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Analysis of Water Treatment Process for Variable Pressure using 4-Stroke Petrol Engine

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ABSTRACT: A typical water treatment has the combination of the process needed to treat the contaminants in the source of water treated by the facility. The presence of waste water causes some problems in obtaining drinking water to be treated. To analysis the water treatment for variable pressure using the 4- stroke petrol engine. In this work 4- stroke petrol engine are used pressure gauge, flow control valve and TDS meter. In the water treatment process pressure varied by the 4- stroke petrol engine using flow control valve to increase the pressure with different operating condition to reduce the water TDS from 1650 to 850ppm. In this work found the result while increasing the pressure. Then, the TDS will reduce.

KEYWORDS: Assemble, Checking, testing process, Result.

I. INTRODUCTION

Drinking water should be obtained from a source free from pollution. The raw water normally available from the surface water sources is not directly suitable for drinking usage. The primarily concerned with the engineering design of process plants for treatment of waste waters of either domestic or industrial origin. It is only in the last few years that the design approaches for these plants has changed from empiricism to a sound engineering basis. Also, fundamental research in new waste water treatment processes, such as reverse osmosis has only recently been greatly emphasized.

II. RELATED WORK

A pressure gauge is a method of measuring fluid, water, or steam intensity in a pressure powered machine to ensure there are no leaks or pressure changes that would affect the performance of the system.it is designed to a measure of fluid pressure. Control valves are fitted with the pump and positioners. Pneumatically-actuated globe valves and diaphragm valves are widely used for control purposes in many industries ball and butterfly valves are also used. A TDS meter is a small hand-held device used to indicate the water total dissolved solids of water salt particles.

III. METHODOLOGY

First, the tank and the foot valve are connected to the 4-stroke petrol engine. Then, the pressure gauge, flow control valve and fixed to measure the pressure in the 4-stroke petrol engine. The engine starts and run one hour properly and the variation of pressure set by the use of flow control valve. With the different pressure the total dissolved solids(TDS) will reduces by the variable pressure. The TDS is checked by the use of total dissolved solids (TDS) meter. The unit of TDS is parts per million(ppm).

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IV. EXPERIMENTAL RESULTS



Tabulation FIRST SET OF READINGS

S . No	Pressure (Bar)	Timing (Sec)	Amount of water flow (in Liters)	Before water TDS(PPM)	After water TDS (PPM)
1	3	2.06	32.9	1650	1545
2	4	1.95	32.9	1650	1482
3	5	1.64	32.9	1650	1302
4	6	1.62	32.9	1650	1214
5	7	1.56	32.9	1650	1138

RAW WATER TDS - 1650 PPM

IN EACH PRESSURE PUMP WAS RUNNED FOR 30 MIN

 \triangleright **INSPECTED THE EFFICIENCY ON 20.04.2022**

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S.No	Pressure (Bar)	Timing (Sec)	Amount of water flow (in Liters)	Before water TDS(PPM)	After water TDS (PPM)
1	10	12.72	1	860	576
2	15	09.51	1	860	529
3	20	07.48	1	860	493

SECOND SET OF READINGS

► RAW WATER TDS – 860 PPM

► IN EACH PRESSURE PUMP WAS RUNNED FOR 1HOUR INSPECTED THE EFFICIENCY ON 21.04.2022

V. RESULT

GRAPH: FIRST SET OF READING



Figure: Pressure vs TDS

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SECOND SET OF READING



Figure: Pressure vs TDS

VI. CONCLUSION

The water treatment process has been analyzed and tested. In the experimental the TDS of water reduced by the use of variable pressure. The pressure varied by the use of flow regulator in 4-stroke petrol engine, the TDS varied from 1650ppm to 800ppm. The pH is varying from 12.5 to 8. Hence, this work concludes that TDS is varied by using the 4-stroke petrol engine. Further the TDS can be reduced by the Usage of filters and permeable membranes. Since 4-stroke petrol engine is used the elimination of electrical energy is done. Whenever the demand for electricity occurs, 4-stroke petrol engine can be used.

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