========== INPUT ==========

Po1 = 185000.0000 Pa

To1 = 800.0000 K

P3 = 170000.0000 Pa

Massflow = 3.0000 Kg/s

Shaft Speed = 10000.0000 RPM

Noz In angle = 90.0000 deg

------- fluid thermodynamic properties ----------

gamma = 1.4056

Rgas = 4124.4000 J/kg-K

Cp = 14292.3000 J/kg-K

------- Choice of design parameters ----------

Phi = 0.4500

Psi = 1.1000

Stator nr vanes = 85.0000

Rotor nr blades = 80.0000

------- First guess values of parameters ----------

Efficiency = 0.9000

Kloss_N = 0.9980

Kloss_R = 0.9920

Blockage = 0.9000

==========

========== FIRST PASS Validation Output ==========

Co = 742.4396 m/s

U = 456.3402 m/s

Ca = 205.3531 m/s

----- Stator Exit Kinematics -----

C2 = 542.3541 m/s

Cu2 = 501.9742 m/s

Ca2 = 205.3531 m/s

Wu2 = 45.6340 m/s

Wa2 = 205.3531 m/s

W2 = 210.3624 m/s

alfa2 = 22.2490 deg

alfa2p = 77.4712 deg

----- Rotor Exit Kinematics -----

Wa3 = 205.3531 m/s

Wu3 = -456.3402 m/s

W3 = 500.4161 m/s

Ca3 = 205.3531 m/s

Cu3 = 0.0000 m/s

C3 = 205.3531 m/s

alfa3p = -24.2277 deg

----- Thermodynamic Quantities (Stator Exit) -----

a2 = 2139.6610 m/s

Mw2 = 0.0983

Ma2 = 0.2535

T2 = 789.7096 K

To2 = 800.0000 K

Tw2 = 791.2576 K

----- Thermodynamic Quantities (Rotor Exit) -----

a3 = 2129.8677 m/s

Mw3 = 0.2350

Ma3 = 0.0964

T3 = 782.4971 K

To3 = 783.9723 K

Tw3 = 791.2576 K

----- Pressures and Densities -----

Po1 = 185000.0000 Pa

Po2 = 184630.0000 Pa

P2 = 176529.9026 Pa

Pw2 = 177732.0167 Pa

rho2 = 0.0542 kg/m^3

Pw3 = 176310.1606 Pa

P3 = 170000.0000 Pa

P3ver = 169637.5478 Pa

P03 = 170748.4095 Pa

rho3 = 0.0527 kg/m^3

----- Geometry -----

rmean = 0.43577 m

L2 = 0.10938 m

L3 = 0.11255 m

L2/D = 0.12550

L3/D = 0.12913

----- Stator/Nozzle Geometry -----

(s/c)noz = 0.7534

(s/bz)noz = 1.1414

pitch noz = 0.0322 m

chord noz = 0.0428 m

bz noz = 0.0282 m

beta_s noz = 41.3023 deg

----- Rotor Geometry -----

(s/c)0 rot = 0.7769

(s/c)1 rot = 0.5755

xi = 0.1905

(s/c)rot = 0.7695

(s/bz)rot = 0.9717

pitch rot = 0.0342 m

chord rot = 0.0445 m

bz rot = 0.0352 m

beta_s rot = 52.3677 deg

---------- LOSS Calculations ----------

------- STATOR ----------

Yp_0 = 0.03397

Yp_1 = 0.14010

xi = 0.00000

Yp_noz = 0.03397

KRe_noz = 1.14179

Ys_noz = 0.02675

Ycl_noz = 0.00000

Y_noz = 0.06553

New Kloss_N= 0.99713

------- ROTOR ----------

Yp_0 = 0.03023

Yp_1 = 0.13052

xi = 0.19049

Yp_rot = 0.03387

KRe_rot = 1.17907

Ys_rot = 0.03158

Ycl_rot = 0.03676

Y_rot = 0.10828

New Kloss_R= 0.99592

T-T Efficiency = 0.9077

Power = 687213.0259 hp

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