

# System design

## Pressure loss in pipe



Flowing media in pipes causes pressure loss, and energy loss within the piping system. The important factors for the calculation of the extent of the pressure loss in a piping system are as follows:

- pipe length
- pipe cross section area
- roughness of the pipe surface
- the geometry of fittings and joints
- the viscosity and density of the flowing medium

The total pressure loss in a piping system is the result of the sum of all the individual pressure losses above. By using simple calculation methods, it is possible to quite accurately forecast the total system pressure loss. However, it is usually necessary only to approximate this value using the flow nomogram on the following page.

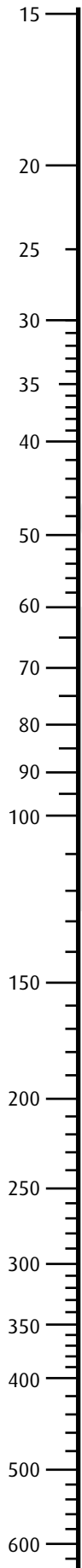
To calculate pressure drop using the flow nomogram:

1. Note the internal diameter in millimetres of the pipe being considered.
2. Mark this diameter on the scale headed "Internal Diameter".
3. Mark the required flow rate in litres per second on the scale headed "Flow Rate".
4. Draw a straight line to connect these two points and extend this through the next two scales.
5. The velocity of flow in metres per second can be read at the point where the line intersects the scale headed "Flow Velocity".
6. The frictional pressure drop in mbar per metre can be read at the point where the line intersects the scale headed "Pressure Loss Per Metre".

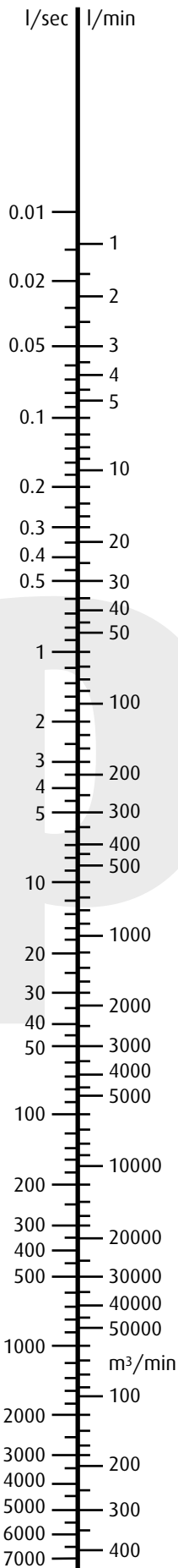


# Flow Nomogram

**Internal Diameter**  
mm



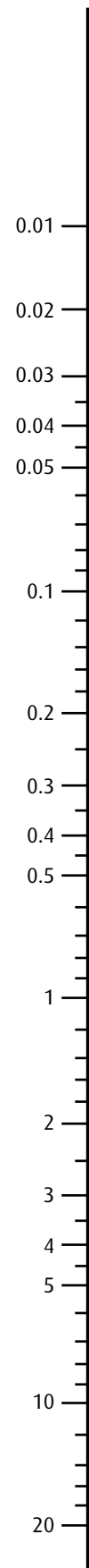
**Flow Rate**



**Flow Velocity**  
m/sec



**Pressure Loss Per Metre**  
mbar/m



Approximate values only  
Calculated for water at 10°C