

# Technical Note

## Service Factor (Sf)

G3 Series, H2 Series and F-F3 Series gearmotors and reducers are designed for the operation of 10 hrs/day with moderate shock loads. In case of using in severer condition, adjust the load torque with the Table-1 below.

Table-1

| Load Condition      | Service Factor(Sf) |                 |                 | Application  |
|---------------------|--------------------|-----------------|-----------------|--|
|                     | Under 3 hrs/day    | 3 ~ 10 hrs./day | Over 10 hrs/day |  |
| Uniform Load        | 1                  | 1               | 1               | Conveyors(uniform load), Screens, Agitators(low viscosity), Sewage Disposal Equipments(light load), Machine Tools(feed shaft), Elevators, Extruders, Distillers  |
| Moderate Shock Load | 1                  | 1               | 1.25            | Conveyors(non-uniform or heavy load), Agitators(high viscosity), Machines for Vehicles, Sewage Disposal Equipments(moderate load), Hoists(light load), Paper Mills, Feeders, Food Machines, Pumps, Sugar Mills, Textile Machines |
| Heavy Shock Load    | 1                  | 1.25            | 1.5             | Hoists(heavy load), Hammer Mills, Metal Mills, Crushers, Tumblers  |

## Allowable Inertia Moment (I<sub>A</sub>) Allowable GD<sup>2</sup> (GD<sub>A</sub><sup>2</sup>)

When operating gearmotors intermittently under high inertia load, critical torque may instantaneously arise at the starting(or stopping in brake gearmotor). This may cause unexpected accident, therefore, be sure that the inertia of the connecting machine should be within the allowable value listed in the Table below, which may vary according to the connecting type and/or starting frequency.

### Allowable Inertia Moment I by Capacity { GD<sup>2</sup> } ( Motor shaft or Input Shaft Equivalent )

Unit: Inertia Moment I ( kg·m<sup>2</sup> } GD<sup>2</sup>( kgf·m<sup>2</sup> ) } Table-2

| 3-Phase                             | 1-Phase | Allowable Inertia Moment( I <sub>A</sub> } AllowableGD <sup>2</sup> ( GD <sub>A</sub> <sup>2</sup> ) } |
|-------------------------------------|---------|--|
| 50W Reduction Ratio 1/10 ~ 1/240    |         | 0.0002 { 0.0008 }  |
| 50W Reduction Ratio 1/300 ~ 1/900   |         | 0.0001 { 0.0004 }  |
| 50W Reduction Ratio 1/1200 ~ 1/1800 |         | 0.0002 { 0.0008 }  |
| 0.1kW                               | 100W    | 0.0008 { 0.003 }   |
| 0.2kW                               | 200W    | 0.0010( 0.0013 ) } 0.004( 0.005 ) }  |
| 0.4kW                               | 400W    | 0.0015( 0.0019 ) } 0.006( 0.0075 ) }   |
| 0.75kW                              |         | 0.0030( 0.0038 ) } 0.012( 0.015 ) }  |
| 1.5kW                               |         | 0.008 { 0.032 }  |
| 2.2kW                               |         | 0.011 { 0.042 }  |

- Note 1** ) In case of reducers, operating with the input rotation speed of over 1800rpm, the allowable inertia moment I (GD<sup>2</sup>) can be obtained by multiplying the value in the left by (1800/Input rpm)<sup>2</sup>. (Example: In case the input shaft rpm is 3600, the allowable inertia moment I (GD<sup>2</sup>) will be 1/4).
- 2** ) Motor shaft(input shaft) equivalent inertia moment I  
= Output shaft inertia moment I × (reduction ratio)<sup>2</sup>  
(Motor shaft(input shaft) equivalent GD<sup>2</sup> = Output shaft GD<sup>2</sup> × (reduction ratio)<sup>2</sup>)  
(Example: In case the reduction ratio is 1/20, the answer is 1/400.)
- 3** ) The values in ( ) in the Allowable Inertia Moment (Allowable GD<sup>2</sup>) in the Table are the ones of gearmotors with reinforced clutch/brake.

### Correction Factor for Allowable Inertia Moment I by Operating Condition { Allowable GD<sup>2</sup> }

Table-3

| Connection Type                 | Starting Frequency | Correction Factor |
|---------------------------------|--------------------|-------------------|
| Direct Coupling (without slack) | Under 70 times/day | 1                 |
|                                 | Over 70 times/day  | 1.5               |
| By Chain (with slack)           | Under 70 times/day | 2                 |
|                                 | Over 70 times/day  | 3                 |