

## PGD-Ai Geared Drive (DC-24V) Installation Manual

NOTE: Control card is not contained. Please purchase it separately.

Thank you for purchasing **PGD-Ai** Geared Drive. These instructions contain important information to enable you to use the products safely and to prevent any harm or damage to you and others. Familiarize yourself with the content before using the products. After reading this manual, be sure to keep in the assigned place.

**Warning:** indicates a potentially hazardous situation, which may result in death or serious injury if improperly handled/used.

**Caution:** indicates a potentially hazardous situation, which may result in injury or property damage if improperly handled/used.

### General



- Never use the Geared Drive outdoors. (A place exposed to rain or direct sunlight)
- Do not use this product in an explosive atmosphere, flammable gas atmosphere, corrosive atmosphere, a place exposed to water splashes, or a place close to combustibles. It may cause an explosion, injury, or fire. (Please contact us when the product is exposed to water splash environment.)
- After confirming the DC power supply, supported voltages and specifications of the Geared Drive, connect them carefully not to make a mistake.
- Do not conduct such operations as move, installation, connection, and inspection while the power is on. Be sure to conduct such operations after turning off the power in order to be safe from electric shock.
- Do not use Geared Drive in any way beyond its specifications. It may cause an injury or fire.
- Be sure to ground the frame of the conveyor / equipment.



- Determine the number of Geared Drive in consideration of the performance/characteristics. (The motor will generate heat when used in an overload condition, resulting in a shorter product life-cycle.)
- Handle the Geared Drive with care because the surface temperature of the tube can be high depending on the conditions of use.
- Do not repair, alter, or disassemble Geared Drive. It may cause an electric shock, injury, or failure.

### Precautions for use

- Use the Geared Drive in the usage environment of ambient temperatures ranging from -10 to +40°C and relative humidity ranging from 10 to 90% (non condensing).
- Do not apply strong impact, such as dropping or striking the Geared Drive.
- Do not carry the Geared Drive by holding the cable, and do not pull the connector. There is a risk that internal connector is disconnected and it results in malfunction and rotation failure.



Do not pull the connector or lead cable. It may cause malfunction or rotation failure.

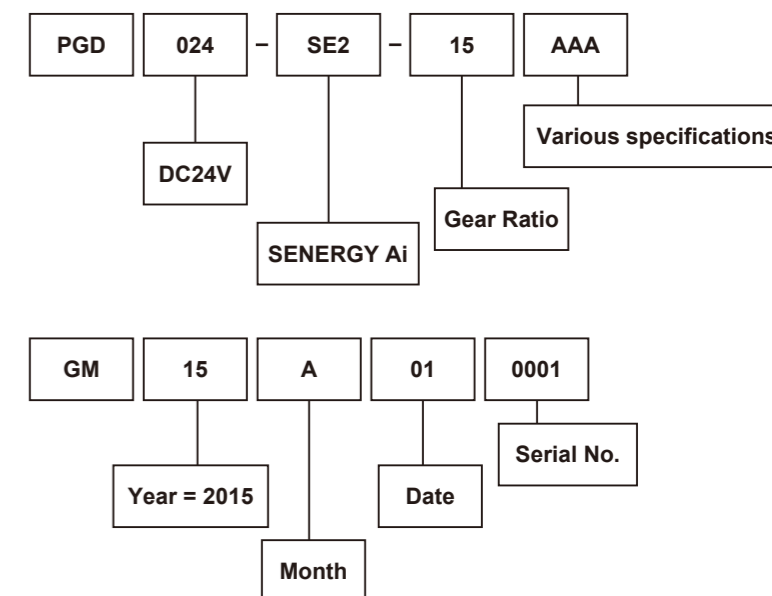
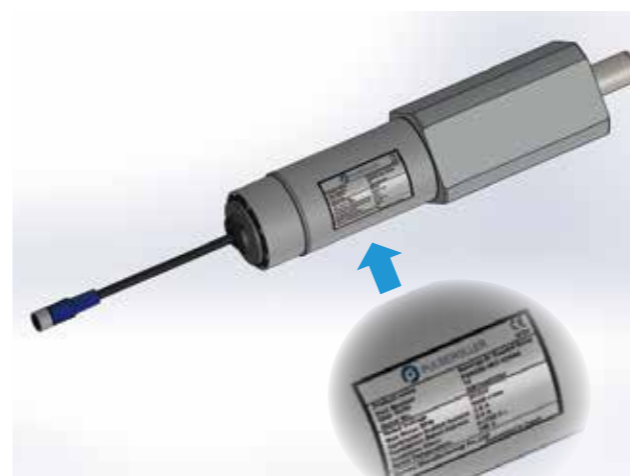
### Storage method

- Never store or leave the Geared Drive outdoors. (It may cause a short circuit or rust.)
- Store the Geared Drive in the environment of ambient temperatures ranging from -30 to +70°C and relative humidity ranging from 10 to 90% (non condensing).
- Rust may be generated in humid environments.
- Do not store in a place with high/low temperature, humidity, or harmful gas. It could affect negatively to inside the Geared Drive.

### Checks after unpacking the carton

- Check the product label on Motor surface to confirm that Part number matches to your order.

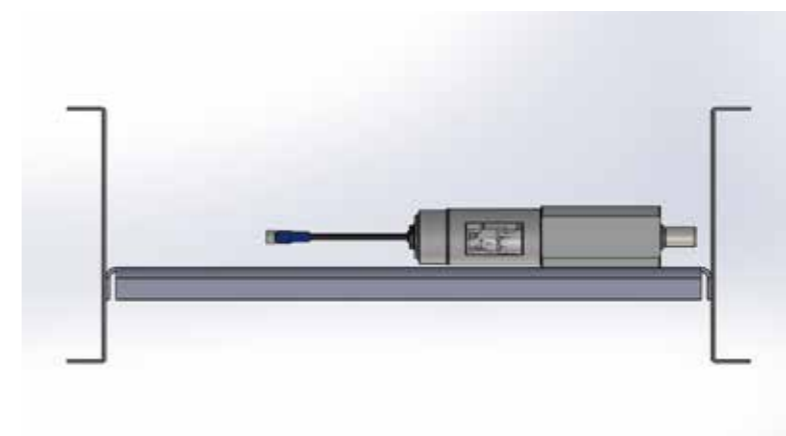
### Part number and Serial number designation



### Before installing



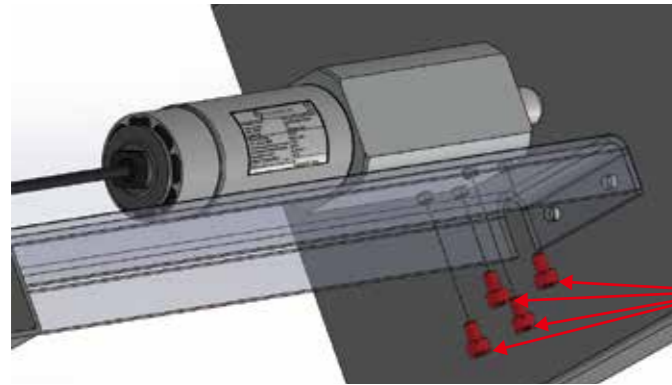
- Do not connect or disconnect the connector when the power is on.
- Be careful not to damage the cable and/or connector while installation.
- Securely mount the Geared Drive using specified size screws at specified tightening torque.



## Installation

Tighten at 4 places by M5 screw with 2.39 ~ 3.59 Nm. Please refer the screw size to the drawing.

When the screw is too long or the tightening torque is too strong, the attaching part and mounting screws of the Geared Drive may be damaged. Conversely, too short screw or weak tightening torque lead to a slack and a fall.



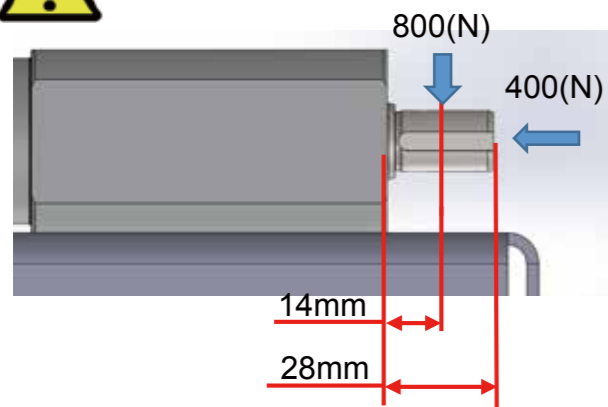
- Recommended screw -  
(e.g.) Frame thickness 2.3t  
Hex socket head screw M5x10(with spring washer)

If the frame thickness is different, check the tap depth by the drawing and determine the screw length.

## Design Precautions



Caution



### Allowable Radial and Thrust load

- When the Geared Drive is driven by Chain or gear, please consider that load position comes to the shaft stem side from the center of the output shaft.
- Please contact us when the driving method or actional position of the load is different.
- Refer to the above drawing about Radial and Thrust load capacity. The position of Radial load should be the center of the output shaft.

### Coupling method for output shaft

- Using a flexible coupling is effective means to extend the service life.
- In case of using chain, the slack amount should be approx. 4% of span length. If the slack amount is large, the impact at the time of start becomes excessive and it may damage the gear of the product.
- Do not forget to put an attached keyway. Failure to do so may result in idling.
- Attach sprocket, gear, and pulley smoothly using the internal threaded hole of output shaft.
- When strongly hit the product with a hammer or the like, the output shaft bearing and gear may be damaged.
- The hole dimensional tolerance such as sprocket, gear, and coupling is H7.

### Rotation from the output shaft side

- Do not rotate the Geared Drive from the output shaft side. The motor will generate electricity and it could affect negatively to the electronic device in the product including the power supply and control card.

### Note

- Please be aware that CW and CCW of motor directions are based upon vewing PGD from cable end, not from output shaft end.

### Motor stall and Overload condition

- When the Geared Drive is stalled in an energized state, the motor will be stopped/protected from control card.
- When Overload state continues and the motor generates heat, the motor will be protected from our control card. However, if motor stall and/or overload condition is repeated, insulation deterioration will be developed gradually and it results in burning of the motor coil.

### Precautions for intermittent operation

- Intermittent operation can be performed by the Geared Drive, however, excessive ON /OFF cycle may cause malfunction as the stress is accumulated in the gear connection part.
- The recommendable shortest duty cycle is approx. 1 second ON - 1 second OFF.

### Modification of output shaft

- Modification of the output shaft may cause damage to the Geared Drive.
- Please contact us for specialty request.

### Cable length between control card and power supply

- Cable size between the control card and the DC24V power supply should be more than AWG # 14, and the distance must be shorter than 5 meters in order to avoid malfunction or voltage drop.
- When extending the power supply cable more than 5 meters, please make sure to secure 24V at the power supply terminal on the control card.

### Grounding

- Make sure to mount the Geared Drive on the grounded equipment/conveyor frame. DC24V power supply also has to be grounded. Otherwise the Geared Drive or control card may cause malfunction or failure.

### Safety precautions

- Be sure that the facilities, in which Geared Drive is used, are equipped with adequate safe guards such as fuse or protection breaker circuit in order to protect from accident threatening human life or serious damage.

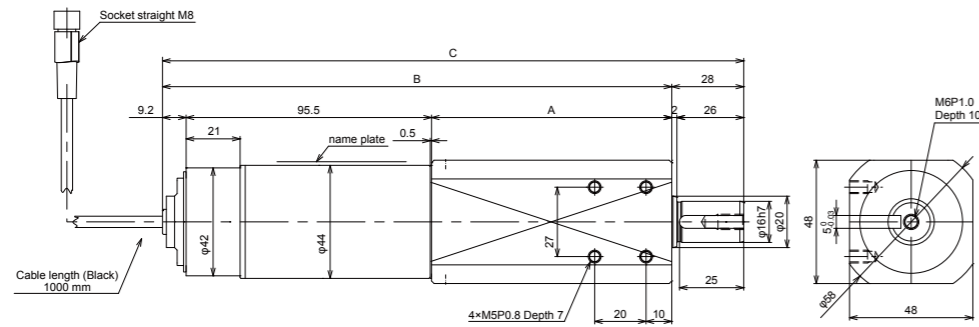


The surface temperature of the Geared Drive and gear case can be high depending on the conditions of use.

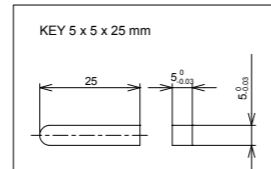


| Surface temperature (at Rated load) |            | Ambient temp.: 20°C |
|-------------------------------------|------------|---------------------|
| Eco-mode                            | Boost-mode | Boost 8-mode        |
| 65°C                                | 80°C       | 85°C                |

**Dimensional drawing**



| Gear    | A     | B     | C     |
|---------|-------|-------|-------|
| 3 stage | 116.9 | 221.6 | 249.6 |
| 2 stage | 93.5  | 198.2 | 226.2 |



**Weight table**

| Gear box | Reduction ratio | Weight |
|----------|-----------------|--------|
| 3 stage  | 67, 45, 33, 27  | 1.5    |
| 2 stage  | 18, 15, 11, 9   | 1.2    |

Unit: kg

**Characteristics data**

| Nominal Gear ratio | Actual Gear ratio | Gear box | ECO-mode     |             |          |       |             | BOOST-mode |              |             |          |       |             |          |
|--------------------|-------------------|----------|--------------|-------------|----------|-------|-------------|------------|--------------|-------------|----------|-------|-------------|----------|
|                    |                   |          | Speed (rpm)  | Torque(N-m) |          |       | Current (A) |            | Speed (rpm)  | Torque(N-m) |          |       | Current (A) |          |
|                    |                   |          |              | Rated       | Starting | Accel | Rated (max) | Starting   |              | Rated       | Starting | Accel | Rated (max) | Starting |
| 67                 | 66.98             | 3 stage  | 8.5 ~ 86.7   | 4.40        | 24.4     | 7.33  | 2.5         | 3.0        | 8.5 ~ 62.7   | 8.03        | 31.81    | 11.82 | 3.5         | 5.0      |
| 45                 | 45.00             |          | 12.8 ~ 129.0 | 2.97        | 16.39    | 4.95  |             |            | 12.8 ~ 93.3  | 5.40        | 21.37    | 7.94  |             |          |
| 33                 | 32.94             |          | 17.4 ~ 176.3 | 2.17        | 12.00    | 3.62  |             |            | 17.4 ~ 127.5 | 3.95        | 15.64    | 5.81  |             |          |
| 27                 | 27.00             |          | 21.3 ~ 215.1 | 1.78        | 9.83     | 2.97  |             |            | 21.3 ~ 155.5 | 3.24        | 12.82    | 4.76  |             |          |
| 18                 | 18.30             | 2 stage  | 31.4 ~ 317.3 | 1.20        | 6.66     | 2.00  | 2.5         | 3.0        | 31.4 ~ 229.5 | 2.19        | 8.69     | 3.59  | 3.5         | 5.0      |
| 15                 | 15.00             |          | 38.4 ~ 387.2 | 0.99        | 5.46     | 1.65  |             |            | 38.4 ~ 280.0 | 1.80        | 7.12     | 2.94  |             |          |
| 11                 | 10.98             |          | 52.4 ~ 528.9 | 0.72        | 4.00     | 1.20  |             |            | 52.4 ~ 382.5 | 1.31        | 5.21     | 2.15  |             |          |
| 9                  | 9.00              |          | 64.0 ~ 645.3 | 0.59        | 3.27     | 0.98  |             |            | 64.0 ~ 466.6 | 1.08        | 4.27     | 1.76  |             |          |

**Pulse output and Gear Backlash angle**

| Nominal Gear ratio | Actual Gear ratio | Pulse Output | Backlash angle |
|--------------------|-------------------|--------------|----------------|
| 67                 | 66.98             | 2009         | 4.8            |
| 45                 | 45.00             | 1350         | 5.1            |
| 33                 | 32.94             | 988          | 5.1            |
| 27                 | 27.00             | 810          | 5.1            |
| 18                 | 18.30             | 549          | 4.5            |
| 15                 | 15.00             | 450          | 4.7            |
| 11                 | 10.98             | 329          | 4.7            |
| 9                  | 9.00              | 270          | 4.7            |

Pulse output --- Number of Pulses per rotation of the Output shaft  
Backlash angle --- Gear Backlash angle at the Output shaft

**Maintenance and measures against failures**

- Please stop using at once if abnormal situations happen. It may cause a fire, electric shock, or an injury.
- Turn off the power supply when you perform maintenance.
- Take care not to touch the product just after operation stop or during operation. You may catch your finger between pulleys or gears. Also it can get very hot and there is a danger that you may get burned.
- Handle the product with care because the surface temperature can be high depending on the conditions of use.

**Disposal**

- The Geared Drive should be wasted as an industry waste in accordance with the regulations of the local municipality.

**Warranty**

- The warranty period is 2(two) years from delivery of the product under proper installation and handling. The warranty covers only the repair of the main body of the delivered product.

**Contact information for Technical support**



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The specifications of the products are subject to change for improvement without prior notice.