NENCINI®
CUSTOM-MADE WATERWORKS VALVES

A member
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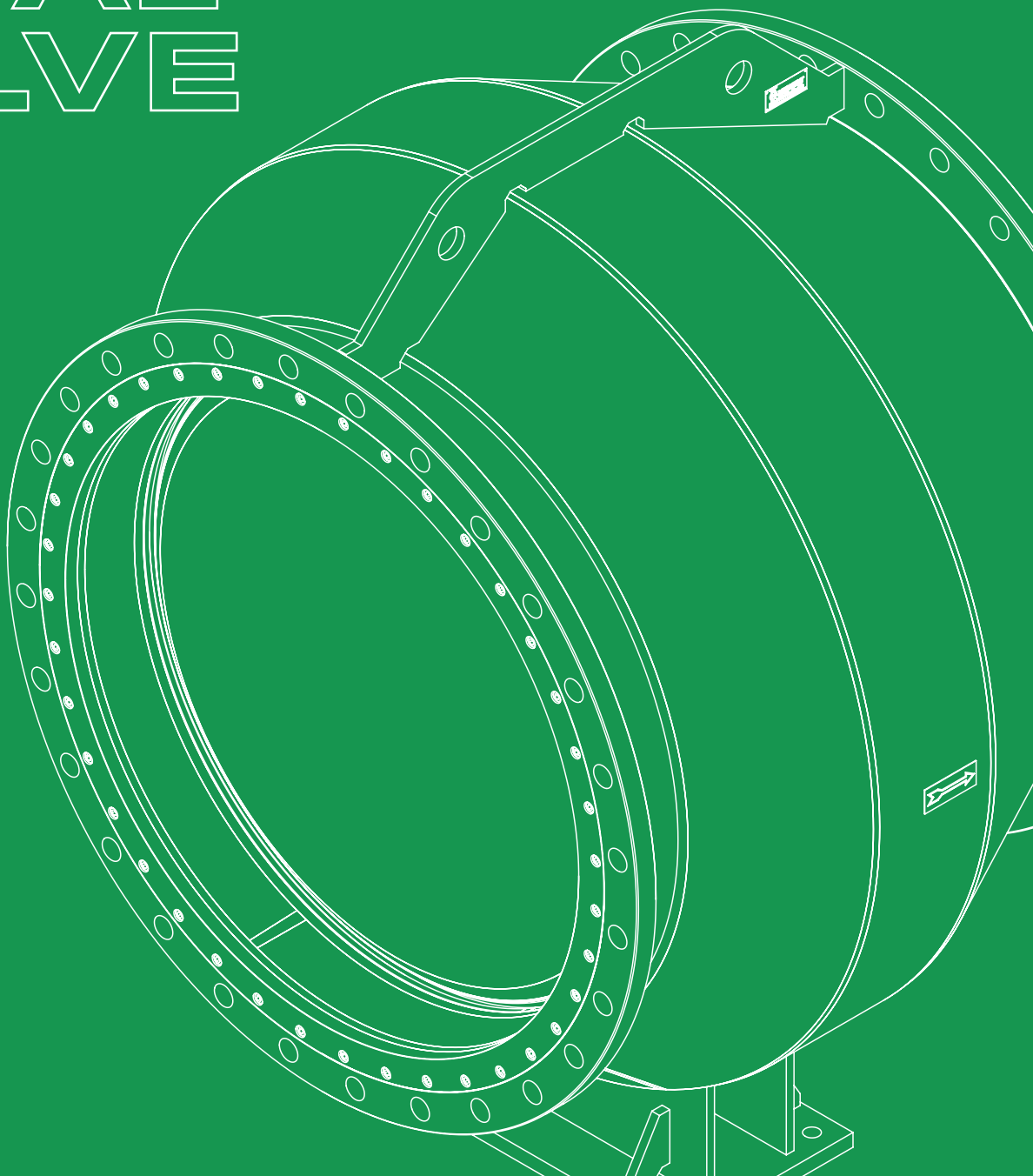
Group

NON-RETURN AXIAL VALVE



Established since 1967, **Nencini** has over fifty years of design and manufacturing experience. As a re-sult, Nencini can accomplish any job efficiently and effectively. Research and Development is an important part of the company strategy and we pride ourselves in our ability to provide modern and effective design solutions with our fully customizable valves. Our experience covers the complete range of hydraulic valves and structures, i.e. flow control valves, on/off and safety valves, automatic valves, discharge valves, penstocks, radial gates, slide gates for high pressure outlets, stop logs, etc.

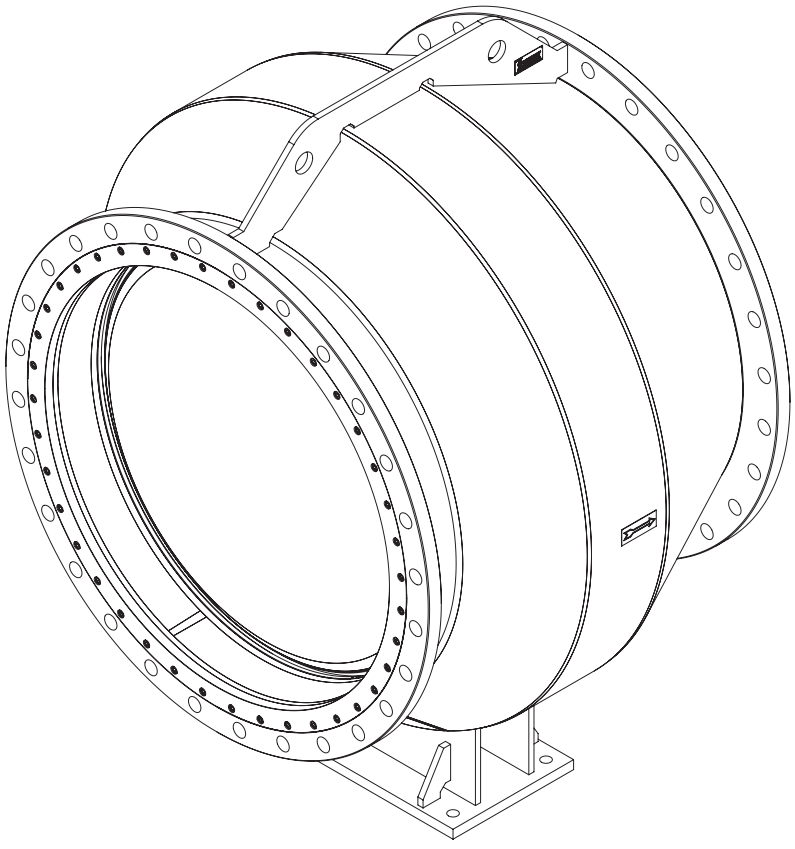
NON-RETURN AXIAL VALVE

Non-return valves are self-actuated devices that react to the pressure/flow variations in a piping system. They are one-way valves allowing the fluid to flow in only one direction.

The Nencini check valve, which is of the axial type, has an optimum fluid-dynamic flow path through the valve, because there is no restriction and no vari-ation in the direction of the flow. The advantages of this valve style, when compared to different check valve types (e.g. tilt-ed, swing, ball, dual disc, ..) are lower turbulence and noise level, absence of vibration and erosion, and extremely high flow capacity.

This highly efficient design combined with the highly respon-sive non-slam operation makes this valve ideally suited for any demanding check valve application.

Our non-return valve design is a direct result of our know-how due to decades of experience; choosing a Nencini check valve will give you the confidence of real world proven reliability and performance.



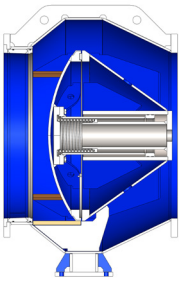
⊕ OPERATIVE PRINCIPLE AND SPRING SIZING

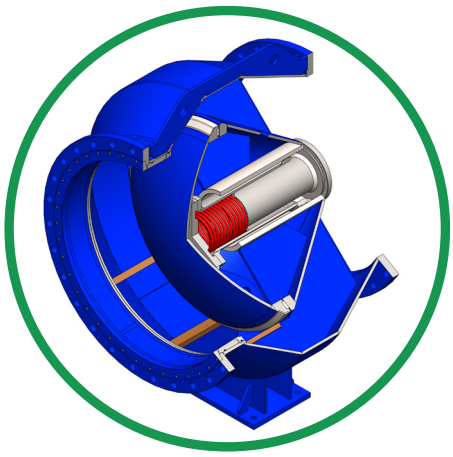
The valve is of automatic and self-operated type:

The actuation of the valve is performed and powered by the following two main units/actions:

1. **the water hydrodynamic action which has the tendency to open the Valve**
2. **the spring action which has the tendency to close the Valve**

In case of dead water (no flow), the spring holds the disc in the full closed position

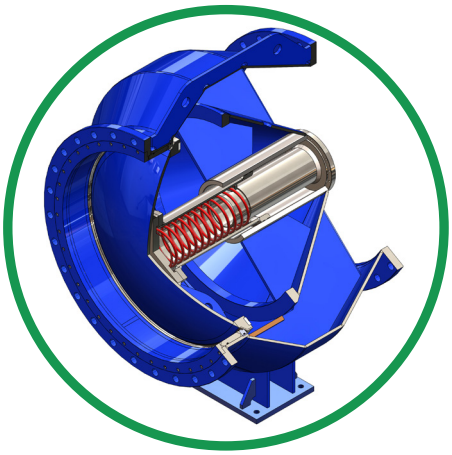


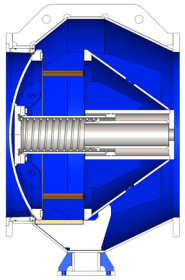


When the flow rate increases, the disc starts to open from the minimum flow condition and shall be in wide open po-sition for a greater flow rate value, with the maximum spring compression

As the flow decreases, the disc starts to close, while the spring provides a powerful closing force and the valve clos-es before the flow is reversed, preventing water hammer and minimizing critical transient phenomena.

No vibration and/or disc flapping phenomena occurs once the valve is under the piping exercise condition.





⊕ THE SPRING

A particularly important element in the design of non-return valves is the spring. In fact, the spring itself plays a key role in the opera-tion of this equipment.

Nencini, project by project, performs the spring sizing and design, resulting in a customized valve to match all the required flow con-ditions of the specific piping.

Over its operating range, the dedicate spring design gives the sta-ble and regular disc motion, without any unsteady position.

For critical application, Nencini can also associate the spring with an internal servomotor, with the purpose of adding a further damping device, to provide special maintenance operations and/or for specific different project requirements.

⊕ VALVE PERFORMANCE

The behavior of each non-return valve is well summarized by the curve of its dimensionless dy-namic characteristics; Nencini has defined this parameter over its many years of experience, by analytic and CFD simulation, collaborating with internationally renowned hydraulic laboratories and by collecting real world data on sites.

Furthermore, each valve capacity is well selected by meaning of its head loss coefficient and flow coefficient, e.g. from its K and Cv curves.

⊕ SEAT AND END CONNECTIONS

The seating of the non-return valve can be of metal-to-metal type or by soft type, depending on the project requirement and the involved medium.

Flanges are usually designed and drilled conforming to the international standards ISO/ ASTM/DIN/UNI, but could also match same particular different requirement of the project.

⊕ APPLICATIONS

Nencini has been designing and manufacturing non-return valve in sizes up to 1500 mm and pres-sure classes of up to 100 bars.

Thanks to the knowledge acquired during these decades of experi-ence, we have the required know-how and approach to solve any critical design challenge.

The valve materials and the related lining and / or painting application are tailored to the project specification and clients' requests. Moreover, the main valve body can either be casted or welded, so that the client material and dimensional requirements can always be met.

VALVE DN mm(inch)	PRESSURE RATING			
	PN 20 (ANSI 150)	PN 50 (ANSI 300)	PN 64 (ANSI 400)	PN 100 (ANSI 600)
< 3200 (126")	CASTED/WELDED			

⊕ QUALITY SYSTEM

Nencini follows the international quality system standard EN ISO 9001:2015.

However, the real testimony to the quality of our products are our satisfied customers around the world for the last 50 years, including many re-nowned engineering consultancy companies like ALSTOM Power, ATB, ENI, Saipem, Salini Impre-gilo, Mirjana Engineering and Voith.

Through close collaboration with our clients, we are able to help define system specification and perform accurate hydraulic studies based on literature studies and experi-mental data as well as structural analysis by in-house de-veloped tools and ANSYS when required. For the analysis of the hydraulic performance during the opening and closing operation of the butterfly valves we use empirical formulas and Computational Fluid Dynamics. Further-more, we conduct destructive as well as non-destructive test on the used materials and perform pressure tests on the final product with the client.

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