



# Gemini



CE (EMC and LVD)

## The Gemini Series

Closing the loop between servo and stepper technology, Compumotor announces Gemini, a family of compact digital drives and drive/controllers perfect for your servo and stepper application needs.

Low-to-mid power servo applications can now be solved with the Gemini GV or the Gemini GV6. They both offer drive features such as digital tuning, digital notch filters, and up to 14.7 kW of peak power. The Gemini GV6 goes one step further and offers basic motion control features such as programmable motion profiles, sequencing, registration, conditional statements, and I/O.

In addition to the high-performance servo systems, the Gemini family also includes the highest performing stepper drive systems in the industry today. The Gemini GT and GT6 have performance enhancing features such as Encoderless Stall detect™, ABS damping™, and up to 8 Amps of continuous current. The Gemini GT6 also offers basic motion control such as programmable motion, sequencing, registration, conditional statements, and I/O. Since the Gemini GT (stepper) and Gemini GV (servo) have equivalent interface, connectivity, and controller options, the Gemini allows an unprecedented opportunity to mix and match servo and stepper technology. Let the Gemini family solve your application and you will always be able to apply the appropriate motor technology for each axis of motion. The Gemini GT offers an easy upgrade path to the GV if the needs of your application change.

Each member of the Gemini family is configurable/programmable via RS-232/485 using Compumotor's Motion Planner™ on a PC or Pocket Motion Planner™ on a palm PC.

You need to look no further. The Gemini offers all of the power levels, connectivity, performance features, and control levels to solve all of your motion control needs.

### Members of the Gemini Family

*Gemini GV - Digital Servo Drive*

*Gemini GV6 - Digital Servo Drive/Controller*

*Gemini GT - Digital Stepper Drive*

*Gemini GT6 - Digital Stepper Drive/Controller*

*Motion Architect, Servo Tuner and CompuCAM are registered trademarks of Parker Hannifin Corporation, Compumotor Division*  
*Microsoft Windows is a registered trademark of Microsoft Corporation*

### Gemini Family Features

- **24V Keep Alive**  
24VDC (not required)--Used to maintain power to the control circuitry in the event of AC power loss
- **Standards**  
UL Recognition, cUL, CE for LVD, and CE for EMC
- **Error Log**  
Records the 10 most recent errors with time stamp
- **RS-232/485**  
Configuration on a PC or a Windows™ CE-based Palm PC

### Gemini GV & GV6 Servo Motor Control Features

- **Simplified Tuning & Configuration**  
It can be as simple as entering in your load and motor parameters.
- **Digital Notch Filters**
- **Sinusoidal Commutation**

### Gemini GT & GT6 Stepper Motor Control Features

- **Encoderless Stall Detect™** (patent pending)  
Remove the encoder from your application and still detect a stall
- **Active Damping™** (patented)
- **Electronic Viscosity™** (patent pending)
- **ABS Damping™** (patent pending)  
No fuss damping feature that dramatically reduces settling time
- **Variable Resolution**  
Continuously variable, up to 128,000 steps/rev
- **Analog Velocity Command Input**

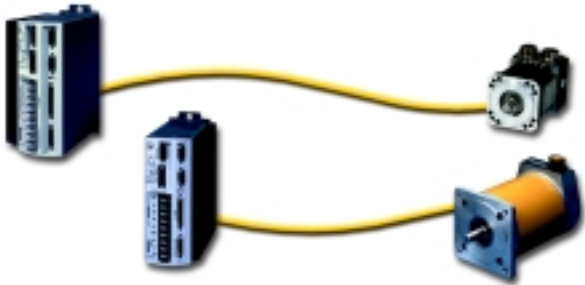
### Gemini GV6 & GT6 Motion Control Features

- **Program Storage and Sequencing**
- **Registration**
- **Motion Profiling**
- **Conditional Statements**
- **S-curve Velocity Profiling**
- **8 Inputs and 6 Outputs**
- **Field Bus and Motion Bus Compatibility**  
Gemini offers connectivity to several field and motion buses including SERCOS, Profibus, and Interbus.

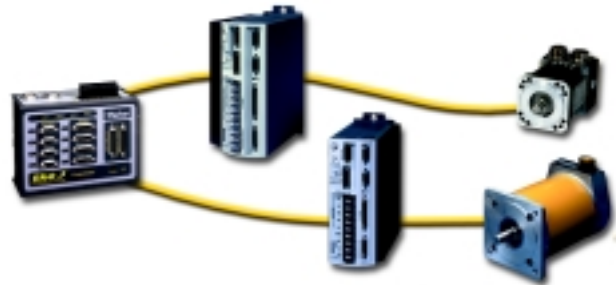
*Motion Toolbox is a registered trademark of Snider Integration Group*  
*LabVIEW is a registered trademark of National Instruments Corporation*  
*All others are trademarks of their respective companies*

## Gemini Gives Your Application Greater Flexibility... No Matter What Your Control Topology May Be!

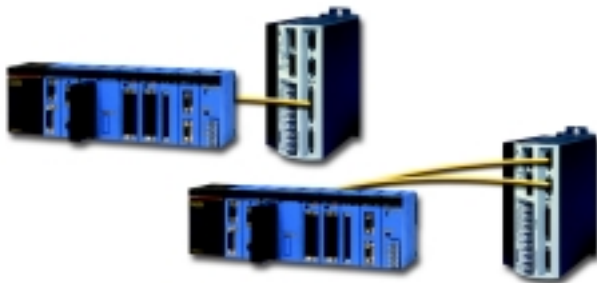
1. **Gemini as Stand-alone Drive/Controller:** The Gemini GV6 and/or GT6 can easily be integrated in most motion control applications providing both drive and control capabilities in one compact package.



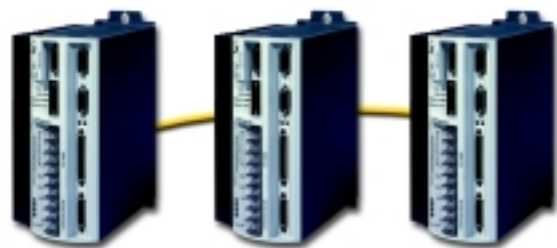
2. **Gemini with the 6K Motion Controller:** Up to 8 axes of the Gemini GV or GT Drives can be accurately controlled with Compumotor's revolutionary 6K Motion Controller.



3. **Connect Gemini with a PLC:** Now you are able to connect with a PLC via I/O, serial communications, or through fieldbuses with the Gemini GV6 & GT6.



4. **Daisy chain up to 99 Gemini GV6's or GT6's:** Up to 99 axis of coordinated motion can now be accomplished when Gemini GV6's or GT6's are integrated into your application.



### Easily Configure and Program Gemini

1. **Using a PC:** The Gemini Family is easily configurable/programmable using Compumotor's Motion Planner™ Software via RS232/485. Turn to page 30 for more information on Motion Planner™.



2. **Using a Palm PC:** Users have an additional option when programming and configuring any member of the Gemini Family with Compumotor's new Pocket Motion Planner™ Software. Via RS232/485, Pocket Motion Planner™ is compatible on a Windows CE™-based Palm PC (patent pending).



Visit [www.compumotor.com](http://www.compumotor.com) to download your free copies of Motion Planner™ and Pocket Motion Planner™ Software.

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# Gemini GV



## The Gemini GV Digital Servo Drive

The Gemini GV is a compact, low-cost, digital servo drive available in five power levels for producing up to 20 Amps continuous and 50 Amps peak current, or up to 14.7 kW of peak power. The Gemini GV is easily configurable via RS232/485 using Compumotor's Motion Planner™ on a PC or Pocket Motion Planner™ on a Window's CE™-based palm PC. With the available power levels, small package size, low cost, and numerous drive features, the Gemini GV will be the obvious choice for all of your low-to-mid power servo drive applications.

### Simplified Tuning/Configuration

Tuning and configuration are easy. They are accomplished via RS232/485 with a PC or palm PC. Only the motor and some basic load information must be known by the drive to determine baseline-tuning gains. These are simple parameter entries the user can complete with the help of the front-end software tools. Users also have the ability to override these parameters for special application requirements.

### Features

#### Performance

- Provides five power ranges for up to 5.9 kW of continuous power
- Torque, velocity, step & direction (cw/ccw), and encoder tracking modes available
- Digital notch filters provide the tools to eliminate mechanical resonance
- Sinusoidal commutation with encoder feedback
- Simplified tuning and configuration
- Variable resolution for the encoder out as well as the command input
- Wide range of PWM frequencies for linear motor support

#### Protection

- Short circuit protection – phase-to-phase and phase-to-ground
- Brownout protection – if AC drops below 85 VAC
- Over temperature – shutdown occurs at ambient 131°F (55°C)

#### Physical

- A wide selection of brushless servo motors are available from Compumotor including the SM Series, NeoMetric, and J Series motors. A family of Linear Motors is also available.
- Three input power ranges available; low: 120V, universal: 120/240V, and high: 240V
- Diagnostic LEDs for drive status, firmware download, and optional keep alive mode

#### Gemini Family Features

- 24V Keep Alive (not required) – keeps logic alive if AC power is removed
- Error Log – records 10 most recent errors with time stamp
- Approvals: UL Recognition, cUL, CE (LVD), and CE (EMC)
- Configurable via RS232/485 using Compumotor's Motion Planner™ on a PC or Pocket Motion Planner™ on a Windows CE™-based Palm PC

#### When Do I Need to use Servo Motor Technology?

*Applications with...*

- |                                                                                                                |                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>✓ Speeds over 50 revs/sec</li> <li>✓ Dynamic load conditions</li> </ul> | <ul style="list-style-type: none"> <li>✓ Very high accelerations</li> <li>✓ Mechanical resonance</li> <li>✓ Immediate feedback requirements</li> </ul> |
|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|



# Gemini GV6



## The Gemini GV6 Digital Servo Drive/Controller

Compumotor's new Gemini GV6 is a compact, low-cost, digital servo drive/controller. In addition to all of the drive features of the Gemini GV, the GV6 incorporates basic motion control and sequencing capabilities, allowing solutions for many distributed control applications. The Gemini GV6 is easily configured/programmed via RS232/485 using Compumotor's Motion Planner™ on a PC or Pocket Motion Planner™ on a Windows CE™-based Palm PC. The Gemini GV6 also offers connectivity to several field buses including Profibus, Interbus, and SERCOS.\*

### Features

#### Performance

- Incorporates all of the powerful features of the Gemini GV- digital servo drive
- Provides five power ranges for up to 5.9 kW of continuous power
- Stand-alone servo controller and drive in one small package
- Control features such as registration, motion profiles, S-curve velocity profiling, electronic gearing, and conditional statements
- Program storage: Up to 32 programs or 190 lines of program code
- Daisy chain up to 99 units
- Simplified configuration and tuning
- 8 programmable inputs and 6 programmable outputs
- Compatibility with Interbus, Profibus, and SERCOS\*
- Wide range of PWM frequencies for linear motor support

#### Protection

- Short circuit protection – phase-to-phase and phase-to-ground
- Brownout protection – if AC drops below 85 VAC
- Over temperature – shutdown occurs at ambient 131°F (55°C)

#### Physical

- A wide selection of brushless servo motors are available from Compumotor including the SM Series, NeoMetric, and J Series motors. A family of Linear Motors are also available.
- Three input power ranges available – low: 120V, universal: 120/240V, and high: 240V
- Diagnostic LEDs for drive status, firmware download, and keep alive mode

#### Gemini Family Features

- 24V Keeps Alive (not required) – keeps logic alive if AC power is removed
- Error Log—records 10 most recent errors with time stamp
- Approvals: UL Recognition, cUL, CE (LVD), and CE (EMC)
- Configurable/Programmable via RS232/485 using Compumotor's Motion Planner™ on a PC or Pocket Motion Planner™ on a Windows CE™-based Palm PC

\* Please Contact Factory for Specifications and Availability

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**GV/GV6 Common Specifications**

Specifications	GV (GV6)-L3E	GV (GV6)-U3E	GV (GV6)-U6E	GV (GV6) -U12E	GV (GV6)-H20E
<b>Drive Input Power</b>					
Voltage	95-132VAC	95-265VAC	95-265 VAC	95-265 VAC	208-265 VAC
Phase	1Ø	1Ø	1Ø	1Ø	3Ø
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
24V Keep Alive (Optional)	24 VDC +/- 20% @ x Amps max	24 VDC +/- 20%	24 VDC +/- 20%	24 VDC +/- 20%	24 VDC +/- 20%
<b>Drive Output Power</b>					
Bus Voltage	170 VDC	170/340 VDC	170/340 VDC	170/340 VDC	295/340 VDC
PWM/Nom. Ripple Freq	40/80 kHz	40/80 kHz	8/16, 16/32, 20/40 KhZ User selectable (current deration applies )		
Continuous Current *	3 Amps	3 Amps	6 Amps	12 Amps	20 Amps
Continuous Power *	0.44 kW	0.88 kW	1.75 kW	3.5 kW	5.9 kW
Peak Current	7.5 Amps	7.5 Amps	15 Amps	30 Amps	50 Amps
Peak Power	1.1 kW	2.2 kW	4.4 kW	8.75 kW	14.7 kW
Commutation	Sinusoidal	Sinusoidal	Sinusoidal	Sinusoidal	Sinusoidal

\* Peak of sine wave

**Performance**

Accuracy

Solid lines represent 240VAC operation, continuous and peak. Dashed lines represent performance using 120VACinput. Speed/torque curves may vary +/- 10%.5 arc min (0.0833°), encoder dependant

**Command Inputs – GV**

Velocity and Torque Mode  
 Position Mode

+/- 10 V  
 Step & Direction/CW & CCW/Encoder Tracking

**Inputs – GV**

Enable, Reset  
 Neg/Pos Limits  
 User Fault  
 Encoder

5-24VDC Selectable, 1/3 1/3 1/3 voltage switching threshold  
 5-24VDC Selectable, 1/3 1/3 1/3 voltage switching threshold  
 5-24VDC Selectable, 1/3 1/3 1/3 voltage switching threshold  
 8 MHz Post Quadrature

**Inputs – GV6**

8 Programmable  
 Enable, Reset  
 Encoder

5-24VDC Selectable, 1/3 1/3 1/3 voltage switching threshold  
 5-24VDC Selectable, 1/3 1/3 1/3 voltage switching threshold  
 8 MHz Post Quadrature

**Outputs – GV**

Fault, At Limit  
 Position Error  
 Analog Monitors  
 Encoder  
 Relay

Open collector, 300mA sink capability  
 Open collector, 300mA sink capability  
 +/- 10 V scalable, 8 bit (not to be used as control functions)  
 Programmable up to 1,024,000 counts/rev post quadrature  
 Normally open, dry contact

**Outputs – GV6**

6 Programmable  
 Analog Monitors  
 Encoder  
 Relay

Open collector, 300mA sink capabilities  
 +/- 10 V scalable, 8 bit (not to be used as control functions)  
 Programmable up to 1,024,000 counts/rev post quadrature  
 Normally open, dry contact

**Communications**

Type  
 Baud Rate  
 Daisy Chain – GV6

RS232/ RS485 (4-wire), 8 bit binary protocol  
 Fixed at 9600  
 Up to 99

**Environmental**

Temperature  
 Humidity  
 Shock/Vibration

Still air: 113°F (45°C), moving air: 122°F (50°C)  
 0-95%, non-condensing  
 Shock:15G half-sine @ 11 msec/ vibration: 2G, 10-2000 Hz

**Protection**

Short Circuit  
 Brownout  
 Over Temperature

Phase-to-phase, phase-to-ground  
 AC drops below 85 VAC  
 Shutdown fault at 131°F (55°C)

**Standards**

**Physical**

Compumotor motors  
 Non-Compumotor motors  
 Connectors  
 Serial  
 Motor and power  
 Command and I/O  
 Feedback  
 +24VDC/Relay

UL, cUL, CE (LVD), CE ( EMC)  
 SM Series, NeoMetric Series, J Series, and Linear Motors  
 Please refer to the GV and GV6 Hardware Installation Guide  
 9-pin D-shell (male)  
 Barrier screw terminal  
 50-pin High density Amp Champ - .050 Series II (with screw attachment)  
 26-pin High density Amp Champ - .050 Series II (with screw attachment)  
 4-pin removable terminal block

\* See product user guide

**Drives & Drive/Controllers**

# Gemini GV6 Commands

In addition to the Gemini GV drive configuration commands, the Gemini GV6 will include the following motion control commands:

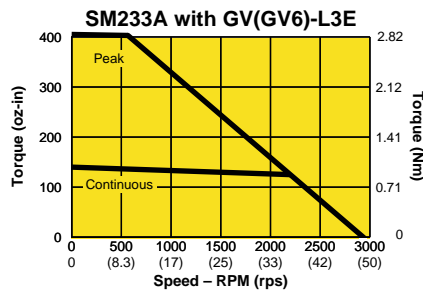
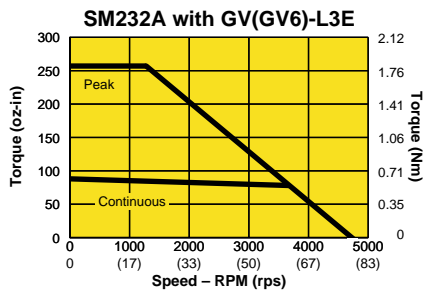
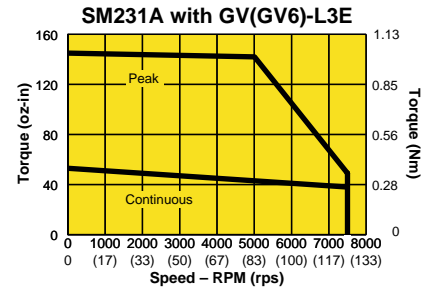
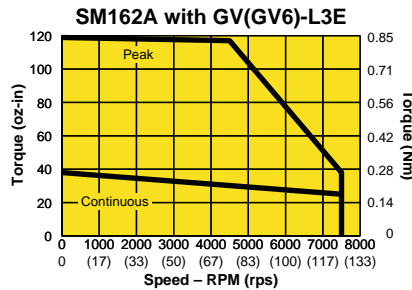
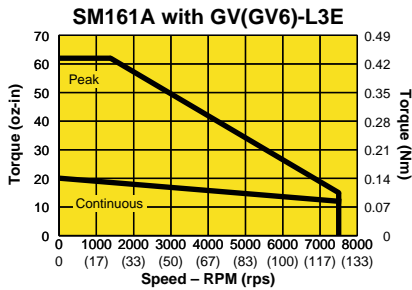
Motion		Program Flow		Program/Profile Definition		Servo/Tuning	
A	Acceleration	C	Continue	DEF PROG	Define a Program	SGAF	Acceleration Feed-Forward Gain
AA	Average Acceleration	COMEXC	Continue Command Processing Mode	DEF PROF	Define a Profile	SGENB	Enable a Servo Gain Set
AD	Deceleration	COMEXL	Continue Execution on Limit	DEL PROG	Delete a Program	SGSET	Save Current Servo Gains to a Gain Set
ADA	Average Deceleration	COMEXR	Continue Motion on Pause/Continue	DEL PROF	Delete a Profile	SGVF	Velocity Feed-Forward Gain
CMDDIR	Commanded Direction Polarity	COMEXS	Continue Execution on Stop	END	End of Program or Profile	STRGTD	Target Distance Zone
D	Distance	ELSE	Else Condition for IF Statement	ERRORP	Assign Error-handling Program	STRGTE	Target Zone Settling Mode Enable
GO	Initiate Motion	ERROR	Error Checking Enable	PRUN PROF	Run a Profile	STRGTT	Target Settling Timeout Period
K	Kill Motion	GOSUB	Branch to Subroutine	RUN PROG	Run a Program	STRGTV	Target Velocity Zone
PSET	Establish Absolute Position Reference	GOWHEN(T)	Go Statement Based on a Time Delay	STARTP	Assign Startup Program		
S	Stop Motion						
V	Velocity						
VF	Final Velocity						
Homing/Limit		IF(AS)	If Conditional based on Axis Status	Registration			
HOM	Go Home	IF(ASX)	If Conditional based on Extended Axis Status	RE	Registration Enable		
HOMA	Home Acceleration	IF(ER)	If Conditional based on Error Status	REG	Registration Distance	Display/Transfer	
HOMBAC	Home BackUp Enable	IF(IN)	If Conditional based on Input Status	REGLOD	Registration Lock-Out Distance	TACC	Display Commanded Acceleration Set Point
HOMDF	Home Final Direction	IF(SS)	If Conditional based on System Status			TACCA	Display Actual Accel. from Feedback Device
HOMEDG	Home Reference Edge	JUMP	Jump to Program, No Return	Compiled Motion		TERRLG	Display Error Log
HOMV	Home Velocity	L	Loop	A	Acceleration	TGAIN	Display Active Gains
HOMVF	Home Final Velocity	LN	End of Loop	AD	Deceleration	TMEM	Display Memory Usage
HOMZ	Home to Encoder Z-Channel	MA	Mode Absolute	D	Distance	TPROG	Display Contents of Program
LS	Software Limit Enable	MC	Mode Continuous	DEF PROF	Define Profile	TSGSET	Display Servo Gain Set
LSAD	Software Limit Deceleration	NIF	End of IF Statement	DEL PROF	Delete Profile	TSTLT	Display Settling Time of Last Move
LSADA	Software Limit Average Deceleration	PRUN PROF	Run a Compiled Profile	END	End Definition of Program/Profile		
LHAD	Hardware Limit End-of-Travel Deceleration	PS	Pause Program Execution	GOBUF	Store a Motion Segment in Compiled Memory	Inputs/Outputs	
LHADA	Hardware Limit End-of Travel Average Deceleration	RUN PROG	Run a Stored Program	GOWHEN(T)	Go Statement Based on a Time Delay	INFNC	Input Function Assignment
LSNEG	Software EOT Limit - Negative Travel Range	T	Time Delay	MC	Mode Continuous	INSELP	Program Selection with Inputs, Enable
LSPOS	Software EOT Limit - Positive Travel Range	TRACE	Program Trace Mode Enable	POUTA	Output State, Compiled	OUT	Set Output State
		TRGFN	Trigger Functions	PRUN PROF	Run a Compiled Profile	OUTFNC	Output Function Assignment
		TRGLOT	Trigger Interrupt Lockout Time	SGENB	Enable a Servo Gain Set		
		WAIT(AS)	Wait for Axis Status	V	Velocity		
		WAIT(ASX)	Wait for Extended Axis Status	VF	Final Velocity		
		WAIT(IN)	Wait for Input Status				
		XONOFF	Enable or Disable XON/XOFF				

Drives & Drive/Controllers

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# Selecting a Servo Motor and Cables

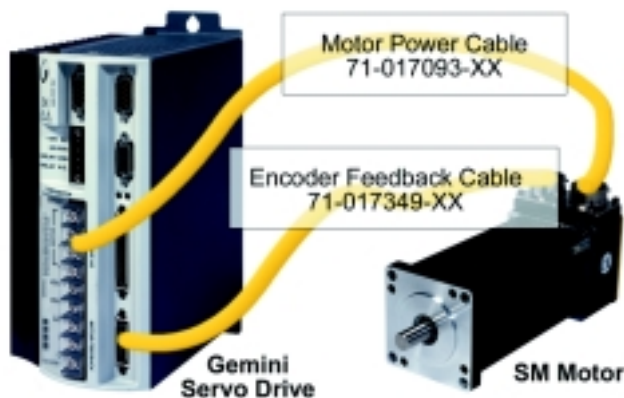
Gemini GV(GV6)-L3 with SM Motors @ 120VAC, Encoder Feedback



Solid lines represent 120VAC operation, continuous and peak. Speed/torque curves may vary +/- 10%.

## Required Cables

The following cables are for use with the Gemini GV(GV6)-L3E and all SM Series motors.



## Additional Cable Information

- All cables have MS connectors and are CE(LVD&EMC)
- XX= cable length. Standard cable lengths are 10, 25, and 35 feet. Contact the factory for custom lengths.
- Cables are also available with brake option (not shown).
- Cable sets (one motor cable and one feedback cable) are also available.

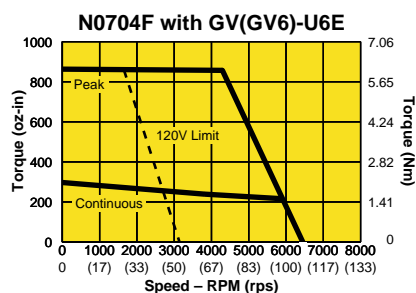
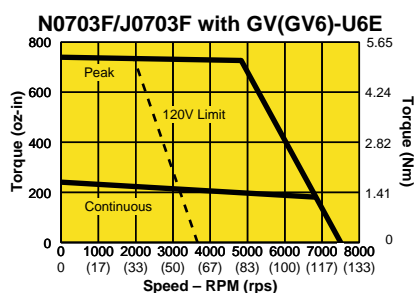
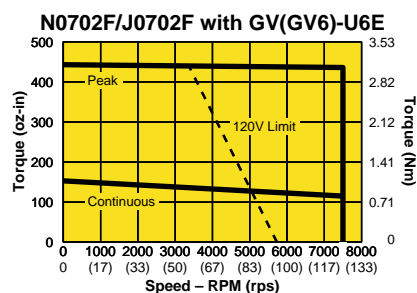
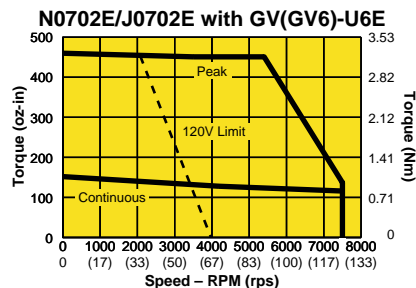
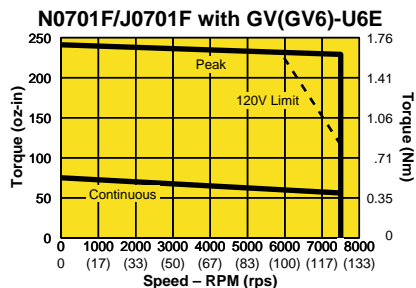
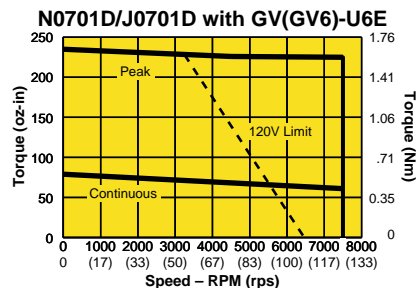
Part Number	Description
23GS Cable-XX	One 71-017093-XX+ One 71-017349-XX

XX = cable length; 10, 25, and 35 are standard cable lengths

Please refer to the Servo Motor Section for complete servo motor and cable specifications.

# Selecting a Servo Motor and Cables

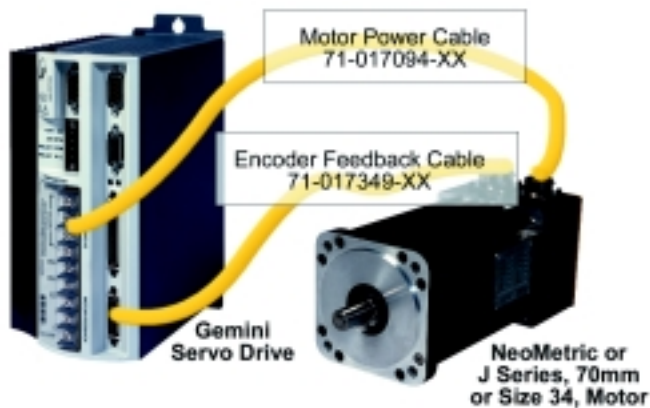
Gemini GV(GV6)-U6 with NeoMetric and J Series Motors, 70mm and Size 34, Encoder Feedback



Solid lines represent 240VAC operation, continuous and peak. Dashed lines represent performance using 120VAC input. Speed/torque curves may vary +/- 10%.

## Required Cables

The following cables are for use with the Gemini GV(GV6)-U6E and the 70mm and Size 34 NeoMetric and J Series Motors.



## Additional Cable Information

- All cables have MS connectors and are CE(LVD&EMC)
- XX= cable length. Standard cable lengths are 10, 25, and 35 feet. Contact the factory for custom lengths.
- Cables are also available with brake option (not shown).
- Cable sets (one motor cable and one feedback cable) are also available.

Part Number	Description
70GS Cable-XX	One 71-017094-XX+ One 71-017149-XX

XX = cable length; 10, 25, and 35 are standard cable lengths

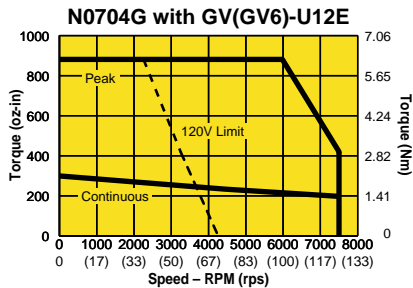
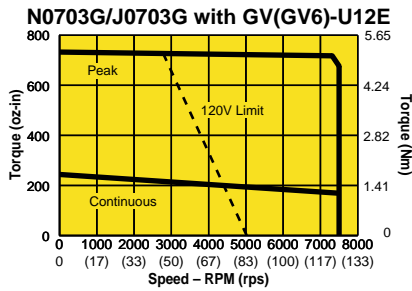
Please refer to the Servo Motor Section for complete servo motor and cable specifications.

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# Selecting a Servo Motor and Cables

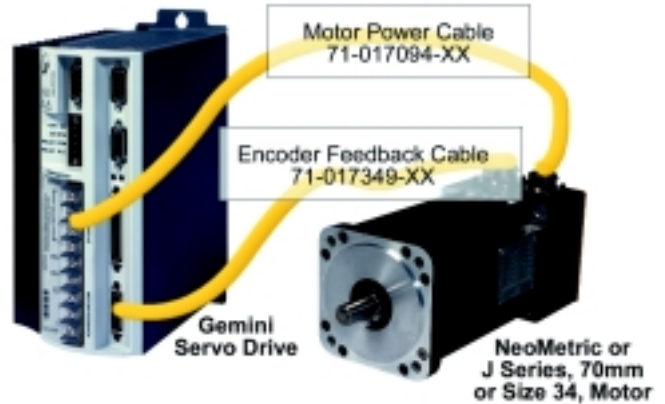
Gemini GV(GV6)-U12E with NeoMetric and J Series Motors, 70mm and Size 34, Encoder Feedback



Solid lines represent 240VAC operation, continuous and peak. Dashed lines represent performance using 120VAC input. Speed/torque curves may vary +/- 10%.

## Required Cables

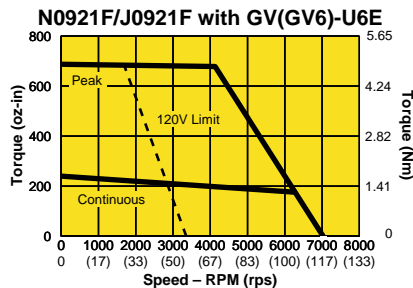
The following cables are for use with Gemini GV(GV6)-U12E and the 70mm and Size 34 NeoMetric and J Series Motors.



## Additional Motor and Cable Information

- All cables have MS connectors and are CE(LVD&EMC)
- XX= cable length. Standard cable lengths are 10, 25, and 35 feet. Contact the factory for custom lengths.
- Cables are also available with brake option (not shown).
- Cable sets (one motor cable and one feedback cable) are also available.
- Please see page 213 for cable set description.

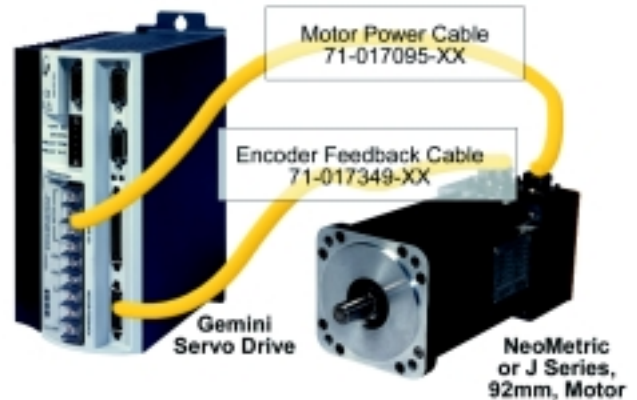
Gemini GV(GV6)-U6E (U12E) with NeoMetric and J Series Motors, 92 mm, Encoder Feedback



Solid lines represent 240VAC operation, continuous and peak. Dashed lines represent performance using 120VAC input. Speed/torque curves may vary +/- 10%.

## Required Cables

The following cables are for use with Gemini GV(GV6)-U6E and the 92 mm NeoMetric and J Series Motors.



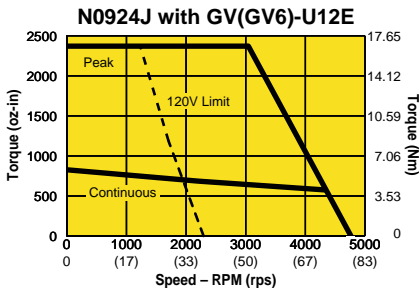
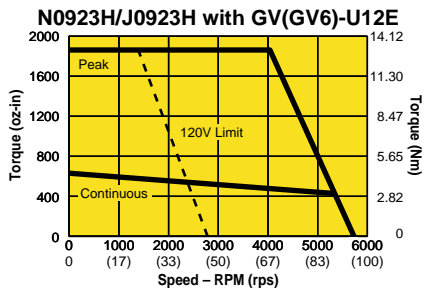
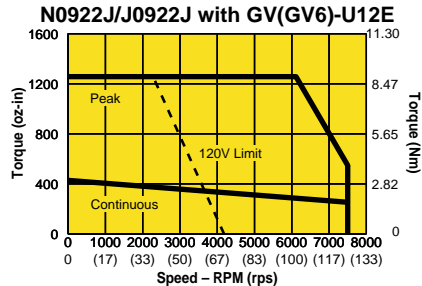
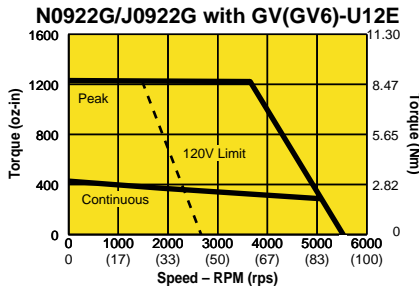
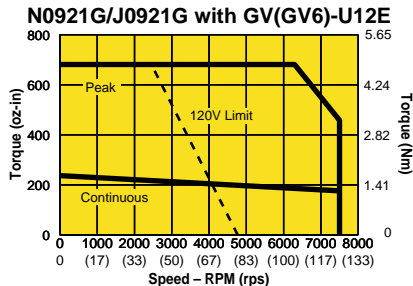
## Additional Motor and Cable Information

- All cables have MS connectors and are CE(LVD&EMC)
- XX= cable length. Standard cable lengths are 10, 25, and 35 feet. Contact the factory for custom lengths.
- Cables are also available with brake option (not shown).
- Cable sets (one motor cable and one feedback cable) are also available.
- Please see page 213 for cable set description

Please refer to the Servo Motor section for complete servo motor and cable specifications.

# Selecting a Servo Motor and Cables

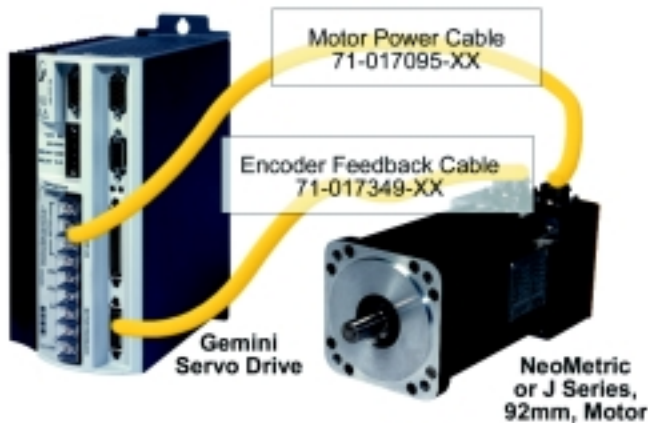
Gemini GV(GV6)-U12E with NeoMetric and J Series Motors, 92 mm, Encoder Feedback



Solid lines represent 240VAC operation, continuous and peak. Dashed lines represent performance using 120VAC input. Speed/torque curves may vary +/- 10%.

## Required Cables

The following cables are for use with Gemini GV(GV6)-U12E and the 92 mm NeoMetric and J Series Motors.



## Additional Motor and Cable Information

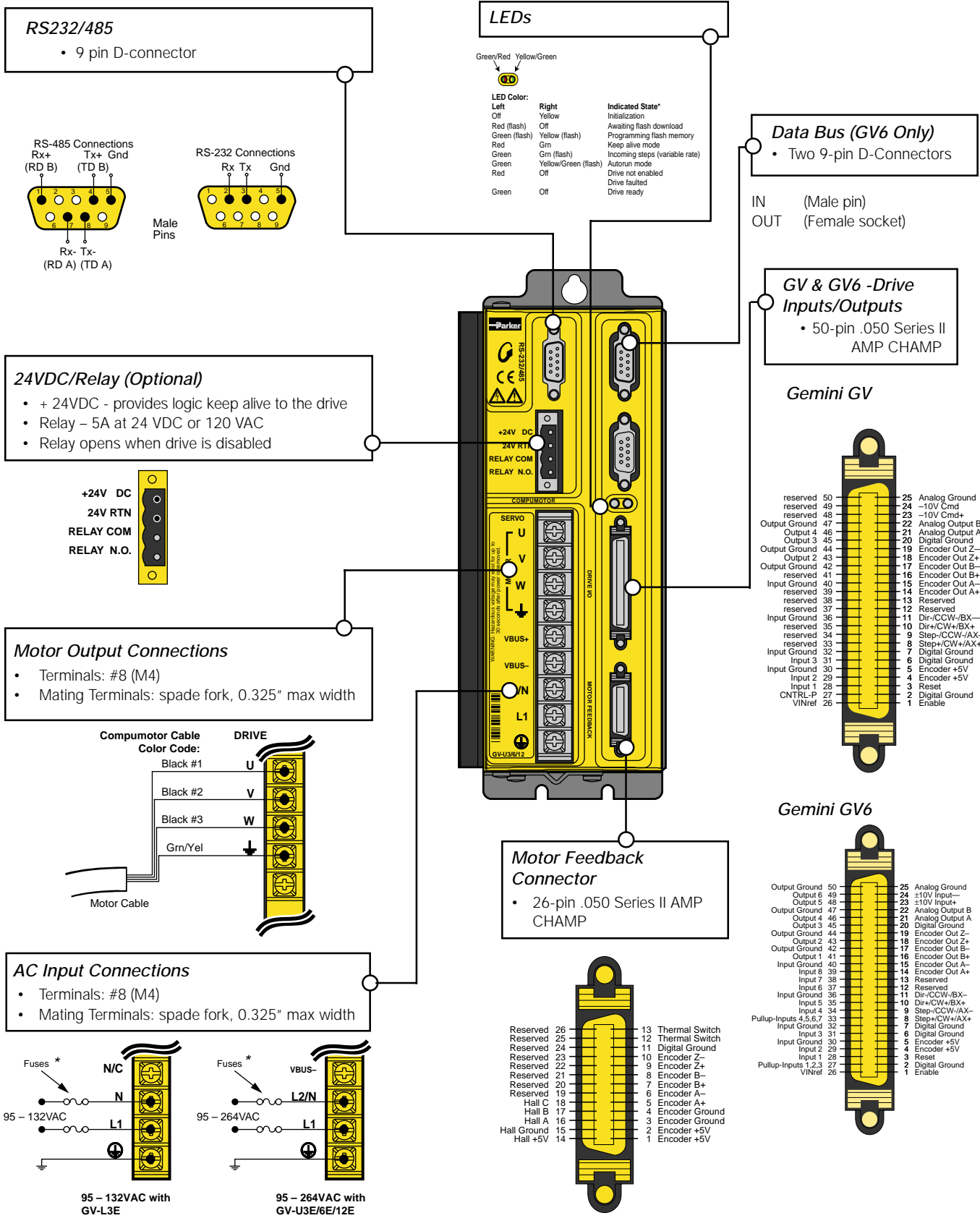
- All cables have MS connectors and are CE(LVD&EMC)
- XX= cable length. Standard cable lengths are 10, 25, and 35 feet. Contact the factory for custom lengths.
- Cables are also available with brake option (not shown).
- Cable sets are also available.

Part Number	Description
92GS Cable-XX	One 71-017095-XX+ One 71-017149-XX
XX = cable length; 10, 25, and 35 are standard cable lengths	

Please refer to the Servo Motor Section for complete servo motor and cable specifications.

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# Gemini GV/GV6 Connections and LEDs



**RS232/485**  
 • 9 pin D-connector

**LEDs**

Green/Red Yellow/Green

LED Color:	Right	Indicated State*
Left	Yellow	Initialization
Off	Off	Awaiting flash download
Red (flash)	Off	Programming flash memory
Green (flash)	Yellow (flash)	Keep alive mode
Red	Grn	Incoming steps (variable rate)
Green	Grn (flash)	Autorun mode
Green	Yellow/Green (flash)	Drive not enabled
Red	Off	Drive faulted
Green	Off	Drive ready

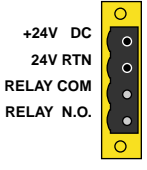
**Data Bus (GV6 Only)**  
 • Two 9-pin D-Connectors

IN (Male pin)  
 OUT (Female socket)

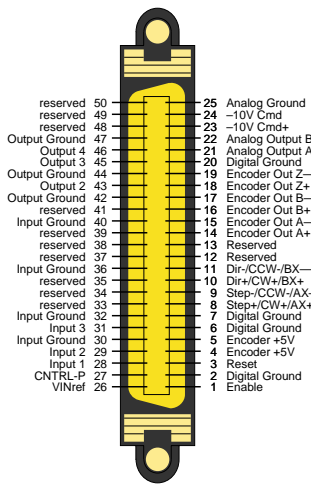
**GV & GV6 -Drive Inputs/Outputs**  
 • 50-pin .050 Series II AMP CHAMP

**24VDC/Relay (Optional)**

- + 24VDC - provides logic keep alive to the drive
- Relay - 5A at 24 VDC or 120 VAC
- Relay opens when drive is disabled

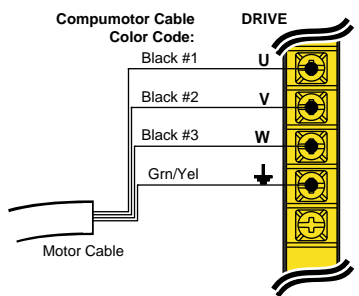


**Gemini GV**

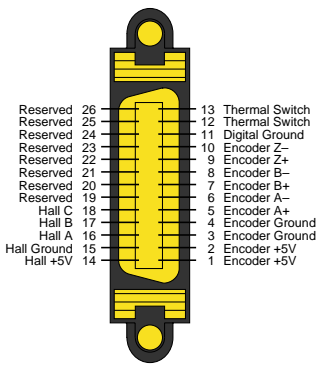


**Motor Output Connections**

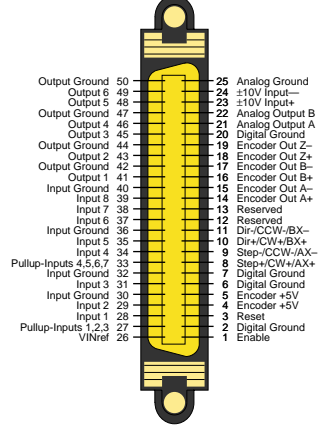
- Terminals: #8 (M4)
- Mating Terminals: spade fork, 0.325" max width



**Motor Feedback Connector**  
 • 26-pin .050 Series II AMP CHAMP



**Gemini GV6**



\*Please Consult the User Guide for Proper Fuse Selection

Drives & Drive/Controllers

controllers  
 drives  
 motors

# Gemini GT



## The Gemini GT Digital Stepper Drive

The Gemini GT is the digital stepper drive member of the Gemini Family. The Gemini GT is easily configurable and programmable via RS232/485 using Compumotor's Motion Planner™ on a PC or Pocket Motion Planner™ on a Window's CE™-based palm PC. The Gemini GT is an alternative to a digital servo drive. With breakthrough techniques such as Encoderless Stall Detect™ and ABS damping™ (patents pending), the Gemini GT provides servo like performance with the lower motor price of a stepper system. With the same connectivity, configurations, and family feature set as the Gemini GV, the Gemini GT allows for an easy upgrade path to the Gemini GV digital servo drive.

### Active Damping™, Electronic Viscosity™ and ABS Damping™

The Gemini GT follows in the footsteps of Compumotor's ZETA drive family and offers Active Damping™ (patented) and Electronic Viscosity™ (patent pending). The Gemini GT goes one step further with ABS Damping™ (patent pending). This damping feature is for speed ranges from 0 to 0.1 revs/sec. This "no-fuss" feature requires no user set up and dramatically reduces settling time.

### Encoderless Stall Detect™

Encoderless Stall Detect™ allows detection of a motor stall without adding an encoder to an application. Stall conditions result from inequality of commanded velocity to actual velocity at the motor shaft, regardless of physical reason. The user will be alerted to a stall condition via LED, digital output, or via query over the communication port. Stall sensitivity can be adjusted with a single parameter.

#### When Can I Take Advantage of a Low-Cost Stepper Motor? Applications with...

- ✓ Predictable loads
- ✓ High stiffness at rest required
- ✓ High accuracy, resolution, and reliability required
- ✓ Continuous power needs
- ✓ Speed less than 50 rps

## Features

### Gemini GT Performance

- Provides four power ranges for up to 8 Amps of continuous current
- Step and direction (cw/ccw), +/- 10 VDC velocity, and encoder tracking modes available
- Active Damping™, Electronic Viscosity™, and ABS Damping™
- Encoderless Stall Detect™
- Simplified configuration
- Variable resolution up to 128,000 steps/rev

### Gemini GT Protection

- Short circuit protection – phase-to-phase and phase-to-ground
- Brownout protection – if AC drops below 85 VAC
- Over temperature – shutdown occurs at ambient 131°F (55°C)

### Gemini GT Physical

- A wide selection of stepper motors are available from Compumotor including the O, R, T, and E Series
- Two input power ranges available; low: 120V, and universal: 120/240V
- Diagnostic LEDs for drive status, firmware download, and optional keep alive mode

### Gemini Family Features

- 24V Keep Alive (not required) – keeps logic alive if AC power is removed
- Error Log – records 10 most recent errors with time stamp
- Approvals: UL Recognition, cUL, CE (LVD), and CE (EMC)
- Configurable via RS232/485 using Compumotor's Motion Planner™ on a PC or Pocket Motion Planner™ on a Windows CE™-based Palm PC

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# Gemini GT6



## The Gemini GT6 Digital Stepper Drive/Indexer

The Gemini GT6 is a stand-alone, compact, digital stepper drive and basic motion controller in one complete package. The Gemini GT6 incorporates all of the GT digital stepper drive features such as Encoderless Stall Detect™ and ABS Damping™ (patents pending) with the flexibility of a simple, yet powerful motion controller.

The Gemini GT6 is easily configurable and programmable via RS232/485 using Compumotor's Motion Planner™ on a PC or Pocket Motion Planner™ on a Window's CE™-based palm PC. The Gemini GT6 also offers connectivity to several field buses including Profibus, Interbus, and SERCOS.\*

Similar to the digital stepper drive, the Gemini GT6 provides servo performance for the package price of a stepper system. It also allows the flexibility of an upgrade path to the Gemini GV6, due to its equivalent connectivity, programmability, and family feature set. For applications requiring stepper motor controls and basic motion control functionality, the Gemini GT6 is today's industry technology leader.

## Features

### Gemini GT6 Performance

- Provides four power ranges for up to 8 Amps of continuous current
- Active Damping™, Electronic Viscosity™, and ABS Damping™
- Encoderless Stall Detect™
- Simplified configuration
- Variable resolution up to 128,000 steps/rev
- Stand-alone controller and drive in one small package
- Program Storage: 32 programs or 190 lines of program code
- Control features such as registration, motion profiles, S-curve velocity profiling, electronic gearing, and conditional statements
- Daisy chain up to 99 units
- 8 programmable inputs and 6 programmable outputs
- Compatibility with Interbus, Profibus, and SERCOS\*

### Gemini GT6 Protection

- Short circuit protection – phase-to-phase and phase-to-ground
- Brownout protection – if AC drops below 85 VAC
- Over temperature – shutdown occurs at 131°F (55°C)

### Gemini GT6 Physical

- A wide selection of stepper motors are available from Compumotor including the O, R, T, and E Series
- Two input power ranges available; low: 120V, and universal: 120/240V
- Diagnostic LEDs for drive status, firmware download, and optional keep alive mode

### Gemini Family Features

- 24V Keep Alive (not required) – keeps logic alive if AC power is removed
- Error Log – records 10 most recent errors with time stamp
- Approvals: UL Recognition, cUL, CE (LVD), and CE (EMC)
- Configurable/Programmable via RS232/485 using Compumotor's Motion Planner™ on a PC or pocket Motion Planner™ on a Windows CE™-based Palm PC

\* Please contact Factory for specifications

**GT/GT6 Common Specifications**

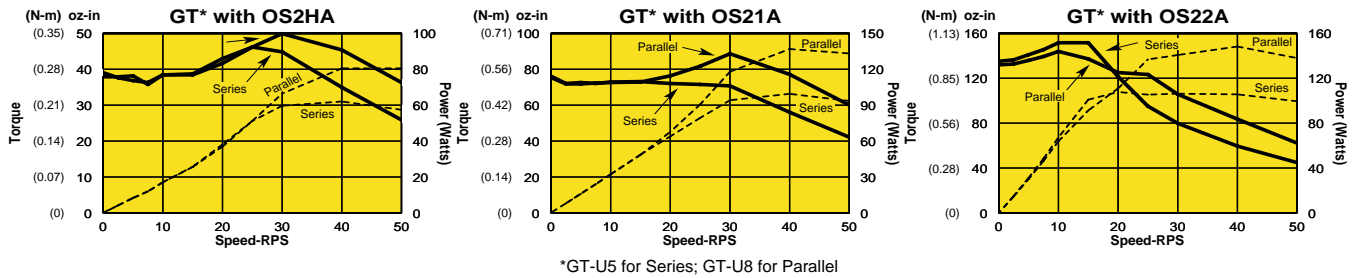
Specifications	GT(GT6)-L5	GT(GT6)-L8	GT(GT6)-U5	GT(GT6)-U8
<b>Input Power</b>				
Voltage	95-132 VAC	95-132 VAC	95-132, 190-265 VAC	95-132, 190-265 VAC
Phase	1Ø	1Ø	1Ø	1Ø
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
24V Keep Alive (Optional)	24 VDC +/- 20%	24 VDC +/- 20%	24 VDC +/- 20%	24 VDC +/- 20%
<b>Output Power</b>				
Bus Voltage	170 VDC	170 VDC	74 VDC	74 VDC
Switching Frequency	20kHz	20kHz	20kHz	20kHz
Continuous Current (Apk)	5 Amps	8 Amps	5 Amps	7.5 Amps
<b>Performance</b>				
Accuracy	+/-5 arc min (0.0833°) unloaded bi-directional with Compumotor motors +/- 1 arc min (0.0167°) loaded in addition to unloaded accuracy			
Repeatability	+/- 5 arc sec (0.0014°), typical unloaded			
Hysteresis	Less than 2 arc min (0.0334°) unloaded			
Resolution	User defined integer value between 200 and 128,000 steps			
Waveform	User defined, pure sine, -20% to 10%, continuously variable 3rd harmonic			
<b>Command Inputs - GT</b>				
Position Mode	Step and Direction/CW & CCW/Encoder Tracking			
Velocity Mode	+/- 10 V			
<b>Inputs – GT</b>				
Enable, Reset, User Fault	5-24VDC Selectable, 1/3 1/3 1/3 voltage switching threshold			
Neg/Pos Limits	5-24VDC Selectable, 1/3 1/3 1/3 voltage switching threshold			
<b>Inputs – GT6</b>				
8 Program., Enable, Reset	5-24VDC Selectable, 1/3 1/3 1/3 voltage switching threshold			
<b>Outputs – GT</b>				
Fault, At Limit, Stall	Open collector, 300mA sink capability			
Analog Monitors	+/- 10 V scalable, 8 bit (not to be used as control functions)			
Step & Direction	Programmable up to 128,000 counts/rev			
Relay	Normally open, dry contact			
<b>Outputs – GT6</b>				
6 Programmable	Open collector, 300mA sink capability			
Analog Monitors	+/- 10 V scalable, 8 bit (not to be used as control functions)			
Step & Direction	Programmable up to 128,000 counts/rev			
Relay	Normally open, dry contact			
<b>Communications</b>				
Type	RS232/RS485 (4-wire), 8 bit binary protocol			
Baud Rate	Fixed at 9600			
Daisy Chain – GT6	Up to 99			
<b>Environmental</b>				
Temperature	Still air: 113°F(45°C), moving air: 122°F (50°C)			
Humidity	0-95%, non-condensing			
Shock/Vibration	Shock:15G half-sine @ 11 msec/ vibration: 2G, 10-2000 Hz			
<b>Protection</b>				
Short Circuit	Phase-to-phase, phase-to-ground			
Brownout	AC drops below 85 VAC			
Over Temperature	Shutdown fault at 131°F (55°C)			
<b>Standards</b>	UL, cUL, CE (LVD), CE ( EMC)			
<b>Physical</b>				
Compumotor motors	O, R, T, and E Series motors			
Non-Compumotor motors	4,6, or 8-lead, 2-phase hybrid permanent magnet motor, 1.8°			
Inductance	0.5mH minimum; 5 to 50 mH recommended, 100mH max			
<b>Connectors</b>				
Serial	9-pin D-shell (male)			
Motor and power	Barrier screw terminal			
Command and I/O	50-pin High density Amp Champ - .050 Series II (with screw attachment)			
+24VDC/Relay	4-pin removable terminal block			

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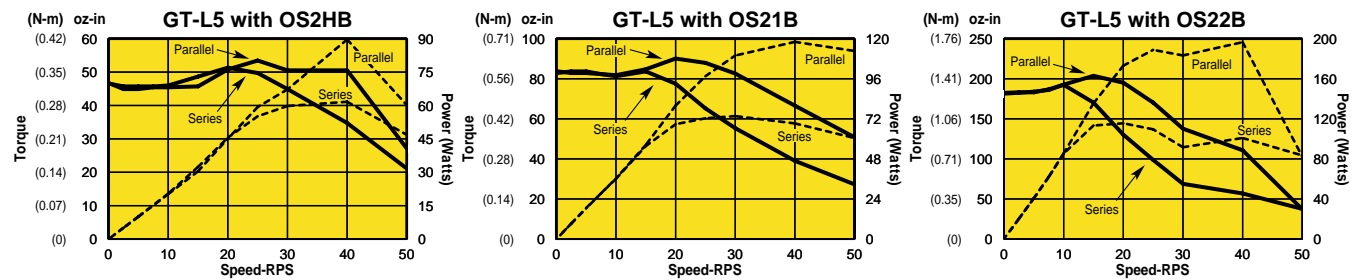


# Stepper Speed/Torque Performance Curves

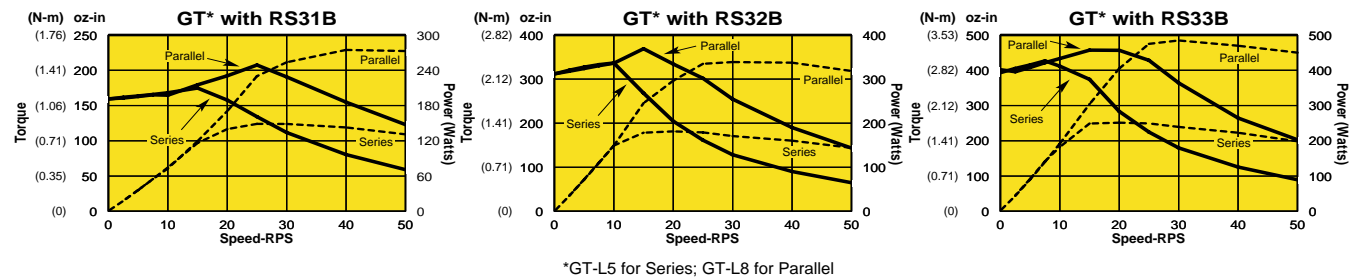
## Gemini GT with O Series Motors, "A" Windings, Size 23 Frame



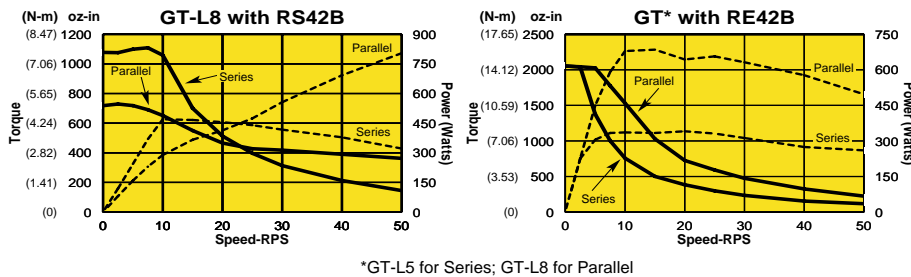
## Gemini GT with O Series Motors, "B" Windings, Size 23 Frame



## Gemini GT with R Series Motors, "B" Windings, Size 34 Frame



## Gemini GT with R Series Motors, "B" Windings, Size 42 Frame

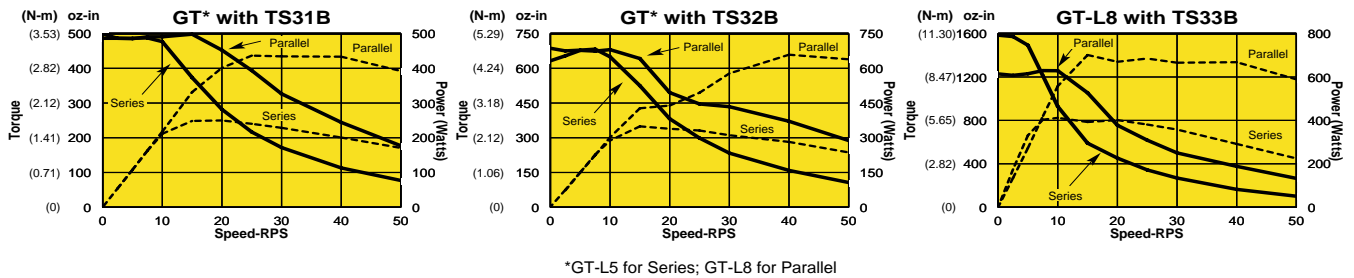


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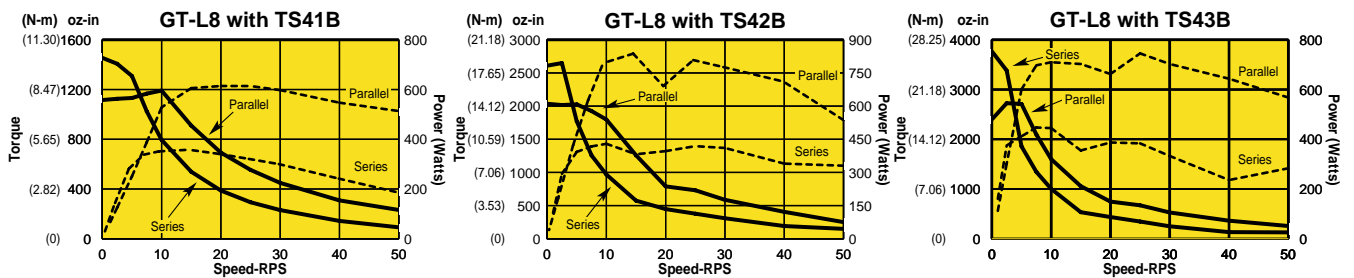


# Stepper Speed/Torque Curves

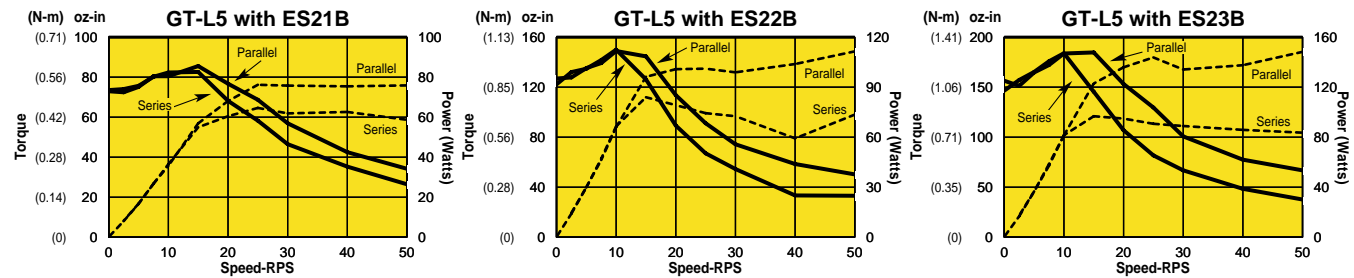
## Gemini GT with T Series Motors, "B" Windings, Size 34 Frame



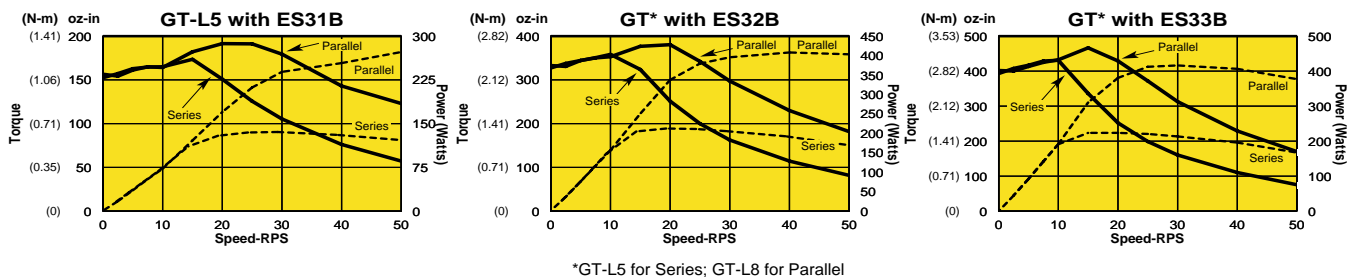
## Gemini GT with T Series Motors, "B" Windings, Size 42 Frame



## Gemini GT with E Series Motors (Previously ZETA and S Series Motors), Size 23 Frame



## Gemini GT with E Series Motors (Previously ZETA and S Series Motors), Size 34 Frame



For additional Gemini speed/torque curves, please refer to [www.compumotor.com](http://www.compumotor.com).

Drives & Drive/Controllers

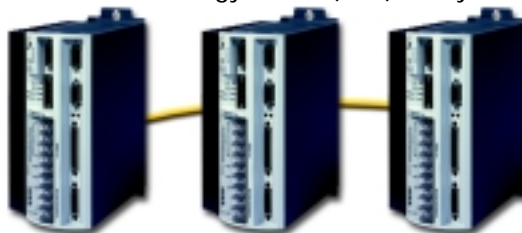
O & R Series Stepper Motor Specifications  
Size 23, 34, & 42 Frame Sizes

Parameters		Size 23 Frame			Size 34 Frame			Size 42 Frame	
		OS2HB	OS21B	OS22B	RS31B	RS32B	RS33B	RS42B	RE42B
Static torque	oz-in	43	82	155	133	267	392	985	1907
	(Nm)	(0.30)	(0.58)	(1.09)	(0.93)	(1.87)	(2.74)	(6.90)	(13.35)
Rotor inertia	oz-in <sup>2</sup>	0.39	0.66	1.39	3.02	6.56	9.65	61.76	61.76
	(kg-cm <sup>2</sup> )	(0.07)	(0.12)	(0.25)	(0.55)	(1.20)	(1.77)	(11.30)	(11.30)
Drive Current (Apk)(Arms)	Series	1.5 (1.0)	1.8 (1.3)	2.2 (1.5)	2.3 (1.6)	2.8 (2.0)	3.4 (2.4)	6.1 (4.3)	3.4 (2.4)
	Parallel	3.0 (2.1)	4.0 (2.8)	4.0 (2.8)	4.6 (3.3)	5.6 (4.0)	6.9 (4.9)	12.0 (8.5)	7.2 (5.1)
Phase Inductance (mH)	Series	8.6	12	16.6	9.4	11.6	9.6	8.2	42.6
	Parallel	2.2	3	4.2	2.4	2.9	2.4	2.1	10.7
Drive Bus Voltage	(VDC)	170	170	170	170	170	170	170	170
Detent Torque	oz-in	2.5	4.0	7.0	8.8	18.0	27.0	50	81.0
	(N-m)	(0.02)	(0.03)	(0.05)	(0.06)	(0.13)	(0.19)	(0.35)	(0.57)
Bearings Information Thrust Load	lb	13	13	13	180	180	180	400	400
	(kg)	(5.9)	(5.9)	(5.9)	(81.6)	(81.6)	(81.6)	(182)	(182)
Radial Load	lb	20	20	20	35	35	35	140	140
	(kg)	(9.1)	(9.1)	(9.1)	(15.9)	(15.9)	(15.9)	63.6)	(63.6)
End Play	in	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
	(mm)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
Radial Play (Per 0.5 lb load)	in	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
	(mm)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Motor Weight	lb	1	1.5	2.5	3.2	5.3	7.6	18.2	18.2
	(kg)	(0.5)	(0.7)	(1.1)	(1.5)	(2.4)	(3.5)	(8.3)	(8.3)
Certifications	UL recognized	No	No	No	Yes	Yes	Yes	Yes	Yes
	CE (LVD)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	CE (EMC & LVD)*	No	No	No	*	*	*	*	*

\* To comply with EMC and low-noise (CISPR22/EN55022 Class A or FCC Class A emissions) standards, the following items are required:

- Gemini GT or GT6 Drives
- CE(LVD) motor for LVD, Compumotor recommends a terminal board (NPS) motor construction for easier EMC installation
- C10(CH10) motor accessory (LVD/EMC cable kit)
- Mains filter as indicated in the User Guide

Discover how easily Gemini fits into your next motion control application by calling 1-800-358-9070. Or visit us on the web at [www.compumotor.com](http://www.compumotor.com) to find a local factory authorized Automation Technology Center (ATC) near you.



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Drives & Drive/Controllers

controllers

drives

motors

**T Series Stepper Motor Specifications  
(Size 34 Frame & 42 Frame)**

		Size 34 Frame			Size 42 Frame		
		TS31B	TS32B	TS33B	TS41B	TS42B	TS43B
Static torque**	oz-in (N-m)	455 (3.19)	647 (4.53)	1525 (10.68)	1332 (9.32)	2515 (17.61)	3479 (24.35)
Rotor inertia	oz-in <sup>2</sup> (kg-cm <sup>2</sup> )	7.80 (1.43)	14.67 (2.68)	21.89 (4.01)	30.22 (5.53)	59.68 (10.92)	88.51 (16.20)
Drive Current (Apk)(Arms)**	Series	3.3 (2.3)	3.1 (2.2)	5.6 (4.0)	6.4 (4.5)	6.7 (4.7)	6.9 (4.9)
	Parallel	6.7 (4.7)	6.2 (4.4)	12.0 (8.5)	12.0 (8.5)	12.0 (8.5)	12.0 (8.5)
Drive Bus Voltage	(VDC)	170	170	170	170	170	170
Phase Inductance (mH)***	Series	10.3	10.3	13.6	15.8	22.0	30.7
	Parallel	2.6	2.6	3.4	3.9	5.5	7.7
Detent Torque	oz-in (Nm)	18 (0.13)	36 (0.25)	54 (0.38)	42 (0.30)	84 (0.59)	106 (0.75)
<b>Bearings Information</b>							
Thrust Load	lb (kg)	305 (139)	305 (139)	305 (139)	404 (184)	404 (184)	404 (184)
Radial Load	lb (kg)	65 (30)	65 (30)	110 (50)	125 (57)	110 (50)	110 (50)
End Play (Reversing load equals 1 lb)	in (mm)	0.001 (0.025)	0.001 (0.025)	0.001 (0.025)	0.001 (0.025)	0.001 (0.025)	0.001 (0.025)
Radial Play (Per 0.5 lb load)	in (mm)	0.0008 (0.020)	0.0008 (0.020)	0.0008 (0.020)	0.0008 (0.020)	0.0008 (0.020)	0.0008 (0.020)
Motor Weight	lb (kg)	5.0 (2.3)	8.4 (3.8)	11.9 (5.4)	11.0 (5.0)	18.4 (8.4)	25.7 (11.7)
Certifications	UL recognized	Yes	Yes	Yes	Yes	Yes	Yes
	CE (LVD)	Yes	Yes	Yes	Yes	Yes	Yes
	CE (EMC & LVD)*	*	*	*	*	*	*

\* To comply with EMC and low-noise (CISPR22/EN55022 Class A or FCC Class A emissions) standards, the following items are required:  
 • Gemini GT or GT6 Drive  
 • CE(LVD) motor for LVD. Compumotor recommends a terminal board

(NPS) motor construction for easier EMC installation  
 • C10(CH10) motor accessory (LVD/EMC cable kit)  
 • Mains Filter as indicated in the User Guide

\*\* Values shown in speed-torque curves  
 \*\*\* Small signal values

**E Series Stepper Motor Specifications  
(Size 23 Frame & 34 Frame)**

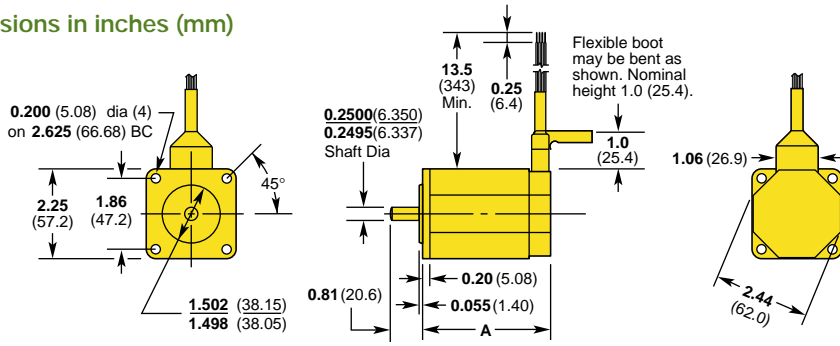
		Size 23 Frame			Size 34 Frame			
		ES21B	ES22B	ES23B	ES31B	ES32B	ES33B	
		(ZETA57-51)	(ZETA57-83)	(ZETA57-102)	(ZETA83-62)	(ZETA83-93)	(ZETA83-135)	
Static torque	oz-in (N-m)	65 (0.46)	125 (0.71)	145 (0.89)	145 (1.14)	300 (2.14)	380 (2.80)	
Rotor inertia	oz-in <sup>2</sup> (kg-cm <sup>2</sup> )	0.546 (9.998)	1.1 (20.1)	1.69 (30.9)	3.47 (63.4)	6.76 (124)	10.47 (191)	
Inductance	Series	mH (small signal*)	17.37	18.5	17	10	10.5	9.2
	Parallel	mH (small signal*)	4.34	4.62	4.25	2.5	2.62	2.3
<b>Bearings Information</b>								
Thrust Load	lb (kg)	25 (11.3)	25 (11.3)	25 (11.3)	50 (22.6)	50 (22.6)	50 (22.6)	
Radial Load (Reverse load equal to 1 lb)	lb (kg)	15 (6.8)	15 (6.8)	15 (6.8)	25 (11.3)	25 (11.3)	25 (11.3)	
End Play	in (mm)	0.001 (0.025)	0.001 (0.025)	0.001 (0.025)	0.001 (0.025)	0.001 (0.025)	0.001 (0.025)	
Radial Play (Per 0.5 lb load)	in (cm)	0.0008 (0.020)	0.0008 (0.020)	0.0008 (0.020)	0.0008 (0.020)	0.0008 (0.020)	0.0008 (0.020)	
Net Weight Motor + Cable + Connector	lb (kg)	1.6 (0.7)	2.4 (1.1)	3.2 (1.5)	3.8 (1.7)	5.1 (2.3)	8.3 (3.8)	
Motor Cable*** Wire Size	AWG (mm <sup>2</sup> )	24 (0.25)	24 (0.25)	24 (0.25)	22 (0.34)	22 (0.34)	22 (0.34)	

\* Small Signal Inductance is found by using an inductance bridge or meter.  
 \*\*\* All Motors Cable length = 10 feet (3m); attached connector is prewired for series current

# Stepper Motor Dimensions

## Size 23 Frame, O Series

Dimensions in inches (mm)



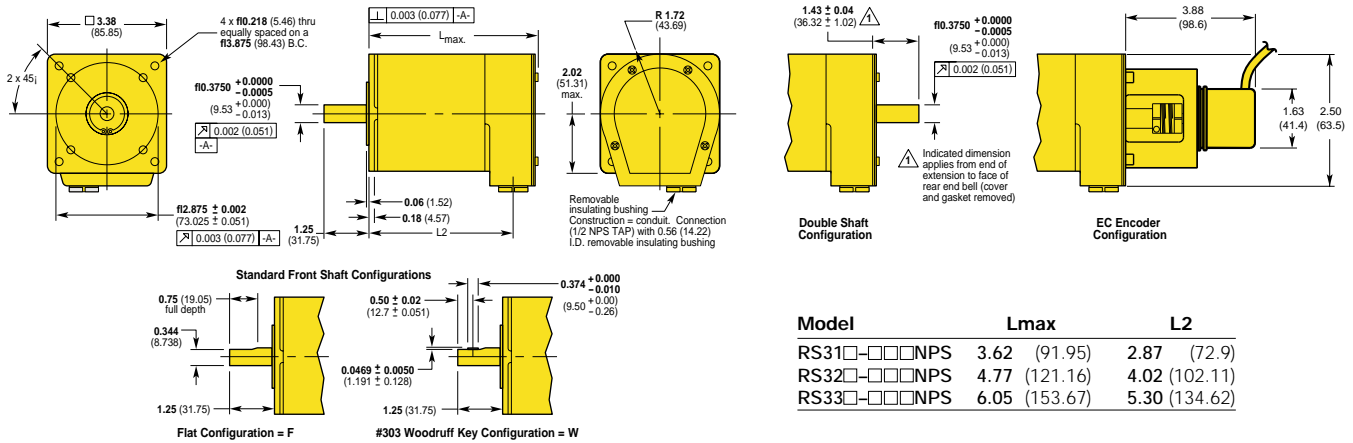
**Frame Size 23**

Model	A
OS2HA (OEM57-40)	1.60 (40.6)
OS21A (OEM57-51)	2.06 (52.3)
OS22A (OEM57-83)	3.10 (78.7)

Dimensions in inches (millimeters)

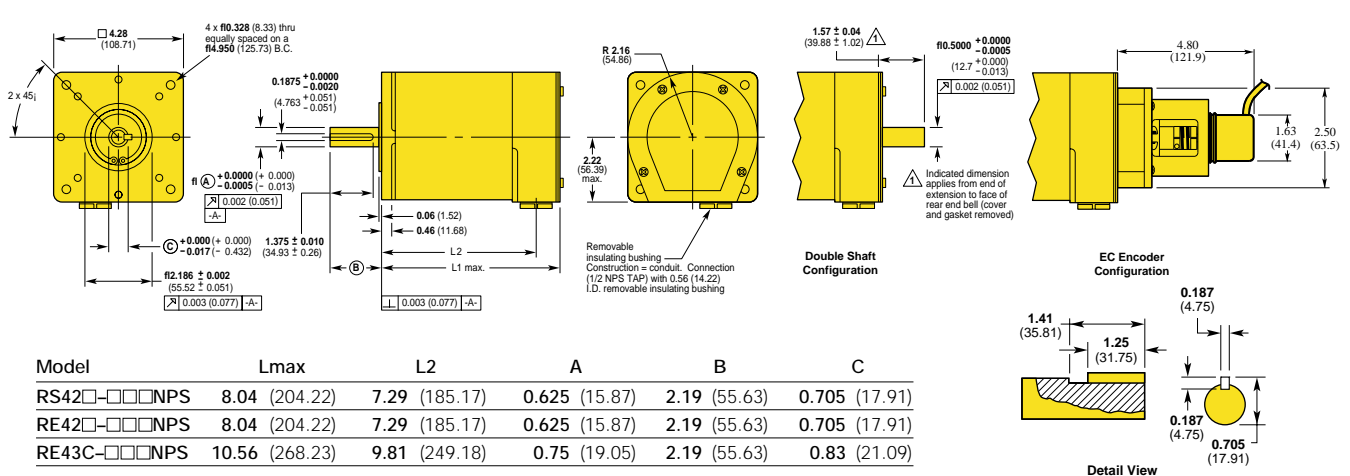
## Size 34 Frame, R Series

Dimensions in inches (mm)



## Size 42 Frame, R Series

Dimensions in inches (mm)



For servo motor information, please turn to that section of the catalog.

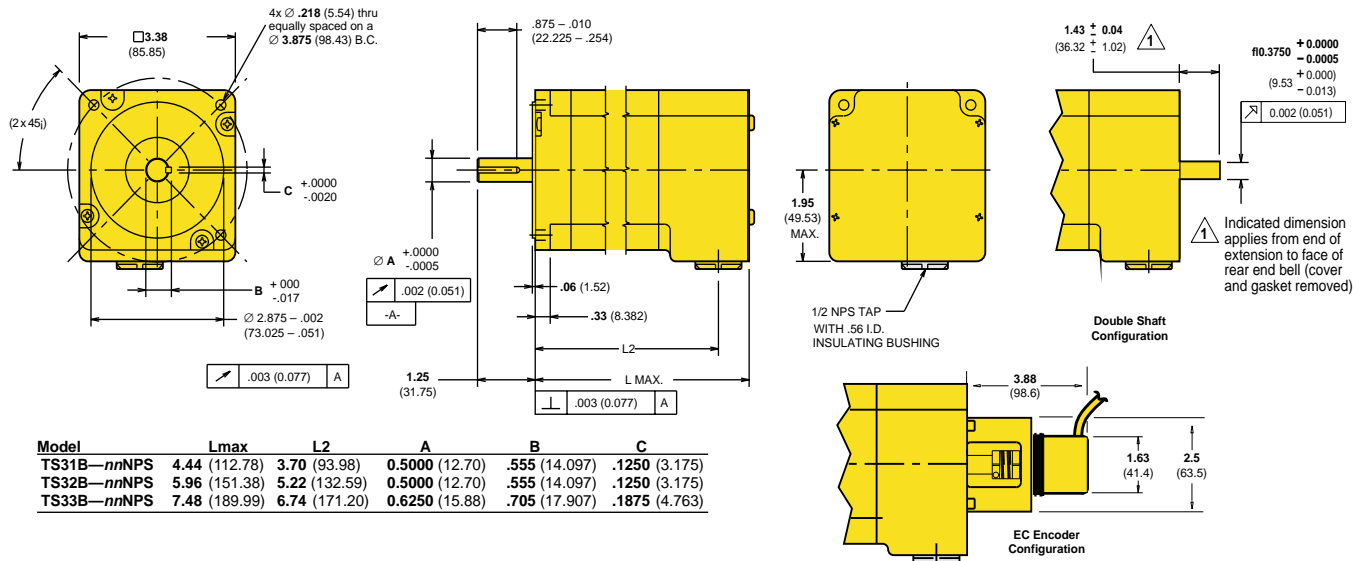
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# Stepper Motor Dimensional Drawings

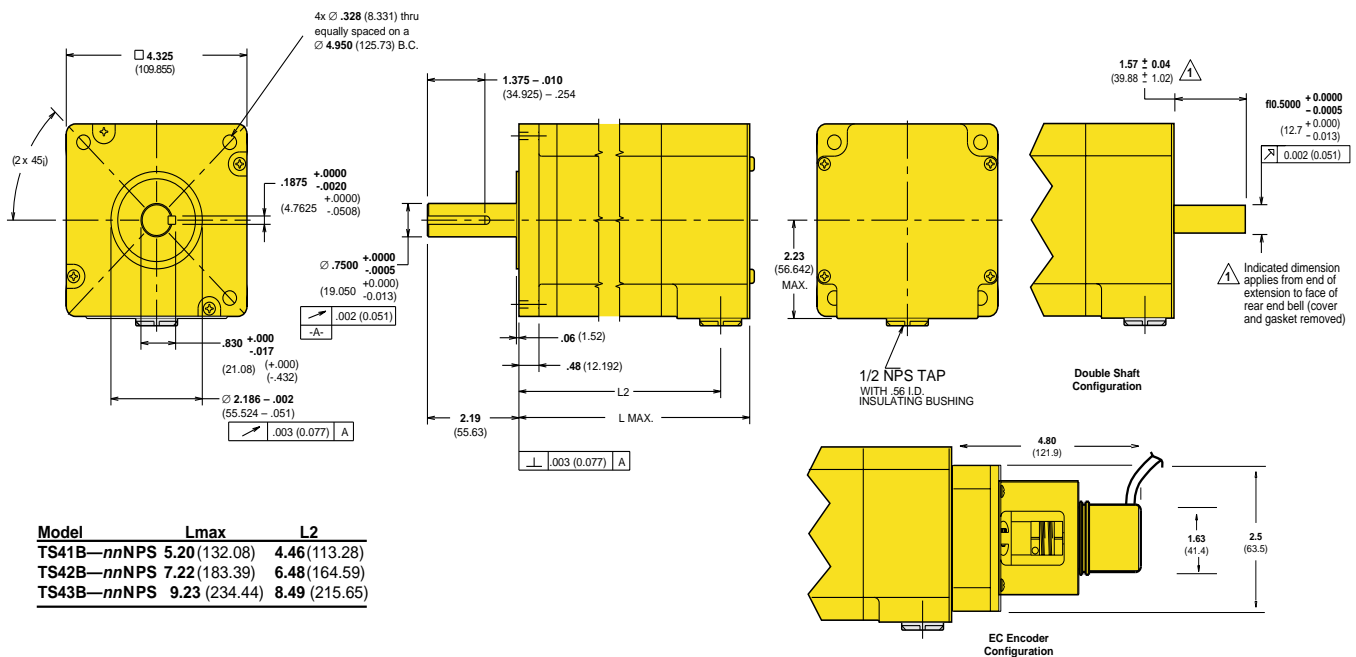
## Size 34 Frame, T Series

Dimensions in inches (mm)



## Size 42 Frame, T Series

Dimensions in inches (mm)

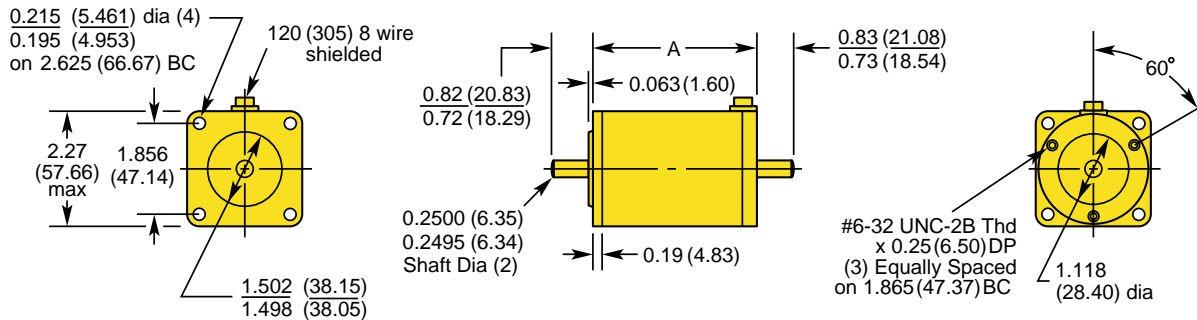


For servo motor information, please turn to that section of the catalog.

# Stepper Motor Dimensional Drawings

## Size 23 Frame, E Series (also known as ZETA Series)

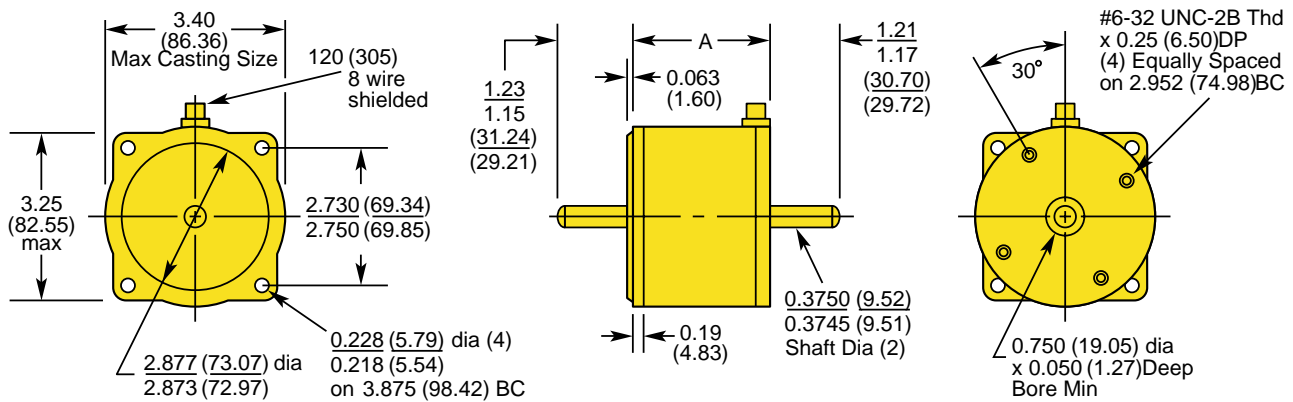
Dimensions in inches (mm)



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, E Series (also known as ZETA Series)

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)

For servo motor information, please turn to that section of the catalog.

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# Stepper Motor Ordering Information

## O Series (CE(LVD), UL (pending))

The O Series Size 23 Frame motors with A Winding (75VDC) are designed for use with the Gemini GT-U5, Gemini GT-U8, OEM750 Series, OEM230/330/530 Series, and the SD Series. The O Series Size 23 Frame motors with B Winding (170VDC) are designed for use with the Gemini GT-L5, Gemini GT-L8, ZETA Series, ZETA-240 Series (@120VAC), S Series, PD Series.

Series O (Octagonal)	Type S=Standard	Frame Size 2=Size 23 (2.5")	No. of Rotor Stacks H=Half stacks 1=1 stack 2=2 stacks	Winding Type A=75VDC winding (Gray painted motors) B=170VDC winding (Black painted motors)	Shaft S=Single D=Double Double shaft req'd for all motors w/encoders	Shaft Modification N=Standard smooth F=Flat (.02" depth) (0.5" length)	Motor Construction/ Hookup FLY=Regular construction with flying (8) leads, 12" L10= Regular construction with 10' LVD cable	Encoder Option Blank=No feedback (no dash required) HJ=512 ppr single-ended kit encoder w/12" flying leads (only available on A winding motors) RE=1000 ppr differential kit encoder w/ line driver & 13' braided shield cable (w/ FLY only) RC=1000 ppr differential kit encoder w/ line driver & 10' cable
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### O Series Part Number Example:

OS2 \_ \_ \_ - \_ \_ \_ \_ - \_ \_ \_  
 OS2HA-SNFLY  
 OS22B-DNL10-RC

## R Series (CE(LVD), CE(EMC)\*, UL recognized)

The R Series Size 34 and Size 42 Frame motors are available in a B Winding (170VDC) and a C Winding (340VDC). Motors with the B Winding are recommended for use with Gemini GT-L5, Gemini GT-L8, the ZETA Series, ZETA240 Series (@120VAC), PD Series, S Series. Motors with the C Winding are recommended for use with the ZETA4-240 (@240VAC).

Series R (Round)	Type S=Standard E=Enhanced (RE 42 only)	Frame Size 3=Size 34 (3.38") 4=Size 42 (4.33")	No. of Rotor Stacks 1=1 stack (34 Frame Only) 2=2 stacks 3=3 stacks	Winding Type B=170VDC winding (Black painted motors) C=340VDC winding (Yellow painted motors)	Shaft S=Single D=Double (Double shaft req'd for all motors w/ encoders)	Shaft Modification N=None (34 Frame only) K=Straight Key (Standard on 42 Frame) F=Flat (34 Frame only, 0.02" depth, 0.5" length)	Motor Construction/ Hookup NPS=End bell/terminal board via 1/2" NPS Pipe thread S10=CE (LVD)/UL, 10' cable option for NPS construction, wired @ motor in Parallel. P10=CE (LVD)/UL, 10' cable option for NPS construction, wired @ motor in Series.	Encoder Option Blank=No feedback (No Dash Required) EC=1000 ppr differential encoder with line driver and 10' cable (-E Series)
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### R Series Part Number Example:

R \_ \_ \_ \_ - \_ \_ \_ \_ - \_ \_ \_  
 RS32B-SNS10  
 RE42C-SKNPS  
 RS42B-DKS10-EC

## T Series (CE(LVD), CE(EMC)\*, UL recognized)

The T Series Size 34 and Size 42 Frame motors are available in a B Winding (170VDC). These motors are designed for use with the Gemini GT-L5, Gemini GT-L8, the ZETA Series, ZETA4-240 (@120VAC), PD Series, S Series.

Series T (Torque)	Type S=Standard	Frame Size 3=Size 34 (3.38") 4=Size 42 (4.33")	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 K=Straight Key (Standard on all T Series Motors)	Motor Construction/ Hookup NPS=End bell/terminal board via 1/2" NPS Pipe thread, no cable S10=CE (LVD)/UL, 10' cable option for NPS construction, wired @ motor in Series P10=CE (LVD)/UL, 10' cable option for NPS construction, wired @ motor in Parallel.	Encoder Option Blank=No feedback (No Dash Required) EC=1000 ppr differential encoder with line driver and 10-ft cable (-E Series)
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### T Series Part Number Example:

TS \_ \_ B - \_ \_ K \_ \_ \_ \_ - \_ \_ \_  
 TS31B-SKNPS  
 TS43B-DKS10

## E Series (also known as ZETA Series)

The E Series Size 23 and Size 34 Frame motors are available in a B Winding (170VDC). These motors are designed for use with Gemini GT-L5, Gemini GT-L8, the ZETA Series, ZETA4-240 (@120VAC), PD Series, S Series.

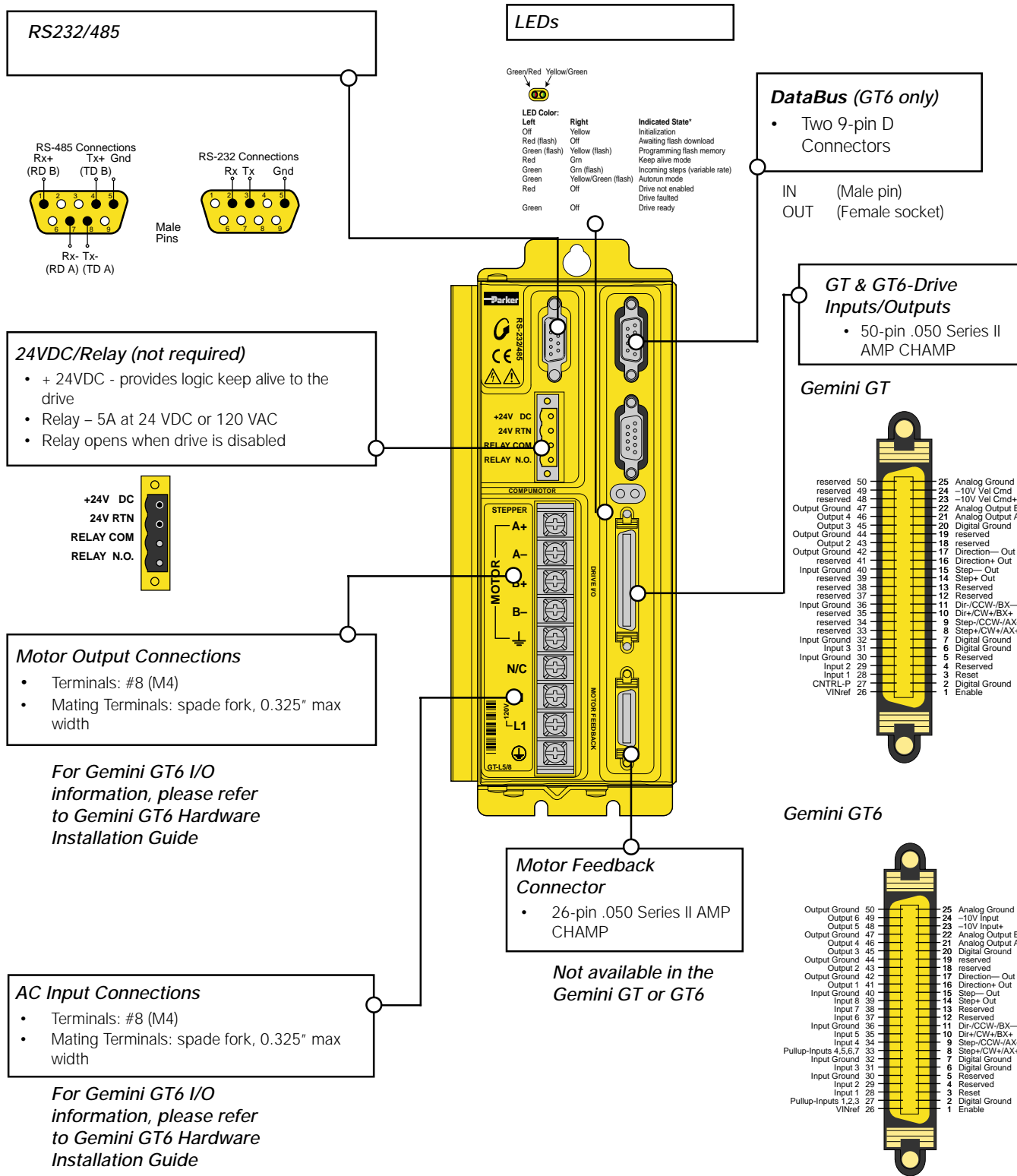
Series E (Extra Smooth)	Type S=Standard	Frame Size 2=Size 23 (2.5") 3=Size 34 (3.38")	No. of Rotor Stacks 1= 1 stack 2= 2 stacks 3= 3 stacks	Winding Type B=170VDC winding (Black painted motors)	Shaft S=Single D=Double Double shaft req'd for all motors w/encoders	Shaft Modification N=None (Standard) F=Flat (.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
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### E Series Part Number Example

ES \_ \_ B - \_ \_ K \_ \_ \_ \_ - \_ \_ \_  
 ES31B-SKNPS  
 ES43B-DKS10

\* EMC is a system compliance. Refer to page 67 for system compliance components.

# Gemini GT and GT6 Connections and LEDs



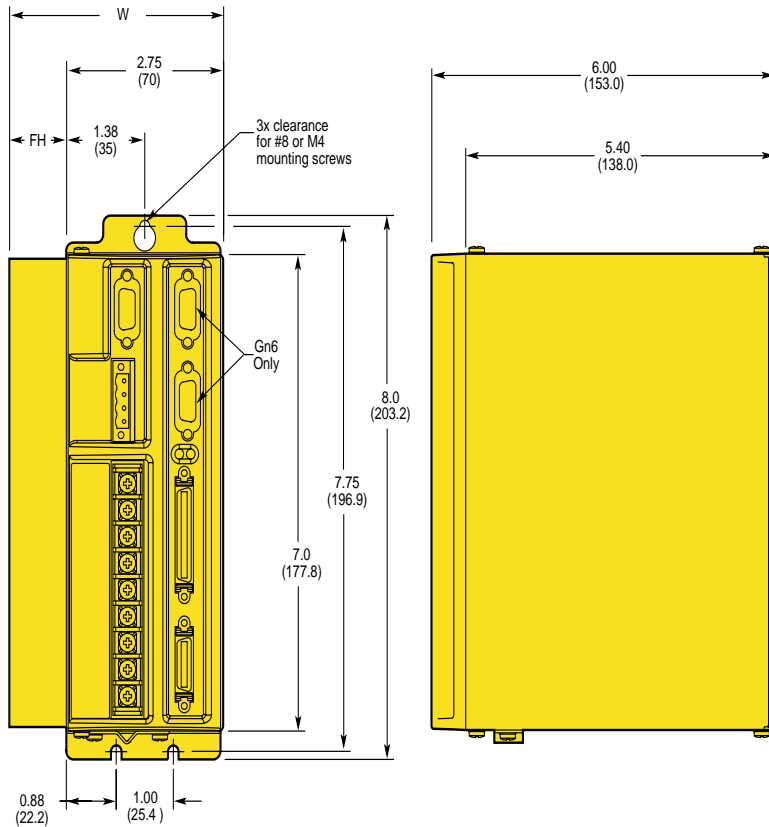
Drives & Drive/Controllers

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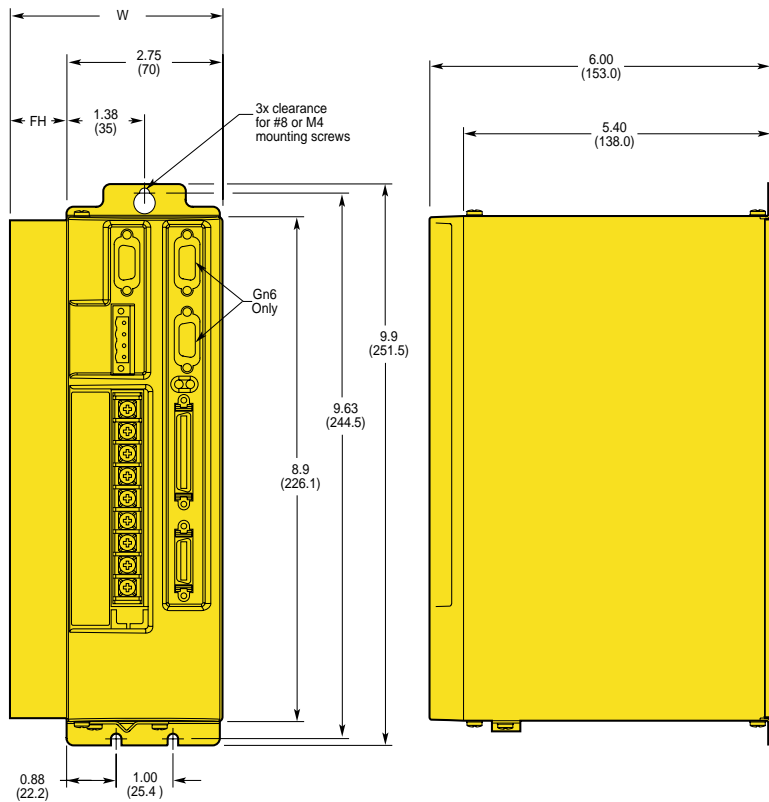


# Gemini Dimensional Drawings

Dimensions in inches (mm)



Gemini Drive Dimensions		
Product	W Width IN (MM)	FH FIN Height IN (MM)
GT_-L5	3.13 (79.4)	0.38 (9.5)
GT_-L8	3.75 (95.3)	1.00 (25.4)
GV_-L3	3.13 (79.4)	0.38 (9.5)
GV_-U3	3.13 (79.4)	0.38 (9.5)
GV_-U6	3.75 (95.3)	1.00 (25.4)
GV_-U12	3.75 (95.3)	1.00 (25.4)
GPDM	2.75 (70.0)	0.00 (0.0)



Gemini Drive Dimensions		
Product	W Width IN (MM)	FH FIN Height IN (MM)
GT_-U5	3.13 (79.4)	0.38 (9.5)
GT_-U8	3.75 (95.3)	1.00 (25.4)
GV_-H20	5.00 (127)	2.25 (57.2)

Drives & Drive/Controllers

**How To Order**

**Gemini GV & GT  
 Digital Drives**

Part Number	Product Description
GV-L3E	Gemini digital servo drive, 120VAC input, 3A cont., encoder feedback
GV-U3E	Gemini digital servo drive, 120/240VAC input, 3A cont., encoder feedback
GV-U6E	Gemini digital servo drive, 120/240VAC input, 6A cont., encoder feedback
GV-U12E	Gemini digital servo drive, 120/240VAC input, 12A cont., encodefeedback
GV-H20E	Gemini digital servo drive, 208/240VAC input, 20A cont., encoder feedback
GT-L5	Gemini digital stepper drive, 120VAC input, 5A cont.
GT-L8	Gemini digital stepper drive, 120VAC input, 8A cont.
GT-U5	Gemini digital stepper drive, 120/240VAC input, 5A cont.
GT-U8	Gemini digital stepper drive, 120/240VAC input, 7.5A cont.

*These items include the Gemini GV – Shipkit or Gemini GT- Shipkit. The Gemini Shipkits include a Gemini Hardware Installation Guide, a Gemini Motor Reference Manual, a Gemini Software Reference Guide, a Gemini Gn Quick Reference Guide, and Compumotor's Motion Planner™ and Pocket Motion Planner™ on a CD-ROM.*

**Gemini GV6 &  
 GT6 Digital Drive/  
 Controllers**

Part Number	Product Description
GV6-L3E	Gemini digital servo drive/controller, 120VAC input, 3A cont., encoder feedback
GV6-U3E	Gemini digital servo drive/controller, 120/240VAC input, 3A cont., encoder feedback
GV6-U6E	Gemini digital servo drive/controller, 120/240VAC input, 6A cont., encoder feedback
GV6-U12E	Gemini digital servo drive/controller, 120/240VAC input, 12A cont., encodefeedback
GV6-H20E	Gemini digital servo drive/controller, 208/240VAC input, 20A cont., encoder feedback
GT6-L5	Gemini digital stepper drive/controller, 120VAC input, 5A cont.
GT6-L8	Gemini digital stepper drive/controller, 120VAC input, 8A cont.
GT6-U5	Gemini digital stepper drive/controller, 120/240VAC input, 5A cont.
GT6-U8	Gemini digital stepper drive/controller, 120/240VAC input, 7.5A cont.

*These items include the Gemini GV6 - Shipkit or Gemini GT6- Shipkit. The Gemini Shipkits include a Gemini Hardware Installation Guide, a Gemini Motor Reference Manual, a Gemini Software Reference Guide, a Gemini Gn6 Quick Reference Guide, and Compumotor's Motion Planner™ and Pocket Motion Planner™ on a CD-ROM.*

**Options**

Part Number	Product Description
-NK	For OEMs or high-volume users who do not require a shipkit, we offer the -NK (no kit) option. <i>This product ships with a Gemini Gn or Gn6 Quick Reference Guide only.</i>
-R	Resolver Option (Call for availability)
-PB	Profibus (Call for availability)
-IS	Interbus (Call for availability)
-SC	SERCOS (Call for availability)

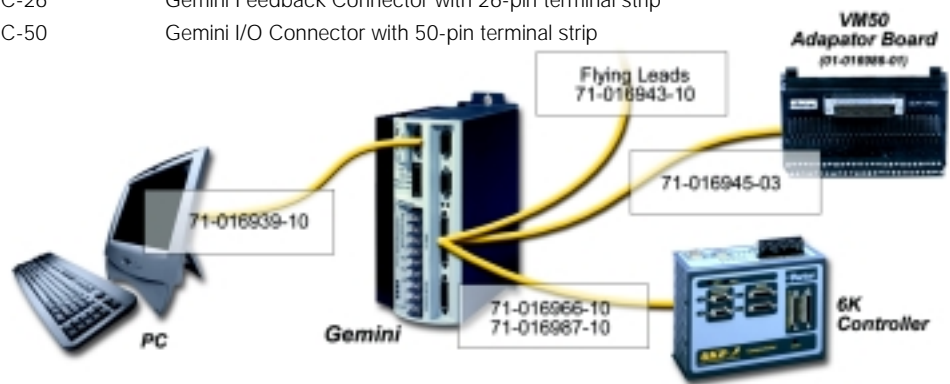
**How to Order Gemini Products is continued on the following page.**

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**How To Order (Continued)**

**Gemini Accessories**

Part Number	Product Description
71-016943-10	10' cable, 50-pin high density Amp Champ (.050 Series II) to flying leads, CE(LVD&EMC)
71-016945-03	3' cable, 50-pin high density Amp Champ (.050 Series II) to 50-pin breakout module, CE(LVD&EMC)
01-016986-01	50-pin screw terminal Gemini breakout module
GEM-VM50	Kit consisting of one 71-016945-03 cable and one 01-016986-01 breakout module
71-016966-10	Gemini to 6K Step & Direction command cable, 10', CE(LVD&EMC)
71-016987-10	Gemini to 6K Analog command cable, 10', CE(LVD&EMC)
71-016939-10	10' cable, RS-232/485 null modem, CE (LVD&EMC)
GPDM	Gemini Power Dissipation Module
GC-26	Gemini Feedback Connector with 26-pin terminal strip
GC-50	Gemini I/O Connector with 50-pin terminal strip



**EMC Components**

Part Number	Product Description
CLAMSHELL KIT	Bulkhead clamshell clamp, 2 per
47-015956-01	Ferrite clamp
47-016140-01	10A mains filter
47-017900-01	16A mains filter
R CLAMP KIT	R CLAMPS (P-CLIP 5/16"), 10 per
53-017355-01	Saddle clamp

**Motor Information**

Description	Page Number(s)
Gemini servo speed/torque curves	56-59
Gemini stepper speed/torque curves	65-66
Servo motor specifications, dimensions, and ordering information	186-221
Stepper motor specifications, dimensions, and ordering information	67-72

controllers

drives

motors