

Intelligent Design Needle Valve

The ProControl Needle Valve is the result of AVM's expertise in cutting edge valve technology, starting more than 5 decades ago.

Introduction:

In most cases, to regulate the flow, the only thing one can do is to adjust/restrict the open section area of the passage in the valve, i.e. the flow area. Doing this is called throttling. It may sound easy, but in fact throttling is a very challenging task; reason being that the water will try to maintain the same flow rate through the throttled/restricted zone, with the result being increased flow velocity and a real risk of local water jets, even cavitation.



To cope with such extreme conditions, a high-tech, well-designed anti-cavitation valve is required. The inline version of this premium valve type is called Needle Valve. (AVM also has a special version called Submerged Discharge Valve, please ask us for details.)

Operation Principle of ProControl ID-NV:

The only possible way to reduce the capacity of the water coming out of the valve, under a certain given differential pressure, is to restrict the flow area. This restriction can cause water jets, conditions that can in turn can cause cavitation and a high amount of energy that needs to be transformed.

In general, all Needle Valves have a fixed ported zone to reach maximum flow when the valve is fully open, and have a balanced cylindrical throttling element, allowing the flow to be reduced in a controlled manner. The cylinder will be open in both ends, allowing very low operation forces.

AVM ProControl ID-NV:

All Needle Valves work according to the same principle: The water is first directed to the outer part of the valve, and thereafter is being directed to the centre of the flow via the throttling zone. In this way, the water jets all "meet" in the centre of the flow, where there is no material, only water. In this way, keeping the cavitation in the centre of the pipeline, all material damage can be eliminated.

AVM ProControl ID-NV works according to the same principle; however, we have improved the basic design in several areas:

- Similar to other needle valves, AVM ProControl ID-NV has a balanced piston for throttling. All such pistons have two open ends, which need to be sealed in the front and in the back, for closing of the valve. However, AVM ID-NV has its front seal in the safe zone, where it

never will be affected by water jets or cavitation. On most other needle valve designs, the front seal is the weakest part of the valve.

- In conventional designs, the piston is either fully guided, or in the front and back. This can cause a possible blockage of the piston from foreign material in the medium, which can get trapped at the guiding face area. In comparison, AVM ProControl ID-NV has a stripped guide design. In this design, there are several rib style guides, and as a result the piston never can get blocked by foreign objects.
- Our anti-cavitation throttling trim (slotted cage, perforated cage or other) is easily replaceable.

Sewage type

Material selection:

AVM ProControl ID-NV has a robust single piece cast housing in ductile iron as standard. Other materials are available on request. All critical parts are in AISI 316 stainless steel (constructed or cast), including the main slotted body piece, since this is the best material for anti-cavitation and erosion resistance. Only the bush bearing systems are made of copper alloys, and all those are out of the cavitation and water jet zone. Rubber seals are EPDM and retainer bolts are A4.

Size Range and Pressure:

DN100 to DN2000 as standard

PN6 to PN64 as standard

Drive options:

- Worm gearbox & handwheel.
- Worm gearbox & electric actuator.
- Hydraulic actuator, double-acting.
- Hydraulic actuator + weight closure.