

**NEW!**



**ERHARD  
VALVES**

**ERHARD  
NON SLAM Nozzle Check Valves**

**DN 80 - DN 600**

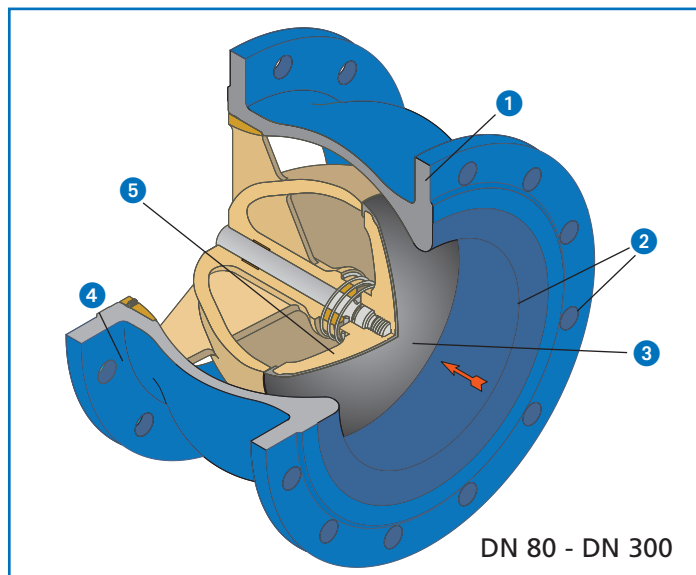


# The **ERHARD** NON SLAM Nozzle Check Valve sets new standards:

The **ERHARD** NON SLAM Nozzle Check Valve is one of the most economical valves among the different types of check valves. It is used to prevent reflux of the

flow medium in a pipeline. The innovative NON SLAM Nozzle Check Valve offers **ERHARD** quality with an optimum price-output ratio and excellent

hydraulic performance. Thanks to some special design features, the NON SLAM Nozzle Check Valve is the ideal non-return valve for any application.



## Fields of application:

- ⇒ Water supply
- ⇒ Pump stations
- ⇒ Water distribution
- ⇒ Process engineering and Industry

## Flow media:

- ⇒ Untreated water and drinking water
- ⇒ Cleaned sewage water

## Typical examples of application:

Non-return valve in pumping stations (with single or parallel pump operation), Non-return valve in cooling-water circuits, Foot valve in pumping stations, Non-return valve for energy storage or network systems (e.g. delivery reservoirs, pipe networks, elevated tanks, headwater basins).

## Performance

Very low head loss thanks to optimised streamlined design: head loss coefficient  $\zeta = 0.5 - 0.7$  in fully open position

Compact shape and short face-to-face dimension. Standard face-to-face to EN 558 series 14.

High-grade surface protection: outside: **EKB**-epoxy coating, inside: **ERHARD** vitreous enamel

Streamlined valve disc: corrosion resistant material with rubber coating (zinc-free bronze/NBR)

Optimum hydraulic characteristics: quick response, short closing stroke

Reliable long-life design:  
 - internal body secured, made of corrosion resistant material (zinc-free bronze),  
 - all interfaces protected against corrosion  
 - maintenance-free guiding bushes

Comprehensive field of application:  
 - spring force adapted to the various cases of application  
 - suitable for high flow velocities and pressure ratings

## Your Advantages

Very economical: continuous energy saving, low operating costs

1) Light weight, very little space requirement with standardised length

2) No rust, thus reliable and clean: permanent protection, safe operation ensured

3) Resilient-seated /permanent tightness (rate A = no drops per minute)  
 Optimum protection against corrosion  
 KTW approved elastomer

4) Reliable and safe operation, minimising water hammer  
 Smooth and quick closing

5) Safe function for life  
 Internal components easily exchangeable  
 Optimum protection against corrosion

Universal application:  
 - any position of installation possible (horizontal/vertical inclined)  
 - adaptable to any plant conditions

1) Corresponds to a head loss < 16 mbars

2) Fully open position attained at a flow velocity of 2 m/s.

3) Value for DN 80 - DN 300

# ERHARD NON SLAM Nozzle Check Valves

## Scope of supply:

Sizes: DN 80-300; DN 350-600

Temperatures up to: 70° C ( Water)

Pressure ratings: PN 10-40; PN 10-16

Face-to-face dimensions: adaptation to all the common face-to-face dimensions possible

Special designs upon request.

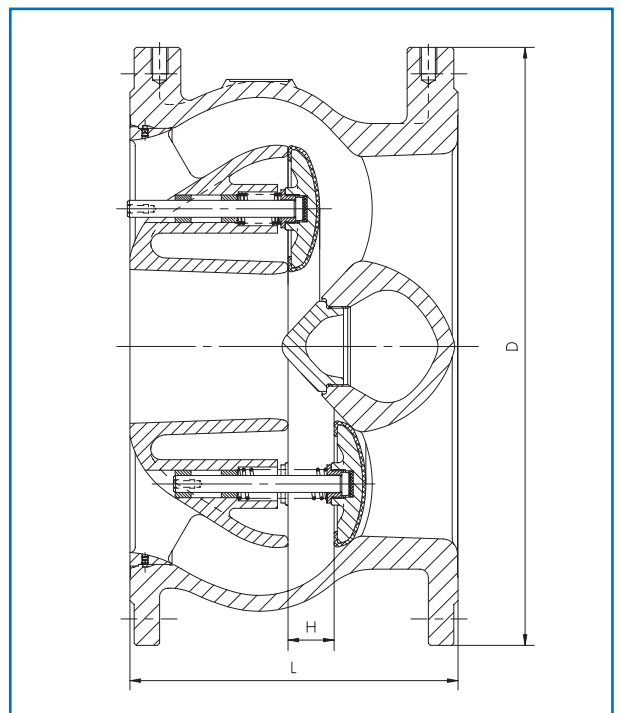
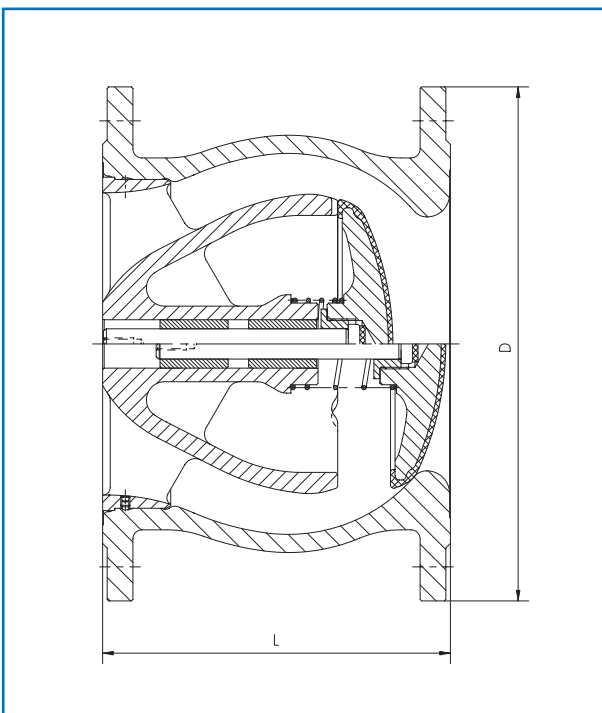
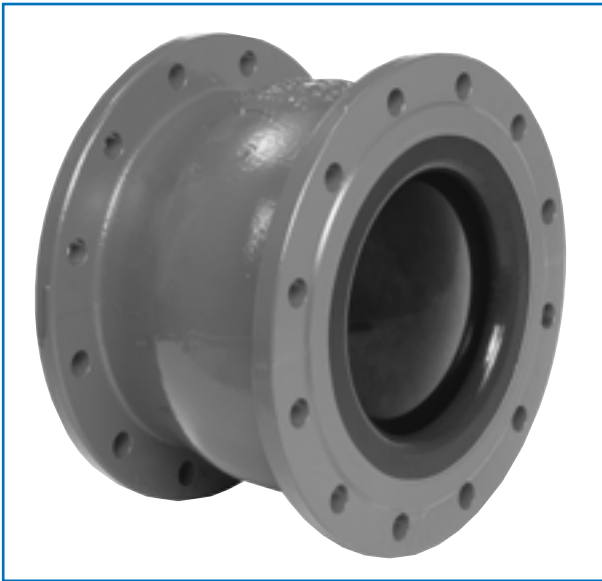
## Types:

DN 80 - 300

rubber-coated valve disc, KTW and W270 approvals

DN 350 - 600

rubber-coated valve ring, KTW and W270 approvals



## Materials:

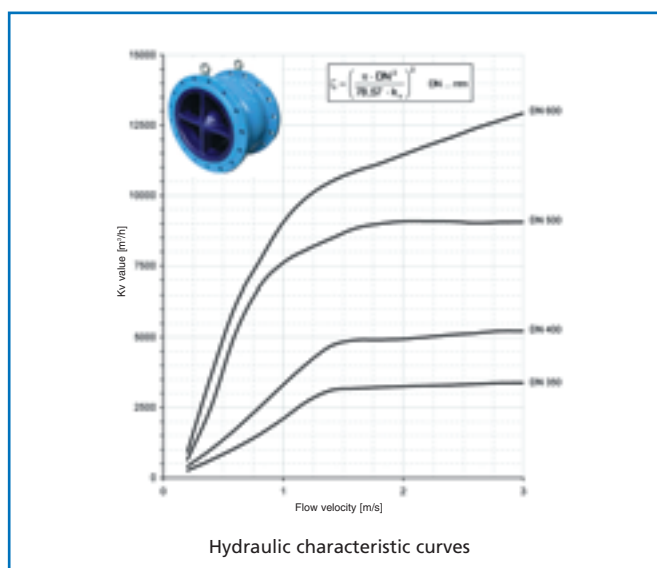
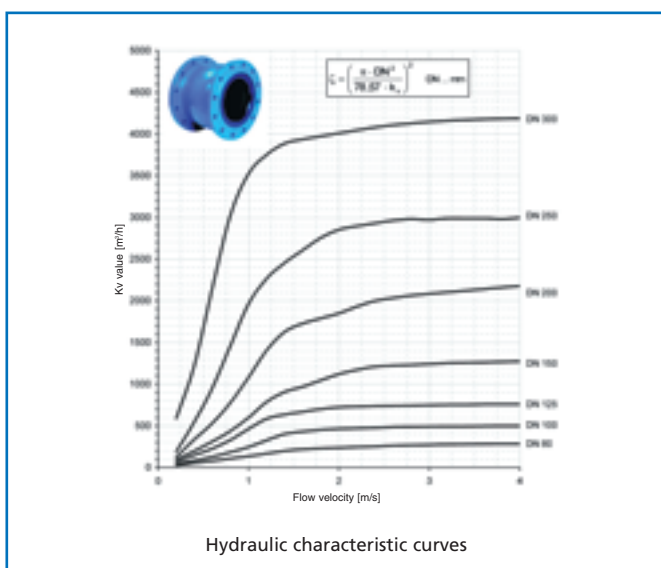
(standard design – special types upon request!)

|                              |  |
|------------------------------|--|
| Valve disc / valve ring:     | zinc-free bronze / stainless steel 1.4404 / elastomer KTW/W270 |
| Internal body:               | zinc-free bronze   |
| Guiding stem:                | stainless steel  |
| Guiding bush:                | high-performance polymer                                       |
| Body:                        | ductile cast iron  |
| Spring:                      | stainless steel  |
| Surface protection, outside: | <b>EKB</b> epoxy coating                                       |
| Surface protection, inside:  | <b>ERHARD</b> vitreous enamel                                  |

## Dimensions, weights:

| Size<br>DN | Face-to-face L<br>(EN 558-series14)<br>mm | Weight<br>approx.<br>kg | Flange outside dia D<br>mm |          |          |          |          |
|------------|---|-------------------------|----------------------------|----------|----------|----------|----------|
|            |   |                         | PN<br>10/16                | PN<br>10 | PN<br>16 | PN<br>25 | PN<br>40 |
| DN 80      | 180                                       | 14                      | –                          | –        | 200      | 200      | 200      |
| DN 100     | 190                                       | 19                      | –                          | –        | 220      | 235      | 235      |
| DN 125     | 200                                       | 27                      | –                          | –        | 250      | 270      | 270      |
| DN 150     | 210                                       | 32                      | –                          | –        | 285      | 300      | 300      |
| DN 200     | 230                                       | 50                      | 340                        | –        | 340      | 360      | 375      |
| DN 250     | 250                                       | 70                      | 400                        | –        | 400      | 425      | 450      |
| DN 300     | 270                                       | 97                      | 455                        | –        | 455      | 485      | 515      |
| DN 350     | 290                                       | 135                     | 505                        | –        | 520      | –        | –        |
| DN 400     | 310                                       | 165                     | 565                        | –        | 580      | –        | –        |
| DN 500     | 350                                       | 275                     | 670                        | –        | 715      | –        | –        |
| DN 600     | 390                                       | 480                     | 780                        | –        | 840      | –        | –        |

## Characteristic curves



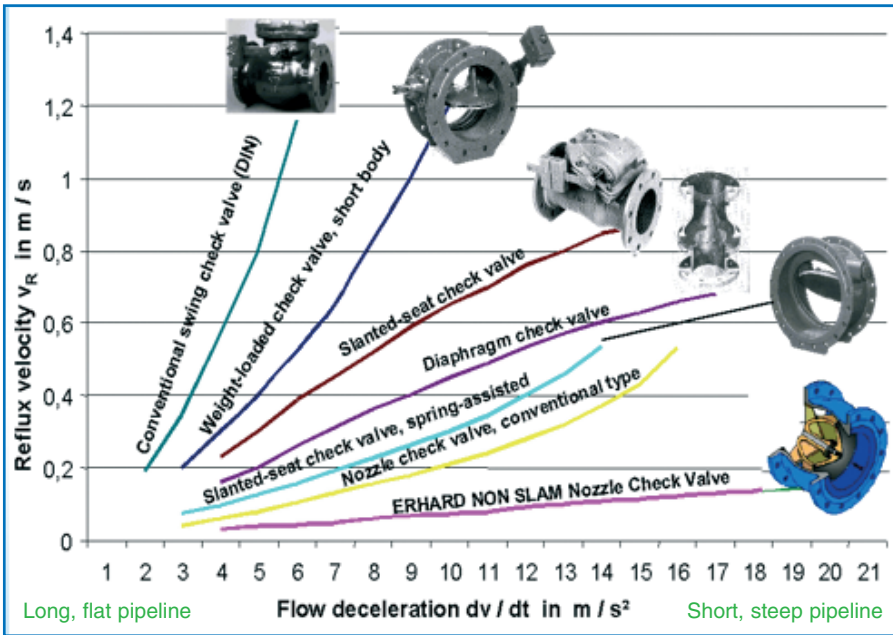
## Enquiry / quotation:

We need the following data for preparing a quotation:

- ⇒ Size DN
- ⇒ Temperature range
- ⇒ Position of installation
- ⇒ Pressure rating PN
- ⇒ Flow velocities (min./max.)
- ⇒ Case of application
- ⇒ Type of flow medium / analysis
- ⇒ Characteristic curve of the plant

Please, contact us. We will be glad to advise you.

# Optimum closing characteristics



The valve disc or ring, the spring, and the closing travel have been designed in such a way that, compared to other types of non-return valves, the ERHARD NON SLAM Nozzle Check Valve acts so quickly that reflux velocities will be minimized, even in case of extremely high flow deceleration (e.g. vertical pipeline). This will lead to a smooth decrease of the flow and the water hammer phenomena will be minimum.

The value of the deceleration depends on the plant.

**Example:** plant with  $8 m/s^2$ :  
 Weight-loaded check valve:  
 $V_R = 0.85 m/s$

ERHARD Non Slam Nozzle Check Valve:

$V_R = 0.1 m/s$

According to Joukowsky, the theoretical max. water hammer effects are as follows:

For weight-loaded check valve:  
 $\Delta H_D = 85 mWC$

For ERHARD Non Slam Nozzle Check Valve:  $\Delta H_D = 10 mWC$

**Water hammer (Joukowsky)**

$$\Delta H_D = \frac{a \cdot \Delta V_{Rmax}}{g}$$

|                         |  |                       |
|-------------------------|--|-----------------------|
| $\Delta H_D$ .....      | Water hammer   | [mWC]                 |
| $a$ .....               | Pressure wave velocity   | [m/s] (1000m/s)       |
| $\Delta V_{Rmax}$ ..... | Modification of the reflux velocity at the Check Valve in case of pump failure | [m/s]                 |
| $g$ .....               | Acceleration due to gravity  | [m/s] (9,81 $m/s^2$ ) |

The water flowing back will be damped to  $v = 0 m/s$  within the reflexion time (Joukowsky).

## Special Feature: NON SLAM Nozzle Check Valve with position indicator



a.) Visual indicator and Open - Closed limit switches

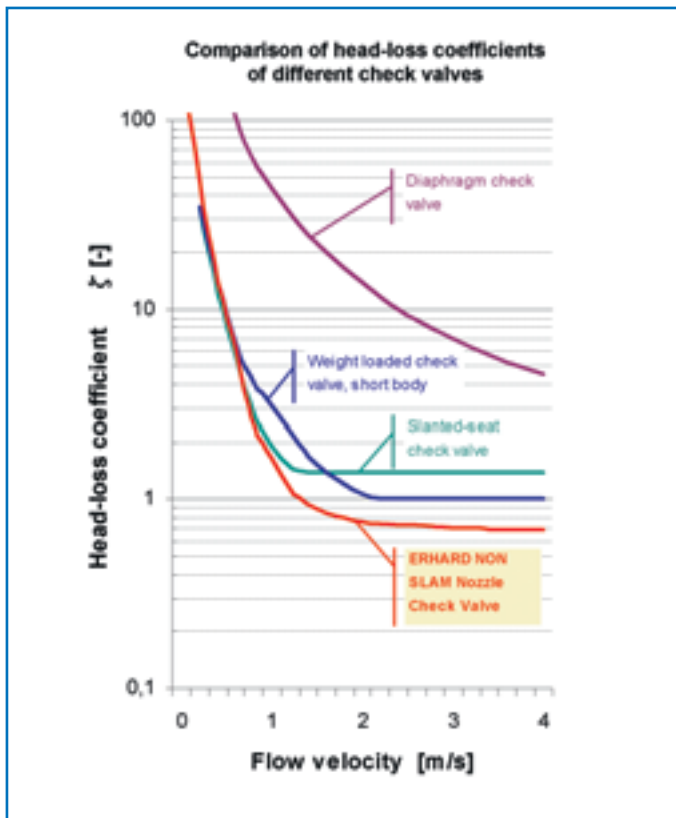


b.) Visual indicator with position sensor

## Hydraulic characteristics compared with other valves:

### Very economical:

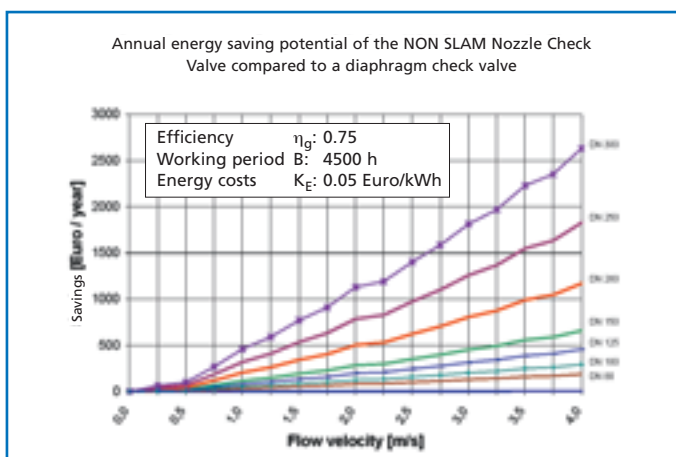
The optimized curve of cross sections and the well designed streamlined contour of the **ERHARD** NON SLAM Nozzle Check Valve result in minimum head-loss coefficient during operation. Compared to other check valves, its ZETA-value will be 0.5 for size DN 150 in fully open position (at a flow velocity of approx. 2m/s).



### Continuous cost saving:

The **ERHARD** NON SLAM Nozzle Check Valve allows enormous energy saving – thanks to its low head-loss coefficients. The diagram shows that for large sizes and high flow velocities, the annual saving might even exceed the purchase price of the valve.

The diagram shows sizes DN 80 - DN 300. For sizes DN 350 - 600, similar savings can be expected.



The above energy cost saving is based on the following equation:

$$\Delta C = \frac{\pi \cdot DN^2 \cdot v^3 \cdot (\zeta_2 - \zeta_1) \cdot \rho}{8000 \cdot \eta_g} \cdot B \cdot K_E$$

**Symbols and units:**

|            |                                     |                  |
|------------|-------------------------------------|------------------|
| $\Delta C$ | cost saving per time unit           | [Euro/a]         |
| DN         | nominal diameter of pipe/valve      | [m]              |
| v          | flow velocity                       | [m/s]            |
| $K_1$      | head-loss coefficient of valve 1    | [-]              |
| $K_2$      | head-loss coefficient of valve 2    | [-]              |
| $\eta_g$   | overall efficiency of pumping plant | [-]              |
| B          | running time of pumping plant       | [h/a]            |
| $K_E$      | energy costs                        | [Euro/Kwh]       |
| $\rho$     | density of the flow medium          | $\frac{kg}{m^3}$ |

### Example DN 300:

With DN 300 and an assumed flow velocity of 2.5 m/s, the possible annual saving when using an **ERHARD** NON SLAM Nozzle Check Valve instead of a diaphragm check valve will be about 1400.– EURO per year.

In any case, it pays to compare the costs.

Postfach 1280 · D-89502 Heidenheim  
 Phone: +49(0)73 21 3 20-0 · Fax: +49(0)73 21 3 20-5 25  
<http://www.erhard.de>  
 e-mail: [export@erhard.de](mailto:export@erhard.de)

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