RPM to ω ⇒ $\omega = \frac{RPM}{60} \cdot 2\pi$

ω to RPM ⇒ $RPM = \frac{60}{2\pi} \cdot \omega$

Torque (Nm) to Power (kW) ⇒ $P = \frac{Torque \cdot \omega}{1000}$

Power (kW) to Torque (Nm) ⇒ $T = \frac{P \cdot 1000}{\omega}$

$MF\ (bar) = \frac{4\pi \cdot FLHV}{capacity \cdot 10^6} \cdot \frac{fc \cdot 10^5}{3600 \cdot \omega}$

$\omega = \frac{RPM}{60} \cdot 2 \cdot \frac{stroke}{1000}$

$ME = \frac{T \cdot 10^5 \cdot 4\pi}{capacity \cdot 10^6}$ (bar)

INPUTS:
- RPM + original vector
- Power or torque or PME of original map
- PMF or fuel consum (FC) of original map

SCALARS:
- stroke [mm]
- FLHV [kJ/kg]
- capacity [cm³]

for Rescaling
Provide new Vd (capacity in cc
Provide new stroke

$Cw_{scaled} = Cw \cdot \frac{Stroke_{new}}{Stroke_{old}}$

$PMF_{scaled} = PMF \cdot \frac{capacity_{old}}{capacity_{new}}$

calc new PME

$Torque_{new} = \frac{10^5 \cdot PMF_{new} \cdot capacity_{new}}{4\pi}$

$Pnew = Torque_{new} \cdot \frac{W}{1000}$ (kW)

INPUTS

-VECTORS

RPM or RPM_{norm} (1:2). In case RPM_{norm} then $RPM = RPM_{norm} \cdot (RPM_{rated} - RPM_{idle}) + RPM_{idle}$

Power or $Power_{norm}$ or Torque or PME (bar)

↳ In case P_{norm} then $P = P_{norm} \cdot P_{max}$ (kW)

↳ In case Power then $T = \frac{Power \cdot 1000}{\omega}$ (Nm) ($Power$ in kW)

↳ In case T(Nm) then $PME = \frac{Torque \cdot 10^{-5} \cdot 4\pi}{capacity_{1\,cc} \cdot 10^{-6}}$ [bar]

Fuel consumption (g/h) or PMF (bar) or Norm fuel consum. In case FC_{norm} then $FC = FC_{norm} \cdot P_{max}$

↳ In case FC then $PMF = \frac{4\pi \cdot FLHV}{capacity_{cc}} \cdot \frac{FC \cdot 10^{-5}}{3600 \cdot \omega}$ [bar]

$$C_m = \frac{RPM}{60} \cdot 2 \cdot \frac{stroke}{1000} \quad [m/sec]$$

Scalars:

First step: stroke [mm], capacity [cm^3], FLHV [kJ/kg], ! In case normalized values are provided also P_{max} (kW), N_{idle} (RPM), N_{rated} (RPM)!

for rescaling: capacity rescaled (cc), New rpm idle, new rpm rated.