

WATER METER



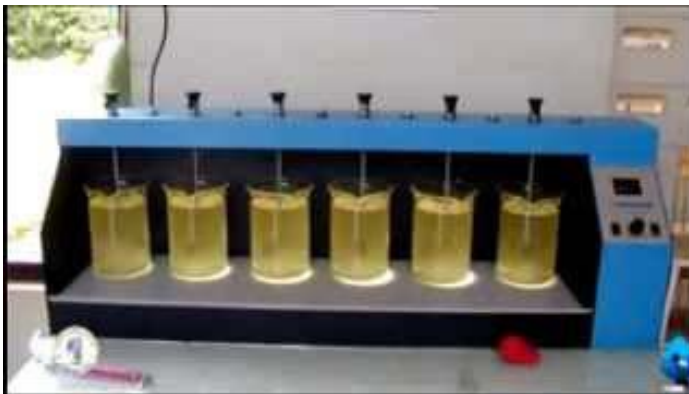
Purpose of Water Meter



1. Measurement for process control



Measurement of raw water volume flow into Sludge tank



Measurement for chemical preparation Proportion

- Water Usage control & Energy Saving
- Control water loss
- To avail volume data



Measure the amount of water supply to the pipe system. To know the volume of water supply from the origin to destination in order to check the leakage and loss control



Billings

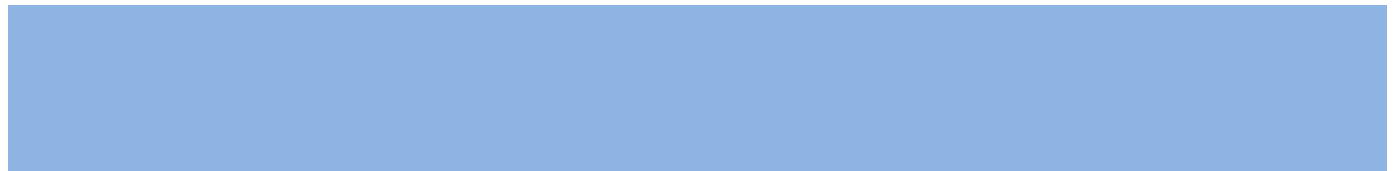


2. For Commercial Purpose

By installing water meters for water users. Select the size of the water meter to meet the user demand. Normally sizes of the water meter are ranging from 15-200mm. Each size has flow rate indicated, select the size of the water meter to meet the user demand.



USER's Justice or Fairness



Classification of Water Meter by Accuracy in accordance with **ISO 4064 : 2005 & Usage**

**Class A - for raw
water or waste
water**

**Class B for household
water supply**

**Class C
Potable water**

Class D for Oil & Gas

Production process Of the water meter Casting Type



Materials



Material	tin	lead	zinc	Copper	iron
Bronze	4-6	4-6	4-6	82-87	-
Brass		1-3.5		55-60	-/+0.3

Production Process

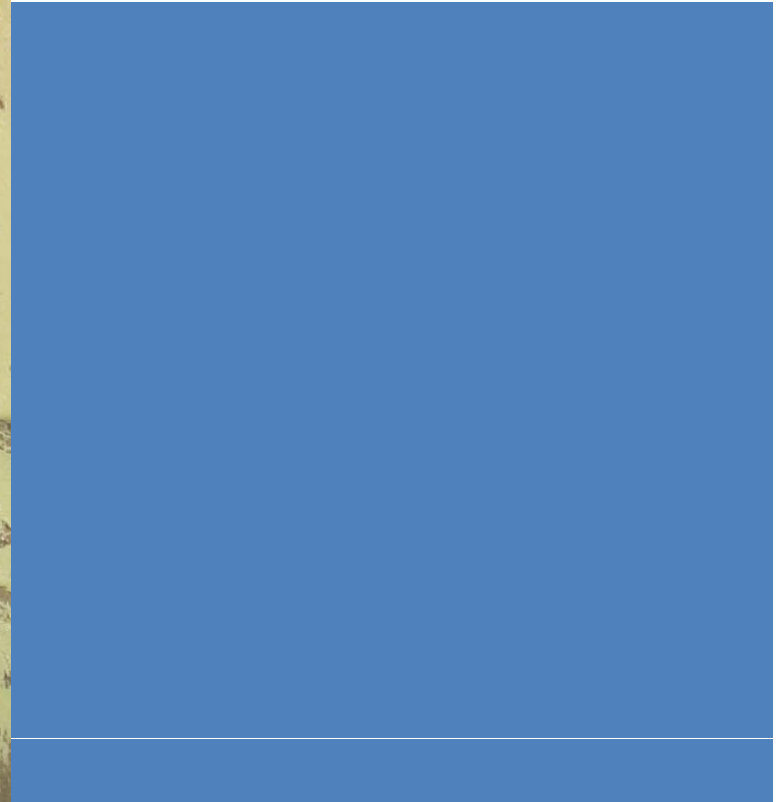
Core Sand Process



กระบวนการอัดไส้แบบ



กระบวนการอัดแบบทราย



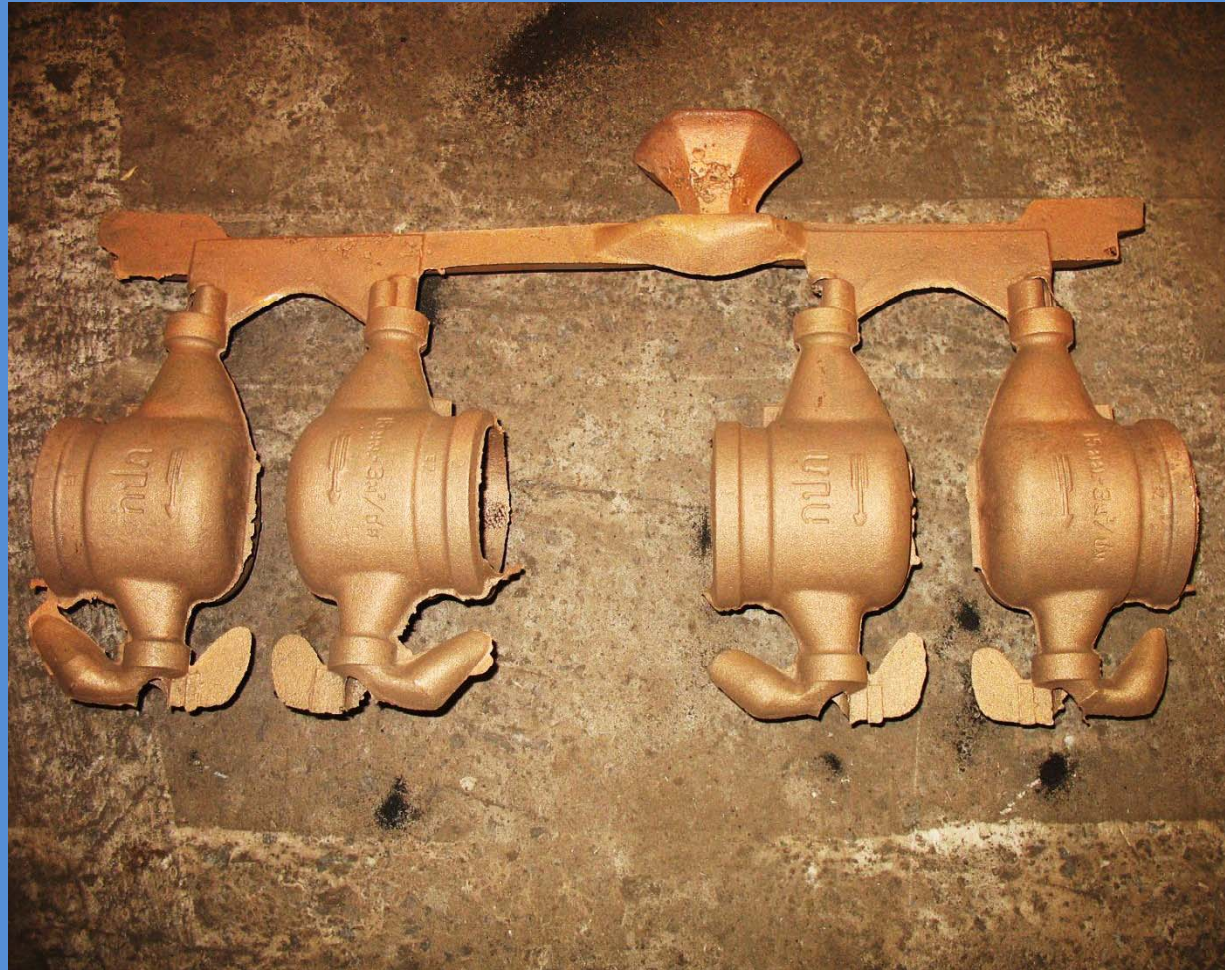
Foundry



Pouring Process



Cool Down

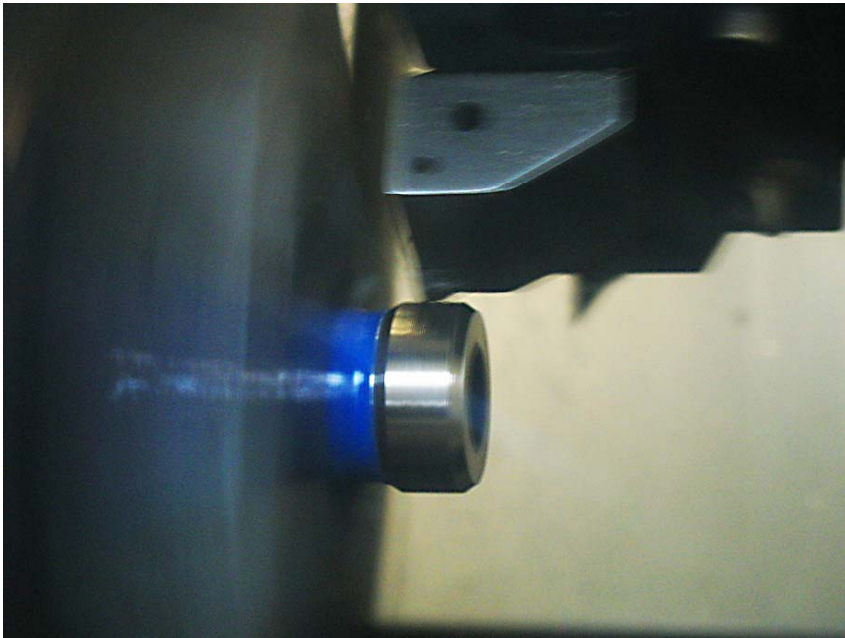


Machining / Finishing



Painting



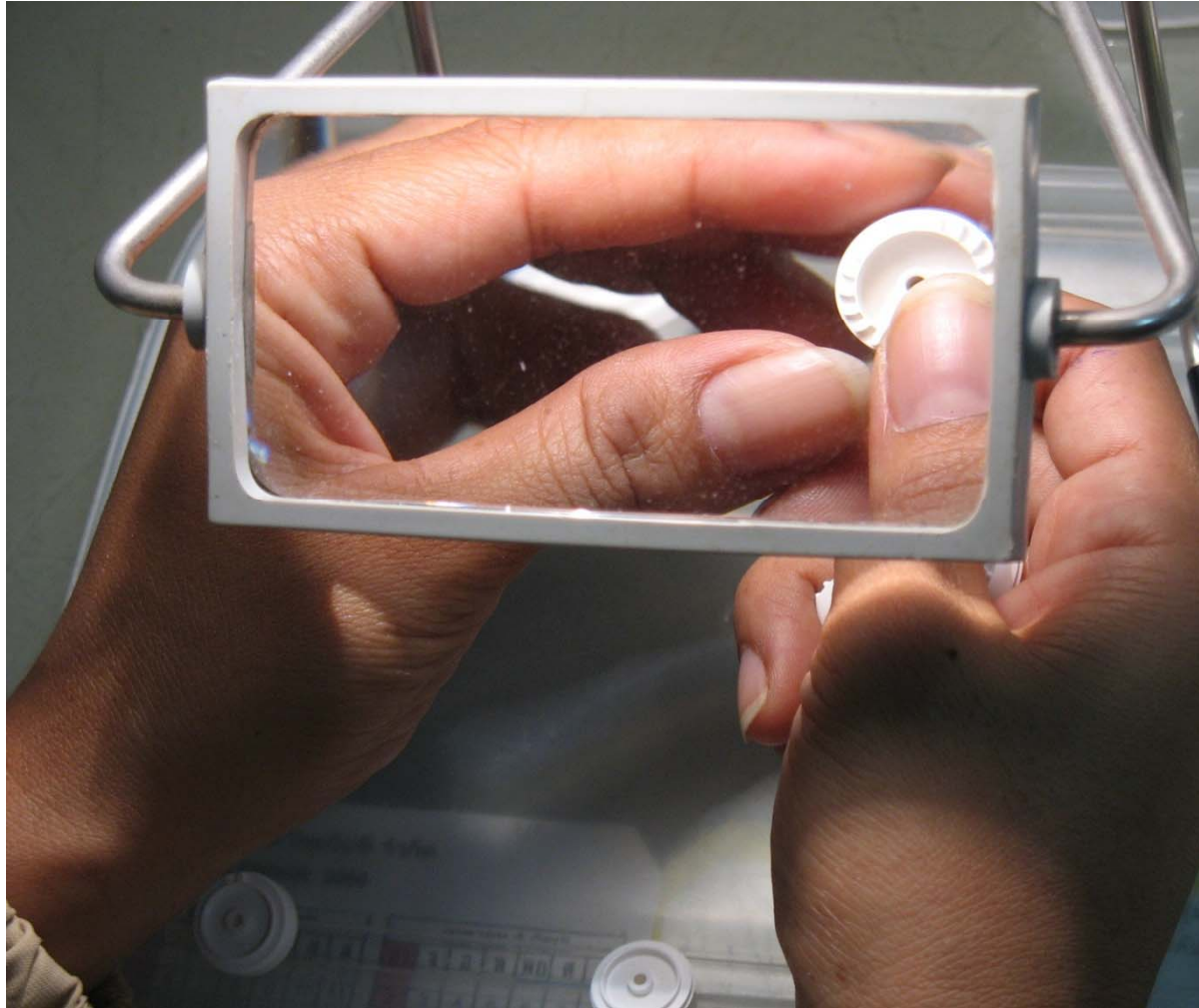


Machining by CNC



Testing of Body

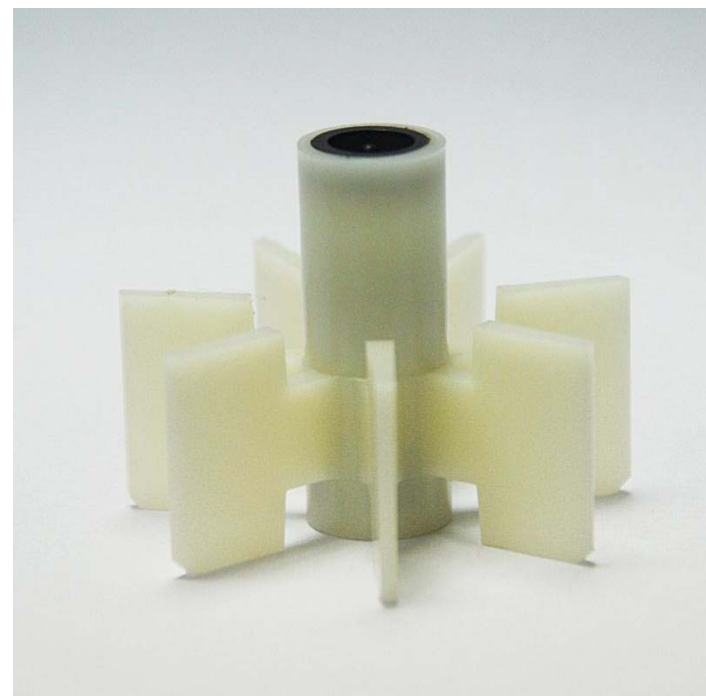
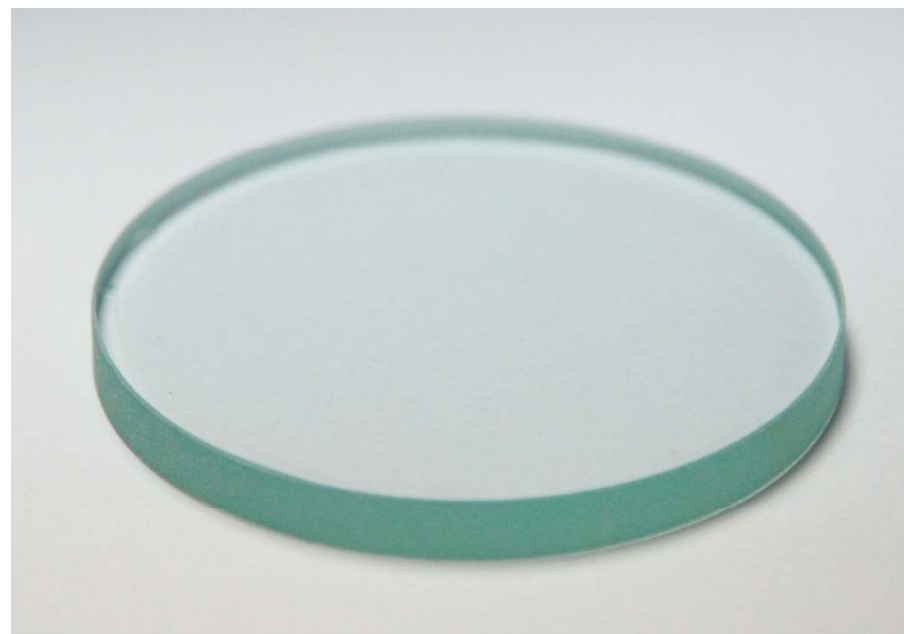




◀ Testing of plastic parts



Assemble of number gears



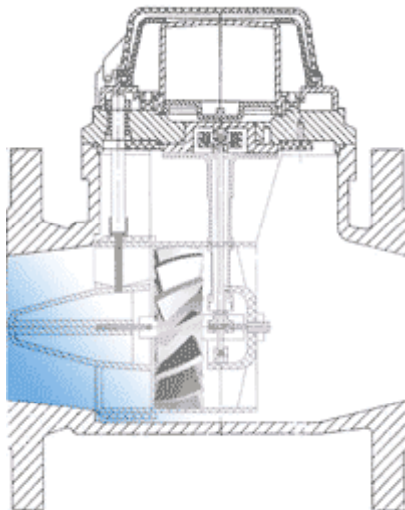
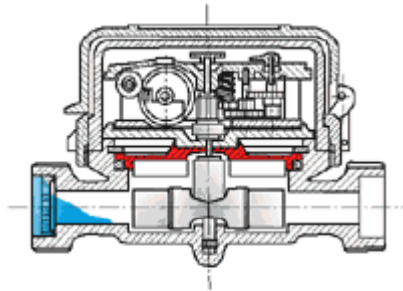
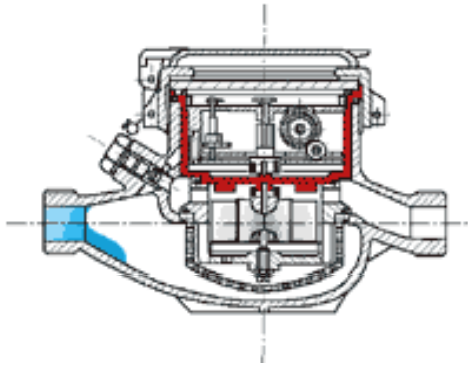


Assemble Register units



Accuracy test & Leakage Test





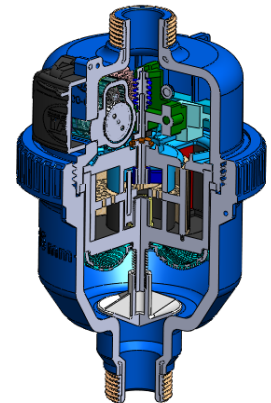
Type of The Water Meter

Single & Multi Jet Type

Pistol Type

Flow Meter

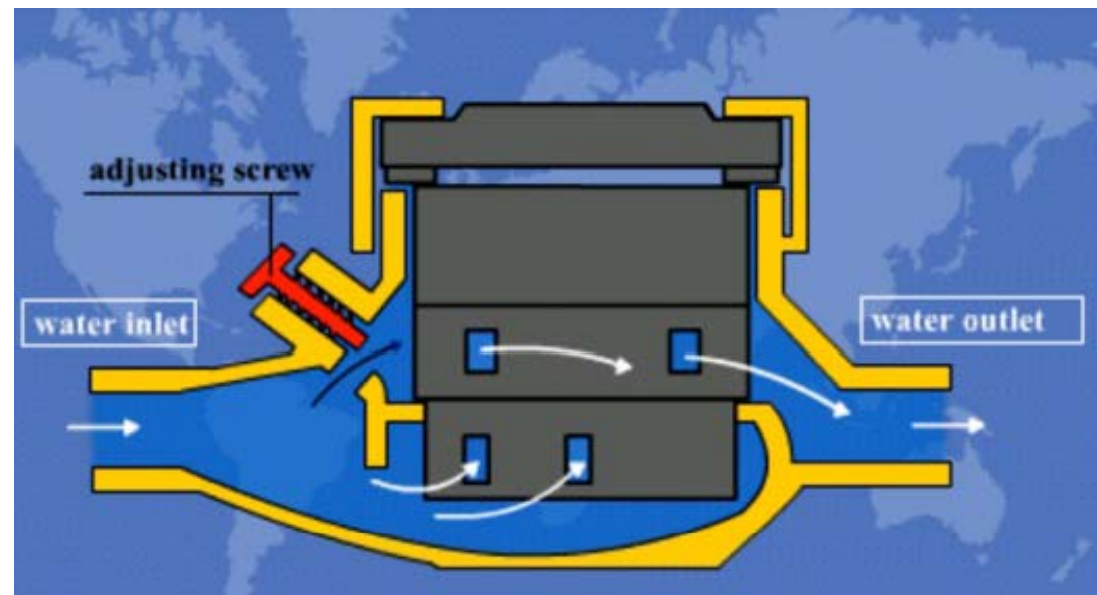
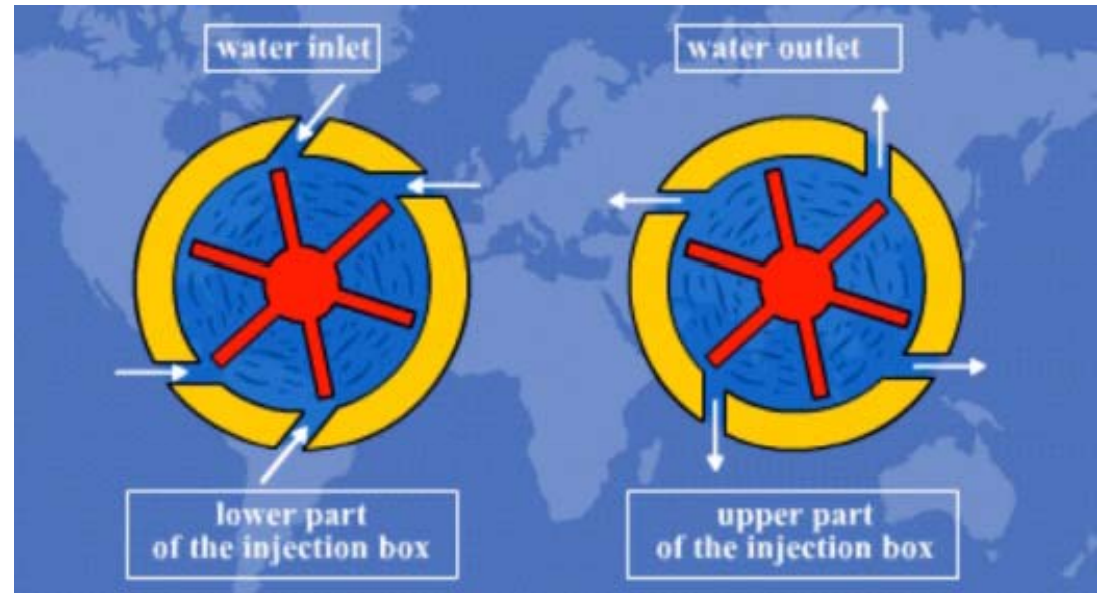
Electromagnetic, pulse meter and etc



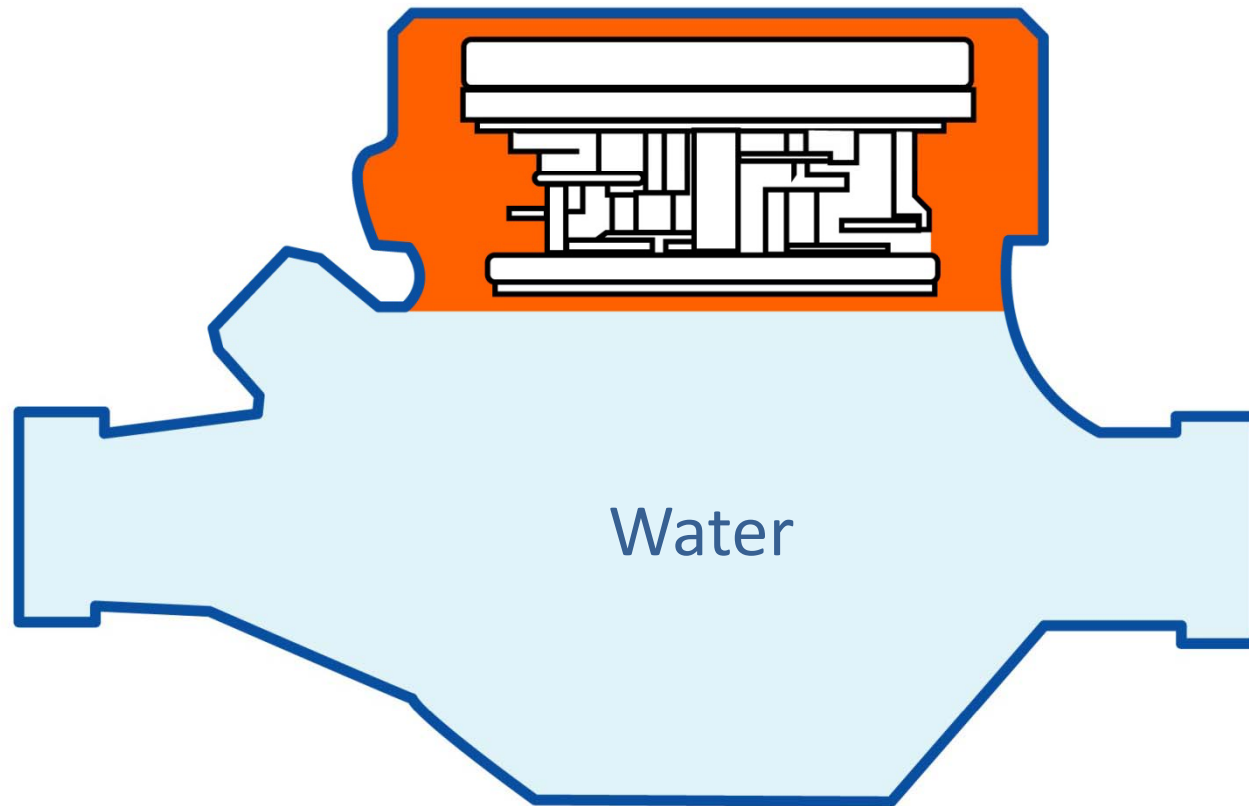
Single-Jet Water meter



Multi-Jet Water meter



DRY DIAL

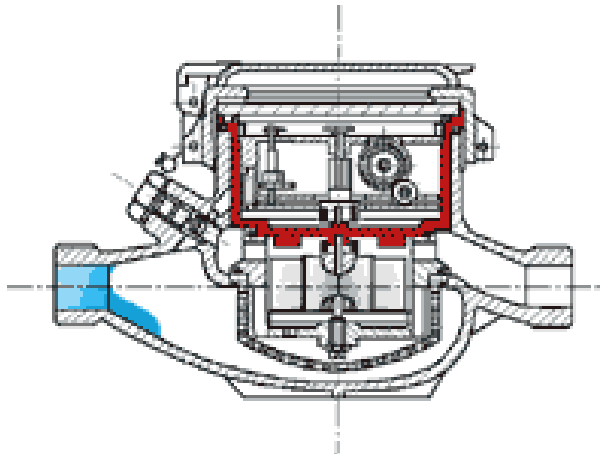


Vacuum Register Unit

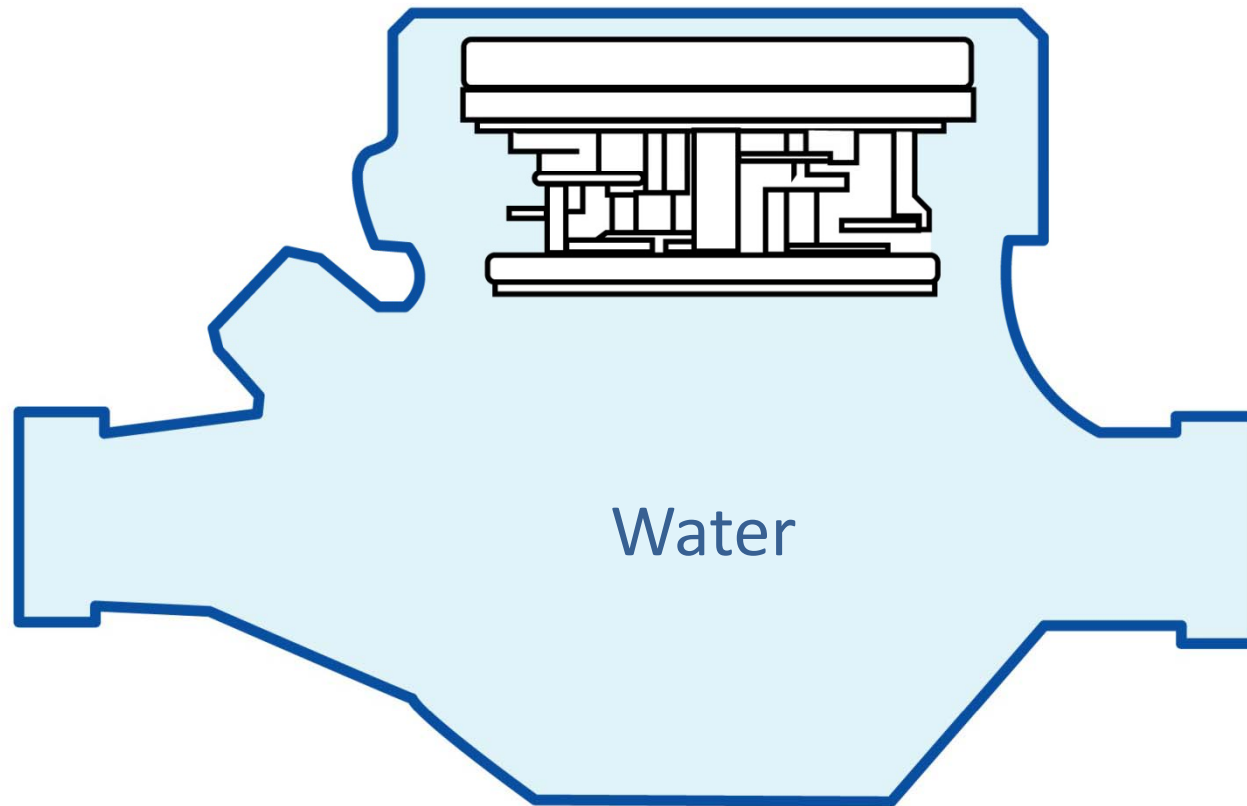


Advantages & Disadvantages Between dry & wet dial

- No rust no corrosion that would accumulate on the gears make meter long lifespan
- No fog on the dial
- Easy maintenance
- May not measure volume of water. when high pressure and flow rate occurs (Slip) meter would stop measuring



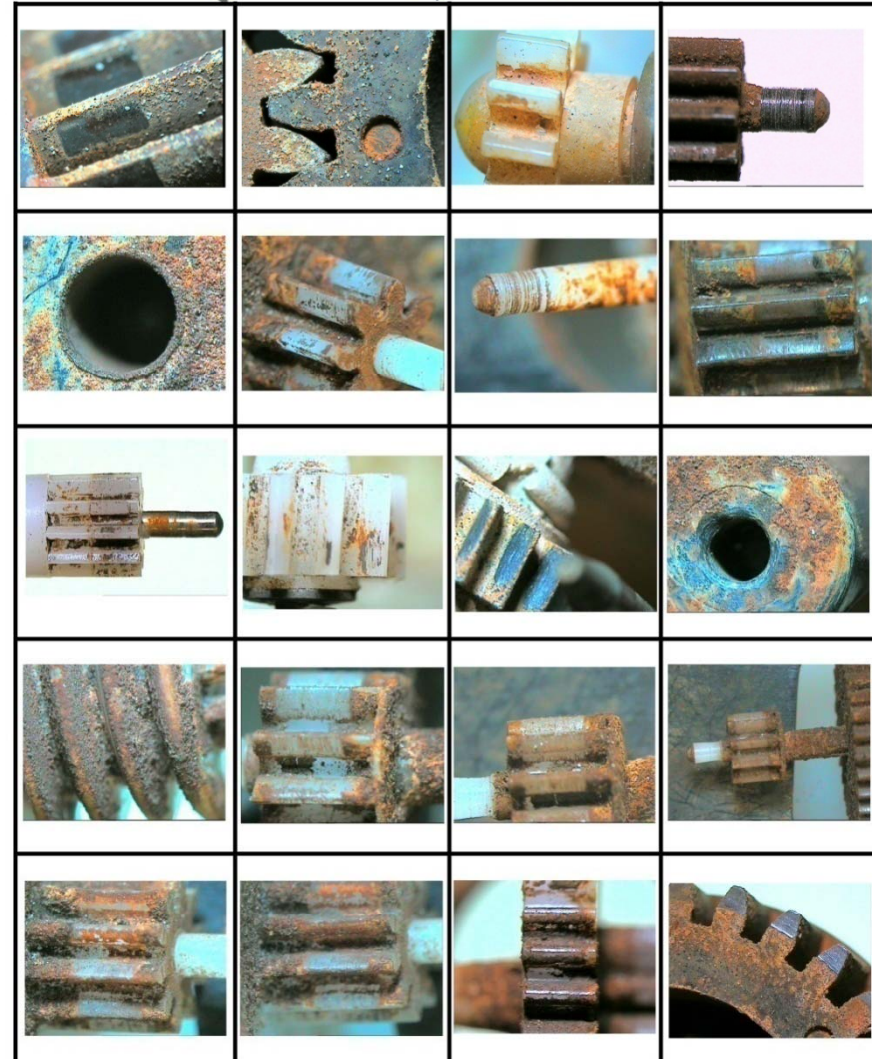
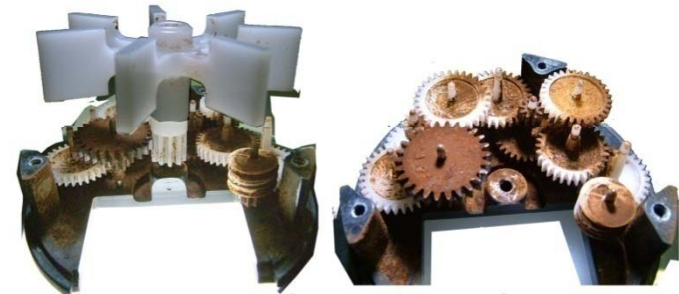
WET DIAL



Water flow through the register unit

Advantage & Disadvantage Of wet dial

- Low cost
- Can measure even at high flow rates and pressure conditions than the standard. But not accurate and part could easily worn out
- Easy rust and corrosive
- Not worth for maintenance



การอ่านค่ามาตรวัดน้ำ

หลักร้อยลิตร

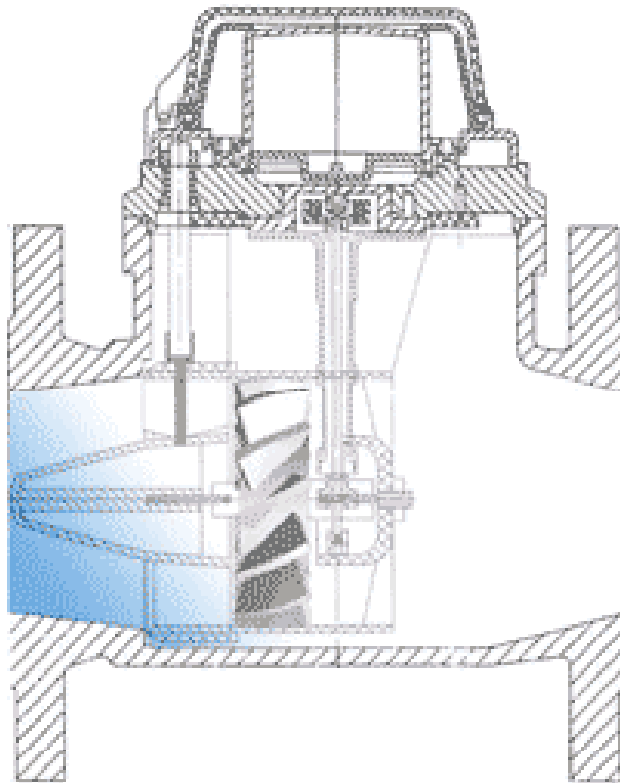
หลักสิบลิตร

หลักหน่วยลิตร

เศษส่วนของลิตร



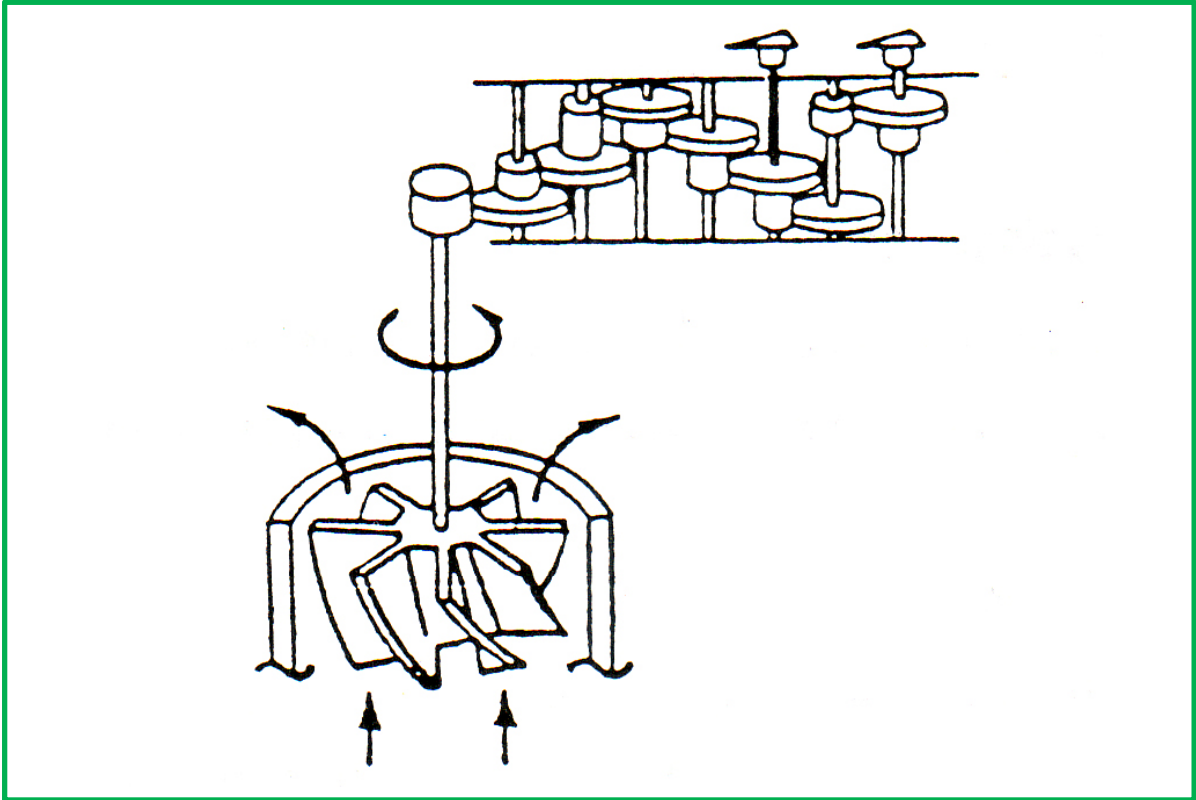
Woltman Type



Horizontal Woltman

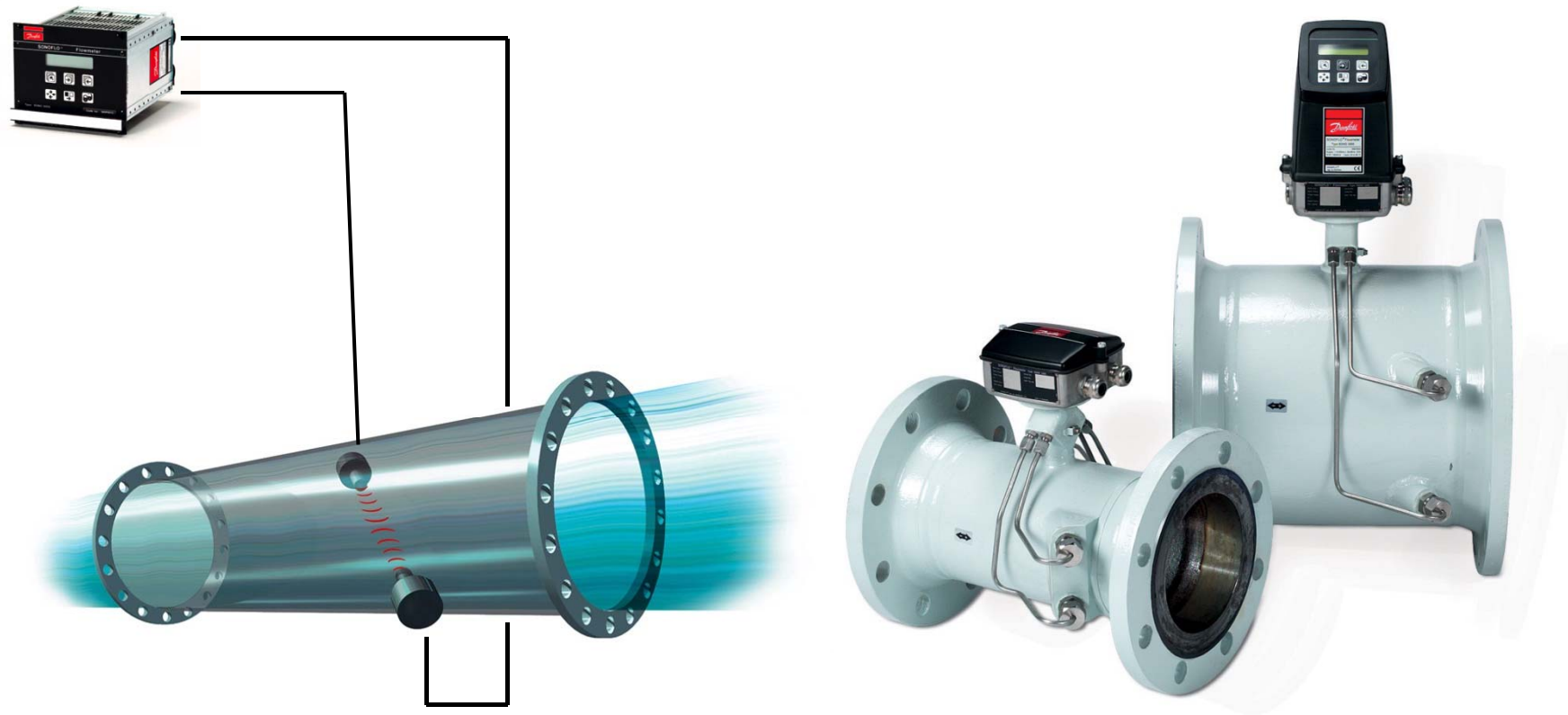


Vertical Woltman

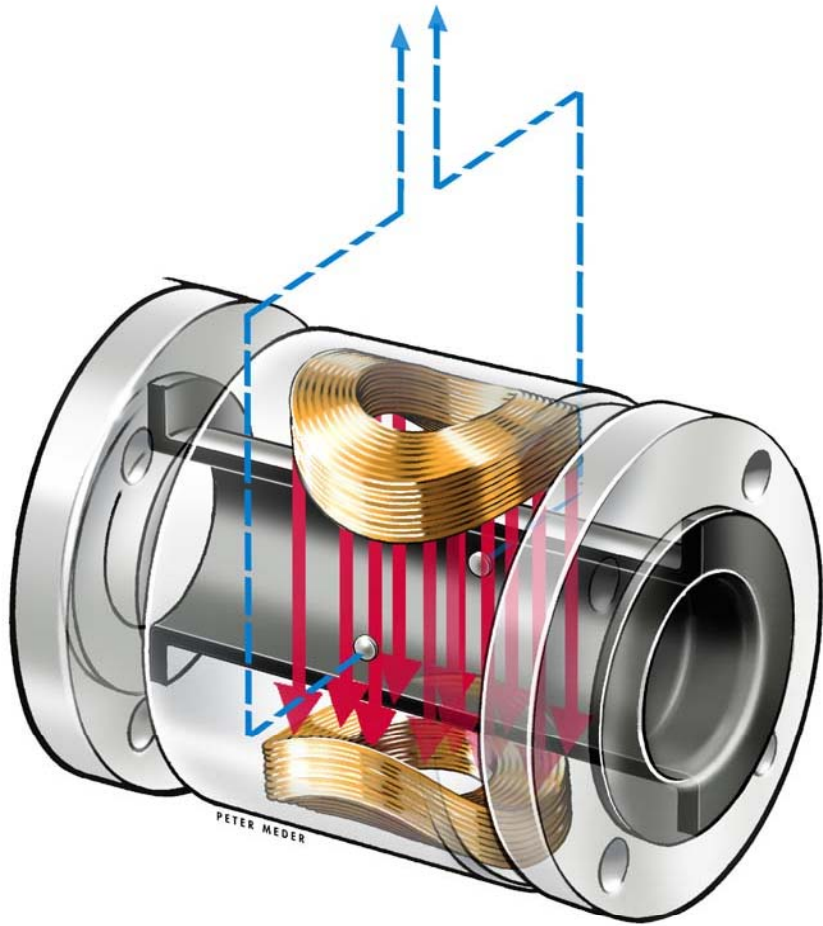


Generally starting from 2." (50 mm.) to 6" (150mm.)

Ultrasonic Flow Meters or electromeganic



มาตรวัดแบบแม่เหล็กไฟฟ้า (Electromagnetic Flow Meter)



Research & Development

A close-up photograph of a blue digital water meter. The meter has a brass fitting at the bottom. A small white label with the number '9' is attached to the blue body. The background is a dark wooden surface.

Digital Water Meter

A close-up photograph of a blue digital water meter. The meter has a brass-colored threaded fitting at the bottom. A small white label with the letter 'Q' is attached to the blue body. The meter is resting on a dark wooden surface.

Digital Water Meter

A close-up photograph of a blue digital water meter. The meter has a brass-colored threaded fitting at the bottom. A small white label with the letter 'Q' is attached to the blue body. The background is a dark, textured surface.

Digital Water Meter

Development

มาตรวัดน้ำแบบลูกสูบ
แสดงค่าเป็นระบบ Digital



Digital Water Meter

How to Select the Right water meter

The water demand and usage is different.
The type of water meter also different

It is important to know the basic usage
information

Maximum & minimum or average usage
of water used for each user or business



The Water Usage by Categories

Residential	100 – 300	Liter/head/day
Office Building	40 – 75	Liter/head/day
Hospital	600 – 1200	Liter/head/day
School	50 – 80	Liter/head/day
Hotel	200 – 400	Liter/head/day
Hostel	200 – 300	Liter/head/day
Laundry	20 – 40	Liter/head/day
Airport	15 – 25	Liter/head/day

The use of water meter to match with the water consumption

Size	Range of the Water Usage		Remark
Inch (mm)	Normal Flow (CUM / Hr)	Maximum Flow (CUM/Hr)	
1/2 (15)	1.5	3	Equipments Pipe Size Sanitation Kitchen & etc Should also be Considered
3/4 (20)	2.5	5	
1 (25)	3.5	7	
1 1/2 (40)	10	20	
2 (50)	15	30	
3 (80)	40	80	
4 (100)	60	120	
6 (150)	150	300	
8 (200)	250	500	
10 (250)	400	800	
12 (300)	600	1,200	



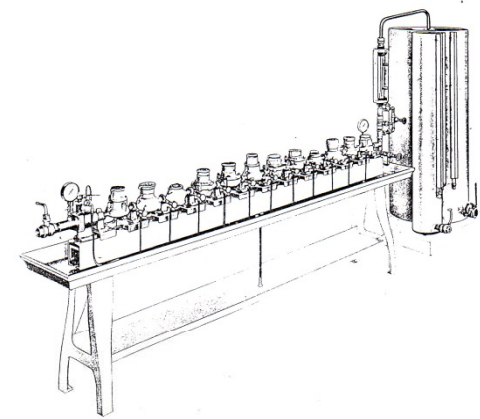
**Select
Too Small
Water Meter**

- Easily worn out**
- Inaccuracy**
- Pressure lost**

**Select
Too Big**

- Inaccuracy**
- High cost**

Accuracy



Standard

Usually, water meter inspect and monitoring by waterworks companies or government bodies. Regulations have been set for all the manufacturers to strictly follows

ISO 4064 standardization is recognized worldwide
TAC also follow the standard without exemption

100% accuracy or 0 tolerance were performed on all TAC water meter





**Portable
Test equipment**



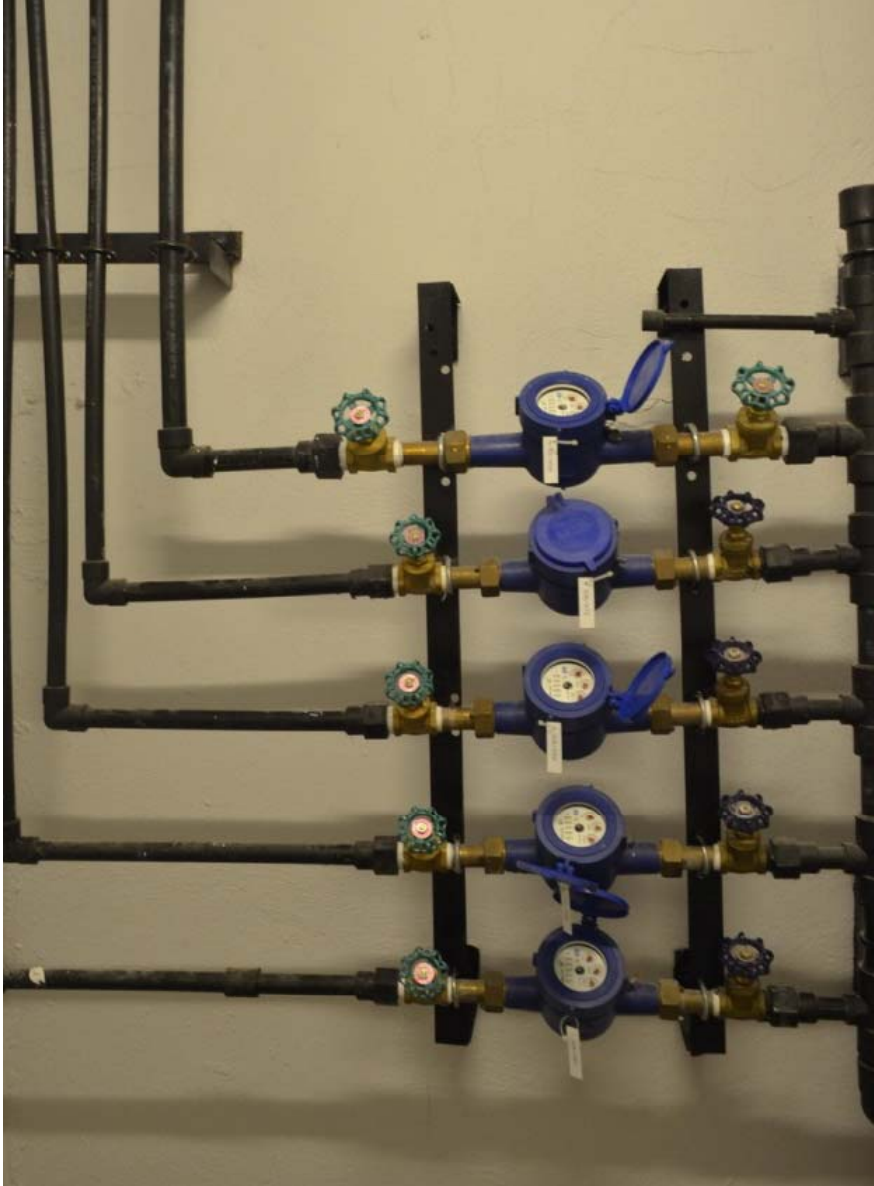
Installation of Water Meter



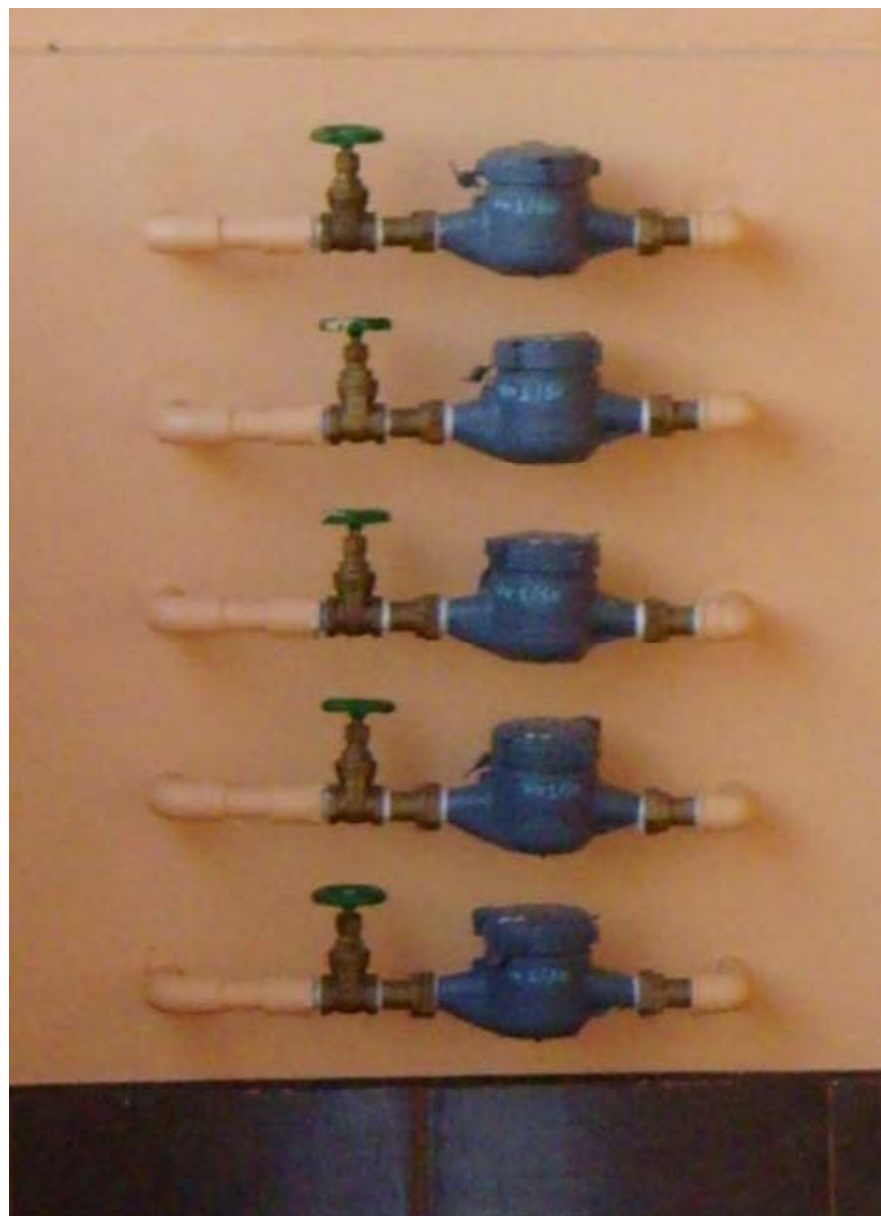
Above Ground)



Under Ground

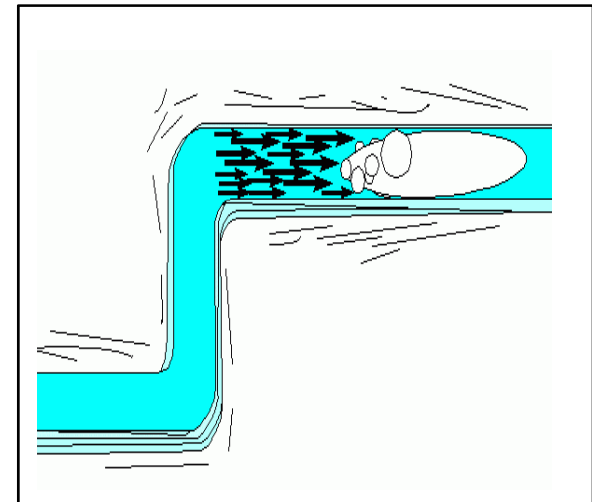
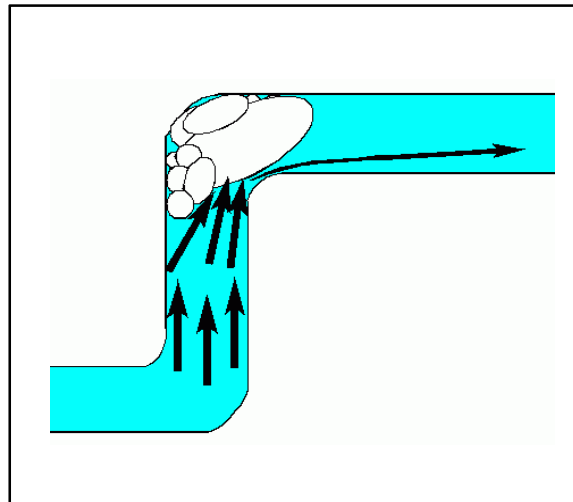
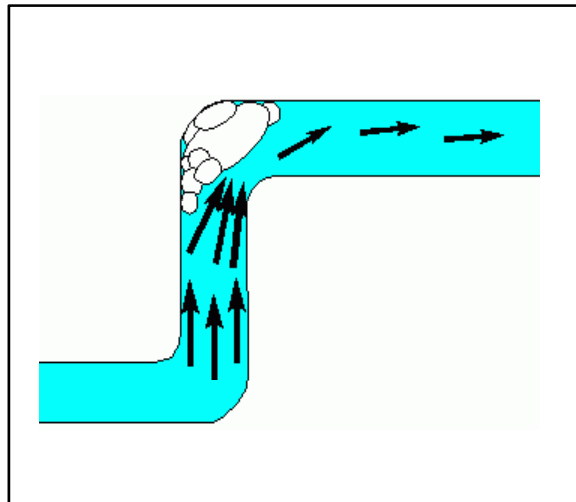


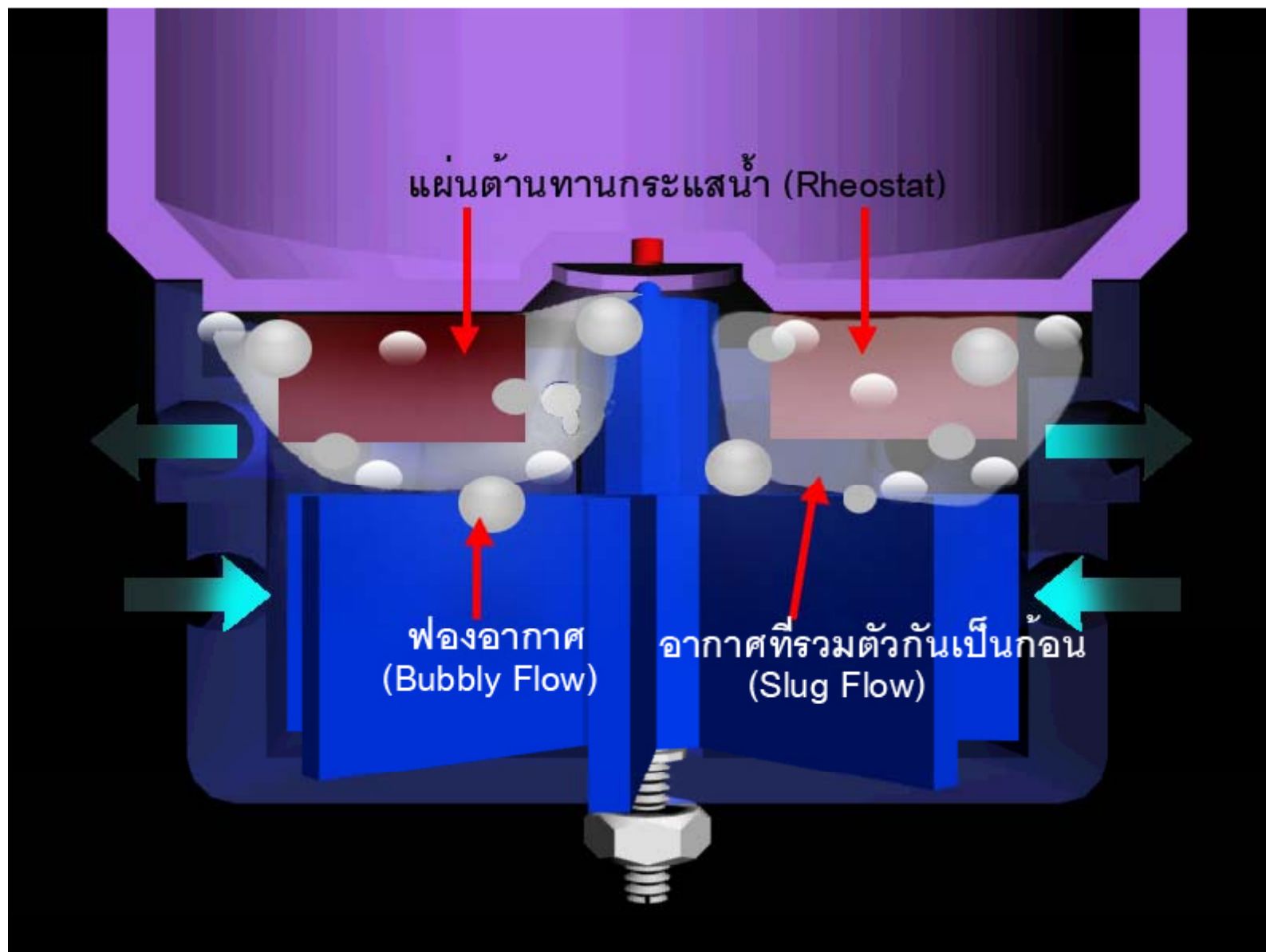
Inside Building Installation



Above Ground

The advantage is ease of maintenance and easy to read.
Air tapping bubbles may occurs





Under Ground

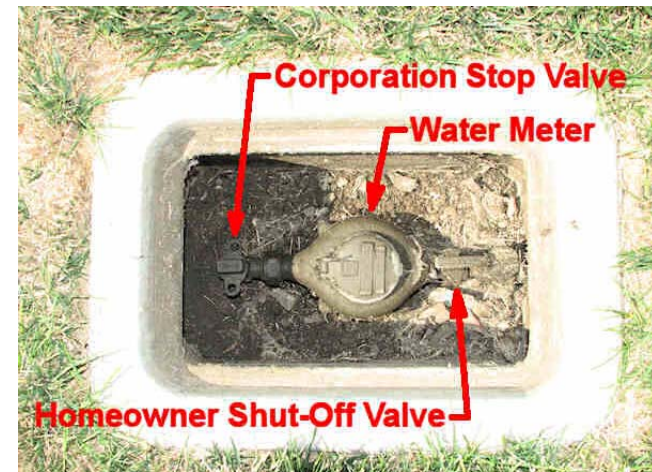
In many countries it is installed below the floor level In this case meter box is required

Advantage-Reduces air tapping bubbles

Disadvantage-High cost, difficult for maintenance



Meter box



Working Temp 50°C



Location of the water meter

Located in an easily accessible area.

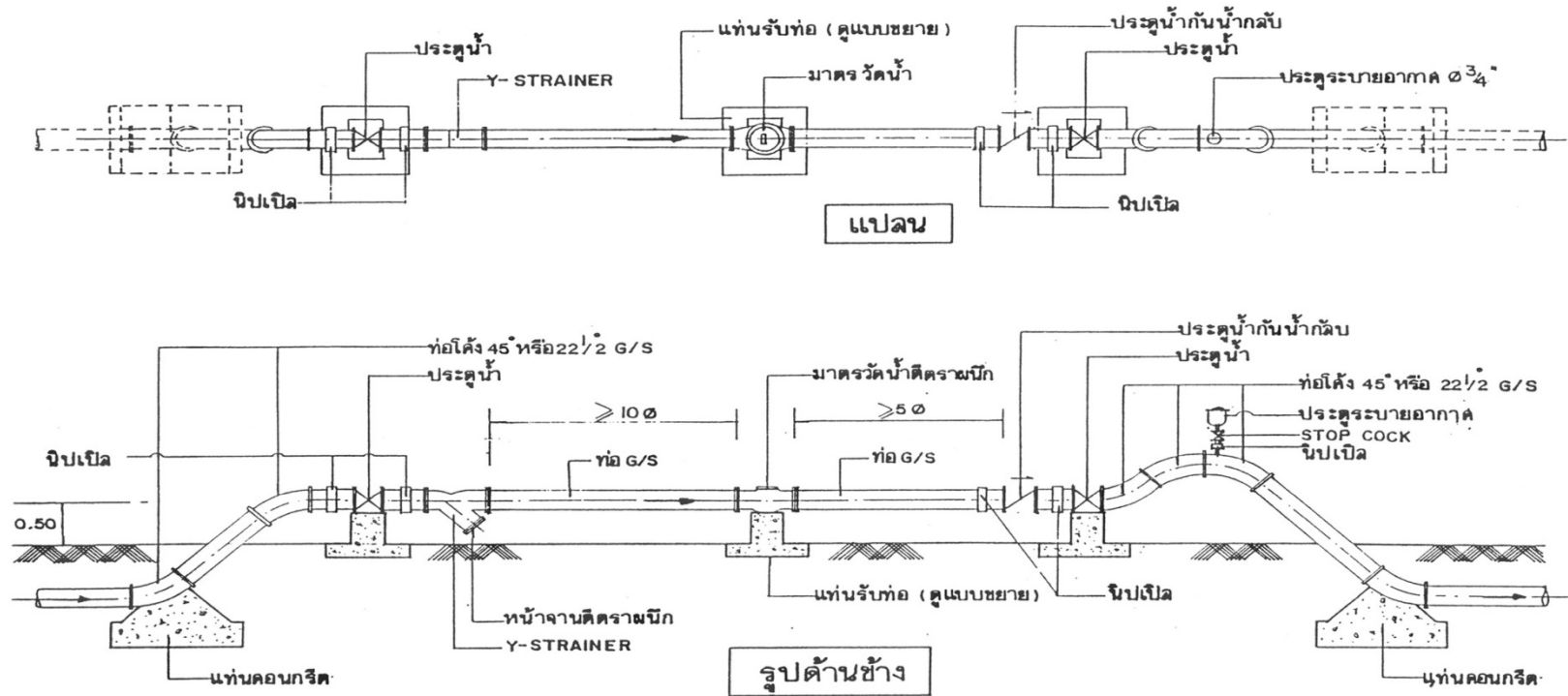
Easy to read

Easy maintenance

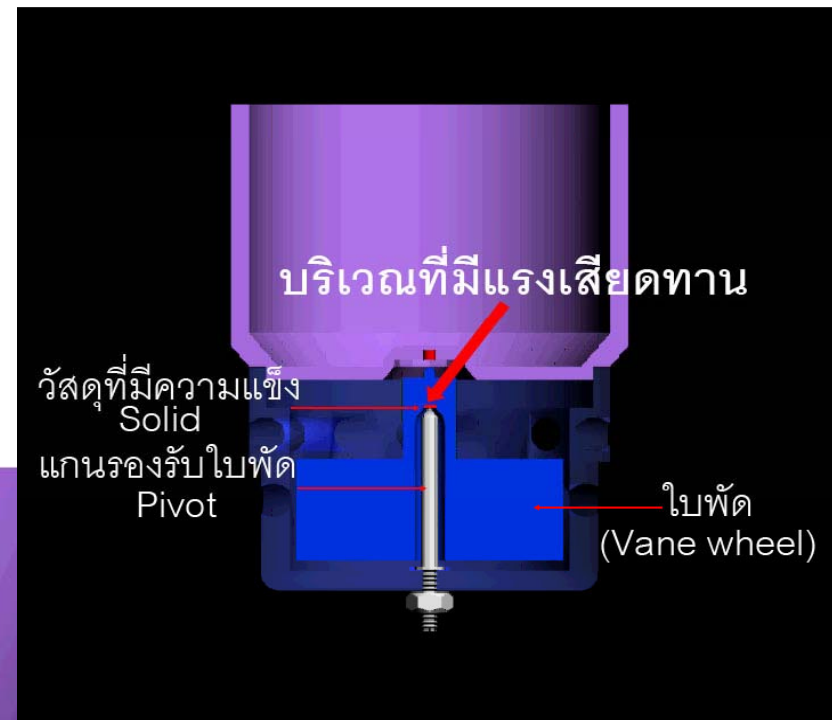
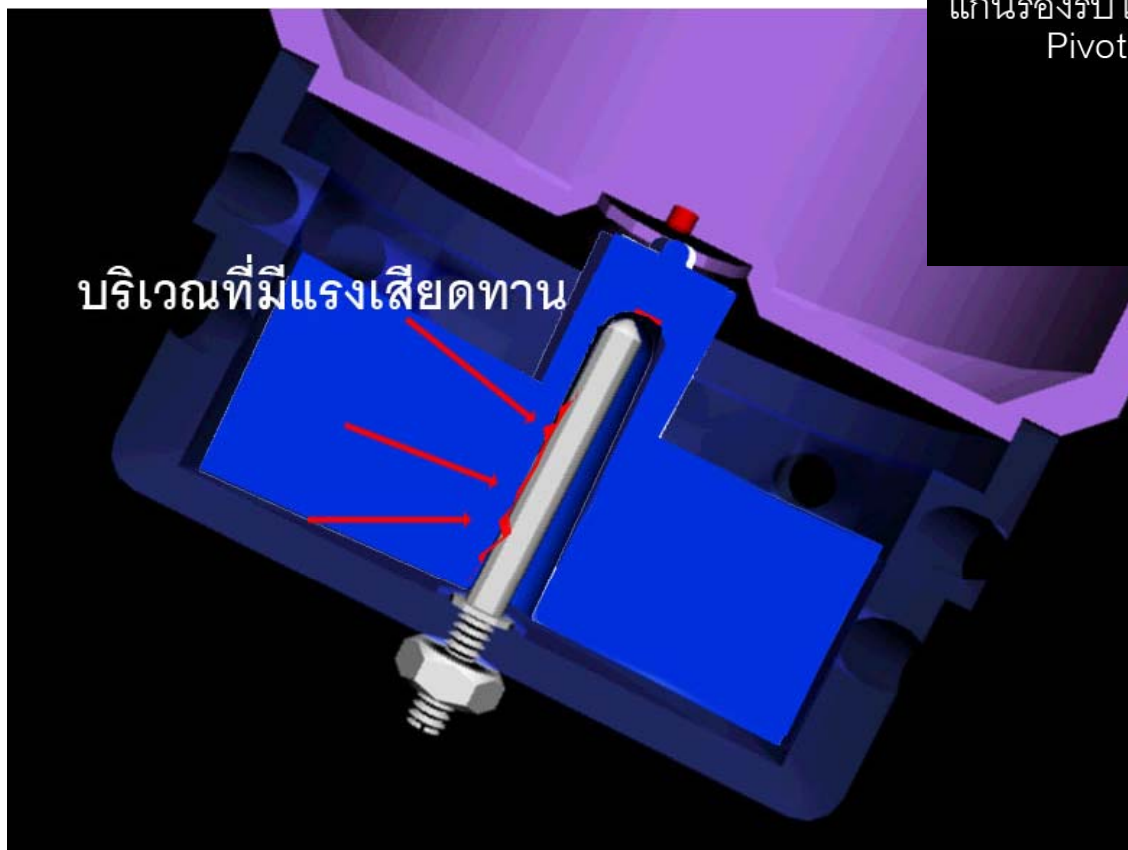


เพื่อป้องกันปัญหาที่เกิดจากกระแสน้ำผันผวน

แบบมาตรฐานการติดตั้งมาตรวัดน้ำ สำหรับท่อบริการ ขนาด 50 – 80 มม.



Should be installed horizontally
Do not incline



Alignment

Avoid Dirt Water



What cause Water Meter Has Short Life Span

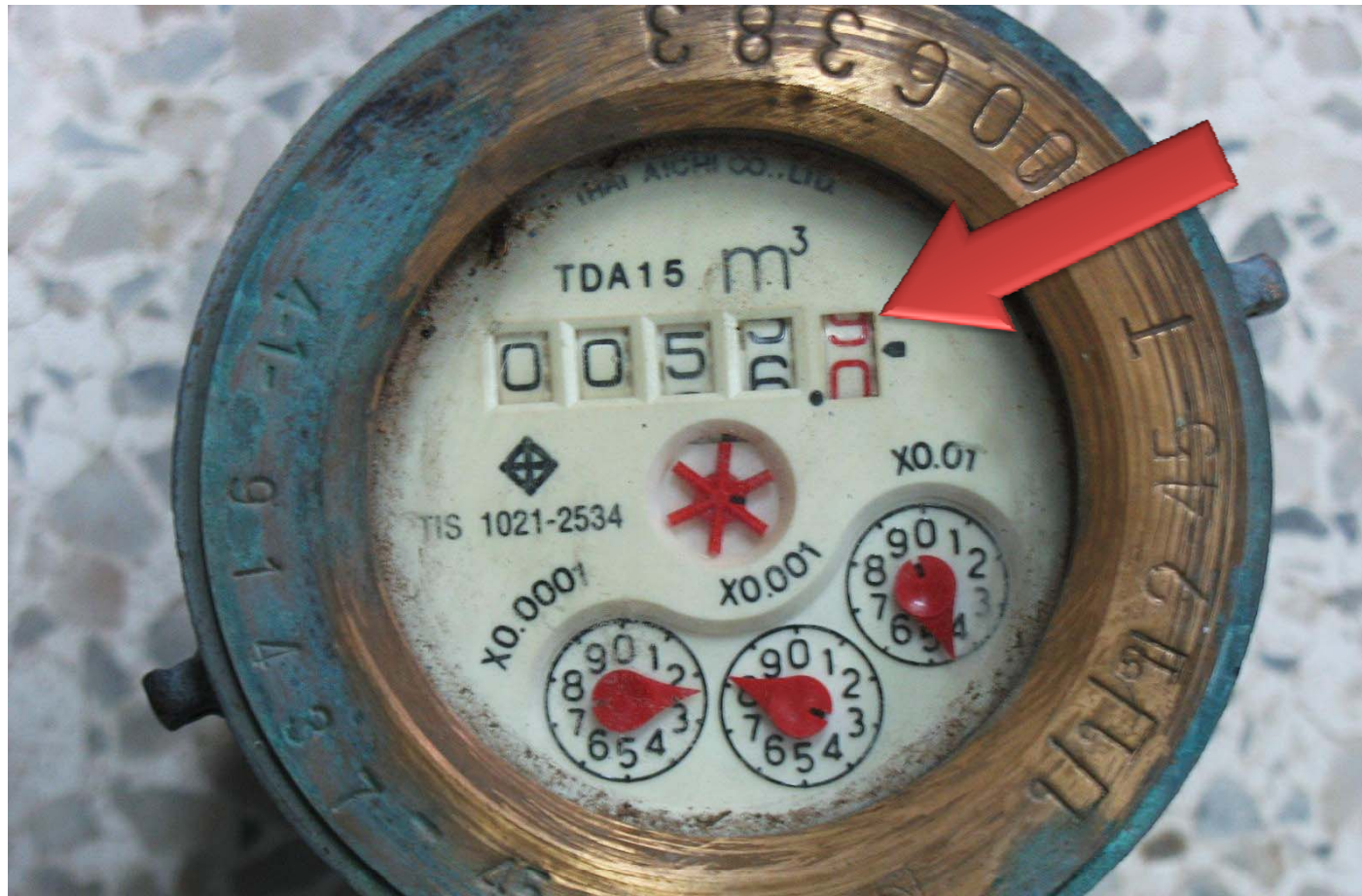
Lack of schedule maintenance



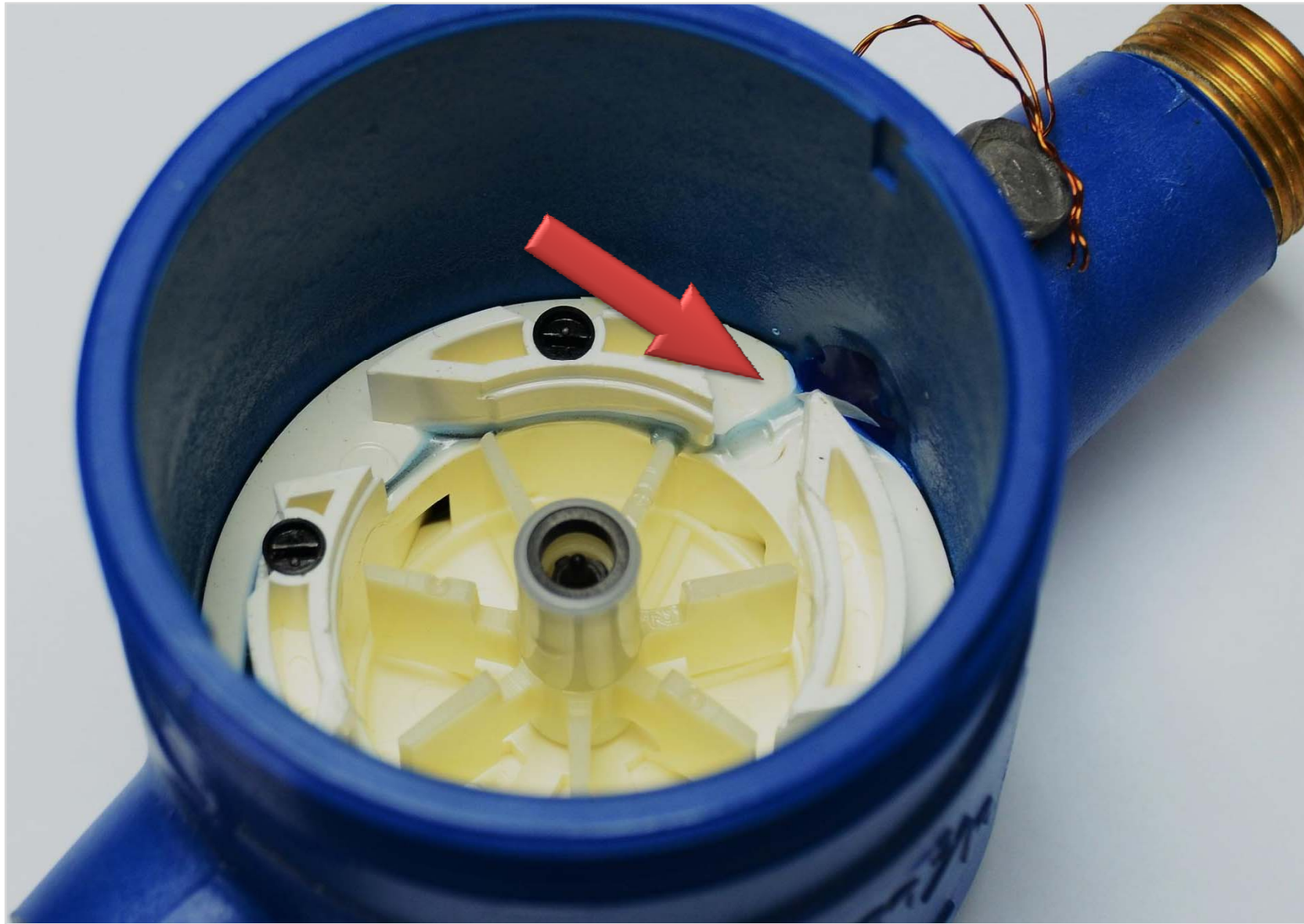




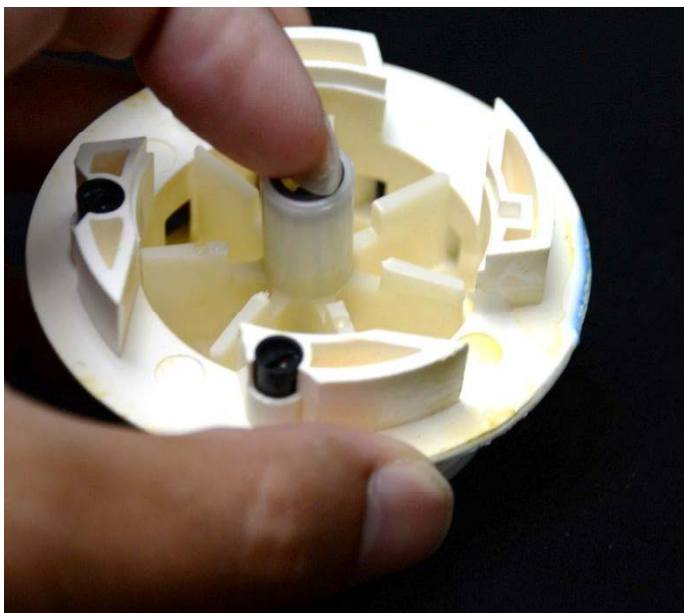


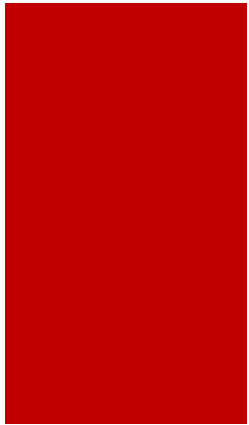


Number Gear Stop movement due to dirt stuck



Adhesive from PVC Pipe flow into the chamber





Modification by means of fraud



Quality of the water









Expired



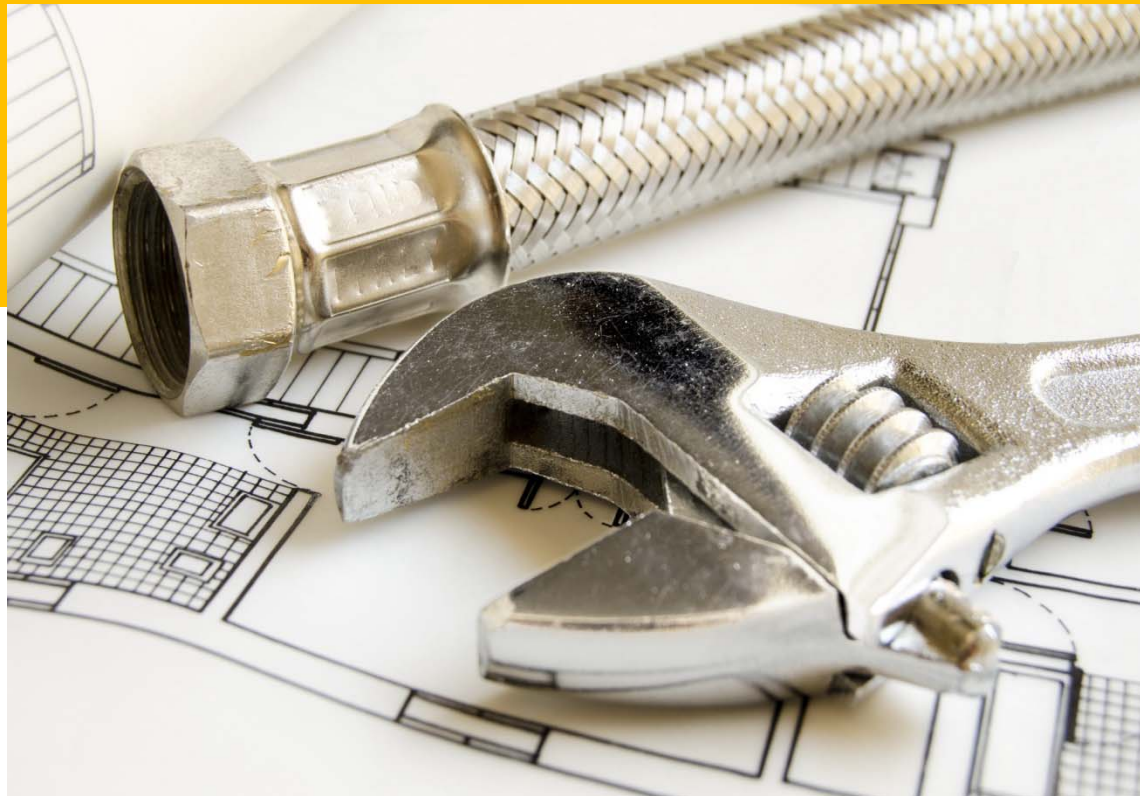


Damaged Seal

Theft



Maintenance



The maintenance schedule should be set Every 4 years

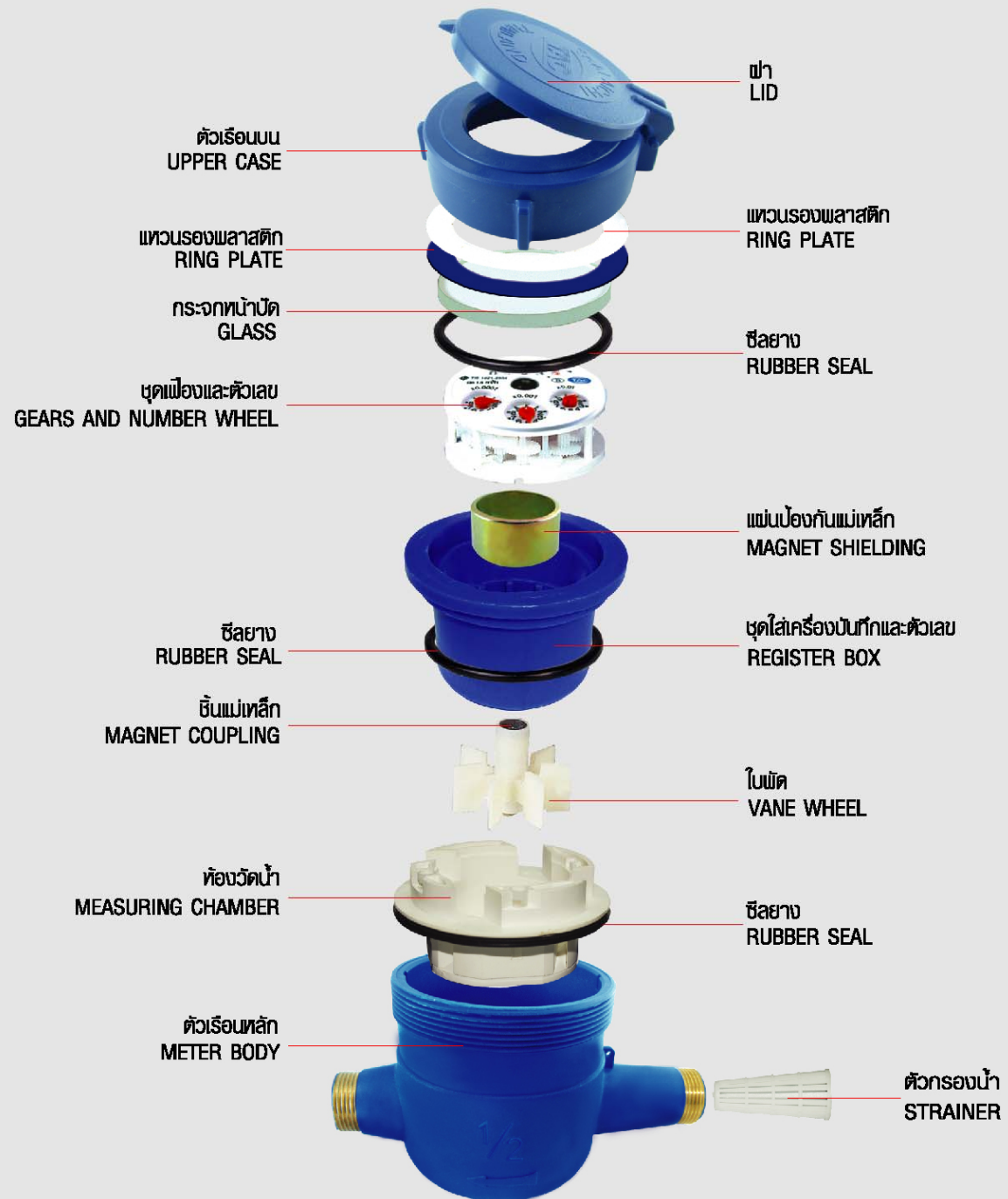
To Do Maintenance

1. Disassembled for cleaning of every parts and assemble all pieces into places.
2. Leakage test for and accuracy test to perform according to standard
3. Maintenance records

Disassemble



ส่วนประกอบมาตรวัดน้ำ
Model : MBA-p



Cleaning



Rust Remover





Testing of Water Meter

- Test pressure Water meter must withstand pressure 17.2 bar at least one minute without leakage.
- Test pressure loss maximum flow rate of up to 1 bar.
- The accuracy test The volume of water measured for Each of the flow rate will not exceed tolerances.
+5 percent for the low side and no more than +2 percent the high side



ISO 4064 : 2005 Standardization

$R = 100$ is the ratio of
Normal flow rates (Q_3) the minimum flow rate (Q_1).

$$R = \frac{Q_3}{Q_1} = 100$$

$$Q_1 = Q_{\min} \qquad \frac{Q_4}{Q_3} = 1.25$$

$$Q_2 = Q_t \qquad \frac{Q_2}{Q_1} = 1.6$$

$$Q_3 = Q_n$$

$$Q_4 = Q_{\max}$$

แบบ **R100** จะทำให้สามารถวัดประสิทธิภาพของมาตรวัดน้ำ
ในช่วงของอัตราการไหลที่กว้างขึ้น

Specification for cold water meter
(R100) No. WM.013/0 MWA.

Size mm. (inch)	Q3 (m ³ /hr.)
15 (1/2)	2.5
20 (3/4)	4.0
25 (1)	6.3

เปรียบเทียบขนาด 15 mm.

Qmax	Q4	Qu	Q3	Qt	Q2	Qmin	Q1
3.0	3.125	1.5	2.5	0.12	0.04	0.03	0.025

สรุป ช่วง High Flow จะสูงขึ้น ช่วง Low Flow จะต่ำลง ทำให้ช่วงกว้างขึ้น แต่ค่า % Error เท่าเดิม