Products & Solutions of Water Intake, Treatment & Distribution

be
think
innovate

GRUNDFOS

Largest

Pump manufacturer in the world

75

Years old (founded in 1945)

83

Companies across the world

>17

Million units produced every year

+19,000

Employees worldwide

27.5

Turnover (billion DKK) in 2019
(USD 4.16 billion)

(1)

Owner

be
think
innovate

GRUNDFOS

BUILDINGS

Family Homes

Commercial Buildings

HVAC OEM

District Energy

INDUSTRY

Industrial Processes

Industrial Utilities

System Builders and OEMs

WATER

Water Utility

Water Treatment Solutions

Developing World Solutions

Irrigation and Agriculture

SERVICE

Circle of Trust

Service Portfolios

Encyclopedia

Service Centres

ABOUT GRUNDFOS INDIA

The Grundfos Company: **Grundfos Pumps India Pvt Ltd**

Company Incorporated: **13th March 1998**

Grundfos employees: **400 +**

Production Plants: **Chennai (10,125 Sq. Mtrs)**
Ahmedabad (3,750 Sq. Mtrs)

Sales Responsibility: **India, Bangladesh, Bhutan, Maldives and Nepal**

Solutions offered as per the Water Cycle

Water Intake

Water Treatment

Water Distribution

Waste Water Transport &
Flood Control

Waste Water Treatment

Solutions offered as per the Water Cycle

Water Intake

Water

SP A, SP, SP-G

4", 6", 8", 10" & 12" submersible pumps

TECHNICAL DATA:

- Flow, Q: max. 470 m³/h
- Head, H: max. 670 m
- Liquid temp: 0°C to +60°C
- Installation depth: max. 600 m

APPLICATIONS:

- Groundwater supply to waterworks
- Irrigation in horticulture and agriculture
- Seawater intake
- Groundwater lowering
- Pressure boosting
- Industrial applications

FEATURES AND BENEFITS:

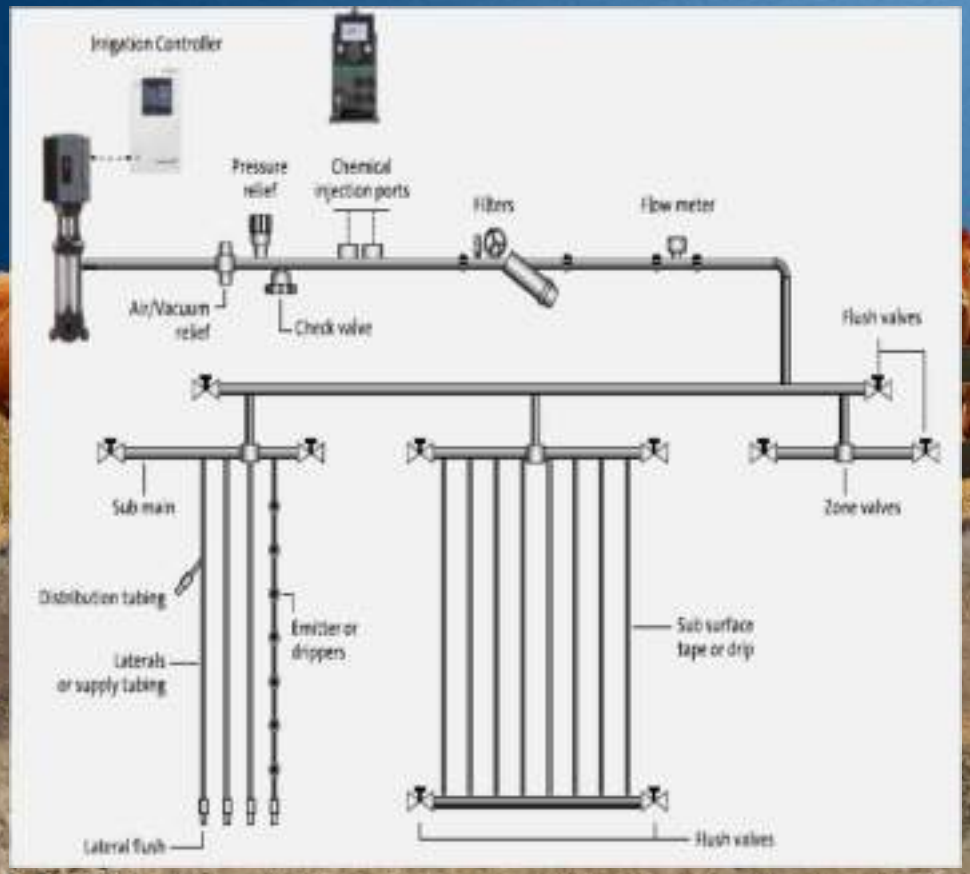
- High efficiency
- Long service life as all components are of stainless steel
- Motor protection via CUE or MP 204

OPTIONS:

- Data can be monitored and controlled via CUE, MP 204/R100

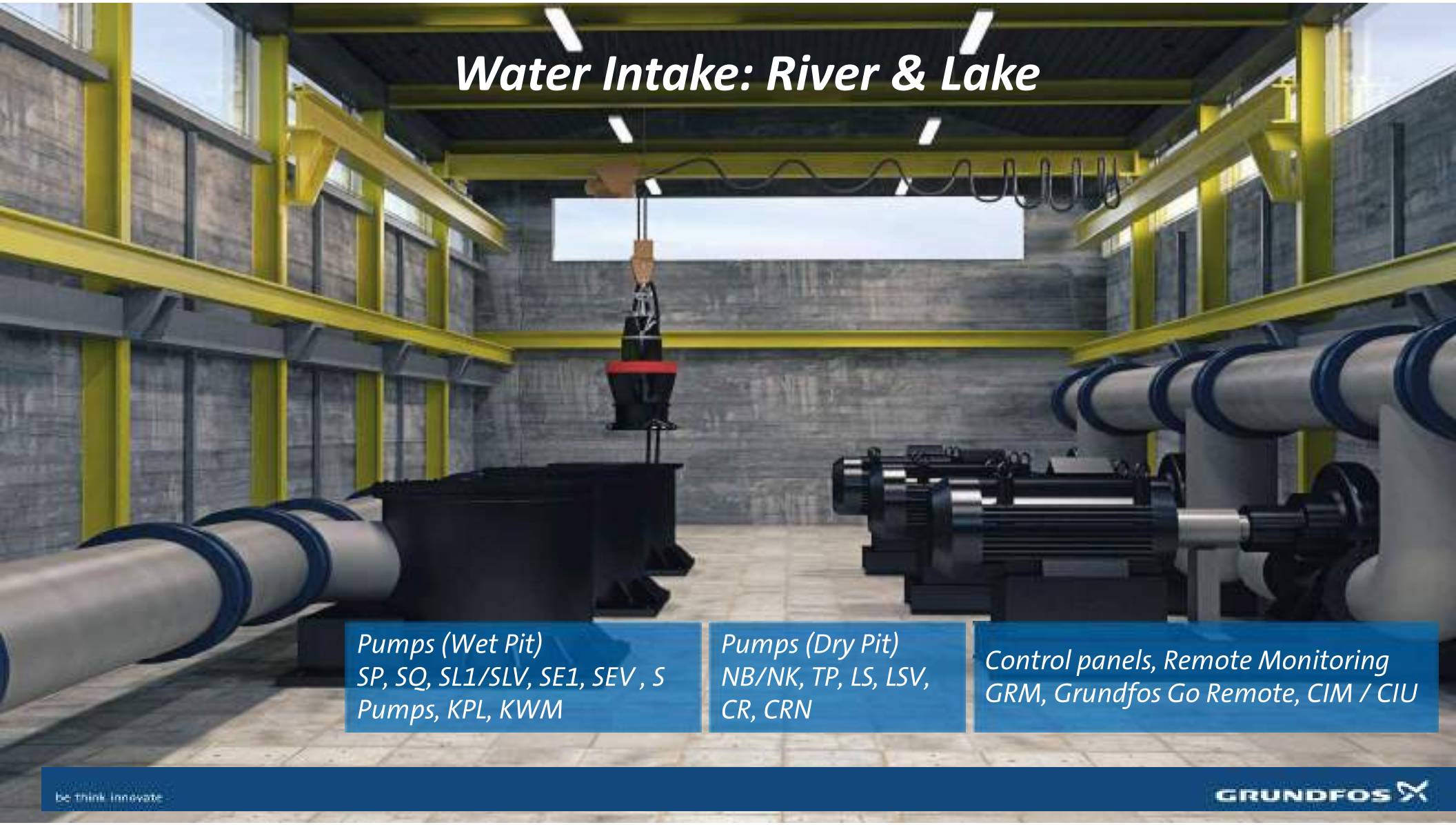
ng
/ CIU

Water Intake: Renewable Intake & Irrigation



Renewable Intake
SQ Flex & CR Flex

Water Intake: River & Lake



Pumps (Wet Pit)
SP, SQ, SL1/SLV, SE1, SEV , S Pumps, KPL, KWM

Pumps (Dry Pit)
NB/NK, TP, LS, LSV, CR, CRN

Control panels, Remote Monitoring
GRM, Grundfos Go Remote, CIM / CIU

Product overview

End Suction Pumps

Long Coupled (NK / NKG)

Range:

- Flow (Q) : Up to 1300 m3/hr
- Head (H) : Up to 160m (250m)
- Pressure : 16 Bar (25 Bar)
- Efficiency : Up to 81%
- Temp. : Up to 140degC
- Free passage : 4-36mm
- MOC : CI / Bronze / SS316 / Duplex

Features:

- Standard dimensions according to EN / ISO
- Robust design
- Back pull-out design- Easy maintenance.
- CED Coating
- Balanced impeller
- EN 12756 shaft seal. No seal cooling and maintenance
- Standard IE3 class motors- Improved overall efficiency

Application:

- Water Supply / Distribution systems
- Pressure boosting
- HVAC
- Irrigation

Close Coupled (NB / NBG)

Range:

- Flow (Q) : Up to 1300 m3/hr
- Head (H) : Up to 160m (250m)
- Pressure : 16 Bar (25 Bar)
- Efficiency : Up to 81%
- Temp. : Up to 140degC
- Free passage : 4-36mm
- MOC : CI / Bronze / SS316 / Duplex

Features:

- Same as NK and NKG
- Compact design - Very lees space
- No pump bearing- No lubrication and maintenance
- No coupling- No alignment
- Less lead time for maintenance

Application:

- Water Supply / Distribution systems
- Pressure boosting
- HVAC
- Irrigation

PACO Long Coupled (LF / LFE / CL)

Range:

- Flow (Q) : Up to 2200 m3/hr
- Head (H) : Up to 125m
- Pressure : 16 Bar (25 Bar)
- Efficiency : Up to 90%
- Temp. : Up to 105degC
- MOC : CI / DI / SS304/SS316/SS316L/ CD4MCu /Super duplex

Features:

- Tangential volute – Improved pump efficiency
- Compact design.
- Casing can be rotated.
- Double volute design - Less radial load/more bearing life.
- Francis design impeller - Improves the NPSH margin (Suction Condition)
- Performance testing - ISO 9906-2B tolerance

Application:

- Water Supply / Distribution systems
- Pressure boosting
- HVAC and Irrigation

Product overview

Split Case Pumps

Axial Split case *(LS)*

Range:

- Flow (Q) : Up to 14,000 m3/hr
- Head (H) : Up to 165m
- Pressure : 20 Bar (25 Bar)
- Efficiency : Up to 91%
- MOC : CI / DI / 2%Ni-CI / Bronze / SS304 / SS316

Features:

- Split case design – Very easy maintenance
- In-line design – Easy piping
- BB design – No shaft deflection and reduced vibration
- Double volute – Improved bearing and seal life
- Double suction – Less axial load
- Less NPSH
- Long coupled – No piping and motor disturbance
- Standard IE3 class motors- Improved overall efficiency
- Performance testing - ISO 9906-1U or 2B tolerance

Application:

- Water Supply / Distribution systems
- Surface water intake
- Water Pressure boosting

Vertical Split Case *(LSV)*

Range:

- Flow (Q) : Up to 12,000 m3/hr
- Head / Pressure / Efficiency / MOC : Same as KP

Features:

- Same as KP
- Compact design
- Very less space
- Less foundation and Civil work
- One mechanical seal – Less seal maintenance
- One Bearing housing – single lubrication sysyem

Application:

- Water Supply / Distribution systems
- Surface water intake
- Water Pressure boosting
- HVAC and Irrigation

Water Intake: Sea Water

Pumps (Duplex) & Dosing Range

Control panels, Remote Monitoring GRM, Grundfos Go Remote, CIM / CIU

-DPK Range
-DWK Range
-SEG Range
-SLV & SL1 Range
-SE & SE1 Range
-SE / SL Range with
S-Tube impeller
-S Range
-KPL & KWM
-Mixer & Flow makers
-Diffusers
-Aerojets
-Dosing & Disinfections
-Mobile pumping
station

WIDE RANGE OF PRODUCTS FOR HANDLING WASTEWATER

Solutions offered as per the Water Cycle

Water Treatment

Water Treatment: Flocculation & Aeration

Water Treatment: Chemical Treatment

Controls *Customized Panel, E-Box*	*DDA, DME, DMX*	*Dosing Tanks & Stations*

Chemical Dosing Systems

Dosing Systems - Polydos

One of Our Polydos 412A 10000 at China Factory

Project	: Field wide implementation of asp at Viraj.
Contractor	: HAL Offshore Limited, Mumbai.
End User	: ONGC Limited (onshore engineering services Delhi).
Consultant	: Petro 6 engineering & Construction Pvt Limited.
Number of Systems	: 3 No of 412 10000, 10,000 LPH Capacity.
Major Documents	: Basic Engineering Package (BEP for Approval & Manufacturing clearance).
Project Status	: System commissioned & Running Successfully

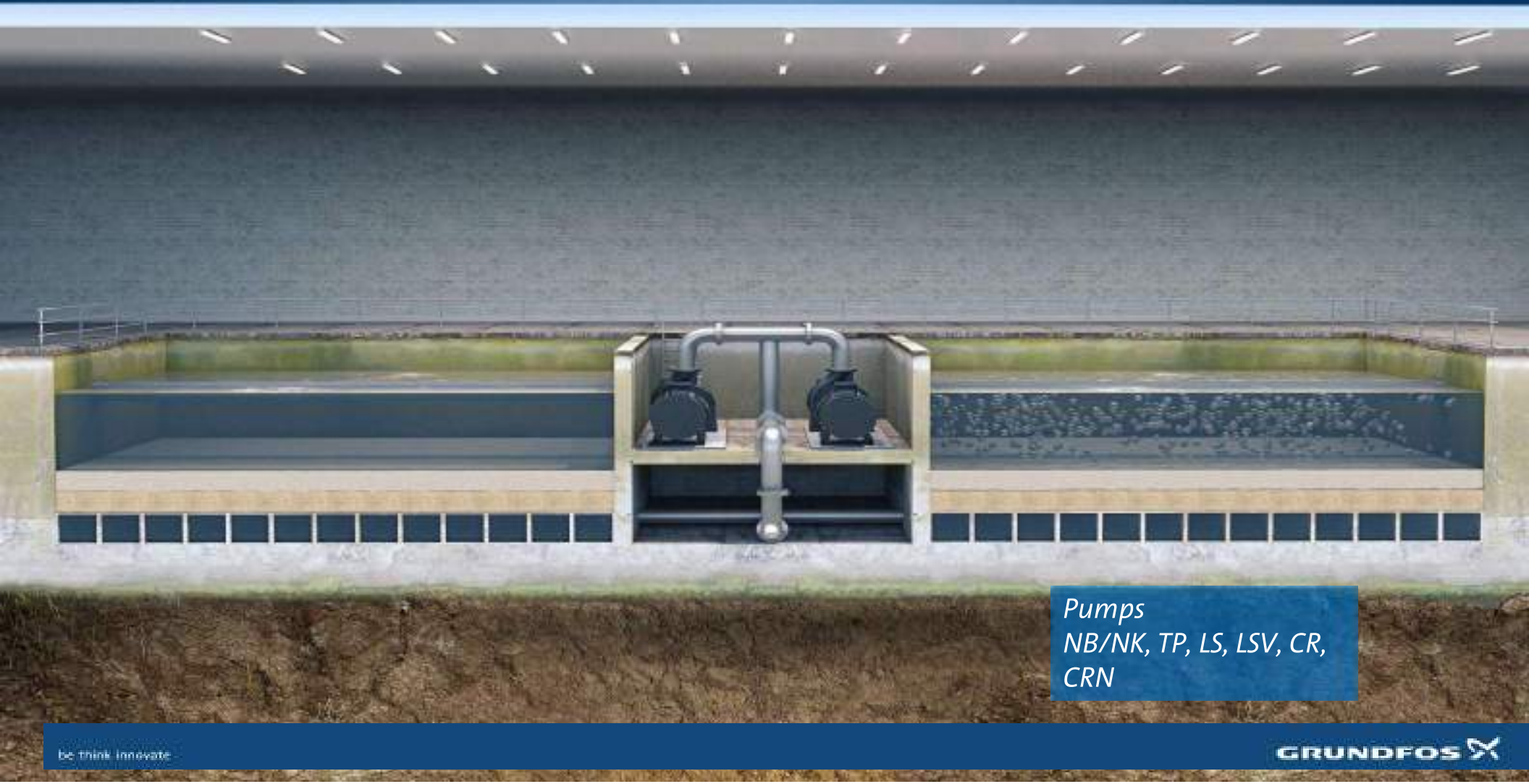
Dosing Skids / Systems

Water Treatment: Sedimentation

Pumps & Control panels
SE1/SEV, SL1/SLV

Mixers & Panels
SMG, SMD

Water Treatment: Filtration & Backwash



Pumps
NB/NK, TP, LS, LSV, CR, CRN

Water Treatment: Disinfection

Oxiperm ISIA

Solutions offered as per the Water Cycle

Water distribution

Water Distribution Systems

Project Sales – 2018

54 Nos Surface Mounted Pumps for Junjunu & Ganganagar

Products of Water Treatment & Distribution

Type of Pumps in the Project (NK Pumps)

Project	***: Jhunjhunu Water Supply & Sewerage Works***
Contractor	***: L&T***
End User	***: Rajasthan urban infrastructure development project (RUIDP)***
Consultant	***: Shah technical consultants Pvt. Ltd***
Number of Systems	***: 54 Surface Mounted NK Pumps***
Major Documents	***: Engineering Package for Approval to Consultant,***
Project Status	***: All Pumps are Supplied at Site.***

Flow analysis Patten's were performed for each pumping station (24 Iterations / Data Per day). Year's – 2016, 2031
In totality we have 48 Data Iterations (Duty conditions) for single pumping Station.

2016 – Requirement														Grundfos				
DEMAND AS PER NETWORK DESIGN						SUPPLY AS PER PUMPS								NK 65-125/132, 3W, 7.5 kW				
Hour	Peak factor	Flow Required	Actual Pump Head Required (Considering Pump house losses)	Pump Head Required at Manifold (without considering Pump house losses)	Head at Critical point	Peak factor	Frequency	Pump speed	Pump Rated speed	Pump speed in % of Rated speed	No of pump working	Pumped Flow	Pump Head Generated	Pump Efy %	Com Efy %	P1	P2	NPSHr
HH:MM		m3/hr	m	m	m		Hz	RPM	RPM	%	nos.	m3/hr	m	%	%	kW	kW	Mtrs
00:00	0.2	14.83	18.21	18.21	12.59	0.2	45.50	2657.20	2920	91.0%	1	14.80	18.21	30.9	26	2.82	2.379	1.85
01:00	0.2	14.83	18.21	18.21	12.59	0.2	45.50	2657.20	2920	91.0%	1	14.80	18.21	30.9	26	2.82	2.379	1.85
02:00	0.2	14.83	18.21	18.21	12.59	0.2	45.50	2657.20	2920	91.0%	1	14.80	18.21	30.9	26	2.82	2.379	1.85
03:00	0.2	14.83	18.21	18.21	12.59	0.2	45.50	2657.20	2920	91.0%	1	14.80	18.21	30.9	26	2.82	2.379	1.85
04:00	0.3	22.25	18.22	18.21	12.59	0.3	45.30	2645.52	2920	90.6%	1	22.30	18.22	42.0	35.8	3.1	2.6	1.9
05:00	0.4	29.66	18.23	18.21	12.59	0.4	45.35	2648.44	2920	90.7%	1	29.66	18.23	50.8	43.6	3.35	2.88	2.04
06:00	1.6	118.65	18.47	18.23	12.59	1.6	46.50	2715.60	2920	93.0%	2	119.00	18.47	71.9	62.9	9.47	8.29	2.75
07:00	2.6	192.80	18.83	18.26	12.59	2.6	50.00	2920.00	2920	100.0%	2	193.00	18.83	81.6	72	13.71	12.09	4.12
08:00	2.6	192.80	18.83	18.26	12.59	2.6	50.00	2920.00	2920	100.0%	2	193.00	18.83	81.6	72	13.71	12.09	4.12
09:00	2.2	163.14	18.66	18.24	12.59	2.2	48.50	2832.40	2920	97.0%	2	163.00	18.66	78.6	62.9	11.96	10.53	3.51
10:00	1.0	74.15	18.32	18.22	12.59	1.0	47.50	2774.00	2920	95.0%	1	74.20	18.32	77.0	67.7	5.45	4.79	3.21
11:00	0.8	59.32	18.28	18.21	12.59	0.8	46.40	2709.76	2920	92.8%	1	59.32	18.28	72.0	63.0	4.67	4.09	2.73
12:00	0.9	66.74	18.30	18.22	12.59	0.9	46.90	2738.96	2920	93.8%	1	66.80	18.3	74.8	65.7	5.05	4.43	2.96
13:00	1.0	74.15	18.32	18.22	12.59	1.0	47.50	2774.00	2920	95.0%	1	74.20	18.32	77.0	67.7	5.45	4.79	3.21
14:00	0.6	44.49	18.25	18.21	12.59	0.6	45.60	2663.04	2920	91.2%	1	44.90	18.25	64.1	55.7	3.99	3.47	2.35
15:00	0.6	44.49	18.25	18.21	12.59	0.6	45.60	2663.04	2920	91.2%	1	44.90	18.25	64.1	55.7	3.99	3.47	2.35
16:00	0.8	59.32	18.28	18.21	12.59	0.8	46.40	2709.76	2920	92.8%	1	59.32	18.28	72.0	63.0	4.67	4.09	2.73
17:00	0.8	59.32	18.28	18.21	12.59	0.8	46.40	2709.76	2920	92.8%	1	59.32	18.28	72.0	63.0	4.67	4.09	2.73
18:00	2.0	148.31	18.59	18.24	12.59	2.0	48.00	2803.20	2920	96.0%	2	148.00	18.59	76.9	67.6	11.09	9.75	3.24
19:00	2.5	185.38	18.79	18.25	12.59	2.5	50.00	2920.00	2920	100.0%	2	185.50	18.79	80.4	70.8	13.37	11.78	3.97
20:00	1.0	74.15	18.32	18.22	12.59	1.0	47.50	2774.00	2920	95.0%	1	74.20	18.32	77.0	67.7	5.45	4.79	3.21
21:00	0.7	51.91	18.26	18.21	12.59	0.7	45.90	2680.56	2920	91.8%	1	51.90	18.26	68.4	59.7	4.31	3.76	2.52
22:00	0.5	37.08	18.24	18.21	12.59	0.5	45.40	2651.36	2920	90.8%	1	37.10	18.24	58.1	50.2	3.66	3.16	2.18
23:00	0.3	22.25	18.22	18.21	12.59	0.3	45.30	2645.52	2920	90.6%	1	22.30	18.22	42.0	35.8	3.1	2.6	1.9

Water Boosting Systems


Fire exit
Demand Driven Distribution
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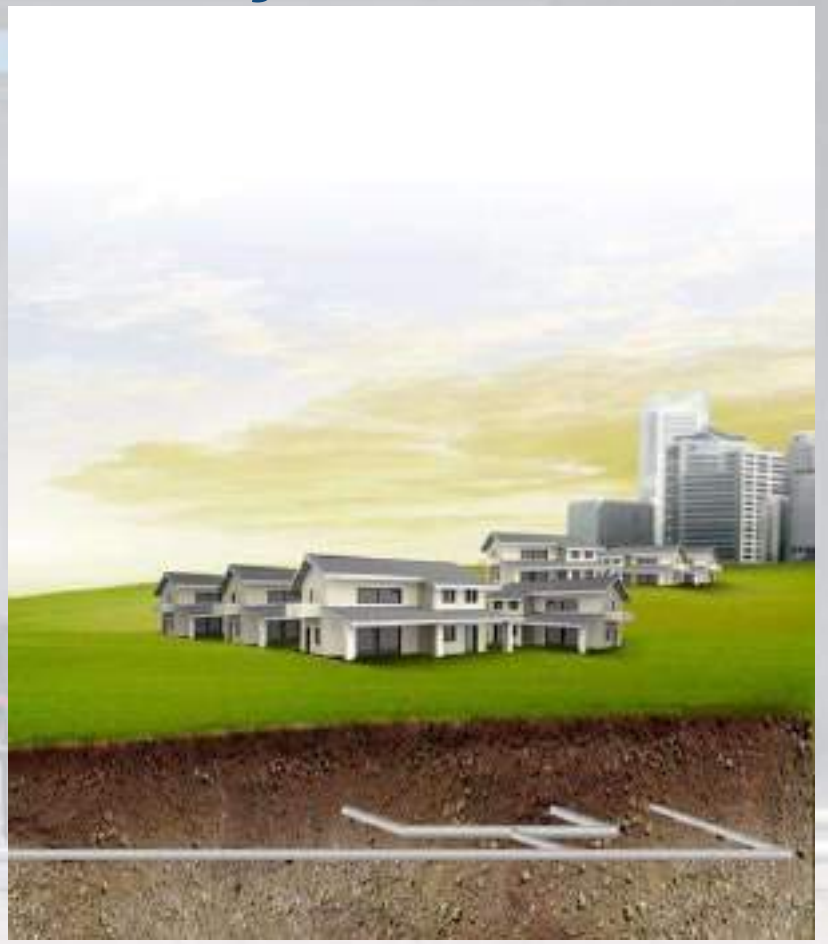
GRUNDFOS
INDFOS

Common challenges in a distribution system

- Secure a stable water supply for the end user (or critical point)
- Scarce water resources
- Pipe breaks
- Leakage
- NRW
- Operation costs



Are leakage losses really a problem?

*How much water do you think is lost **daily in the world** because of **leakages?***

***45 million cubic meters** (of drinking water)*
are lost daily through water leakage in the distribution networks

*– enough to serve nearly **200 million people***

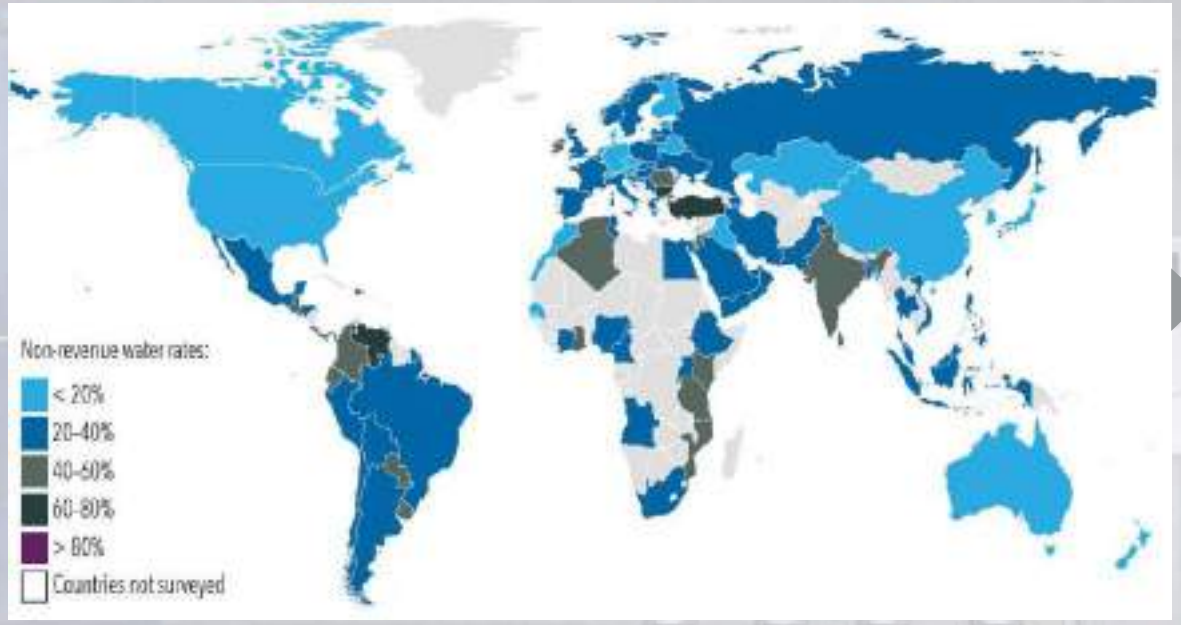
"Energibesparelse på kildepladsniveau"
DANVA - FORSKNINGS- OG UDREDNINGSPROJEKT NR. 16, 2009

Pipe bursts in relation to pressure

Operating at steady pressure in the mains, the number of new leaks (pipe bursts) compared to intermittent supply is
reduced by a factor 10 or maybe even 20 ...

"What do we know about pressure:leakage relationships?"
Lambert A., Brno, 2001. ISBN: 80-7204-197-5

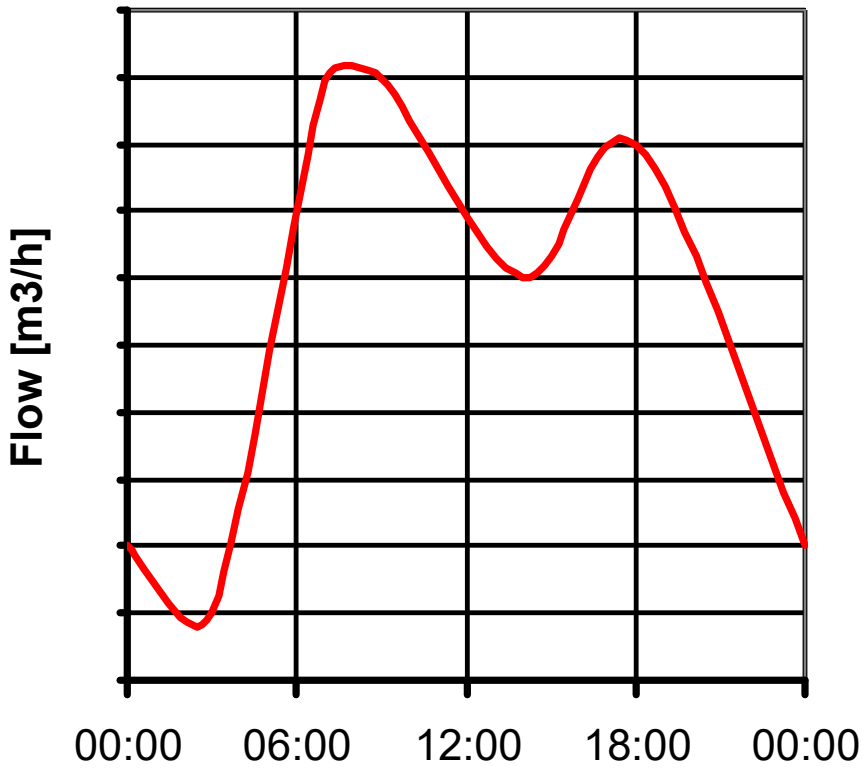
Global NRW Map



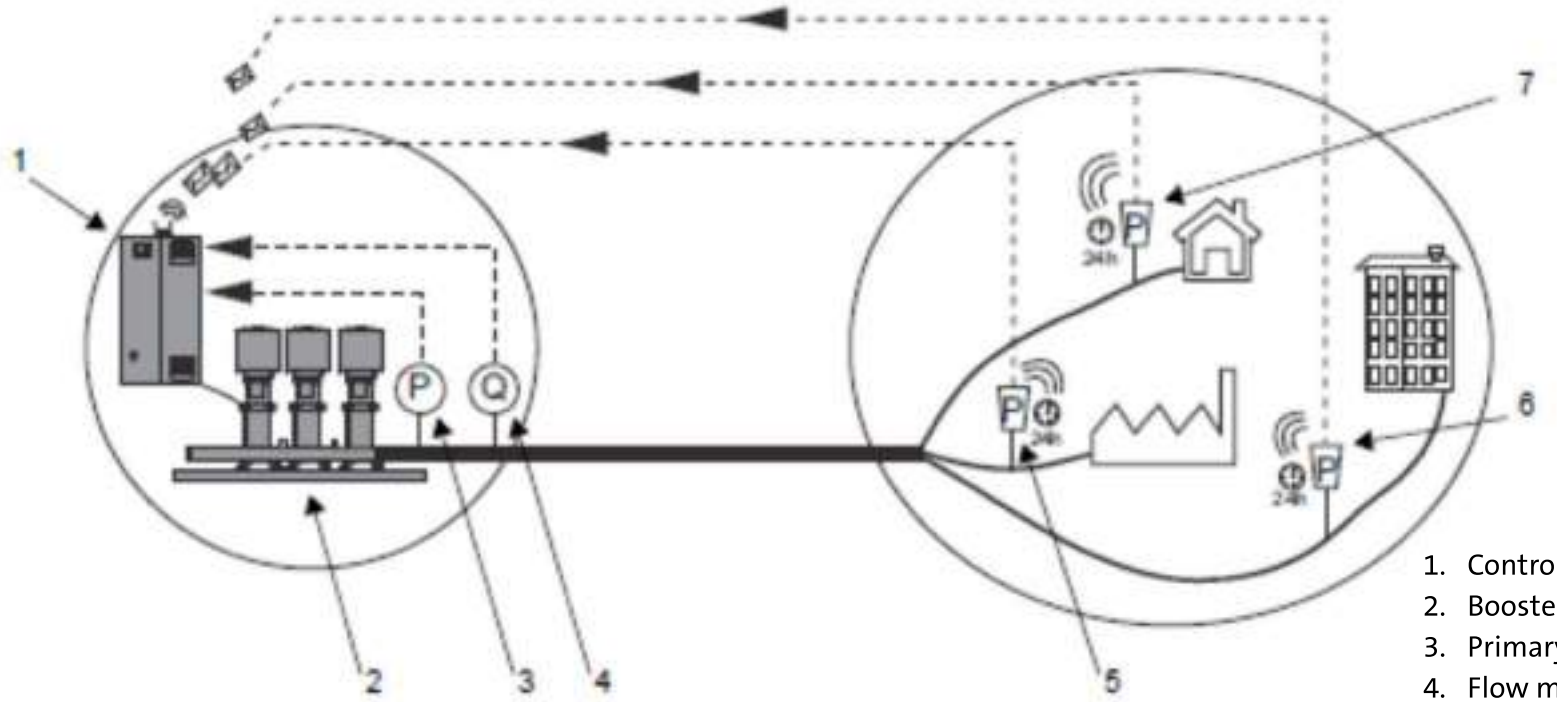
Source: GWI, Global Water Market 2017 (96 countries are analyzed with respect to NRW)

- NRW = most important indicator of network quality and security of supply
- 24 of the countries having NRW rates above 40%
- Highest NRW rates are above 60% (e.g. Turkey and Bulgaria)

Water consumption profile for a typical day

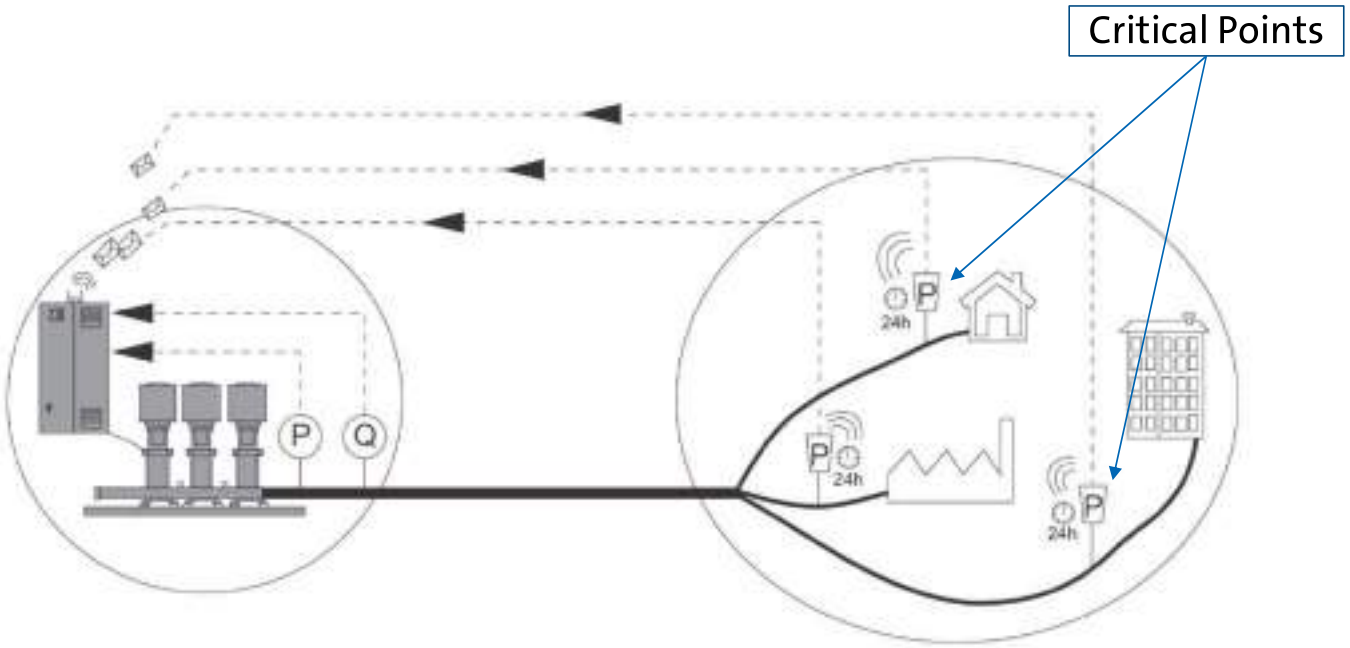


DDD Concept



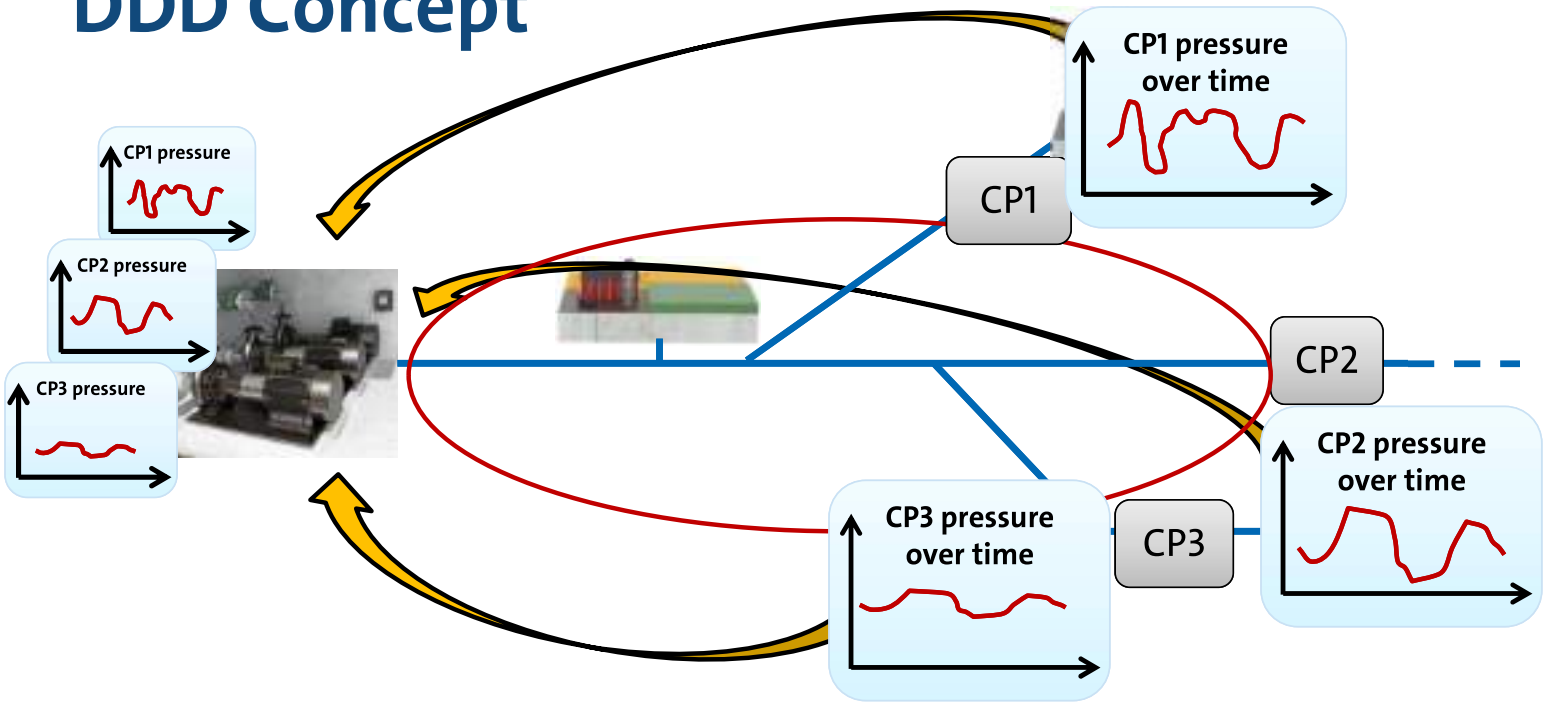
1. Control DDD
2. Booster pumps
3. Primary Discharge pressure sensor
4. Flow meter at pumping Station
5. Remote sensor – 1*
6. Remote Sensor -2*
7. Remote Sensor – 3*

What is a Critical Point



- If the customer has complaints from end users concerning lack of pressure
- If a area of the network is located at a high elevation level
- At the end of a network (high friction loss)
- The critical points can be identified based on hydraulic model

DDD Concept



- Remote pressure sensors (data loggers) are installed at critical points (CP)
- DDD creates a model of the distribution network pipe system
- Each CP contributes with its own pressure profile
- Profiles are logged, and sent daily to pumping station (SMS messages)
- Pumping station optimizes control curve based on updated sensor data

DDD benefits

- Increases comfort by delivering a stable pressure in the critical points
- Saves energy as pressure is lowered on average
- Reduces leakage due to lower pressure
- Minimizes the risk of pipe bursts due to more stable pressure
- Minimizes manual work related to changes in the weather and water demand

Who are our Potential Customers ?

- 100 + Smart cities
- 200+ Green Field Projects (General)
- Existing Old & inefficient networks
- OHT tanks catering distribution networks with improper pressure distribution at critical points

Smart Cities & Green Field Projects Where sustainability & Growth is a key Factor


Treated water discharge
Thank You ....