The 5-phase Stepping Set

DP4 series
DC24V
Micro-step (500 x 1 to 80 divisions)

Configuration of the 5-phase Stepping Motor Set, DP4 Series

Name	Quantity
DP4 Series Instruction Manual	1 pc.
PM Driver	1 pc.
Stepping Motor	1 pc.
Signal Cable (CN1)	1 pc.
Power Cable (CN2)	1 pc.
Stepping Motor Cable (CN3)	1 pc.

Characteristics

- **Compact PM driver**
  This product is a compact and lightweight driver with 50% reduction in volume compared to the conventional products.
- **Micro-step function available**
  Smooth operation without vibration at low speeds can be realized.
- **Flexible**
  This stepping system is able to drive wide variety of stepping motors from small capacity to large capacity without adjustment, resulting in wide applications.
- **Compact**
  Mounting dedicated HIC realizes highly integrated and higher reliable system.

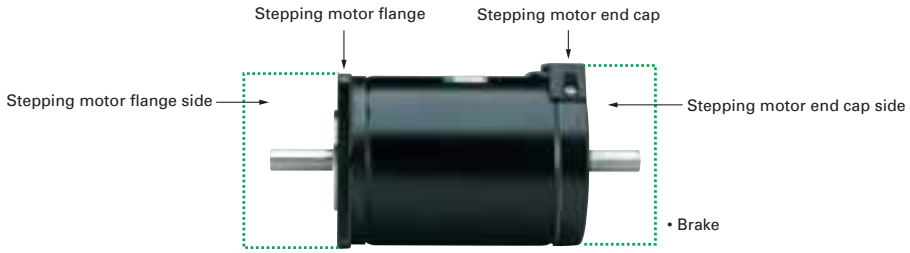
Built-in function

- **Resolution setting function**
  10 types of resolution, ranging from one to 80 divisions, can be set for a standard stepping motor step angle by using rotary switches.
- **Pulse input system selection function**
  Either "Pulse and direction mode" or "2-input mode" can be selected, using a dipswitch. Resolution setting function.
- **Power down function**
  Stepping motor current can be turned off through an external input signal.
- **Operation current switchover function**
  Regarding operation current of the stepping motor, currents ranging from rated current to 55% of rated current can be set using rotary switches.

Explanation of set model number

System on the stepping motor end cap side

Code	End cap side	Function
B	Brake	Electromagnetic brake
E	Encoder	Please contact us regarding the encoder.
X	None	



Explanation for model number in the combined case

The set model number of the stepping motor is as follows when PMDPC1S3P01 and 103F7853 type are combined and equipped with the system of harmonic gear (1/100) and brake:

DP42F783D—X B

Standard set model number

Brake

None

How to order

Please use the "Set Model Number" in the List of Combined Stepping Motor Model Number for the 5-phase Stepping Set, DP4 Series.
To order brake, put the product code number after the set number according to the "Explanation of combination numbering".

PM driver specifications

		Model number	PMDPC1S3P01
Standard specification		Input source	DC24V±10%
		Source current	2A
	Environment	Operating ambient temperature	0 ~ +50˚C
		Conservation temperature	-20 ~ +70˚C
		Operating ambient humidity	35 ~ 85%RH (no condensation)
		Conservation humidity	10 ~ 90%RH (no condensation)
		Vibration resistance	0.5G Tested under the following conditions, frequency range: 10 to 55Hz, direction: along the X, Y, and Z axes, for 2 hours
		Impact resistance	Considering the NDS-C-0110 standard section 3.2.2 division "C", not influenced.
		Withstand voltage	Not influenced when applying AC500V between the power input terminal and cabinet for one minute.
		Insulation resistance	10 MΩ MIN. when applying DC500V between the power input terminal and cabinet.
		Mass(Weight)	0.25kg(0.55 lbs)
Function		Select function	Auto current down, pulse input system, step angle, power specification
I/O signals		Command pulse input signal	Photo coupler input method, input resistance 330Ω Input signal voltage "H" level: 4.0 to 5.5V, "L" level: 0 to 0.5V Maximum input frequency 400 kpulse/s
		Power down input signal	Photo coupler input method, input resistance 330Ω Input signal voltage "H" level: 4.0 to 5.5V, "L" level: 0 to 0.5V

* For information about the operation, connection, function, and dimensions of the PM driver, refer to pages 227 and after.

Stepping motor common specifications

Item	Combined stepping motors of DP4 series
Insulation class	Class B (+130˚C)
Withstand voltage	Conditions: AC1000V, 50/60 Hz, and for one minute
Insulation resistance	100MΩ MIN. against DC500V
Vibration resistance	Conditions: amplitude 1.52 mm (P-P), frequency range 10 to 55 Hz, 5 minutes sweep time, along X, Y, and Z axes, for 2 hours
Impact resistance	Conditions: 98 m/s² acceleration, 11 minutes duration, half-wave/sine wave, three times each along X, Y, and Z axes, 18 times in total
Operating ambient temperature	-10~+50˚C
Operating ambient humidity	20~90%(no condensation)

Standard combined stepping motors for 5-phase stepping set “DP4” series

PM driver model number : PMDPC1S3P01

Combination Model Number for STEPSYN F Series

System support	Dimensions of stepping motor	Single shaft		Double shaft	
		Set model number	Standard combined stepping motor number	Set model number	Standard combined stepping motor number
Standard type	□ 42mm	**DP42F552S**	103F5508-7041	**DP42F552D**	103F5508-7011
		DP42F554S	103F5510-7041	**DP42F554D**	103F5510-7011
	□ 60mm	**DP42F781S**	103F7851-7041	**DP42F781D**	103F7851-7011
		DP42F782S	103F7852-7041	**DP42F782D**	103F7852-7011
		DP42F783S	103F7853-7041	**DP42F783D**	103F7853-7011
Electromagnetic brake	□ 42mm	**DP42F551S-XB**	103F5505-70XB41		
		DP42F552S-XB	103F5508-70XB41		

Stepping motor data sheet

STEPSYN F Series (Standard)

Set model number	Single shaft	DP42F552S	DP42F554S
	Double shaft	DP42F552D	DP42F554D
Holding torque	N·m(oz·in)	0.18(25.49)	0.26(36.82)
Rotor inertia	x10⁻⁴kg·m²(oz·in²)	0.053(0.29)	0.065(0.36)
Mass(Weight)	kg(lbs)	0.28(0.62)	0.37(0.82)

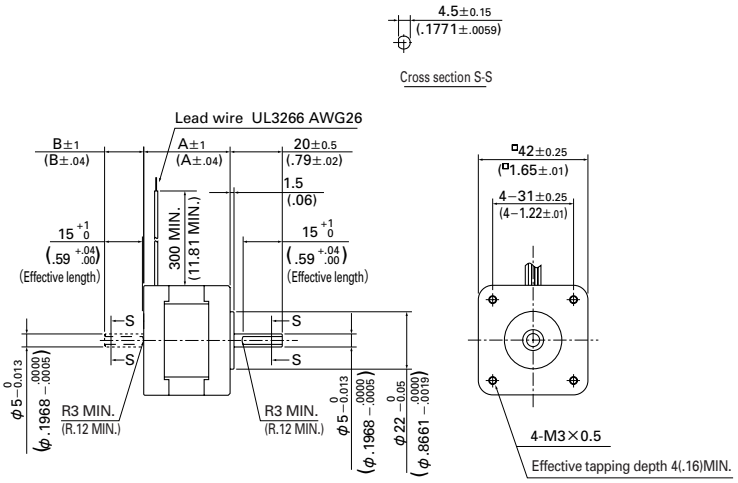
Set model number	Single shaft	DP42F781S	DP42F782S	DP42F783S
	Double shaft	DP42F781D	DP42F782D	DP42F783D
Holding torque	N·m(oz·in)	0.6(85.0)	0.93(131.7)	1.79(253.5)
Rotor inertia	x10⁻⁴kg·m²(oz·in²)	0.275(1.50)	0.4(2.19)	0.84(4.59)
Mass(Weight)	kg(lbs)	0.6(1.32)	0.78(1.72)	1.36(3.00)

STEPSYN F Series (With electromagnetic brake)

Set model number		Single shaft	DP42F552S-XB	DP42F554S-XB
		Double shaft	———	———
Holding torque		N·m(oz·in)	0.18(25.49)	0.26(36.82)
Rotor inertia		x10⁻⁴kg·m²(oz·in²)	0.068(0.37)	0.08(0.44)
Mass(Weight)		kg(lbs)	0.43(0.95)	0.52(1.15)
Electromagnetic brake specification	Brake operation system		Non-excitation operation system	
	Source voltage	V	DC 24 ± 5%	
	Exciting current	A	0.08	
	Electric power consumption	W	2	
	Static friction torque	N·m(oz·in)	0.3(42.48)	
	Brake operating time	ms	30	
	Brake release time	ms	20	
	Polarity		Brown:⊕,White:⊖	

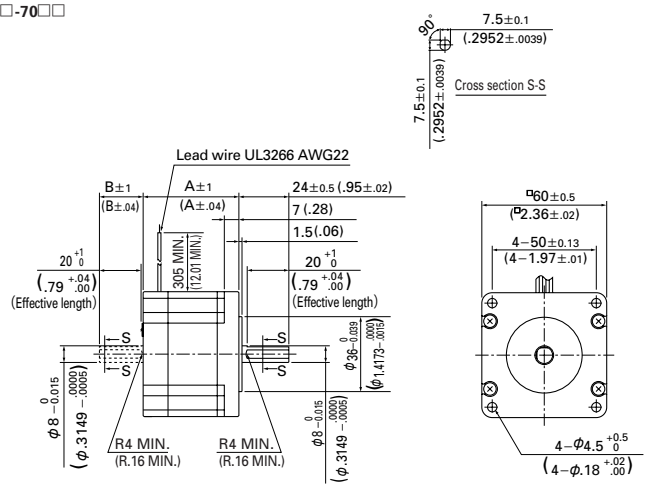
Dimensions [Unit: mm (inch)]

STEPSYN F
DP42F55□□
103F55□□-70□□



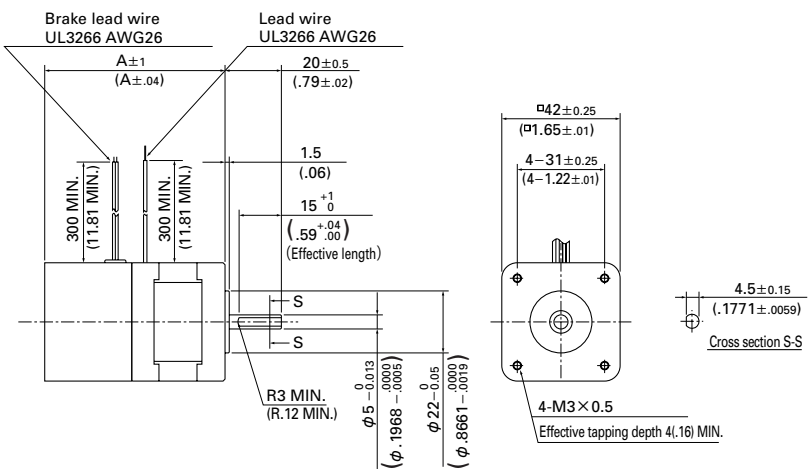
Model name	A	B
DP42F552S (103F5508-7041)	40 (1.57)	—
DP42F552D (103F5508-7011)	40 (1.57)	15 (.59)
DP42F554S (103F5510-7041)	49 (1.57)	—
DP42F554D (103F5510-7011)	49 (1.57)	15 (.59)

DP42F78□□
103F785□-70□□



Model name	A	B
DP42F781S (103F7851-7041)	46.5 (1.83)	—
DP42F781D (103F7851-7011)	46.5 (1.83)	21 (.83)
DP42F782S (103F7852-7041)	55 (2.17)	—
DP42F782D (103F7852-7011)	55 (2.17)	21 (.83)
DP42F783S (103F7853-7041)	87.5 (3.44)	—
DP42F783D (103F7853-7011)	87.5 (3.44)	21 (.83)

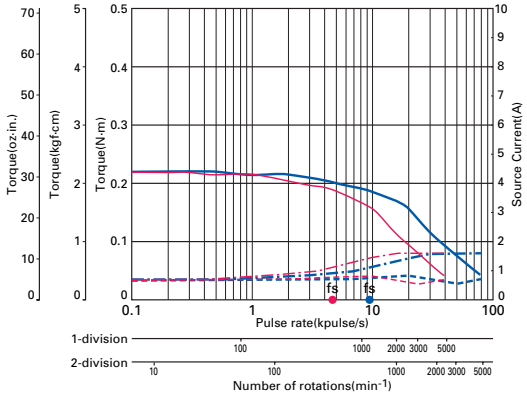
STEPSYN F with electromagnetic brake
DP42F55□S-XB
103F55□□-70□□



Model name	A
DP42F552S-XB (103F5508-70XB41)	70.5 (2.78)
DP42F553S-XB (103F5510-70XB41)	79.5 (3.13)

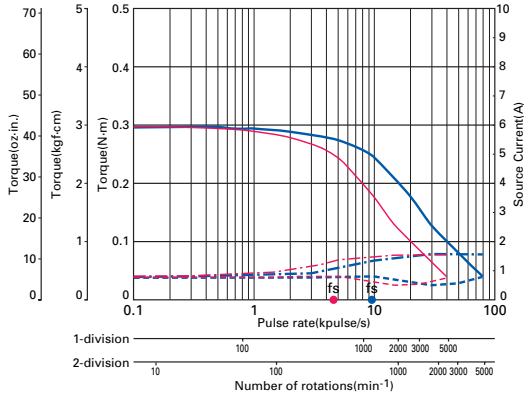
Pulse rate-torque characteristics/pulse rate-source current characteristics

● DP42F552□ / DP42F552S-XB : 24V



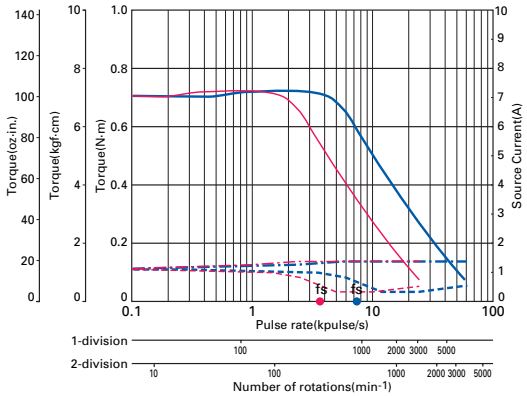
103F5508-70□□
Source voltage : DC24V·Operating current : 0.75A/phase
—— Pull-out torque(J_{L1}=0.94×10^{-4}kg·m^2[5.14 oz·in^2] Use the rubber coupling)
– · – Source current(T_L=MAX) – – – Source current(T_L=0)
fs : No load maximum starting pluse rate
■ 1-division is specified. ■ 2-division is specified.

● DP42F554□ / DP42F554S-XB : 24V



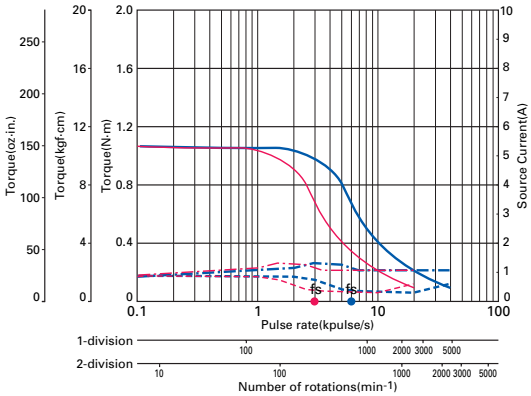
103F5510-70□□
Source voltage : DC24V·Operating current : 0.75A/phase
—— Pull-out torque(J_{L1}=0.94×10^{-4}kg·m^2[5.14 oz·in^2] Use the rubber coupling)
– · – Source current(T_L=MAX) – – – Source current(T_L=0)
fs : No load maximum starting pluse rate
■ 1-division is specified. ■ 2-division is specified.

● DP42F781□ : 24V



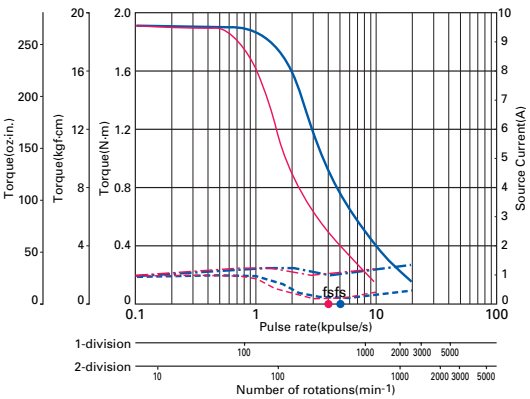
103F7851-70□□
Source voltage : DC24V·Operating current : 0.75A/phase
—— Pull-out torque(J_{L1}=0.94×10^{-4}kg·m^2[5.14 oz·in^2] Use the rubber coupling)
– · – Source current(T_L=MAX) – – – Source current(T_L=0)
fs : No load maximum starting pluse rate
■ 1-division is specified. ■ 2-division is specified.

● DP42F782□ : 24V



103F7852-70□□
Source voltage : DC24V·Operating current : 0.75A/phase
—— Pull-out torque(J_{L1}=2.6×10^{-4}kg·m^2[14.22 oz·in^2]Use the rubber coupling)
– · – Source current(T_L=MAX) – – – Source current(T_L=0)
fs : No load maximum starting pluse rate
■ 1-division is specified. ■ 2-division is specified.

● DP42F783□ : 24V



103F7853-70□□
Source voltage : DC24V·Operating current : 0.75A/phase
—— Pull-out torque(J_{L1}=7.4×10^{-4}kg·m^2[40.46 oz·in^2]Use the rubber coupling)
– · – Source current(T_L=MAX) – – – Source current(T_L=0)
fs : No load maximum starting pluse rate
■ 1-division is specified. ■ 2-division is specified.