

Technical drawing of a mechanical part showing front, top, and side views with dimensions.

**Front View (Left):**

- Overall diameter:  $\phi 37 \pm 0.2$
- Inner diameter:  $\phi 6 \pm 0.1$
- Angle:  $30^\circ$
- 6 holes:  $6 \sim M3 \times p0.5 \times 3.4 \text{ dp.}$
- Pitch Circle Diameter (PCD):  $\text{PCD } \phi 31$

**Top View (Right):**

- Overall diameter:  $\phi 32 \pm 0.3$
- Inner diameter:  $\phi 12$
- Length:  $L \pm 0.3$
- Radius:  $R12$
- Step diameter:  $\phi 6 \pm 0.05$
- Step length:  $12$
- Overall length:  $29 \pm 0.3$
- Bottom flange diameter:  $\phi 15 \pm 0.3$
- Bottom flange length:  $6 \pm 0.2$

unit:mm

|                              | 減速比<br>Reduction ratio      | 1/18 | 1/30 | 1/50 | 1/60 | 1/75 | 1/90 | 1/100 | 1/120 | 1/150 | 1/180 | 1/200 | 1/250 | 1/300 | 1/500 | 1/600 | 1/750 | 1/1000 | 1/1500 | 1/3000 |  |
|------------------------------|-----------------------------|------|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--|
| 12V                          | 定扭矩<br>Rated torque (kg-cm) | 0.8  | 1.2  | 2.0  | 2.0  | 2.9  | 3.0  | 3.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0    | 4.0    | 4.0    |  |
|                              | 定轉速<br>Rated speed (rpm)    | 270  | 172  | 100  | 85   | 67   | 57.5 | 52    | 43    | 36    | 31    | 29    | 23    | 20.5  | 12    | 10    | 8     | 6.2    | 4.1    | 2.1    |  |
| 24V                          | 定扭矩<br>Rated torque (Kg-cm) | 0.8  | 1.2  | 2.0  | 2.0  | 3.0  | 3.0  | 3.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0   | 4.0    | 4.0    | 4.0    |  |
|                              | 定轉速<br>Rated speed (rpm)    | 278  | 170  | 98   | 84   | 65   | 57   | 51    | 42    | 35    | 31    | 29    | 23    | 20    | 12    | 10    | 8     | 6.2    | 4.1    | 2.1    |  |
| 軸心迴轉方向<br>Rotation direction |                             | CCW  |      | CW   |      |      |      |       | CCW   |       |       |       |       | CW    |       |       |       |        | CCW    |        |  |
| 長度<br>Length (L)             |                             | 22.0 |      | 24.5 |      |      |      |       | 27.0  |       |       |       |       | 29.5  |       |       |       |        | 32.0   |        |  |

| 定格電壓<br>Rated volt (V) | 定格扭力<br>Rated torque (g·cm) | 定格轉數<br>Rated speed (rpm) | 定格電流<br>Rated current (mA) | 無負荷轉數<br>No load speed (rpm) | 無負荷電流<br>No load current (mA) | 定格出力<br>Rated output (W) | 重量<br>Weight (g) |
|------------------------|-----------------------------|---------------------------|----------------------------|------------------------------|-------------------------------|--------------------------|------------------|
| 12                     | 60                          | 5100                      | ≤ 470                      | 6200                         | ≤ 120                         | 3.14                     | 75               |
| 24                     | 62                          | 5000                      | ≤ 210                      | 6200                         | ≤ 60                          | 3.17                     | 75               |

The graph displays four performance curves for the 11 TYPE 12V engine. The x-axis represents torque  $T$  in g-cm and rotational speed in rpm. The y-axis represents power  $P_o$  in HP, efficiency  $EF$  in %, and current  $I$  in A. The curves are labeled  $P_o$ ,  $EF$ ,  $I$ , and  $N$ . The  $N$  curve is a straight line from 65 rpm to 325 rpm. The  $P_o$  curve peaks at approximately 195 g-cm. The  $EF$  curve peaks at approximately 130 g-cm. The  $I$  curve increases linearly from 2.0 A at 65 rpm to 5.6 A at 325 rpm.

| $T$ (g-cm) | rpm  | $P_o$ (HP) | $EF$ (%) | $I$ (A) | $N$ (rpm) |
|------------|------|------------|----------|---------|-----------|
| 65         | 3100 | 0.0        | 0.0      | 2.0     | 65        |
| 130        | 3100 | 0.5        | 2.8      | 2.5     | 130       |
| 195        | 3100 | 1.0        | 2.0      | 3.0     | 195       |
| 260        | 3100 | 0.5        | 1.0      | 3.5     | 260       |
| 325        | 3200 | 0.0        | 0.0      | 5.6     | 325       |

