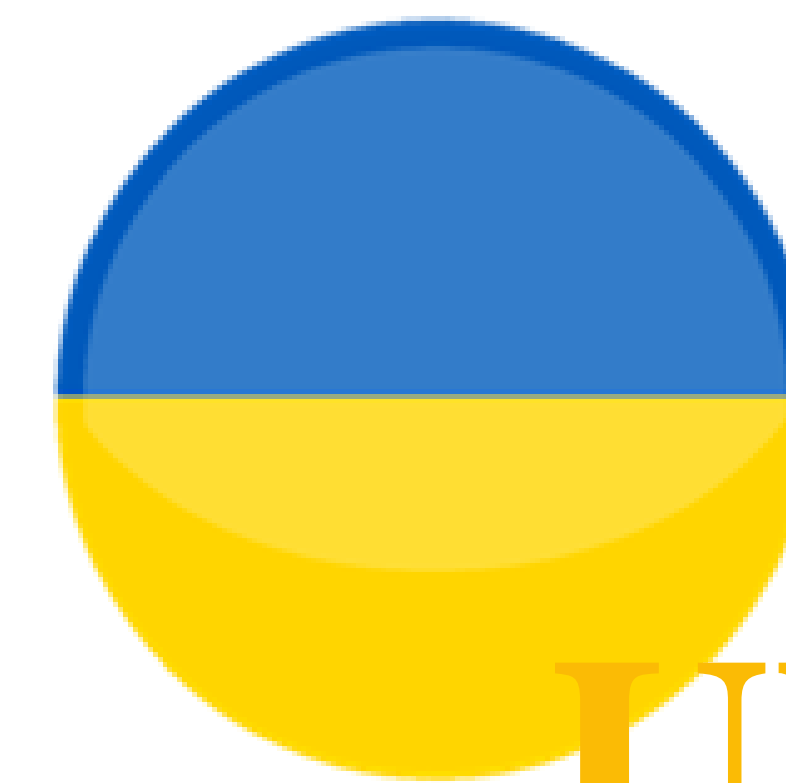




United Nations  
Educational, Scientific and  
Cultural Organization

Junior Academy  
of Sciences of Ukraine  
under the auspices of UNESCO

# System Of Fast Heating Of The Gas Reducer-evaporator "Quick Start"



Ukraine

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**Relevance and connection of work with the UN sustainable development goals:**

7 AFFORDABLE AND  
CLEAN ENERGY



Goal 7: Energy

7.3 By 2030, double the global rate of improvement in energy efficiency

7.A By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology

Analog analysis

**Planned stages  
to achieve  
a goal**

Choosing the concept of  
the future system

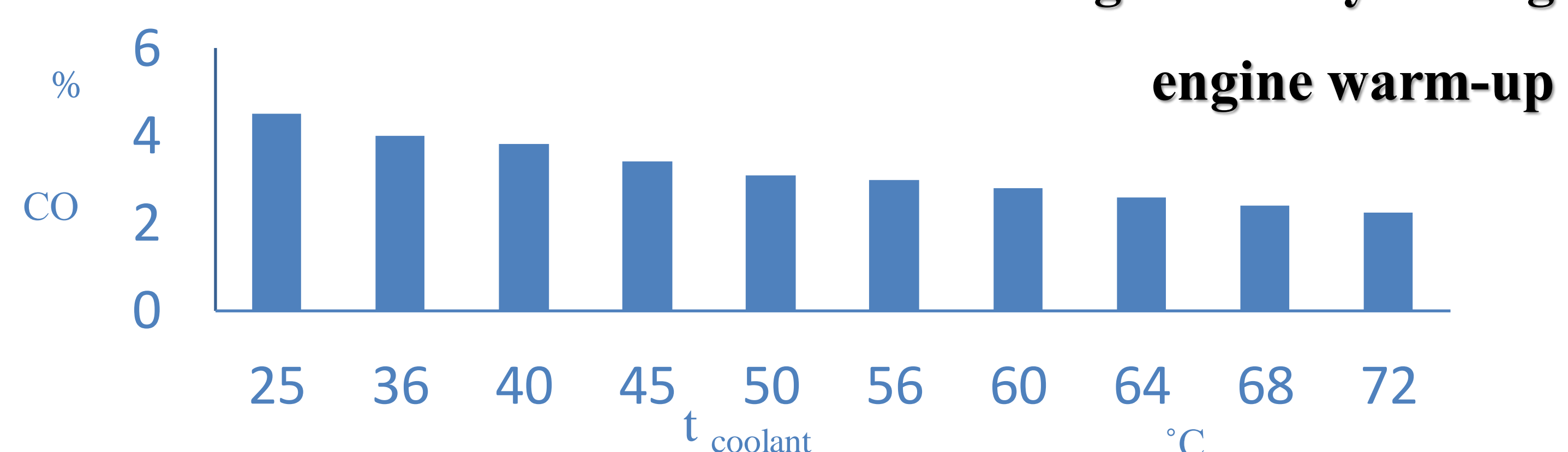
Rationalization of it's  
parameters

Search for appropriate components  
and study their characteristics

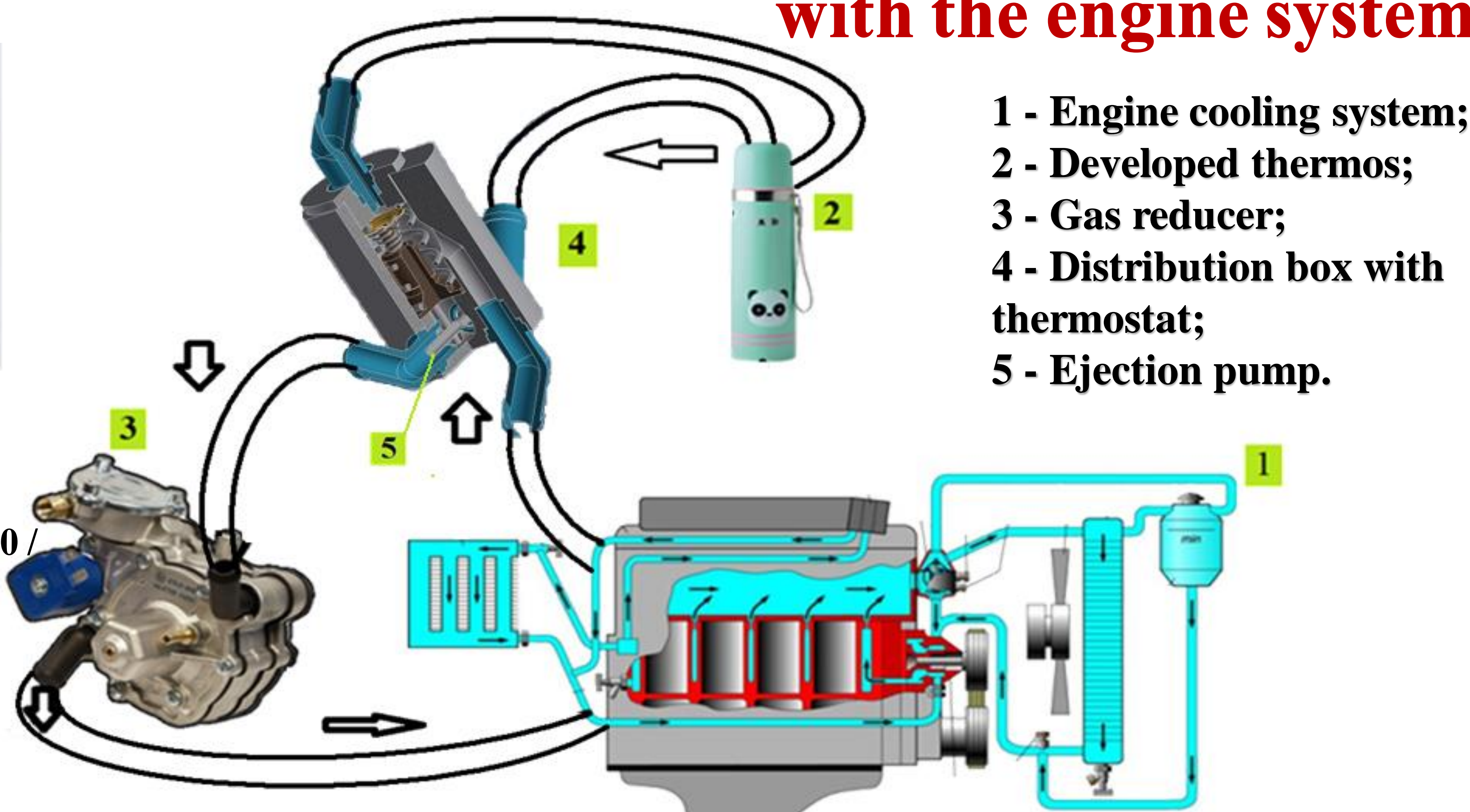
CO<sub>2</sub> content (g / km) in different types of fuel



The results of measurements of exhaust gas toxicity during engine warm-up



## Diagram of "Quick Start" system and it's relationship with the engine systems.



Decision on  
issuance of  
patent №24460/  
3Y / 19 dated  
15.10.2019



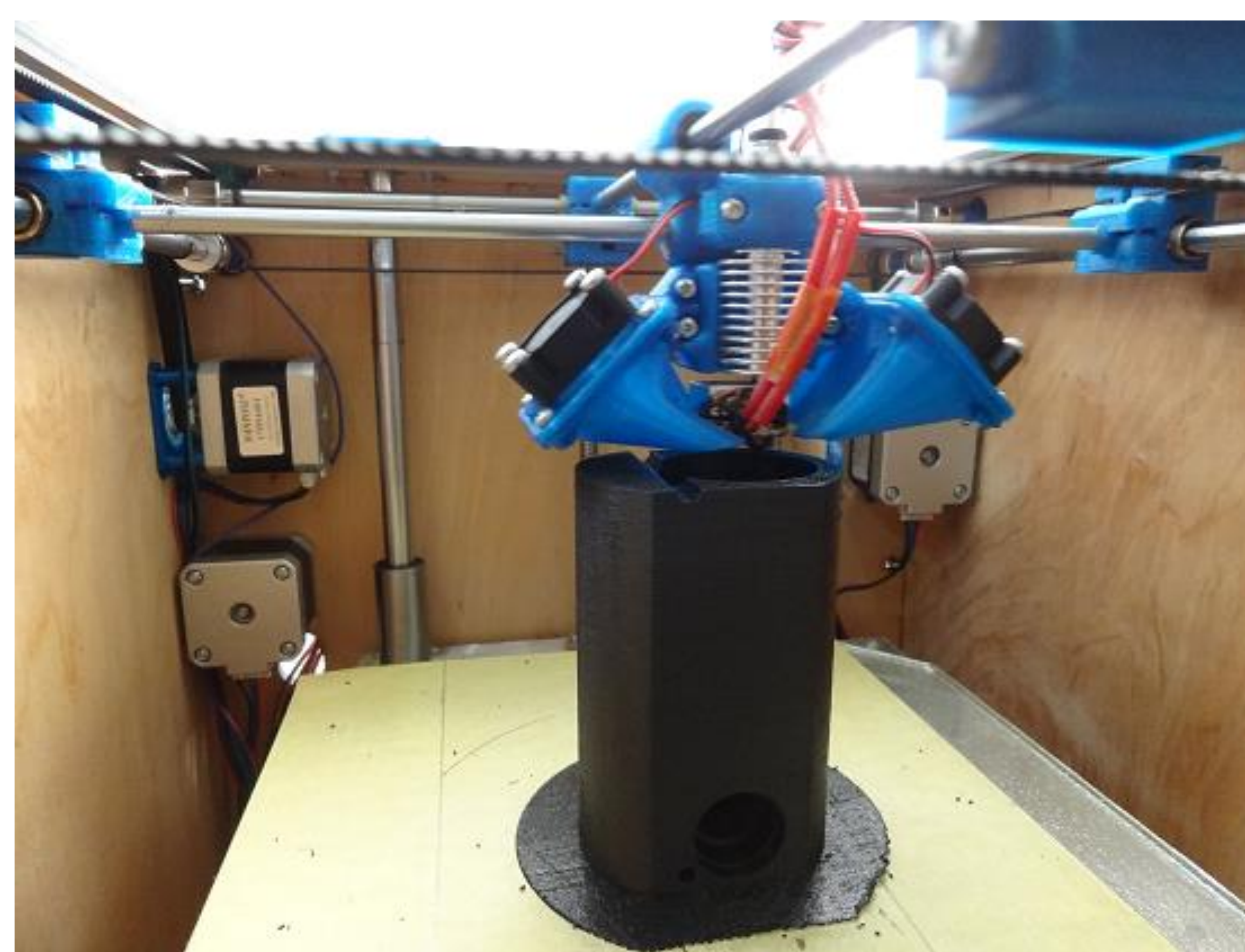
Layout of the system of fast heating of a gas reducer

Payback period of systems:  
for heating the reducer-evaporator - 154 days.

Additional elements to the gas injection system



Production of the body of a thermo distribution box on the 3D printer



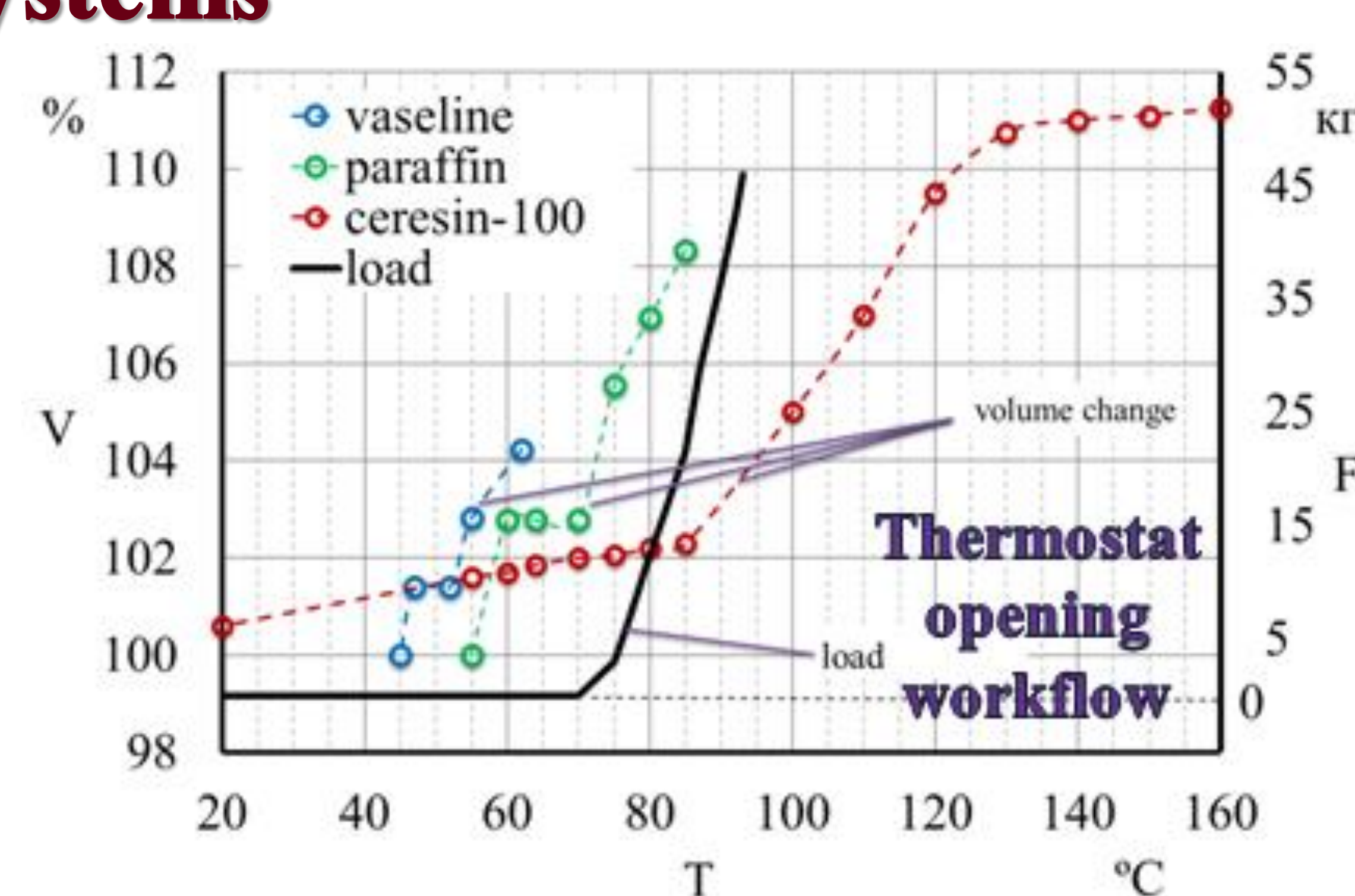
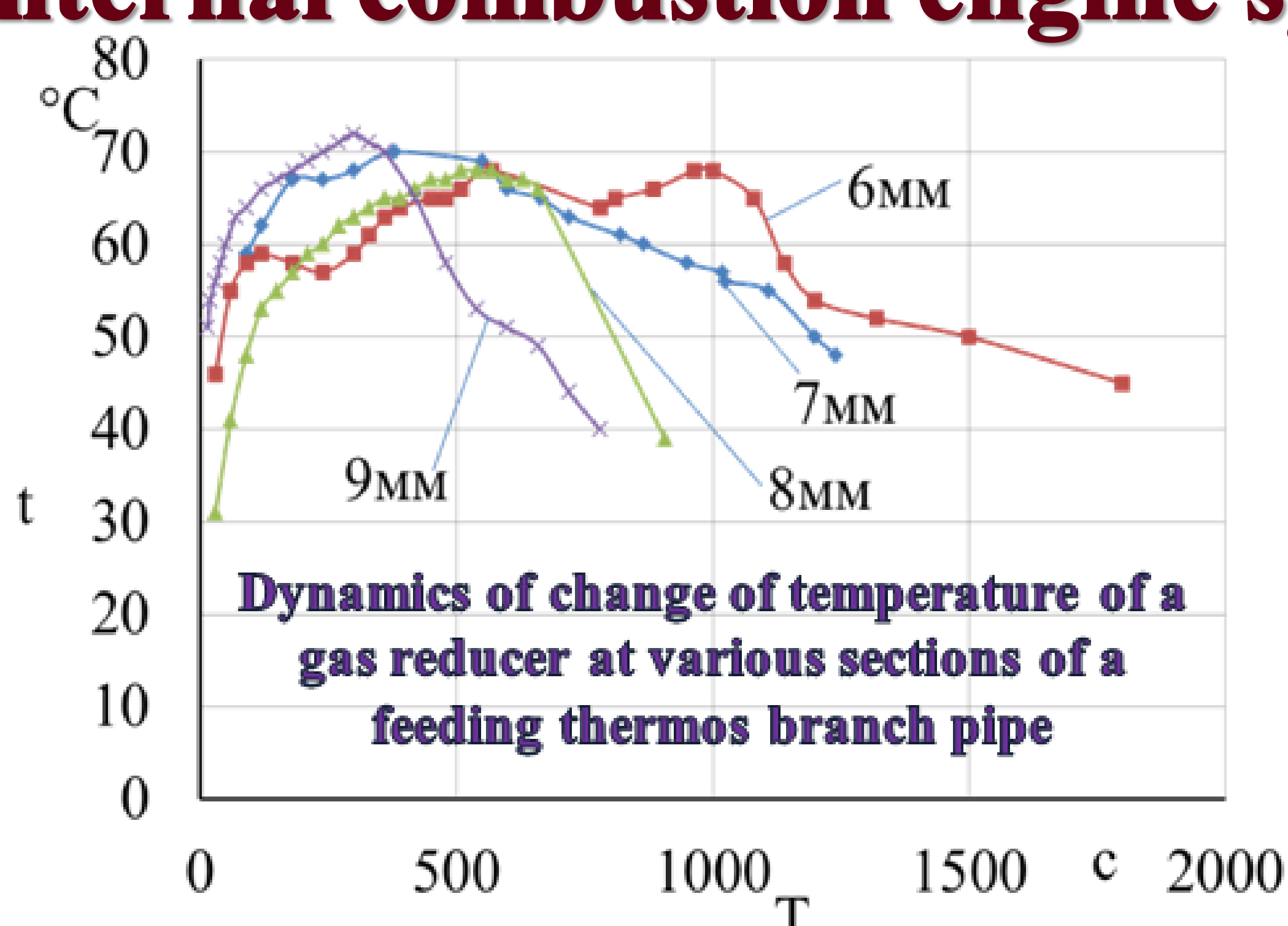
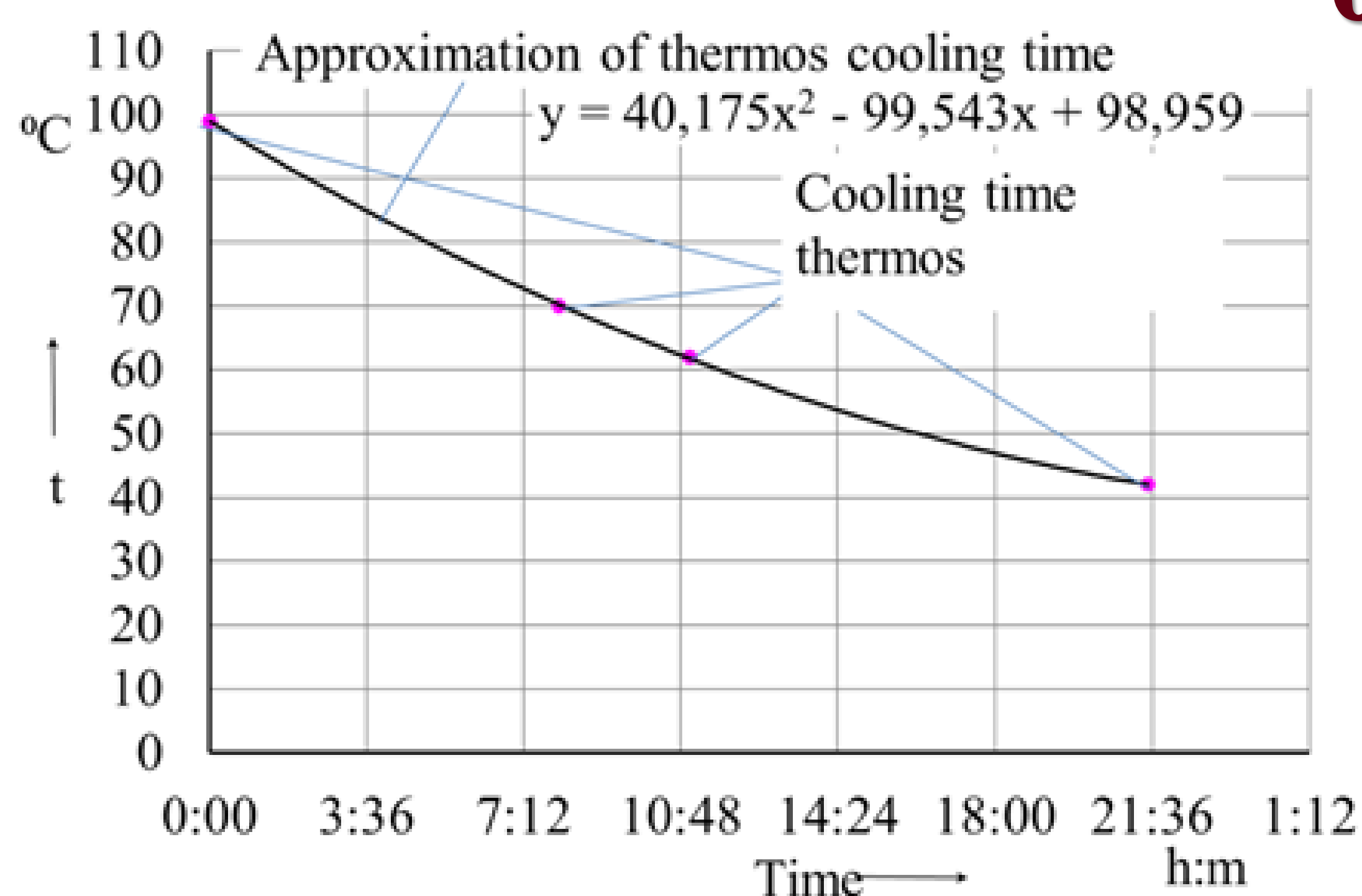
Distribution box with thermostat



General view of the thermos of the "Quick start" system



## Search experiments to select the required parameters of the heating devices of internal combustion engine systems



POTENTIAL MARKET FOR INSTALLATION OF DEVICES FOR FAST HEATING OF AUTOMOTIVE ENGINE SYSTEMS:

gas reducer approach system: 2.25 million - in Ukraine and 7.8 million - EU;  
engine heating system: 6.9 million in Ukraine and 15 million in the EU.