

MASTER FORMULA FOR WINDING REDESIGN

$$T_2 = T_1 \times \sqrt{\frac{HP_1}{HP_2}} \times \sqrt{\frac{F_1}{F_2}} \times \sqrt{\frac{P_2}{P_1}} \times \frac{E_2}{E_1} \times \frac{K_{p1}}{K_{p2}} \times \frac{N_2}{N_1} \times CC$$

WHERE:

T = TURNS, HP or KW $\left(\sqrt{\frac{KW_1}{KW_2}} \right)$ = OUTPUT POWER

F = FREQUENCY, P = POLES, E = VOLTAGE

K_p = CHORD FACTOR

N = CCTS IN PARALLEL

CC = 0,58 FROM Δ TO λ OR 1.73 FROM λ TO Δ

1 = OLD DATA.

2 = NEW DATA.

IN THIS CASE WE NEED FEED ONE 440V (Δ) WINDING TO WORK WITH POWER SOURCE OF 380V WITH OUT FREQUENCY CHANGE.

ALSO NO OUTPUT POWER, CHORD FACTOR, OR POLE CHANGES.

$$\text{THEN } T_2 = T_1 \times \frac{E_2}{E_1} \times \frac{N_2}{N_1} \times CC.$$

OLD DATA : $E_1 = 440$, $N_1 = 1 (\Delta)$

NEW DATA : $E_2 = 380$, $N_2 = 2 (\lambda)$

CC IS 0.58 DUE TO WE GO FROM Δ TO λ CONNECTION.

FOR THIS CASE

$$T_2 = T_1 \times \frac{380}{440} \times \frac{2}{1} \times 0.58$$

Then $T_2 = T_1$ SO NO WINDING CHANGES WILL NEEDED,

THE SAME WINDING CAN WORK IN 380 AFTER RECONNECTION.

* THIS WILL WORKS FOR 400V AND 460V $\left(\frac{E_2}{E_1} = \frac{400}{460} = 0,869 \right)$