

ABSTRAK

PENGARUH DEBIT UDARA TERHADAP UNJUK KERJA AIRLIFT PUMP 1 INCI MENGGUNAKAN PENAMPUNG UDARA DENGAN TINGGI SIPHON 10 CM

Keberhasilan budidaya ikan dipengaruhi oleh beberapa faktor, salah satu yaitu kadar oksigen di dalam air. *Airlift Pump* dapat dijadikan solusi untuk meningkatkan kadar oksigen di air. Rancangan yang sederhana dengan biaya relatif murah dan mudah dalam perawatan serta pembuatannya adalah keunggulan *airlift pump*. Namun efisiensi yang dihasilkan *airlift pump* masih rendah.

Penelitian ini bertujuan menginvestigasi pengaruh debit udara yang diinjeksikan serta penambahan penampung udara terhadap debit air yang dihasilkan dan efisiensi *airlift pump*. Penampung udara yang digunakan berukuran lebar 25 cm, panjang 25 cm dan tinggi 50 cm. Debit udara diinjeksikan dari kompressor sebesar 20 liter/menit, 30 liter/menit dan 40 liter/menit pada tekanan 1 bar.

Hasil penelitian ini menunjukkan bahwa dengan pada debit udara 40 liter/menit dihasilkan debit air sebesar 5,647 liter/menit tanpa penampung udara dan 1,125 liter/menit menggunakan penampung udara. Peningkatan debit udara meningkatkan efisiensi *airlift pump*. Pada debit udara 40 liter/menit diperoleh efisiensi 3,16 % tanpa penampung udara dan 1,04 % menggunakan penampung udara. Hasil penelitian menyatakan bahwa penambahan penampung udara mengurangi nilai debit air dan efisiensi yang dihasilkan. Di sisi lain, struktur aliran yang terbentuk dalam penelitian ini yaitu *slug*, *churn bubbly*.

Kata kunci: *Airlift pump*, debit air, debit udara, efisiensi, pola aliran

ABSTRACT

THE EFFECT OF AIR FLOW RATE ON THE PERFORMANCE OF A 1 INCH DIAMETER AIRLIFT PUMP USING AN AIR COLLECTOR WITH A SIPHON PIPE HEIGHT OF 15 CM

The success of fish farming is influenced by several factors, one of which is the oxygen level in the water. Airlift Pump can be used as a solution to increase oxygen levels in water. A simple design with relatively low cost and easy maintenance and manufacture are the advantages of the airlift pump. However, the efficiency produced by the airlift pump is still low.

This research aims to investigate the effect of the injected air flow and the addition of an air reservoir on the resulting water flow and the efficiency of the airlift pump. The air reservoir used measures 25 cm wide, 25 cm long and 50 cm high. The air flow injected from the compressor is 20 liters/minute, 30 liters/minute and 40 liters/minute at a pressure of 1 bar.

The results of this research show that with an air discharge of 40 liters/minute, a water discharge of 5,647 liters/minute without an air reservoir is produced and 1,125 liters/minute using an air reservoir. Increasing the air flow increases the efficiency of the airlift pump. At an air flow rate of 40 liters/minute, the efficiency was 3.16% without the air reservoir and 1.04% using the air reservoir. The results of the research state that the addition of an air reservoir reduces the water discharge value and the resulting efficiency. On the other hand, the flow structures formed in this research are slug, churn bubbly.

Key words: Airlift pump, water discharge, air discharge, efficiency, flow pattern