"Turbo HW5"
"Zhaoyi Jiang (.1364)"
"Problem 4"

"Given"
t0=55[c]
ps=0.25[bar]
rho=1000[kg/m^3]
z0=1[m]
lambda=0.025
Q=150*convert(l/min,m^3/s)
La=0.5[m]
Lb=1[m]
D=0.05[m]
g=9.81[m/s^2]
p0=1[bar]

z1a=3[m]
c=Q/(pi*D^2/4)
hfc=2.3
hfd=lambda*((La+Lb)/D)*c^2/(2*g)
m_dot=rho*Q
hfcd=hfc+hfd
(p0*convert(bar,pa)/(rho*g)+z0)-(p1a*convert(bar,pa)/(rho*g)+z1a)=-hfcd
NPSH_a=5[m]
NPSH_a=p1b*convert(bar,pa)/(rho*g)-ps*convert(bar,pa)/(rho*g)-hfcd
(p0*convert(bar,pa)/(rho*g)+z0)-(p1b*convert(bar,pa)/(rho*g)+z1b)=-hfcd

SOLUTION
Unit Settings: SI C bar kJ mass deg

c = 1.273 [m/s]	D = 0.05 [m]
g = 9.81 [m/s^2]	hfc = 2.3 [m]
hfcd = 2.362 [m]	hfd = 0.06197 [m]
La = 0.5 [m]	λ = 0.025
Lb = 1 [m]	$\dot{m}$ = 2.5 [kg/s]
$NPSH_a$ = 5 [m]	p0 = 1 [bar]
p1a = 1.036 [bar]	p1b = 0.9722 [bar]
ps = 0.25 [bar]	Q = 0.0025 [m^3/s]
ρ = 1000 [kg/m^3]	t0 = 55 [C]
z0 = 1 [m]	z1a = 3 [m]
z1b = 3.645 [m]	

No unit problems were detected.