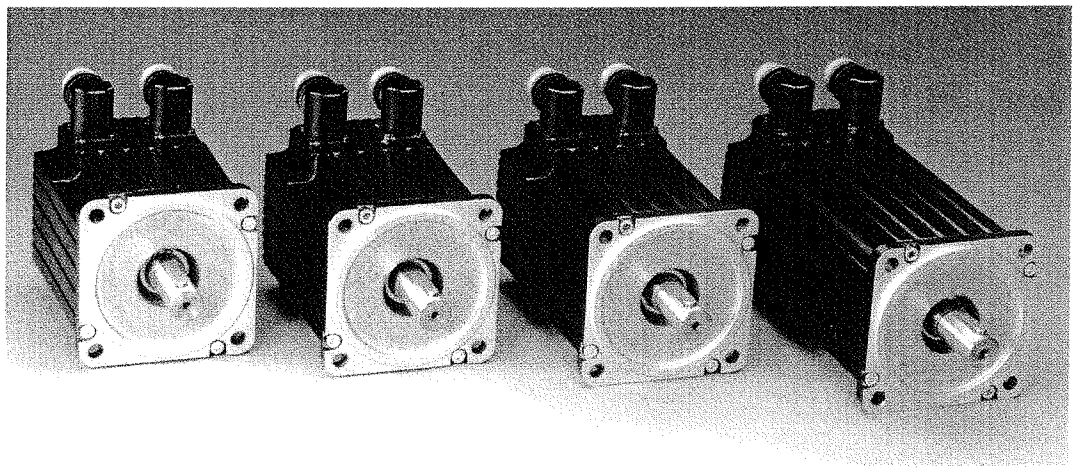


# MOOG

## G404 Series

High Power Density  
Brushless Servo Motors



Moog's G400 Series brushless motors are built with rare earth magnets (SmCo) and offer the highest peak torque per motor volume. The G404 Series is packaged in a compact, lightweight aluminum housing for maximum heat transfer.

Moog brushless G404 Series motors are mechanically compatible with Moog's 304A Series motors and come with the following standard features:

- Slot & Key Shaft
- Optional Shaft Seal (IP67 Sealing)
- Brake Provision
- Integral Resolver
- Right Angle Connectors
- Thermistor
- Class H Insulation
- CE Compliant

## SPECIFICATIONS

| MOTOR                       | UNITS              |                                           | MODELS   |       |          |      |          |      |          |      |
|-----------------------------|--------------------|-------------------------------------------|----------|-------|----------|------|----------|------|----------|------|
|                             | METRIC             | ENGLISH                                   | G404-15x |       | G404-16x |      | G404-17x |      | G404-18x |      |
| PERFORMANCE                 |                    |                                           |          |       |          |      |          |      |          |      |
| ⚠ Continuous Stall Torque   | Nm                 | lb-in                                     | 1.30     | 11.5  | 2.60     | 23.0 | 4.70     | 41.6 | 8.20     | 72.6 |
| ⚠ Continuous Stall Current  | Arms               | Arms                                      | 3.10     | 3.10  | 4.80     | 4.80 | 6.70     | 6.70 | 9.20     | 9.20 |
| ⚠ Peak Stall Torque         | Nm                 | lb-in                                     | 3.20     | 28.3  | 6.50     | 57.5 | 12.5     | 111  | 22.0     | 195  |
| ⚠ Peak Stall Current        | Arms               | Arms                                      | 9.00     | 9.00  | 15.0     | 15.0 | 20.0     | 20.0 | 28.0     | 28.0 |
| ⚠ Nominal Speed             | rpm                | rpm                                       | 5800     | 5800  | 5500     | 5500 | 4300     | 4300 | 3500     | 3500 |
| ⚠ Nominal Power             | kW                 | hp                                        | 0.58     | 0.78  | 0.95     | 1.27 | 1.80     | 2.41 | 2.31     | 3.10 |
| ⚠ Theoretical No Load Speed | rpm                | rpm                                       | 8800     | 8800  | 6900     | 6900 | 5200     | 5200 | 4200     | 4200 |
| ⚠ Max Speed                 | rpm                | rpm                                       | 10000    | 10000 | 8000     | 8000 | 5800     | 5800 | 4700     | 4700 |
| Torque Constant             | Nm/Arms            | lb-in/Arms                                | 0.42     | 3.72  | 0.54     | 4.78 | 0.70     | 6.20 | 0.89     | 7.88 |
| Back EMF Constant           | Vpk/rad/sec        | Vpk/krpm                                  | 0.34     | 35.6  | 0.44     | 46.1 | 0.57     | 59.7 | 0.73     | 76.4 |
| ELECTRICAL                  |                    |                                           |          |       |          |      |          |      |          |      |
| Max Voltage                 |                    | Vpk                                       | 360      |       | 360      |      | 360      |      | 360      |      |
| ⚠ Resistance Ø - Ø          |                    | Ohm                                       | 5.10     |       | 2.70     |      | 1.50     |      | 0.90     |      |
| Inductance Ø - Ø            |                    | mH                                        | 8.5      |       | 5.8      |      | 4.6      |      | 3.5      |      |
| ⚠ Electrical Time Constant  |                    | msec                                      | 1.7      |       | 2.15     |      | 3.07     |      | 3.89     |      |
| MECHANICAL                  |                    |                                           |          |       |          |      |          |      |          |      |
| Inertia – w/o brake         | kg-cm <sup>2</sup> | lb-in-sec <sup>2</sup> x 10 <sup>-4</sup> | 1.05     | 9.29  | 1.55     | 13.7 | 2.60     | 23.0 | 4.70     | 41.6 |
| Weight – w/o brake          | kg                 | lb                                        | 3.0      | 6.6   | 3.6      | 7.9  | 4.7      | 10   | 6.9      | 15   |

### NOTES:

- ⚠ With motor mounted on a 300 x 300 x 12 mm steel heat sink with a coil temperature 100°C over still air ambient (max. 40°C)
- ⚠ For at least 1 second out of 10 seconds and less than 15% saturation. Contact Moog for higher torque at lower duty cycle.
- ⚠ K<sub>t</sub>-line shows non-linearity between current and torque at high end.
- ⚠ Nominal values at maximum continuous output power with conditions as in note 1.
- ⚠ Speed, where EMF is equal to bus voltage 325V (for 310V bus voltage this value is reduced by 4.6%)
- ⚠ Speed, where EMF is 360 volts
- ⚠ At 25°C (80°F) coil temperature
- 8. Currents are rms phase amperes
- 9. Specification tolerances are ±10%
- 10. 1 Nm = 8.85 lb-in
- 11. 1 N = 0.225 lb
- 12. 1 kW = 1.341 hp
- 13. 1 kg-cm<sup>2</sup> = 8.85 lb-in-sec<sup>2</sup> x 10<sup>-4</sup>

### BRAKE-OPTIONAL

| Voltage Input 24VDC ±10% |                    |                                           | CODE |     |     |      |
|--------------------------|--------------------|-------------------------------------------|------|-----|-----|------|
|                          |                    |                                           | 1    | 2   | 1   | 2    |
| Torque (minimum)         | Nm                 | lb - in                                   | 6    | 53  | 15  | 133  |
| Power Input (maximum)    | Watt               | Watt                                      | 13   | 13  | 19  | 19   |
| Inertia (additional)     | kg-cm <sup>2</sup> | lb-in-sec <sup>2</sup> x 10 <sup>-4</sup> | 0.5  | 4.4 | 1.0 | 8.85 |
| Weight (additional)      | kg                 | lb                                        | 0.5  | 1.1 | 0.8 | 1.8  |

### RESOLVER-TRANSMITTER

|                      | SPECIFICATIONS    |
|----------------------|-------------------|
| Input voltage        | 4.0 Vac rms       |
| Input frequency      | 3400 Hz - 8000 Hz |
| Input current        | ≤ 35 mA rms       |
| Transformation Ratio | 0.5               |

### MODEL NUMBER DEFINITION

#### G404-1XXX

Revision Index

Options:

| Code  | 1  | 2   | 3    | 4   | 5    | 6   |
|-------|----|-----|------|-----|------|-----|
| Seal  | No | Yes | No   | No  | Yes  | Yes |
| Brake | No | No  | 15Nm | 6Nm | 15Nm | 6Nm |

Stack Length

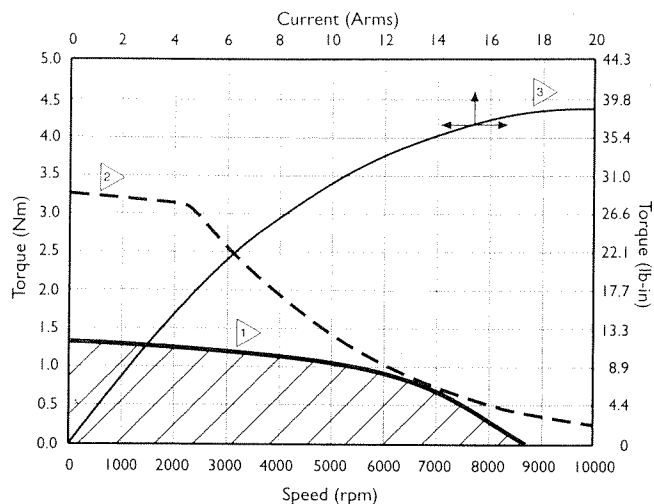
| Code | Stack Length |
|------|--------------|
| 5    | L05          |
| 6    | L10          |
| 7    | L20          |
| 8    | L40          |

To satisfy international regulations for safety and EMC compliance, G400 Series motors are equipped with CE compliant connectors. Accordingly, these motors are not direct electrical replacements for Moog 300A Series motors. To facilitate 300 Series motor replacement, Moog offers adapter cables which allow the G400 Series motor to be directly connected to existing system cables without the need for rewiring or connector replacement.

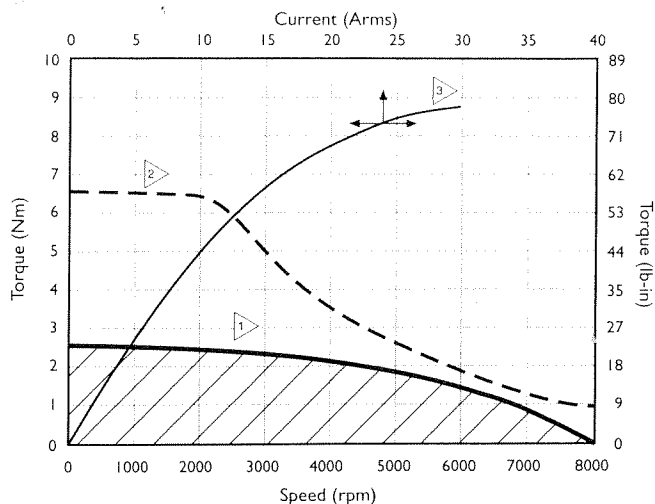
Contact sales office for adapter cable part numbers and installation instructions.

## PERFORMANCE CURVES

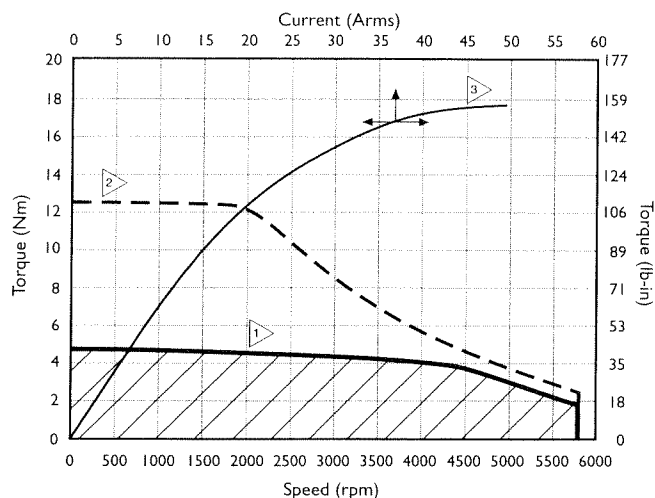
MODEL G404-15x



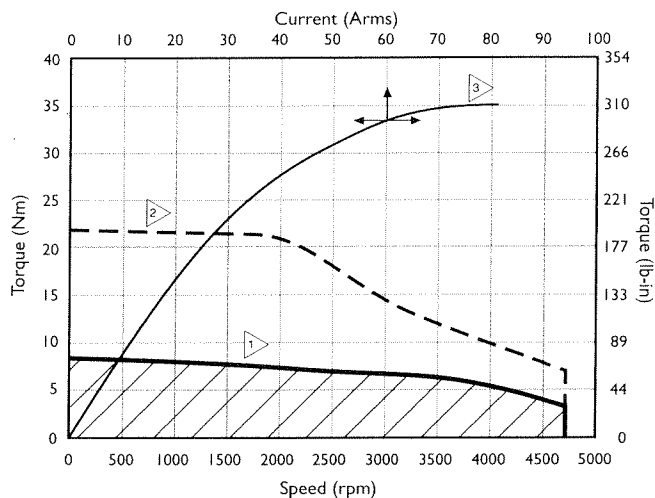
MODEL G404-16x



MODEL G404-17x



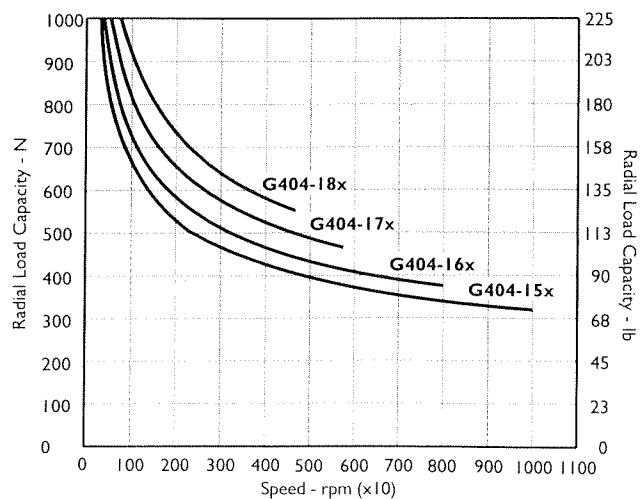
MODEL G404-18x



Conditions : See notes ,  and 

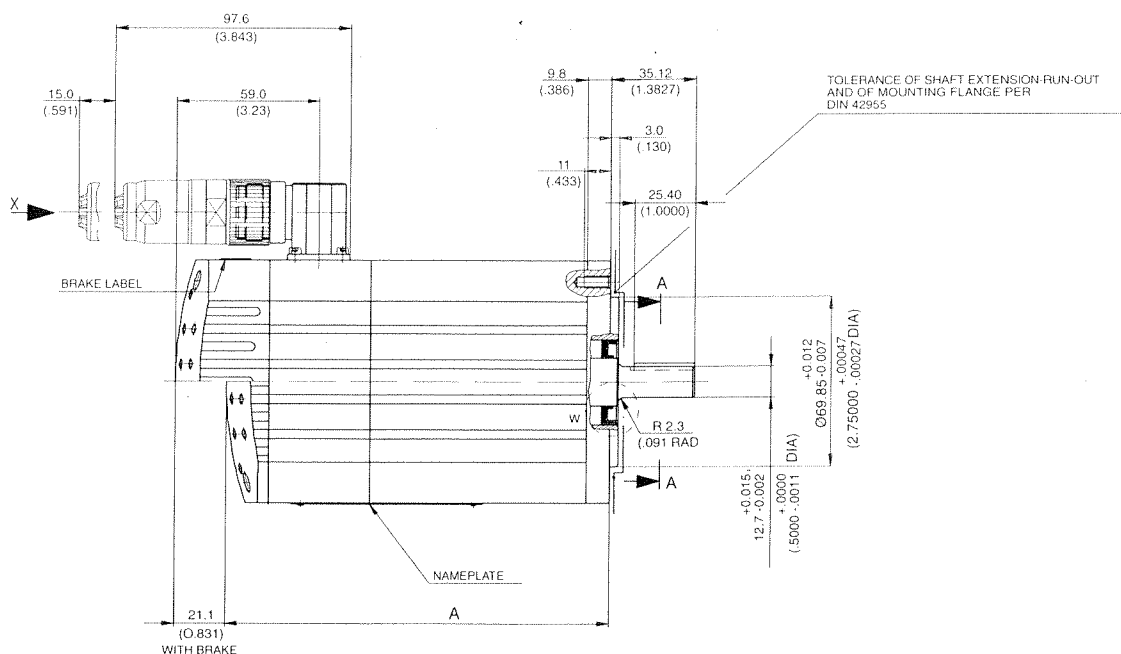
 Designates Continuous Operating Area

## BEARINGS - RADIAL LOAD CAPACITY

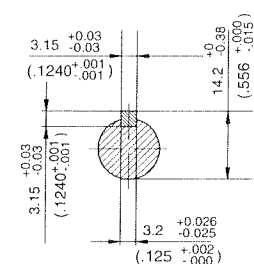


Radial Load Capacity (for 20,000 hr. B10 life) applied at shaft extension mid-point.  
Consult factory for other loading conditions.

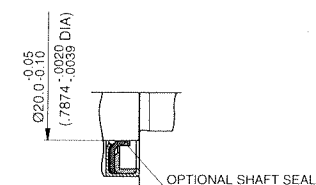
## INSTALLATION DRAWING



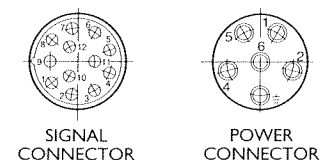
SECTION A-A



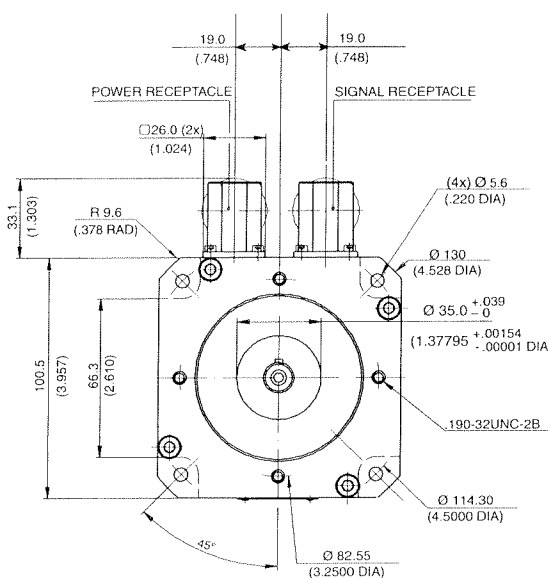
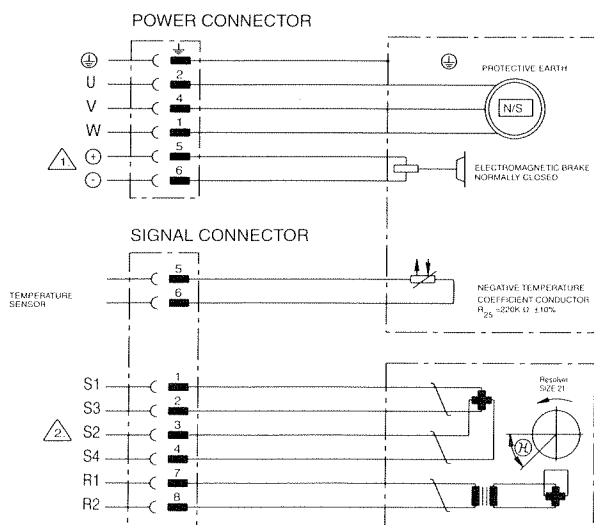
DETAIL W



VIEW X



## CONNECTOR PIN OUTS



| MODEL NO. | "A"          |
|-----------|--------------|
| G404-15x  | 133.2 (5.24) |
| G404-16x  | 146.2 (5.76) |
| G404-17x  | 171.2 (6.74) |
| G404-18x  | 222.2 (8.75) |

NOTES:

- ⚠ MOTOR WITHOUT BRAKE  
PINS 5 AND 6 NOT CONNECTED
- ⚠ NOT CONNECTED  
SIGNAL CONNECTOR PIN 9, 10, 11, 12
3. DIMENSIONS IN PARENTHESIS ARE IN INCHES

# MOOG

**MOOG**  
Industrial Controls Division

Moog Inc., East Aurora, NY, 14052-0018 • 716/655-3000 • Fax 716/655-1803 • 1-800-272-MOOG • <http://www.moog.com>

500-349 1299