

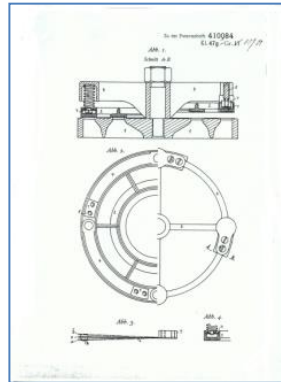


**NoREVA** GmbH  
Düsenrückschlagventile  
Non-Return-Valves



**NoREVA**

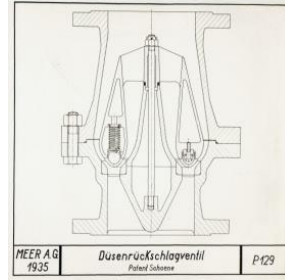
# Where we come from



**1923**  
First Patent  
Engineer Dr. Schoene



**1933**  
Patent bought  
Maschinenfabrik Meer AG



**1935**  
Production and  
Sales NSCV



**1955**  
Development  
Piston type valve  
Mannesmann Meer AG



**2001**  
Noreva founded



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# Who we are

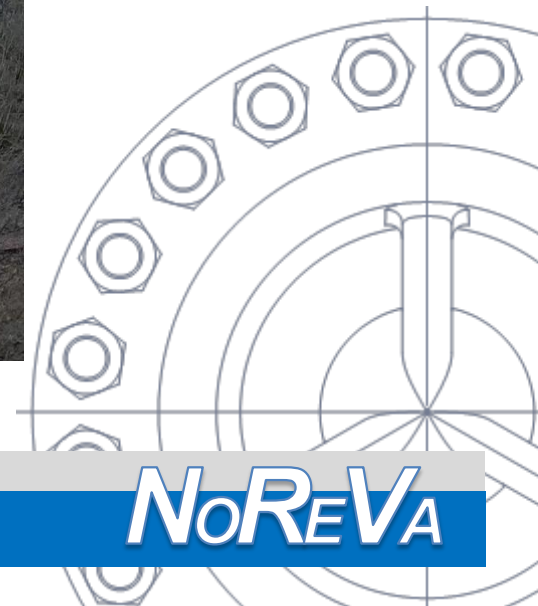
- NOREVA located in Mönchengladbach, Germany
- Specialized in Nozzle Check Valves
- Design/Construction, Workshop with Coating/FBE-, Machining-, Assembly- & Test Facilities
- Employees: 55
- Turnover: 20 – 25 Million USD
- Quality Accreditations:
  - ISO 9001:2008
  - OHSAS 18001:2007
  - PED 97/23/EC
- More than 80 Years Experience
- Part of Goodwin PLC Group, UK since 2007



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# Development in 2016

- Additional 300 sqm Warehouse
- New Fusion Bonded Epoxy Coating Facility
- New High Pressure Testing Station (Up to 20.000 PSI)



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# What we do



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# NoReVa Nozzle Check Valves!

The only Check Valves that combine:

- Non-Slamming Closure

- Lowest Pressure Losses (Energy Saving)

- Maintenance Free Design



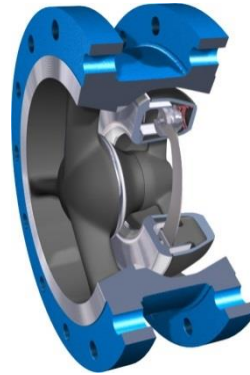
**NoReVa**

# Noreva Nozzle Check Valves

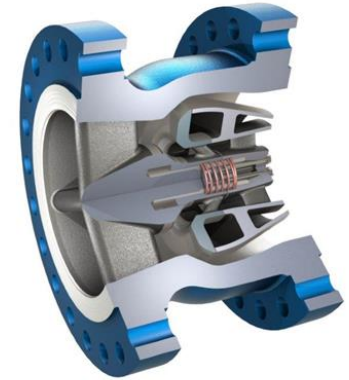
Ring Disc Type NB



Ring Disc Type NK



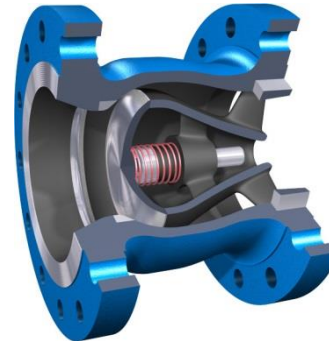
Ring Disc Type NZ



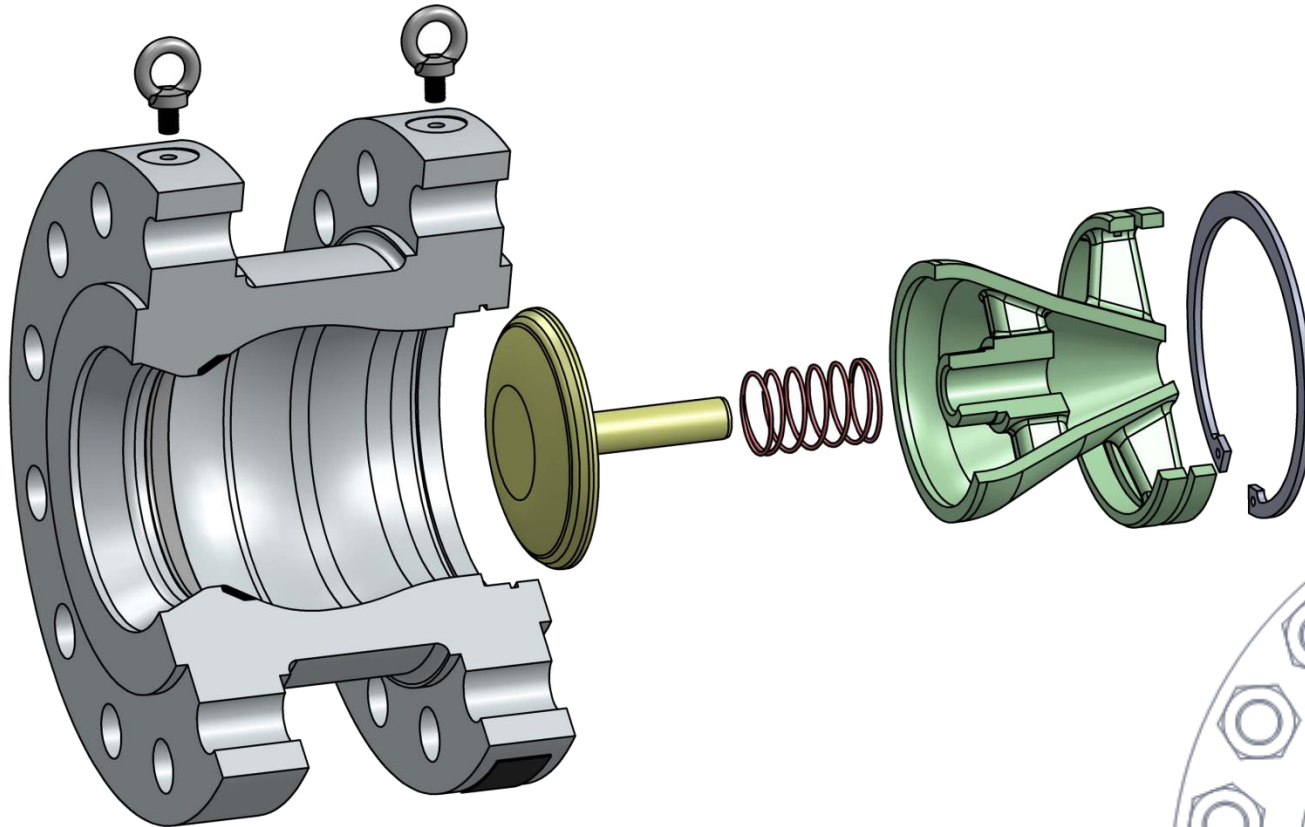
Solid Disc Type ZO



Solid Disc Type ZB



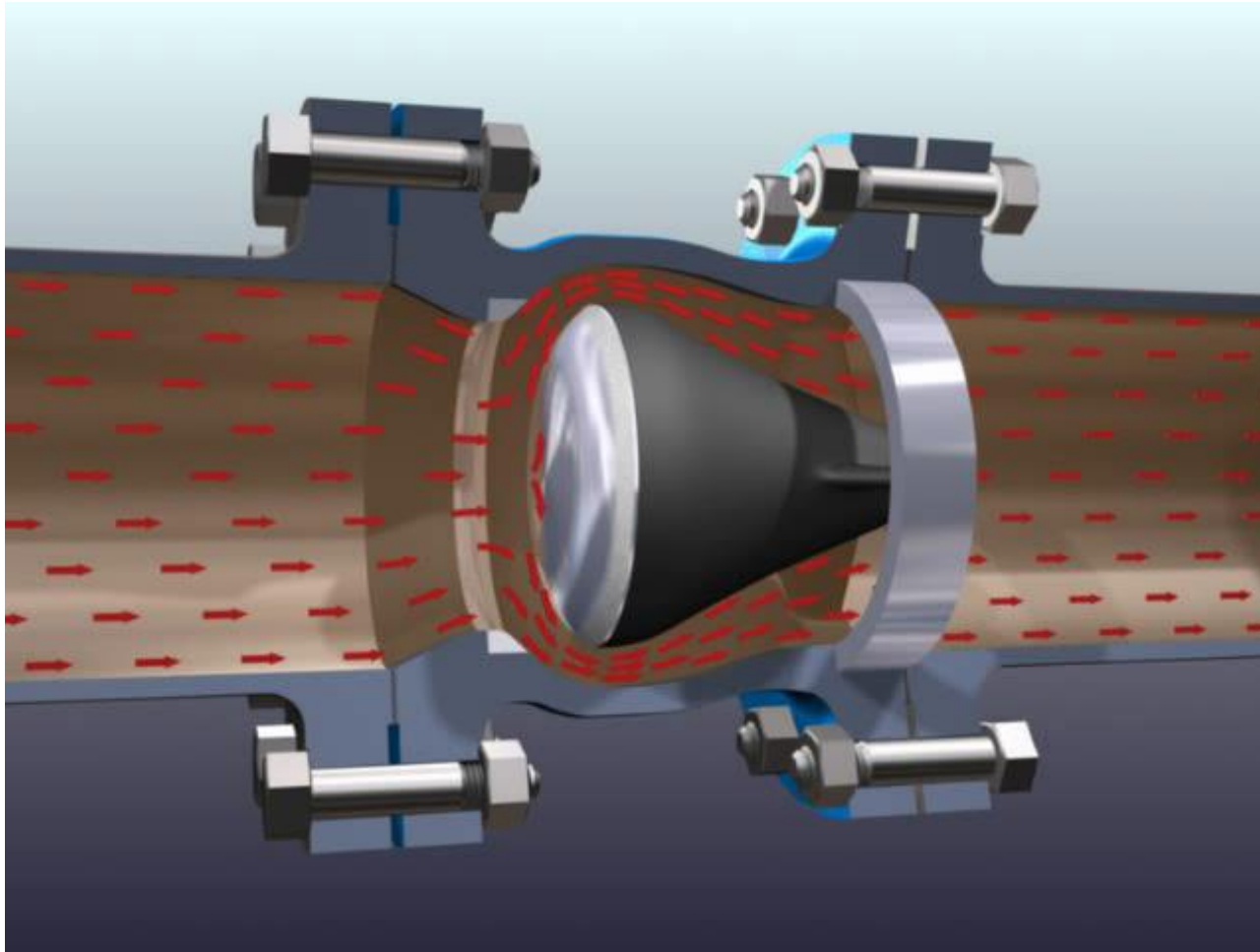
# Nozzle Check Valves – Solid Disc Z-Type (1" to 10")



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# Z-Type



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ZB 1in ANSI 150, full 316 stainless steel



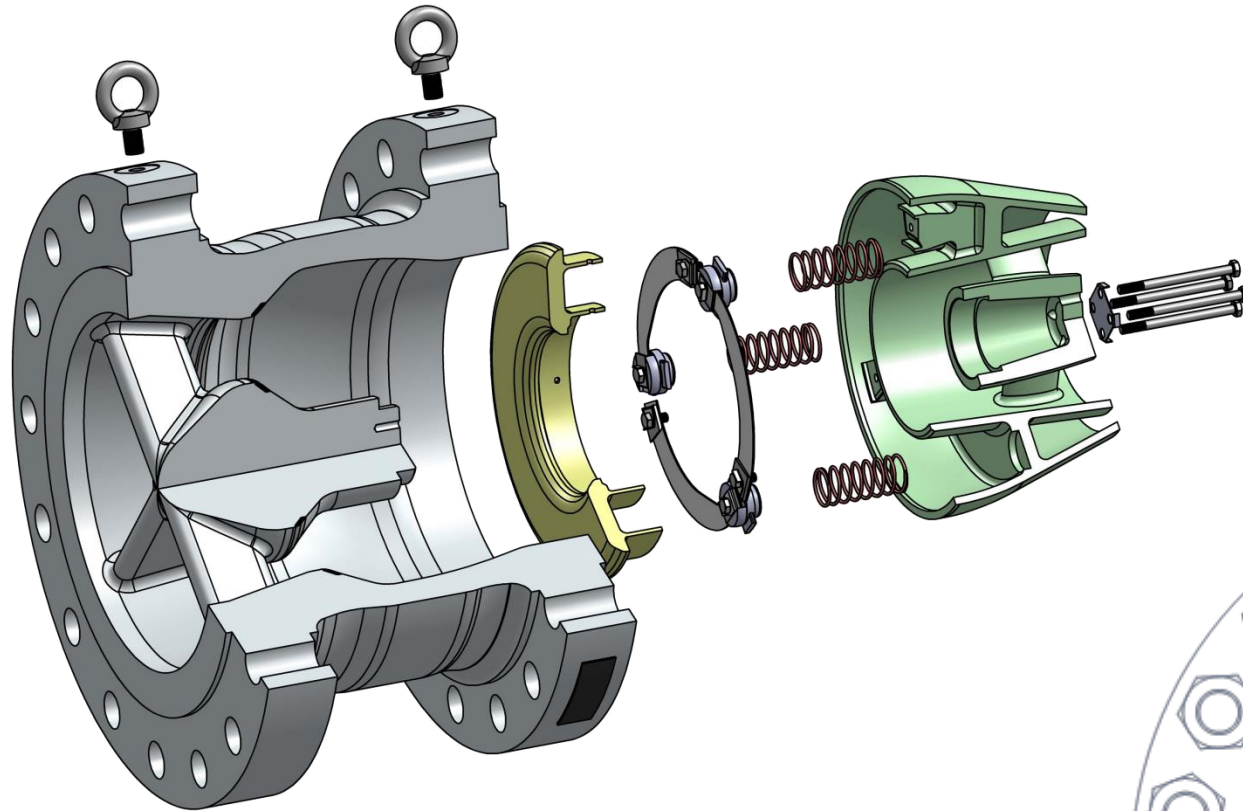
ZB 8in class 2500 refinery Brazil



ZO DN100 PN 16 Water Distribution

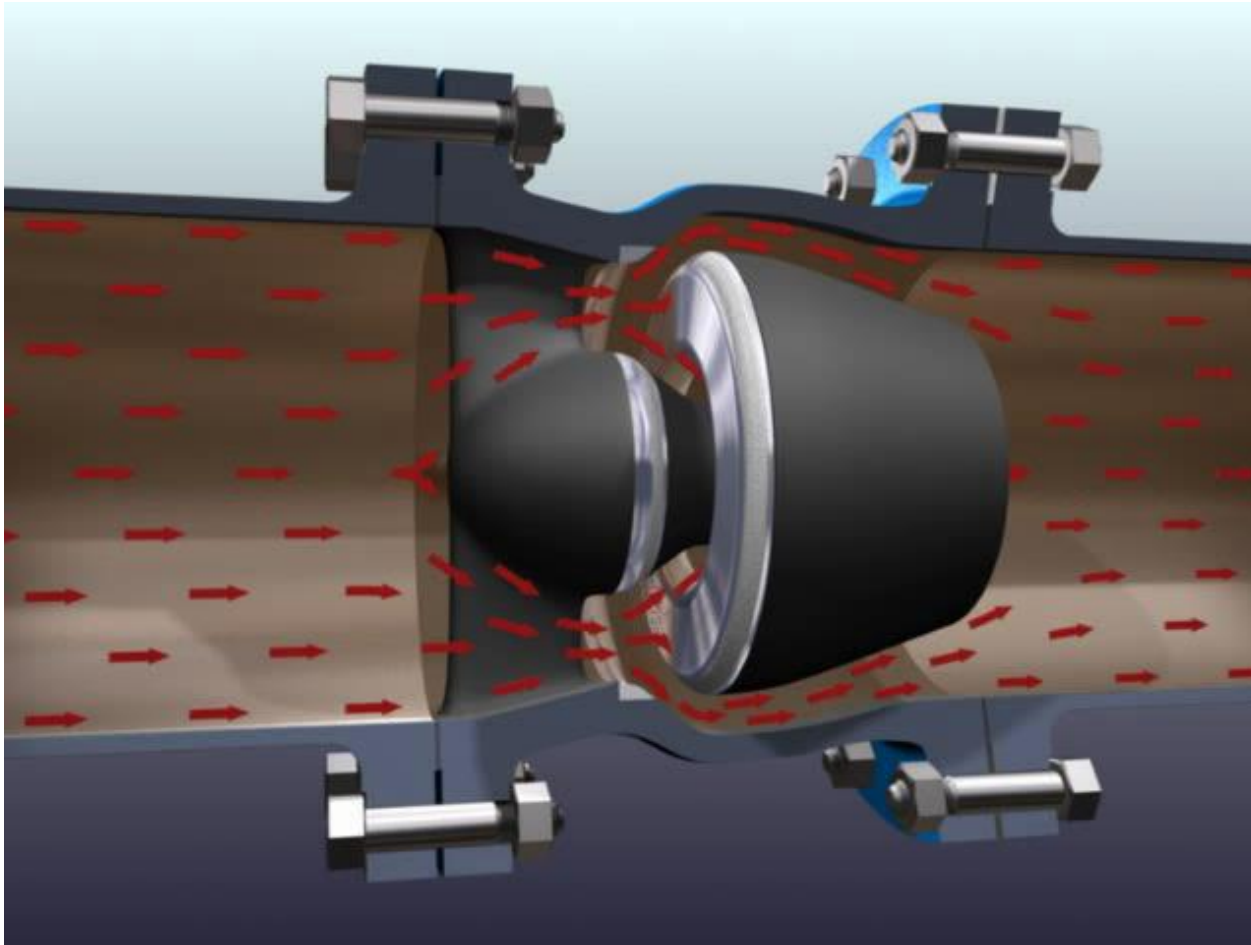


# Nozzle Check Valves – Ring Disc N-Type (12" to 88")



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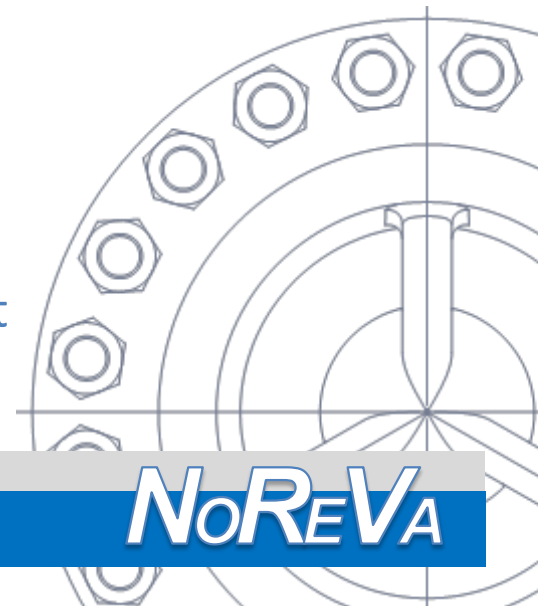
# N-Type



**NoREV A**



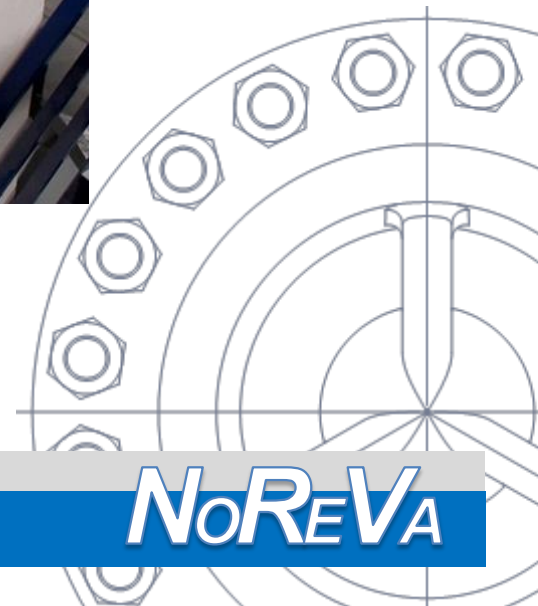
NB 56in class 600 welding ends, Water Transmission Project in Saudi Arabia



**NoREVA**



NB 48in class 150 Paris, France



**NoREVA**



NK DN 1800 PN 25, Dam Project in South Africa



**NoREVA**

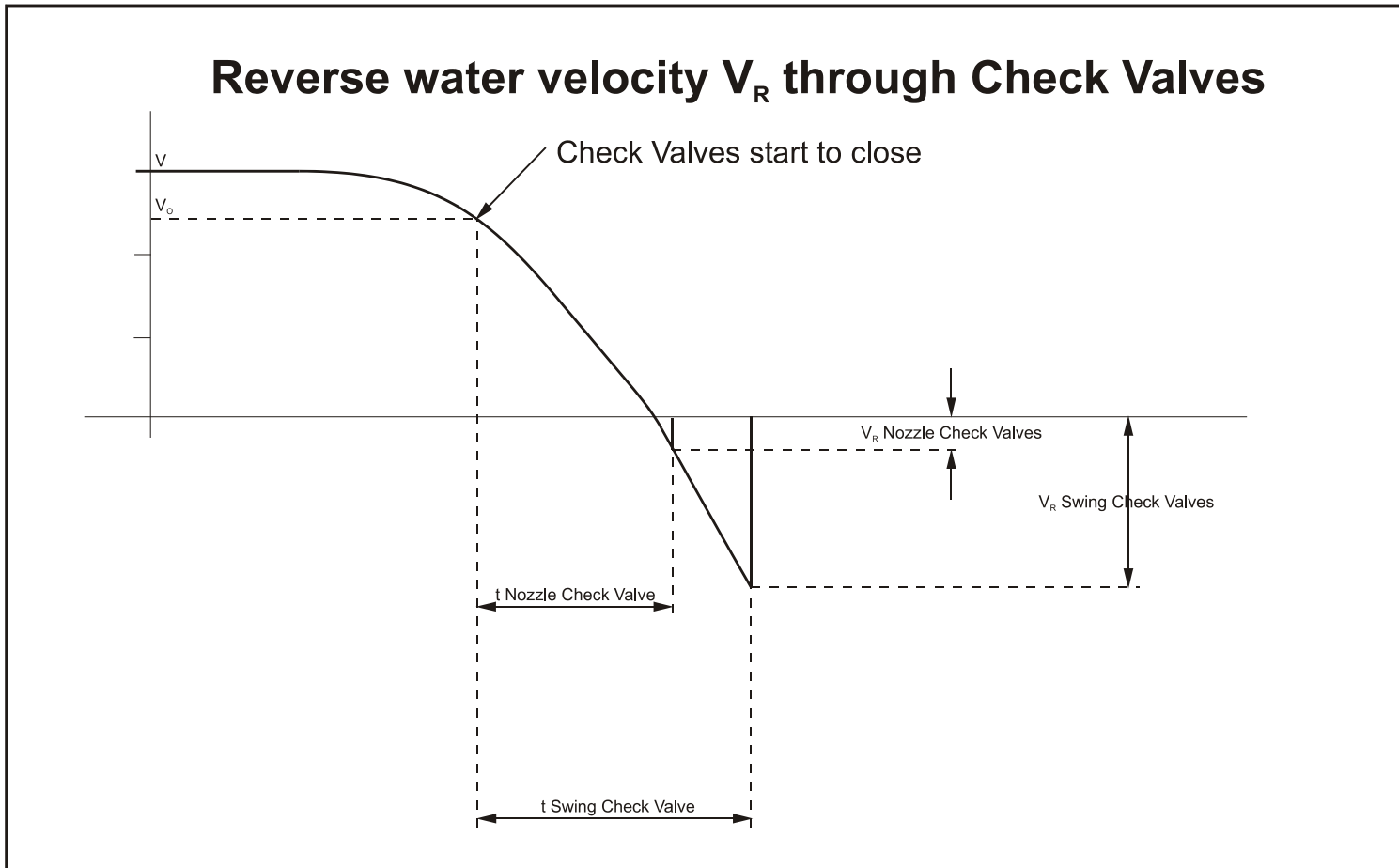
# Pressure Loss & Dynamic Behaviour



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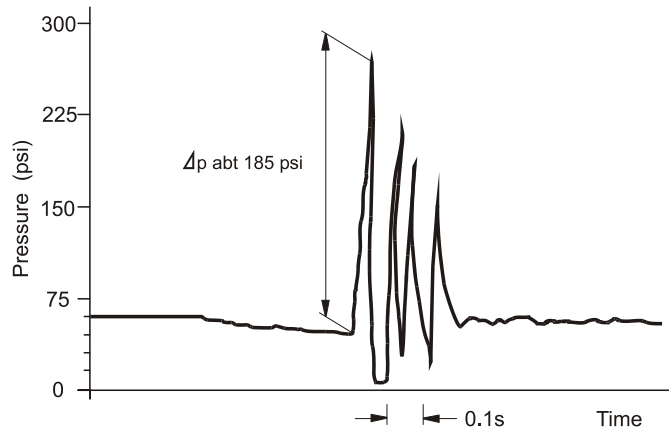


# Dynamic Behaviour



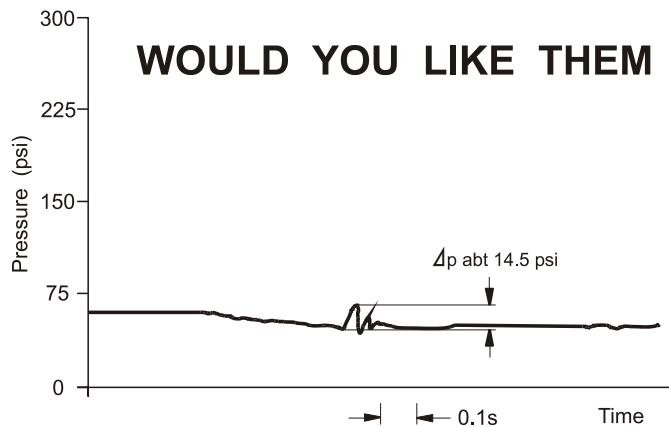
# Dynamic Behaviour

DO YOUR PUMP PRESSURE SURGE CURVES LOOK LIKE THIS ?



Swing Type Check Valve

DN = 12 inch



Nozzle Check Valve NRV-B

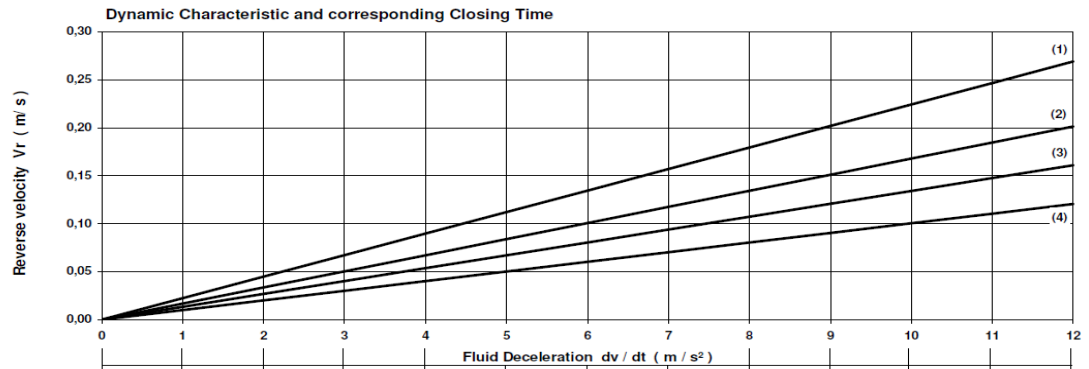
DN = 12 inch



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# Dynamic Behaviour

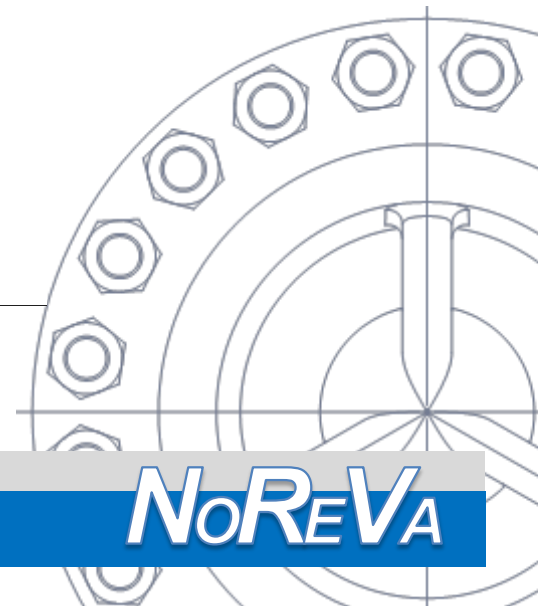
Valve Type: NRV-B  
Size: DN 300



	0,00	1,27	0,65	0,44	0,33	0,27	0,23	0,20	0,18	0,16	0,15	0,14	0,13
Spring (1) : 1,25	0,00	1,27	0,65	0,44	0,33	0,27	0,23	0,20	0,18	0,16	0,15	0,14	0,13
Spring (2) : 1,67	0,00	1,69	0,85	0,57	0,43	0,35	0,30	0,26	0,23	0,20	0,18	0,17	0,16
Spring (3) : 2,09	0,00	2,10	1,06	0,71	0,54	0,43	0,36	0,31	0,27	0,25	0,22	0,20	0,19
Spring (4) : 2,79	0,00	2,80	1,41	0,94	0,71	0,57	0,48	0,41	0,36	0,32	0,29	0,26	0,24

Closing time ( s )

H. Gustorf  
19.12.2007



# Life Cycle Costs

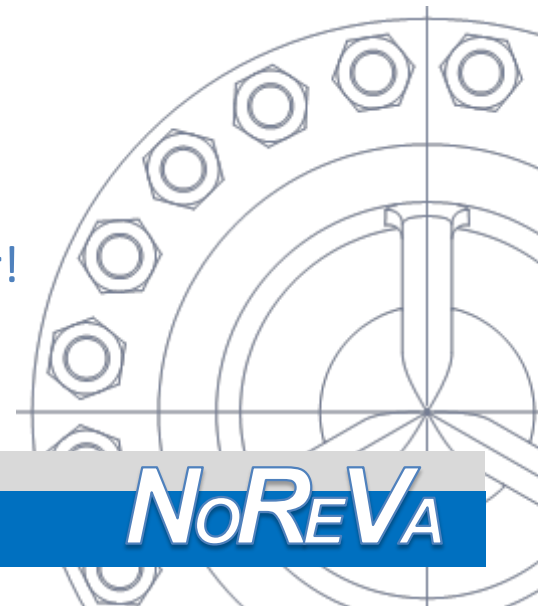
Valve			No.1	No. 2	No. 3
Check Valve Size		mm	600	600	0
Manufacturer			NOREVA	SAPAG - CLASAR	?
Valve Type			NB	20111-600 PN16	?
Pressure loss Coefficient		Zeta	0,77	2,00	3,00
Flow Rate		m3/h	3000	3000	0
Flow Rate (Water)		kg/s	833,333	833,333	0,000
Pipe Velocity (Water)		m/s	2,95	2,95	#DIV/0!
Pressure Loss		mWC	0,3413	0,8864	#DIV/0!
Power calculated with efficiency factor of pump and engine		kw	4,2917	11,1472	#DIV/0!
Energy Cost per Year			<b>2,747</b>	<b>7,135</b>	#DIV/0!
Energy costs	0,08	€/kWh			
Operating hours	8000	h/year			
Energy Cost in Years (Cost of Valve and Maintenance not included )		20	<b>54,940</b>	<b>142,700</b>	#DIV/0!



# Maintenance free design



500 items 6in ANSI 600 in permanent operation  
One cycle per minute = 1 Million moves per year!  
High corrosive salt water service  
Maintenance free since 2004!



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# Features & Benefits of the Noreva Nozzle Check Valve Design

- Very short stroke, spring assistance and low moving masses effect fast non-slam closure
- Metal to metal sealing (Maintenance free and fire safe by design)
- Very low pressure losses reducing total life cycle costs
- Installation in horizontal and vertical position



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# There is ONE way to make Swing Check Valves Non-Slamming:



**WRAP them!**



**NoREVA**



**NoREVA** <sup>GmbH</sup>  
Düsenrückschlagventile  
Non-Return-Valves

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