

NPM

Linear-type stepper motor

LINEARSTEP[®]

PFCL25/PFL35T series

Fully Threaded Shaft



PFCL25 series



PFL35T series

Features

1. Simple control
Because it is a stepper motor, it is simple to control.
2. Simple design
This motor is constructed by creating female threads inside the rotors of both bearing supports, and the male shaft is simply threaded through.
3. High efficiency
By employing a special type of thread, it offers high thread efficiency and a large driving force
4. Long life
Has a long life thanks to ball bearing support and low-friction threads.
5. Many lines and many options

Outline of Linearstep

What is the Linearstep?

A motor that utilizes the advantages of its stepping motor structure and conducts linear motions.

All screw types: Total 9 Options; Motor: 3 models, Lead screw: 3 types

1. PFCL25-24 : Leadscrew 3 types (0.48mm, 0.96mm, 1.20mm)
2. PFCL25-48 : Leadscrew 3 types (0.48mm, 0.96mm, 1.20mm)
3. PFL35T-48 : Leadscrew 3 types (0.48mm, 0.96mm, 1.20mm)

What is the effective stroke?

Two types of effective stroke (travel) are available - 30mm (total length 60mm) and 60mm (total length 90mm).

30mm is the standard effective stroke. Please specify when ordering.

The motor will have effective stroke of 30mm if specific requirements are not made in order.

Motor Number

PFCL 25 - 48 C 4 (120)
① ② ③ ④ ⑤ ⑥

① Linearstep Model Designation

PFCL : Connector Type PFCL25 type only

PFL : Lead Wire Type PFL35T type only

② Motor Dimensions (mm)

③ Step Per Revolution : PFCL25:48 steps and 24 steps
: PFL35T:48 steps

④ Wiring : Wiring model varies according to voltage : (ex: C coil stands for DC12V)

⑤ Magnet : Nd-type magnet

⑥ Lead Pitch : Distance the shaft move to the axial direction with one revolution.

There are 3 types. (048).....0.48mm, (096).....0.96mm, (120).....1.20mm

The relationship between the pulse rate and speed

The motor speed will vary according to the lead pitch and pulse rate.

① 48 steps motor

Unit: [mm/s]

Lead Pitch [mm]	Pulse Rate [pps]						
	100	200	300	400	500	600	700
0.48	1	2	3	4	5	6	7
0.96	2	4	6	8	10	12	14
1.20	2.5	5.0	7.5	10	12.5	15	17.5

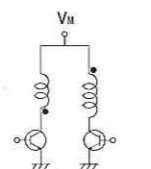
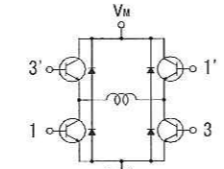
① 24 steps motor

Unit: [mm/s]

Lead Pitch [mm]	Pulse Rate [pps]						
	100	200	300	400	500	600	700
0.48	2	4	6	8	10	12	14
0.96	4	8	12	16	20	24	28
1.20	5	10	15	20	25	30	35

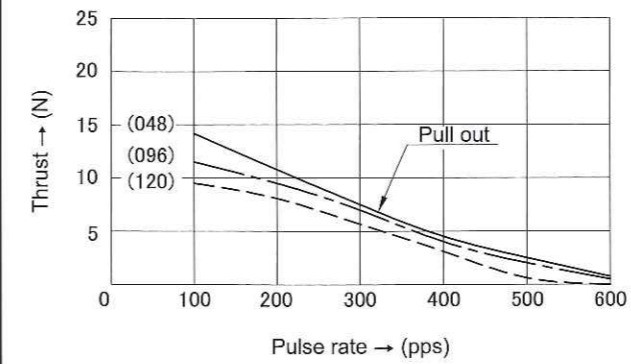
Drive

A typical example of drive mode is shown below.

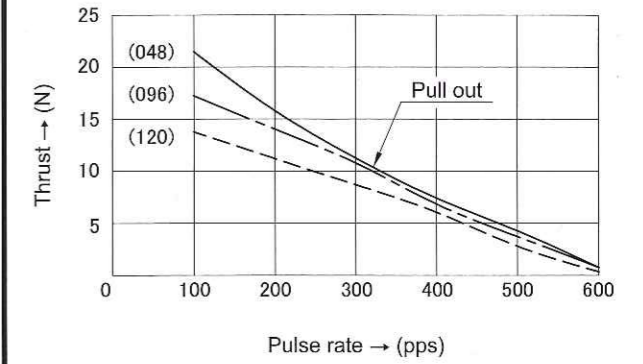
Item	Unipolar Drive	Bipolar Drive
Current	One Direction	Bi-directions
Wiring	Bifilar Winding	Unifilar Winding
Lead Wires	6	4
Basic Circuits		
	Unipolar Constant Voltage	Bipolar Constant Voltage

Dynamic Thrust Characteristics

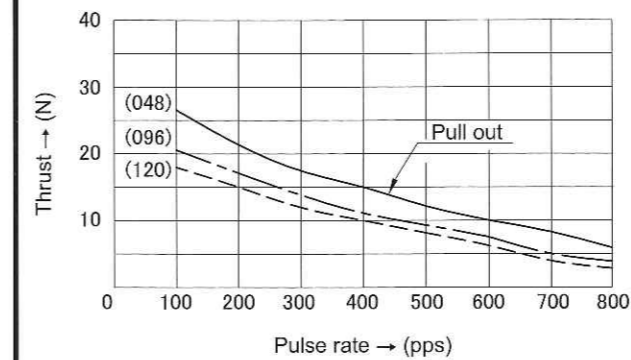
PFCL25-24 (Unipolar Drive)



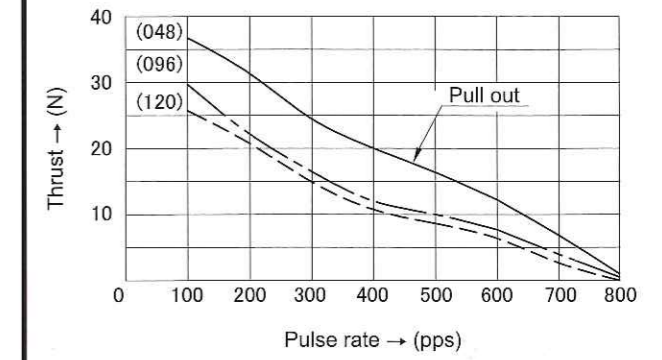
PFCL25-24 (Bipolar Drive)



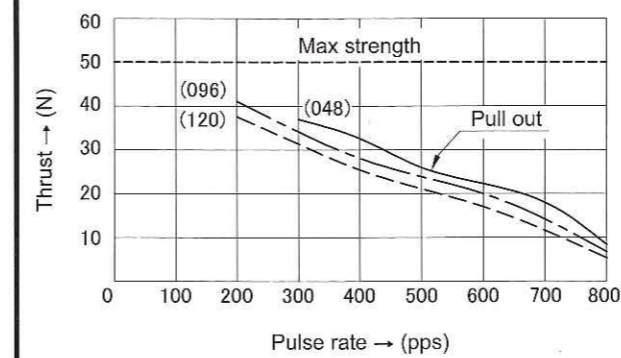
PFCL25-48 (Unipolar Drive)



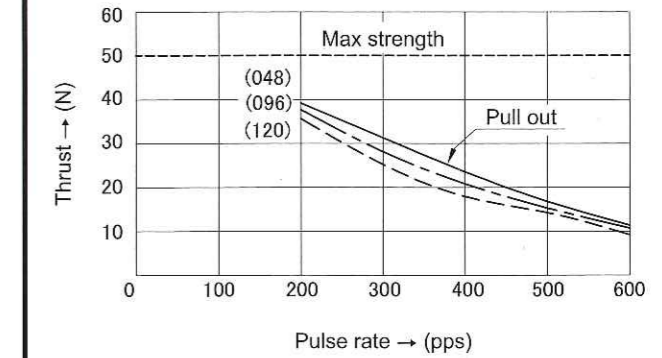
PFCL25-48 (Bipolar Drive)



PFL35T-48 (Unipolar Drive)



PFL35T-48 (Bipolar Drive)



Motor Specifications (Ex:Unipolar DC12V)

No.	Item	PFCL25-48C4(xxx)	PFCL25-24C4(xxx)	PFL35T-48C4(xxx)
1	Number of Phases	PM (Linear step), 2-phase	←	←
2	Excitation Mode	2-2 phase	←	←
3	Resolution (Feed Amount)	0.025mm 0.020mm 0.010mm	0.050mm 0.040mm 0.020mm	0.025mm 0.020mm 0.010mm
	Thread Lead Pitch	1.20mm 0.96mm 0.48mm	1.20mm 0.96mm 0.48mm	1.20mm 0.96mm 0.48mm
4	Operating Temperature Range	-10 to +50°C (Ambient Temperature)	←	←
5	Insulation Withstand Voltage	500 VAC (For One Minute)	←	←
6	Insulation Resistance	100 M-ohm (500 VDC)	←	←
7	Insulation Class	E (Maximum Coil Temperature)/120°C	←	←
8	Maximum Motor Temperature	+80°C or less (On The Case)	←	←
9	Coil Resistance	120 Ω	←	70 Ω
10	Temperature Rise	70 K (OPPS, Resistance Method)	←	←
11	Weight	60 g (Standard)	←	95 g (Standard)

Notes

- Resolution (feed amount) of No. 3 is value in full step. (In the case of half step, it is half of full step theoretically.)
- No. 9 is value at the time of power supply in normal temperature (20°C±5%), normal humidity (RH65%±20%).
- No.10 is value when saturated.

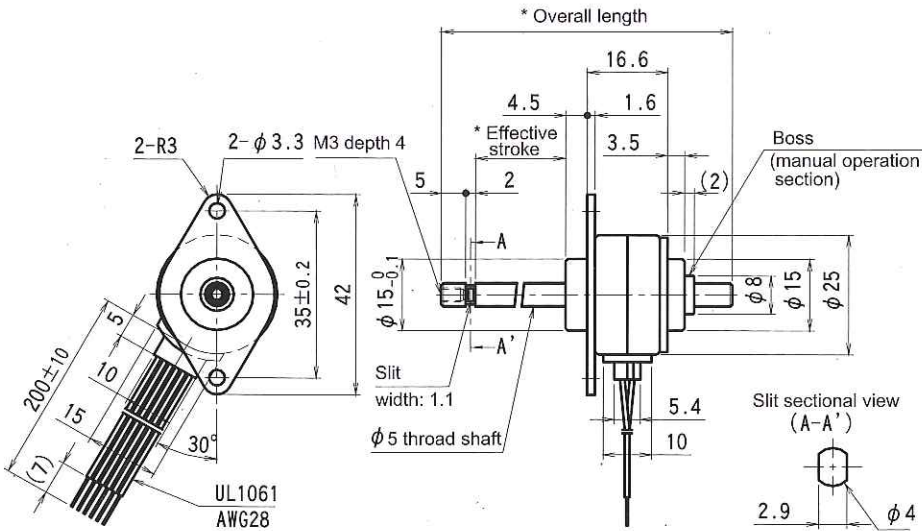
Notes

- ① Voltage Specifications
The standard wiring of the Linearstep is 12V, but we have many other wirings available.
- ② The thrust characteristics are based on unipolar/bipolar constant voltage drive.
(Thrust characteristics are reference value.)
Also, the thrust characteristics are measured by force gauge.
Please contact us for detail on the thrust characteristics of the constant current drive.
(Response and thrust characteristic on high speed will improve.)
Please confirm factors such as thrust when selecting a motor.
They may change depending on measuring methods / drive circuits.
- ③ The life of the motor changes according to the load conditions.
- ④ The total length of the screw shaft is 60mm when the effective stroke is 30mm, and it is 90mm when the effective stroke is 60mm.
- ⑤ Please see below for inquiries.

TEL. 03(3813)8841/FAX. 03(381)7970

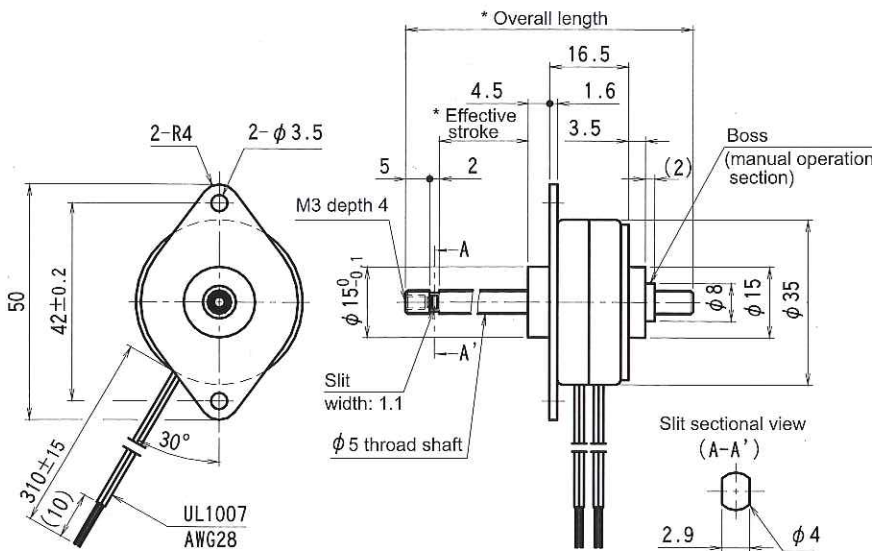
E-mail : motor@npm.co.jp

Outline Drawing PFCL25-48/PFCL25-24



* Screw shaft length: The total length is 60mm when the effective stroke is 30mm and the total length 90mm when it is 60mm.

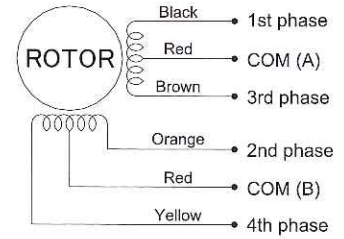
Outline Drawing PFL35T-48



* Screw shaft length: The total length is 60mm when the effective stroke is 30mm and the total length 90mm when it is 60mm.

Connection Diagram

1. Unipolar Drive



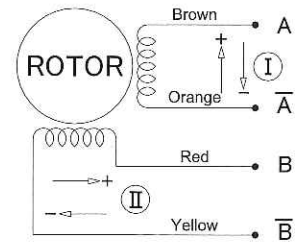
Motion direction

Looking at flange of fitting side

No	Black	Brown	Orange	Yellow	No
1	ON	OFF	ON	OFF	4
2	OFF	ON	ON	OFF	3
3	OFF	ON	OFF	ON	2
4	ON	OFF	OFF	ON	1

← Screw out / Screw in ↑

2. Bipolar Drive



Motion direction

Looking at flange of fitting side

No	(I)	(II)
1	+	+
2	-	+
3	-	-
4	+	-

← Screw out / Screw in ↑

Related Products



Motion Checker MCH-5

MCH series is a product in which the control circuits and drive circuits have been combined. The test of stepping motor performance, experiments, etc. can easily be done with this one. Furthermore, you can connect the MCH series to other devices, such as sequencers.



PCD4511

PCD4511 is a 1-axis pulse control IC developed by NPM. This is built into our "Motion Checker", MCH series. PCD series is available for 1-axis to 4-axis stepper motor control.



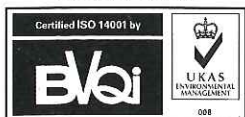
Drivers

◇ Constant voltage drive: PS1LD-42, PS2LD-5
 ◇ Constant current drive: BCD4020UT, BCD4012B
 ◇ Drivers compatible with networks T-BCD series, T-BCDC series
 Many drivers for 1-axis to multi-axis controls are available.

* The specifications may be changed without prior notice for improvement.



ISO 9001 Certified



ISO 14001 Certified

NPM

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Printed in Japan

E CAT. No. Linearstep PFCL25/PFL35T-21E-5507-3(5507)JPA