

# Demand Driven Distribution

The reliable solution for reduced leakage and lower energy costs



## Grundfos iSOLUTIONS



Pump



Cloud



Services



[grundfos.com](https://www.grundfos.com)

**GRUNDFOS** 

Possibility in every drop



# Drive Down Water Loss

The key issue of reducing and controlling non-revenue water (NRW) in distribution networks has many facets with no single cure. Central to a typical strategy is to minimize losses through existing leaks and reduce the risk of new leaks. Pressure management is now well recognized as being essential to effective leakage management. In addition to pressure management, the International Water Association (IWA) also recommends active leak control, speed and quality of repairs, and infrastructure management. Grundfos' contributions lie within pressure management and infrastructure management, as presented in the following pages. We have developed systems to support pressure management systems, which are integrated into our pumping solutions.

## Cut Water Leakage By 15% In Average

With unique pressure control, the Grundfos DDD multi-pump controller automatically reduces surplus pressure in the water mains. Both leakage losses and energy costs are reduced significantly as a result.

## Start With The Pump First

When you start replacing pipes, you also reduce water loss and friction loss, resulting in increased pressure in other parts of the network. It is important to manage pressure from the pump. Before digging up the streets to repair leaks, ensure you have the proper pumps and controllers first. If you have variable flow, analyzing patterns will reveal the potential benefits of optimizing your pump systems.

In 2018, Non-Revenue Water (NRW) was estimated at 126 billion cubic meters globally, equivalent to an economic value of more than

**\$39 billion per year\***










Pressure Management: Reduction Of Excess Average And Maximum Pressure								
Observation Benefits			Water Utility Benefits			Customer Benefits		
Reduced Flow Rates			Reduced Frequency Of Bursts And Leaks					
Reduced excess or unwanted consumption	Reduced flow rates of leaks and bursts	Reduced and more efficient use of energy	Reduced repair and reinstatement costs, mains & services	Reduced leakage cost and reduced bad publicity	Deferred renewals and extended asset life	Reduced cost of active leakage control	Fewer customer complaints	Fewer problems on customer plumbing & appliances
								

Figure 1: Multiple benefits of pressure management

# What Is Your Issue?

The operation of pumping stations and water networks is both interesting and challenging at the same time. Some issues and the consequences you meet as a Water Networks Professional are listed below. Luckily, sometimes the toughest problem can be solved with a simple solution - such as pressure management and/or clever design.

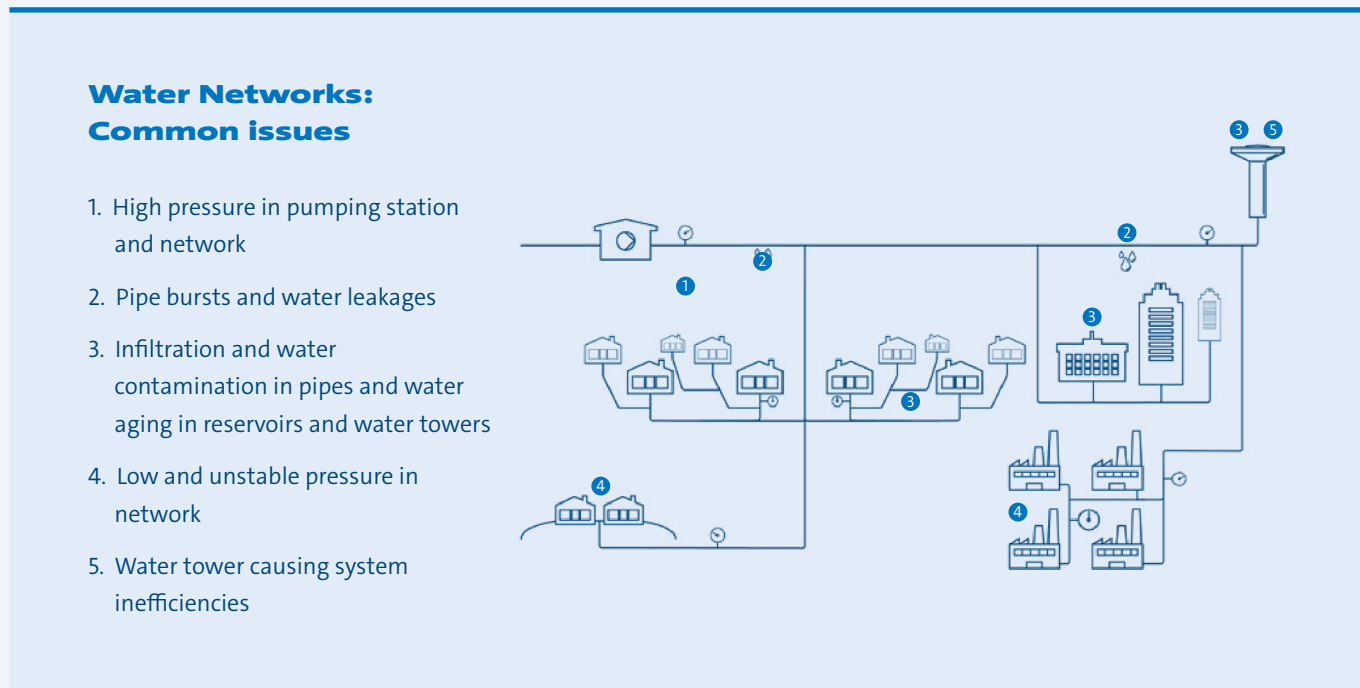


Figure 2

## Which of these issues do you recognize in your Water Network?

Issues	Consequences
1. High pressure in pumping station and network	<ul style="list-style-type: none"> <li>• Too high energy consumption</li> <li>• Too high leakage level</li> <li>• Too many pipe bursts</li> <li>• Too high service &amp; maintenance costs on pumps and pipes</li> </ul>
2. Pipe bursts and water leakages	<ul style="list-style-type: none"> <li>• Too high non-revenue water level*</li> <li>• Too high service &amp; maintenance costs on pipes</li> </ul>
3. Infiltration and water contamination in pipes and water aging in reservoirs and water towers	<ul style="list-style-type: none"> <li>• Higher health risks</li> <li>• Risk of bad publicity</li> <li>• Risk of fines</li> </ul>
4. Low and unstable pressure in network	<ul style="list-style-type: none"> <li>• Increasing number of customer complaints</li> <li>• Too high pumping pressure to compensate for low demand periods</li> </ul>
5. Water tower causing system inefficiencies	<ul style="list-style-type: none"> <li>• Too high energy consumption</li> <li>• Too high leakage level</li> <li>• Higher health risks</li> <li>• Risk of bad publicity and fines</li> </ul>

\*According to IWA, 80% of non-revenue water is caused by leakage & bursts

Figure 3

# Take Control Over Network Pressure With Demand Driven Distribution

Taking control of pressure equals control of your water distribution system – this is the key to learning from Pressure Management. Grundfos has developed DDD for pressure management in different types of water distribution networks, such as single pumping station network, with or without water tower as a part of the design. It is estimated that the current solution fits between 40% to 90% of all water network pumping stations, depending on local standards/traditions for design. DDD is constantly developing and strives to cover as many different network designs as possible. DDD is self-learning and self-tuning, and individual customization to each project is kept to a bare minimum. DDD is Plug & Play in its purest form. The different DDD solutions are described on the following pages.

The Grundfos Demand Driven Distribution solution ensures complete, instant control and unbeatable efficiency while reducing leakage loss, energy costs, and maintenance work.





# DDD1 Pressure Management Single Pumping Station Network

## The Solution

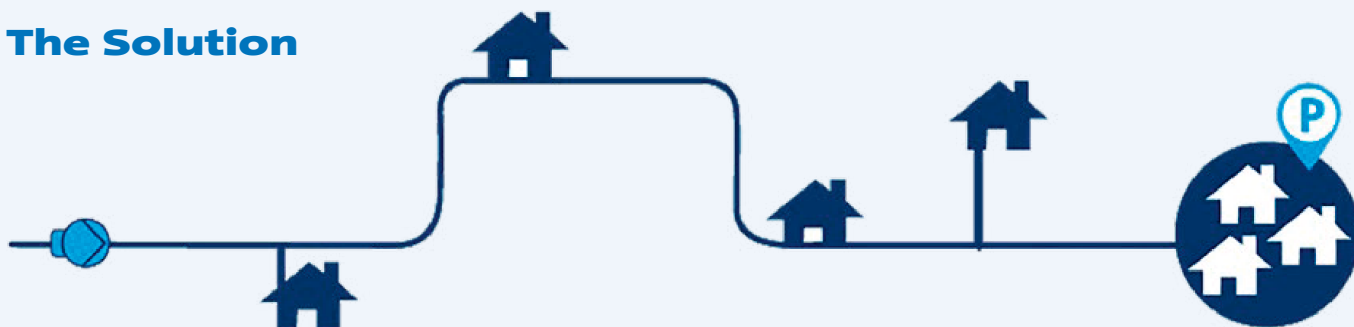


Figure 4

Demand Driven Distribution measures the pressure in the network using several battery-driven data loggers that transmit the measured and logged values to the Demand Driven Distribution pump controller. The data is used in a smart adaptive control approach that controls the pumping station, stabilizing the pressure in the network at the desired level without compromising end-user comfort.

## +100 DDD Case studies: Results achieved

Average results/savings achieved in +100 DDD projects all over the world are:



**15%**  
Leakage  
savings



**25%**  
Energy  
savings



**35%**  
Reduction in  
pipe burst



Figure 5

# DDD2 Water Tower Filling Single Pumping Station Network

## The Solution

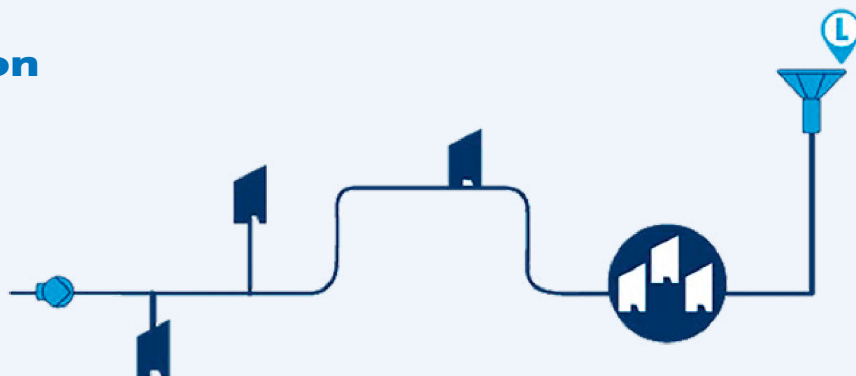


Figure 6

Most water towers are filled using an on/off pumping strategy, which can eventually cause water hammer and increase the risk of pipe burst and infiltration. Likewise, an on/off pumping strategy will lead to fluctuation pressure conditions in the network, which can be considered unsatisfying for the consumer. Grundfos DDD for water tower applications is designed to “level out” pump operation and tank filling as much as possible – without compromising the ability to secure a sufficient water supply. DDD Controller highly efficient pumps, frequency drives, and online level sensors are cornerstones in the infrastructure.

## The Benefits



**Reduce Energy consumption**  
(13%)



**Increase comfort**  
(Constant pressure in the city)



**Reduce Service & Maintenance**  
(Less burst, Less water hammer)



**Increase the life time**  
of the pipes and the pumps  
(Less inrush current)



**Easier to get control**  
over water age in the water tank

Figure 7

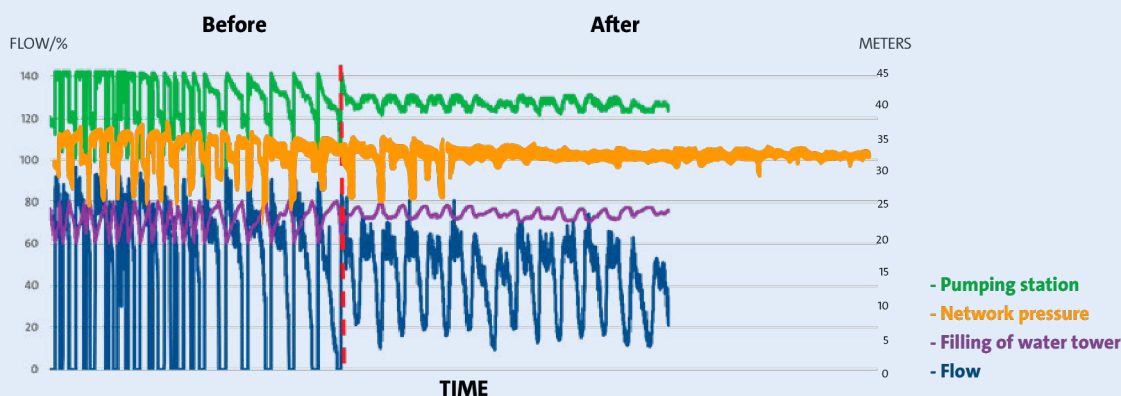


Figure 8

**Grundfos**  
856 Koomey Rd  
Brookshire, TX 77423  
[www.grundfos.com](http://www.grundfos.com)

