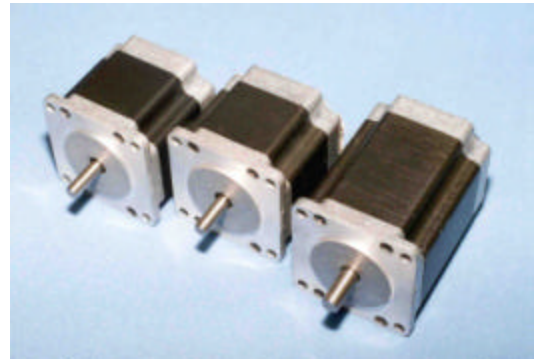


# High performance size 23 hybrid stepper motors HSX series

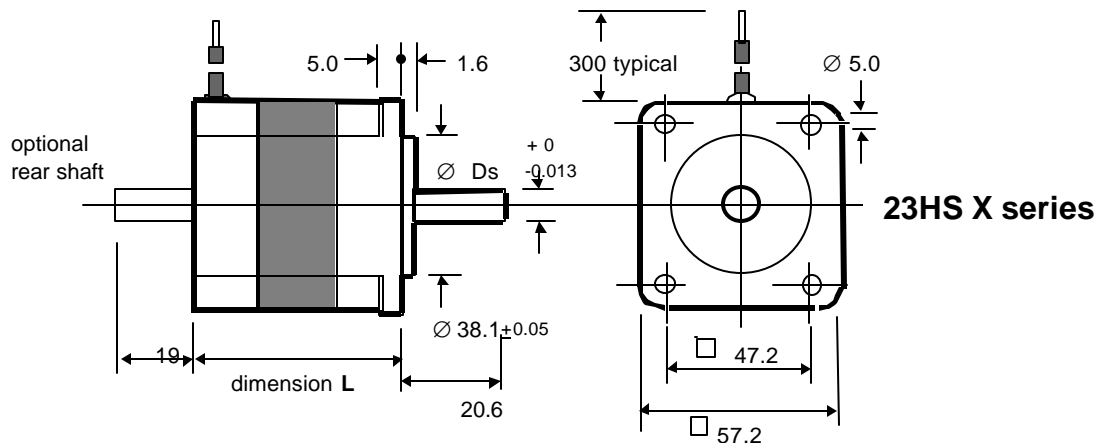
The high performance 23HSX series hybrid stepper motors conform to the international NEMA standard, and provide 200 steps/rev when used with full step drives or 400 steps per revolution in the preferred half step drive mode.



## Features:

- High energy Neodymium magnets for increased performance
- 50% more torque than conventional hybrid types
- Choice of single or double shaft options
- Optional encoder or parking brake.
- High quality & Economical prices
- Available with a choice of precision planetary gearheads for increased torque and resolution at reduced speed.
- 8 leads provide the choice of Uni-polar or Bi-polar operation
- Non-standard customised executions available to special order
- Wide range of matched drives and control modules enable complete systems to be economically constructed based on 'in-service proven' technology.

## Dimensions mm



## Mechanical Specification: 1.8 degree high performance stepper motors

motor type	length 'L' mm	Shaft diameter 'Ds' Mm	number of leads	mass Kg	Uni-polar Holding Torque Ncm	Bi-polar Holding Torque Ncm	Rotor Inertia Kgcm <sup>2</sup>
23HSX-102	41	6.35	8	0.5	37	47	0.077
23HSX-202 23HSX-206	55	6.35	8	0.7	75	98	0.22
23HSX-306	78.5	8.0	8	1.0	125	163	0.34

## Electrical Specification:

### Uni-polar operation

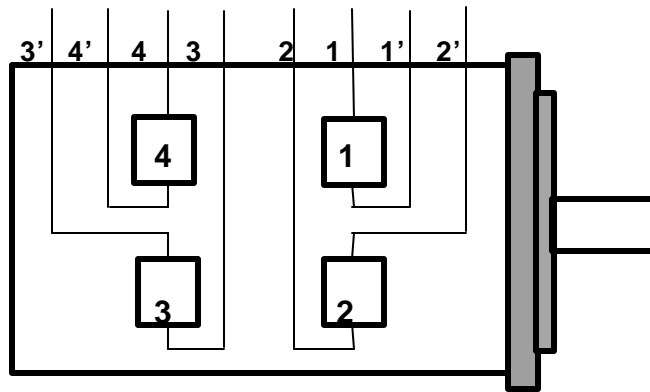
motor type	Resistance per phase ohms	Current per phase Amps	Inductance per phase mH
23HSX-102	4.6	1.0	4.6
23HSX-202	6.2	1.0	8.8
23HSX-206	0.7	3.0	0.9
23HSX-306	1.1	3.0	1.7

### Bi-polar operation

Current / phase Series connection Amps	Current / phase Parallel connection Amps
0.7	1.4 max.
0.7	1.4 max.
2.1	4.2 max.
2.1	4.2 max.

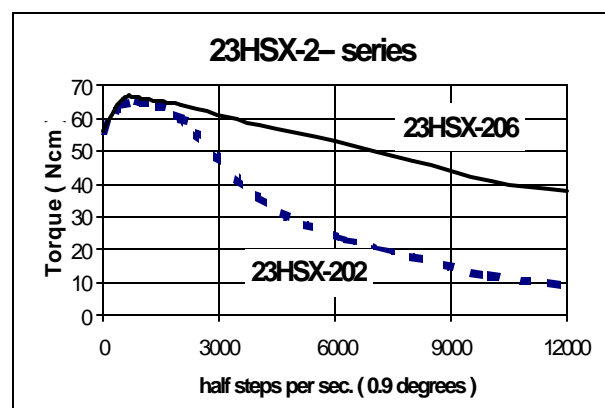
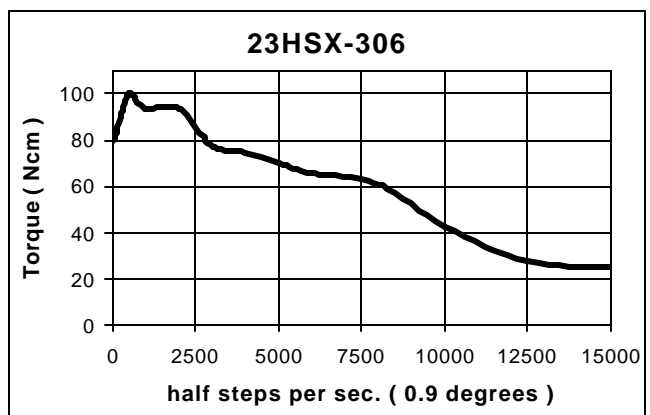
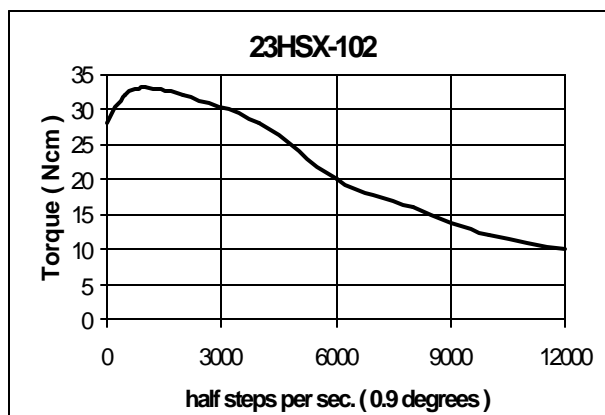
Note Rear shaft may be specified by adding 'E' to part number EXAMPLE: 23HSX-206E

## 23HSX stepper motor lead colours:



Motor Types	lead or terminal identification							
Lead identity	1	1'	2'	2	3	3'	4'	4
23HSX 102 23HSX 202 23HSX 206 23HSX 306	Red	Red/ White	Yellow/ White	Yellow	Orange	Orange/ White	Brown/ White	Brown

## Typical performance



### Performance Curves

Bi-polar operation, coils in parallel

Motor	Current Per phase ( Amps )	Rail Voltage ( Vdc )
23HSX-102	1.4	36
23HSX-202	1.4	36
23HSX-206	4.0	70
23HSX-306	4.0	70

# High performance size 34 hybrid stepper motors HSX series

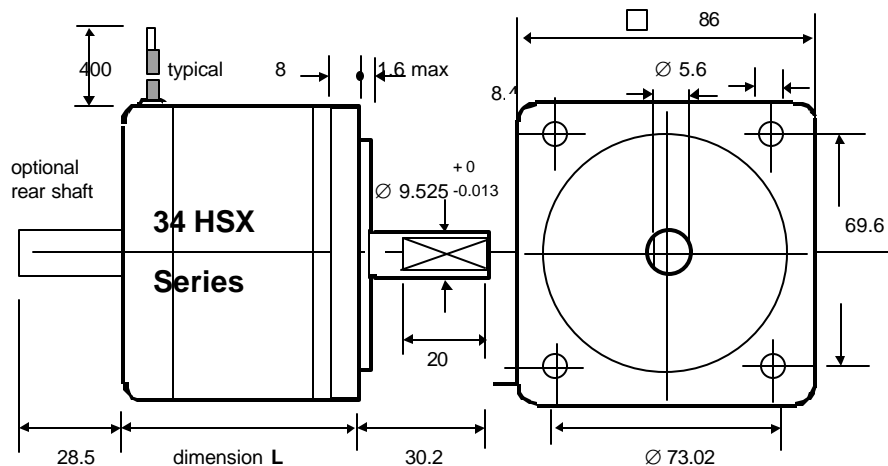
The high performance 34 HSX series hybrid stepper motors conform to the international NEMA standard, and provide 200 steps /rev when used with full step drives or 400 steps per revolution in the preferred half step drive mode.



## Features:

- High energy Neodymium magnets for increased performance
- 50% more torque than conventional hybrid types
- Choice of single or double shaft options
- Optional encoder or parking brake.
- High quality & Economically prices
- Available with a choice of precision planetary gearheads for increased torque and resolution at reduced speed.
- 8 leads provide the choice of Uni-polar or Bi-polar operation
- Non-standard customised executions available to special order
- Wide range of matched drives and control modules enable complete systems to be economically constructed based on 'in-service proven' technology.

## Dimensions mm



## Mechanical Specification: 1.8 degree high performance stepper motors

motor type	Length 'L'	number of leads	Mass	Uni-polar Holding Torque	Bi-polar Holding Torque	Rotor Inertia
	Mm		Kg	Ncm	Ncm	Kgcm <sup>2</sup>
34HSX-108	67	8	1.6	230	280	0.66
34HSX-208	94	8	2.4	380	480	1.20
34HSX-312	125	8	3.6	620	760	1.80

## Electrical Specification:

### Uni-polar operation

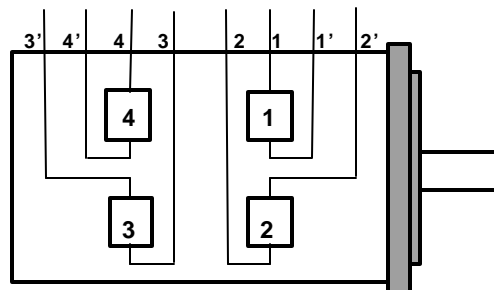
motor type	Resistance per phase ohms	Current per phase Amps	Inductance per phase mH
34HSX-108	0.55	4.3	2.1
34HSX-208	0.75	4.3	3.5
34HSX-312	0.50	6.4	2.5

### Bi-polar operation

Current / phase Series connection Amps	Current / phase Parallel connection Amps
3.0	6.0 Max.
3.0	6.0 Max.
4.0	8.5 Max.

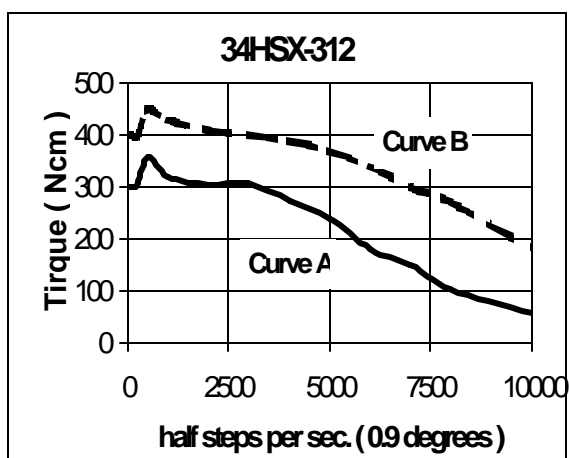
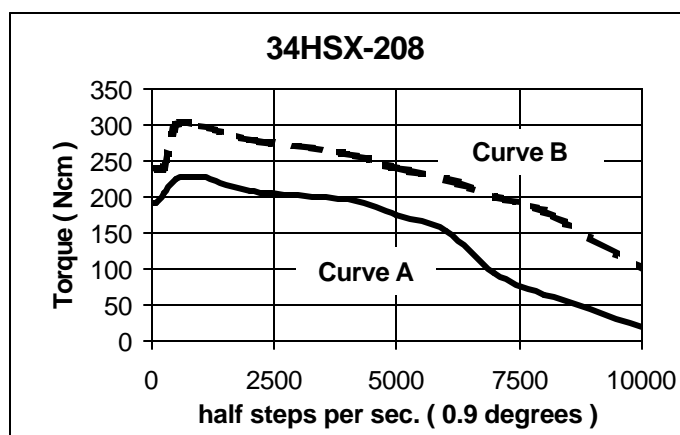
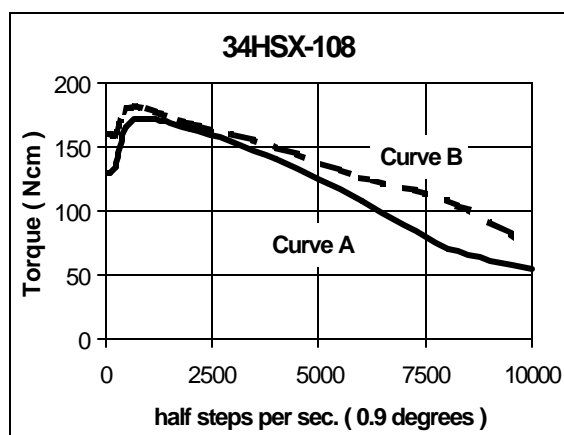
Note Rear shaft may be specified by adding 'E' to part number EXAMPLE: 34HSX-208E

## 34 HSX stepper motor lead colours:



Motor Types	lead or terminal identification							
Lead identity	1	1'	2'	2	3	3'	4'	4
34HSX 108 34HSX 208 34HSX 312	Red	Red/ White	Yellow/ White	Yellow	Black	Black/ White	Orange/ White	Orange

### Typical Performance



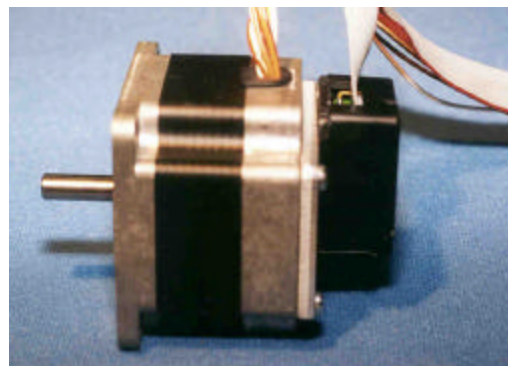
Performance Curves			
Bi-polar operation, coils in parallel			
Motor	Curve	Current Per phase ( Amps )	Rail Voltage ( Vdc )
34HSX-108	A	5	70
	B	6	75
34HSX-208	A	5	70
	B	6	120
34HSX-312	A	6	70
	B	9	120

# Hybrid stepper motors with integral encoders HSX series

The **23HSX** & **34HSX** stepper motors are available fitted with dual track encoders to provide feedback of motor position. Motors thus equipped are therefore ideally suited for use with motion systems employing closed loop controllers such as PM341.

Two encoders types **CI** & **RI** series are available, which may be specified with the **23HSX** motors & **34HSX** types as shown below. Since the controllers monitor each signal transition on each of the encoder's A & B tracks, a line count of 100 ppr provides a measuring resolution of 400 steps/rev while a 500 ppr encoder is used with 2000 step per rev. microstepping drives.

Where customers require an encoder for use with control systems not supplied by McLennan and which require alternative line counts, the model '**RI**' encoder is available with any line count required up to a maximum value of 2,000 ppr. resulting in a measuring resolution of 8,000 steps/rev. .



## Encoder signals:

The **CI...T** encoder provides a 5V TTL output signal and is suitable for instrumentation applications where the encoder is to be sited no further than 5 meters from the measuring electronics.

The **CI...L** & **RI ...L** encoders are equipped with a 5V line driver output suitable for industrial installations where the motor-encoder may be up to 50 meters away from the measuring electronics providing the encoder lead is correctly screened.

Dual track output	pulses/rev	index	motor steps/rev	motor type	Encoder type
A B	100	-	400	23HS...	CI 100T
A $\bar{A}$ B $\bar{B}$	100	$\bar{C}$ C	400	23HS...	CI 100L
A B	500	-	2000	23HS...	CI..500T
A $\bar{A}$ B $\bar{B}$	500	$\bar{C}$ C	2000	23HS...	CI 500L
A $\bar{A}$ B $\bar{B}$	100	$\bar{C}$ C	400	34HS.	RI 100L
A $\bar{A}$ B $\bar{B}$	500	$\bar{C}$ C	2000	34HS...	RI 500L

stepper motor fitted with CI Encoder

RI...L encoder

