"Scenario 6 - Perfect insulation Pressure rise"

"case A subcooled liquid - there is little change of T and v when pressure rises"
"case B two phase - both T and v change when pressure rises, not sure how to obtain work"

F$ = 'Steam_IAPWS'   "water"

dia = 0.1[m]   "piston diameter"
A_P = pi*dia^2/4   "cross sectional area of the piston"
m2 = 100[kg]   "added mass"
//delta_P = m2*g#/A_P*convert(Pa, kPa)   "added pressure from mass m2"

k=IsentropicExponent(F$,T=TC[1],P=PC[1])   "isentropic exponent"

"Initial state - case C superheated vapor"
PC[1] = 1[kPa]   "pressure at state 1"
TC[1] = 150[C]   "temperature at state 1"
vol[1] = 1e-3[m3]   "1 liter volume"

vC[1] = volume(F$, T=TC[1], P=PC[1])   "specific volume at state 1"
hC[1] = enthalpy(F$, T=TC[1], P=PC[1])   "specific enthalpy at state 1"
uC[1] = intenergy(F$, T=TC[1], P=PC[1])   "specific internal energy at state 1"
sC[1] = entropy(F$, T=TC[1], P=PC[1])   "specific entropy at state 1"
mass_C = vol[1]/vC[1]   "mass of H2O"

"initial conditions chosen so that final state will still be in the superheated regime"
PC[2] = PC[1] + delta_P   "final pressure"
uC[2] = uC[1] - PC[1]*vC[1]^k/(k-1)*(vC[1]^(1-k)-vC[2]^(1-k)) "determine final internal energy from 1st law"
TC[2] = temperature(F$, u=uC[2], P=PC[2])   "final temperature"
vC[2] = volume(F$, u=uC[2], P=PC[2])   "specific volume at state 2"
hC[2] = enthalpy(F$, u=uC[2], P=PC[2])   "specific enthalpy at state 2"
sC[2] = entropy(F$, u=uC[2], P=PC[2])   "specific entropy at state 2"

Arrays Table: Main

	vol_i	PC_i	hC_i	sC_i	uC_i	vC_i	TC_i
	[m³]	[kPa]	[kJ/kg]	[kJ/kg-K]	[kJ/kg]	[m3/kg]	[C]
1	0.001	1	2784	9.753	2588	195.3	150
2		126	4577	9.821	4001	4.565	973.3

Parametric Table: Table 1

	δ_P	PC_2	TC_2	vC_2
	[kPa]	[kPa]	[C]	[m3/kg]
Run 1	1.25	2.25	240.3	105.3
Run 2	2.5	3.5	296.2	75.07
Run 3	3.75	4.75	337.9	59.36
Run 4	5	6	371.5	49.58
Run 5	6.25	7.25	399.8	42.84
Run 6	7.5	8.5	424.5	37.88
Run 7	8.75	9.75	446.4	34.06
Run 8	10	11	466.1	31.01
Run 9	11.25	12.25	484.1	28.53
Run 10	12.5	13.5	500.6	26.45
Run 11	13.75	14.75	515.9	24.69
Run 12	15	16	530.3	23.17
Run 13	16.25	17.25	543.7	21.85
Run 14	17.5	18.5	556.4	20.69
Run 15	18.75	19.75	568.3	19.66
Run 16	20	21	579.7	18.74

Parametric Table: Table 1

	δ_P	PC_2	TC_2	vC_2
	[kPa]	[kPa]	[C]	[m3/kg]
Run 17	21.25	22.25	590.5	17.91
Run 18	22.5	23.5	600.9	17.16
Run 19	23.75	24.75	610.8	16.48
Run 20	25	26	620.3	15.86
Run 21	26.25	27.25	629.4	15.29
Run 22	27.5	28.5	638.2	14.76
Run 23	28.75	29.75	646.7	14.27
Run 24	30	31	654.9	13.82
Run 25	31.25	32.25	662.9	13.39
Run 26	32.5	33.5	670.6	13
Run 27	33.75	34.75	678	12.63
Run 28	35	36	685.3	12.29
Run 29	36.25	37.25	692.3	11.96
Run 30	37.5	38.5	699.1	11.65
Run 31	38.75	39.75	705.8	11.36
Run 32	40	41	712.3	11.09
Run 33	41.25	42.25	718.6	10.83
Run 34	42.5	43.5	724.8	10.59
Run 35	43.75	44.75	730.8	10.35
Run 36	45	46	736.7	10.13
Run 37	46.25	47.25	742.5	9.919
Run 38	47.5	48.5	748.1	9.717
Run 39	48.75	49.75	753.7	9.524
Run 40	50	51	759.1	9.34
Run 41	51.25	52.25	764.4	9.163
Run 42	52.5	53.5	769.6	8.994
Run 43	53.75	54.75	774.7	8.832
Run 44	55	56	779.7	8.676
Run 45	56.25	57.25	784.6	8.526
Run 46	57.5	58.5	789.4	8.382
Run 47	58.75	59.75	794.2	8.243
Run 48	60	61	798.8	8.11
Run 49	61.25	62.25	803.4	7.981
Run 50	62.5	63.5	807.9	7.856
Run 51	63.75	64.75	812.3	7.736
Run 52	65	66	816.7	7.62
Run 53	66.25	67.25	821	7.508
Run 54	67.5	68.5	825.2	7.4
Run 55	68.75	69.75	829.4	7.295
Run 56	70	71	833.5	7.193
Run 57	71.25	72.25	837.6	7.094
Run 58	72.5	73.5	841.6	6.999
Run 59	73.75	74.75	845.5	6.906
Run 60	75	76	849.4	6.816
Run 61	76.25	77.25	853.2	6.729
Run 62	77.5	78.5	857	6.644
Run 63	78.75	79.75	860.7	6.561
Run 64	80	81	864.4	6.481
Run 65	81.25	82.25	868	6.403
Run 66	82.5	83.5	871.6	6.327
Run 67	83.75	84.75	875.2	6.253
Run 68	85	86	878.7	6.181
Run 69	86.25	87.25	882.1	6.11
Run 70	87.5	88.5	885.6	6.042
Run 71	88.75	89.75	888.9	5.975

Parametric Table: Table 1

	δ_P	PC_2	TC_2	vC_2
	[kPa]	[kPa]	[C]	[m3/kg]
Run 72	90	91	892.3	5.91
Run 73	91.25	92.25	895.6	5.846
Run 74	92.5	93.5	898.9	5.784
Run 75	93.75	94.75	902.1	5.724
Run 76	95	96	905.3	5.665
Run 77	96.25	97.25	908.5	5.607
Run 78	97.5	98.5	911.6	5.55
Run 79	98.75	99.75	914.7	5.495
Run 80	100	101	917.7	5.441
Run 81	101.3	102.3	920.8	5.388
Run 82	102.5	103.5	923.8	5.337
Run 83	103.8	104.8	926.8	5.286
Run 84	105	106	929.7	5.237
Run 85	106.3	107.3	932.6	5.188
Run 86	107.5	108.5	935.5	5.141
Run 87	108.8	109.8	938.4	5.094
Run 88	110	111	941.2	5.049
Run 89	111.3	112.3	944	5.004
Run 90	112.5	113.5	946.8	4.96
Run 91	113.8	114.8	949.6	4.917
Run 92	115	116	952.3	4.875
Run 93	116.3	117.3	955	4.834
Run 94	117.5	118.5	957.7	4.793
Run 95	118.8	119.8	960.3	4.753
Run 96	120	121	963	4.714
Run 97	121.3	122.3	965.6	4.676
Run 98	122.5	123.5	968.2	4.638
Run 99	123.8	124.8	970.8	4.602
Run 100	125	126	973.3	4.565

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