Pressure drop for ideal gas

Calculation

Version-1

1. **Introduction:**
   The continuous flow of a fluid in a pipeline can be considered as a fluid system in motion, under equilibrium or steady state conditions.

   Fanno flow refers to adiabatic flow through a constant area duct where the effect of friction is considered. Compressibility effects often come into consideration, although the Fanno flow model certainly also applies to incompressible flow. For this model, the duct area remains constant, the flow is assumed to be steady and one-dimensional, and no mass is added within the duct.

   Nature of fluid:

- The fluid is compressible and compressibility effect is considered.
- Pressure drop is a function of friction factor which is a function of Re, surface roughness and diameter.

2. **Algorithm:**

- Please refer “Pressure Drop-Ideal gas_v.1.0” visio document.

3. **Assumptions:**

- The diameter of the pipe is constant.
- One-dimensional steady frictional flow.
- Absence of heat and work transfer, and body forces.
- Pipe is horizontal.

References:

1. (J.P.HOLMAN)
2. (Hesson, 1953)
3. (tableGasDynamics, 2007)
4. (H.Perry, 2011)
5. (YAHYA, 1997)