



OPTIMIZATION OF MODIFIED ROTAMETER USING HALL PROBE SENSOR WITH RESPECT TO LIQUID DENSITY AND ITS CALIBRATION USING ARTIFICIAL NEURAL NETWORK

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Abstract- Rotameter is the one of the most commonly used local indicating type flow measuring instrument. For remote indication and control a secondary transducer like Hall Probe sensor, LVDT etc. is incorporated with the conventional rotameter. In this paper, a modified rotameter with Hall Probe sensor is used as a measuring instrument. The output hall voltage is proportional to the flow rate of the fluid and the change in fluid density may also vary the hall voltage. So this kind of variation shows incorrect flow rate if the density of the float is not taken to a very high value compared to the density of the fluid. But the density float may affect the flow rate measurement and introduce error. In this respect firstly the variation of Hall voltage with respect to liquid density is analyzed and then the measuring system is calibrated using ANN. The ANN calculates the correction factor with respect to the change in liquid density, which results in obtaining the output close to the desired output. The simulation results show that the calibration technique is efficient.

Index terms: Flow rate, Hall Probe sensor, rotameter, Artificial Neural Network, Correction factor, Accuracy.