

TOHNICHI power torque tools tighten screws accurately when they are used correctly.

■ Calculating the compressor capacity.

The compressor capacity necessary to drive a power torque tool can be determined by the volume of air required to tighten each screw (m³/piece) and the number of screws requiring tightening (piece/h). Provide some allowance, however, for leakage and future system expansion.

$$\begin{array}{ccccccc} \text{Volume of air} & = & \text{Volume of air required to} & \times & \text{Number of screws to} & \times & \text{Thread ratio} \times \frac{1}{60} \\ \text{consumption} & & \text{tighten each screw} & & \text{be tightened} & & \\ \text{[m}^3\text{/min]} & & \text{[m}^3\text{/piece]} & & \text{[Piece/h]} & & \text{[Thread/10]} \end{array}$$

Volume of air required to tighten each screw : Volume of air (standard air) necessary for tightening one screw (number of threads tightened = 10). Values are given in the specification column for each tool.

Number of screws to be tightened : Number of screws to be tightened per hour.

Thread ratio : The number of threads to be tightened divided by 10, the standard number of threads. For example, when the number of threads is 6, the ratio is 0.6.

Example:

When four thousand M5 screws (number of threads: eight) are to be tightened using several U500CN tools. (volume of air required to tighten each screw: 0.0031 [m³/piece])

$$\begin{aligned} \text{Volume of air consumption} &= 0.0031 \times 4000 \times 0.8 \times \frac{1}{60} \text{ [m}^3\text{/min]} \\ &= 0.165 \text{ [m}^3\text{/min]} \end{aligned}$$

$$\begin{aligned} \text{Compressor output} &= 0.165 \times 6.5 \text{ [kW]} \\ &= 1.07 \text{ [kW]} \end{aligned}$$

(The motor output necessary for the compressor to discharge 1 [N] is 6.5 [kW] at a gauge pressure of 0.7 [MPa])

$$\begin{aligned} \text{Cost of tightening power} &= 0.0031 \times 4 \text{ [yen/piece]} \\ &= 0.0124 \text{ [yen/piece]} \end{aligned}$$

(Cost of compressed air is 4 [yen/piece] at a gauge pressure of 0.7 [MPa], including the costs of electricity, compressor depreciation, etc.)