

Specifications

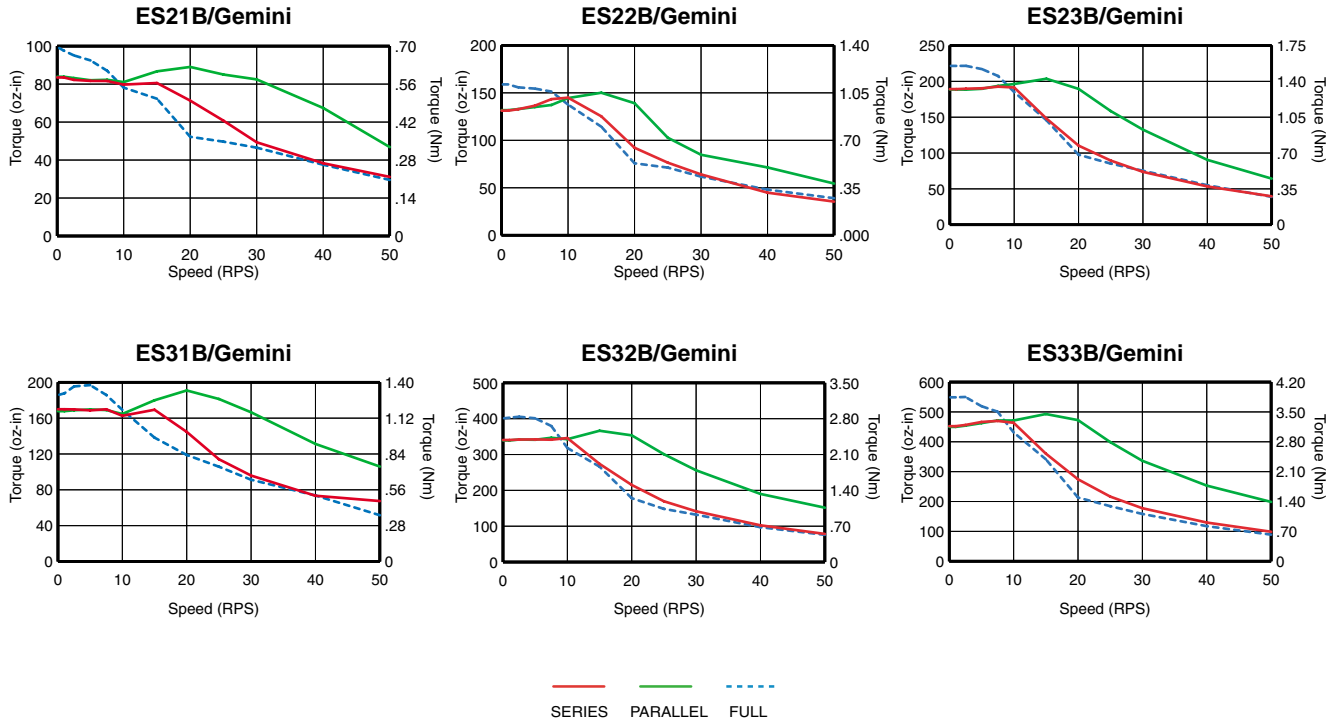
ES Series Stepper Motor Specifications Size 23 & 34 Frame

| Parameters | | Size 23 Frame | | | Size 34 Frame | | |
|--|---|---------------|-------------|-------------|---------------|-------------|------------|
| | | ES21B | ES22B | ES23B | ES31B | ES32B | ES33B |
| Static torque | oz-in | 117 | 196 | 264 | 255 | 502 | 655 |
| | (N-m) | (0.8) | (1.4) | (1.9) | (1.8) | (3.5) | (4.6) |
| Rotor inertia | oz-in ² | 0.546 | 1.1 | 1.69 | 3.47 | 6.76 | 10.47 |
| | (kg-m ² x 10 ⁻²) | (9.998) | (20.1) | (30.9) | (63.4) | (124) | (191) |
| Phase Inductance | Series | 17.37 | 18.5 | 17 | 10 | 10.5 | 9.2 |
| | Parallel | 4.34 | 4.62 | 4.25 | 2.5 | 2.62 | 2.3 |
| Drive Bus Voltage | VDC | 170 | 170 | 170 | 170 | 170 | 170 |
| Detent Torque | oz-in | 1.4 | 2.08 | 2.78 | 1.94 | 4.03 | 5.55 |
| | (N-m) | (0.01) | (0.01) | (0.02) | (0.01) | (0.03) | (0.04) |
| Bearings | | | | | | | |
| Thrust load | lb | 25 | 25 | 25 | 50 | 50 | 50 |
| | (kg) | (11.3) | (11.3) | (11.3) | (22.6) | (22.6) | (22.6) |
| Radial load | lb | 15 | 15 | 15 | 25 | 25 | 25 |
| | (kg) | (6.8) | (6.8) | (6.8) | (11.3) | (11.3) | (11.3) |
| End play | in | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 |
| Reversing load Equal to 1 lb Radial play | (cm) | (0.013) | (0.013) | (0.013) | (0.013) | (0.013) | (0.013) |
| Per 0.5 lb load | in | 0.0008 | 0.0008 | 0.0008 | 0.0008 | 0.0008 | 0.0008 |
| | (cm) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) | (0.002) |
| Weight (net) | | | | | | | |
| Motor+Cable +Connector | lb | 1.6 | 2.4 | 3.2 | 3.8 | 5.1 | 8.3 |
| | (kg) | (0.7) | (1.1) | (1.5) | (1.7) | (2.3) | (3.8) |
| Motor Cable | | | | | | | |
| Wire size | AWG | 24 | 24 | 24 | 22 | 22 | 22 |
| | (mm ²) | (0.25) | (0.25) | (0.25) | (0.34) | (0.34) | (0.34) |
| Drive Current | | | | | | | |
| Apk (Arms) | | | | | | | |
| GT | Series | 1.76 (1.24) | 1.75 (1.24) | 2.63 (1.86) | 2.76 (1.95) | 3.49 (2.47) | 4.0 (2.83) |
| | Parallel | 3.5 (2.48) | 3.51 (2.48) | 5.26 (3.72) | 5.51 (3.90) | 6.99 (4.94) | 8.0 (5.66) |
| ZETA | Series | 1.76 (1.24) | 2.01 (1.42) | 2.63 (1.86) | 2.76 (1.95) | 3.63 (2.57) | 4.0 (2.83) |
| | Parallel | 3.5 (2.48) | 4.0 (2.83) | 5.16 (3.65) | 5.42 (3.83) | 7.23 (5.11) | 8.0 (5.66) |

All motors: Cable length = 10 feet (3 m); attached connector is prewired for series current.

Motor Speed-Torque Performance Curves

GT Drive with ES Series motors – 23 and 34 frame
(previously ZETA and S Series motors)



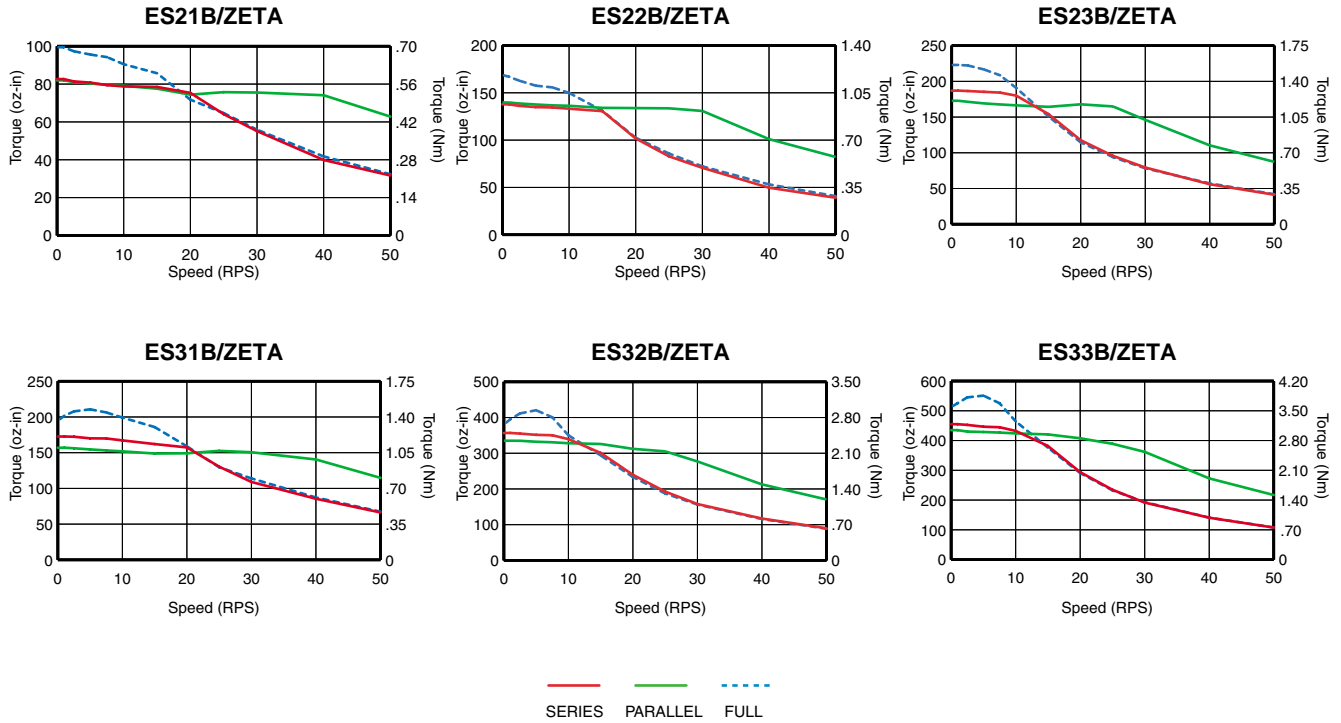
Parallel connected motors are limited to 50% duty cycle when operated above 5 rps. For greater than 50% duty cycle above 5 rps, connection must be made to the motor in series. Fan cooling the motor will increase duty cycles above 5 rps.

Viscous damper is not required to achieve speed-torque curves.

Note: ±10% torque variance due to motor tolerance

Motor Speed-Torque Performance Curves

ZETA with ES motors – 23 and 34 frame
(previously ZETA and S Series motors)

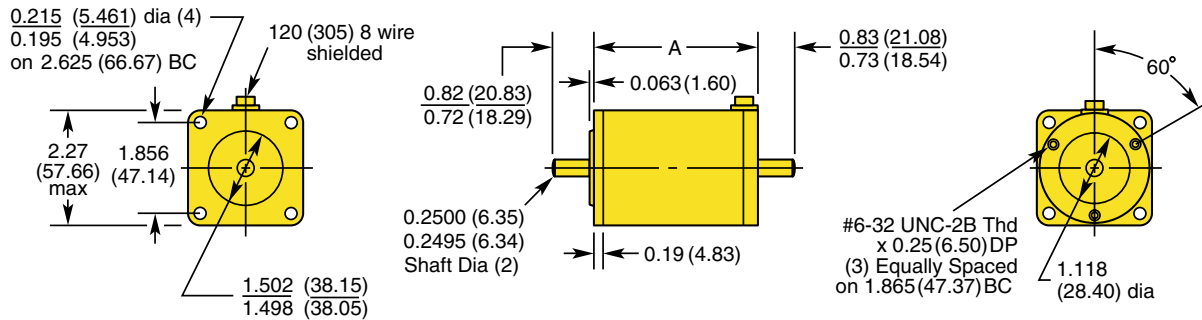


Dimensions

ES Series Dimensional Drawings

Size 23 Frame

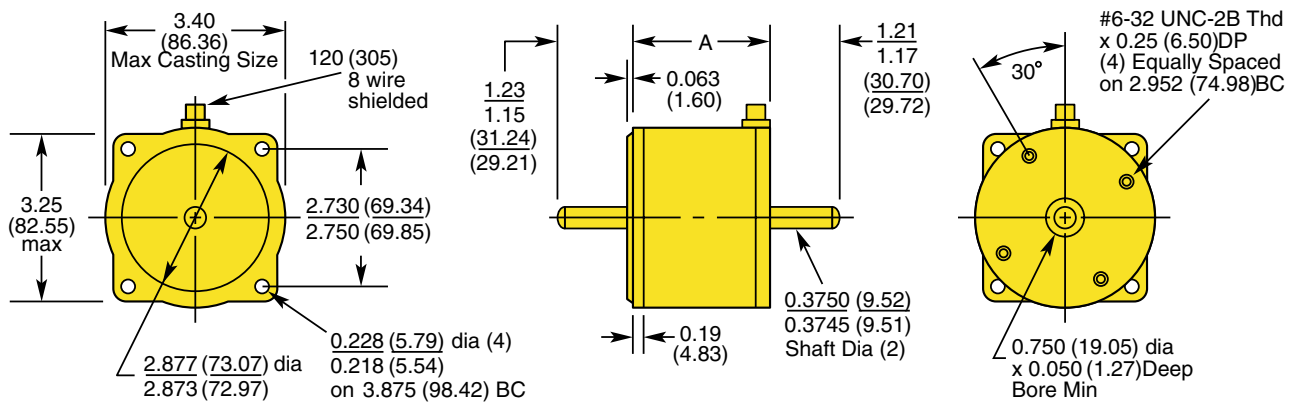
Dimensions in inches (mm)



| Model | A |
|---------------------|-------------|
| ES21B (ZETA 57-51) | 2.0 (50.23) |
| ES22B (ZETA 57-83) | 3.1 (75.23) |
| ES23B (ZETA 57-102) | 4.0 (101.6) |

Size 34 Frame

Dimensions in inches (mm)



| Model | A |
|---------------------|-------------|
| ES31B (ZETA 83-62) | 2.5 (62.0) |
| ES32B (ZETA 83-93) | 3.7 (93.98) |
| ES33B (ZETA 83-135) | 5.2 (129.0) |

Ordering Information

Motor Ordering Information

ES Series

The ES Series Size 23 and Size 34 Frame motors are available in a B Winding (170VDC). These motors are designed for use with Gemini GT, ZETA Series, ZETA4-240 (@120VAC).

| | | | | | | | | |
|-------------------------------|--------------------|---|---|--|---|--|--|--|
| Series E (Extra Smooth) | Type S=Standard | Frame Size 2=Size 23 (2.5") 3=Size 34 (3.38") | No. of Rotor Stacks 1= 1 stack 2= 2 stacks 3= 3 stacks | Winding Type B=170VDC winding (Black painted motors) | Shaft S=Single D=Double Double shaft req'd for all motors w/encoders | Shaft Modification N=None (Standard) F=Flat (.02" depth) (0.5" length) K=Straight Key (34 Frame Only) | Motor Construction/ Hookup R10=Regular hookup w/ 10' Flying Leads | Encoder Option Blank=No feedback (no dash required) EC=1000 ppr differential line encoder w/ 10' cable |
|-------------------------------|--------------------|---|---|--|---|--|--|--|

E Series Part Number Example

ES __ B - _ K _____ - _____
 ES31B-SKNPS
 E 43B-DKS10