

Development of water flow standard system for calibrating water flow meters up to 2000 m³/h in KRISS

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There are a lot of needs for calibrating water flow meters with large-capacity in applications for steam turbine, chemical processing and water resource management industries. Accredited laboratories have equipped with gravimetric or master-meter flow calibration systems to calibrate water flow meters up to 5000 m³/h – 12000 m³/h. KRISS had its water flow standard system only up to 400 m³/h. In this study, the water flow standard system (WFSS), of which measurement capacity was enlarged up to 2000 m³/h, was recently developed. Toward its ends, four weighing tanks (0.1 t, 1 t, 5 t, 25 t) were integrated into one system with eight pipe lines (25A, 50A, 80A, 100A, 150A, 200A, 250A, 400A). Four pumps were applied to supply water to the head tank located at 20 m high. A mathematical model was revised in view of relative deviations according to the GUM. The BED (best existing device) uncertainty was also incorporated according to the WGFF resolutions. The measurement uncertainty of the WFSS was estimated to be less than 0.06 %. Some parts of the WFSS are involved in the CCM.FF-K1 KC and the APMP.M.FF-S1 SC. More details on the WFSS are described in this paper.

Keywords: buoyancy correction, calibration, gravimetric flow metering, measurement standard, uncertainty, water flow

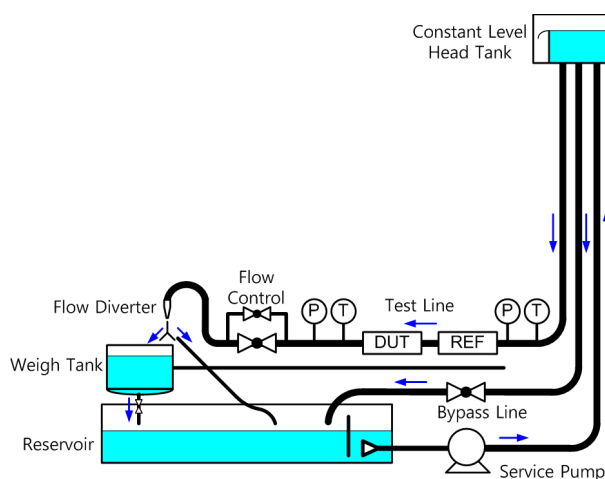


Fig. 1 Schematic diagram of KRISS WFSS

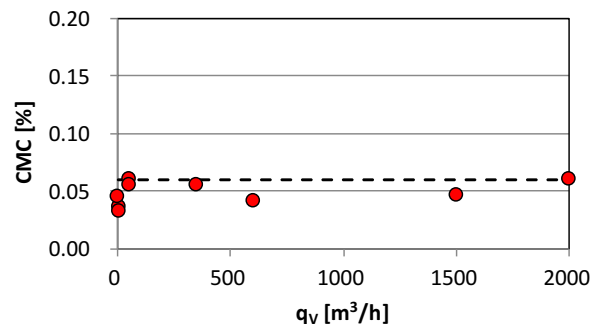


Fig. 2 Calibration and measurement capability of KRISS WFSS