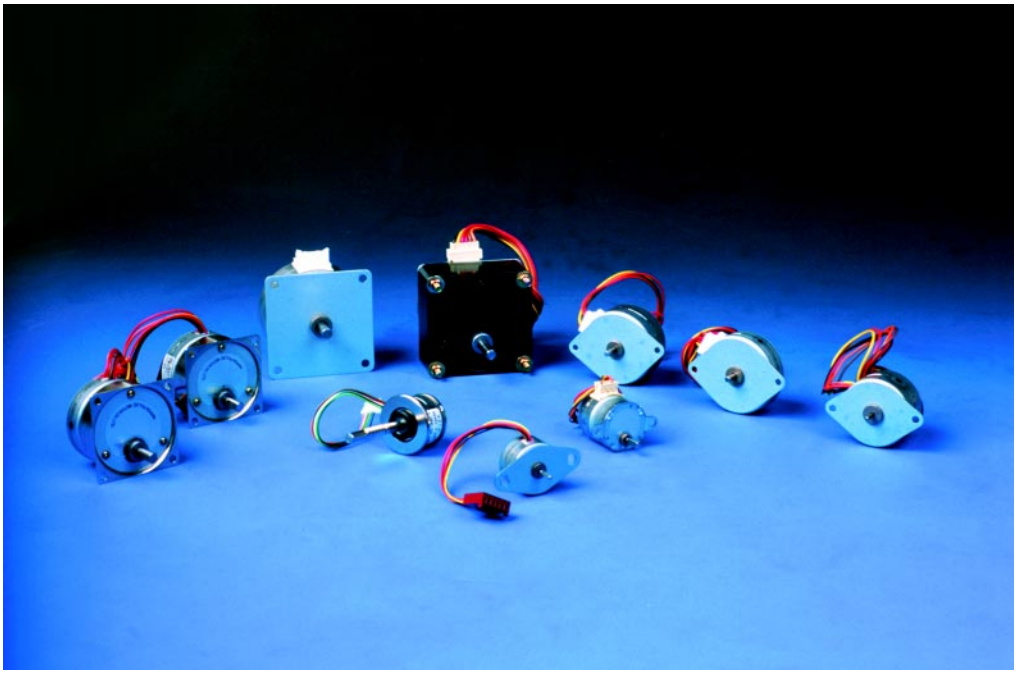


2 Phase Tin-Can type Stepper Motors (PF/PFC series)

PF/PFC series tin-can motors range in diameter from 25mm to 55mm and are permanent magnet type stepper motors with superior cost and performance. The PF/PFC series motors are ideal for mass production applications. Available in three step angles (3.75°, 7.5° and 15°), a choice of windings and magnet materials (Ferrite Anisotropic, Ferrite Isotropic and Neodymium), the PF/PFC series offers the design engineer the ultimate in flexibility to match the applications requirements with the most cost effective motors. A variety of optional flanges, shafts and gear heads are available to meet the requirements of most applications. Also, upon request, accessories such as ball bearings, pinion gears, pulleys, or connectors can be added to the motor providing a complete assembly. Applications for PF/PFC series include medical equipment, printers, fax machines, copiers, analysis machines and industrial equipment.

PF / PFC SERIES

Series	Step angle			Magnet			Motor dimensions		Mass
	3.75° -96	7.5°-48	15°-24	Ferrite	Ferrite	Neodymium	OD (mm)	Thickness (mm)	(g)
PF25		X	X	X	X	X	25	15	35
PFC25		X	X	X	X	X	25	15	35
PF35		X	X	X	X		35	21	80
PF35T		X		X	X	X	35	15	77
PF42		X	X	X	X	X	42	22	160
PF42T	X	X		X	X	X	42	15	105
PFC42H		X		X			42	22	160
PFC42T		X		X		X	42	15	105
PF55		X		X	X	X	55	25	300
PFC55		X		X	X	X	55	25	300
PFC55H		X		X			55	25	300
PFC60		X		X			60	40.4	500

PF / PFC Series Motor Designation

PF C 42 H - 48 C 1

Connector Version
- Blank - Standard
- C - Connector Version (automatic wound motor)

Motor Size (dia. in mm)
- 25
- 35
- 42
- 55

Motor Length or High Torque Version
- Blank - Standard stack & standard torque version
- T - Thin stack & standard torque version (avail. in 35 & 42 sizes)
- H - High torque version (avail. in 42 & 55 sizes)

Steps/Rev
- 24 (15°/step)
- 48 (7.5°/step)
- 96 (3.75°/step)

Coil Winding code
(letter: one space, number: two spaces)
- B - 24 volt unipolar
- C - 12 volt unipolar
- D - 5 volt unipolar
- P - 12 volt bipolar
- Q - 5 volt bipolar
- Other windings available

Magnet Material Type Code
- 1 - Ferrite Anisotropic
- 3 - Ferrite Isotropic
- 4 - Neodymium

For the gear head motors, the gear ratio is designated after the magnet material type code.

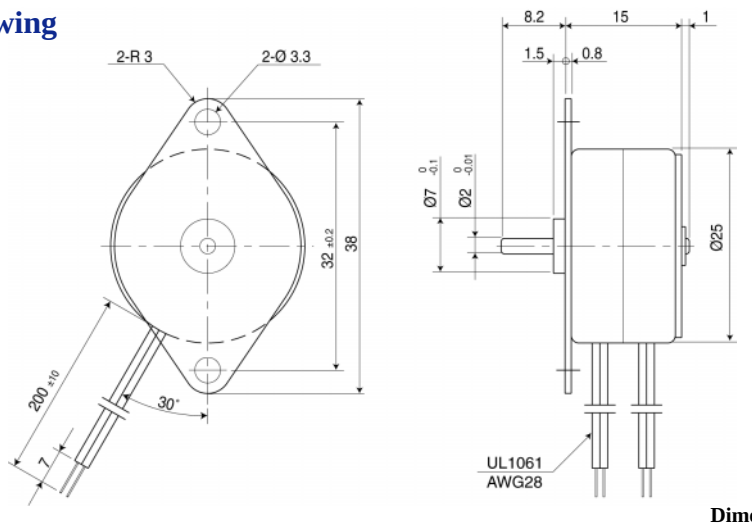
PF C 42 H - 48 B 1 G 1/10

- Gear Ratio
- G means with gear head

Parameters	Unit	PF25-24				PF25-48			
Drive Mode		Unipolar		Bipolar		Unipolar		Bipolar	
Excitation Mode		Full-step (2-2 ex)				Full-step (2-2 ex)			
Step Angle	°	15				7.5			
Step Angle Tolerance	%	± 5				± 5			
Steps per Revolution		24				48			
Voltage	V	12	5	12	5	12	5	12	5
Winding Resistance	Ω/Ø	120	16	122	15	120	16	122	15
Winding Inductance	mH/Ø	34	4.5	66	8	39	5.5	81	10
Holding Torque	mN•m	8	8	10	10	10	10	12	12
Rotor Inertia	kg•m²	1.0 x 10^{-7}				1.0 x 10^{-7}			
Starting Pulse Rate, Max	pps	490				790			
Slewing Pulse Rate, Max	pps	900				900			
Ambient Temp. Range, Operating	°C	-10 ~ + 50				-10 ~ + 50			
Temperature rise	K	70				70			
Mass	g	35				35			

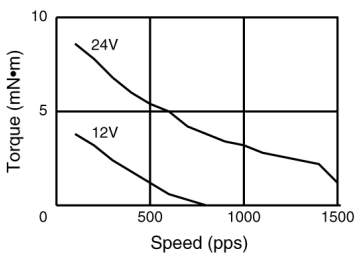
Note: Above data is based on Rated Voltage Drive. The magnet type is Anisotropic.

Outline Dimension Drawing

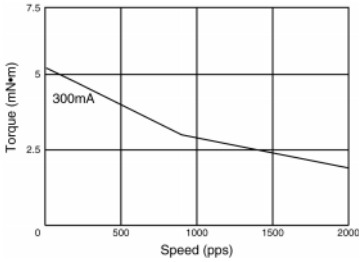


Dimensions in MM. Inches = MM*0.04

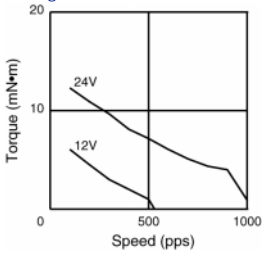
PF25-24C1 Unipolar Rated / Double Voltage Drive



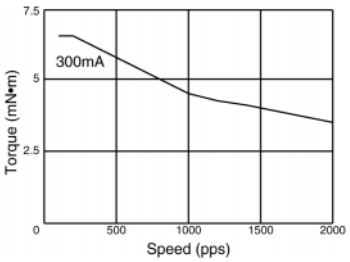
PF25-24D1 Unipolar Chopper Drive at 24V



PF25-24P1 Bipolar Rated/Double Voltage Drive



PF25-24Q1 Bipolar Chopper Drive at 24V



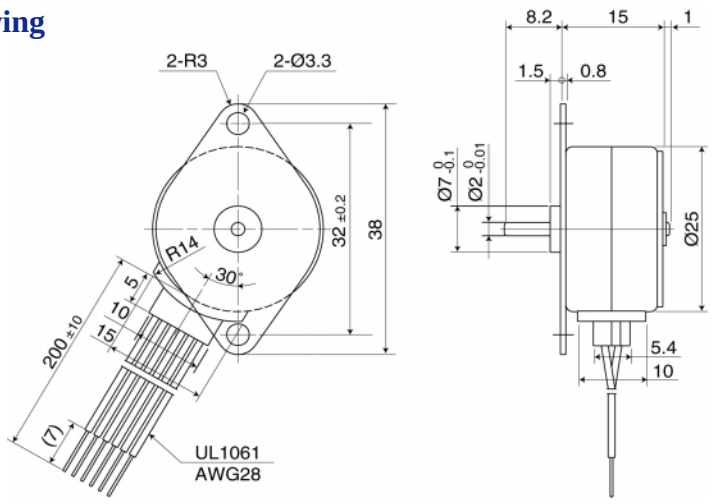
Torque Curve Note: 1 mN•m = 0.14 oz-in

PFC25-24 / PFC25-48

Parameters	Unit	PFC25-24				PFC25-48			
Drive mode		Unipolar		Bipolar		Unipolar		Bipolar	
Excitation Mode		Full-step (2-2 ex)				Full-step (2-2 ex)			
Step Angle	°	15				7.5			
Step Angle Tolerance	%	± 5				± 5			
Steps per Revolution		24				48			
Voltage	V	12	5	12	5	12	5	12	5
Winding Resistance	Ω/Ø	120	16	122	15	120	16	122	15
Winding Inductance	mH/Ø	34	4.5	66	8	39	5.5	81	10
Holding Torque	mN•m	8	8	10	10	10	10	12	12
Rotor Inertia	kg•m²	1.0 x 10^{-7}				1.0 x 10^{-7}			
Starting Pulse Rate, Max	pps	490				790			
Slewing Pulse Rate, Max	pps	900				900			
Ambient Temp. Range, Operating	°C	-10 ~ + 50				-10 ~ + 50			
Temperature rise	K	70				70			
Mass	g	35				35			

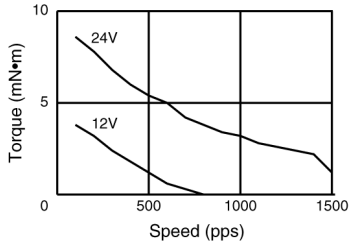
Note: Above data is based on Rated Voltage Drive. The magnet type is Anisotropic.

Outline Dimension Drawing

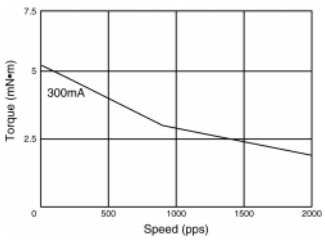


Dimensions in MM. Inches = MM*0.04

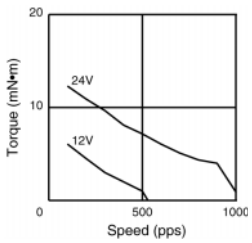
PFC25-24C1 Unipolar Rated / Double Voltage Drive



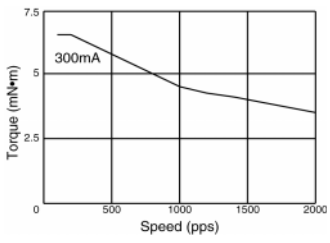
PFC25-24D1 Unipolar Chopper Drive at 24V



PFC25-24P1 Bipolar Rated/Double Voltage Drive



PFC25-24Q1 Bipolar Chopper Drive at 24V

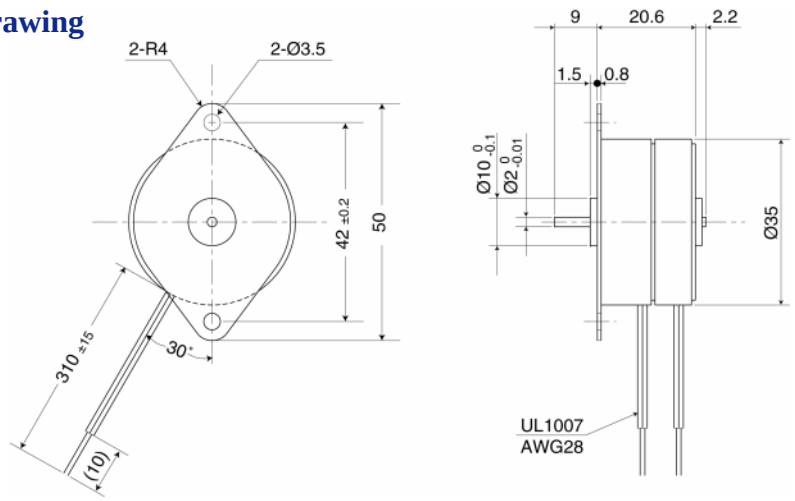


Torque Curve Note: 1 mN•m = 0.14 oz-in

Parameters	Unit	PF35-24				PF35-48			
Drive mode		Unipolar		Bipolar		Unipolar		Bipolar	
Excitation Mode		Full-step (2-2 ex)				Full-step (2-2 ex)			
Step Angle	°	15				7.5			
Step Angle Tolerance	%	± 5				± 5			
Steps per Revolution		24				48			
Voltage	V	12	5	12	5	12	5	12	5
Winding Resistance	Ω/Ø	90	16	100	17	90	16	100	17
Winding Inductance	mH/Ø	48	8.9	95	14	48	8.9	124	19
Holding Torque	mN•m	15	15	19	19	20	20	25	25
Rotor Inertia	kg•m²	4.5 x10^{-7}				4.5 x10^{-7}			
Starting Pulse Rate, Max	pps	310				500			
Slewing Pulse Rate, Max	pps	410				530			
Ambient Temp. Range, Operating	°C	-10 ~ + 50				-10 ~ + 50			
Temperature rise	K	55				55			
Mass	g	80				80			

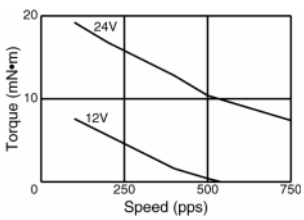
Note: Above data is based on Rated Voltage Drive. The magnet type is Anisotropic.

Outline Dimension Drawing

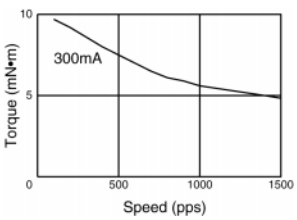


Dimensions in MM. Inches = MM*0.04

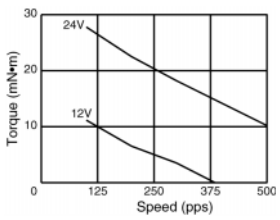
PF35-24C1 Unipolar Rated / Double Voltage Drive



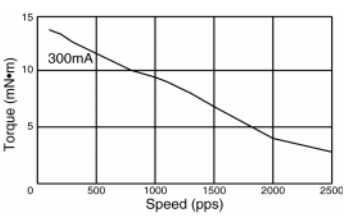
PF35-24D1 Unipolar Chopper Drive at 24V



PF35-24P1 Bipolar Rated/Double Voltage Drive



PF35-24Q1 Bipolar Chopper Drive at 24V



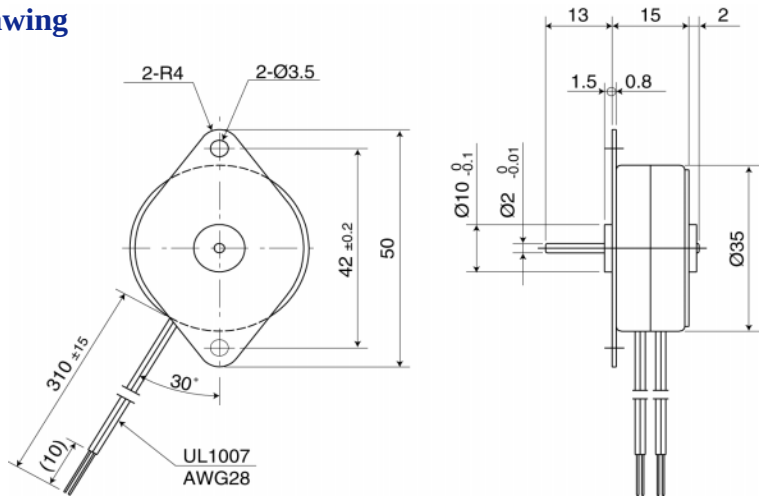
Torque Curve Note: 1 mN•m = 0.14 oz-in

PF35T-48

Parameters	Unit	PF35T-48			
Drive mode		Unipolar		Bipolar	
Excitation Mode		Full-step (2-2 ex)			
Step Angle	°	7.5			
Step Angle Tolerance	%	± 5			
Steps per Revolution		48			
Voltage	V	12	5	12	5
Winding Resistance	Ω/Ø	70	12	72	16
Winding Inductance	mH/Ø	36	6.5	60	6.2
Holding Torque	mN•m	18	18	27	27
Rotor Inertia	kg•m²	2.7 x10^{-7}			
Starting Pulse Rate, Max	pps	600			
Slewing Pulse Rate, Max	pps	610			
Ambient Temp. Range, Operating	°C	-10 ~ + 50			
Temperature rise	K	70			
Mass	g	77			

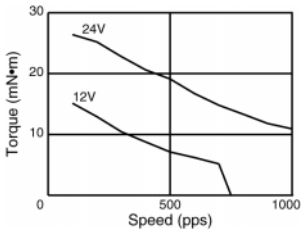
Note: Above data is based on Rated Voltage Drive. The magnet type is Anisotropic.

Outline Dimension Drawing

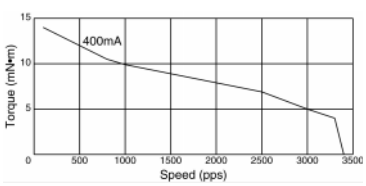


Dimensions in MM. Inches = MM*0.04

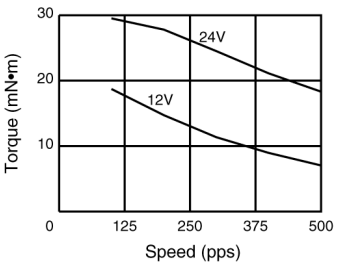
PF35T-48C1 Unipolar Rated / Double Voltage Drive



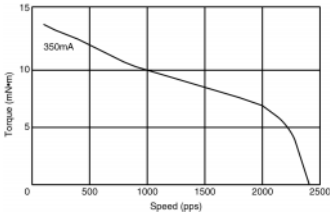
PF35T-48D1 Unipolar Chopper Drive at 24V



PF35T-48R1 Bipolar Rated/Double Voltage Drive



PF35T-48Q1 Bipolar Chopper Drive at 24V

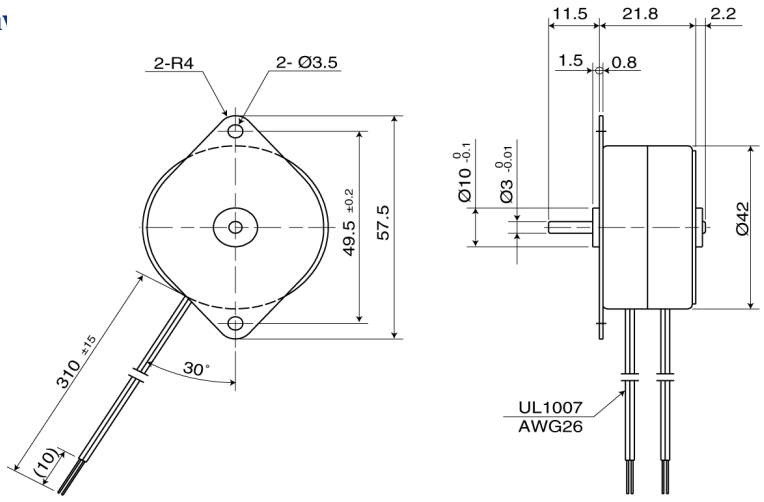


Torque Curve Note: 1 mN•m = 0.14 oz-in

Parameters	Unit	PF42-24				PF42-48			
Drive mode		Unipolar		Bipolar		Unipolar		Bipolar	
Excitation Mode		Full-step (2-2 ex)				Full-step (2-2 ex)			
Step Angle	°	15				7.5			
Step Angle Tolerance	%	± 5				± 5			
Steps per Revolution		24				48			
Voltage	V	12	5	12	5	12	5	12	5
Winding Resistance	Ω/Ø	70	12	76	14	70	12	76	14
Winding Inductance	mH/Ø	43	7.2	74	14	54	9.1	87	16
Holding Torque	mN•m	28	28	41	41	45	45	54	54
Rotor Inertia	kg•m²	16.8 x10^{-7}				12.8 x10^{-7}			
Starting Pulse Rate, Max	pps	240				310			
Slewing Pulse Rate, Max	pps	350				320			
Ambient Temp. Range, Operating	°C	-10 ~ + 50				-10 ~ + 50			
Temperature rise	K	55				55			
Mass	g	160				160			

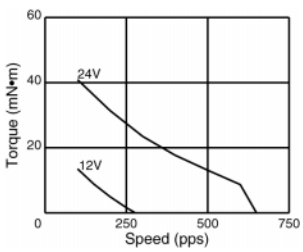
Note: Above data is based on Rated Voltage Drive. The magnet type is Anisotropic.

Outline Dimension Dra

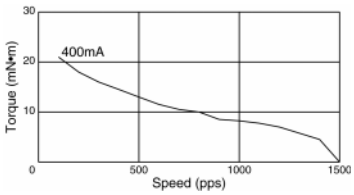


Dimensions in MM. Inches = MM*0.04

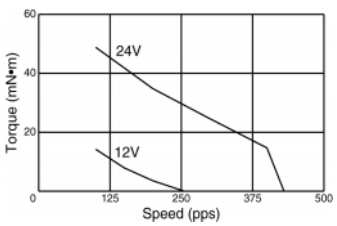
PF42-24C1 Unipolar Rated / Double Voltage Drive



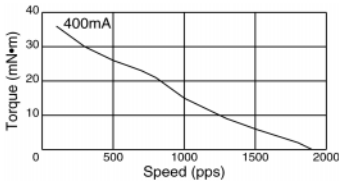
PF42-24D1 Unipolar Chopper Drive at 24V



PF42-24P1 Bipolar Rated/Double Voltage Drive



PF42-24Q1 Bipolar Chopper Drive at 24V



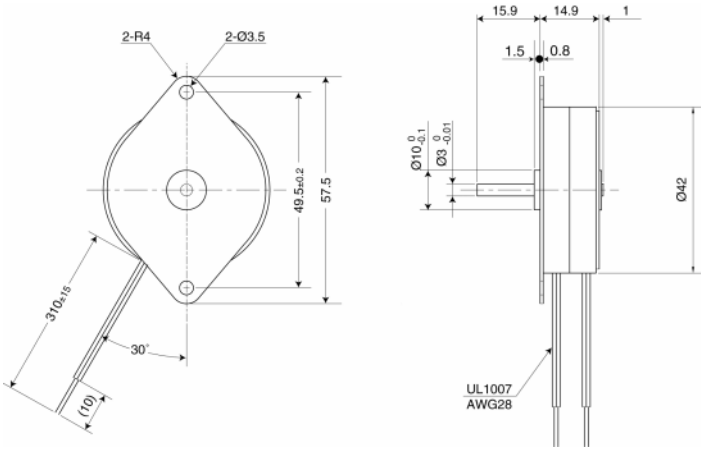
Torque Curve Note: 1 mN•m = 0.14 oz-in

PF42T-48 / PF42T-96

Parameters	Unit	PF42T-48				PF42T-96			
Drive mode		Unipolar		Bipolar		Unipolar		Bipolar	
Excitation Mode		Full-step (2-2 ex)				Full-step (2-2 ex)			
Step Angle	°	7.5				3.75			
Step Angle Tolerance	%	± 5				± 5			
Steps per Revolution		48				96			
Voltage	V	12	5	12	5	12	5	12	5
Winding Resistance	Ω/Ø	60	9.5	64	12	60	95	64	12
Winding Inductance	mH/Ø	35	5.6	50	16	25	4	51	17
Holding Torque	mN•m	34	34	42	42	36	36	49	49
Rotor Inertia	kg•m²	14.3 x10^{-7}				14.3 x10^{-7}			
Starting Pulse Rate, Max	pps	380				540			
Slewing Pulse Rate, Max	pps	520				590			
Ambient Temp. Range, Operating	°C	-10 ~ + 50				-10 ~ + 50			
Temperature rise	K	70				70			
Mass	g	110				110			

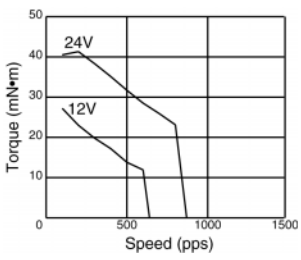
Note: Above data is based on Rated Voltage Drive. The magnet type is Anisotropic.

Outline Dimension Drawing

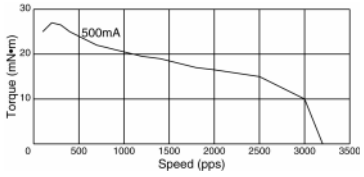


Dimensions in MM. Inches = MM*0.04

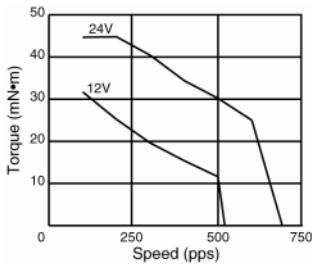
PF42T-96C1 Unipolar Rated / Double Voltage Drive



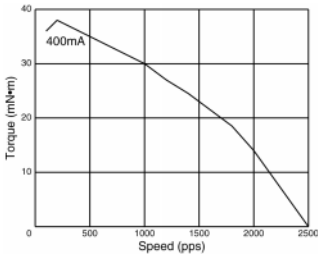
PF42T-96D1 Unipolar Chopper Drive at 24V



PF42T-96P1 Bipolar Rated / Double Voltage Drive



PF42T-96Q1 Bipolar Chopper Drive at 24V

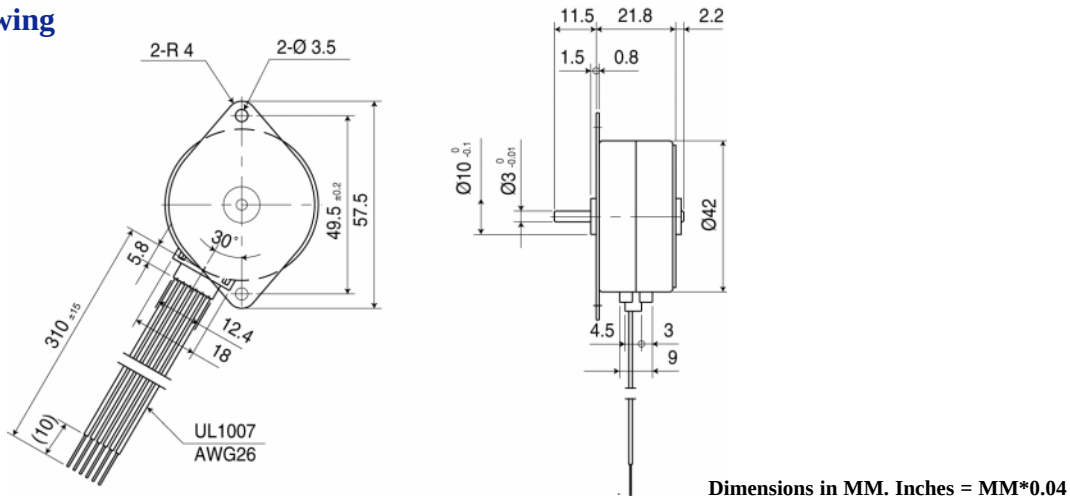


Torque Curve Note: 1 mN•m = 0.14 oz-in

Parameters	Unit	PFC42H-48			
Drive mode		Unipolar		Bipolar	
Excitation Mode		Full-step (2-2 ex)			
Step Angle	°	7.5			
Step Angle Tolerance	%	± 5			
Steps per Revolution		48			
Voltage	V	12	5	12	5
Winding Resistance	Ω/Ø	70	12	70	12
Winding Inductance	mH/Ø	39	6.6	80	13
Holding Torque	mN•m	50	50	70	70
Rotor Inertia	kg•m²	14.0 x10^{-7}			
Starting Pulse Rate, Max	pps	360			
Slewing Pulse Rate, Max	pps	380			
Ambient Temp. Range, Operating	°C	-10 ~ + 50			
Temperature rise	K	55			
Mass	g	160			

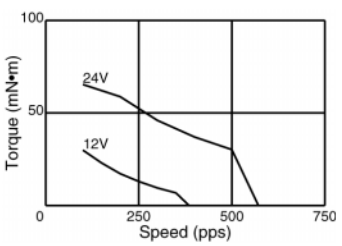
Note: Above data is based on Rated Voltage Drive. The magnet type is Anisotropic.

Outline Dimension Drawing

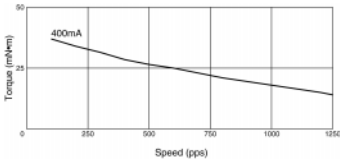


Dimensions in MM. Inches = MM*0.04

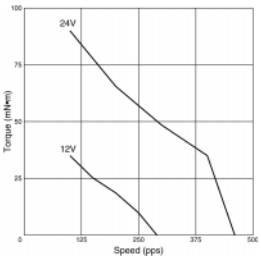
PFC42H-48C1 Unipolar Rated / Double Voltage Drive



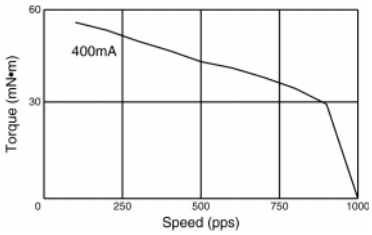
PFC42H-48D1 Unipolar Chopper Drive at 24V



PFC42H-48P1 Bipolar Rated / Double Voltage Drive



PFC42H-48Q1 Bipolar Chopper Drive at 24V



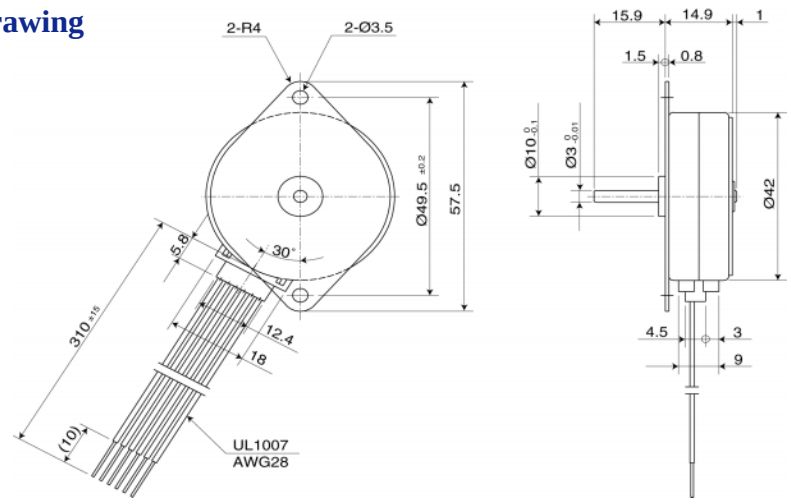
Torque Curve Note: 1 mN•m = 0.14 oz-in

PFC42T-48

Parameters	Unit	PFC42T-48			
Drive mode		Unipolar		Bipolar	
Excitation Mode		Full-step (2-2 ex)			
Step Angle	°	7.5			
Step Angle Tolerance	%	± 5			
Steps per Revolution		48			
Voltage	V	12	5	12	5
Winding Resistance	Ω/Ø	60	9.5	64	12
Winding Inductance	mH/Ø	35	5.6	50	16
Holding Torque	mN•m	34	34	42	42
Rotor Inertia	kg•m²	14.3 x10^{-7}			
Starting Pulse Rate, Max	pps	380			
Slewing Pulse Rate, Max	pps	520			
Ambient Temp. Range, Operating	°C	-10 ~ + 50			
Temperature rise	K	70			
Mass	g	110			

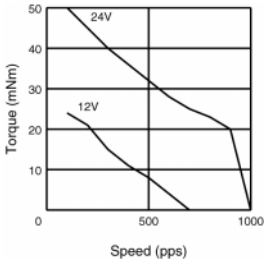
Note: Above data is based on Rated Voltage Drive. The magnet type is Anisotropic.

Outline Dimension Drawing

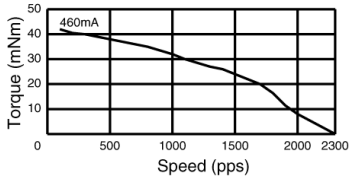


Dimensions in MM. Inches = MM*0.04

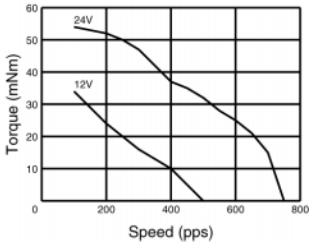
PFC42T-48C1 Unipolar Rated / Double Voltage Drive



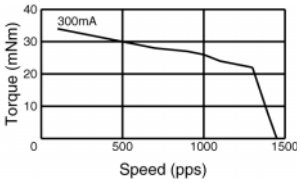
PFC42T-48071 Unipolar Chopper Drive



PFC42T-48P1 Rated / Double Voltage Drive



PFC42T-48271 Bipolar Chopper Drive

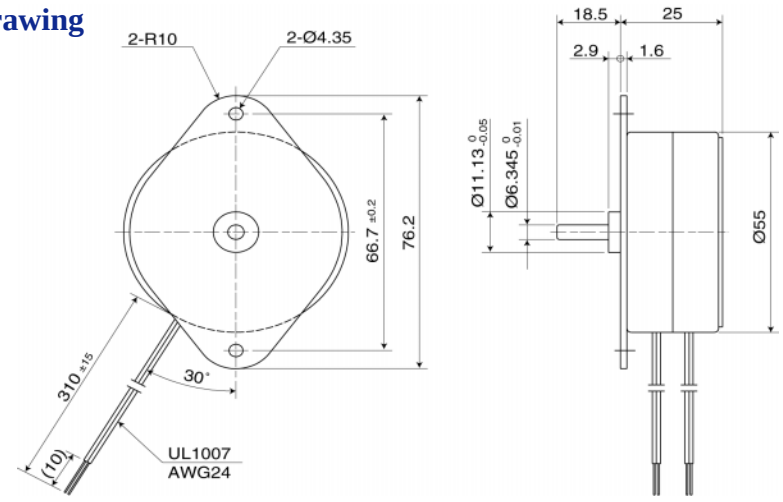


Torque Curve Note: 1 mN•m = 0.14 oz-in

Parameters	Unit	PF55-48			
Drive mode		Unipolar		Bipolar	
Excitation Mode		Full-step (2-2 ex)			
Step Angle	°	7.5			
Step Angle Tolerance	%	± 5			
Steps per Revolution		48			
Voltage	V	12	5	12	5
Winding Resistance	Ω/Ø	36	5	40	6.75
Winding Inductance	mH/Ø	43	5.9	84	12
Holding Torque	mN•m	120	120	150	150
Rotor Inertia	kg•m²	40.0 x10^{-7}			
Starting Pulse Rate, Max	pps	300			
Slewing Pulse Rate, Max	pps	310			
Ambient Temp. Range, Operating	°C	-10 ~ + 50			
Temperature rise	K	55			
Mass	g	300			

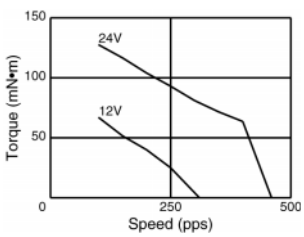
Note: Above data is based on Rated Voltage Drive. The magnet type is Anisotropic.

Outline Dimension Drawing

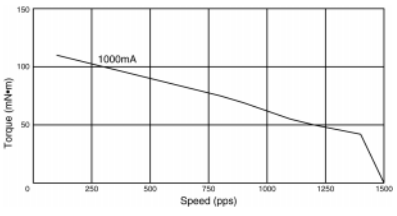


Dimensions in MM. Inches = MM*0.04

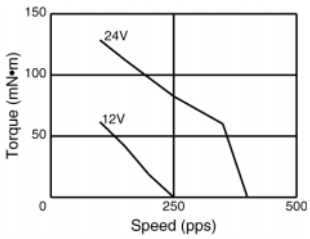
PF55-48C1 Unipolar Rated / Double Voltage Drive



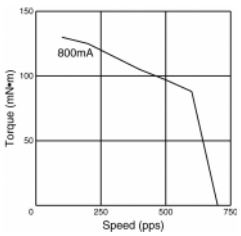
PF55-48D1 Unipolar Chopper Drive at 24V



PF55-48P1 Bipolar Rated / Double Voltage Drive



PF55-48Q1 Bipolar Chopper Drive at 24V



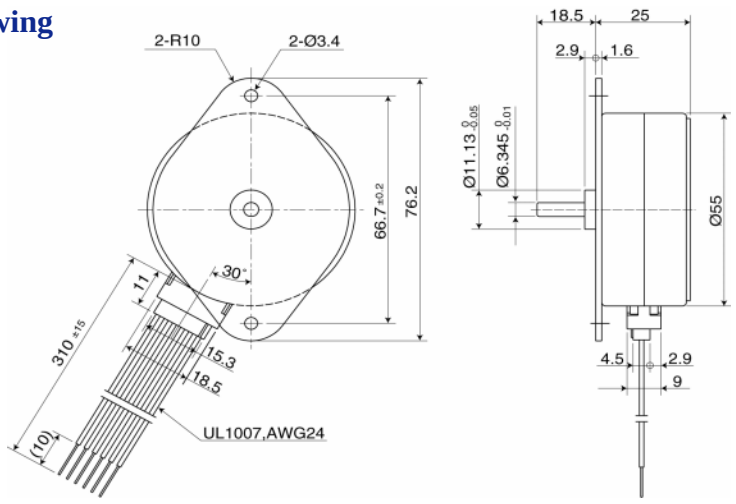
Torque Curve Note: 1 mN•m = 0.14 oz-in

PFC55-48

Parameters	Unit	PFC55-48			
Drive mode		Unipolar		Bipolar	
Excitation Mode		Full-step (2-2 ex)			
Step Angle	°	7.5			
Step Angle Tolerance	%	± 5			
Steps per Revolution		48			
Voltage	V	12	5	12	5
Winding Resistance	Ω/Ø	36	5	40	6.75
Winding Inductance	mH/Ø	43	5.9	84	12
Holding Torque	mN•m	120	120	150	150
Rotor Inertia	kg•m²	40.0 x10^{-7}			
Starting Pulse Rate, Max	pps	300			
Slewing Pulse Rate, Max	pps	310			
Ambient Temp. Range, Operating	°C	-10 ~ + 50			
Temperature rise	K	55			
Mass	g	300			

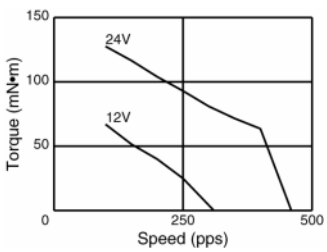
Note: Above data is based on Rated Voltage Drive. The magnet type is Anisotropic.

Outline Dimension Drawing

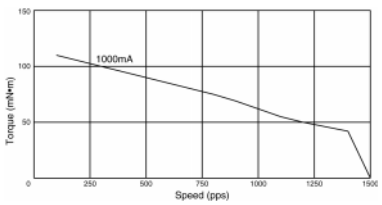


Dimensions in MM. Inches = MM*0.04

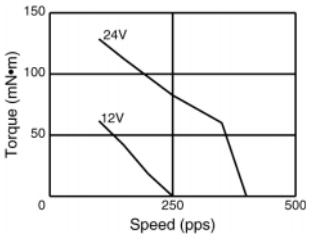
PFC55-48C1 Unipolar Rated / Double Voltage Drive



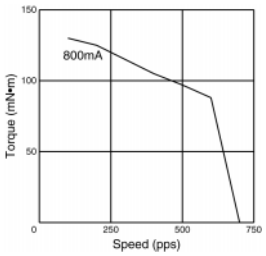
PFC55-48D1 Unipolar Chopper Drive at 24V



PFC55-48P1 Bipolar Rated / Double Voltage Drive



PFC55-48Q1 Bipolar Chopper Drive at 24V

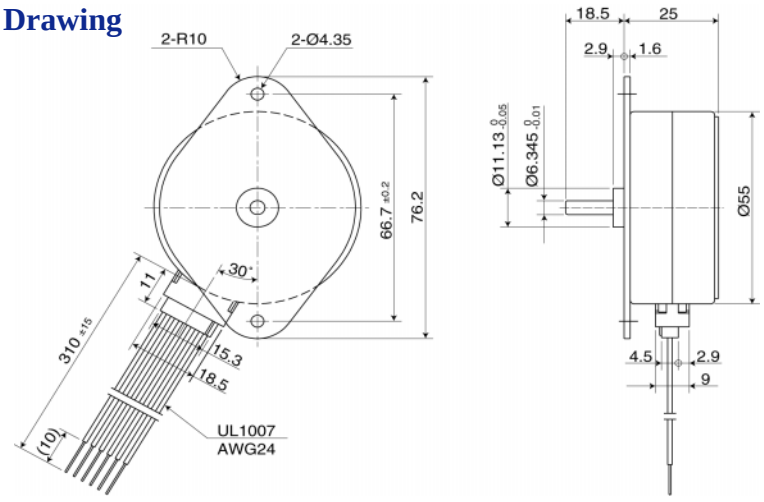


Torque Curve Note: 1 mN•m = 0.14 oz-in

Parameters	Unit	PFC55H-48			
Drive mode		Unipolar		Bipolar	
Excitation Mode		Full-step (2-2 ex)			
Step Angle	°	7.5			
Step Angle Tolerance	%	± 5			
Steps per Revolution		48			
Voltage	V	12	5	12	5
Winding Resistance	Ω/Ø	36	5	40	8
Winding Inductance	mH/Ø	30	4.4	66	16
Holding Torque	mN•m	120	120	180	180
Rotor Inertia	kg•m²	57.0 x10^{-7}			
Starting Pulse Rate, Max	pps	270			
Slewing Pulse Rate, Max	pps	280			
Ambient Temp. Range, Operating	°C	-10 ~ + 50			
Temperature rise	K	55			
Mass	g	300			

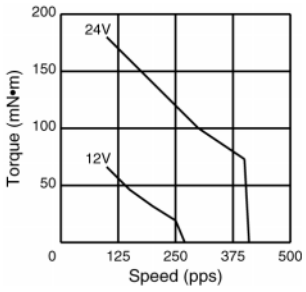
Note: Above data is based on Rated Voltage Drive. The magnet type is Anisotropic.

Outline Dimension Drawing

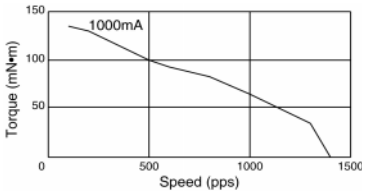


Dimensions in MM. Inches = MM*0.04

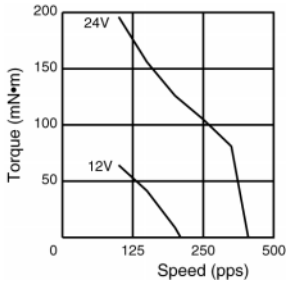
PFC55H-48C1 Unipolar Rated / Double Voltage Drive



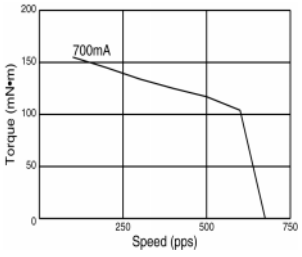
PFC55H-48D1 Unipolar Chopper Drive at 24V



PFC55H-48X1 Bipolar Rated / Double Voltage Drive



PFC55H-48S1 Bipolar Chopper Drive at 24V



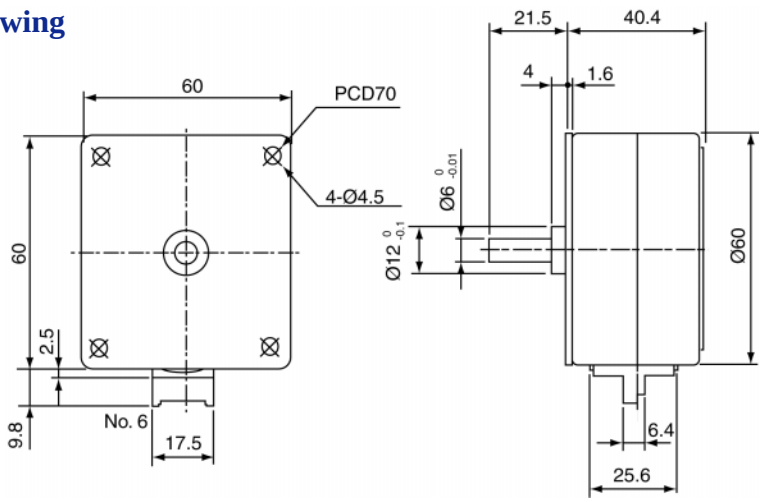
Torque Curve Note: 1 mN•m = 0.14 oz-in

PFC60-48

Parameters	Unit	PFC60-48			
Drive mode		Unipolar		Bipolar	
Excitation Mode		Full-step (2-2 ex)			
Step Angle	°	7.5			
Step Angle Tolerance	%	±5			
Steps per Revolution		48			
Voltage	V	12	5	12	5
Winding Resistance	Ω/Ø	32	4.2	32	4.2
Winding Inductance	mH/Ø	43	5.8	80	10
Holding Torque	mN•m	240	240	270	270
Rotor Inertia	kg•m²	160 x 10^{-7}			
Starting Pulse Rate, Max	pps	150			
Slewing Pulse Rate, Max	pps	160			
Ambient Temp. Range, Operating	°C	-10 ~ +50			
Temperature rise	K	70			
Mass	g	500			

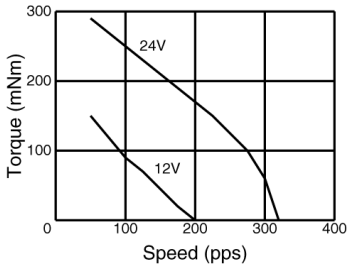
Note: Above data is based on Rated Voltage Drive. The magnet type is Anisotropic.

Outline Dimension Drawing

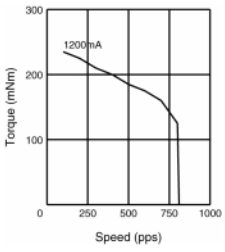


Dimensions in MM. Inches = MM*0.04

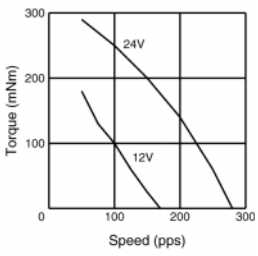
PFC60-48C1 Unipolar Rated / Double Voltage Drive



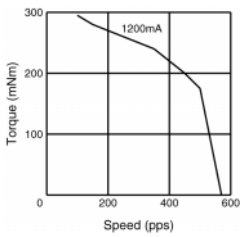
PFC60-48D1 Unipolar Chopper Drive at 24V



PFC60-48X1 Bipolar Rated / Double Voltage Drive



PF60H-48S1 Bipolar Chopper Drive at 24V



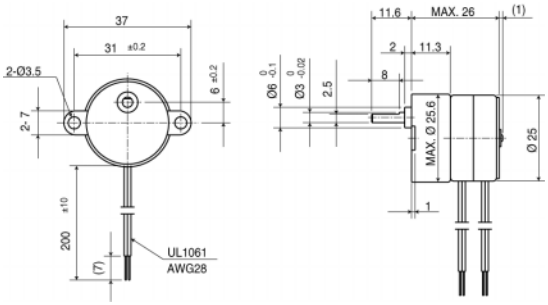
Torque Curve Note: 1 mN•m = 0.14 oz-in

PF / PFC SERIES WITH GEAR HEAD

Motor	Gear Head	Ratio
PF25,PFC25 GH motors	P Gear Head	21 gear ratios are available between 6/25 and 1/300
PF35,PF35T GH motors	M Gear Head	23 gear ratios are available between 1/5 and 1/900
PF35,PF35T GH motors	H Gear Head	20 gear ratios are available between 6/25 and 1/300
PF42,PFC42H,PF42T,PFC42T GH motors	H Gear Head	20 gear ratios are available between 6/25 and 1/300
PF55,PFC55,PFC55H GH motors	F Gear Head	17 gear ratios are available between 6/25 and 1/300
PF55,PFC55,PFC55H GH motors	FG Ball Bearing Gear Head	16 gear ratios are available between 1/3 and 1/180

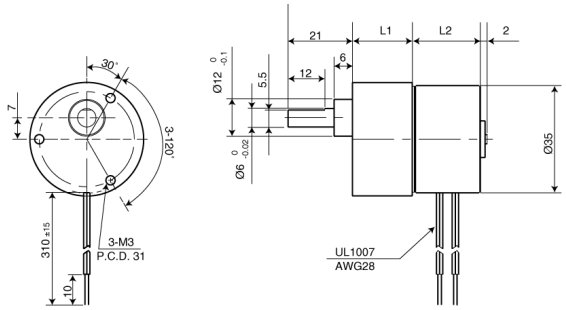
PF25 / PFC25 with P gear head

Gear ratio	6/25	1/5	3/25	1/10	2/25	1/15	3/50	1/20	1/25	1/30	1/50	1/60	1/75	1/100	1/120	1/125	1/150	1/200	1/250	1/300
Max allowable torque	20mN•m				50mN•m				70m•Nm					100m•Nm						



PF35 / PF35T with M gear head

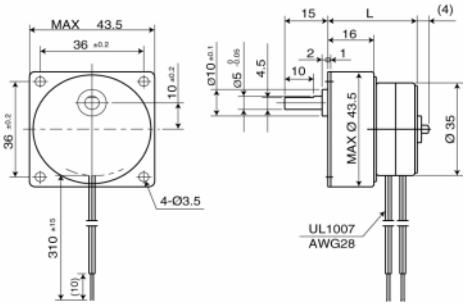
Gear ratio	1/5	1/6	1/10	1/18	1/30	1/50	1/60	1/75	1/90	1/100	1/120	1/125	1/150	1/180	1/200	1/270	1/300	1/400
Max allowable torque (mN•m)	100	100	100	200	200	300	300	300	300	300	300	600	600	600	600	600	600	600
L1	19.5	19.5	19.5	19.5	21.7	21.7	21.7	21.7	21.7	21.7	21.7	23.8	23.8	23.8	23.8	23.8	23.8	26.0



	L2
PF35	19.1
PF35T	13.5

PF35 / PF35T with H gear head

Gear ratio	6/25	1/5	3/25	1/10	1/12.5	1/15	3/50	1/20	1/25	1/30	1/50	1/60	1/75	1/100	1/120	1/125	1/150	1/200	1/300
Max allowable torque	100 mN•m		200 mN•m				250 mN•m				300 mN•m			400 mN•m					



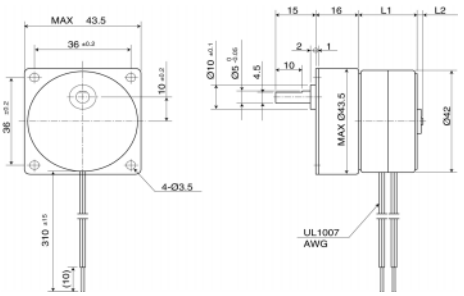
	L
PF35	Max 36.6
PF35T	Max 31

Dimensions in MM. Inches = MM*0.04

PF / PFC SERIES WITH GEAR HEAD

PF42 / PFC42H / PF42T / PFC42T with H gear head

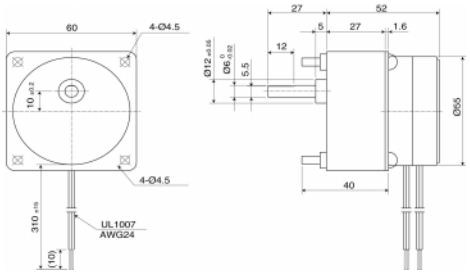
Gear ratio	6/25	1/5	3/25	1/10	1/12.5	1/15	3/50	1/20	1/25	1/30	1/50	1/60	1/62.5	1/75	1/100	1/120	1/125	1/150	1/200	1/300
Max allowable torque	100 mN•m		200 mN•m				250 mN•m				300 mN•m				400 mN•m					



	L1	L2	AWG
PF42/PFC42H	21.8	26	AWG26
PF42T/PFC42T	15	28	AWG28

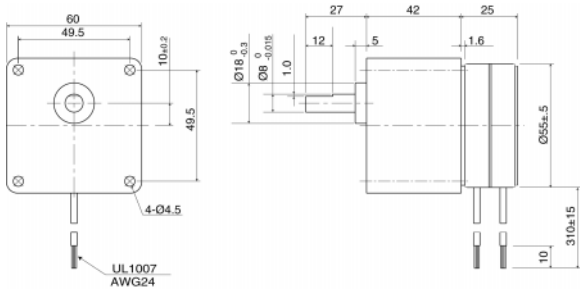
PF55 / PFC55 / PFC55H with F gear head

Gear ratio	6/25	1/5	3/25	1/10	1/12.5	1/15	3/50	1/25	1/30	1/50	1/60	3/250	1/100	1/125	1/150	1/250	1/300
Max allowable torque	400mN•m							700mN•m				1000mN•m					



PF55 / PFC55 / PFC55H with FG-BB gear head

Gear ratio	1/3	1/5	1/7.5	1/10	1/12.5	1/15	1/20	1/25	1/30	1/50	1/60	1/75	1/100	1/125	1/150	1/180
Max allowable torque	400mN•m		500mN•m			600mN•m	800mN•m	900mN•m	1100mN•m	1600mN•m		2500mN•m				



Dimensions in MM. Inches = MM*0.04