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NOMENCLATURE

A_c, A_p	area of collector and absorber plate respectively (m^2)
C	conversion factor
c_p	specific heat of air (J/kg-K)
D_h	hydraulic diameter (m)
$Ex_{i,f}$	exergy at inlet of fluid
$Ex_{o,f}$	exergy at outlet of fluid
$Ex_{r,f}$	exergy radiated from the sun (W)
F_p	fin pitch (distance between two fins, m)
f	fanning friction factor
H	duct height (m)
H_f	fins height (m)
h_w	heat transfer coefficient due to wind flowing over the glass cover (W/m^{2}K)
$h_{r,ga}$, $h_{r,pg}$, $h_{r,pb}$	radiative heat transfer coefficient between glass cover and ambient, absorber plate and glass cover, and absorber plate and bottom plate respectivelly (W/m^{2}K)
$h_{c,pg}$, $h_{c,pf}$, $h_{c,fb}$	convective heat transfer coefficient between absorber plate and glass cover, absorber plate and air stream, air stram and bottom plate respectively (W/m^{2}K)
I	radiation intensity (W/m^2)
k_{air}, k_{ins}, k_{fn}	thermal conductivity of air , insulation and fins respectively (W/mK)
L	distance between glass cover and absorber plate (m)
L_1	length of the collector (m)
L_2	width of the collector (m)
$\dot{m}$	mass flow rate of air (kg/s)
N	number of fins
Nu_{pg}	Nusselt number between absorber plate and glass cover.
Nu_{pb}	Nusselt number between absorber plate and bottom plate.
p	pitch for 180° rotation of twisted tape (m)
Q_u	useful heat gain (W)
Re	Reynolds number
T_i, T_o	inlet and outlet temperature of air (K)
T_a	ambient temperature (K)
T_g, T_p, T_b, T_f	average temperature of glass cover, absorber plate, bottom plate and fluid respectively (K)
t_f, t_{ins}	thickness of fins and insulation respectively (m)
U_b	bottom heat loss coefficient (W/m^{2}K)
V_w	wind velocity (m/s)
w	width of twisted tape which equals to fin pitch
Y	twist ratio = p/w, dimensionless
α_p, α_g	absorptivity of absorber plate and glass cover respectively
ε_p, ε_b, ε_g	emissivity of absorber plate, bottom plate and glass cover respectively
σ	Stefan's constant (5.67x10^{-8} Wm^{-2}K^{-4})
Δp	pressure drop (N/m^2)
ρ	density of air (kg/m^3)
η_f	fins efficiency
η_{th}, η_{eff}, η_{II}	Thermal, effective or thermohydraulic and exergy efficiency respectively