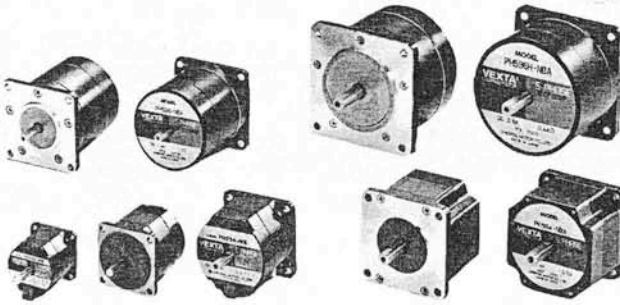


## 5-Phase Stepping Motors



The high output power of these compact stepping motors with a step angle of  $0.72^\circ$  ( $0.36^\circ$ ) makes them suitable for a large variety of applications.

### ■ Features

- $0.72^\circ$  in full step and  $0.36^\circ$  in half step ; 2.5 times the resolution of a 2-phase stepping motor.
- Because there is no noticeable resonance smooth rotation is achieved, the motors keep vibration and noise level low.
- High speed and high torque.
- The rotating angle of the motor is directly proportional to the number of input pulses.
- The angle error per step is very small and nonaccumulative.
- Rapid response to starting, stopping and reversing.
- Digital signals such as the pulse input signal provide open-loop control, thus making the system simple.
- Self-holding capability makes it possible for the rotor to be held in the stopped position without the use of brakes.
- A wide range of rotating speeds proportional to the frequency of the pulse signal can be achieved.

# Product Specifications

## 5-Phase 0.72° / Step Type

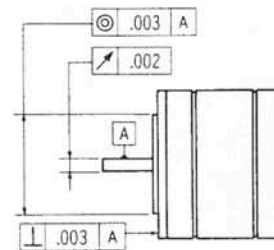
Installing Base Size inch	Model Number		Holding Torque		Current per Phase A/Phase	Resistance per Phase Ω/Phase	Rotor Inertia oz-in <sup>2</sup>	Number of Lead Wire	Page
	Single Shaft	Double Shaft	oz-in	N-cm					
1.3" sq.	<b>PH533-NA</b>	<b>PH533-NB</b>	3.6	2.5	0.75	1.8	0.049	5	176
1.65" sq.	<b>PH544-NA</b>	<b>PH544-NB</b>	15.3	10.8	0.75	2.5	0.131	5	
1.97" sq.	<b>PH554-NA</b>	<b>PH554-NB</b>	31.9	22.6	0.75	3.0	0.437	5	
2.36" sq.	<b>PH564-NAA</b>	<b>PH564-NBA</b>	31.9	22.6	0.75	0.75	0.55	5	174
	<b>PK564-NAA</b>	<b>PK564-NBA</b>	58.3	41.2	1.4	0.7	0.96	5	
	<b>PH566-NAA</b>	<b>PH566-NBA</b>	51.4	36.3	0.75	1.2	1.09	5	
	<b>PK566-NAA</b>	<b>PK566-NBA</b>	115.3	81.4	1.4	1.1	1.53	5	
	<b>PH569-NAA</b>	<b>PH569-NBA</b>	105.5	74.5	1.4	2.3	2.19	5	
	<b>PK569-NAA</b>	<b>PK569-NBA</b>	230.5	162.8	1.4	1.7	3.06	5	
3.35" sq.	<b>PH596H-NAA</b>	<b>PH596H-NBA</b>	163.9	115.7	2.8	0.4	3.83	5	178
	<b>PH599H-NAA</b>	<b>PH599H-NBA</b>	277.7	196.1	2.8	0.5	6.56	5	
	<b>PH5913H-NAA</b>	<b>PH5913H-NBA</b>	527.7	372.7	2.8	1.0	9.84	5	

## 5-Phase 0.36° / Step Type

Installing Base Size inch	Model Number		Holding Torque		Current per Phase A/Phase	Resistance per Phase Ω/Phase	Rotor Inertia oz-in <sup>2</sup>	Number of Lead Wire	Page
	Single Shaft	Double Shaft	oz-in	N-cm					
1.50" sq.	<b>PX534M-NAA</b>	<b>PX534M-NBA</b>	13.8	9.8	0.75	2.8	0.049	5	180
2.36" sq.	<b>PH564M-NAA</b>	<b>PH564M-NBA</b>	25.0	17.6	3.5	0.75	0.55	5	
	<b>PH566M-NAA</b>	<b>PH566M-NBA</b>	51.4	36.2	3.5	1.2	1.09	5	
	<b>PH569M-NAA</b>	<b>PH569M-NBA</b>	101.4	71.5	3.5	2.3	2.19	5	

## General Specifications

Item	Specifications
Shaft Runout	0.002 inch T.I.R. at top of output shaft
Shaft Radial Play	0.001 inch max. of 1.1 lb.
Shaft Axial Play	0.003 inch max. of 2.2 lb.
Perpendicularity	0.003 inch T.I.R.
Concentricity	0.003 inch T.I.R.
Step Accuracy*	±3 minute (at full-step, unloaded)
Insulation Resistance	100M ohms or more under normal ambient temperature and humidity when the megger reading between the windings and frame is DC 500V.
Dielectric Strength	Under normal ambient temperature and humidity, sufficient to withstand 1.0kV at 60Hz applied between the windings and frame for one minute following a period of continuous operation.
Insulation Class	Class B [266° F (130°C)]
Temperature Rise	144° F (80°C) or less as measured by the Resistance Change Method after the rated voltage is applied to the stepping motor at rest.
Ambient Temperature Range	14° F to 122° F (-10°C to +50°C)



\*Step Accuracy: 5 phase on, unloaded

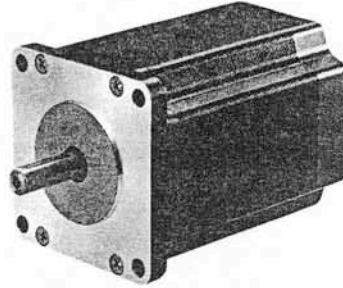
# High Torque Stepping Motors

## PK56□ type

### Step Angle 0.72°

#### Features

- Installing Base size 2.36" sq.
- High torque, low vibration, low noise

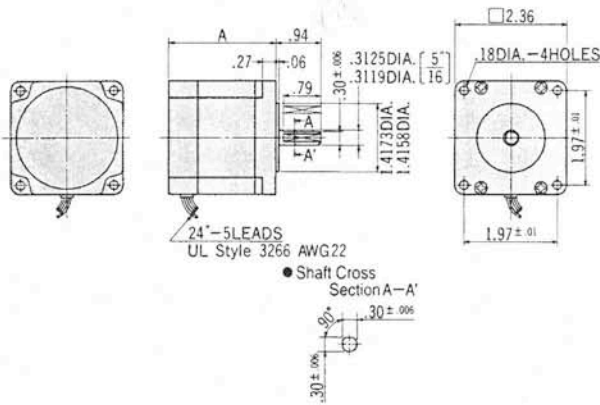


#### Specifications

Model Number		Holding Torque		Current per Phase A/Phase	Resistance per Phase Ω/Phase	Rotor Inertia oz-in <sup>2</sup>	Number of Lead Wire
Single Shaft	Double Shaft	oz-in	N-cm				
<b>PK564-NAA</b>	<b>PK564-NBA</b>	58.3	41.2	1.4	0.7	0.96	5
<b>PK566-NAA</b>	<b>PK566-NBA</b>	115.3	81.4	1.4	1.1	1.53	5
<b>PK569-NAA</b>	<b>PK569-NBA</b>	230.5	162.8	1.4	1.7	3.06	5

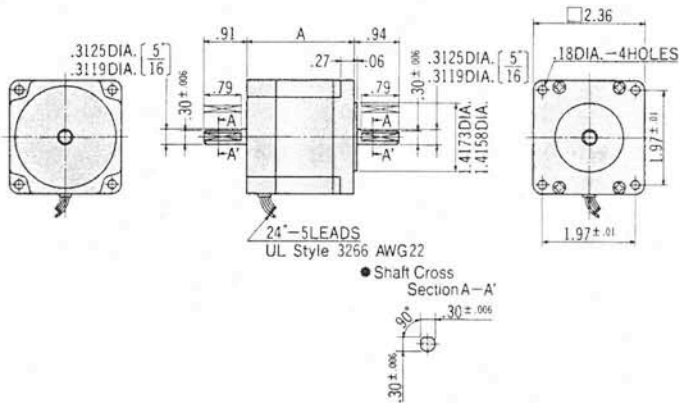
#### Dimensions scale 1:4, unit = inch

##### Single Shaft



Model	A (inch)	Weight	
		lbs.	kg
<b>PK564-NAA</b>	1.83*	1.32	0.6
<b>PK566-NAA</b>	2.26*	1.76	0.8
<b>PK569-NAA</b>	3.43*	2.87	1.3

##### Double Shaft



Model	A (inch)	Weight	
		lbs.	kg
<b>PK564-NBA</b>	1.83*	1.32	0.6
<b>PK566-NBA</b>	2.26*	1.76	0.8
<b>PK569-NBA</b>	3.43*	2.87	1.3

1.8° Step

0.9° Step

0.1° Step

0.72° Step

0.36° Step

Stepping Motor Packages

Low-Speed Synchronous

Accessories

Brushless DC Motors

FBL Series

HBL Series

2-Phase Stepping Motors

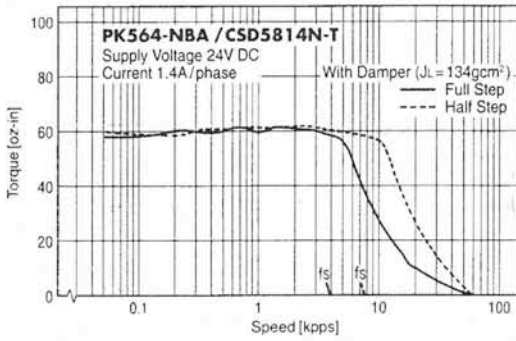
5-Phase Stepping Motors



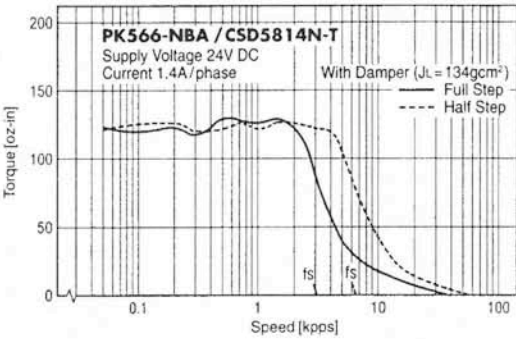
## Speed vs. Torque Characteristics

• Measured by constant current chopper drive

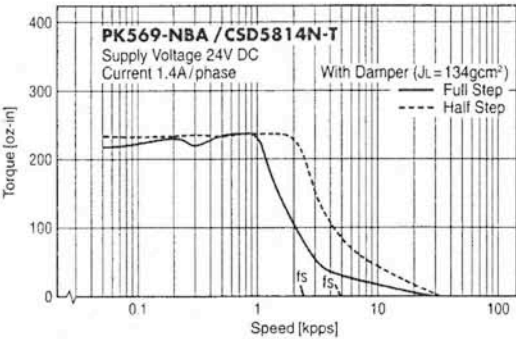
### PK564-NBA



### PK566-NBA



### PK569-NBA



1.8° Step

0.9° Step

0.1° Step

0.72° Step

0.36° Step

Stepping Motor Packages

Low-Speed Synchronous

Accessories

FBL Series

HBL Series

Brushless DC Motors

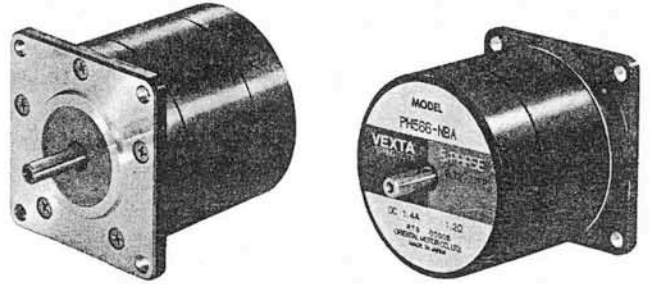
STEPPING MOTORS

PH5□□ type

Step Angle 0.72°

■ Features

- Installing Base Size 1.3" sq. ~ 2.36" sq.
- Standard type



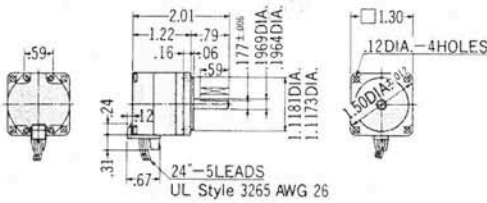
■ Specifications

Installing Base Size inch	Model Number		Holding Torque		Current per Phase A/Phase	Resistance per Phase Ω/Phase	Rotor Inertia oz-in <sup>2</sup>	Number of Lead Wire
	Single Shaft	Double Shaft	oz-in	N-cm				
1.3" sq.	PH533-NA	PH533-NB	3.6	2.5	0.75	1.8	0.049	5
1.65" sq.	PH544-NA	PH544-NB	15.3	10.8	0.75	2.5	0.131	5
1.97" sq.	PH554-NA	PH554-NB	31.9	22.6	0.75	3.0	0.437	5
2.36" sq.	PH564-NAA	PH564-NBA	31.9	22.6	0.75	0.75	0.55	5
	PH566-NAA	PH566-NBA	51.4	36.3	0.75	1.2	1.09	5
	PH569-NAA	PH569-NBA	105.5	74.5	1.4	2.3	2.19	5

■ Dimensions scale 1:4, unit = inch

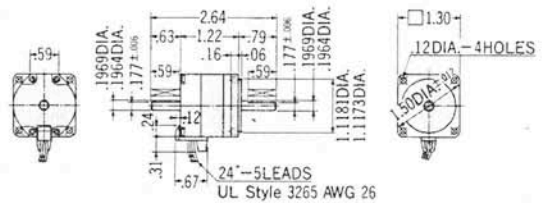
Single Shaft

● PH533-NA

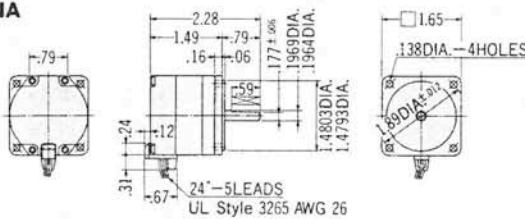


Double Shaft

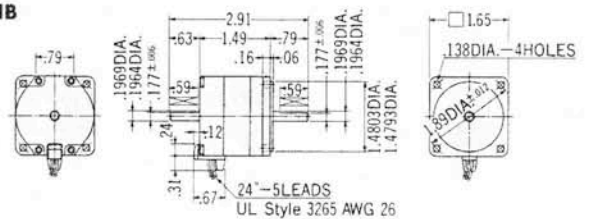
● PH533-NB



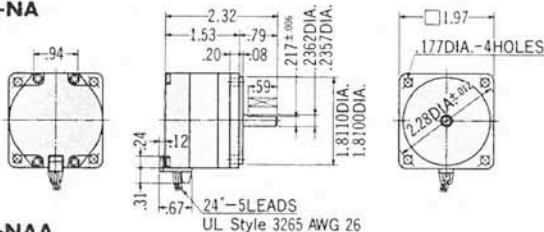
● PH544-NA



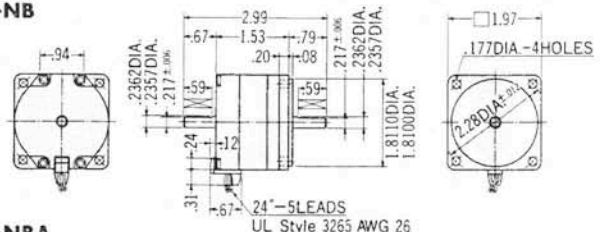
● PH544-NB



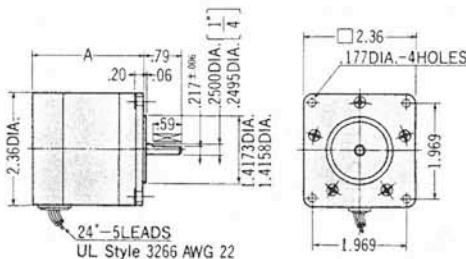
● PH554-NA



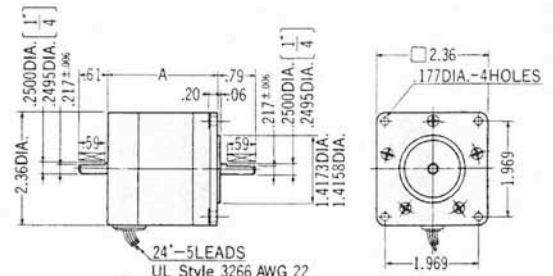
● PH554-NB



- PH564-NAA
- PH566-NAA
- PH569-NAA



- PH564-NBA
- PH566-NBA
- PH569-NBA



Model	A (inch)	Weight	
		lbs.	kg
PH564-NAA	1.65"	1.10	0.5
PH566-NAA	2.32"	1.65	0.75
PH569-NAA	3.72"	2.87	1.3

Model	A (inch)	Weight	
		lbs.	kg
PH564-NBA	2.52"	3.31	1.5
PH566-NBA	3.82"	5.51	2.5
PH569-NBA	5.12"	7.72	3.5

1.8" Step  
0.9" Step  
0.1" Step  
2-Phase Stepping Motors

0.72" Step  
0.36" Step  
5-Phase Stepping Motors

Stepping Motor Packages

Low-Speed Synchronous

Accessories

FBL Series

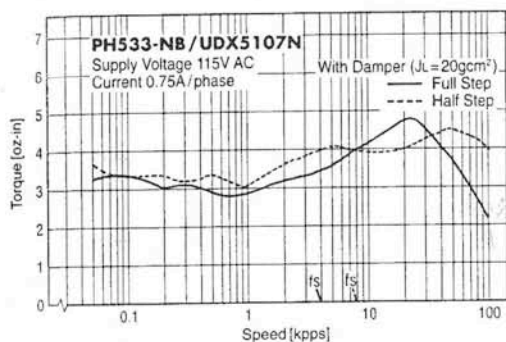
Brushless DC Motors

HBL Series

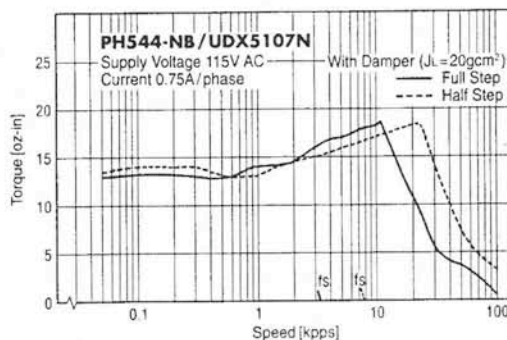
## Speed vs. Torque Characteristics

• Measured by bipolar constant current chopper drive

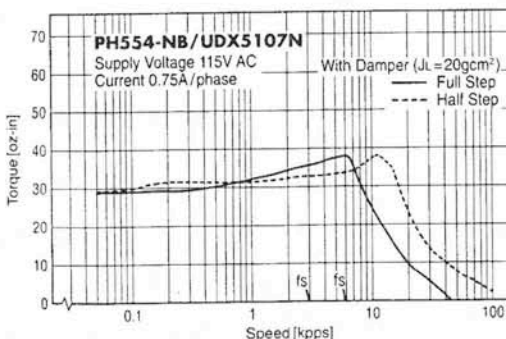
### PH533-NB



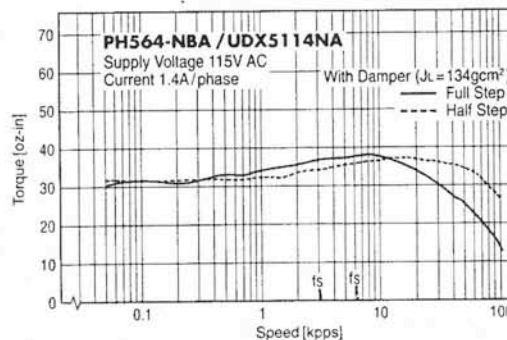
### PH544-NB



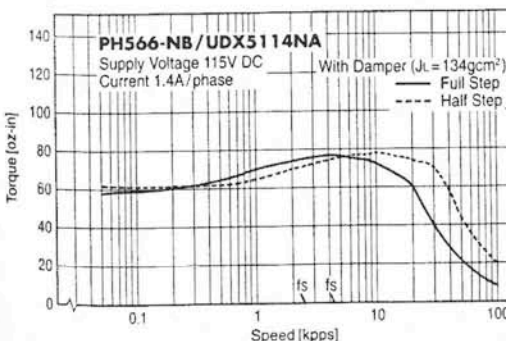
### PH554-NB



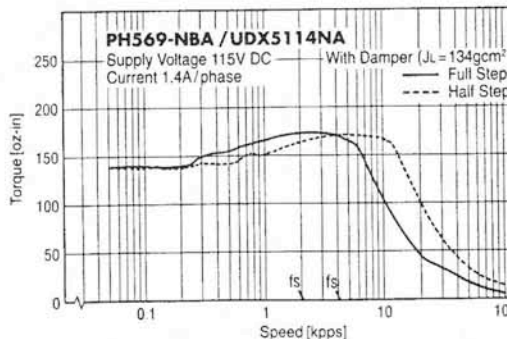
### PH564-NBA



### PH566-NBA



### PH569-NBA





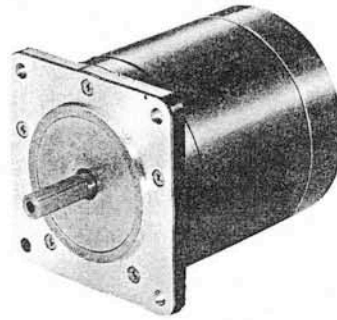
# STEPPING MOTORS

## PH59□H type

### Step Angle 0.72°

#### ■ Features

- Installing Base size 3.35" sq.
- High speed type

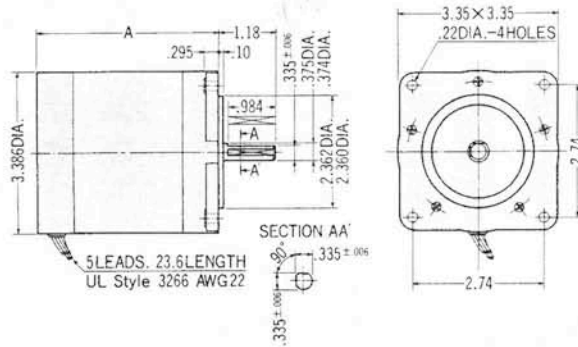


#### ■ Specifications

Model Number		Holding Torque		Current per Phase A/Phase	Resistance per Phase Ω/Phase	Rotor Inertia oz-in <sup>2</sup>	Number of Lead Wire
Single Shaft	Double Shaft	oz-in	N-cm				
<b>PH596H-NAA</b>	<b>PH596H-NBA</b>	163.9	115.7	2.8	0.4	3.83	5
<b>PH599H-NAA</b>	<b>PH599H-NBA</b>	277.7	196.1	2.8	0.5	6.56	5
<b>PH5913H-NAA</b>	<b>PH5913H-NBA</b>	527.7	372.7	2.8	1.0	9.84	5

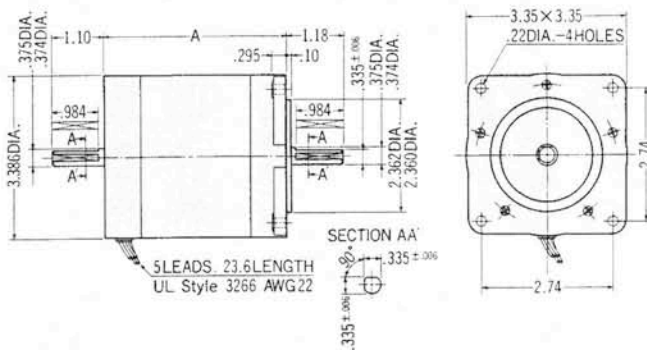
#### ■ Dimensions scale 1:4, unit = inch

##### Single Shaft



Model	A (inch)	Weight	
		lbs.	kg
<b>PH596H-NAA</b>	2.52"	3.31	1.5
<b>PH599H-NAA</b>	3.82"	5.51	2.5
<b>PH5913H-NAA</b>	5.12"	7.72	3.5

##### Double Shaft



Model	A (inch)	Weight	
		lbs.	kg.
<b>PH596H-NBA</b>	2.52"	3.31	1.5
<b>PH599H-NBA</b>	3.82"	5.51	2.5
<b>PH5913H-NBA</b>	5.12"	7.72	3.5

1.8° Step  
0.9° Step  
0.1° Step

2-Phase Stepping Motors  
5-Phase Stepping Motors

0.72° Step  
0.36° Step

Stepping Motor Packages  
Low-Speed Synchronous

Accessories

Brushless DC Motors  
FBL Series  
HBL Series

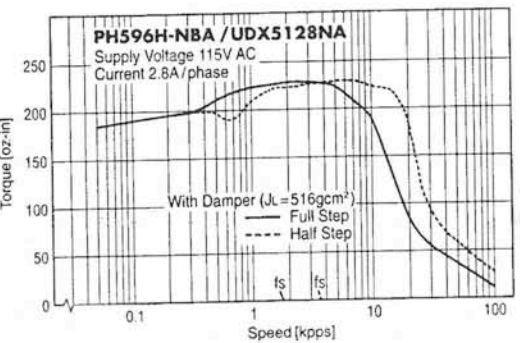


2-Phase Stepping Motors	1.8° Step
	0.9° Step
	0.1° Step
5-Phase Stepping Motors	0.72° Step
	0.36° Step
Stepping Motor Packages	
Low-Speed Synchronous	
Accessories	
FBL Series	
Brushless DC Motors	
HBL Series	

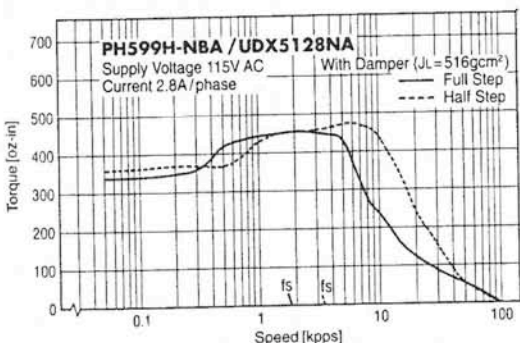
## Speed vs. Torque Characteristics

• Measured by constant current chopper drive

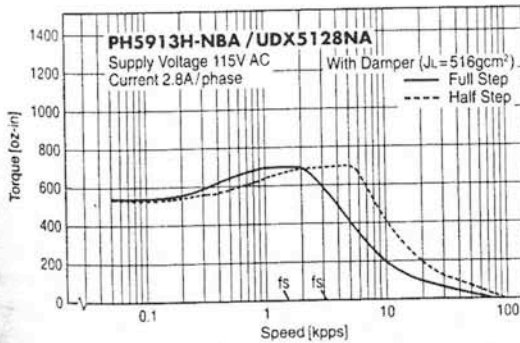
### PH596H-NBA



### PH599H-NBA



### PH5913H-NBA





# STEPPING MOTORS

## PH5□□M type

Step Angle 0.36°

### Features

- Installing Base Size 1.50" sq., 2.36" sq.
- High resolution type



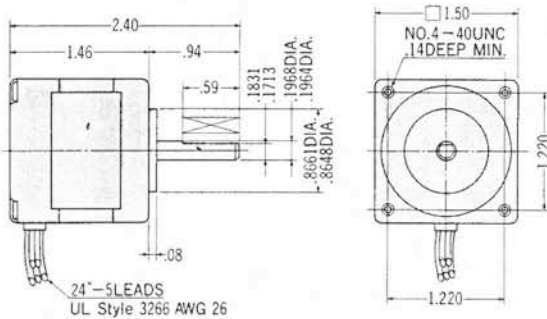
### Specifications

Installing Base Size inch	Model Number		Holding Torque		Current per Phase A/Phase	Resistance per Phase Ω /Phase	Rotor Inertia oz-in <sup>2</sup>	Number of Lead Wire
	Single Shaft	Double Shaft	oz-in	N-cm				
1.50" sq.	<b>PX534M-NAA</b>	<b>PX534M-NBA</b>	13.8	9.8	0.75	2.8	0.049	5
	<b>PH564M-NAA</b>	<b>PH564M-NBA</b>	25.0	17.6	3.5	0.75	0.55	5
2.36" sq.	<b>PH566M-NAA</b>	<b>PH566M-NBA</b>	51.4	36.2	3.5	1.2	1.09	5
	<b>PH569M-NAA</b>	<b>PH569M-NBA</b>	101.4	71.5	3.5	2.3	2.19	5

### Dimensions scale 1:4, unit =inch

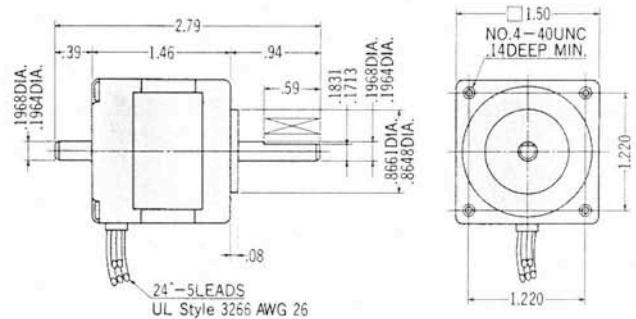
#### Single Shaft

● **PX534M-NAA** Weight: 1.98 lbs. (0.9kg) \* scale 1:2

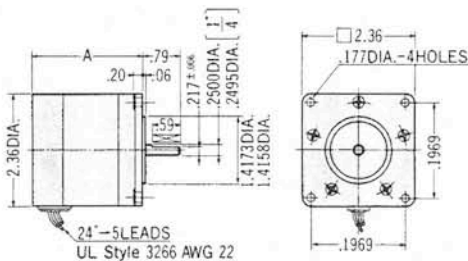


#### Double Shaft

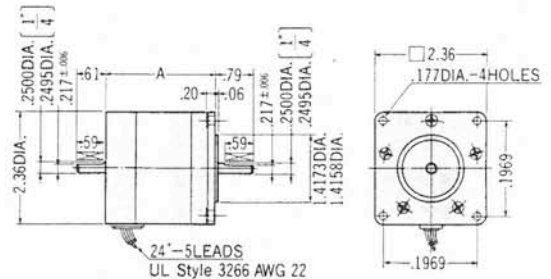
● **PX534M-NBA** Weight: 1.98 lbs. (0.9kg) \* scale 1:2



#### ● PH56□M-NAA



#### ● PH56□M-NBA



Model	A (inch)	Weight	
		lbs.	kg
<b>PH564M-NAA</b>	1.65"	1.10	0.5
<b>PH566M-NAA</b>	2.32"	1.65	0.75
<b>PH569M-NAA</b>	3.72"	2.87	1.3

Model	A (inch)	Weight	
		lbs.	kg
<b>PH564M-NBA</b>	1.65"	1.10	0.5
<b>PH566M-NBA</b>	2.32"	1.65	0.75
<b>PH569M-NBA</b>	3.72"	2.87	1.3

1.8" Step  
0.9" Step  
0.1" Step

2-Phase Stepping Motors  
5-Phase Stepping Motors

0.72" Step  
0.36" Step  
Stepping Motor Packages  
Low-Speed Synchronous

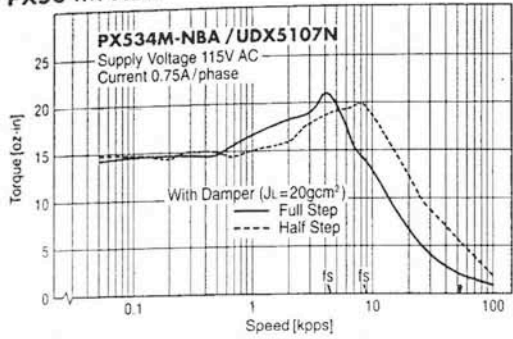
Accessories

Brushless DC Motors  
FBL Series  
HBL Series

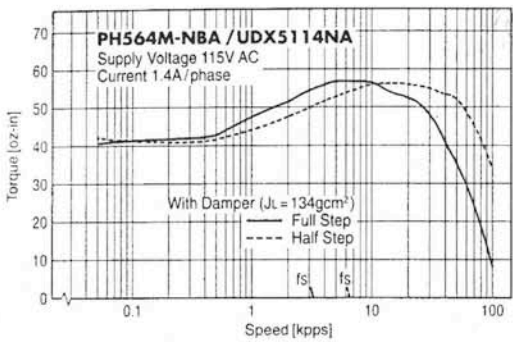
# Speed vs. Torque Characteristics

• Measured by constant current chopper drive

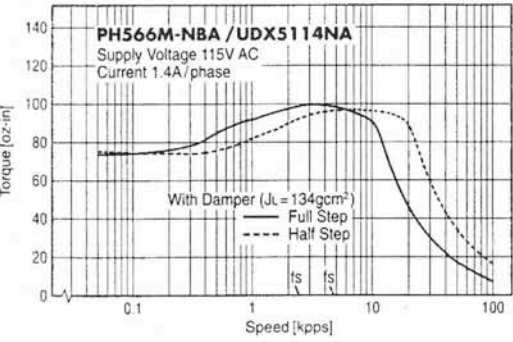
## • PX534M-NBA



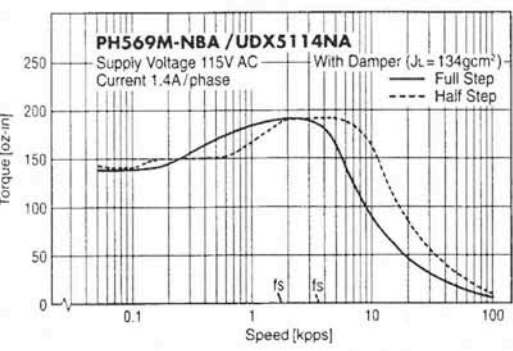
## • PH564M-NBA



## • PH566M-NBA



## PH569M-NBA



1.8° Step	0.9° Step	0.1° Step	0.72° Step	0.36° Step	Stepping Motor Packages	Low-Speed Synchronous	Accessories	FBL Series	HBL Series
2-Phase Stepping Motors			5-Phase Stepping Motors					Brushless DC Motors	