

# PREDICTIVE METHOD AND SYSTEM FOR DETERMINING THE OPERATING CONDITION IN BIG-BLASTER AIR CANNONS AND MICRO-CANNONS

**Patent application:** No. a/2022 00818/16.12.2022

**Applicant:** National Institute for Research Development and Testing in Electrical Engineering - ICMET Craiova

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## DESCRIPTION

According to the invention, the diagnosis system (fig.1) is composed of a source (100) of compressed air, an electropneumatic module (200) specific to the application for preparing the compressed air and ensuring the command for loading-waiting-firing the pneumatic cannon, an information system (300), which includes a dynamic pressure sensor (301) mounted in a threaded connection of the air cannon tank, an analog-digital data acquisition board (303), an industrial PC computer (304) running a software with a graphical interface for acquisitions and automatic pressure signal analysis, as well as a printer (305) for automatic generation of Word-type reports.

## FIELD OF APPLICABILITY

- It is applied to establish the proper functioning or failure status of Big-Blaster type pneumatic cannons and micro-cannons, used to unblock and ensure the rhythmicity of the flow of bulk/powdery materials such as: cement, clinker, lime, ores, coal, cereals from bunkers and silos.
- It applies both to newly manufactured products and to products in operation on the technological flows at companies manufacturing cement and construction materials at steel mills, coal-based thermoelectric plants, (fig. 2 and fig.3).

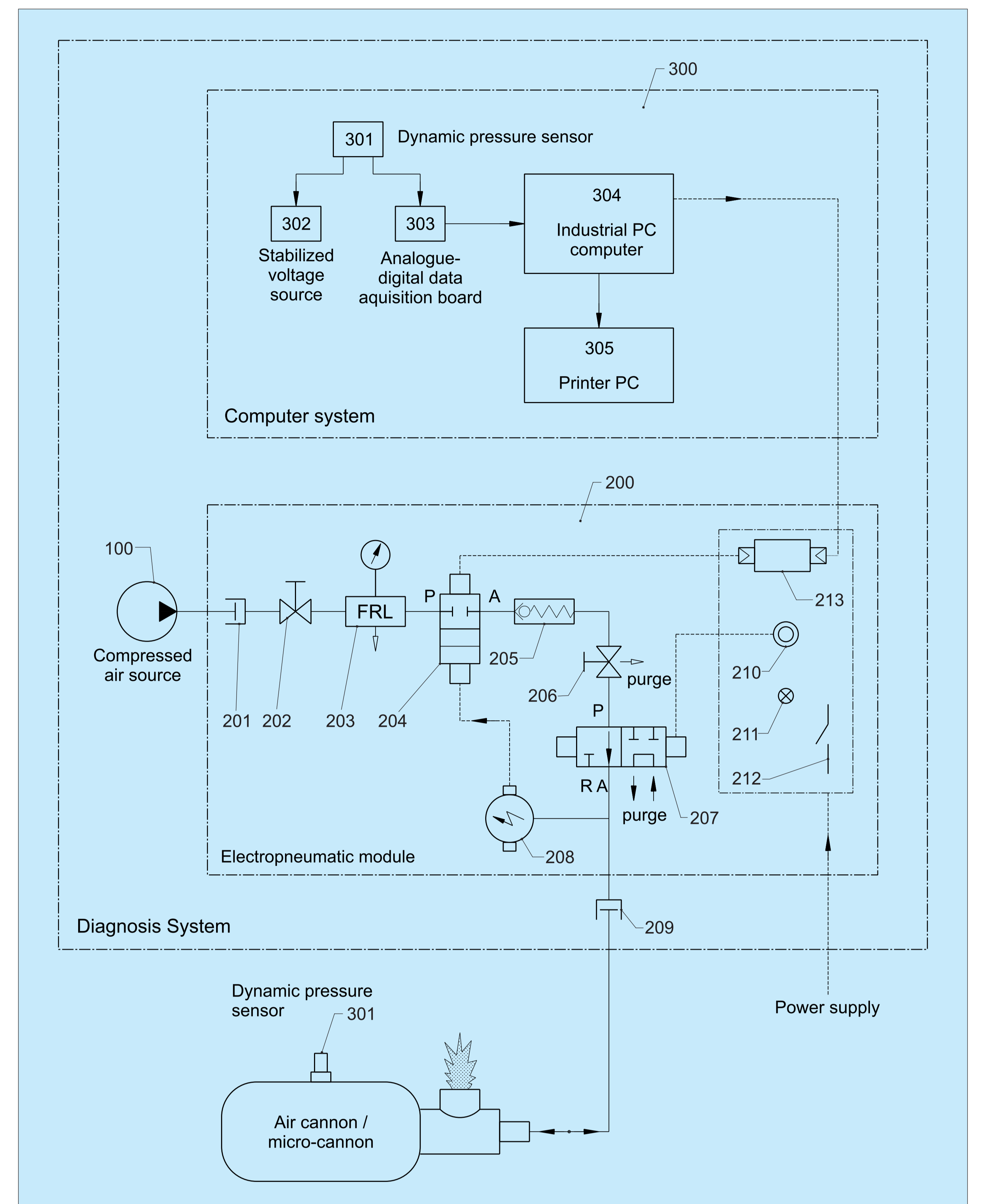


Fig.1

## ADVANTAGES OFFERED

According to the technical solution and the four claims, the invention presents advantages such as:

- It applies both to newly manufactured products and to products in operation on the technological flows of companies.
- It establishes the state of good operation or failure of pneumatic cannons and micro-cannons in operation, without them being dismantled from the installations and without being disassembled into component parts, with significant reductions in time and costs.
- It produces and distributes the compressed air to the pneumatic cannon and transmits an electrical signal to initiate data acquisition to the hardware structure.
- Through the hard structure and the specific software, (fig.4) ensures the real-time acquisition of the "status curve" of a product, compares it with the "standard curve" (fig.5) and establishes the state of good operation or defect of the product, respectively: functionally fit or functionally unfit.

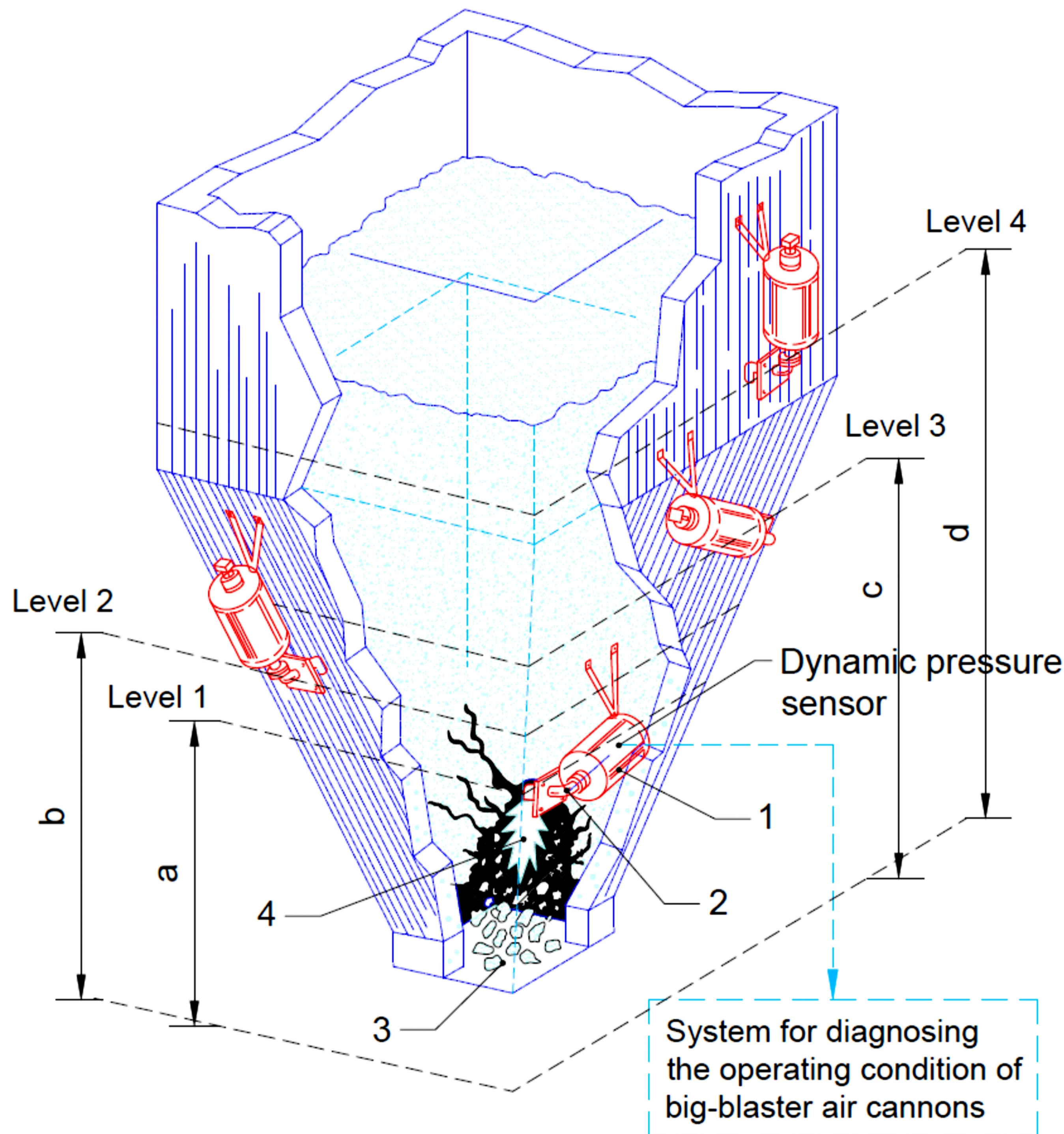


Fig.2



Fig.3

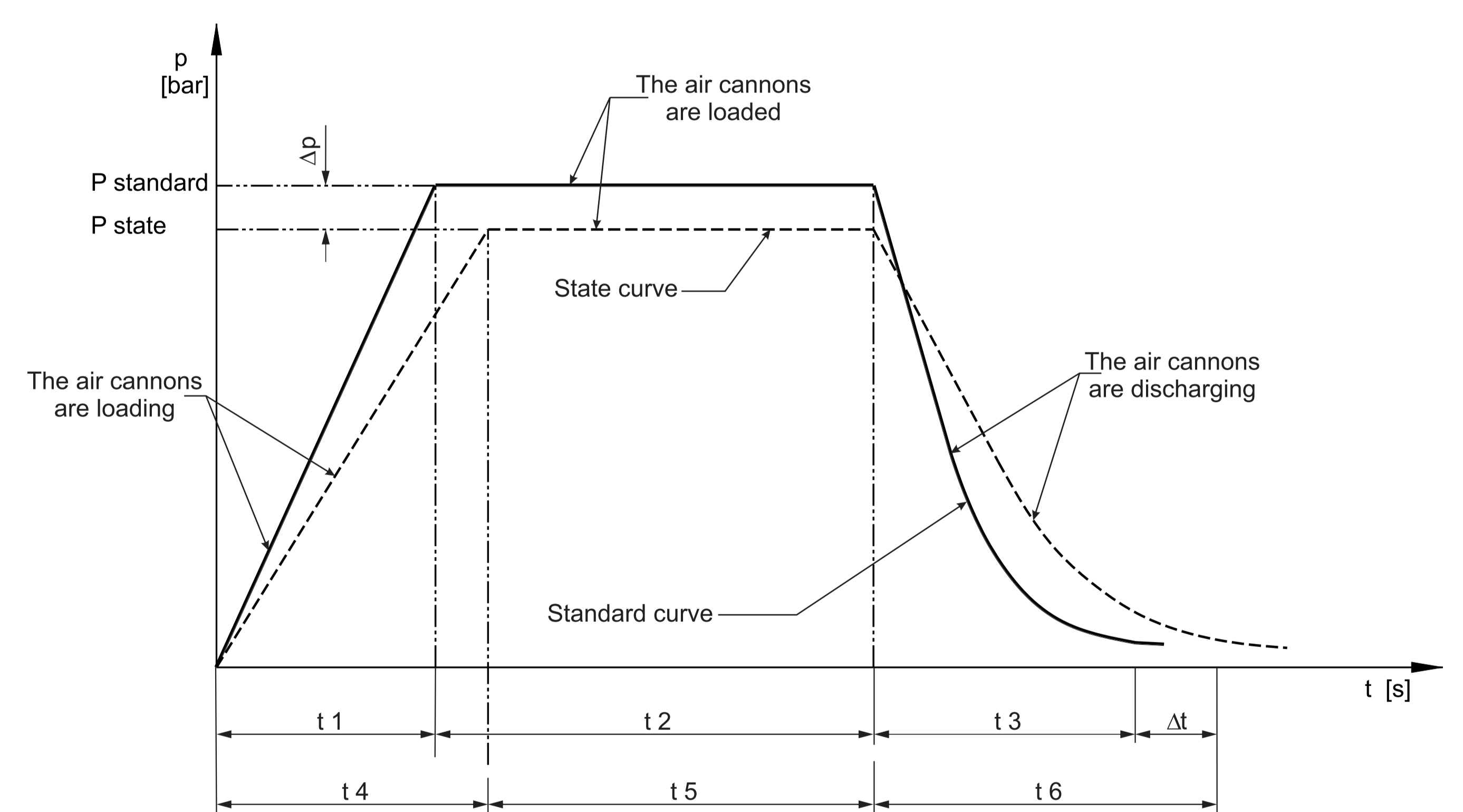


Fig.5

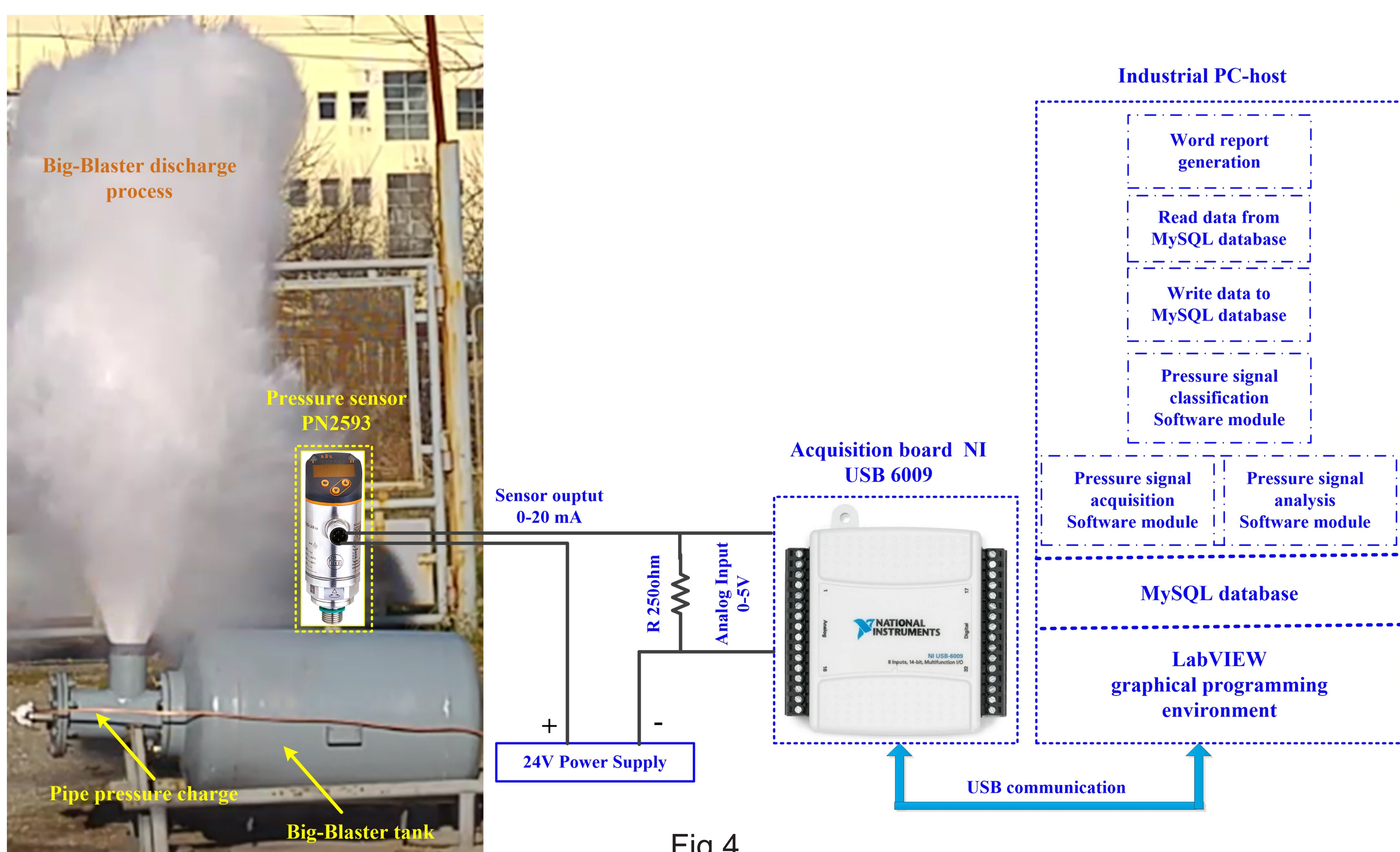


Fig.4



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**PREDICTIVE METHOD AND SYSTEM FOR DETERMINING THE  
OPERATING CONDITION IN BIG-BLASTER AIR CANNONS AND  
MICRO-CANNONS.**

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to

*Teisaru F., Chelaru C., Butoi M., Patru I.,  
Iordache I., Nicola C., Nicola M.*  
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On the occasion of  
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