

The Performing Test of Bell Prover as Gas Volume Flow Rate Standards at RCM LIPI Indonesia

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Abstract

Although Research Center for Metrology (RCM) - Indonesian Institute of Sciences (LIPI) has bell prover facilities as gas flow rate national standards of Indonesia since 2008, the measurement values of bell prover haven't been validated. Moreover, the gas volume flow rate values of bell prover still use the factory value. The purpose of this study is to test the performing of bell prover of its gas volume flow rate measurement value. The artefact of gas turbine flow meter has been calibrated in K-Factor value as many as three times which consist of before at RCM LIPI, at Center for Measurement Standards(CMS), Industrial Technology Research Institute(ITRI) and after at RCM LIPI. Because the value between before and after at RCM LIPI are different enough, there are uncertainty of measurement drift. This measuring produces the K- Factor data of (73.26 ± 0.82) pulses / L for before at RCM LIPI, (73.31 ± 0.28) pulses / L at CMS ITRI and (72.68 ± 0.74) pulses / L for after at RCM LIPI. The final measurement results from bell prover at RCM LIPI by (73.0 ± 1.1) pulses / L have the larger uncertainty than CMS ITRI around three times. The performing of bell prover is good that it has En number by 0.29 comparing to reference of CMS ITRI results although the bell prover factory value has the larger uncertainty and hasn't been validated to SI Units. This bell prover measurement value from factory are still worthy to be comparative reference for the next attempting validated value to SI Units at RCM LIPI.

Keywords: performing test, bell prover, gas flow rate, turbine, validate.