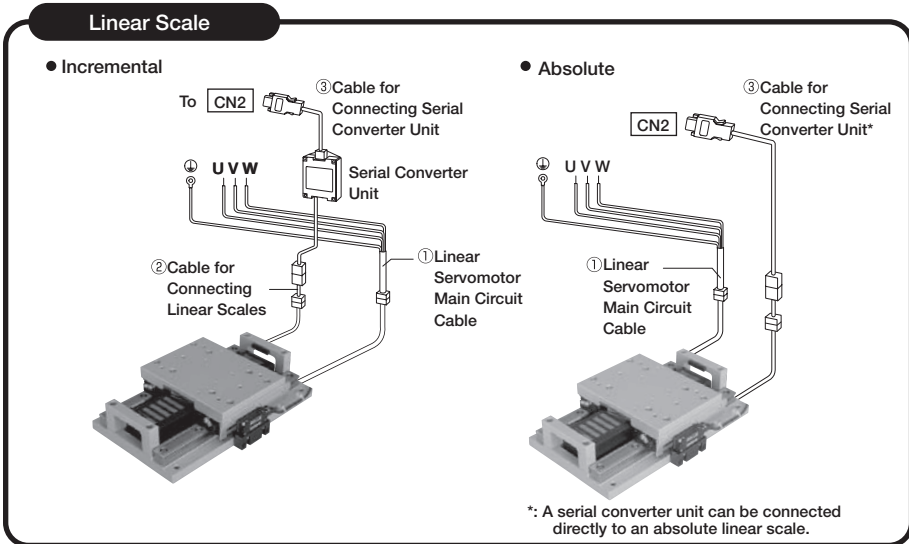
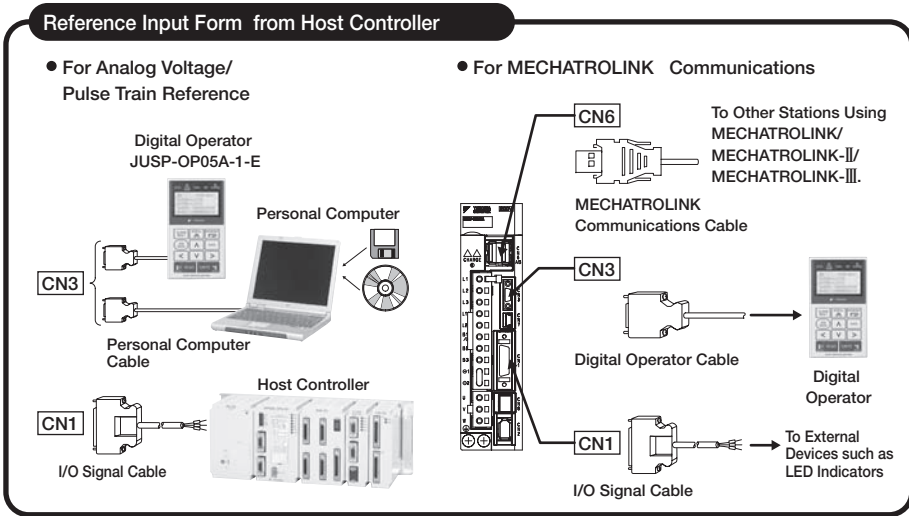
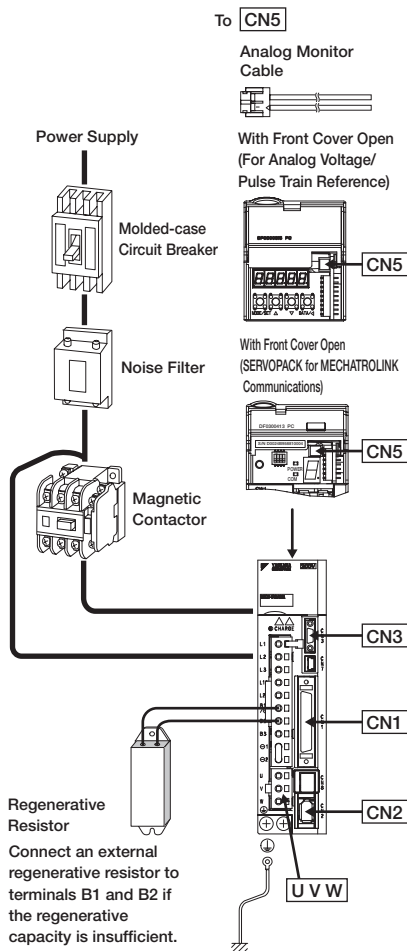


Linear Slider Model	L1	L2	L3	L4	L5	L6	L7	N
SGTMF	mm	mm	mm	mm	mm	mm	mm	
5A-054ABS1A	185	195	37.5	60	120	25	12.5	6
5B-072ABS1A	110	270	15	60	240	62.5	-	10

Linear Sliders

Selecting Cables and Connectors

● Connection diagrams



● Applicable Cables and Connectors

Motor Type	Linear Scale Type	Servo Drive		Motor Cable	Serial Converter Unit Model JZDP-	Linear Scale Connection Cables		
		SERVOPACK Model SGD-V	SERVOPACK+Motor	[CN2]→Serial Converter Unit		Serial Converter Unit→linear scale		
	Σ-Trac-MAG Series Model	Single-phase 100 V	Three-phase 200 V	① Linear Servomotor Main Circuit Cable (Flexible Type)		③ Cable for Connecting Serial Converter Unit (Flexible Type)	② Cable for Connecting Linear Scales (Flexible Type)	
Moving Magnet (MM)	Incremental	SGTMF4A-027AH20A	2R1F	1R6A	JZSP-CLN11-□□-E-G#	□003-243-E	JZSP-CLP70-□□-E-G#	JZSP-CLL00-□□-E-G# <sup>1</sup> The numbers in the boxes(□□) indicate the cable length. 01 = 1 m 03 = 3 m 05 = 5 m 10 = 10 m 15 = 15 m 20 = 20 m
		SGTMF4B-036AH20A	2R1F	1R6A	JZSP-CLN11-□□-E-G#	□003-244-E	JZSP-CLP70-□□-E-G#	
		SGTMF5A-054AH20A	—	5R5A	JZSP-CLN21-□□-E-G#	□003-245-E	JZSP-CLP70-□□-E-G#	
		SGTMF5B-072AH20A	—	5R5A	JZSP-CLN21-□□-E-G#	□003-246-E	JZSP-CLP70-□□-E-G#	
	Absolute	SGTMF4A-027ABS1A	2R1F	1R6A	JZSP-CLN11-□□-E-G#	—	JZSP-CLP70□□-E	—
		SGTMF4B-036ABS1A	2R1F	1R6A	JZSP-CLN11-□□-E-G#	—	JZSP-CLP70□□-E	
		SGTMF5A-054ABS1A	—	5R5A	JZSP-CLN21-□□-E-G#	—	JZSP-CLP70□□-E	
		SGTMF5B-072ABS1A	—	5R5A	JZSP-CLN21-□□-E-G#	—	JZSP-CLP70□□-E	

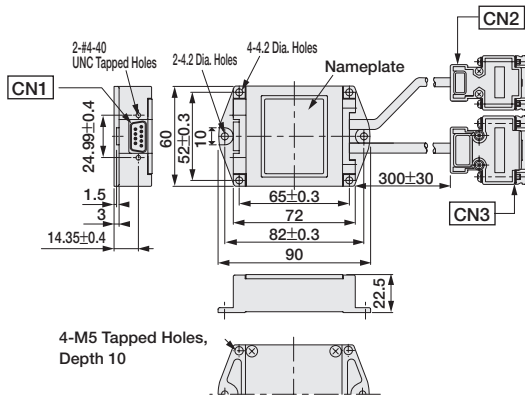
Note: The digit "#" of the order number represents the design revision.



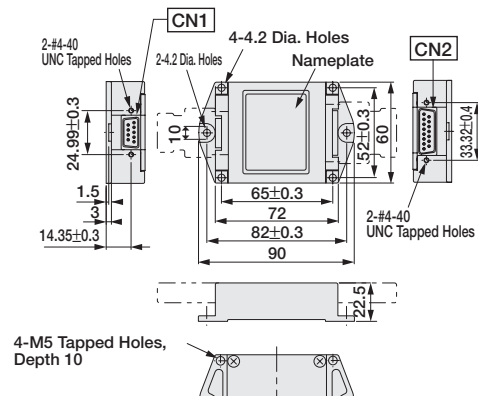
Selecting Cables and Connectors

● Detail Drawings: Serial Converter Units for Linear Scales by HEIDENHAIN Corporation


● JZDP-□006-□□□-E  
(With Hall Sensor Cable)



● JZDP-□003-□□□-E  
(Without Hall Sensor Cable)




● Details on Connectors

**CN1**   
SERVOPACK End  
Serial Data Output


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

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

**CN2**   
Linear Scale End  
Analog Signal Input

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

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

**CN3**   
Linear Servomotor End  
Hall Sensor Signal Input

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

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

Analog Voltage/Pulse Train Reference Type SERVOPACK		MECHATROLINK Communications Reference Type SERVOPACK				Cables for Setting Devices/Monitors
I/O Signal Connector [CN1]		I/O Signal Connector [CN1]		MECHATROLINK-II Communications Connector [CN6A] or [CN6B]	MECHATROLINK-III Communications Cable [CN6A] or [CN6B]	[CN5]
Connector Terminal Block Converter Unit	Cable with Loose Wires at One End	Connector Terminal Block Converter Unit	Cable with Loose Wires at One End			Analog Monitor Cable
JZSP-JA50PG-□-E <sup>2</sup> The number in the box(□) indicates the cable length. None = 0.5 m 1 = 1 m 2 = 2 m	JZSP-CSI01-□-E <sup>2</sup> The number in the box(□) indicates the cable length. 1 = 1 m 2 = 2 m 3 = 3 m	JZSP-JA26P-□-E <sup>2</sup> The number in the box(□) indicates the cable length. None = 0.5 m 1 = 1 m 2 = 2 m	JZSP-CSI02-□-E <sup>2</sup> The number in the box(□) indicates the cable length. 1 = 1 m 2 = 2 m 3 = 3 m	MECHATROLINK communications cable: JEPMC-W6002-□□-E The numbers in the boxes (□□) indicate the cable length. A5 = 0.5 m 20 = 20 m 01 = 1 m 30 = 30 m 03 = 3 m 40 = 40 m 05 = 5 m 50 = 50 m 10 = 10 m	The numbers in the boxes (□□) indicate the cable length. JEPMC-W6012-□□-E A2 = 0.2 m 05 = 5 m A5 = 0.5 m 10 = 10 m 01 = 1 m 20 = 20 m 02 = 2 m 30 = 30 m 03 = 3 m 50 = 50 m 04 = 4 m JEPMC-6013-□□-E <sup>3</sup> 10 = 10 m 50 = 50 m 20 = 20 m 75 = 75 m 30 = 30 m JEPMC-6014-□□-E A5 = 0.5 m 10 = 10 m 01 = 1 m 30 = 30 m 03 = 3 m 50 = 50 m 05 = 5 m	JZSP-CA01-E (1 m)

\*1: When using serial converter unit JZDP-G00□-□□□-E, the maximum cable length is 3 m.  
\*2: A connector kit and cable materials are required to assemble cables. For details, refer to SERVOPACKS in this catalog.  
\*3: Currently in pre-release. Will be available soon.