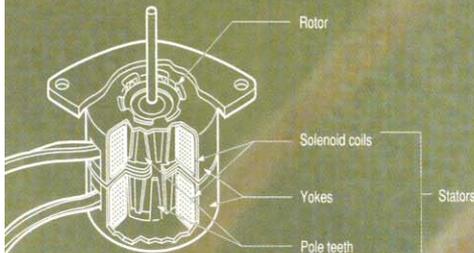


BPM-Series Permanent Magnet Stepper Motors

Astrosyn is a major supplier of stepper motors, drives and controls. In addition to this product guide, detailed specifications are available on each device and we are happy to discuss any applications or requirements that you may have.

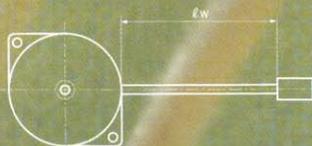
Introduction to Permanent Magnet Steppers

Stepper motors convert electric pulses into incremental mechanical motions. Astrosyn BPM stepper motors have a yoke structure with a cylindrical permanent magnet rotor, as illustrated below. The rotor turns when a rotating magnetic field is generated and when the rotor magnet is synchronised with the rotating magnetic field. The rotating field is generated by applying alternating current to the solenoid coils of two stators, which are sandwiched between yokes. These yokes have the same number of teeth as the poles of the rotor magnet. The stators are positioned so that their electric phase angles are 90 degrees apart.



Connectors and Lead Wires

Our standard motor range is fitted with FPC connectors, but motors with lead wires are also available.



The lead wire length is measured from the outer circumference of the motor to the near end of the connector. The standard tolerance is $\pm 10\text{mm}$.

BPM-Series Motor Specifications

Standard Lead Wires

The standard lead wire colours are red (x2), yellow, orange, black and brown.

UL Rating

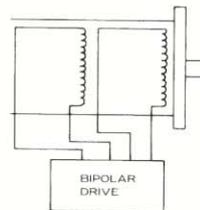
Standard lead wires on models BPM20 and BPM25 are UL1061. Larger frame sizes BPM35 to BPM55 are either UL1007 or UL1430.

Drive Electronics

The performance of BPM-steppers is strongly influenced by the type of drive used. Models BPM10 and BPM15 can only be driven in bipolar mode; all others can be configured for unipolar or bipolar drives.

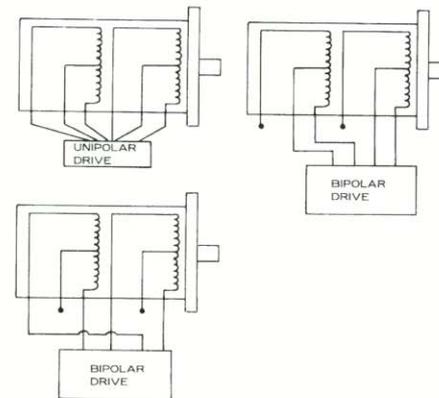
BPM-Series stepper motors may be driven with clockwise or counter clockwise rotation, depending on the switching sequence of the phases.

4 Lead wire stepper motors



Can only be driven from a bipolar drive. Bipolar drives require 4 motor wires and energise the 2 phases sequentially with alternate polarity.

6 Lead wire stepper motors



Can be driven from unipolar or bipolar drives.

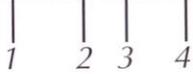
Customisation

Astrosyn can supply motors customised to suit an individual application, e.g., d-flats, holes, threads, keyways. We also offer a range of accessories and welcome custom requirements.

BPM Stepper Motor Range

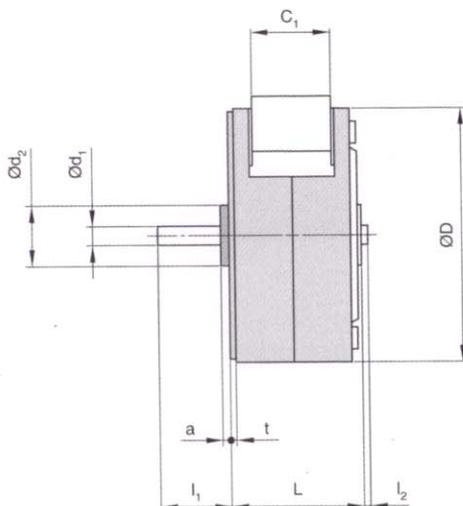
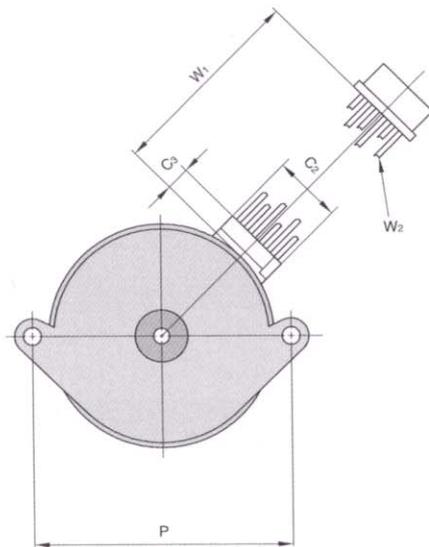
Astrosyn BPM stepper motor model numbers are coded according to the following convention.

BPM25 Y-024-XX



- 1 Code for motor type
- 2 Stack Length (short or long)
- 3 Number of steps/revolution
- 4 Model serial number

Standard Dimensions



Models and Dimensions

All dimensions in mm

Motor Type	D	L _{max}	d ₁	d ₂	a	C ₁	C ₂	C ₃	W _{min}	t	l ₂
BPM10S	10	10.2	1.5	6	1.2	n/a	n/a	n/a	n/a	0.5	1.0
BPM15S	15	12.0	1.5	6	0.5	n/a	n/a	n/a	n/a	0.8	1.0
BPM20S	20	15.5	1.5	6	1.5	11	7.6	4.4	70	0.8	1.0
BPM20L	20	19.6	1.5	6	1.5	11	7.6	4.4	70	0.8	1.0
BPM25S	25	12.5	2	7	1.5	11	7.6	4.4	70	0.8	1.0
BPM25L	25	17.0	2	7	1.5	11	7.6	4.4	70	0.8	1.0
BPM35S	35	15.5	2 or 3	10	1.5	13	13	5	70	0.8	1.0
BPM35L	35	22.2	2 or 3	10	1.5	13	13	5	70	0.8	1.0
BPM42S	42	15.5	3	10	1.5	13	13	5	70	0.8	1.0
BPM42L	42	22.2	3	10	1.5	13	13	5	70	0.8	1.0
BPM55L	55	25.7	4 or 6.3	11.1	2.3	13	13	5	70	1.6	1.0

Motor Shaft Lengths

Motor Type	Standard Shaft Lengths in mm											
	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	11-15
BPM10S	✓		✓		✓		✓		✓		✓	
BPM15S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BPM20S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BPM20L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BPM25S			✓	✓	✓	✓	✓	✓	✓	✓	✓	
BPM25L			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Motor Type	Standard Shaft Lengths in mm											
	7	8	9	10	11	12	13	14	15	16	18	20-24
BPM35S	✓	✓	✓	✓	✓	✓	✓	✓	✓			
BPM35L	✓	✓	✓	✓	✓	✓	✓	✓	✓			
BPM42S	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BPM42L	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BPM55L				✓	✓	✓	✓	✓	✓	✓	✓	✓

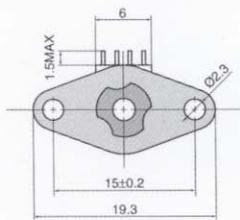
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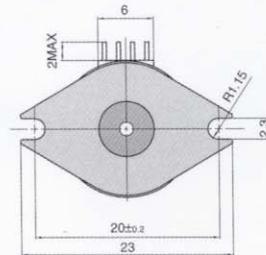
Standard Range

Models BPM10 & BPM15

Flange Type	Θ 30°	Θ 45°	Θ 60°	Θ 75°	Θ 90°	Θ 105°	Θ 120°	Θ 135°	Θ 150°	P	H	T	a	R	A
BPM10	n/a	n/a	n/a	n/a	√	n/a	n/a	n/a	n/a	15	2.3	n/a	n/a	n/a	n/a
BPM15	n/a	n/a	n/a	n/a	√	n/a	n/a	n/a	n/a	20	2.3	n/a	n/a	n/a	n/a



Model BMP 10

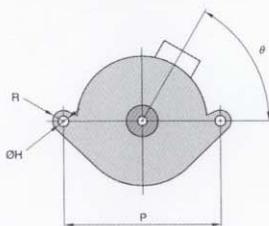


Model BMP 15

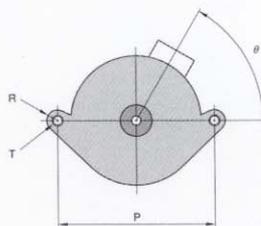
Motor Type	Motor Stack Length	Steps per Rotation	Holding Torque (x10 ⁻⁴ Nm)	Maximum Pull-in Frequency (pulses/s)	Typical Drive Frequency Range (pulses/s)	Typical Pull-out Torque Range (x10 ⁻⁴ Nm)	Winding Resistance (Ω)	Drive Voltage (V)
BPM10	Short	20	18	470	200-600	8-10	20	5
BPM15	Short	20	25	1200	250-500	14-18	100	12

Model BPM20

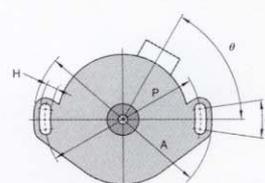
Flange Type	Θ 30°	Θ 45°	Θ 60°	Θ 75°	Θ 90°	Θ 105°	Θ 120°	Θ 135°	Θ 150°	P	H	T	a	R	A
FPH/FPT	√	√	√	√	√	√	√	√	√	25,28	2.3	M2	n/a	3	31
FPL	n/a	√	√	√	√	√	√	√	n/a	25	2.3	M2	18°	3	31



FPH TYPE



FPT TYPE



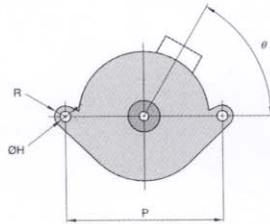
FPL TYPE

Motor Type	Motor Stack Length	Steps per Rotation	Holding Torque (x10 ⁻⁴ Nm)	Maximum Pull-in Frequency (pulses/s)	Typical Drive Frequency Range (pulses/s)	Typical Pull-out Torque Range (x10 ⁻⁴ Nm)	Winding Resistance (Ω)	Drive Voltage (V)
BPM20	Short	20	54	740	100-500	22-33	100	12
BPM20	Long	20	83	670	100-500	28-58	80	12

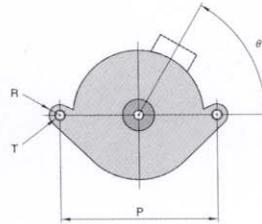
Standard Range

Model BPM25

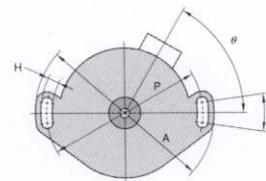
Flange Type	θ 30°	θ 45°	θ 60°	θ 75°	θ 90°	θ 105°	θ 120°	θ 135°	θ 150°	P	H	T	a	R	A
FPH/FPT	√	√	√	√	√	√	√	√	√	32	3	M2.6	n/a	3.3	38.6
FPL	n/a	√	√	√	√	√	√	√	n/a	32	3	M2.6	15°	3.3	38.6



FPH TYPE



FPT TYPE

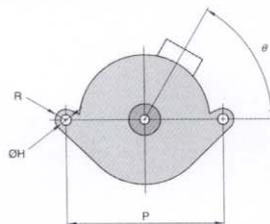


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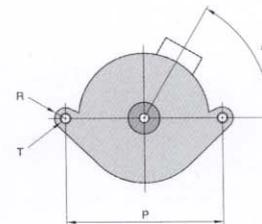
Motor Type	Motor Stack Length	Steps per Rotation	Holding Torque (x10 ⁻⁴ Nm)	Maximum Pull-in Frequency (pulses/s)	Typical Drive Frequency Range (pulses/s)	Typical Pull-out Torque Range (x10 ⁻⁴ Nm)	Winding Resistance (Ω)	Drive Voltage (V)
BPM25	Short	24	73	660	100-500	29-43	80	12
BPM25	Long	24	137	690	100-500	49-113	50	12
BPM25	Short	48	118	1100	200-500	60-79	65	12

Model BPM35

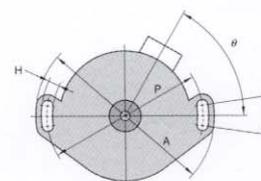
Flange Type	θ 30°	θ 45°	θ 60°	θ 75°	θ 90°	θ 105°	θ 120°	θ 135°	θ 150°	P	H	T	a	R	A
FPH/FPT	√	√	√	√	√	√	√	√	√	42	3.2	M3	n/a	3.5	49
FPL	n/a	√	√	√	√	√	√	√	n/a	42	3.2	M3	15°	3.5	49



FPH TYPE



FPT TYPE



FPL TYPE

Motor Type	Motor Stack Length	Steps per Rotation	Holding Torque (x10 ⁻⁴ Nm)	Maximum Pull-in Frequency (pulses/s)	Typical Drive Frequency Range (pulses/s)	Typical Pull-out Torque Range (x10 ⁻⁴ Nm)	Winding Resistance (Ω)	Drive Voltage (V)
BPM35	Short	24	294	490	100-400	103-186	30	12
BPM35	Long	24	540	455	100-300	226-309	20	12
BPM35	Short	48	412	710	100-400	172-284	30	12
BPM35	Long	48	569	650	100-300	314-460	20	12

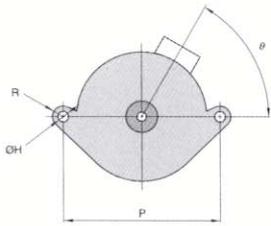
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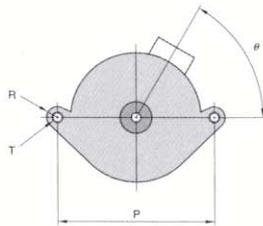
Standard Range

Model BPM42

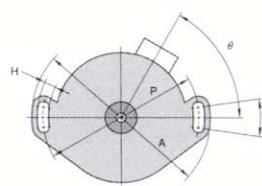
Flange Type	θ 30°	θ 45°	θ 60°	θ 75°	θ 90°	θ 105°	θ 120°	θ 135°	θ 150°	P	H	T	a	R	A
FPH/FPT	√	√	√	√	√	√	√	√	√	49.5	3.5	M3	n/a	3.75	57
FPL	n/a	√	√	√	√	√	√	√	n/a	49.5	3.5	M3	15°	3.75	57



FPH TYPE



FPT TYPE

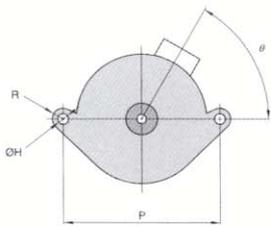


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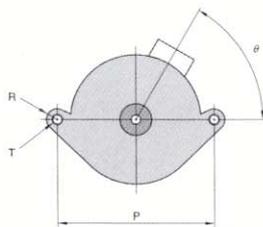
Motor Type	Motor Stack Length	Steps per Rotation	Holding Torque (x10 ⁻⁴ Nm)	Maximum Pull-in Frequency (pulses/s)	Typical Drive Frequency Range (pulses/s)	Typical Pull-out Torque Range (x10 ⁻⁴ Nm)	Winding Resistance (Ω)	Drive Voltage (V)
BPM42	Short	48	667	640	100-300	348-475	15	12
BPM42	Long	48	1080	550	100-300	520-804	10	12
BPM42	Short	96	441	730	100-600	206-402	15	12
BPM42	Short	100	432	750	100-600	206-392	15	12

Model BPM55

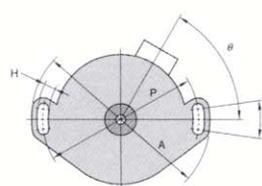
Flange Type	θ 30°	θ 45°	θ 60°	θ 75°	θ 90°	θ 105°	θ 120°	θ 135°	θ 150°	P	H	T	a	R	A
FPH/FPT	√	√	√	√	√	√	√	√	√	65	3.5	M3	n/a	5	75
FPL	n/a	√	√	√	√	√	√	√	n/a	65	3.5	M3	15°	5	75



FPH TYPE



FPT TYPE



FPL TYPE

Motor Type	Motor Stack Length	Steps per Rotation	Holding Torque (x10 ⁻⁴ Nm)	Maximum Pull-in Frequency (pulses/s)	Typical Drive Frequency Range (pulses/s)	Typical Pull-out Torque Range (x10 ⁻⁴ Nm)	Winding Resistance (Ω)	Drive Voltage (V)
BPM55	Long	48	1765	370	100-200	834-1080	10	12
BPM55	Long	96	1570	430	100-300	560-980	10	12
BPM55	Long	100	1470	440	100-300	560-960	10	12