

HYSON Force and Temperature Calculator

Purpose:

The Force and Temperature Calculator was developed for customers to visualize how HYSON's gas springs would operate in their applications. The calculator aims to display the force and temperature; demonstrating the effect of running the cylinders until they reach temperature stability given the cylinder's operating factors such as; work stroke and strokes per minute (SPM). Stability is the point at which the cylinders temperature will no longer increase during operation. The calculator benefits the customer by displaying potential service life warnings.

T4-4200x150 Example:

The catalog approximates the contact force at 42,000 N, and the full-stroked force at 65,100 N, by inputting the following operating factors into the tool: Cylinder Quantity 1, Filling Pressure 150, Used Stroke 150, SPM 8, and Surrounding Temperature 20°C. The tool displays the point where the heat being generated and the heat being dissipated are equal. The contact and stroked force are approximated at 45,000 N and 84,000 N, the cylinder's temperature stability is somewhere between 37°C and 47°C.

Introduction:

There are four **(4)** selection boxes to properly navigate the calculator:

1. Cylinder Standards
2. Cylinder Family
3. Cylinder Size
4. Stroke

There are two **(2)** available outputs that have a drop-down menu *for user's preference*:

1. Units

- a. Metric (bar, KN, mm, °C)
- b. Imperial (psi, lbf, inch, °F)

2. Thermodynamics

- a. Isothermal
- b. Polytropic

Calculator Instructions:

For the calculator to work properly:

1. Click "Enable content" in yellow task bar
2. Select the information from the left section to the right, starting with *Cylinder Standards* and ending with *Stroke*.

NOTE: if a selection is made in any selection boxes to the left, the data to the right will reset and need to be re-entered.

3. Once all inputs have been selected, the *HYSON part number* will show below input boxes

User Data Input (Operating Factors):

To get correct calculations that generate the graph and temperature ruler, enter data based on your application:

1. Number of Cylinders
2. Filling Pressure (Maximum filling pressure will be added)
3. Used Stroke
4. Frequency
5. Surrounding Temperature

When *User Data* inputs are entered, the temperature and force graph will update accordingly.

NOTE: Units that are outside the parameters will create a warning notice next to the input.