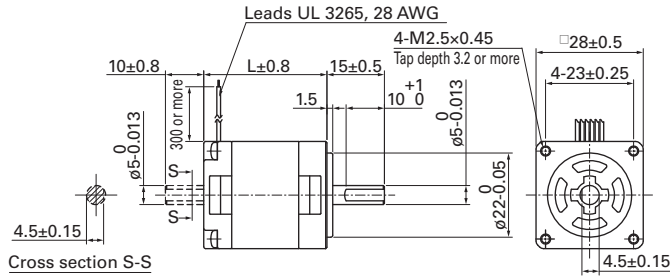


# Stepping Motor Dimensions Unit: mm

## 28 mm sq.



Note: The figure above shows a unipolar motor. The bipolar variant has four leads.

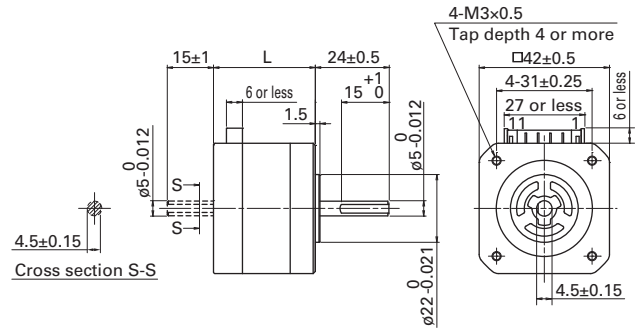
### Unipolar

Set order no.		Motor model no.		Motor length (L)
Single shaft	Dual shaft	Single shaft	Dual shaft	
DU14S281S	DU14S281D	SH2281-5271	SH2281-5231	32
DU14S285S	DU14S285D	SH2285-5271	SH2285-5231	51.5

### Bipolar

Set order no.		Motor model no.		Motor length (L)
Single shaft	Dual shaft	Single shaft	Dual shaft	
DB14S281S	DB14S281D	SH2281-5771	SH2281-5731	32
DB14S285S	DB14S285D	SH2285-5771	SH2285-5731	51.5

## 42 mm sq.



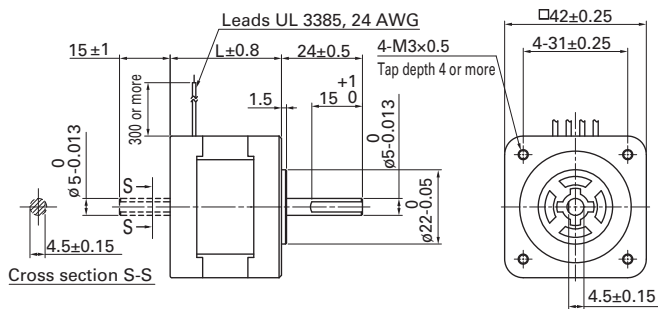
### Unipolar

Set order no.		Motor model no.		Motor length (L)
Single shaft	Dual shaft	Single shaft	Dual shaft	
DU15S421S	DU15S421D	SF2421-12U41	SF2421-12U11	$33 \pm 0.5$
DU15S422S	DU15S422D	SF2422-12U41	SF2422-12U11	$39 \pm 0.5$
DU15S423S	DU15S423D	SF2423-12U41	SF2423-12U11	$48 \pm 0.5$
DU15S424S	DU15S424D	SF2424-12U41	SF2424-12U11	$59.5 \pm 1$

### Bipolar

Set order no.		Motor model no.		Motor length (L)
Single shaft	Dual shaft	Single shaft	Dual shaft	
DB14S421S	DB14S421D	SF2421-10B41	SF2421-10B11	$33 \pm 0.5$
DB14S422S	DB14S422D	SF2422-10B41	SF2422-10B11	$39 \pm 0.5$
DB14S423S	DB14S423D	SF2423-10B41	SF2423-10B11	$48 \pm 0.5$
DB14S424S	DB14S424D	SF2424-10B41	SF2424-10B11	$59.5 \pm 1$

## 42 mm sq.



Note: The figure above shows a bipolar motor. The unipolar variant has six leads.

### Unipolar

Set order no.		Motor model no.		Motor length (L)
Single shaft	Dual shaft	Single shaft	Dual shaft	
DU15S141S	DU15S141D	SH1421-0441	SH1421-0411	33
DU15S142S	DU15S142D	SH1422-0441	SH1422-0411	39
DU15S144S	DU15S144D	SH1424-0441	SH1424-0411	48

### Bipolar

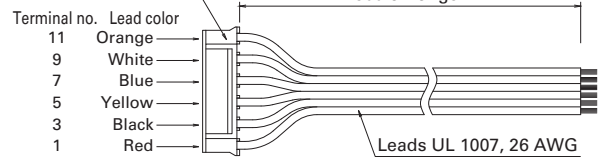
Set order no.		Motor model no.		Motor length (L)
Single shaft	Dual shaft	Single shaft	Dual shaft	
DB16S141S	DB16S141D	SH1421-5241	SH1421-5211	33
DB16S142S	DB16S142D	SH1422-5241	SH1422-5211	39
DB16S144S	DB16S144D	SH1424-5241	SH1424-5211	48

### Unipolar motor cable 4835774-1

Mfr.: J.S.T.

Housing: PHR-11

Terminal: SPH-002T-P0.5S



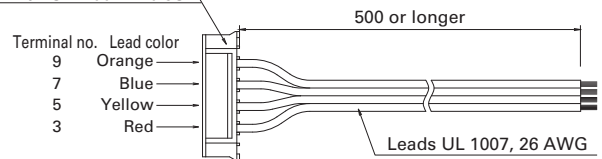
This is a motor-driver cable for use with SF242□-12U□1 motors.

### Bipolar motor cable 4835775-1

Mfr.: J.S.T.

Housing: PHR-11

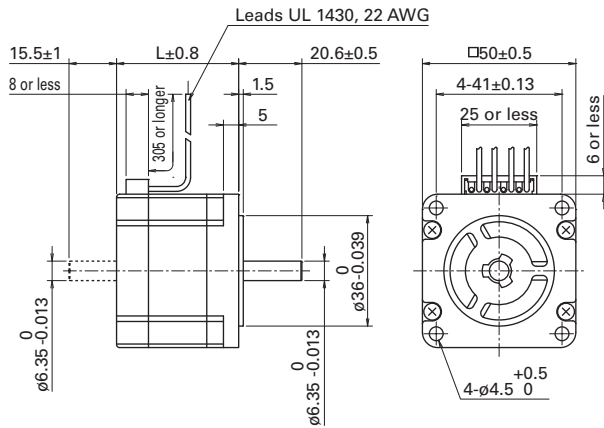
Terminal: SPH-002T-P0.5S



This is a motor-driver cable for use with SF242□-10B□1 motors.

# Stepping Motor Dimensions Unit: mm

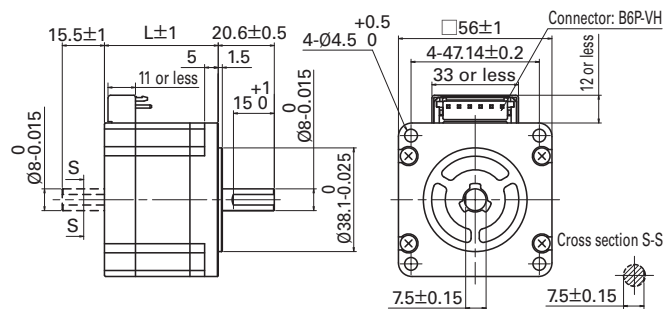
## 50 mm sq.



### Bipolar

Set order no.		Motor model no.		Motor length (L)
Single shaft	Dual shaft	Single shaft	Dual shaft	
DB16H671S	DB16H671D	103H6701-5040	103H6701-5010	39.8
DB16H673S	DB16H673D	103H6703-5040	103H6703-5010	51.3

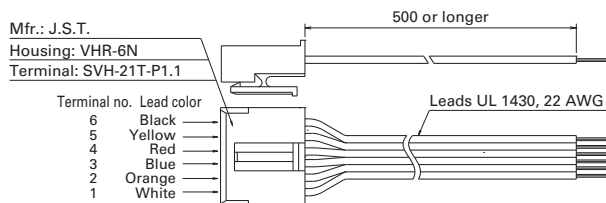
## 56 mm sq.



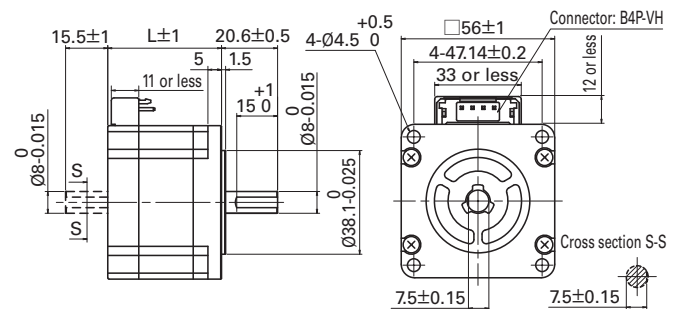
### Unipolar

Set order no.		Motor model no.		Motor length (L)
Single shaft	Dual shaft	Single shaft	Dual shaft	
DU16M711S	DU16M711D	SM2561C20U41	SM2561C20U11	41.8
DU16M712S	DU16M712D	SM2562C20U41	SM2562C20U11	53.8
DU16M713S	DU16M713D	SM2563C20U41	SM2563C20U11	75.8
DU16M714S	DU16M714D	SM2564C20U41	SM2564C20U11	85.8

### Unipolar motor cable 4837798-1



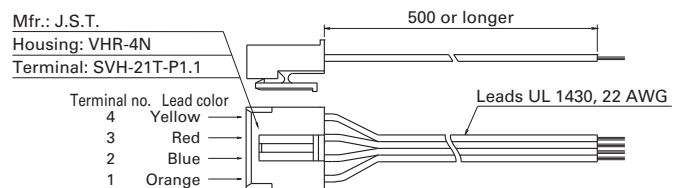
## 56 mm sq.



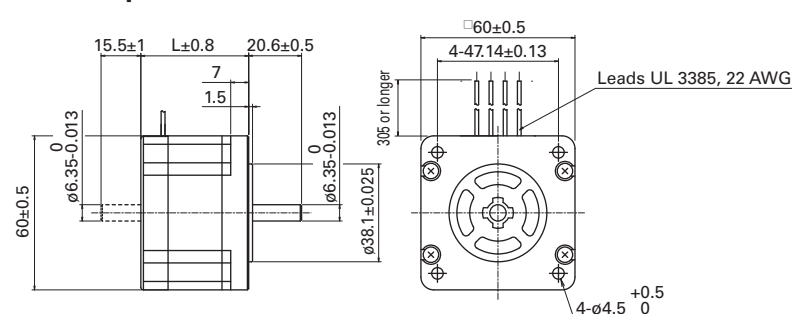
### Bipolar

Set order no.		Motor model no.		Motor length (L)
Single shaft	Dual shaft	Single shaft	Dual shaft	
DB16M711S	DB16M711D	SM2561C20B41	SM2561C20B11	41.8
DB16M712S	DB16M712D	SM2562C20B41	SM2562C20B11	53.8
DB16M713S	DB16M713D	SM2563C20B41	SM2563C20B11	75.8
DB16M714S	DB16M714D	SM2564C20B41	SM2564C20B11	85.8

### Bipolar motor cable 4837961-1



## 60 mm sq.



### Bipolar

Set order no.		Motor model no.		Motor length (L)
Single shaft	Dual shaft	Single shaft	Dual shaft	
DB16S161S	DB16S161D	SH1601-5240	SH1601-5210	42
DB16S162S	DB16S162D	SH1602-5240	SH1602-5210	54

# General Specifications of Stepping Motors

Motor model no.	SH228□	SH142□	SF242□	103H670□	SM256□	SH160□
Operation type	-					
Operating ambient temperature	-10 to +50°C					
Storage temperature	-20 to +65°C					
Operating ambient humidity	20 to 90% RH (non-condensing)					
Storage humidity	5 to 95% RH (non-condensing)					
Operating altitude	Up to 1000 m above sea level					
Vibration resistance	Frequency 10 to 500 Hz, amplitude 1.52 mm (10 to 70 Hz), acceleration 150 m/s <sup>2</sup> (70 to 500 Hz), sweep time 15 min/cycle, 12 cycles for each of both directions in each X, Y, and Z axes.					
Shock resistance	Acceleration 500 m/s <sup>2</sup> , duration 11 ms, half sine wave, tested 3 times in both directions for each X, Y, and Z axis for a total of 18 times					
Thermal class	B (+130°C)				B (+130°C) (A for UL models)	B (+130°C)
Dielectric strength	500 VAC for one minute (between motor winding and frame)			1000 VAC for one minute (between motor winding and frame)	1120 VAC for one minute (between motor winding and frame)	1000 VAC for one minute (between motor winding and frame)
Insulation resistance	100 MΩ or more at 500 VDC (between motor winding and frame)					
Protection rating	-					
Winding temperature rise	80 K or less (based on our own standard)					
Positional accuracy tolerance	± 0.09°	± 0.054°	± 0.09°		± 0.054°	± 0.054°
Thrust play <sup>(1)</sup>	0.075 mm or less (With a 1.5 N load)	0.075 mm or less (With a 5 N load)	0.075 mm (With a 5 N load)	0.075 mm (With a 10 N load)	0.075 mm (With a 10 N load)	0.075 mm (With a 10 N load)
Radial play <sup>(2)</sup>	0.025 mm (With a 5 N load)					
Shaft runout	0.025 mm					
Concentricity of motor shaft and fitting part	ø0.05 mm	ø0.05 mm	ø0.05 mm	ø0.075 mm	ø0.075 mm	ø0.075 mm
Perpendicularity of mounting surface and motor shaft surface	0.1 mm	0.1 mm	0.1 mm	0.1 mm	0.1 mm	0.1 mm
Motor mounting orientation	Can be installed vertically or horizontally.					

(1) Thrust play: Shaft position displacement when a load is exerted in a direction parallel to the motor shaft.

(2) Radial play: Maximum shaft position displacement when a load is exerted in a direction perpendicular to the motor shaft. Load is exerted on the point 1/3 the shaft length from the shaft end.

## Safety standards

Model no.: SM256 □ UL models

UL	Classification	Standards	File no.
UL	UL	UL 1004-1, UL 1004-6	E179832
	UL for Canada (cUL)	CSA C22.2 No. 100	

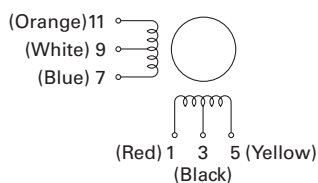
# Internal Wiring and Rotational Directions

## Unipolar winding

Connector type, model no.: SF242

### Internal wiring

In parentheses are lead colors of the motor cable



### Direction of motor rotation

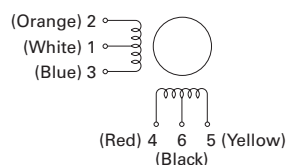
When excited by a direct current in the order shown below, the direction of rotation is clockwise as viewed from the output shaft side.

		Connector pin no.				
		3, 9	1	7	5	11
Excitation sequence	1	+	-	-		
	2	+		-	-	
	3	+			-	-
	4	+	-			-

Connector type, model no.: SM256

### Internal wiring

In parentheses are lead colors of the motor cable



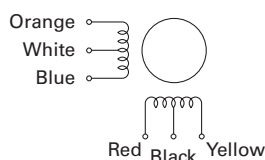
### Direction of motor rotation

When excited by a direct current in the order shown below, the direction of rotation is clockwise as viewed from the output shaft side.

		Connector pin no.				
		1, 6	4	3	5	2
Excitation sequence	1	+	-	-		
	2	+		-	-	
	3	+			-	-
	4	+	-			-

Lead type

### Internal wiring



### Direction of motor rotation

When excited by a direct current in the order shown below, the direction of rotation is clockwise as viewed from the output shaft side.

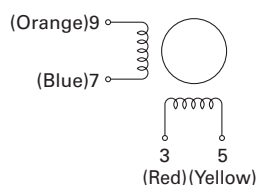
		Lead color				
		White, Black	Red	Blue	Yellow	Orange
Excitation sequence	1	+	-	-		
	2	+		-	-	
	3	+			-	-
	4	+	-			-

## Bipolar winding

Connector type, model no.: SF242

### Internal wiring

In parentheses are lead colors of the motor cable



### Direction of motor rotation

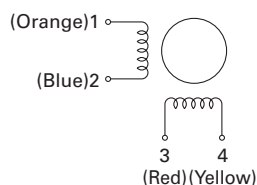
When excited by a direct current in the order shown below, the direction of rotation is clockwise as viewed from the output shaft side.

		Connector pin no.			
		3	7	5	9
Excitation sequence	1	-	-	+	+
	2	+	-	-	+
	3	+	+	-	-
	4	-	+	+	-

Connector type, model no.: SM256

### Internal wiring

In parentheses are lead colors of the motor cable



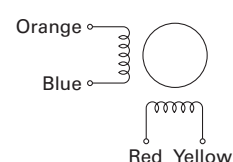
### Direction of motor rotation

When excited by a direct current in the order shown below, the direction of rotation is clockwise as viewed from the output shaft side.

		Connector pin no.			
		3	2	4	1
Excitation sequence	1	-	-	+	+
	2	+	-	-	+
	3	+	+	-	-
	4	-	+	+	-

Lead type

### Internal wiring



### Direction of motor rotation

When excited by a direct current in the order shown below, the direction of rotation is clockwise as viewed from the output shaft side.

		Lead color			
		Red	Blue	Yellow	Orange
Excitation sequence	1	-	-	+	+
	2	+	-	-	+
	3	+	+	-	-
	4	-	+	+	-