

*Localised comments:*

External force (F): the force applied by a cylinder (like a press) or to a cylinder. It is NOT the weight of the applied mass, it is entered under the Mass (M) parameter (minimum = 0).

Stroke (c): (minimum=1, maximum=6000 mm)

Supply pressure (Pa): the valve input pressure (minimum=1 bar, maximum = 16 bar)

Length of connecting pipes (L): Total length of pipes from valve to cylinder (minimum = 0)

Mass (M): mass to move (minimum=0)

Inclination ( $\alpha$ ): angle between the horizontal plane and the cylinder axis (minimum -90°, maximum 90°)

Coefficient of friction: coefficient of friction between the mass and any guides or sliding surfaces. A drop-down menu prompts you to select the most commonly used values (minimum=0, maximum=1).

Number of curved fittings: the number of curved fittings between valve and cylinder. This figure is used to calculate any pressure losses at junctions (minimum=0).

Maximum flow rate: the maximum cylinder flow rate. If the flow rate resulting from the calculation exceeds the maximum flow rate allowed, the user is prompted to increase the stroke time (minimum=0 but without useful results; maximum 4 m/s).

Stroke time: the time it takes for the cylinder to complete a stroke (minimum 0.1 sec.)

Presence of a pressure relieving duct: if this option is selected, the algorithm considers that it takes a certain residual pressure at the valve relieving point to push the air into the relieving duct.

Quick-relief valve: if this option is selected, the algorithm considers the fact that the air leaving the cylinder does not require any residual pressure to reach and pass through the valve.