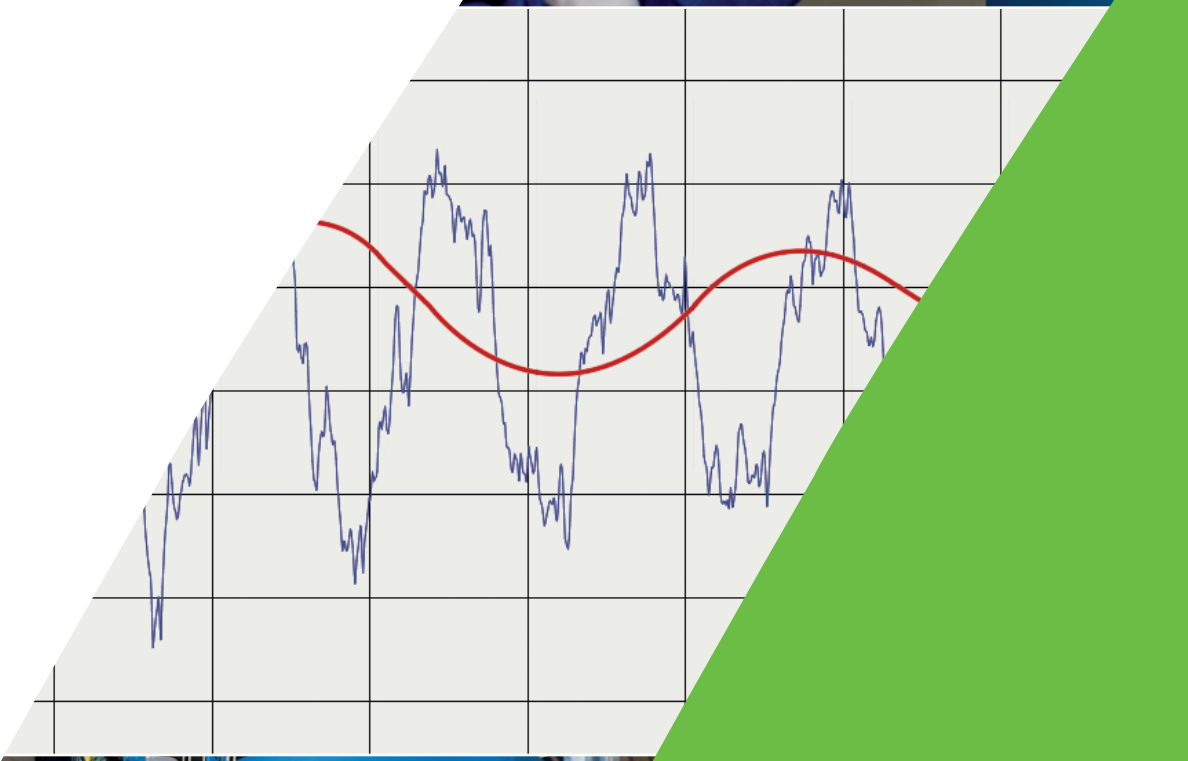
ORELL

Pressure Shock Consideration



Safety concepts
for water, waste water
and chemical applications

Analysis-Planning-Implementation

FIRST VISIT ON SITE

Visit at site, project discussion and project support to the implementation

We make simulations, calculations, proposals and pressure measurements at site (with concluding report). With our flow simulation system, we make calculations and simulations of pressure surges and negative pressure in pump stations or pipe systems. The most frequent calculations are emergency shut-downs for pumps, opening and closing of hydrants and valves and the sourcing of big quantities of water. With the clear graphic representations, we offer you an interpretation of the system conditions by referring to potential problems. We also make solution proposals.

Our attractive calculation models

BASIC

One Line System

Performance Overview

- Registration of plant data
- Plant modelling
- Graphic representation
  - Plant schema
  - Pressure gradient without safety elements
  - Pressure gradient over length/height profile without safety elements
  - Pressure gradient with safety elements
  - Pressure gradient over length/height profile with safety elements
- Elaboration of the solution proposal
  - Determination of the shock absorbers and/or aeration/ventilation valves
- Cost estimate for the solution

MIDDLE-SIZED

More Line System

Performance Overview

- like „BASIC“

plus:

- Calculation of more lines, including their graphical representation

MAXI

More Line System with Report

Performance Overview

- like „MIDDLE-SIZED“

plus:

- Elaboration of a detailed report and a reporting with additional graphics
- Detailed recommendations for the use of the safety elements
- Option: German or English

„Simulation leads to innovation – and is fun.“
Christoph Meier, Romeo Tedaldi, Frei + Krauer AG

ON-SITE PRESSURE MEASUREMENT

Pressure Surge Measurement – Safety for Your Pipelines
Detect invisible hazards. Prevent damage. Save costs.

Pressure surges in piping systems often occur unnoticed – yet they can cause severe damage, leaks, or system failures. With our professional pressure surge measurement, you can identify risks at an early stage and protect your systems sustainably.

What causes pressure surges?

- Rapid closing of valves
- Pump start-up or shutdown
- Emergency shutdowns
- Malfunctions in the control system

These pressure spikes can lead to material fatigue, pipe ruptures, and consequential damage.

Our services

- Precise measurement of pressure peaks
- Analysis under real operating conditions
- Short-term or long-term measurements
- Professional evaluation & documentation
- Actionable recommendations to prevent damage

Your benefits

- Early detection of weak points
- Prevention of unplanned downtime
- Extended service life of your systems
- Reduction of maintenance and repair costs
- Increased operational safety

LET US MODEL YOUR SYSTEM

To analyse your situation, we need the following documents:

Indications about the property
- Exact project designation, place, country
- Type of medium
- If available, local (new or existing) conditions

Length and height profile
- Profile of the conduct with length and height indications
- Coordination of changes of materials or pipe dim

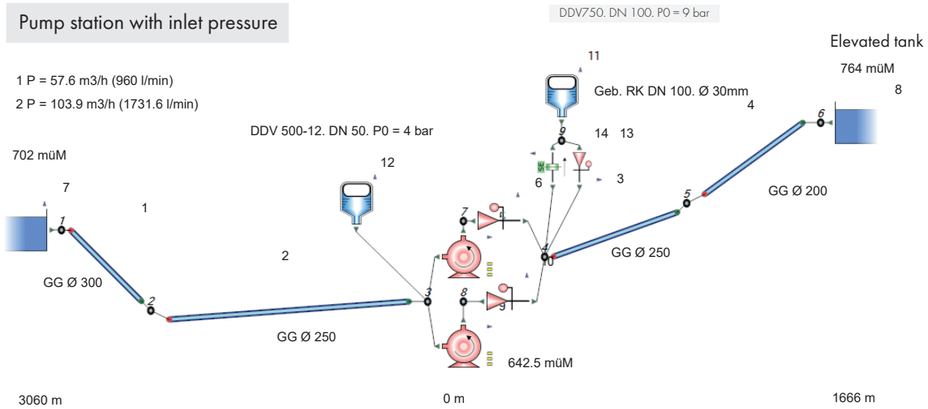
Performance-related indications
- Length of partial sections
- Materials of partial sections
- Diameter of partial sections
- Approximate age of the pipes
- Do we have an inlet pressure/pre-pressure, or an inlet pipeline?
- Is the pumping station operated with inlet (suction) pressure?

Indications about the pump or pump diagram
- Dry well installation/underwater pump
- Number of pumps, parallel or series connection
- Volume flow Q in m3/h
- Delivery head of the pump in mWS
- Rotation in in U/min
- Performance in kW
- Degree of efficiency in %

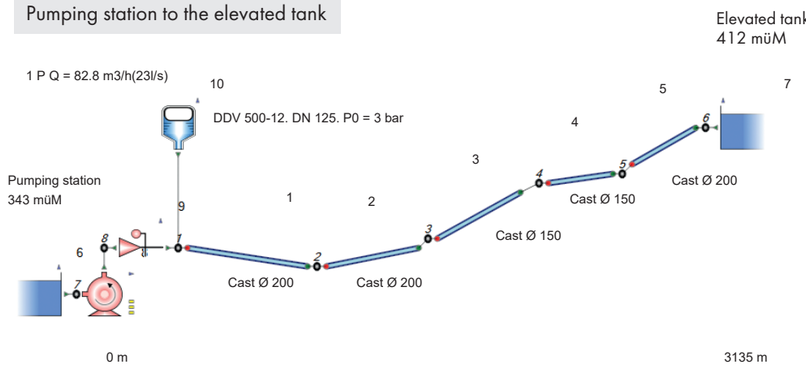
Other indications or documents
- Are there safety elements?
- How are the special conditions at site?
- Do we need a seismographic calculation of this region?

Call us or use the form “System Data Collection” for data acquisition.

Pump station with inlet pressure



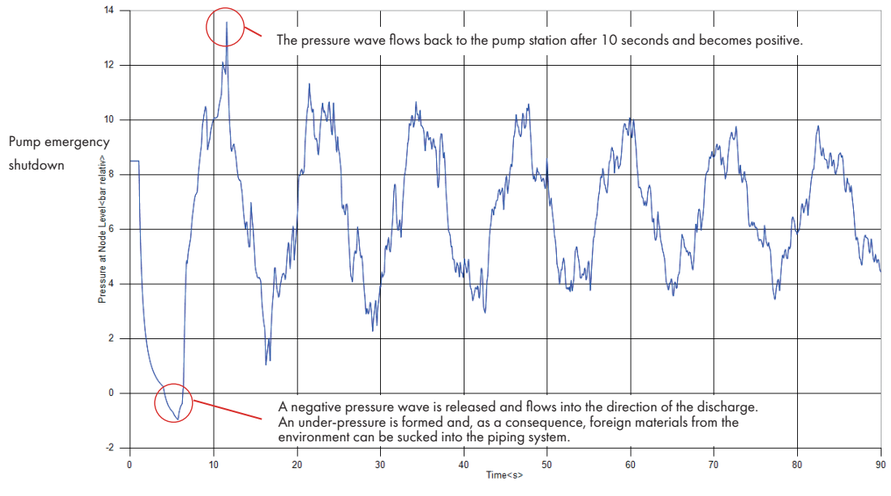
Pumping station to the elevated tank



ANALYSIS OF THE EXISTING SITUATION

Interpretation and solution proposals
Which are the problems existing in your net?

Pressure gradient in the pump system during the emergency stop without safety element



A strong pressure fall and pressure increase within seconds. Pressure peaks ΔP over 14 bar.

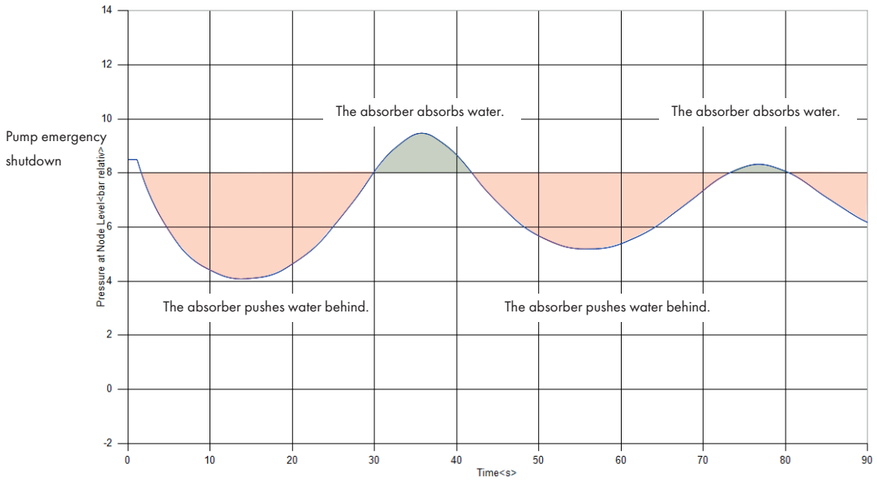
Pressure gradient over the whole length/height profile without safety

Negative pressure over the whole pipe profile. Unnecessary charge of the pipe and risk of pollution by the aspiration of wastewater during the phase of negative pressure.

DEVELOPMENT OF A SECURITY CONCEPT

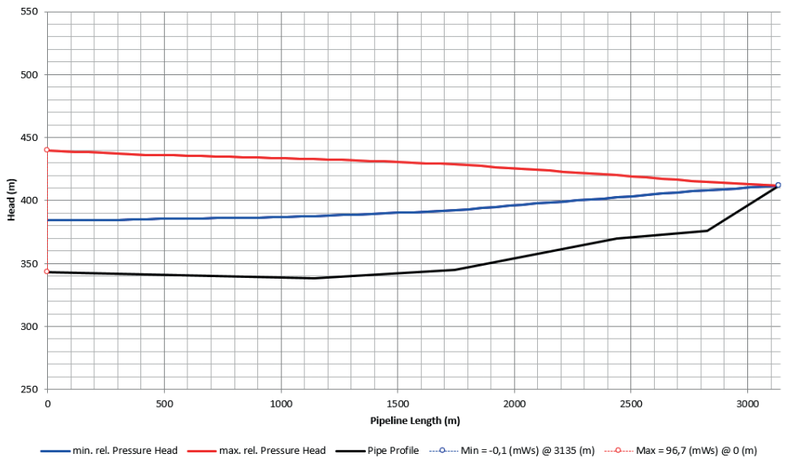
Interpretation of the security concept. What we offer for your safety?

Pressure gradient in the pump system in case of emergency shutdown with safety elements (absorbers)



The shock pressure absorber pushes water behind and reabsorbs water after the inversion of the water column. By using a correctly sized safety element, the ΔP amounts only to 5 bar. The pump and the pipes are not charged if it is not necessary.

Pressure gradient over the whole length/height profile with safety elements (absorbers)



In the whole pipe net there is no negative pressure / no cavitation anymore.

SIZING AND INSTALLATION

Design and dimensioning of the safety components.

Design of pressure surge dampers, expansion vessels, and pulsation dampers, as well as air release and vacuum valves.

In contrast to expansion tanks or pressure maintenance vessels, ORELL Tec pressure surge dampers are specifically designed to withstand extreme, highly dynamic pressure fluctuations.

This requires an appropriate vessel design, solution-specific and high-quality elastomers, and flange connections precisely adapted to the application.

Drinking Water

Volume range:	Standard 100 to 5,000 liters Sizes up to 20,000 liters available
Pressure range:	Standard 16 / 25 / 40 bar, other pressure ratings on request
Versions:	Protected steel or stainless steel
Forced flow:	Patented
Bladder material:	Depending on the medium

Wastewater

Volume range:	Standard 100 to 5,000 liters Custom solutions up to 20,000 liters
Pressure range:	Standard 10 / 16 bar
Versions:	Welded stainless steel 1.4404 / 1.4571
Accessories:	Compressed air compressor, Series DDA OB

SVGW DVGW

FORCED FLOW

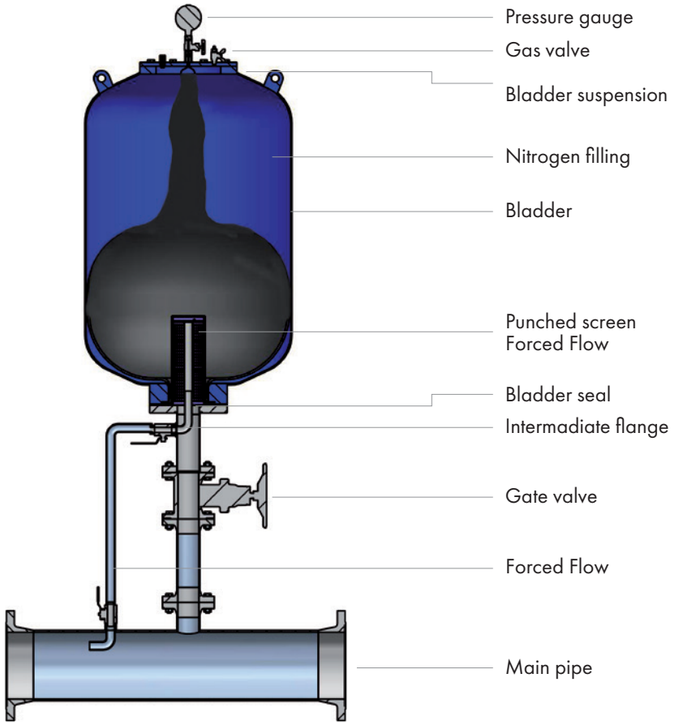
Forced flow in pressure surge dampers for drinking water

With the patented forced flow, the constant water exchange is carried out in addition by an external conduct.

With the assembly of a small arch against the current in the main pipe a small section narrowing is created. So approx. 1-2% of the current output flow through the bypass pipe into the absorber and finally back to the main pipe through the main connection.

Damper advantages

- Operates without external energy
- Minimum space requirements
- Cost saving on the building
- No vessel corrosion
- Long service life
- Low maintenance
- Controlled water exchange in vessel (Forced Flow)
- Automation through electronic water level monitoring in the tank



APPLICATION AREAS

Drinking Water

Booster systems, drinking water pumping stations, pressure maintenance

Wastewater

Wastewater pumping stations, pressure maintenance

Industry, construction & building tech.

Concrete batching plants, pressure equalization

Beverage Industry

Breweries, beverage filling plants, CIP systems

Food & Animal Feed

Mixing plants, CIP systems, pressure equalization, cleaning systems

Firefighting and sprinkler systems

Tunnel fire suppression pipelines, pressure equalization

Snowmaking Technology

Pumping stations, booster systems

STARTING-UP AND AFTER SALES SERVICE

Assembly in our workshop and putting into operation at site. Now we get the system running.

The digital level display permits an easy monitoring of the water level in the pressure chock absorber. Through a differential pressure measurement the water column is displayed in centimetres in the tank. The display device is battery-operated or is used by an interface with external current supply to permit a constant monitoring.

After Sales Service

Maintenance and control are part of our services. With a maintenance contract, the company ORELL Tec guarantees a regular maintenance and control of this important protection device.

TÜV-/SVTI-Test

We are glad to give you an information about if the tank must be checked or not. We accompany and support you as well during your regular check with the inspection offices. Please inform us on time about the deadline of the inspection citation.

10-YEAR ORELL EASY WARRANTY ON PRESSURE SURGE DAMPERS

After the standard 2-year warranty expires, your Easy Warranty* is extended to 10 years.

This requires a service contract and at least one annual maintenance performed by the ORELL Tec AG service team.

*Normal wear and tear excluded, including consumable parts and bladders/membranes.

ORELL

SVGW

DVGW
MITGLIEDS
UNTERNEHMEN

Switzerland, Germany

ORELL Tec AG
Bonnstrasse 3
CH–3186 Düdingen
Tel. +41 26 492 70 00
info@orelltec.com
www.orelltec.com

Austria

ORELL Tec Austria GmbH
Gewerbestraße 5
AT–4654 Bad Wimsbach-Neydharting
Tel. +43 7242 90 98 98
info.at@orelltec.com
www.orelltec.com

International

ORELL Tec AG
Bonnstrasse 3
CH–3186 Düdingen
Tel. +41 26 492 70 00
info@orelltec.com
www.orelltec.com