



Daley's Water Service Pty Ltd
Specialising in
Water & Energy Efficiency

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Calculate cost of pumping

TDH (Total Dynamic Head):

Suction vacuum measured in Kpa when the pump is operating. (10Kpa = 1 meter)

Height difference between the suction gauge and discharge gauge in meters.

Discharge pressure in Kpa when the pump is operating.

Total of all readings.

TDH

Flow Rate (L/S to ML):

L/S multiplied by 3600 seconds of time = LPH Liters per hour divided by 1 million liters gives you the number of hours to pump 1 ML

Hours

Kwh of energy:

Method 1 (Timing Disc) Use a stopwatch, record the amount of time it takes for you to count a convenient Number of disc revolution for each meter.

Disc Revs / kWh (c) _____

Disc Revs counted (R) _____

Time (sec) (t) _____

Meter 1: $R * 3600 / t / c = \text{_____} * 3600 / \text{_____} / \text{_____} = \text{_____}$

Meter 2: $R * 3600 / t / c = \text{_____} * 3600 / \text{_____} / \text{_____} = \text{_____}$

Meter 3: $R * 3600 / t / c = \text{_____} * 3600 / \text{_____} / \text{_____} = \text{_____} + \text{kW.h} / \text{hr} = \text{_____}$

Analogue Meter

Method 2 Record before and after readings on the meters whilst timing against a stopwatch.

Time Measured _____ mins

H/D refers to High/Day tariff reading & L/N refers to Low/Night tariff reading

Start (kW) Finish (kW) Total (kW)

Dial # 1 H / D

L / N

Dial # 2 H / D

L / N

Dial # 3 H / D

L / N

Start (hr) Finish (hr) Sum of Total (kW)

Time (hr) Sum of Total (kW/hr)

Digital Meter

Method 3 Use a stopwatch measure the time between 2 readings.

Start (kW) _____

Finish (kW) _____

Time measured _____ mins

Total (kW) _____

kWh = Sum of total / mins x 60 = _____ / _____ x 60 = _____ Kwh

Tariff Code _____ Night _____ c/kWh Day _____ c/kWh

Total Kwh/ML:

Kwh x the number of hours to pump a ML = Kwh/ML.

Kwh/ML/M pressure:

Kwh/ML divided by TDH. (5Kwh/ML/M is the bench mark for pump performance)

Irrigation System Audits * System Mapping * Flow & Pressure Verification * Energy & Water Efficiency Designs *
Quote Analysis Service * Skills Development Training * Workshop Presentations

Calculate Pump Efficiency

$$\frac{\text{Pump Flow Rate (L/s)} \times \text{Total Pump Head (m)}}{1.02 \times \text{Power Use (kW)} \times \text{Motor efficiency} \times \text{Drive efficiency}}$$

Eg.
$$\frac{32 \text{ (L/s)} \times 30 \text{ (m)}}{1.02 \times 14.2 \text{ (kW)} \times 0.9 \times 1}$$
$$= 74\%$$