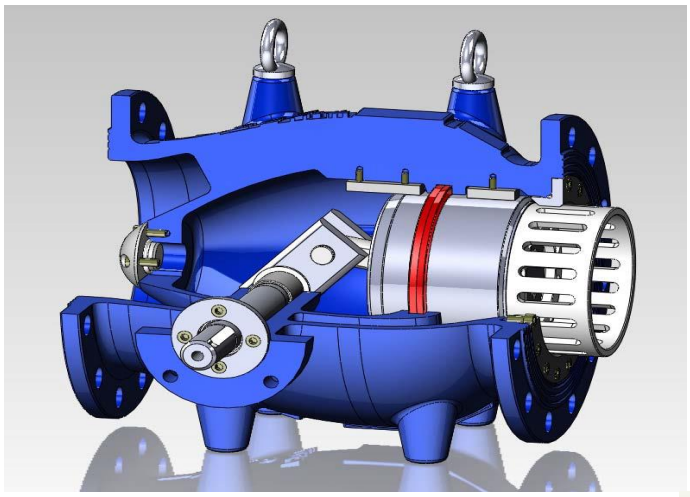
Nero Needle Valves

Main Characteristic
The needle valve is mainly designed for water flow rate and pressure regulation in a pipeline.
The regulation takes place thank the axial movement of the piston, operated by a rod and crank mechanism.

The piston is positioned in the center of the valve, in a chamber properly shaped in order to protect the piston from the water stream: this avoids noises and cavitation damages.
This characteristic allows also vibrations -free operation.

The water flow is guided in an annular chamber around the central body of the valve.
The cross section of this chamber reduces continuously from the inlet up to the outlet.
Because of this, the flow speed rises and the pressure falls.

The geometrically ideal design, allows to protect the pipe from the cavitation's bubbles, which are directed towards the center of the outlet mouth.
We suggest to operate our needle valves between 20 and 80% opening.



Nero Needle Valves

Construction Data

Due to the perfect balance between the upstream and downstream chambers, the needle valves need a low torque to be operated.

The operating mechanism consists in a glyph, a shaft, a connecting rod and two pins made of stainless steel.
All the moving parts rotate on marine bronze bushings.

The piston's sliding surfaces is entirely made of stainless steel and is led by sliding blocks, which ensure stability in all operating conditions.
The sliding blocks are screwed to the valve's body, this allows a very easy maintenance.

The seating ring is bolted onto the valve's body and is made of stainless steel, it's design ensures a perfect seal and an easy maintenance of the parts inside the valve.

The seals are made of polyurethane rubber: the main seal is inserted directly into the top of the piston, the secondary one has a special anti-extrusion profile and from the image you can see how the fluid is directed towards the axis of the valve: the outflow collides at valve's axis height, dispersing energy, allowing the protection of the walls of the downstream side pipe

Corrosion protection:

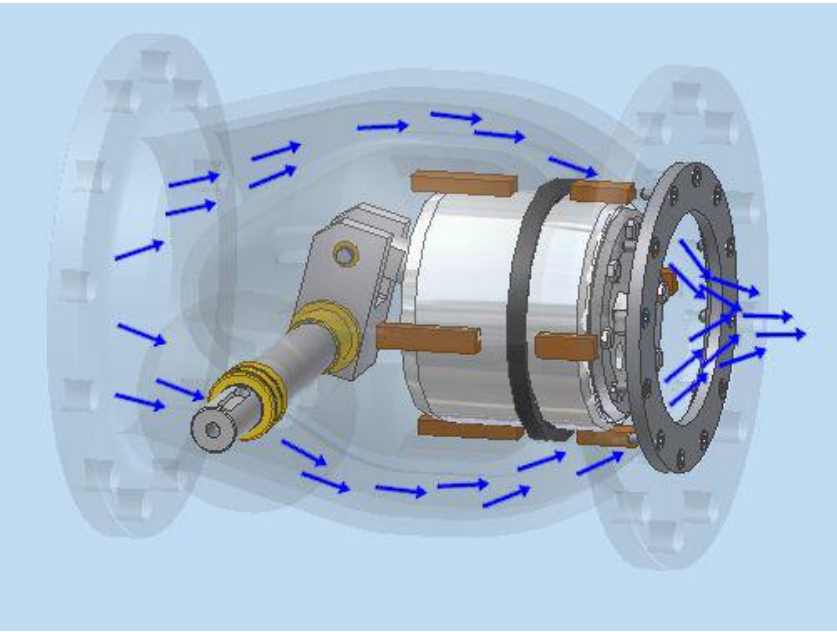
The valve body is corrosion protected by a FBE (fusion bonded epoxy coating process) with a thickness of 250 µm, approved by the European laboratory for drinking water as Dvgw (Germany), WrC (U.K), DgS (France)

Test:

The valves are tested following the internationals rules UNI EN 1074-1 e ISO 5208-1982 (E).

Temperature:

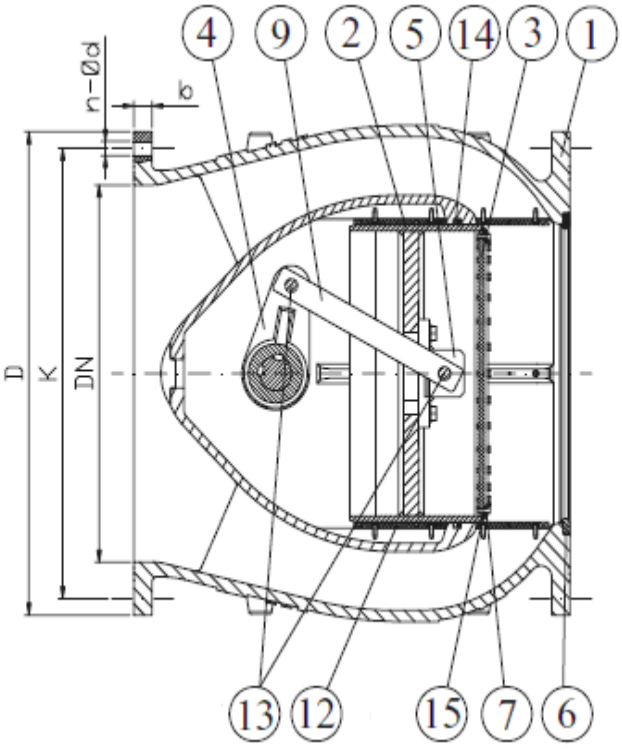
Temperatures of work: (temperatures of the water) min. 0°C max. + 40°C Storing temperatures: (temperatures of the air) min. – 20°C max. +80°C

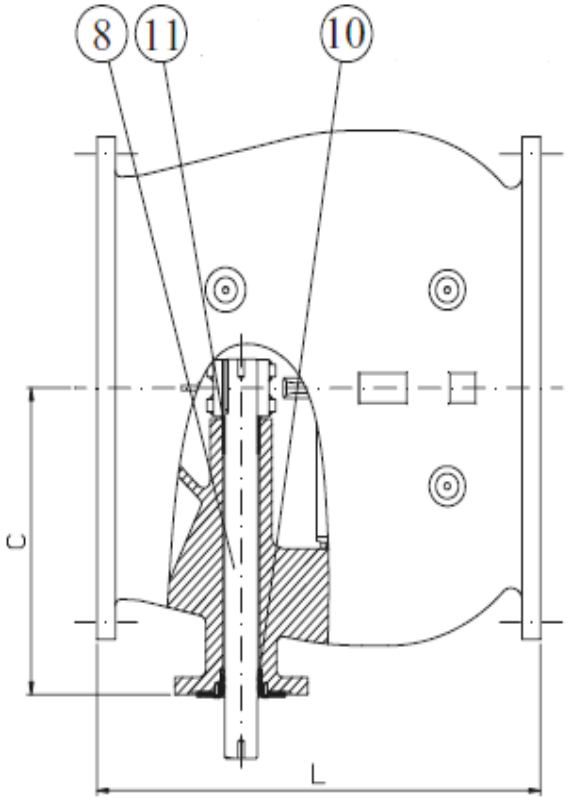


Nero Needle Valves

Nero Needle Valve materials

Item	Part	Materials
1	Body	Ductile Iron GJS 400; or Ductile Iron GJS 500; or Cast Steel
2	Piston	Stainless steel 14021; AISI 304
3	Piston	Stainless steel 1.4021; AISI 304
4	Crank	Carbon steel, C40
5	Fork	Carbon steel; C40
6	Seal ring	Stainless steel, 1.4021; AISI 304
7	Seal retaining ring	Stainless steel; 1.4021; AISI 304
8	Operating shaft	Stainless steel, 1.4521?; AISI 420
9	Connecting Rod	Stainless steel; 1.4521?; AISI 420
10	External Bush	Bronze
11	Internal Bush	Bronze
12	Guide Rails	Brass
13	Parallel pin	Stainless steel, 1.4521?; AISI 420
14	Lip seal	NBR Rubber
15	Main seal	Teflon (PTFE





Subject to alternation
We reserve the right to make any technical modification. We are not responsible for any error in printing.

Nero Needle Valves

Dimensions and pressure

Dimensions

D						n-ø d							
DN	**PN**	**PN**	**PN**	**PN**	**PN**	**PN**	**PN**	**PN**	**PN**	**PN**	**L**	**C**	**Weight Kg**
	10	16	25	40	64	10	16	25	40	64			
80	200	200	200	200	215	8-22	8-22	8-22	8-22	8-25	260	125	35
100	220	220	235	235	250	8-19	8-19	8-19	8-22	8-22	300	130	45
125	250	250	270	270	--	8-19	8-19	8-22	8-22	--	300	130	50
150	285	285	300	300	345	8-23	8-23	8-28	8-28	8-34	350	165	75
200	340	340	360	375	415	8-23	12-23	12-28	12-31	12-37	400	205	130
250	405	405	450	450	470	12-23	12-28	12-31	12-34	12-37	450	240	150
300	460	460	485	515	530	12-23	12-28	16-31	16-34	16-37	500	270	200
400	565	580	620	660	--	16-28	16-31	16-37	16-41	--	600	337	410
500	670	715	730	--	--	20-28	20-34	20-37	--	--	700	422	640
600	780	840	845	--	--	20-31	20-37	20-41	--	--	800	488	780
700	895	910	--	--	--	24-31	24-37	--	--	--	900	550	1020
800	1015	1025	--	--	--	24-34	24-41	--	--	--	1000	620	1320
900	1115	1125	--	--	--	28-34	28-41	--	--	--	1100	685	1770
1000	1230	1255	--	--	--	28-37	28-44	--	--	--	1200	755	2200
1200	**Dimension 1200 – 1400 On REQUEST**												
1400													

K and B Dimensions

K						b				
DN	**PN**	**PN**	**PN**	**PN**	**PN**	**PN**	**PN**	**PN**	**PN**	**PN**
	10	16	25	40	64	10	16	25	40	64
80	160	160	160	160	170	22	22	22	22	22
100	180	180	190	190	200	19	19	19	19	25
125	210	210	220	220	--	19	19	19	23,5	--
150	240	240	250	250	280	19	19	20	16	37
200	295	295	310	320	345	20	20	22	30	38
250	350	355	370	385	400	22	22	24,5	34,5	43
300	400	410	430	450	460	24,5	24,5	27,5	39,5	48
400	515	520	550	585	--	24,5	28	32	48	--
500	620	650	660	--	--	26,5	31,5	36,5	--	--
600	725	770	770	--	--	30	36	42	--	--
700	840	840	--	--	--	32,5	39,5	--	--	--
800	950	950	--	--	--	35	43	--	--	--
900	1050	1050	--	--	--	37,5	46,5	--	--	--
1000	1160	1170	--	--	--	40	50	--	--	--
1200	**Dimension 1200 – 1400 On REQUEST**									
1400										

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Nero Needle Valves

Hydraulic specifications:

The piston can be equipped, under operative functioning conditions, with a stainless steel cylinder adequately perforated and slotted that symmetrically subdivides the flow into more radial jets colliding among themselves at the centre of the valve.

This accessory allows modulating the energy dissipation by:
- Modifying that valve adjustment curve in function of the plant's effective requirements;
- Sensibly improving the resistance at the valve's cavitation's.

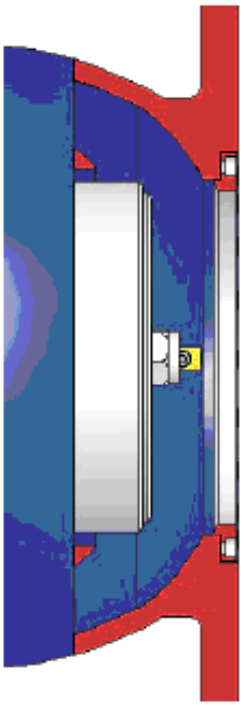
Standard perforated and slotted cylinders called K20 - K50 - K100 - K150 are available having resistance at the cavitations characteristics and progressively growing load losses.

Special perforated cylinders can be used where the dimension, the form and the apertures' distribution is calculated on the basis of the valve's operative effective conditions.

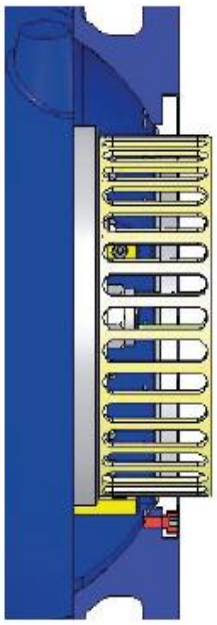
It is thus possible to obtain, for example, low load losses with open valve and high resistance to the cavitation's at the valve's minor aperture degrees

Type of Needle Valves in terms of Seating:

Standard Type



Slotted Cylinder Type



Standard Type
As a shot-off and flow regulating
Valve under high pressure differences and
Sufficient down stream pressure

Slotted cylinder Type:
as flow and pressure regulating valve
under high pressure differences and low down
stream pressure
For the optimization of the pump function/ in the Line

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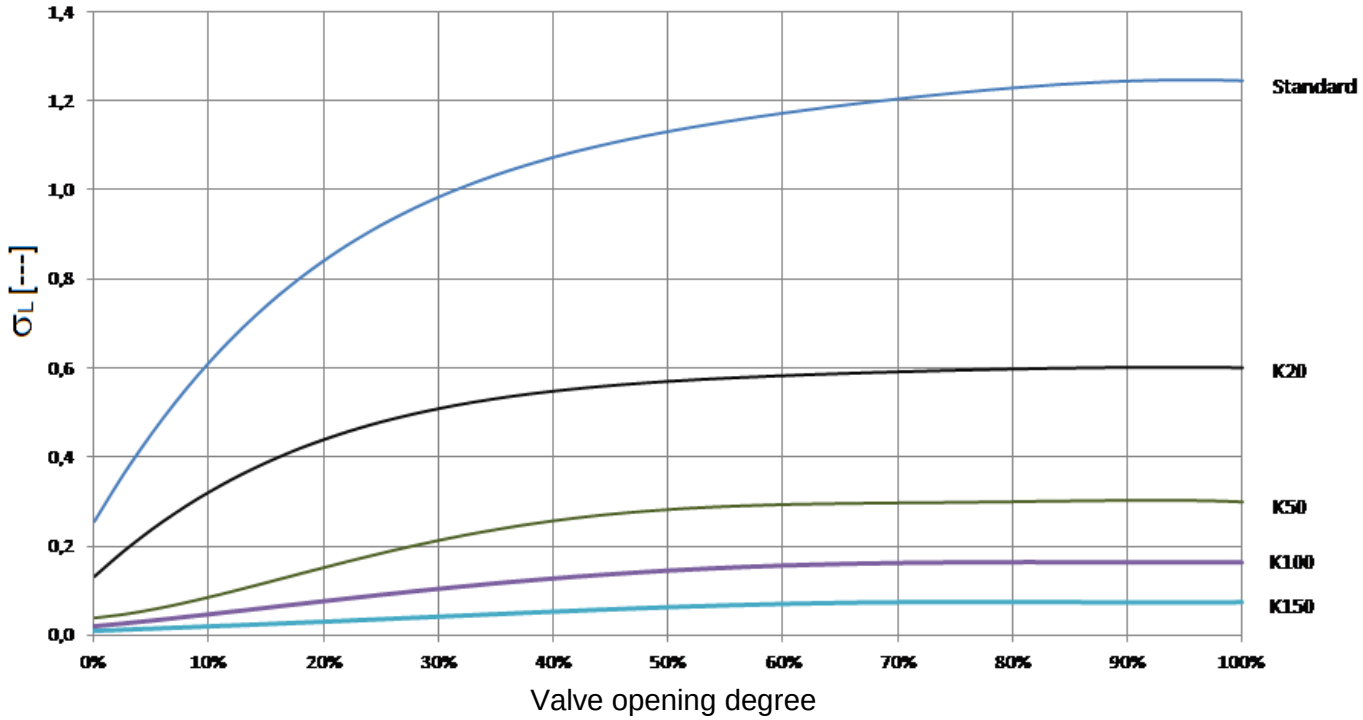
Hydraulic Specifications

NEEDLE VALVES F500 / Cavitation limit



Calculating of Pressure Drops ΔP
Water 20°C

$$\Delta P = Pin - Pout = \left(\frac{Q}{Kv}\right)^2$$

$$\Delta P = Pin - Pout = \zeta \frac{v^2}{2g}$$

Flow rate	**Q (m³/h)**
Valve Flow coefficient	**Kv (m³/h)**
Valve pressure drops coefficient	**ζ (---)**
Pressures, pressure drops	**pin, pout, ΔP (bar)**
Fluid velocity	**v (m/s)**
Gravity constant	**g = 9, 81 (m/s)**

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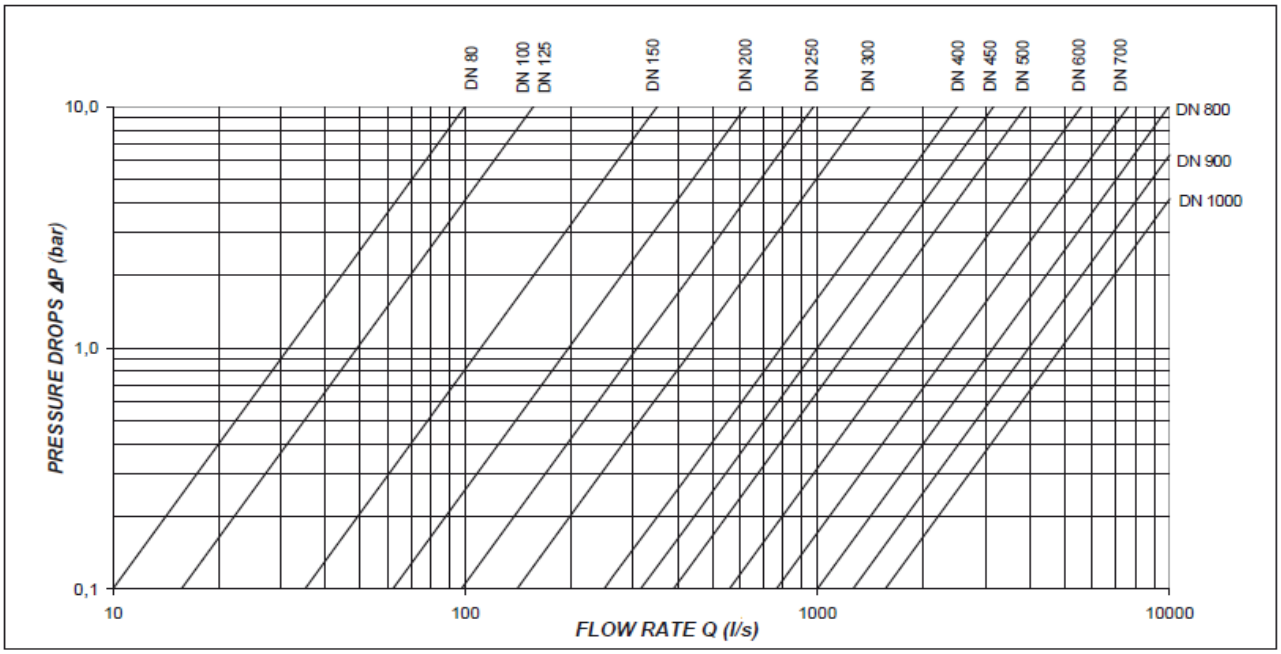
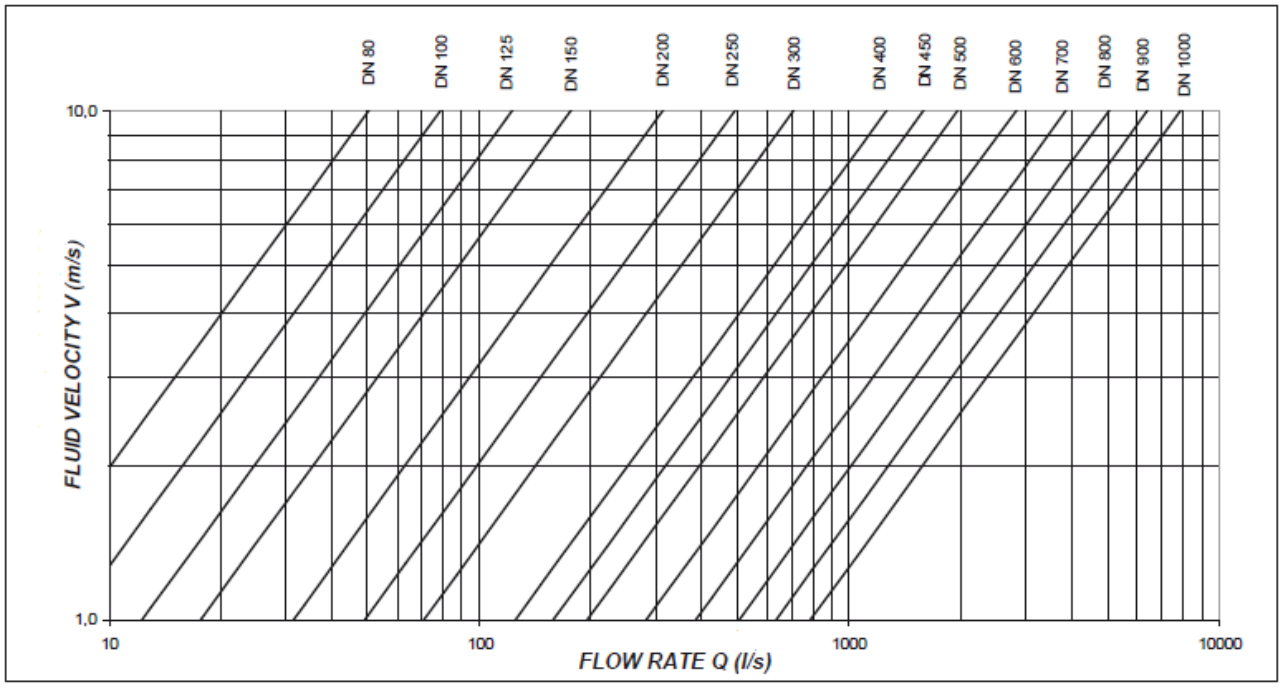
Nero Needle Valves

Pressure Drops Diagram (Standard Valve 100% open)



Flow Rate / Fluid Velocity Diagram



Examples of applications

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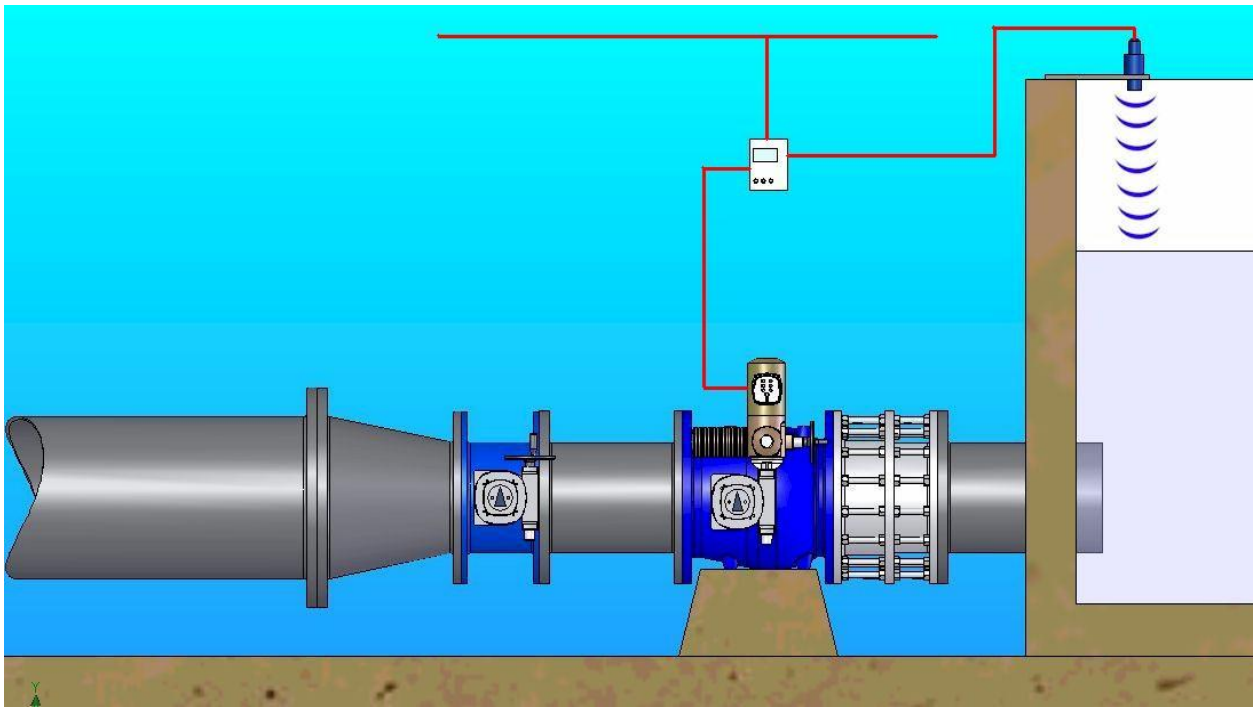
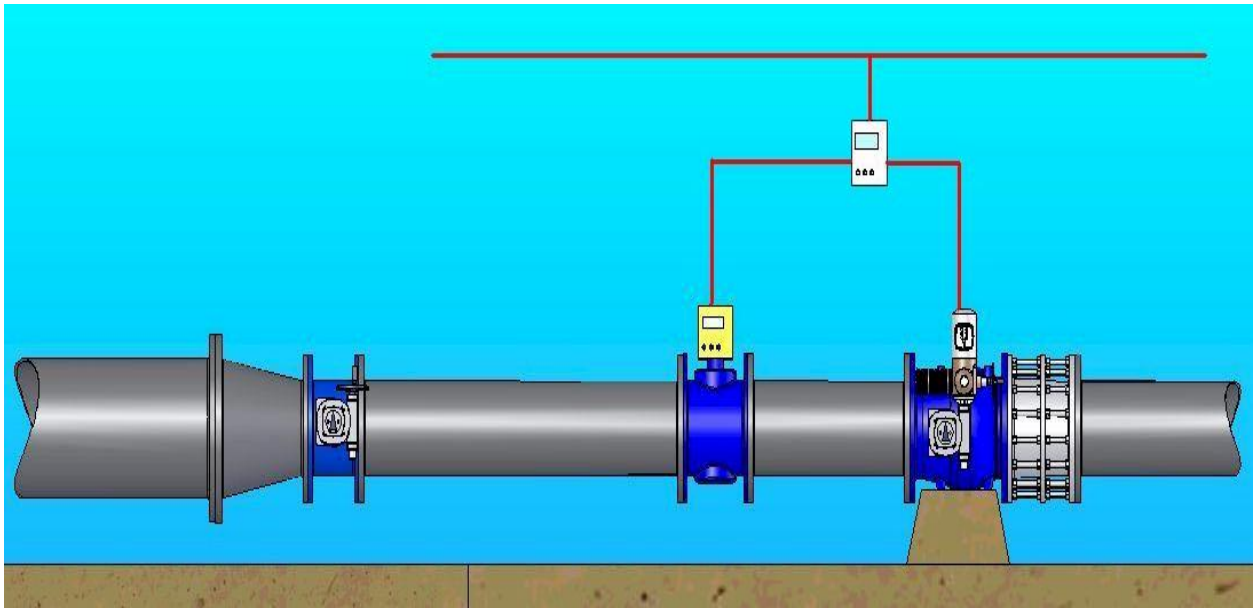
Nero Needle Valves

Nero Needle valves with electric actuator, modulating function to control water level

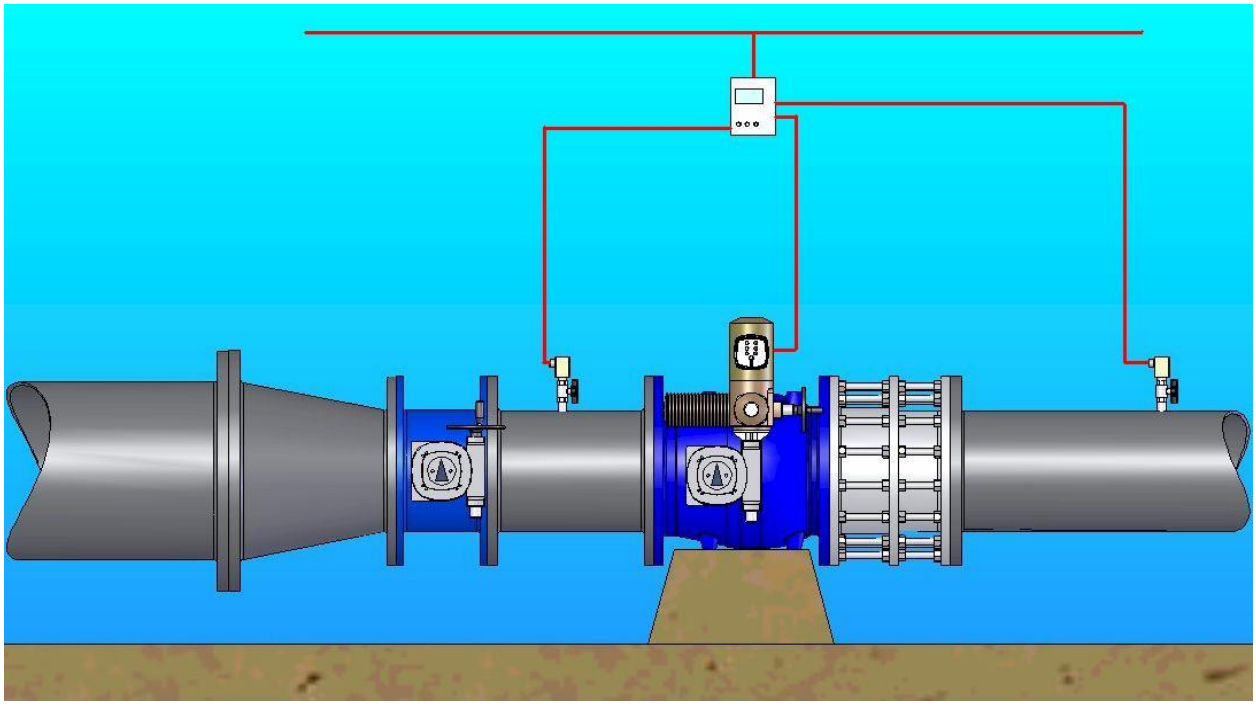


Needle valves as a rate of flow control valve

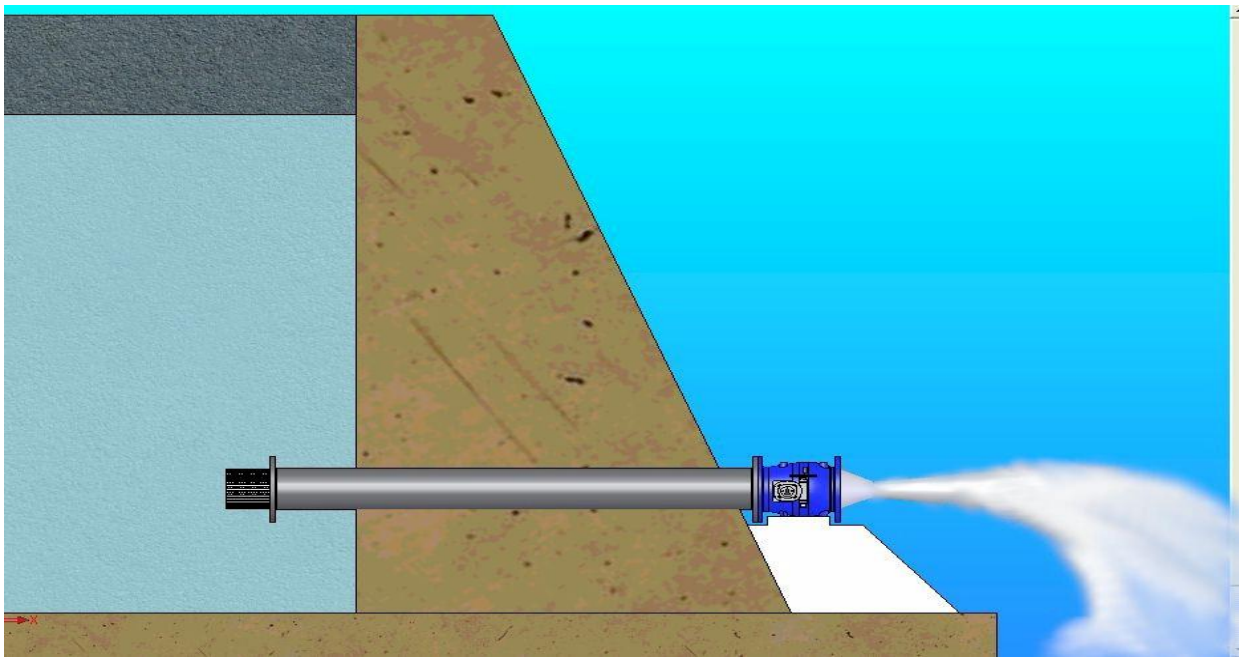


Nero Needle valve as a pressure reducing and sustaining

Nero Needle Valves

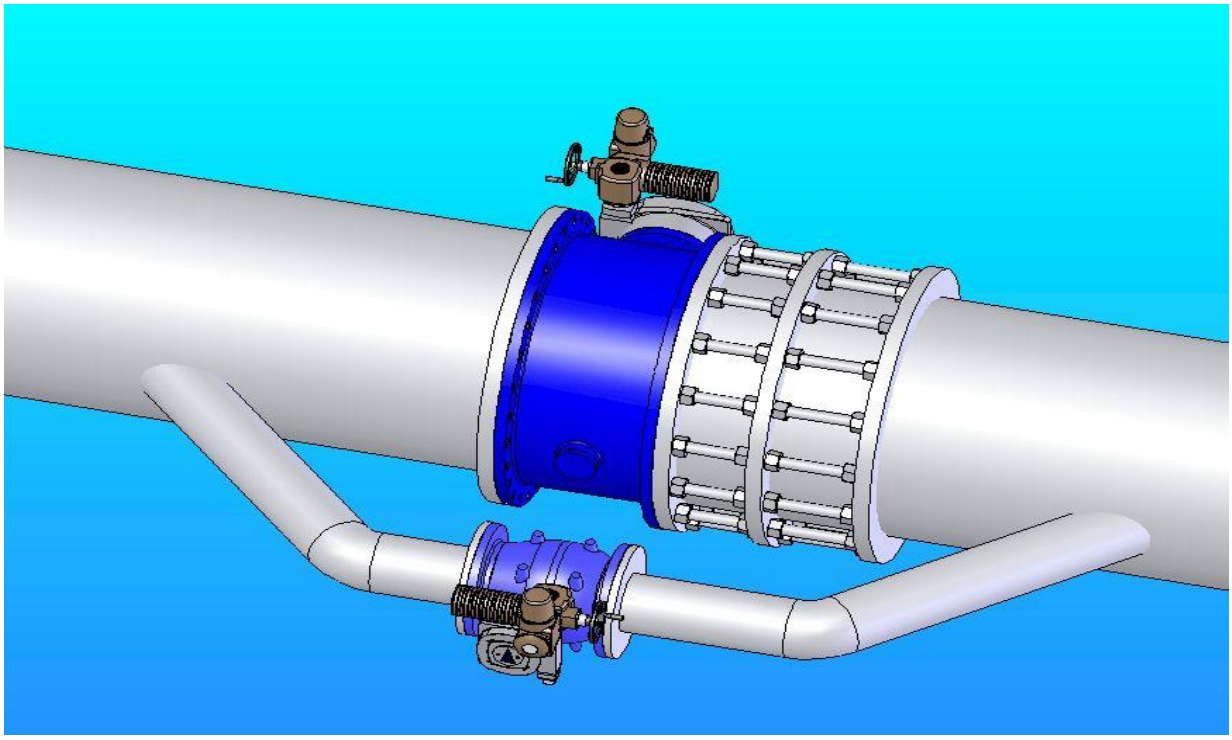


Nero Needle valves as bottom outlet valve “free discharge” of dam



Nero Needle valves as by-pass to fill the main pipe being closed

Nero Needle Valves



Nero Needle valve with float actuator (modulating functioning)