

تاریخ: ۱۴۰۲/۱۲/۱۰

شماره: ۱۴۰۲/ب/۱۲/۱۰

## باسمه تعالی

جناب آقای مهندس سیدزاده

مدیرکل محترم دفتر مدیریت مصرف، خدمات مشترکین و کاهش هدررفت شرکت مهندسی آب و فاضلاب کشور

موضوع: گزارش نتایج پایلوت‌های اجرا شده با استفاده از قطعات کاهنده مصرف ماریک

با سلام و احترام

باعنایت به جلسه مورخ ۱۴۰۲/۰۹/۲۲ که با عوامل شرکت بهین انرژی سرداب کویر در دفتر حضرتعالی در شرکت مهندسی آب و فاضلاب کشور برگزار شد، مقرر گردید تا گزارشی مبنی بر نتایج پایلوت‌های اجرا شده با استفاده از قطعات شرکت ماریک استرالیا در ایران و کشورهای خارجی ارسال گردد. لذا با هماهنگی و دریافت اطلاعات از شرکت آب و فاضلاب استان یزد، نتایج نصب این قطعات در انشعابات برخی فضای سبزه‌ها و منازل مسکونی استان یزد به پیوست ارائه می‌گردد.

برای بررسی جدول شماره یک، توجه به نکات زیر الزامی است:

- ۱- اعداد موجود در جدول برای یک دوره مصرف مشابه قبل و بعد از نصب شیر کنترل جریان می‌باشند.
- ۲- لیترآژ شیر کنترل جریان در فضای سبز بر اساس مساحت درختکاری، تعداد آبخوری‌ها، سرویس بهداشتی و نوع آبیاری انتخاب شده است و در مسکونی‌ها بر اساس تعداد مصرف‌کننده‌ها، تعداد اعضای خانواده و اینکه فضای سبز دارند یا خیر، انتخاب شده است.
- ۳- بسته به انتخاب لیترآژ شیر کنترل جریان و اینکه مصرف‌کننده چه نوع رفتار مصرفی داشته باشد (پرمصرف یا استاندارد)، درصد کاهش مصرف تغییر می‌کند.

ردیف	کاربری	سایز انشعاب (اینچ)	سایز قطعه (ماریک (اینچ))	لیتراژ قطعه (لیتر بر دقیقه)	متوسط مصرف دوره قبل از نصب ( $m^3$ )	متوسط مصرف دوره بعد از نصب ( $m^3$ )	میزان افزایش یا کاهش مصرف ( $m^3$ )	درصد افزایش یا کاهش مصرف
۱	فضای سبز	۱/۲	۱/۲	۱۶	۱۹۴۰	۲۵۳	-۱۶۸۷	-۸۷
۲	فضای سبز	۳/۴	۳/۴	۲۰	۳۴۱۷	۱۴۶۲	-۱۹۵۵	-۵۷
۳	مسکونی	۱/۲	۱/۲	۱۸	۱۸۹	۱۷۳	-۱۶	-۸
۴	مسکونی	۱/۲	۱/۲	۱۸	۲۱۰	۱۲۰	-۹۰	-۴۳
۵	مسکونی	۱/۲	۱/۲	۱۸	۱۶۶	۱۱۷	-۴۹	-۳۰
۶	مسکونی	۱/۲	۱/۲	۱۸	۱۷۷	۱۴۰	-۳۷	-۲۱
۷	مسکونی	۱/۲	۱/۲	۱۸	۳۲۶	۱۵۴	-۱۷۲	-۵۳

جدول ۱- اطلاعات پایلوت‌های اجرا شده با استفاده از قطعات کاهنده مصرف ماریک در شرکت آب و فاضلاب استان یزد

### بررسی کاهش مصرف در منازل مسکونی:

مشاهده می‌گردد که در ۹۰ درصد از مشترکین پرمصرف، با انتخاب درست لیتراژ قطعه کاهنده مصرف، انشعابات مسکونی کاهش مصرف قابل توجهی داشته‌اند.

### بررسی کاهش مصرف در فضای سبزه‌ها:

در فضای سبزه‌ها مشاهده می‌گردد که با انتخاب لیتراژ بیشتر برای قطعه کاهنده مصرف، طبیعتاً محدودیت کمتر و در نتیجه کاهش مصرف کمتری رخ داده است. بررسی نتایج کاهش مصرف در فضای سبز نشان می‌دهد که با بکارگیری این شیرآلات میزان قابل توجهی در مصرف آب صرفه‌جویی می‌شود.

نمونه‌های استفاده شده از شیر کنترل جریان ماریک در خارج از کشور:

## 1. The Willunga Basin Water Company (WBWC)

A large reclaimed water scheme in the McLaren Vale region of South Australia that provides vigneron with reclaimed water for irrigation, supplied primarily from the Christies Beach wastewater treatment plant. This scheme has been developed in response to many irrigators across the McLaren Vale region reporting a drop in the water table and an increasing level of salinity within their irrigation water supplies. The reclaimed water is cheaper than bore water and completely safe for drip irrigation.

Users access the reclaimed water supply at a mutually agreed flow rate. Each outlet has a flow meter and water usage flow rate is logged continuously. There are **significant fines** for customers exceeding their maximum daily flow rate allowance of the reclaimed water.

### Managing Water flow rate

The problem for **Wilpena Vineyards** was to find a reliable method of ensuring that they did not exceed their maximum water usage over a 24-hour period. **The proprietor, John Trott**, chose to install a **Maric Flow Control valve** at the connection, to ensure that the maximum flow rate 175 Kiloliters per day was never exceeded. The Maric valve was the only product available which could ensure this.

John chose an 80mm Maric Wafer style valve, with a PVC body and a “Kwyflo” nitrile control rubber. The valve is rated at a flow rate of 162 liters per minute across the operating Differential Pressure range. The Kwyflo rubber is designed to limit operating noise while limiting flow rate.

### Customer Satisfaction

The valve was installed in 2016. Subsequently, data displayed on the performance graphs for monitoring water usage verified that the flow rate accuracy of the Maric valve was “spot on”.



The valve has the additional benefits of being tamper-proof and maintenance free. This product has given them peace of mind in a fail-safe technology and saved the company significant over-use fines.

## **2. When a windmill delivers stock water from a bore, there is a risk of water shortage during low wind conditions or when there is a short-term increase in water demand**

In remote regions, a submersible pump is necessary to supplement the windmill pump during calm weather.

A Belvedere Bypass valve is a valve connected between the submersible pump and the Windmill pump. It allows the Windmill pump to operate without drawing its water through the impellers of the submersible pump. The performance of the Windmill will be greatly reduced if the flow into the windmill pump is restricted in any way.

**Adelaide based Butlers Pumps & Irrigation fitted a 32 mm brass Maric Flow Control valve directly above a submersible bore pump supplying stock water on large remote sheep station.**

This bore pump was fitted below a windmill via a Belvedere Bypass valve to supply stock water.

The Submersible pump was oversized and consequently the flow rate was exceeding the capacity of the bore, potentially causing damage should the pump operate dry. The Maric valve guaranteed that the flow rate would not exceed the capacity of the bore.

**The Maric valve was chosen because it is simple to install, inexpensive and reliable in the remote location.** It was the solution of choice for this situation

### 3. Protecting pump longevity at a truck wash down facility



#### Protecting Pump Longevity at a Truck Washdown Facility

All centrifugal pumps have a maximum flow rate beyond which serious pump damage will occur. This can occur inadvertently at Truck wash down stations when truckies attempt to achieve maximum flow rate. At the newly designed Western Victoria Livestock Exchange, this problem has been solved using Maric Flow Control valves. Pump longevity is protected.

## **When the pump runs off the curve, pump longevity is reduced**

Truckies are generally keen to get their trucks washed with the highest volume of water possible, to clean the truck as thoroughly as possible in as short a time as is possible. Unfortunately, this may jeopardise the pump longevity, since excess throttling of the pump may cause the pump to “run off its curve”.

Pumps are selected to operate at the optimum flow rate/pressure point for a specific impeller speed, and this point can be determined from the Pump Curve. The Pump Curve is a graphical representation of flow rate vs pressure, or Pump Head, and is specific to the pump. The pump is “running off the curve” when flow rate exceeds the maximum rate for which the pump is designed. When the pump operates beyond the right-hand side of the pump curve, the likelihood of upthrust damage and cavitation is increased, and pump longevity is drastically reduced.

## **WVLX (Western Victorian Livestock Exchange)**

Pump Longevity has been considered in the meticulously designed Western Victoria Livestock Exchange at Mortlake, in South Western Victoria. The WVLX is a world-class regional livestock selling center, recently designed to meet the needs of Victoria’s cattle industry. Sitting on 12 hectares, it is a with a capacity to sell 3,000 cattle on any given sale day. Extensive research into the design and functionality of the saleyards has achieved a world-class facility focused on animal safety and wellbeing, environmental sustainability and workplace health and safety.

## **Protecting the pumps at the truck washdown**

When designing the Truck wash at the stock yards, the engineers considered the pump longevity and conserving rain water, as well as the needs of the truck drivers. To maintain the appropriate pump duty, the engineers have incorporated a Maric valve to restrict the flow at each bay. [Fletcher Plumbing & Co Pty Ltd](#) installed the Truck Wash-down facility for the site. At each bay, they installed a [Maric No 25 FF BSP Brass Precision flow control valve](#) delivering a maximum of 92 litres per minute.

The valves protect the pump, they save money and they save water. They are simple and reliable. They cannot be adjusted by an operator attempting to access a higher flow rate. Thus they prevent unintended damage to the pump and maintain Pump longevity.

#### 4. Preserving the media in media filtration

Based in Cairns Northern Water manufactures, installs and services desalinators and water treatment equipment. Northern Water uses Maric Flow Control valves in their desalinators for controlling the flow of backwash water and providing consistent flow of water within their filtration equipment.

The desalination process includes a media filtration step. The filters used in this step are loaded with a single filtering layer of sand or of anthracite. The maximum head loss reached at the end of a cycle can vary from 0.2 to 2 bar, mainly depending on the thickness of the filter layer and on filtration rate.

The media filters are backwashed with water only. The backwashing process relies upon return water at a pre-determined flow rate. The flow rate has to be calculated depending upon the type and the granulometry of the media. The Backwash flow rate needs to be controlled to prevent media loss.

**Maric Flow Control valves are fitted to ensure that the correct constant flow rate through the media is maintained.** The Maric valves are chosen because they are simple to install, reliable, economical and tamperproof.

Northern Water believe the Maric valve is a quality product backed by good service.

رضایتمندی شرکت‌های استفاده کننده از شیرهای کنترل جریان ماریک:

##### 1. Total Eden Riverland

**We have found that the best method to control the rate of flow of the fertiliser being pumped is with the use of the Maric precision flow control valve.** Usually we would use a standard PVC bodied valve with the nitrile elastomer. At the selected flow rate, the pump would then be selected to deliver at least 20m more head at that flow rate than the highest pressured irrigation shift (at the injection site).

**Ian Arnold B.App.Sc.Ag.**  
Branch Manager  
TOTAL EDEN PTY LTD

## 2. SA Water

Although SA Water is unable to endorse individual suppliers or products, I am pleased to acknowledge the importance of supporting local manufacturers and the benefit that provides to the state of South Australia. In addition, I can provide the following Statement of Use in relation to Marie Flow Control (MFC) products:

- SA Water's annual usage of MFC products totals approximately 400 items per year;
- The majority of SA Water's direct expenditure with MFC relates to 20mm brass highpressure flow control valves ranging from 5 L/min to 49 L/min;
- SA Water's annual volumes for these particular products totals approximately 300 items per year;
- SA Water has found these items to operate to a satisfactory standard consistent with their intended use, and SA Water continues to hold some regular MFC items in its inventory for repeated operations and maintenance use across the organisation.

Roch Cheroux  
CHIEF EXECUTIVE

## 3. Rowater Australia

**Equipment reliability, serviceability, timely delivery and ability to meet and exceeds customers specification are key to Rowater Australia Pty Ltd's engineering and design criteria that ensure customer's satisfaction.**

ROWATER Australia Pty Ltd use Maric Flow Control valve for our equipment to achieve our stringent product criteria, and we are very happy with the products and with the service from Maric Flow Control.

We use the Maric flow control valves to regulate and control water flow within our RO Plants, UV sanitising systems, and filtration and softening systems.

The valves are long lasting, reliable and maintenance free. Management and staff of Maric Flow Control are friendly and helpful in resolving technical issues. We appreciate the prompt service from the staff at Maric Flow Control.

Chee Fong  
Managing Director



#### 4. Pittsburgh Industrial Supply

This document is pertaining to “Maric Flow Control”, and is in an agreement with “Pittsburgh Industrial Supply, Inc” as a supplier/distributor relationship. The first listed, “Maric Flow Control” is the supplier for the distributor, “Pittsburgh Industrial Supply Inc.”. This company recognizes Maric Flow Control as an outstanding partner. In our business relationship we have received outstanding service, knowledgeable help, satisfactory training, and great communication.

Pittsburgh Industrial Supply Inc. is very happy to have joined Maric Flow Control in a relationship. We have rarely encountered a problem and have never had an issue unsolved. All the shipments have been very punctual from the delivery agreement set forth and has only improved since. The amount of knowledge the company shows on hand has always been helpful. The response time of certain questions is very quick and we have all of our questions answered by the end of our work day in the United States for our clients. Data transfer for training is satisfactory for operating a successful business where we can handle many issues on the spot. We can always respond to our clients with surprising turnaround time and feel confident that the client is always happy.

The product distributed (Maric Flow Control Valve) is a very efficient way for conserving water energy and water. This product has a very large range for controlling flow rates and our clients are very pleased and surprised at the durability and effectiveness of the product. The different design of the valves lets this valve be useful in very many applications and for many different jobs from heavy equipment mining jobs to subtle prototypes.

We are pleased to be a distributor and look forward to an ongoing and progressing relationship with Maric Flow Control and would like to see the business prosper and move forward in the future.

Regards,

George Navarro  
Export Manager



Pittsburgh Industrial Supply, Inc.  
Electrical, Mechanical & Instrumentation Equipment

George Navarro  
Export Manager

8050 N.W. 64<sup>th</sup> Street  
Suite 3  
Miami, FL 33166

To: Maric Flow Control  
Subject: Supplier Testimonial

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Regards,  
George Navarro



Phone: (305) 597 - 9002  
Fax: (305) 597 - 9003  
Email: pittksales@aol.com  
Website: www.pittsburgh-industrial.com

## 5. Riverina Water County Council

**Riverina Water County Council has been using Maric flow control valves for over 10-12 years as part of its water supply operations involving groundwater bore installations and on new rural customer's service connections.**

The traditional reliance on bore pump foot-valves to hold adequate water head pressure against the pump at start-up were unreliable, resulting in excessive thrust on pump bearings and increased wear & tear on bore casings caused by the pump

starting at the extreme end of its pump curve (until pipes were filled and system pressures normalised). The installation of Maric flow control valves immediately on the discharge side of bore pumps minimise these issues. This application significantly reduced bore and bore pump maintenance costs.

Riverina Water has also been installing Maric flow control valves on customer service connections on new rural water supply schemes. This benefits both council and new customers. The council benefits by improved operational efficiency in its rural trunk main systems in maintaining more consistent system pressures during peak demand periods, and customers benefit from the significantly reduced contribution cost to Council's water supply infrastructure even though they are required to provide their own on-site storage tank (and pump booster system if required) to manage their own on-site peak demands.

Yours Faithfully,

Jason Ip

OPERATIONS ENGINEER

## 6. Dick Howard Pumps

I write to thank you all for an absolutely excellent product.

I frequently am called upon to supply stock and domestic bore water pump systems. It is quite common for the bore supply to be small, and, to avoid over pumping, we need to ensure that the pump discharge is less than the maximum safe pumping rate of the bore. Submersible borehole pumps are remarkable pieces of equipment, quite efficient, robust, and capable of high pressure and volume. However, being mass-produced, they may well perform beyond the stated characteristics. So we reign them in.

In the bad old days, before Maric became known to me, I would attempt to restrict the flow using a gate valve, partly-opened. But gate valves have a regrettable flaw – the gate is loose when open, and rattles in the flow of water. That rattle does two things in particular – it wears the shaft from which the gate is suspended, and eventually that falls off, closing the valve as it does so. Or the rattle vibrates the screwed shaft, and causes the valve to open further, or to close. Any of these action is potentially catastrophic to both the pump and the bore.

## Enter Maric valves.

Now we have a fixed control mechanism. No errant child, or foolish adult, can fiddle with the flow rate. Presto, our bore and pump are safe from over or under pumping damage .. My favorite place to install the Marie Flow Control Valve is beneath the bore cap, where it is a concealed item. In some instances, I do not even tell my customer it is present – some customers simply have to fiddle with things, and what they do not know may save them from damage, intentional or otherwise.

So I thank you from the bottom of my pump installer's heart for this remarkable product line.

Lord only knows how many pumps you have saved from destruction, how many pump sales have been thwarted, or how many well-drillers have never had a job sinking a replacement bore.

My very best to you all, RB Howard.

در ادامه نتایج پایلوت‌های اجرا شده توسط شرکت ماریک استرالیا و میزان صرفه جویی حاصل شده در دو شهر آدلاید (استرالیا) و دبی (امارات متحده عربی) که در کاتالوگ این شرکت موجود می‌باشد، ارائه می‌گردد:

### ❖ (آدلاید، استرالیا ۲۰۱۹)

شیرهای کنترل جریان ماریک به طور خودکار یک دبی ثابت را حفظ می‌کنند و اغلب برای صرفه‌جویی در مصرف آب در خانه‌ها، متل‌ها و ساختمان‌های تجاری در خروجی‌های زیر مورد استفاده قرار می‌گیرند:

- دوش‌ها
- سینک‌های آشپزخانه
- حوضچه‌های حمام

محاسبات زیر نشان می‌دهد که چگونه یک خانه متوسط پس از نصب کنترل کننده‌های جریان ماریک فقط برای دوش گرفتن می‌تواند 1207.00 دلار (دلار استرالیا) در سال صرفه‌جویی کند. نصب کنترل کننده‌های جریان به آشپزخانه، حوضچه‌های حمام و غیره باعث افزایش بیشتر صرفه‌جویی می‌گردد.

### فرضیات:

تعداد اعضای خانوار	۴ نفر
۴ مرتبه دوش گرفتن در روز (هردوش ۱۰ دقیقه)	۴۰ دقیقه
مصرف دوش بدون شیر ماریک	۱۵ لیتر بر دقیقه $\times 40 = 600$ لیتر آب گرم
دمای متوسط آب محیط	$16^{\circ}\text{C}$
دمای متوسط آب دوش	$43^{\circ}\text{C}$
هزینه آب	۱ کیلولیتر = 3.37 دلار
هزینه برق	0.219 دلار در واحد (۱ واحد = ۱ کیلووات ساعت)
هرکیلو وات ساعت ۱۰۰ لیتر آب را گرم می‌کند. (این یک ثابت شناخته شده است.)	$8.5^{\circ}\text{C}$ افزایش دما

### محاسبات صرفه جویی آب:

فرض کنید یک کنترل کننده جریان دوش ۷ لیتر در دقیقه نصب شده است.

۸ لیتر در دقیقه صرفه جویی  $\times 40$  دقیقه = ۳۲۰ لیتر در روز.

۳۲۰ لیتر  $\times 365$  روز = ۱۱۷۰۰۰ لیتر در سال صرفه جویی می‌شود.

۱۱۷ کیلولیتر  $\times 3.37$  دلار برای هرکیلولیتر = 394.00 دلار در سال صرفه جویی می‌شود.

### محاسبات صرفه جویی برق:

افزایش دمای مورد نیاز ۲۷ درجه سانتی‌گراد است. (دمای دوش ۴۳ درجه سانتی‌گراد، منهای دمای ورودی ۱۶ درجه سانتی‌گراد)

اگر ۱ کیلووات ساعت، ۱۰۰ لیتر آب را  $8/5$  درجه سانتی‌گراد گرم کند،

بنابراین ۱ کیلووات ساعت،  $31/5$  لیتر آب را ۲۷ درجه سانتی‌گراد گرم می‌کند،

بنابراین ۳۷۱۴ کیلووات ساعت، ۱۱۷ کیلولیتر آب را (میزان صرفه جویی)، ۲۷ درجه سانتی‌گراد گرم می‌کند.

۳۷۱۴ کیلووات ساعت  $\times 0.219$  دلار برای هر کیلووات ساعت = 813.00 دلار در سال صرفه جویی می‌شود.

### کل صرفه جویی سالانه:

394.00 دلار در سال صرفه جویی آب.

813.00 دلار در سال صرفه جویی برق.

1207.00 دلار صرفه جویی کل سالانه برای اتاق هتل یا منزل مسکونی فقط برای دوش گرفتن.

(با نصب شیرآلات در سینک آشپزخانه و حوضچه های حمام، میزان صرفه جویی بیشتر نیز خواهد شد.)

نتیجه: اگر شیرآلات ماریک در آدلاید حدود ۳۰ دلار خریداری شود، در کمتر از یک ماه مبلغ هزینه شده برای شیرآلات جبران می گردد.

### ❖ (دبی، امارات متحده عربی ۲۰۱۵)

هدررفت آب رخ می دهد، زمانی که:

• مصرف کنندگان نگران هدررفتن یا هزینه بالای آب نباشند. به عنوان مثال: خدمتکار خانه، مهمانان، کودکان و ...

• هنگامی که دو یا چند شیر به طور همزمان استفاده می شوند. زمانیکه یک شیر بسته شود، سرعت جریان در شیرهایی که باز هستند ممکن است افزایش یابد و باعث هدررفت آب شود.

• هنگامی که فشار آب در لوله ها بسیار زیاد است و شیر آب برای رسیدن به دبی مطلوب نیاز است تنظیم شود. در مدت زمان تنظیم شیر، مقدار قابل توجهی آب می تواند هدر رود.

شیرهای کنترل جریان ماریک به طور خودکار یک نرخ جریان ثابت را حفظ می کنند و اغلب برای صرفه جویی در مصرف آب در خانه ها، هتل ها و ساختمان های تجاری در خروجی های زیر مورد استفاده قرار می گیرند:

- دوش های حمام
- دوش های توالت
- سینک های آشپزخانه

- حوضها
- آبیاری باغها

محاسبات زیر نشان می‌دهد که چگونه یک خانه متوسط پس از نصب کنترل کننده‌های جریان ماریک فقط برای دوش گرفتن می‌تواند 1140.00 درهم در سال صرفه‌جویی کند. نصب کنترل کننده‌های جریان به آشپزخانه، حوضچه‌های حمام و غیره باعث افزایش بیشتر صرفه‌جویی می‌گردد.

### فرضیات:

تعداد اعضای خانوار	۴ نفر
۴ مرتبه دوش گرفتن در روز (هردوش ۱۰ دقیقه)	۴۰ دقیقه
مصرف متوسط آب در دوشها	۱۵ لیتر بر دقیقه $\times 40 = 600$ لیتر آب گرم یا ۱۵۹ گالن آب گرم
دمای متوسط آب محیط	۲۵ °C
دمای متوسط آب دوش	۴۰ °C
هزینه آب و فاضلاب ترکیبی	۱ گالن آمریکایی (۳/۷۸۵ لیتر) = 0.041 درهم
هزینه برق	0.345 درهم برای هر کیلووات ساعت
هر کیلو وات ساعت بطور میانگین ۱۰۰ لیتر آب را گرم می‌کند.	8.5°C افزایش دما
گرمای موردنیاز برای آب دوش	تقریباً برای نیمی از سال

### محاسبات صرفه جویی آب:

با نصب یک کنترل کننده جریان دوش ۷ لیتر در دقیقه:

۸ لیتر در دقیقه صرفه‌جویی  $\times 40$  دقیقه = ۳۲۰ لیتر در روز (۸۴ گالن).

۸۴ گالن  $\times 365$  روز = ۳۰۶۶۰ گالن در سال صرفه‌جویی می‌شود. (۱۱۷ کیلولیتر)

۳۰۶۶۰ گالن  $\times 0.041$  درهم برای هر گالن = 1257.06 درهم در سال صرفه‌جویی می‌شود.

## محاسبات صرفه جویی برق:

افزایش دمای مورد نیاز ۱۵ درجه سانتی‌گراد است.

اگر بطور میانگین، ۱ کیلووات ساعت، ۱۰۰ لیتر آب را ۸/۵ درجه سانتی‌گراد گرم کند،

بنابراین ۱ کیلووات ساعت، ۵۷ لیتر آب را ۱۵ درجه سانتی‌گراد گرم می‌کند،

بنابراین ۲۰۵۰ کیلووات ساعت، ۱۱۷۰۰۰ لیتر آب را (میزان صرفه‌جویی)، ۱۵ درجه سانتی‌گراد گرم می‌کند.

با فرض اینکه آبگرمکن‌ها به دلیل شرایط دمایی محیط در دبی فقط نیمی از سال استفاده می‌شوند:

$$2050 \text{ KWH} \div 2 = 1025 \text{ KWH}$$

۱۰۲۵ کیلووات ساعت  $\times 0.345$  درهم برای هر کیلووات ساعت = ۳۵۳ درهم در سال صرفه‌جویی می‌شود.

## کل صرفه‌جویی سالانه:

۱۲۵۷.۰۰ درهم در سال صرفه‌جویی آب.

۳۵۳.۰۰ درهم در سال صرفه‌جویی برق.

۱۶۱۰.۰۰ درهم صرفه‌جویی کل سالانه برای اتاق هتل یا منزل مسکونی فقط برای دوش گرفتن.

نتیجه: نصب شیرهای ماریک در آشپزخانه، حوضچه‌های حمام و دوش‌های توالت، صرفه‌جویی قابل توجهی در

پرداخت قبوض آب و برق و کمک به حفظ محیط زیست خواهد داشت.

در انتهای گزارش، صفحاتی از کاتالوگ شرکت ماریک که دربرگیرنده متن اصلی نتایج پایلوت‌ها می‌باشد،

پیوست می‌گردد.

با تشکر

شرکت بهین انرژی سرداب کویر



**Maric Constant Flow Valves**

Constant Flow Rate  
Regardless of Pressure



Est. 1963

**(Adelaide, Australia 2019)**

**Maric flow control valves** automatically maintain a fixed, maximum constant flow rate, and are often used to save water in homes, motels and commercial buildings in the following outlets;

- Showers • Kitchens Sinks • Bathroom Basins

The following calculations demonstrate how an average home can save \$ 1207.00 (Australian Dollars) per year after installing Maric flow controllers to just the shower alone. The fitting of flow controllers to kitchen and bathroom basins, etc., will further increase savings.

**Assumptions:**

• Family size	4 people
• 4 x 10 minute showers per day	40 minutes
• Shower consumption without Maric valve	15 litres per minute, x 40 = 600 litres of warm water
• Average ambient water temperature	16° C
• Average shower water temperature	43° C
• Cost of water	1 Kilo litre = \$ 3.37
• Cost of electricity	\$0.219 per unit (1 unit = 1 KiloWatt Hour)
• 1 KiloWatt Hour (KWH) heats 100 litres	8.5° C (this is a known constant)

**Water Saving Calculations:**

Assume a 7 lpm shower flow controller is installed. 8 lpm will be saved, x 40 minutes = 320 litres per day.  
320 x 365 days = 117,000 Litres per year saved.

*117 Kilo litres x \$ 3.37 per KL = **\$394.00 per year saved.***

**Electricity Saving Calculations:**

Lift in temperature required is 27° C (43° C shower temp, minus 16° C incoming temp)

If 1.0 KWH heats 100L by 8.5° C,  
Therefore 1.0 KWH heats 31.5 litres 27° C  
Therefore 3714 KWH heats 117 Kilo litres (saving) by 27° C

*3714 KWH x \$0.219 per KWH = **\$813.00 per year saved.***

**Total Annual Savings:**

Savings per year Water	\$ 394.00
Savings per year Electricity	\$ 813.00
	\$ 1207.00 total annual savings per hotel room or family home in the shower only.

Further savings will be made by installing valves in the kitchen and bathroom basins also.



**Conclusion; If Maric valves retail in Adelaide for around 30 Dollars, it will take less than one month for the valve pay for itself!**

Maric Constant Flow Valves

Constant Flow Rate Regardless of Pressure



Est. 1963

### (Dubai U.A.E. 2015)

#### Water Waste Occurs:

- When users are not concerned about waste or the high cost of water –e.g. “House Help”, “Hotel Guests”, “Children”, etc.
- When two or more taps are simultaneously in use and one is closed down, flow rate in the one’s that are open might increase, creating waste.
- When the water pressure in pipes is very high and the water tap would need to be adjusted to reach the desirable flow rate. In this adjustment period considerable amount of water could be wasted.

**Maric flow control valves** automatically maintain a fixed, maximum constant flow rate, and are often used to save water in homes, hotels and commercial buildings in the following outlets:

- **Bath Showers • Toilet Showers • Kitchens Sinks • Basins • Garden Irrigation**

The following calculations demonstrate how an average home can save Dhs. 1140.00 per year after installing Maric flow controllers to just the shower alone. The fitting of flow controllers to kitchen and bathroom basins, etc., will further increase savings.

#### Assumptions:

• Family size	4 people
• 4 x 10 minute showers per day	40 minutes
• Average water consumption in shower	15 litres per minute, x 40 = 600 litres, or 159 gallons of warm water
• Average ambient water temperature	25° C
• Average shower water temperature	40° C
• Cost of water & sewerage combined	1.0 U.S. gallon (3.785 litres) = Dhs. 0.041
• Cost of electricity	Dhs. 0.345 per KiloWatt Hour
• 1 KiloWatt Hour (KWH) heats Avg. 100 litres	8.5° C
• Shower water heating required	For approximately half the year only.

#### Water Saving Calculations:

With a 7 lpm shower flow controller installed, 8 lpm will be saved, x 40 minutes = 320 litres per day. (84 gallons)  
84 gallons x 365 days = 30,660 gallons per year saved. (117 Kilolitres)

**30,660 gallons @ Dhs. 0.041 per gallon = Dhs. 1257.06 per year saved.**

#### Electricity Saving Calculations:

Lift in temperature required =15°C

If Avg. 100 litres heated 8.5°C = Electric consumption of 1.0 KWH  
> 57 litres heated 15.0°C = Electric consumption of 1.0 KWH  
therefore 117000 litres heated 15.0°C = Electric consumption of 2050.0 KWH

Assuming water heaters are used for only half the year due to ambient temperature conditions in Dubai  
= 2050.0 KWH ÷ 2 = 1025 KWH

**1025 KWH x Dhs. 0.345 per KWH = Dhs. 353.00 per year saved.**

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#### Total Annual Savings:

Savings per year Water Dhs. 1257.00

Savings per year Electricity Dhs. 353.00

Dhs.1610.00 (total annual savings per hotel room or family home in the shower only).

**Conclusion; Installing Maric Valves in the kitchen, bathroom basins, and toilet showers will demonstrate considerable savings in payment of utility bills and contribute to saving our environment.**

